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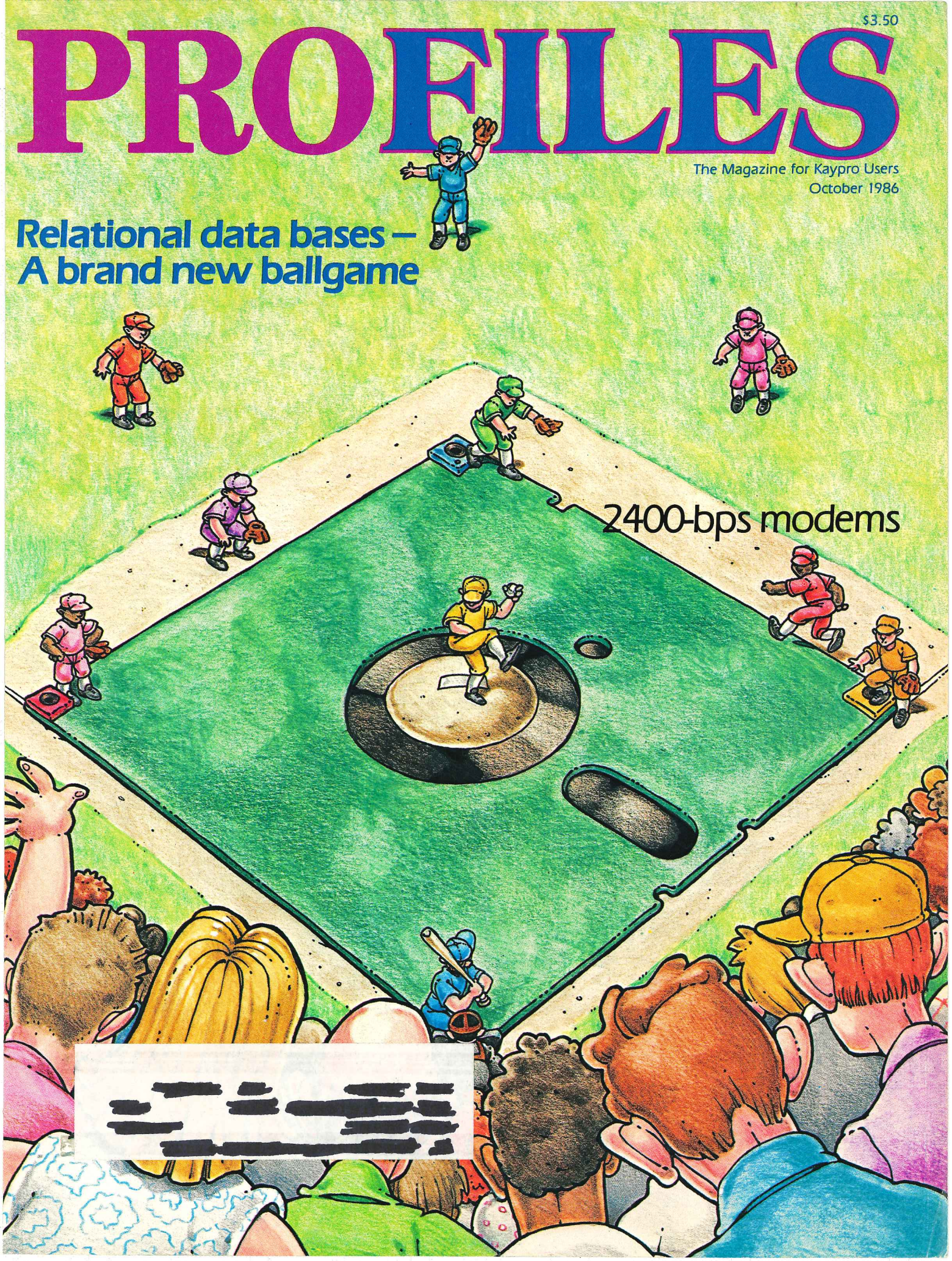
PROFILES

The Magazine for Kaypro Users
October 1986

Relational data bases – A brand new ballgame

2400-bps modems



"The Sears Of CP/M" -Peter McWilliams

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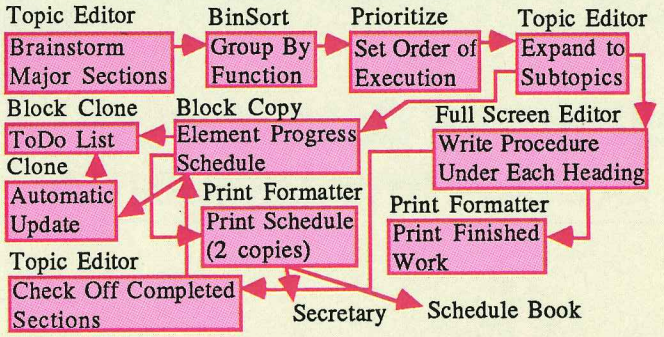
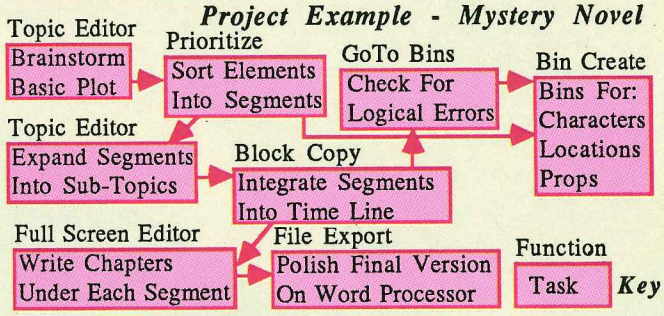


Project Example - Mystery Novel



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> ...by the way, ***Thoughtline*** is just right - excellent balance in design - *Dick Runke*
>
> To the basic software I use frequently (WordStar, Supercalc II) I now add without reservation ***Thoughtline***, as being equally useful and equally significant - *Fred Schultze*
>
> ...and as for ***Thoughtline***, WOW! I bought KAMAS and waded though Adam Trent's obtuse mental gyrations until I was literally dizzy ...I sent for KAMAS's little brother OutThink. Again, another great disappointment. ...then comes ***Thoughtline***. Now I can outline my books and articles just as I had hoped to when I bought KAMAS and OutThink. - *Dr. Eric Skousen, Writer*
>
> *All User comments are unsolicited, from letters on file.*

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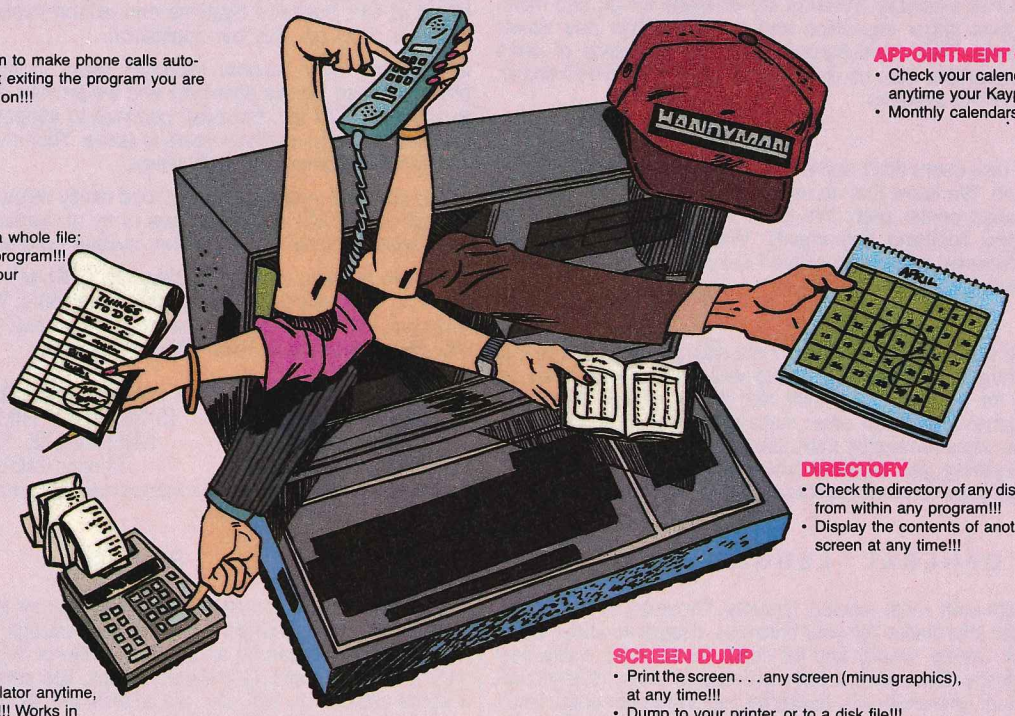

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CP/M users may become MS-DOS users in the years ahead; CPI has planned ahead for this possibility and we provide data file conversion service to any user. CPI will, however, continue to support and enhance these fine systems for CP/M users for years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

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ACCOUNTS RECEIVABLE

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

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$80.00 CP/M — $100.00 MS-DOS

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CAPACITIES - 600/2000 emp. (CPM/MS-DOS), 98 Tax File Rcds.

ACCOUNTS PAYABLE

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

HARDWARE REQUIREMENTS

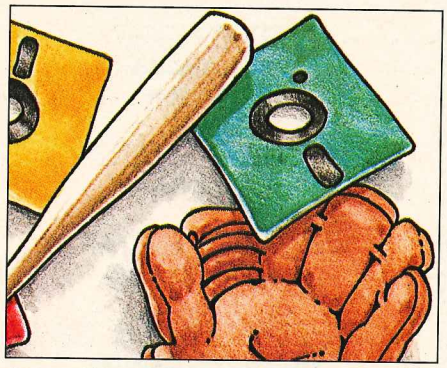
CP/M: 64K (53K TPA) & CP/M 2.0 or higher.
MS-DOS: 128K (or more) & MS-DOS/PC-DOS 2.0 or higher - ANSI.SYS.
Printer: 132 columns (compressed pitch supported), continuous forms.
Disk/s: Dual Floppies/Hard Disk/Both - 191K recommended, less works.
CRT: 80/24 with Clear, Home, Clear to EOL, Up, Down, Left,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

CURRENT UPDATE: **NEW A/R STSTEM FOR CP/M AND MS-DOS USERS NOW SHIPPING. NEW FEATURES INCLUDE 4 LINE NAME AND ADDRESS, FINANCE CHARGES, VARIABLE AGEING, DESCRIPTIVE BILLING, ASCII OUTPUT FILES, MULTI-CLIENT PROCESSING. MANY NEW REPORTS, ITEM INVOICE FORMATS, SERVICE INVOICE FORMATS, STATEMENT FORMATS, ETC. FOR PLAIN PAPER AND MANY POPULAR PRE-PRINTED FORMS. TAXABLE AND NON-TAXABLE ITEMS ON SAME INVOICE. FLASH REPORTING TO SCREEN OR PRINTER; MORE . . .**

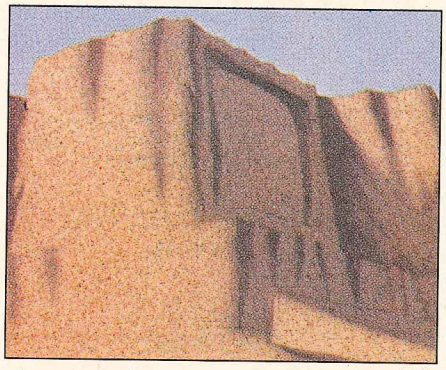
PROFILES

The Magazine for Kaypro Users • Volume 4, Number 4 • October 1986

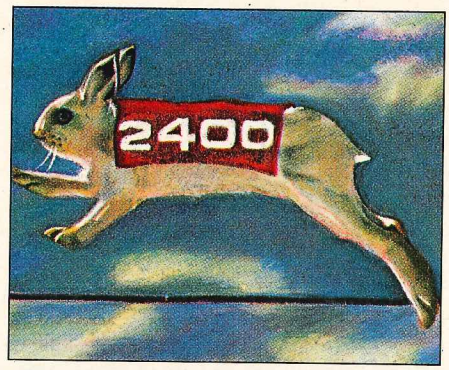
FEATURES



Data Bases 20



Landmarks 36



Fast Lane 52

DEPARTMENTS

COLUMNS

On the cover:

It used to be that only programmers could manipulate powerful but complex relational data bases. But menu-driven features for the non-programmer have been added to many DOS data base programs, and now, as Rick Geary's whimsical illustrations suggests, it's a whole new ballgame.

Editors' Notes

Probably the most popular applications of personal computers are word processing, spreadsheets, and data bases. The first two are readily accessible to the average user, but until recently you had to be a programmer to take advantage of the capabilities of a relational data base program (as opposed to a simpler list manager).

Newer data base programs offer special features that allow non-programmers to make use of relational capabilities. In "Relational Data Bases—A New Ballgame," Joseph Comanda explains these features and evalutes several popular programs from the non-programmer's point of view.

Also in this issue is part two of our open-ended series on programming. In this article, Thomas E. Wagner explains some of the common components of programs so that beginners will be able to recognize them more readily in code and thereby get a boost in learning the language of their choice.

In "Life in the Fast Lane," Brock Meeks looks at 2400-bps modems. Though these modems were introduced with much fanfare, 2400-bps communications failed to become an industry standard. This article explains why and suggests who can and cannot benefit from making the switch from 1200 to 2400 bps.

In "Academic Writing with Perfect Writer," Robert Schechter presents a *system* for generating and revising footnotes or endnotes, plus other tips for those who regularly write academic papers.

And in "A Program to Rename DOS Directories," Allen M. Lewis delivers just that—an assembly language program that could get you out of a jam.

Terian Tyre
Diane Ingalls

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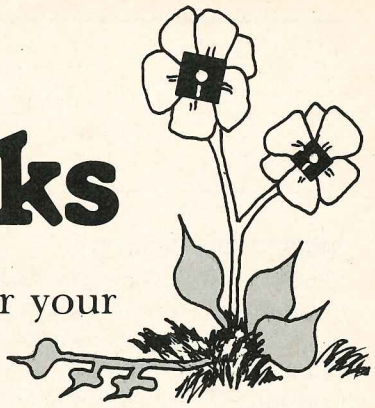

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Letters

Missed his calling

Please compliment yourselves on publishing James Spencer's article, "A Whirlwind Tour of Perfect Filer," in the August issue. He undoubtedly missed his calling as a tech writer. He imparts more logical information in four pages than the Perfect Filer originators did in several hundred. Let's promote the retired police sergeant to general! He's great.

J.C. Simon
Los Angeles, California

The $50,000 WordStar

Upon my return from a 20-day trip to the Orient, I found in my mail the August issue of *PROFILES*. David Weinberger's story ("The $50,000 WordStar") is the classic case of optimism versus pessimism.

I had the opportunity to visit the Golden Triangle in Hong Kong and the Funan Building in Singapore. The Golden Triangle is a five-story building, and the entire lower floor is devoted to computers: hardware, software, and all sorts of peripheral items—I would estimate 10,000 square feet and in excess of 100 dealers. You name it, they have it there. Many of the shops offer a Xeroxed list of the disks they have for sale. They make copies while you wait. The cost is about $2 per disk. This includes WordStar, Word Perfect, Lotus 1-2-3, Fastback, etc. The manuals are being sold for from $2 to $15 each. (Prices are in U.S. dollars.)

In Singapore, the Funan Building's entire sixth floor—about 150 shops—is entirely devoted to computers. This is hog heaven. Fun? It's unbelievable! This letter is being written on Word Perfect 4.1, and the cost for five disks was $7.50. The manual was $8. Crosstalk is $3.50 for disk and book. ThinkTank and Ready! are $1.50 each, with no manuals. IBM-compatible computers are $450. You can add a 20MB hard disk for $500 installed.

Now for customs: I make several trips a year to the Orient. I report my total purchases overseas. The customs lady looks in one of my pieces of hand luggage, sees the computer books, and asks, "Do you have a computer?" I say, "Yes, I do." She says, "I guess you get some good buys over there."

If the manufacturers want to stop illegal hardware and software from coming in, they can follow the U.S. Customs procedure of posting a bond and having their trademarks and patents enforced.

I have been told that Singapore will begin enforcing trademarks and patents in January 1987. I doubt if Hong Kong will, and certainly Taiwan will not stop printing books or manuals. One thing is for sure, if it becomes illegal, there will be an underground computer industry.

Mr. Weinberger, you're very naive.

Jim Kaplan
Palm Desert, California

It's not a question of counterfeit computer products—which is what they are—becoming *illegal. They* are *illegal, and software publishers are beginning to try to protect their interests by supporting the efforts of a number of international anti-counterfeiting organizations. No doubt the illegality of these products will remain merely an inconvenient detail in many people's minds, but "naive" or not,* PROFILES *could not condone that stance. And if Weinberger's reports about the products he received were less glowing than yours, perhaps it is not because he's "pessimistic," but because in several respects the products he ordered turned out not to be such great deals, after all. In any event, our intent was to warn our readers about both the unpredictable quality of these products and their legal status—some software companies have been known to prosecute the "little guy."*

Nice article by David Weinberger on Hong Kong software. From a publishing point of view, though, it raised some questions it didn't answer.

Which electronics magazine carried the ad?

Are they still carrying it or comparable ads?

Did Weinberger inquire about their philososphy on copyright, particularly when it comes to material *they* have copyrights on?

John Walker
Washington, D.C.

The omissions you cite were deliberate. If we had mentioned where the ad appeared it could have been construed as encouraging readers to obtain counterfeit products, and as the information was not germane to the article, we decided not to include it. That applied also to the other points you mention. The electronics magazine's present policy regarding the ad and its stance on copyright were not investigated because we regarded these points as too tangential to this article, and because the ad quoted is only one of several sources of lists of counterfeit software.

A perplexing patch

Although interesting and informative, I have a few comments about Robert Sawyer's article, *Do It Your Way*:

The simple patch he describes for the Opening Menu does not work (at least, not on my 3.3 version of WordStar). Changing the ^M command to ^P in fact *removes* the MailMerge option. When you type **P**, the program looks for the associated command and finds the regular Print option first, since it precedes the MailMerge option in

the program code. It executes the regular print command (P=Print) and stops, ignoring the subsequent MailMerge command (P=MailMerge). Typing **M**, on the other hand, gets no response, since you have removed the command and replaced it with a non-responsive one. The solution is to make the responses for P and M the *same*, i.e., set them *both* to the MailMerge response (08 01 instead of 06 01).

That said, I'd like to express my appreciation for this informative article. I learned a lot and, and my customized WordStar is much nicer to use because I have.

Mark Rand
Davis, California

We're glad you found the article helpful. Mr. Sawyer's instructions for patching WordStar were not wrong, but they could have been more complete. Patching WordStar so that pressing M runs the print routine will work, as long as you have also patched it so that P will run MailMerge. *You must make both changes. That is, patch NOFTAB+10 to* **0D 00**, *and NOFTAB+14 to* **10 00**. *Your solution is simpler, though, and easier to implement.*

Simplicity, please

Please continue articles at the beginner's level, such as "Beginner's Luck," by William Murdick, in your July 1986 issue.

Gerson W. Goodman
New York, New York

I bought my Kaypro 2X in August of 1984 and I subscribe to two computer magazines—yours and *Personal Computing*. Reading the latter makes me feel like someone living in a barrio watching "Lifestyles of the Rich and Famous." I can't do a thing with my Kaypro but run WordStar and The Word Plus. I do well with them, but all the other programs (CalcStar, ReportStar,

Letters

Data Star, MailMerge, ProfitPlan, etc.,) may as well be written in Choctaw for all I can make of them.

Listen, kids, I don't know a spreadsheet from a bedspread, and I don't know either from a breadboard . . . Reading *PROFILES* has never netted me anything but the vaguest sense of frustration. I don't feel as big a fool as when I read *Personal Computing*, but it doesn't make me feel smart.

I suppose what I'm saying is that computers scare people off because they seem complicated. And they *are*, and no amount of friendly explanation by people who know better will ever convince me otherwise.

This will sound like an endless litany of complaints, and I don't want to give that final impression . . . your explanation of The Word Plus in the July 1986 issue by William Murdick was fine. Now get him to explain ProfitPlan as simply. Get him to explain all the other programs as simply as that. Or even simpler. For God's mercy, keep it simple. The technical nerds may itch and complain, but the rest of us are too ashamed to say we don't understand.

David Karp
Pacific Palisades, California

We are trying to plan for at least one feature article per issue at the beginner's level, in addition to our regular column, "Beginner's Luck." Few programs can be explained simply in the space of one article, and even beginners' articles may require some patient study, but we hope articles we've published recently and others that are planned will dispel a few mysteries for you. We welcome suggestions and requests regarding articles for beginners. For encouragement, read on.

How sweet it is

At the end of 1984 I bought a Kaypro 2X and printer together as a package. I gave myself a year to computerize my small insurance agency, starting from scratch. "Scratch" means reading the manual to turn on the little red button next to the screen. It means looking up "cursor" in a glossary.

Now, a year and a half later, my agency is computerized. I use WordStar, DataStar, ReportStar, CalcStar and Smartkey II. As Jackie Gleason would say, "How sweet it is!" The programs work, the computer works, and only after a year and a half has my Juki developed its first glitch. My expense is still under $2,000.

Starting from absolute and all-encompassing ignorance, with no talent for mathematics, and at the age of 50, I have computerized a small business pretty much on schedule. Except for memory requirement problems with CalcStar, which I eventually worked around, there hasn't been one time I felt whipped.

I have a friend who owns a much larger business than mine. His business is computerized, but he can't sleep at night. His programmer hasn't had a vacation in six years, and about every two days this tired-but-loyal employee rushes over to give my friend's computer another fix. My friend is now hostage to an overworked programmer and an expensive computer. He claims if his computer is down more than three days, he is effectively out of business.

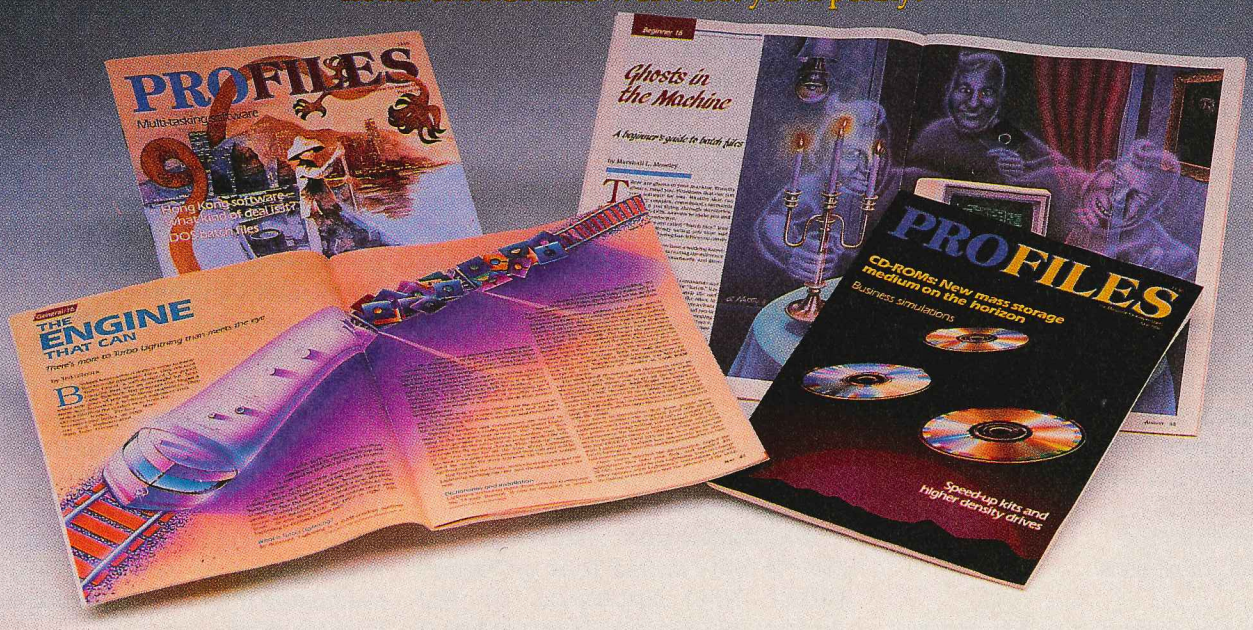
This has been a long letter to say I'm happy with my 2X and the programs that came with it. There is no expectation I had that hasn't been realized. If I have used a strategy, it has been to keep things simple, to avoid bells and whistles, to never go beyond what is necessary. May the drives wear out on my 2X before I get something else.

Donald L. Elliott
King, North Carolina

PROFILES

The Magazine For Kaypro Users

If you own a Kaypro computer, your first six issues of PROFILES won't cost you a penny!



CP/M USERS!

That's right! If you bought a Kaypro computer, the cost of a six-issue subscription to PROFILES Magazine was included in the purchase price.

PROFILES is the only international magazine dedicated exclusively to serving the needs of Kaypro computer users. Each month our special features, columns, and new products listings keep you up to date on the latest developments in Kaypro-compatible products. Our how-to articles provide users with step-by-step instructions for making the most of hardware and software available for the Kaypro. PROFILES is sure to enhance your efficiency and enjoyment of your Kaypro computer.

Ordering PROFILES is EASY! If you sent in your warranty card, you should be on our mailing list. If you haven't received your first issue yet or did not send in your warranty card, please fill out the form below and send it in. We'll take care of the rest.

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We *must* have accurate serial numbers and zip codes to begin introductory subscriptions. Please allow 10-12 weeks for delivery. Note: the introductory subscription begins with the first issue you receive in the mail and has no relationship to the complimentary issue packed with your machine.

Name: _____
(Last) (First) (M.I.)

Address: _____

City: _____

State: _____ Zip: _____

Signature: _____

Serial Number: _____ Model K-_____

I am interested in the CP/M MS-DOS operating system. (CIRCLE ONE)

☐ YES, I own a Kaypro. Please begin my introductory six-issue subscription. (International subscribers add $10 for postage.)

☐ NO, I don't own a Kaypro. Please begin a one-year (12 issue) subscription. Enclosed is a $25 check or money order made payable to PROFILES. (International subscriptions are $45, including postage.)

Q & A

by Marshall L. Moseley

MS-DOS for CP/M?

I used to see advertisements for companies that were selling special boards to make it possible for a Kaypro CP/M computer to run MS-DOS, but lately I haven't seen them. I also recall that the people who sold such MS-DOS boards were only able to come up with a limited number of programs that could actually run successfully on them.

Do you know of any company that is making a good board that would convert a conventional CP/M Kaypro to run a wide variety of MS-DOS programs? If so, please let me know where I might get information and what the cost might be.

Norman Shaifer
Tappan, New York

There are boards on the market that will enable you to run a "plain vanilla" version of MS-DOS on your CP/M Kaypro, but none of them does a satisfactory job.

Most software written for the MS-DOS operating system is written to run on IBM PCs. Programs such as Lotus 1-2-3, Framework, and SideKick make extensive use of characteristics that are unique to the IBM PC and true compatibles, like the Kaypro PC.

An MS-DOS enhancement board for your CP/M Kaypro will run a form of MS-DOS, but probably will not run most of the software you wish to use.

Confounded by Filer

How can I get help with Perfect Filer? I have been using my Kaypro 2'83 for a little over a year now and have become fairly proficient with WordStar. Now I would like to catalog my nature library and create my own data base to print Christmas card mailing labels. Whatever I do—like alphabetizing first names, for instance—the program keeps throwing me curves. And there seems to be no way to include titles, such as Mr. & Mrs. or Rev., in the name printout. There must be someone, somewhere, using this software. How can I find them?

Harold Fisher
Grafton, New York

The best place to find help with Perfect Filer is your local Kaypro users' group (KUG). Users' groups can provide a wealth of information on just about every aspect of Kaypro computer use. To find the users' group nearest you, write to:

KUG Manager
Kaypro Corporation
533 Stevens Avenue
Solana Beach, CA 92075

Be sure to include your address and zip code.

You might also check the article, "A Whirlwind Tour of Perfect Filer," that appeared in the August 1986 issue of PROFILES. *It explains, step by step, how to create a customized data base and may answer many of your questions.*

There are also many third-party books on the Perfect series, among them The Perfect Manual, *from PeopleTalk Associates of Plano, Texas. This manual has sections on Perfect Filer, Speller, Writer and Calc. You can contact PeopleTalk Associates at (800) 782-6657. In Texas call (214) 423-4634.*

A single-sided dilemma

I own a Kaypro 4'83, but I have a piece of software written in 1985 for a Kaypro 2 (5-1/4-inch, SSDD drives, running CP/M 2.2). How can I run this program on my Kaypro 4'83? I am not able to run it; I keep getting a BDOS error message that says the disk has a bad sector. Any suggestions?

R. Carle
Houston, Texas

The double-sided disk drive on your 4'83 may be having trouble working with the single-sided disk. To solve this, you can copy the software from the single-sided disk to a double-sided disk.

First, boot on your 4'83 CP/M disk, then use the COPY program to create a blank disk. Run PIP. When the PIP prompt (*) appears, place the single-sided disk containing the software in the B drive and the blank disk in the A drive. Then copy the contents of the single-sided disk over to the double-sided disk by typing **A:=B:*.*** [V], *and pressing RETURN. Press RETURN again to leave PIP. Once you have the software on a double-sided disk, try to run it.*

If this does not work, the problem may not be the software, but a bad sector on the master disk itself. I suggest you contact the manufacturer and arrange to exchange it for a new double-sided *master disk.*

A drive reset problem

I have had problems with software and my Kaypro 1, which I believe is due to a modification of CP/M. Since *PROFILES* has written about the 2.2u1 modification, I hope you will be able to help.

Specifically, two pieces of software, $FINANCE by Micro-Art, and dBASE II, version 2.43*, seem to be unable to reset the drives when changing disks.

As a result, when trying to rollover data to the next year on the checkbook program ($FINANCE), I get an error message. When changing disks on dBASE, I get an error message when using the new data base.

Your assistance would be appreciated.

Edward Gordon
North Salem, New York

Your problem may be related to the ROM in your machine. The A and B versions of the 2.2u1 ROM have an intermittent bug wherein they set both the A and B drives to read-only status. The C version of the ROM solves this problem. Your

dealer should be able to get you a replacement without charge, though there may be a charge for installation.

Patching information

In your October 1985 issue (page 8), you mentioned that WordStar could be patched to take advantage of the printer's "continuous underline" capability. You neglected, however, to provide the exact information that should be patched in at PALT and PSTD. My printer manual designates ESC E to turn underline on and ESC R to turn it off. I patched these two commands in, but nothing happened. Can you help?

William K. Dreskin
Brooklyn, New York

Any character can be expressed three ways: as a character (A, a, B, b, etc.), as a decimal number (base 10), or as a hexadecimal number (base 16). For example, the character "A" is also a decimal 65 and a hexadecimal 41. Upper-case characters have different decimal and hexadecimal values than lower-case ones.

When patching a program using DDT, you must use hexadecimal *numbers. To find the hexadecimal value of a given character, look at the ASCII chart in the back of your* Kaypro User's Guide. *This chart contains a table of all the characters your computer can produce, along with their decimal and hexadecimal values.*

A look at the ASCII chart reveals that the hexadecimal value of ESC is 1B, and the hexadecimal value of the letter E is 45. So the value you patch in to initiate underlining is 1B 45. The hexadecimal value of the letter R is 52, so the value you patch to stop underlining is 1B 52.

When patching certain values in WordStar, you not only have to insert the printer code for what you wish to do, you must also tell WordStar how long that code is. For example, the code 1B 45 is two bytes long. When you patch the values 1B 45 at PALT, you must prefix the patch with the length of the code. So you would actually write three characters to PALT: 02 1B 45, where 02 is the length of the string 1B 45.

The procedure for patching breaks down into three steps: Read the printer manual and find the code or codes for what you want to do; look at an ASCII chart and find out what the hexadecimal or decimal values for those codes are; then patch the software with those values.

The above is just a quick explanation. For more information, read the excellent article by Ted

Q&A

Silveira, "WordStar Deluxe," in the July/August 1985 issue of PROFILES. *It will tell you everything you need to know about patching WordStar.*

Surge protectors

My reason for writing is a plea for information on surge protectors. I am sure many of your readers are as confused as I am. Now that I have a considerable amount of money invested in hardware, do I need a surge protector? Can I really get good protection out of any device short of a line tamer, which costs hundreds of dollars? I would appreciate any light you could shed on the subject.

Jeff Wahl
Coraville, Oregon

A surge protector is a device that prevents your computer from receiving a sudden increase in voltage, called a power spike. When the power to the computer is increased suddenly, the internal circuitry can be damaged, sometimes severely. A surge protector acts as a filter by absorbing any power spikes that would otherwise go to your computer.

You can buy an adequate surge protector for between $15 and $40, depending on how fancy you want to get. Most protectors do double duty as splitters, providing many power outlets from one. Many include a power on/off switch that lets you turn all your equipment on or off at once.

Surge protectors are not a panacea for all power problems; they will not protect you from a power failure, or from malfunctions due to low power. They will not protect you from a power surge caused by a lightning strike (see "Beginner's Luck" in this issue). Power spikes themselves are relatively rare—you may never experience one, but they do happen, and they can cause a great deal of damage ("Hey! That looks like smoke. Hey, that is smoke!"). Fifteen dollars is a small price to pay to protect $1,500 worth of equipment.

The Multi-Adapter slot

I have a Kaypro 2000 with a Multi-Adapter. I primarily bought the Multi-Adapter for use with the 5-1/4-inch external disk drive. While it works well, I have some questions the local dealer cannot answer.

Is the expansion slot in the Multi-Adapter only usable for connecting an external monitor, or does it function as an all-purpose expansion slot? Specifically, can it be used for either a hard drive card, or an external hard drive controller card? Is there any way to attach a hard drive device to the 2000? What would be required?

Dean Mericas
Las Vegas, Nevada

The expansion slot in the Multi-Adapter cannot be used for a hard drive controller for two reasons: One, a hard drive requires more power than the Multi-Adapter can deliver, and two, even if the hard drive is powered independently, the Multi-Adapter cannot handle the DMA (Direct Memory Access) functions that some software uses.

Kaypro Corporation sells the Kaypro 2000 Base Unit, available from your dealer with an optional hard drive.

Also, check "New Products" in this issue. Systems Peripherals Consultants has recently introduced a hard drive unit for use with the Kaypro 2000.

The expansion port on the Multi-Adapter is intended for half-length video boards only. In fact, Kaypro Corporation recommends its use with only one board: The Persyst Color II Card, from Emulex Corporation, 3545 Harbor Blvd., Costa Mesa, CA 92626; (714) 662-5600.

TurboROM: Ver. 3.4 just released: Provides substantial improvements to your CP/M Kaypro computer. Adds many new features to your computer. Compare the TuboROM with the competition, you can't get more performance for your money with any other product.

The competition - P= partial feature M= circuit modifications required

		Advent TurboROM features
P	•	2 X to 4X speed on all disk writes (both hard and floppy)
	•	Faster disk reads (with Advent format)
•	•	Supports 48 and 96 TPI drives
M	•	Supports fast seek (3 ms) for 96 tpi floppys that's easily installed
•	•	Up to 4 floppy drives in any mix of SS, DS, 48TPI and 96TPI drives
	•	256 directory entries using Advent floppy format
	•	Up to 10 built in disk formats including Osborne, QX-10, Xerox, Micro C
	•	Super-speed disk copying with Turbocopy program
	•	Allows redefining of logical drive assignments
	•	Up to 2 Mbytes more storage on K10 hard disks
	•	Add a second or larger hard disk to K10s
	•	Up to 3.25K more program area on K10s
•	•	Built-in screen dump
•	•	Programmable cursor -- block, line, flashing, non-flashing
	•	Video screen blanking after 10 minutes of non-use (optional on '83s)
P	•	Improved video performance on '84 computers
•	•	Time displayed on 25th line of '84 computers (Real Time Clock required)
	•	Hard disk support built in (up to 112Mb)
P	•	Ram disk support built in (up to 2048K)
	•	Driver Software available for MicroSphere and SWP RAM disks
	•	User written device drivers supported
	•	32 charater type-ahead keyboard buffer
	•	ZCPR1 included - Supports ZCPR2 and ZCPR3
P	•	Advanced features list includes fine tuning floppy and hard disk performance
P	•	Full set of utility software provided
	•	Compatible with all Plu*Perfect CP/M enhancements
	•	Compatible with Uniform, Media Master, Fast Back, etc.
	•	No modifications required to your computer to use the TurboROM

TurboROM (Specify Kaypro model when ordering) **$79.95**

TurboROM Support Diskettes:

Developers Disk: Notes and tools for the TurboROM. ZCPR1 source, HD park program, Warm Boot speed up, XON/XOFF driver, etc **$25.00**

TruboROM Applications diskette: A menu dirven program to patch all Kaypro 'U' ROM software to provide complete compatability with the TurboROM. Complete with source code of each program patch **$10.00**

External Dirver diskette: Notes and tools to write external drivers. Also SWP and MicroSphere Ram disk drivers to allow these products to be used with the TruboROM (Ver 3.4) **$40.00**

RAM Disk Utility disk: Utility to modify block size, number of directory entries and reserved tracks of the Advent RAM Disk with TurboROM installed. **$15.00**

RAM Disk: Add an electronic disk drive to your computer. Enables programs to run faster than you ever thought possible. Ideal for applications involving word processing, spread sheets, data base management or any other tasks that require frequent use of the disk drives. Features:

- Fastest RAM disk available for Kaypro computers
- 10 to 30 times faster than floppy drives
- More directory entries than floppy drives
- Low power consumption (no fan required)
- Easy expansion up to 2048K
- Software driver loads FAST! (instant driver loading with TurboROM)
- Software driver may be loaded above the system to conserve memory
- Can be assigned to any drive name (A: thru P:)
- Auto loads the system if assigned as drive A:
- Mounts inside the Kaypro
- Works on all CP/M Kaypro computers - Nothing extra to buy
- Expandable to include TurboROM
- Expandable to include Real Time Clock/Calendar
- Expandable to include hard disks
- High reliability - Built to our proven high standards

Speed Comparison at 4 MHz - Times measured in seconds.

Function	Floppy	MicroSphere	SWP	Advent
Load "Ladder.com"	8.89	2.21	1.82	.80
Write 64K file	55.65	3.25	2.93	1.52

256K Ram Disk **$349.95**
512K RAM Disk **$389.95**
768K RAM Disk **$429.95**
1024K RAM Disk **$469.95**

Expansion Board **$242.50**
256K Expansion Ram **$40.00**
Real Time Clock **$30.00**

Clock/Calendar: Real time Clock/Calendar for all Kaypro computers without built-in clocks. Works with Plu*Perfect Datestamper or your own application software. Source code drivers provided for use with MBASIC, SBASIC, dBASE II, Turbo Pascal, C, and assembly languages. The Clock/Calendar also functions as a host adapter to our RAM Disk and hard disk add-on products. Add these other products as needed.

Clock/Calendar Interface **$99.95**

Hard Disk Systems: Now you can add hard disks to any CP/M Kaypro computer. Yet another reason not to sell your old workhorse to get the extra performance you now require. Add an additional 11, 22 or 34 Mb drive inside your Kaypro 10, or install a single 44 or 56 Mb drive. If complete systems are not what you need, then order just the parts you want. Call for more information. TurboROM included.

- High-speed disk read / write -- much faster that K10
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- Each logical drive can be any size up to 8 Mb
- User may select number of directory entries for each logical drive
- User-selectable block size for each logical drive
- Expandable to include RAM Disk
- Expandable to include Real Time Clock / Calendar
- Supports all features of our TurboROM
- Includes the Advent hard disk formatter software
- Advanced features include complete user definable disk formatting
- Supports a wide range of hard disk manufacturers and models

Floppy Disk Kaypro Systems (Internal): Add a single 11, 22 or 34 Mb drive to any Kaypro II, 4, 2X, 1 etc.

System, less drive **$556.35**
11 Mb System **$1021.35**
22 Mb System **$1176.35**
34 Mb System **$1281.35**

Kaypro 10 System (Internal): Add a 11, 22 or 34 Mb drive to the existing hard disk. The 44 & 56Mb drives replace the existing 10Mb drive.

System, less drive **$177.00**
11 Mb System **$642.00**
22 Mb System **$797.00**
34 Mb System **$902.00**
44 Mb System **$1377.00**
56 Mb System **$2177.00**

Floppy Disk Add-On: Convert any CP/M Kaypro with single sided (192K) drives to double sided (394K) or 96TPI (780K) drives. Add 3 or 4 drives in '83 computers. No soldering is required. Includes TurboROM. Kits start at $79.95 less drives. Call for further information and pricing.

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5 MHz TurboBoard: Our tried and true 5 MHz speed enhancement for the earlier Kaypro models.

5 MHz TurboBoard for Kaypro II & 4 ..... **$74.95**

Software: Advent stocks a large selection of software for Kaypro CP/M and MS-DOS computers. The following is a list of some of our more popular software products.

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General DateStamper **$49.00**
Media Master **$39.95**
Media Master Plus **$59.95**
MultiCopy **$49.95**
Sidekick **$54.95**
Smartkey II **$49.95**
Smartprint **$29.95**
Uniform **$69.95**
UniDOS **$99.95**

Programming Languages

C/80 Ver 3.1 ..... **$49.95**
C/80 MathPak **$29.95**
Toolworks C **$49.95**
Turbo Pascal **$69.95**
Turbo Toolbox **$54.95**
Turbo Tutor **$34.95**

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Basic Business **$149.95**
Checks & Balances **$74.95**

Graphics

Rembrandt **$39.95**
Rembrandt '83 ..... **$44.95**

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Adventure **$19.95**
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Eliza **$24.95**
MyChess **$34.95**
Word Wiggle **$29.95**

Health & Diet

MyDiet (MS-DOS) **$49.95**
Computer Chef **$29.95**
What's for Dinner **$19.95**
Best of Wok Talk **$29.95**

All items are warranteed for 90 days. 30 day money back guarantee if not completely satisfied. Money back guarantee for software applies only if diskette seal is intact. VISA and MasterCard are welcome. Please add $2.50 freight per total order (additional freight and insurance on hard disk products) and $2.50 for COD orders. California residents please add 6% sales tax. Prices, availability and specifications subject to change without notice.

Trademarks: Kaypro - Kaypro Corp., CP/M - DRI, MS-DOS - MicroSoft, dBASE II - Ashton Tate

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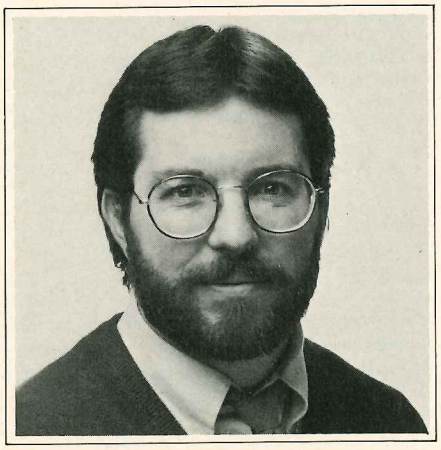


by Brock N. Meeks

This month we're going to look at three online systems that show great promise. One is a regional network out of Ft. Worth, Texas, featuring videotex; the second is a system for industrial real estate development that just happens to be a tremendous research tool; and the third is the latest entry in the online data retrieval derby.

A star is born

It promised to be a great marriage. In September 1981 the Tandy Corporation approached the *Ft. Worth Star-Telegram* and asked if it would be willing to start a videotex version of that newspaper. Tandy would provide the capital; *Star-Telegram* would provide the text. Nice arrangement if you can get it.

The *Star-Telegram*, not wanting to overlook this information-age gift horse, bought the idea in January 1982, and in May 1982 STARTEXT was born. As often happens in a hasty marriage, there were many adjustments to be made. The biggest adjustment STARTEXT faced in its early days was that access to its system was limited—it could only be done with a Tandy brand microcomputer. Sensing an extremely narrow market, STARTEXT quickly set about making its system compatible with any microcomputer—and that's where the system stands today.

Since STARTEXT expanded its compatibility, everyone from the IRS to the Japanese has taken a liking to it. (The IRS selected STARTEXT as a test system for putting its tax publications on an online public forum.)

The system isn't accessible on any of the packet-switched networks. Instead you just use your favorite long-distance service and dial into the Ft. Worth exchange. If you're worried about such a system operating on regular phone lines, don't be. According to Gerry Barker, STARTEXT's manager: "The system runs on two VAX-750 computers that service 48 simultaneous phone lines." Busy signals at STARTEXT are rarely a problem.

The system offers a range of daily news, from the *Star-Telegram*'s print edition to the Associated Press (AP) version of local and international news, and it's updated every two hours. "It's like having an AP news wire right in your living room," said Barker.

If you don't want to access the Dow Jones News/Retrieval System to update your stock portfolio at the close of business on Wall Street, you might consider STARTEXT. You get the closing stock prices from all the exchanges long before *The Wall Street Journal* hits the newsstand.

Besides giving you news, STARTEXT puts you in touch with more than 70 local experts who write their own columns.

These columns are "user supported" in that each one is written gratis—columnists don't get paid for providing this service to STARTEXT readers.

The newest features of STARTEXT are a home banking service, *Grolier's Academic American Encyclopedia*, and the Ft. Worth Police Department's daily update on crime statistics and stolen checks report (a favorite with the local merchants, claims Barker).

The system houses a host of entertainment files, such as the Film Vault, which allows you to type in the name of a movie and receive an instant synopsis. There are information files dealing with nightclubs, music, art, book reviews and more. Just about any computer you can think of—even some of the orphans—has its own special interest group (SIG) on STARTEXT. This system is CompuServe in a ten-gallon hat.

STARTEXT also publishes the *STARTEXT INK*, a tabloid that informs its subscribers of new offerings and system changes.

Subscription rates are $9.95 a month, billed on a quarterly basis, for *unlimited access*. You can buy three-, six-, nine-, or twelve-month

subscription packages, all at discount prices. CompuServe should offer such a deal.

You can reach STARTEXT at (817) 390-7905.

Worldwide research source

Ferreting out an industrial real estate site can become complex in a short time. Besides assessing the physical attributes of a piece of industrial real estate, a site planner (the industry title for these site sleuths) must also take into account the political, social, and financial climate of the surrounding area. This requires a tremendous research effort. One company, Conway Data, Inc., has built a lucrative business by compiling exhaustive reference materials on these subjects.

Writing in one of Conway Data's publications, the *Site Selection Handbook*, publisher McKinley Conway states: "We must look seriously at all possibilities, no matter how far-fetched they appear, and plot our economic and industrial planning strategies accordingly."

SiteNet maintains 24 data bases for researching industrial real estate sites.

Following his own advice, Conway put all the company's research online via a system known simply as SiteNet.

SiteNet maintains 24 data bases that contain information gathered from worldwide sources. A sampling of the data bases you'll find include: climatic summaries, disaster risks, corporate facilities planners, quality of life factors, environmental data, and office space availability. The data bases are organized geographically—by global region, nation, state or province, and city, county, or metropolitan area.

Two of the most interesting data bases on SiteNet have nothing to do with site planning. They are Project EASYLOGG and SUPERPRO. EASYLOGG is a detailed set of "how-to-access" procedures for connecting with U.S. communication networks from various foreign countries. If you're going to find yourself in Tanzania next week and need to access a Telenet node, this data base will give you all the details.

SUPERPRO is a list of worldwide research and development projects that have price tags of a billion dollars or more. You can search SUPERPRO by U.S. state or by nation.

You may never use the office space availability data base, but a sociologist can gather extensive information from the quality-of-life index. And writers can access some great research data, such as the name and address of every high-tech company in a particular city or state.

You can use the system free of charge; it's available via Uninet. To find your nearest Uninet node, call (800) 821-5340. Then call SiteNet at (404) 446-6996 for log-on instructions.

Information master

Western Union's first advance into the Information Age was development of its electronic mail system, EasyLink. Western Union's latest venture is an online retrieval system called InfoMaster.

Western Union bills InfoMaster as "the largest, most comprehensive electronic library in the world." It's a heady claim, but an examination of the available data bases reveals it to be true.

InfoMaster is not really an independent data base, but a "front-end engine" that acts as an electronic gateway (or entry point) to a multitude of other online retrieval services. These include Automatic Data Processing (ADP), Bibliographic Retrieval Service (BRS), Datasolve, Datatimes, Dialog, NewsNet, Infoline, System Development Corporation (SDC), Vu/Text and more. That amounts to more than 700 individual data bases.

The great thing about InfoMaster is that it gives you an excellent method of cost control. Where a system like Dialog will charge you at every keystroke (or so it seems), InfoMaster charges you only when you execute a successful search. A single, full-text data base search costs only $8, and that includes a display of the 15 most recent titles, plus one full-text record. On Dialog that same full-text listing would cost $9, plus online charges, carrier network charges and more.

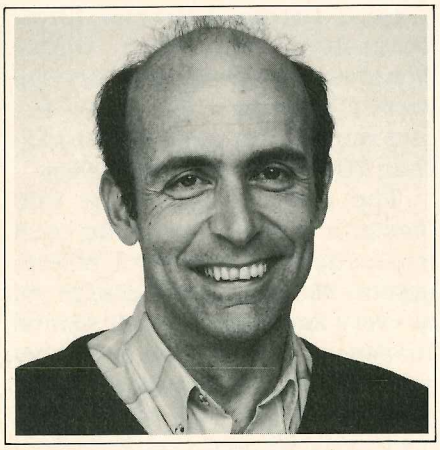
For those who need a high-powered data base search service, but only once in a while, InfoMaster seems like a good choice. If you're a professional data base user, however, you may find the extensive InfoMaster menus frustrating.

A sample search for MS-DOS payroll software took me through ten different menus. Your answers to these menu choices allow InfoMaster to formulate a search strategy, which it automatically executes. There is a "go direct" option, but with the range of data bases covered by InfoMaster, it seems unwise to make these decisions yourself, unless you are an accomplished online researcher.

If you'd like to give InfoMaster a workout, call (800) 247-1373. InfoMaster will give you a free password to use. This password lets you "test drive" the system within a sampling of available data bases.

A year's subscription to InfoMaster is $25. A subscription also gets you access to EasyLink, which lets you send and receive electronic mail worldwide, as well as send and receive Mailgrams, telexes, and even cablegrams.

Flea Market



Patching DataStar and ReportStar

by Ted Silveira

I get nervous if I don't tinker with my programs every so often. But after Robert Sawyer's excellent article on modifying WordStar's command keys ("Do It Your Way," *PROFILES*, July 1986), I knew I had to leave WordStar alone for a while. So what could I do? Rummaging through my disk boxes, I came across a dusty disk that held just what I needed—the MicroPro data base programs, DataStar and ReportStar.

Most of you who got WordStar with your Kaypros received DataStar as part of your bundled software. And those of you who bought the Kaypro 2X Business Pak also got ReportStar. Like WordStar, DataStar and ReportStar are easily patched, and experienced WordStar patchers will find that 90 percent of what they already know will carry over, including most of the mnemonic labels. The actual programs you can patch are DATASTAR.COM and FORMGEN.COM from the DataStar group and REDIT.COM, REPORT.COM, and RGEN.COM from the ReportStar group. The patch areas for these five programs are exactly the same, right down to the addresses, with one minor exception.

Patching techniques

To patch the ReportStar group, you can use the installation program RINSTALL.COM, which came with the ReportStar programs. You can also use DDT.COM, from your CP/M master distribution disk, or a public domain "disk editor" program such as PATCH18A.COM or SUPERZAP.COM, which I've reviewed here previously (October 1985).

To patch the DataStar group, you'll have to use either DDT or a disk editor. There is a DINSTALL.COM program for installing DataStar, but as far as I know, it was never part of the Kaypro software package.

To use RINSTALL (or DINSTALL, if you have it), proceed as you would with the WordStar installation program, using either hexadecimal addresses or mnemonic labels (like TRMUNI) to locate patch points. If you've never done this before, read the description of using WINSTALL in Robert Sawyer's "Do It Your Way" (July 1986) or Tom Enright's "Technical Forum" (April 1985). Follow the procedures described for the installation program of WordStar version 3.0 rather than for version 3.3.

If you're going to use DDT.COM and have never used it before, you can read a description of how to use it for patching in my article, "WordStar Deluxe" (July/August 1985). Read the sections on hexadecimal numbers and addresses, on operating DDT, and on using the CP/M SAVE command when you're done.

If you're going to use one of the disk editors, read the sections in "WordStar Deluxe" concerning hexadecimal numbers and addresses.

A sampling of patch points

Here are some user-patchable points in the DataStar and ReportStar programs (there are others). I'll give the mnemonic label (which you can use with RINSTALL or DINSTALL, if you have it) followed by the hexadecimal address (the same for all five programs, except in one case) and a description of what the patch point does. This information applies to DATASTAR.COM and FORMGEN.COM (both version 1.42), plus REDIT.COM, REPORT.COM, and RGEN.COM (version 1.03 for these three). All these patch points are available in all five programs, but I haven't worked with the programs enough to know that they're all actually used in all five. You'll have to experiment.

TRMINI (0295h). This patch point (*ter*minal *ini*tialization) can contain a string of bytes to be sent to your screen when you start the program, but it comes with nothing installed. If you use DDT to insert the bytes **01 1A** here, the program will clear your screen when it starts up.

If you're using an installation

program (RINSTALL or DINSTALL) and the mnemonic labels, just insert the single byte **1A**. The installation program will automatically add the 01 byte, which is a counter that tells the patched program how many bytes there are in the following string (see "WordStar Deluxe" for more details on this). If you're using the installation program but patching with the addresses instead of the labels, then insert **01 1A** as with DDT.

You'll find an assembly language listing of the DataStar user patch area in the reference manual.

TRMUNI (029Eh). This patch point holds the *terminal uninitialization* string, which is sent to your screen when you exit the program. To have the program clear your screen on exit (not necessary, but tidy), use DDT to patch in the bytes **01 1A**.

As with TRMINI, if you're using the installation program and the mnemonic labels, just patch in the byte **1A**.

IVON (028Eh). This patch point contains the string that turns on *inverse* or highlighted video. As it applies to '84 series Kaypros, this patch point is set to use half-intensity reverse video. Most people leave this alone, but some prefer a different kind of highlighting, such as half-intensity only or reverse video only. ReportStar and DataStar don't seem to make much use of this feature, but you can always experiment.

IVOFF (0287h). This patch point reverses the effect of IVON, turning off the video highlighting. As applied by Kaypro, it is set to turn off half-intensity reverse video. If you change IVON, make sure you also change IVOFF to counteract it.

ERAEOL (0270h). This patch point contains the codes for *erase-to-end-of-line*, a feature that erases everything on a line from the cursor to the right edge of the screen. As delivered from Kaypro, ERAEOL is empty, which means that the programs use spaces to execute this command. To implement the Kaypro's erase-to-end-of-line command and get slightly better screen performance, use DDT to insert the bytes **01 18** or, if you're using the installation program and the labels, insert the byte **18**.

DELCLR (02AFh). This patch point and the following two contain values that set delays after various screen functions. By lowering the values, you shorten the delays and speed up screen performance. You can probably lower all three delays to zero (00h) without any problems, but if you do, watch for any odd screen behavior. If you lose characters or see strange things happen, increase the delays until the trouble goes away.

The value at DELCLR controls the *delay* after *clearing* the screen and comes set to 19h (about 25 milliseconds).

DELCUS (02B0h). The value at this patch point controls the *delay* after *cursor*-positioning and comes set to 0Ah (about 10 milliseconds). See explanation at DELCLR for more information.

DELMIS (02B1h). The value at this patch point controls the *delay* after *miscellaneous* functions and comes set to 05h (about 5 milliseconds). See explanation at DELCLR for more information.

ITHELP. This patch point is at address 0331h in REDIT.COM, REPORT.COM, and RGEN.COM, and at address 032Ch in DATASTAR.COM and FORMGEN.COM. The value stored here sets the *initial help* level—it comes set to 04h, the highest help level. Lower this value to reduce the starting help level.

That covers the standard things

people want to change. If you want more, you have two choices. First, in the back of the *DataStar Reference Manual* (page C-1), you'll find an assembly language listing of the DataStar user patch area, which shows all the patch points I've mentioned along with many others, all with brief comments, addresses, and mnemonic labels. These patch points apply to all five programs I've mentioned, not just to DATASTAR.COM. The only exception is ITHELP, which has a different address in the ReportStar programs, as mentioned above.

Second, you can use DDT or a disk editor to display the innards of the ReportStar installation program, RINSTALL.COM. Near the end of this program, you'll find a table listing all the mnemonic labels. Following each label are two bytes that give the hexadecimal address corresponding to that label in the ReportStar programs. These addresses are listed in "byte-reversed" format, which means that if the bytes listed are 8D 03, the hexadecimal address is 038Dh.

You'll find many more labels here than are listed in the back of the *DataStar Reference Manual*, including many that apply to printer installation and special features. These labels are the same ones used in WordStar, and though the addresses are different, of course, the functions are the same. Look at "WordStar Deluxe"—particularly the table of patch points—to find out more about these.

I don't use ReportStar and DataStar much, so I haven't done any elaborate patching. I'd be interested in hearing from anyone who does.

The MS-DOS corner

If you have an MS-DOS computer and a modem, and you haven't signed up with CompuServe (the largest of the commercial "bulletin board" services), you're missing out on a great natural resource.

CP/M users can get plenty of help and useful programs from CompuServe's Kaypro forum (GO KAYPRO) and the much larger CP/M forum (GO CPMSIG), but MS-DOS users have *four* extremely useful and active forums to visit—one for new users (GO IBMNEW), one for software (GO IBMSW), one for hardware (GO IBMHW), and one for communications (GO IBMCOM).

All of these forums are wonderful places both for getting tough questions answered and for finding the latest in public domain and shareware programs. The most active forum, IBMSW, logs thousands of messages every week.

Cut your CompuServe costs in half with the aid of ATO, available on Kaypro's KUG ROS.

The problem is that CompuServe costs money—the longer you stay connected, the more you pay. It's expensive to spend a lot of time reading and writing messages online. But if you don't scan the messages regularly, you miss a lot of valuable but ephemeral information—the oldest messages are automatically deleted as new ones are added, and the turnover rate on IBMSW is considerably less than a week.

The solution is a free communications program known as AutoSIG or ATO, written by a group consisting of Vernon Buerg, Frank Lipschutz, Don Watkins, and anonymous others. This program has only one function in life—communicating with CompuServe.

ATO lets you set up a separate menu for each CompuServe forum that you visit regularly. Using just single-keystroke commands from this menu, you can have ATO:

- Call CompuServe, give your name and password, and log you into the forum;
- Capture any messages for you;
- Collect the headings (sender, receiver, subject) of all messages left since you last logged on;
- Scan the captured list of headings, mark ones that interest you, and capture the actual messages;
- Reply to messages or write original messages while off-line, using ATO's own editor, and then send them when online; and much more.

ATO also has a normal terminal mode so that you can interact with CompuServe "manually" and upload or download files using CompuServe's B protocol.

Those features would make ATO invaluable, but there's more. Using an ATO function called OTTO, you can automate an entire CompuServe session from log-on to log-off.

Here's a typical OTTO session for me. With ATO running but not yet connected to CompuServe, I kick in OTTO. I select the forums I want to visit (KAYPRO, CPMSIG, IBMNEW, and IBMSW) and what I want to do in each one—on this first pass, just collect my mail and capture the headings of messages left since I last logged on. Once I'm set, OTTO calls CompuServe and gives my user number and password. Then it goes to the first forum, collects my mail, captures the new message headings, and exits to the next forum, where it repeats the performance. When it's visited all the forums I selected, it logs off.

The result is that I spend very little time actually online (running up connect charges). I take care of time-consuming activities such as reading and writing messages off-line, at no cost. And tasks such as logging on, changing forums, and sending or capturing messages the computer does much more quickly than I could do them myself.

ATO is available in Data Library 1 of the IBM Communications Forum (GO IBMCOM) and also on the KUG ROS board at Kaypro.

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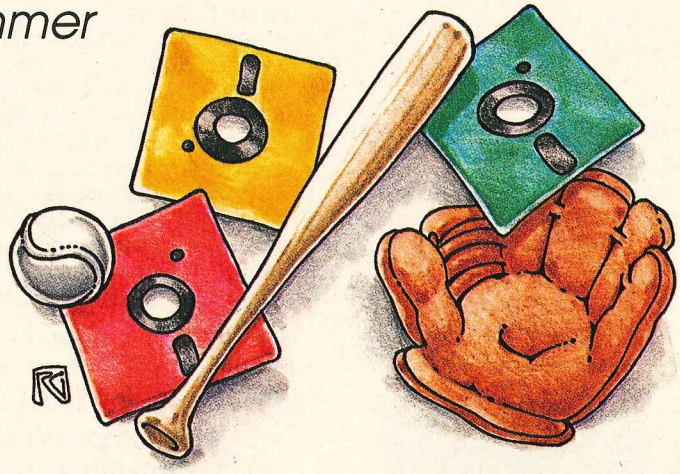
Relational Data Bases – A New Ballgame

A look at the lineup for the non-programmer



by Joseph Comanda

On a World Series team each player has strengths and weaknesses. There may be a power hitter whose fielding could be better, or an ace shortstop whose batting needs work. In the world of data base programs, relational data bases are the undisputed champions, but they too have varying abilities.

Relational data base programs are descendants of powerful programming languages used on mainframe computers. They are intended for complex applications, and novices usually find them rough going. At least they used to. But now that's changing.

dBASE II was the first leading data base program for personal computers. Programmers loved it because they could build sophisticated applications with it. But non-programmers couldn't do anything with it unless they typed their commands in a language described misleadingly as "English-like." They had trouble with its syntax and usually ended up having to learn to program to do what they wanted.

But hard as dBASE was to master, there was a real need for the product. There were less intimidating programs around called "list managers," but they all had their limitations. In particular, they weren't *relational*—unlike dBASE II, they couldn't provide linkages between different kinds of information, a critical requirement in many data base applications. An order-entry system, for example, links order information with inventory and customer information. (See the accompanying article on page 23 for a more detailed explanation of relational data bases.)

So relational data bases were needed, but their unfriendliness remained a barrier for many. This gave impetus to a software race to produce the ultimate data base program, one that combined power and flexibility with ease of use. In the last year a number of contenders have appeared—including the latest version of dBASE. We're going to take a close look at four: dBASE III PLUS, R:BASE 5000, Paradox, and KnowledgeMan2.

These programs are roughly equivalent in power. They are all adequate relational data base programs, and in addition each has its own unique programming language for even more power. Though they use somewhat different approaches, they can all do pretty much anything you would ever want them to do.

More interestingly, they are all easier for non-programmers to use than the original dBASE II. In this article, we'll look at the new features that make them easier to use, and we'll see how far each program goes in delivering relational power to the non-programmer.

The new, easy-to-use features

Menus vs. commands. Early data base programs like dBASE II were command-driven. To do anything you had to learn the data base's "language" and type commands in that language. Some commands used single words; others required whole phrases. For example, to see the names of everybody in Pennsylvania, in dBASE you'd type the command **Display all first, last for state = 'PA'**.

A command-driven system is hard to learn because the user must first master its vocabulary and syntax,

but experienced users tend to like its directness and flexibility.

The newer programs have all supplemented their command-driven languages—or bypassed them entirely—with menu-driven systems. A menu-driven system is easier to use initially because a beginner can select options from a menu without having to know the language behind it. For example, to see the names of everybody in a given state, you would type the option number for that request from a menu (i.e., "4. Print names by state"). Then you'd be asked to supply the name of the state and the program would do the rest.

Ideally, a program should offer both a menu-driven system for beginners and a command mode for advanced users.

Generators. Designing an application is tough for a non-programmer, so the newer programs have added design tools called "generators." Generators, even more than menu-driven systems, put significant new power into the non-programmer's hands.

A generator acts as an interface between you and the data base program. You issue it instructions, usually by selecting options from a menu, and the generator will let you design data files, data-entry forms, reports, and more. Some generators even let you create your own custom menu system.

Another nice feature in some programs, such as dBASE III, is a "query generator." One test of a good data base system is how responsive it is to user requests for information—i.e., queries. A command-driven system usually requires you to use convoluted phrases to make such requests. For example, the following dBASE command produces a list of California residents whose last names start with C: **List first, last for last >= "C" .and. last < "D" .and. state = "CA"**. A

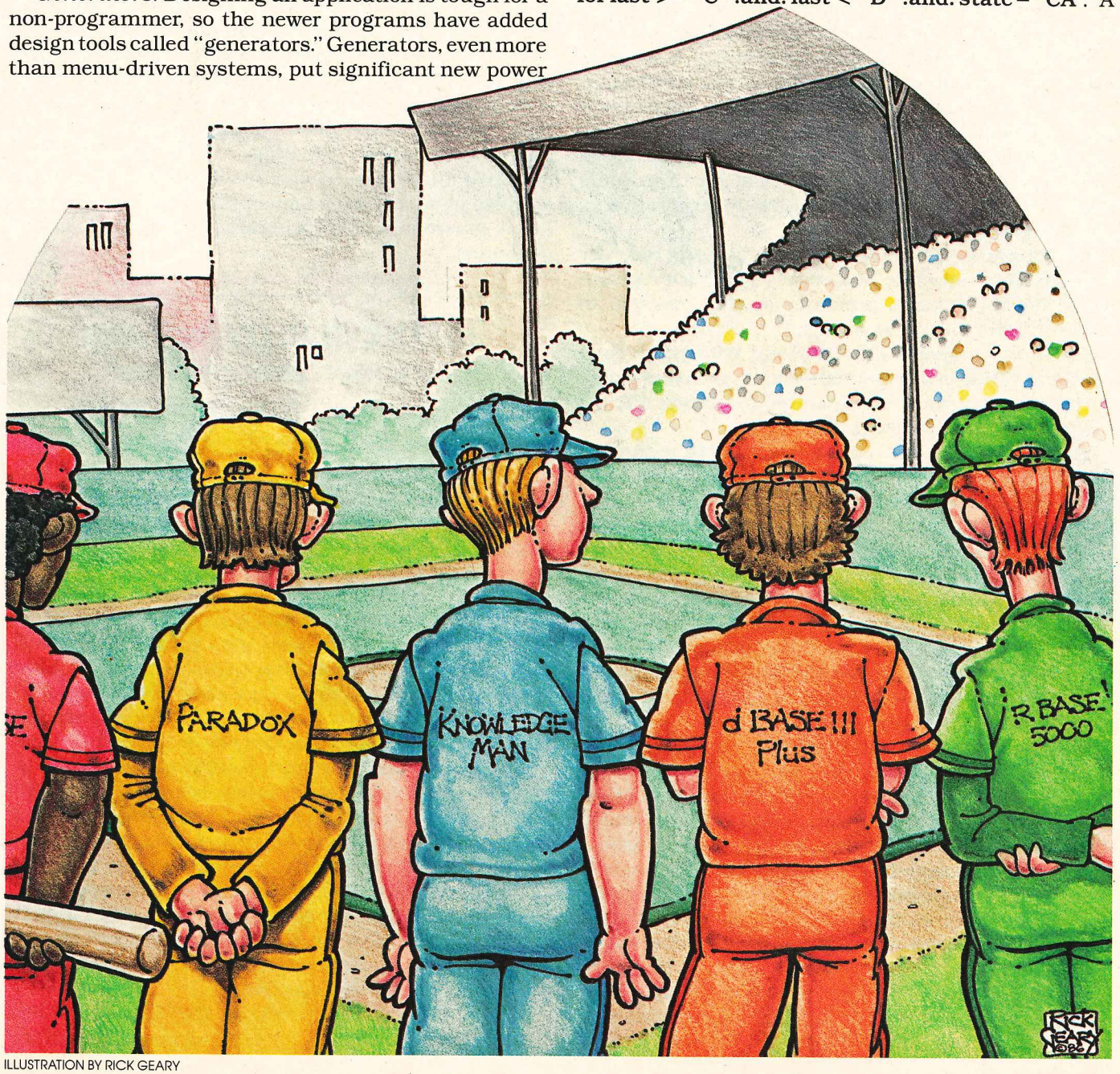


ILLUSTRATION BY RICK GEARY

query generator usually takes the form of a menu that leads you through the process of creating a query. Rather than typing obscure phrases, you choose options from the menu. The generator interprets your choices and requests data from the data base in exactly the form you require.

R:BASE and KnowledgeMan offer the next best thing to a generator: a user-definable query language that lets you accomplish the same thing. In a user-definable query language, you assign queries to single words or phrases. By defining your terms properly, you could get the program to spit out the above list by typing "Give me the C's in CA."

Script recorders. Much data base work is repetitive. For example, a user may go through the same five steps every month to print a monthly statement. A script recorder allows you to record those steps and perform them again later with a single command. A script is like a macro in Lotus or like the kind of key redefinition you can do with a program like SuperKey. You record a script by turning the recorder on and going through the sequence of keystrokes involved in a routine. Once you've saved a script you can replay it at any time. Some data base software even allows the incorporation of scripts into programs.

Paradox is the first program to offer a script recorder that lets you automate procedures without programming. Its applications generator even allows you to attach scripts to custom menus.

Relational capabilities. Working with more than one file at a time involves some tricky maneuvers. Some of the new programs offer features that make the job easier for the non-programmer.

In applications that require you to work with multiple files there are three main things you have to be able to do: Link (or sometimes merge) files by means of a field common to all of them, look up records in one file while working on another, and update one file from another.

All the programs discussed provide a way to link or merge related files, but some let you do it outside the command language. For example, dBASE has a "views generator" that lets you define a relationship between files, view a list of records based on that definition, and save the resulting file for later use.

Once you've linked files it's fairly easy to look something up. Updating—changing information in one file and having the changes reflected in another file—is another matter. None of the programs I discuss makes updating easy. It remains an advanced skill, and to make it happen seamlessly you still have to program. Short of programming, you can update by learning a command or two in most of the programs or, in Paradox, you can employ an advanced query technique.

Manuals. Data base manuals used to be dense, forbidding volumes written primarily as reference tools for programmers. Even if they offered tutorials, they still took too much for granted. They were really intended to teach the particular features of a program to programmers who already knew the terminology and fundamentals of data base design.

For the most part, manuals are better these days. The good ones go beyond introducing the program's features. They also teach in simple terms the fundamentals of data base design. And they look friendly, too.

Any modern data base program should have most, if not all, of the features outlined above. Let's take a look at the lineup and see how each "player" measures up.

dBASE III PLUS

dBASE is still leading the pack in sales. The new version is considerably friendlier than its predecessors. You can now avoid the infamous dot prompt (dBASE's command mode) and do all your work with the Assistant (a Lotus-like, top-line menu system). Even its command mode is easier to use now. An extensive help system constituting an onscreen reference manual is one keystroke away, and a new "history" feature saves past commands and lets you reissue them without retyping.

dBASE III PLUS also comes packed with generators: a screen painter, a report generator, a label generator, a query generator, a views generator, and an applications generator.

dBASE III PLUS includes a screen painter that allows you to design your own data entry screens.

The screen painter helps you design data-entry screens that accept information into one or more files and establish rules for data entry (e.g., only upper case letters in the state field.

dBASE's report generator is somewhat limited compared to the competition, but it's also easier to use. It produces reports in columns with up to two levels of subheadings and subtotalling. Unfortunately, you have to program to do anything fancier. dBASE does, however, have a nice label generator with five pre-defined label specifications, plus options for defining your own.

The query generator takes you through the steps of specifying criteria for selecting records. You select conditions (up to seven of them) that the desired data must meet—like "lives in California, has green or blue hair, eats tofu," etc. Once the conditions are selected, the program allows you to view and page through only the records that match those conditions. More importantly, you can save the conditional instructions and use them to do other operations on the selected records, such as create labels for a mailing.

The views generator makes dBASE's relational

(continued on page 26)

Some Concepts in Brief

In simple terms, a data base is a collection of information that's easy to get at. By that definition a file cabinet is a data base. So is a phone book or an appointment calendar. A cluttered desk is not—or if it is, it's a poorly maintained one.

The heart of a *computerized* data base is the data file, the basic repository for information.

Data files

Think of a data file as a computerized version of an index card file box. In a file box, individual cards contain certain standard categories of information and are arranged in some kind of alphabetical or numerical order so they'll be easy to find. In a name-and-address filing system, for example, the standard categories are first name, last name, street, city, state, and zip code, and the cards would probably be arranged alphabetically by last name.

A data file stores names and addresses in the computer in much the same way. It organizes the information into records (corresponding to the index cards) that are further divided into fields (the standard categories of information).

	FIRST	LAST	STREET	CITY	STATE	ZIP
1	John	Smith	123 Palm Drive	Mainville	CA	93456
2	Mary	Jones	1 W. Main	Newtown	PA	19054
3	Bob	Morris	7556 Waller Dr.	Small Town	NY	11204

Figure 1: A Name-and-Address Data File

Figure 1, above, displays the contents of a small name-and-address data file in table form. Each row is a separate record, and each column corresponds to a category of information—i.e., a field.

Since data files can be displayed as tables that look a lot like spreadsheets, some programs like R:BASE and Paradox actually use spreadsheet terminology. They refer to the data file as a "table" composed of rows (records) and columns (fields).

Linking data files: a savings bank example

What sets relational data base programs apart from list managers is their ability to work with more than one file at a time, if those files are related by some common element.

For example, Figure 2, below, shows two files that make up a simple savings bank system. The accounts file has an individual record for each savings account that contains the account number, the name of the person who owns the account, and the current balance.

	ACCOUNTNUM	NAME	BALANCE
1	111	John Smith	525.00
2	222	Mary Jones	438.00
3	333	Wilson Waterway	299.00
4	444	Julie Johnson	127.50

The Accounts Data File

	ACCOUNTNUM	TRANSTYPE	AMOUNT	DATE
1	111	D	123.00	02/10/86
2	222	D	123.00	02/10/86
3	333	D	100.00	04/14/86
4	444	W	34.00	04/14/86
5	111	W	20.00	04/14/86
6	222	W	10.00	05/09/86
7	333	W	35.00	05/19/86
8	444	D	36.00	06/11/86
9	222	D	23.00	06/15/86
10	111	D	200.00	06/25/86

The Trans Data File

Figure 2: The Banking Files: Accounts and Time

However, banks need to know more than the current balance of each account. They also have to keep track of the details of each withdrawal and deposit. Those details are stored in the transaction file. Each record contains information about a specific transaction: the account number, the amount, the type (withdrawal or deposit), and the date the transaction was performed.

The two files are linked by a common field, the account number. Every record of a withdrawal or deposit in the transaction file is related to a unique record in the account file. That relationship is important for two reasons. First, we want to be able to look up the account record to see who owns it, and second, we want to update the current balance figure in the account record. Ideally we would like the program to handle these functions somewhat automatically.

Here's how it would work in a fully-programmed system. We're entering a new transaction, a withdrawal of $200 from account number 111. When we enter the account number into the new transaction record, the program shows us that it belongs to John Smith and that there is a current balance of $525. We then enter the transaction type and the amount, and the program calculates the new balance ($325) and places it in John Smith's account record. At the same time it also saves a record of the transaction, even entering today's date in the date field.

Relational systems can be quite complex, but they all work pretty much like this banking example. Files are always linked through common fields, and relationships between files involve either look-ups, updates, or both. —**Joseph Comanda**

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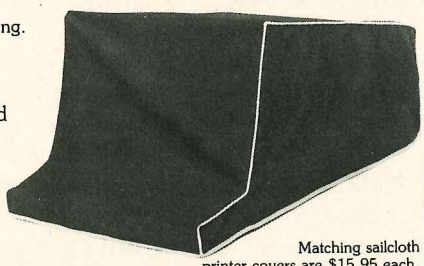

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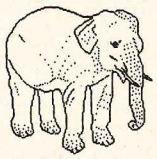

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(continued from page 22)

power accessible to the non-programmer. It leads you through the process of defining relationships between data files and lets you save that definition in a special file. Once the relationships have been defined, they can be reestablished at any time by activating the view.

To set up a view for our banking example (see accompanying article), we would specify that the transaction file be linked to the account file through the field they have in common, the account number. We could use such a view to produce a monthly statement that pulls name information from the account file and transaction information from the transaction file.

Appsgen, dBASE's applications generator, offers a way to design custom menus. Essentially, it allows a non-programmer to set up a simple, single-level menu for working with a single data file.

While the other tools we've mentioned have an integrated feel, Appsgen seems to be a last-minute, tacked-on feature. It's not accessible from the Assistant and doesn't work like the other generators. It's also limited in its results and fails to tap any of the relational features. It does have advanced features for programmers, but most will probably prefer to do it by hand.

R:BASE 5000

If dBASE is the standard, then R:BASE is its closest competitor, and its advertising has capitalized on dBASE's unfriendly reputation.

In place of an integrated menu system like dBASE's Assistant, R:BASE offers three modes of operation: command mode, prompt mode, and a separate program called Express for design.

Prompt mode is like command mode with a teacher giving you hints. It provides a limited menu from which to select some commands and a special prompt for typing in the rest. With some commands it displays the syntax rules; with others, it leads you through the steps of building a complete grammatical command. Since you can't avoid R:BASE's command language, prompt mode is a good way to learn it.

Express is R:BASE's applications generator, and as a design tool, it is superior to dBASE's Appsgen. It gives you greater control over the look of your menu and the options it contains, and it lets you design multi-level menus easily without programming.

You can also design a data base with Express. What R:BASE calls a "data base" is actually three linked files that can contain up to 40 *related* data bases, which R:BASE calls "tables." (Tables are related if they share a common field. For example, one table might contain account numbers and addresses, and another might contain account numbers and billing histories. Their common field would be account numbers.) This approach of keeping related tables together gets new users thinking relationally from the start. R:BASE's manual reinforces this by introducing the idea of linking tables at the very beginning.

R:BASE also has a more powerful report generator than dBASE that can produce either columnar or free-form reports with up to ten levels of subheadings.

Paradox (ver. 1.1)

Paradox burst upon the scene a year ago heralded as a totally new approach to data base management, and there is some substance to the claim.

Paradox's novelty lies in its workspace orientation and its approach to querying.

Like the new dBASE, Paradox is menu-driven and has a programming language behind the scenes. Unlike dBASE, it has done away entirely with command mode. It also has the various generators for forms, reports, and custom menus, all of which are the best the market has to offer right now. But these are not what make it unique. Paradox's novelty lies in its "workspace" orientation and its approach to querying.

When I say Paradox has a "workspace orientation," I mean that much of what happens behind the scenes in other programs takes place *onscreen* in Paradox—the screen is the "workspace." Open data files (or tables) appear there in spreadsheet-like form, and a user can flip from one table to another or scroll through a table's columns and rows. With one keystroke you can switch from a tabular view to a form view where records appear individually, filling the screen. You can add or change records in either view by hitting an edit key.

A lot of traditional data base work gets done in Paradox through queries. Queries can be used to select a group of records from one or more tables, to look up individual records, even to update records.

Instead of requiring lengthy statements of selection criteria, Paradox uses a special query form. The user checks off appropriate columns and specifies conditions with a minimum of writing (e.g., entering "CA" in the state column of a mailing list table would select the people from California). Then Paradox creates an answer table that includes all the columns checked and all the rows that satisfy the selection criteria.

Establishing links between tables is only slightly more complex. It involves an approach called "querying by example." To illustrate, let's use our banking system example with its accounts table and transaction table. Suppose we wanted to see a list of transactions showing the account owners' names. We'd use two query forms, one for each table. Then we'd give Paradox an example of the kind of linkage we had in mind. We'd do that by entering an example of identical account numbers into the account number column in each table. This would tell Paradox that we wanted to link records from the two tables that have common account

numbers.

Query instructions can also be saved. Combined with Paradox's script-recording capability, this provides an easy way for non-programmers to automate routine procedures.

KnowledgeMan2

KnowledgeMan2 has extra features not found in the other programs: a spreadsheet, graphics, telecommunications, a mouse interface, and a full-featured text editor. Its forms generator is especially versatile in the use of color blocks (or windows) and generates both data-entry screens and free-form (non-columnar) printouts such as labels and invoices. And its report generator is powerful, allowing—among other things—26 levels of subheadings.

For all that, it's hard to imagine a non-programmer *liking* KnowledgeMan. It's at least one generation behind the competition in ease-of-use features, and in some cases more.

That impression takes hold when you first see its manuals, which consist of tiny black-and-white print and a minimum of diagrams. It is further corroborated by KnowledgeMan's inexplicable practice of prefacing key names with an "F"—the enter key becomes FENTER, and even more ominously, it labels the right arrow key FRIGHT!

These may seem to be trivial flaws, but they're indicative of a user interface that is not well thought out. For example, KnowledgeMan has a menu system that bypasses its command mode, but some critical features are missing. You can't get to the form and report generators from it or even *use* forms without exiting to command mode.

One feature that *is* available to menu-users is the ability to save executed commands in a file. While KnowledgeMan doesn't have a query generator as such, this feature provides a way to save queries. You could, using the menu, build a fairly complex statement for displaying information from several files with a particular format and then save it for later use.

There are some nice features hidden in KnowledgeMan's programming language that should be brought out for non-programmers to use. For example, tucked away in the mouse interface part of the program is a command for creating menu systems that could be used as a rudimentary applications generator. It should be made more accessible and easier to use. KnowledgeMan has good relational capabilities too, but the documentation and the menu system do not help you exploit them fully. KnowledgeMan is still a programmer's program.

(Editor's note: As we go to press, Micro Data Business Systems has issued a new release of KnowledgeMan2 [version 2.01]. This version features better memory management and faster program execution. The company has also removed the menu generator from the mouse module and incorporated

it into the main program. Contact Micro Data Business Systems for further information.)

In conclusion

The only product I would not recommend for beginners is KnowledgeMan2. Its graphics and spreadsheet capabilities might make it attractive to some, but all the other programs discussed can transfer data to and from Lotus, so even that's not a clear advantage. And it certainly doesn't outweigh the chief drawbacks: inadequate documentation for beginners and the incomplete integration of ease-of-use features for non-programmers.

R:BASE and dBASE are closely matched. R:BASE's user-friendly features are not as well integrated as dBASE's, but it has a better applications generator and report writer. Its manual is good in the early stages at helping a novice get started, but it's less thorough in the intermediate stage when a non-programmer is trying to harness some of the real power of the program.

dBASE, on the other hand, has a well-designed Assistant, better-integrated generators (including query and views generators that R:BASE lacks), and a set of manuals that are thorough and clear. One of them is the best introduction to programming for the non-programmer that I have seen.

But it is still hard for me to imagine developing a complete relational application with dBASE or R:BASE without programming.

I came away convinced that Paradox was a clear winner. Its manuals are exemplary. Its menu system is complete. Its query system is intuitive, easy, even fun. It is hard to imagine a better report generator. Its script-recording feature gives significant power to the non-programmer that the other programs can't duplicate. With all these features it's still incredibly fast.

Most importantly, it really is possible for a non-programmer to develop a full-fledged relational data base application with Paradox. It might not be as refined a system as a programmer could develop; nor would it handle updating between tables as smoothly as a programmed application, but it could be done.

Two considerations might rule Paradox out for some people: It is not yet multi-user, and it needs lots of memory. Paradox requires 512K to run and likes more. That compares to 256K for dBASE and 320K for R:BASE. It also makes intensive use of the disk while operating and requires a couple of megabytes of spare disk storage for operation on large applications.

Each of these programs is a skilled player in the relational data base game, and what looks like a rookie may end up the league champion.

Joseph Comanda is a freelance writer and data base consultant living in Philadelphia.

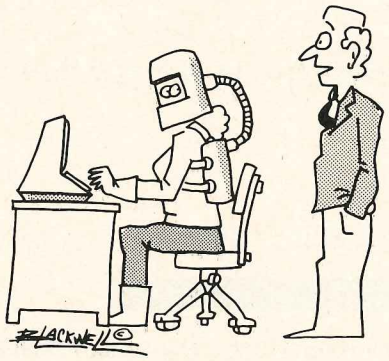
Quick Reference Summary

Product: dBASE III PLUS
Manufacturer: Ashton-Tate
20101 Hamilton Avenue
Torrance, CA 90502
Phone: (213) 329-8000
Sugg. List: $695

Product: R:BASE 5000
Manufacturer: MicroRim
P.O. Box 97022
Redmond, WA 98073-9722
Phone: (206) 883-0888
Sugg. List: $495

Product: Paradox version 1.1
Manufacturer: Ansa Software
1301 Shoreway Road
Belmont, CA 94002
Phone: (415) 595-4469
Sugg. List: $695

Product: KnowledgeMan2
Manufacturer: Micro Data Business Systems
P.O. Box 248
Lafayette, IN 47902
Phone: (800) 344-5832
Sugg. List: $595



"I wish you'd believe me, Ms. Jones, when I say that fears of VDT radiation are groundless."

Academic Writing with Perfect Writer

A referencing system that's easy to live with

by Robert J. Schechter

"Publish or perish" is an often-heard axiom in college halls. And it's one of the reasons college teachers were among the first to embrace word processing as a tool of their trade. But all word processing software is not created equal, and for academic purposes, Perfect Writer is a popular choice. Why? Because the style required by academic or scientific journals is more easily created with Perfect Writer than it is using WordStar alone. Writers are able to turn out a professional paper with less maneuvering.

What follows below is a step-by-step guide for producing academic papers. The first section covers the details of appearance, such as margins, page numbers, and page headings. The second section—and majority of the article—discusses how to handle footnotes and endnotes. While footnoting has been covered in previous *PROFILES* articles, this method provides you with a *system* that allows maximum flexibility, a way to cross-check all references cited, and the ability to make your citations understandable at a future date.

Margin mania

Often professional journals and/or textbook publishers request large margins, such as one and a half inches on all four sides. Any such margin changes may be easily handled by the appropriate @STYLE commands at the beginning of the document. The left- and right-hand margins are easily set by typing **@STYLE(leftmargin 15 chars, rightmargin 15 chars)**. At 10 cpi (characters per inch), this gives the necessary one and a half inches on the right- and left-hand sides.

The top and bottom margins may be handled similarly. You can set the top and bottom margins by typing the @STYLE command **@STYLE(topmargin X lines, bottommargin Y lines)**. (Note the two "m's" in bottommargin.) Naturally, the question here is what the values of X and Y should be.

Before I answer that question, let's make sure we're starting from the same set of assumptions. I'm assuming that your default spacing is double spacing, since that is usually required for professional or academic articles. In requesting Perfect Writer to leave a "top margin," it seems as if Perfect Writer "knows" that you are double spacing. Thus, if you choose **@STYLE(topmargin 3 lines)**, you will get three double-spaced lines at the top, or one inch. If you need a one-and-a-half-inch top margin, use **@STYLE(topmargin 5 lines)**.

For the bottom margin, however, Perfect Writer returns to counting each line as a single line. Thus, to leave one and a half inches at the bottom of each page, type **@STYLE(bottommargin 9 lines)**; to leave a one-inch bottom margin, make it five lines. It sounds crazy, but it works. Print out a sample page to check the way your printer-software combination handles the problem and modify the instructions as needed.

Proper page numbering

Page numbering is another thorny problem. For those who would like to remove the dash from each side of the number on the bottom of each page (to have plain "3" on the bottom of the third page rather than "- 3 -"), the solution is simple, although it has rarely been correctly stated. At the beginning of the document type: **@PAGEFOOTING(center="@VALUE{page}")** and the page number will appear in the footing without any dashes beside it. Type **@PAGEFOOTING(center = "Page @VALUE{page}")** and the word "Page" will appear with the page number.

Some journals require specific page headings with the author's last name, a running abbreviated title,

page number, etc. All these can be easily constructed by using the @PAGEHEADING command and left =, center =, and/or right =.

The bottom page numbering, of course, can be turned off completely by typing **@PAGEFOOTING()**.

Here's how to check the appearance of the heading and/or footing without wasting paper. First, you must redefine a "device," which may be either the console (screen) or a file, to be an 8-1/2-by-11-inch page. Then you must format your manuscript file to that device, which will produce a FIN version of your manuscript. Finally, calling up the FIN file to edit on the screen will let you see how your heading and footing text will look.

Notes—end and foot

One of the ways in which Perfect Writer is superior to WordStar is that it makes it easier to put reference citations in an academic paper. References in the text may be cited by using the @NOTE command. Perfect Writer will automatically put a number in the text at that point and then write the reference itself in a numbered reference list at the end of the document.

For example, suppose I'm writing an article for a medical journal about performing appendectomies. I might write:

> There are many new methods of performing an appendectomy that have recently been popularized.@NOTE(Smith, J.: Nifty New Ways to Take Out Appendixes. Archives of Appendix Surgery, 32: 42-49, 1983) Some of the methods that have...

When this is passed through the formatting portion of Perfect Writer (Perfect Formatter) it will appear as follows:

> There are many new methods of performing an appendectomy that have recently been popularized.[1] Some of the methods...

Or, depending on your "footpush" style choice (discussed below), the printout might appear as:

> There are many new methods of performing an appendectomy that have recently been popularized.[1] Some of the methods...

Perfect Writer will number the reference citation with whatever the appropriate number is and print the information contained within the @NOTE structure (everything between the parentheses) at the end of the document. The information within the @NOTE structure is stored in the mysteriously named "end space," the size of which is set with the PFCONFIG program, found on Perfect Writer's installation disk.

For those documents in which you wish to place the reference or comment at the bottom of the page rather than at the end of the document, the @FOOT command (for *foot*note) may be used in a manner similar to the @NOTE command. Note that with either command, if you later wish to add or delete a reference, Perfect Writer will automatically renumber all the remaining references to correct for the addition or deletion.

There is one problem, however, if you wish to use end-of-document references *and* footnotes in the same document. Perfect Writer will number each @NOTE or @FOOT sequentially. Thus, if your first referencing command is @NOTE, your second @FOOT, and your third @NOTE again, Perfect Writer will reference each of them with the appropriate number (1, 2, and 3). However, the footnote on the bottom of the page will be numbered 2, with no footnote number 1, and the end-of-document references will be numbered 1 and 3 with no number 2. Thus, Perfect Writer may not be satisfactory if you wish to use *both* types of references in the same document.

The reference number after each citation will appear either as a raised number—i.e., [1] (superscript)—or enclosed in a pair of square brackets—i.e., [1]. You can choose either way of displaying reference numbers when you select the default style parameters with PFCONFIG. The normal default is superscripted.

Alternately, you can set the style for an individual document by using the @STYLE command "footpush." **@STYLE(footpush yes)** will cause the reference to appear as a superscript; **@STYLE(footpush no)** will cause it to be enclosed in square brackets. Most of the journals to which I submit articles prefer references to be listed as superscripted numbers, but in Perfect Writer, the choice is yours (or perhaps I should say your editor's).

For some reason, the designers of Perfect Writer thought that editors would prefer an extra line to be left above such superscripts to prevent confusion with the line above. However, this means that any line on which a referencing superscript appears will be *triple*-spaced. For example, a document referenced in that manner would appear as follows:

> Many such operations have been developed in the past.
>
> Often, the surgeon has had other considerations in dealing with these diseases.[1] The problems of infection remain, and continue to cause more serious complications than

Virtually no editors, at least in my experience, will accept this format. When setting default parameters you are asked "Pad Super- and Subscripts?" If you answer "yes," then extra white space (an extra line) will be left above each superscripted line. If you answer "no," then theoretically the extra line will not be inserted. There's a catch, however, and it has to do with your printer's capabilities. My printer cannot micro-feed vertically, so this option *cannot* be set to "no." In spite of the way in which I set this option on the

installation disk, Perfect Writer continues to leave that jarringly unwanted third line of white space.

Fortunately, Perfect Writer *does* allow this option to be overridden with a @STYLE command. At the beginning of the document, type **@STYLE(scriptpush no)**, and the third line will disappear into the unpleasant stylistic nightmare from which it came.

A system you can live with

Now we come to my second series of suggestions, which deals with how to arrange the list of references and print them out. Perfect Writer, through its @NOTE command, will automatically list the references in order at the end of the document, preceded by a line of nine dashes. Below these dashes, the references will be single spaced, separated from each other by one blank line.

There are several problems with this result. First, the nine dashes are unnecessary and will antagonize journals that give specific instructions as to how the references are to be formatted. Second, references are usually listed on a separate page. Third, references, like the rest of the paper, are supposed to be double spaced. Finally, all this reference information will be stored in Perfect Writer's end space, the size of which may not be large enough to accommodate all the information for a significant number of references. If you anticipate any of these problems, you've come to the right place. Read on.

Let's suppose that you're writing a paper for a surgery journal that requires references to appear as described above. The file name for your document might be SURG.MSS. The first "trick" for arranging your reference list is to create a *second* file for references. Let's call it SURG-REF.MSS (hereafter referred to as the "REF" file).

Consider our example citing a reference from *Archives of Appendix Surgery*. This is the way I suggest handling this sort of writing:

> There are many new methods of performing an appendectomy that have been recently popularized.@NOTE(Smith, Nifty) Some of the methods suggested have involved the

At this point, you've generated a superscripted (or bracketed) reference number in the document. The list of references, to be typed out at the end of the document, will say only "Smith, Nifty." This is enough for you to identify which reference it is, but it is clearly not enough for anyone else.

Now use the split screen command, **^X2**. If you wish to keep your primary document in the top screen, type **^XO** (the letter O, for other screen, not the number zero). Now, in the bottom screen type **^X^F**. When asked for "File to find?" request the REF file.

Begin the REF file with a centered title, such as "REFERENCES." Do this by writing **@CENTER(REFERENCES)**. Then leave a few blank lines before the beginning of the references themselves by typing something like **@BLANKSPACE(2 lines)**.

There are two formatting commands with which you should begin the REF file. Let me start by explaining the second one, @LEVEL. This command is ideally suited for setting up a list of references. Using the @LEVEL command, each new "paragraph" will be numbered in sequence—ideal for a list of references.

Begin the REF document with **@LEVEL[**, then follow with all your references in the order you cited them. Note the open square bracket; this tells Perfect Writer to number every paragraph until it comes across a closing square bracket. So remember to add the closing square bracket at the end of SURG-REF.MSS. Thus, in the example above, after typing **@NOTE(Smith, Nifty)**, switch down to the other screen and, after your REFERENCES heading, type:

> @LEVEL[Smith, J.: Nifty New Ways to Take Out Appendixes. Archives of Appendix Surgery, 32: 42-49, 1983]

After adding a second reference, your REF file will look like:

> @LEVEL[Smith, J.: Nifty New Ways to Take Out Appendixes. Archives of Appendix Surgery, 32: 42-49, 1983
>
> Jones, B.: Problems in Finding the Appendix. Journal of Geographic Surgery, 45: 145-151, 1981]

When this @LEVEL environment passes through Perfect Formatter, each successive entry will be given a number and listed, just as you would want in a list of references. It will appear as follows:

1. Smith, J.: Nifty New Ways to Take Out Appendixes.

   Archives of Appendix Surgery, 32: 42-49, 1983

2. Jones, B.: Problems in Finding the Appendix. Journal

   of Geographic Surgery, 45: 145-151, 1981

The other formatting command is the @STYLE command "levelhang." I prefer to have everything indented from the reference numbers. To accomplish this, simply begin the REF document with the command **@STYLE(levelhang yes)**. Then the output will appear as follows:

1. Smith, J.: Nifty New Ways to Take Out Appendixes.

   Archives of Appendix Surgery, 32: 42-49, 1983

2. Jones, B.: Problems in Finding the Appendix. Journal

   of Geographic Surgery, 45: 145-151, 1981

As you write the paper, whenever you need to insert another reference, list it using @NOTE with only enough information to allow you to identify which reference it is. This "stinginess" in labeling will protect you from using up your limited end space. Then, use ^XO to switch to the other window (the REF file) and add the complete reference as the next entry in the @LEVEL environment (remember to put the terminal

"]" at the end of the last entry).

You could use the split screen command (^X2) to call up the REF file anew each time. However, if you add references fairly often, you'll probably find it more convenient to keep the REF file in the bottom screen at all times. Since you're not really reading from that screen, you can make it as small as possible. Perfect Writer allows you to reduce the size of a split screen to as little as three lines. To do this, press **^XO** to get to the top screen if you're not already there. Then press **ESC 7** (or ESC and a number greater than 7) followed by **^X^** (the up-caret symbol over the 6 key, not the cursor arrow key). Now your top screen is almost as large as it would normally be, yet at the same time you have instant access to the REF file in the bottom screen.

To summarize, as you write the manuscript in the top screen, every time you wish to add another reference, use the @NOTE command with the abbreviated information as discussed above. Perfect Writer will automatically number all the references. Then transfer down to the REF file and write the complete reference identification. The @LEVEL format will automatically number these.

Changing horses in mid-stream

Suppose that you want to go back into the middle of the document and add another reference citation. Go to the desired location and add the citation using @NOTE. Perfect Writer will automatically renumber all the other references.

But what about the numbering caused by the @LEVEL command in the REF file? You'll have to add the complete information about the new reference and insert it into the correct place in the list.

It's easier to do this than it may seem. After writing the new reference in the top file (using @NOTE), search backward using **^R** for the previous @NOTE. Then use **^XO** to go down to the REF file, and use **^S** to search forward *or* **^R** to search backward to find the matching reference. Your new reference goes below this one. @LEVEL will take care of everything else, renumbering the reference list correctly.

Citing the same reference twice

Before I tell you how to clean everything up and produce a product suitable for submission to even the most finicky editor, there is one more problem to discuss: What you do if you want to cite the *same* reference a second time. In such a case you will want the same citation number that was used in the first citation of that source. We cannot use the @NOTE command again—that would assign a second number to the reference and duplicate the citation on our list of references at the conclusion of the manuscript.

The solution to this dilemma is Perfect Writer's @+ command. This allows you to place *anything* as a superscript. (Later I'll explain how to use @+ to place commas between multiple citations.)

If you need to cite the same reference a second time, I suggest that you use @+ to place your abbreviated title within the brackets—for example, @+(**Smith, Nifty**). Why not just put in the correct reference number at this point? Because if you do, you'll lose one of the main advantages of my referencing system—the ability to later add or remove references during editing and have everything automatically renumbered. If you use the @+ command with a specific number, and later add or remove a reference, the number will be incorrect. Therefore, wait until the last possible stage to change the superscripted, abbreviated title to the appropriate number.

More on the system

Sooner or later you will reach the stage where you're ready to add the appropriate numbers to the various @+ commands. Although at that point you can remove the abbreviated titles and replace them with the appropriate numbers, it will provide you with maximum flexibility if you retain the abbreviated titles (in a non-printable form).

Type **^X^C** (making sure all your documents have been saved) and return to the main menu. Choose **F** to *f*ormat your REF file. When you see the formatting menu, press **D**, for *d*evice. When asked for the name of the device that you are formatting, type **file**. This will create a console-oriented FIN file that can be viewed on the screen. (The "file" device should have been defined as using an 8-1/2 by 11-inch page if you want to see page by page what the output will look like. However, even if it was not defined that way, it can still be used in the way described below.)

For example, suppose you're ready to put in the final referencing numbers for your paper, SURG.MSS, with the @LEVEL references in a second file, SURG-REF.MSS. First, format SURG-REF.MSS for the device "file." This will create the file SURG-REF.FIN. This is *not* a printable file—it's formatted for viewing on the screen.

When the formatting is completed, go back to the main menu and choose to edit SURG-REF.FIN. Thanks to the @LEVEL command, when it appears on the screen each reference will be numbered sequentially.

Now split the screen with **^X2**, then use **^X^F** to "Find the file" SURG.MSS. When this is accomplished, SURG.MSS will be in the top screen and SURG-REF.FIN will be in the bottom screen. Now use **^S** to find the first @+ in SURG.MSS. Let's suppose that it's @+(Smith, Nifty). Switch down into SURG-REF.FIN to find that reference and its associated number. If necessary, go to the front of the file and use ^S to find "Smith." Let's say that it is reference number 4. Switch back up into SURG.MSS.

Now you *could* just replace @+(Smith, Nifty) with @+(4) and that would solve the problem. However, in the future, if you wanted to revise the manuscript, you'd have to recheck all numbered superscripts to make sure the references were still correct. (Some authors may not ever revise or update a completed manuscript, so at this point they may want to simply replace the abbreviated references with the numbers and be done with it.)

For those who *do* wish to retain the abbreviated reference information over each citation, here is one more "trick" to use in replacing the reference with a number, while still retaining a check on the reference to which it refers. For example, suppose the line in SURG.MSS is as follows:

Other methods were also suggested.@+(Smith, Nifty)

First, check SURG-REF.FIN on the bottom screen and confirm that this reference to Smith is the previously cited reference number 4. Now go back to the top screen (SURG.MSS) and change the manuscript to read as follows:

Other methods were also suggested.@+(4$Smith, Nifty])

Right after the beginning parenthesis of the @+ command you added the correct reference number, in this case **4**, and also the **$** (or any other symbol *that is not used anywhere else in the manuscript*). You also added an *unmatched* closing square bracket (]) just before the closing parenthesis.

Now go and find the next repeated reference citation that needs to be handled in this way. How do you find it? You should have guessed by now—^**S** to search forward for "@+." Repeat the steps described above.

When you've gone through all the added @+ references in this way, it's time to tidy up and eliminate the symbol you chose (the $). Go to the beginning of SURG.MSS. Type **ESC R** (for replacing one string of characters with another). When asked what to replace, type your symbol, then type **ESC** to indicate that you're ready for the next command. When asked what you wish to replace the $ with, type @**COMMENT**[. Note the opening square bracket. This matches the closing square bracket you typed above. Thus, in our example,

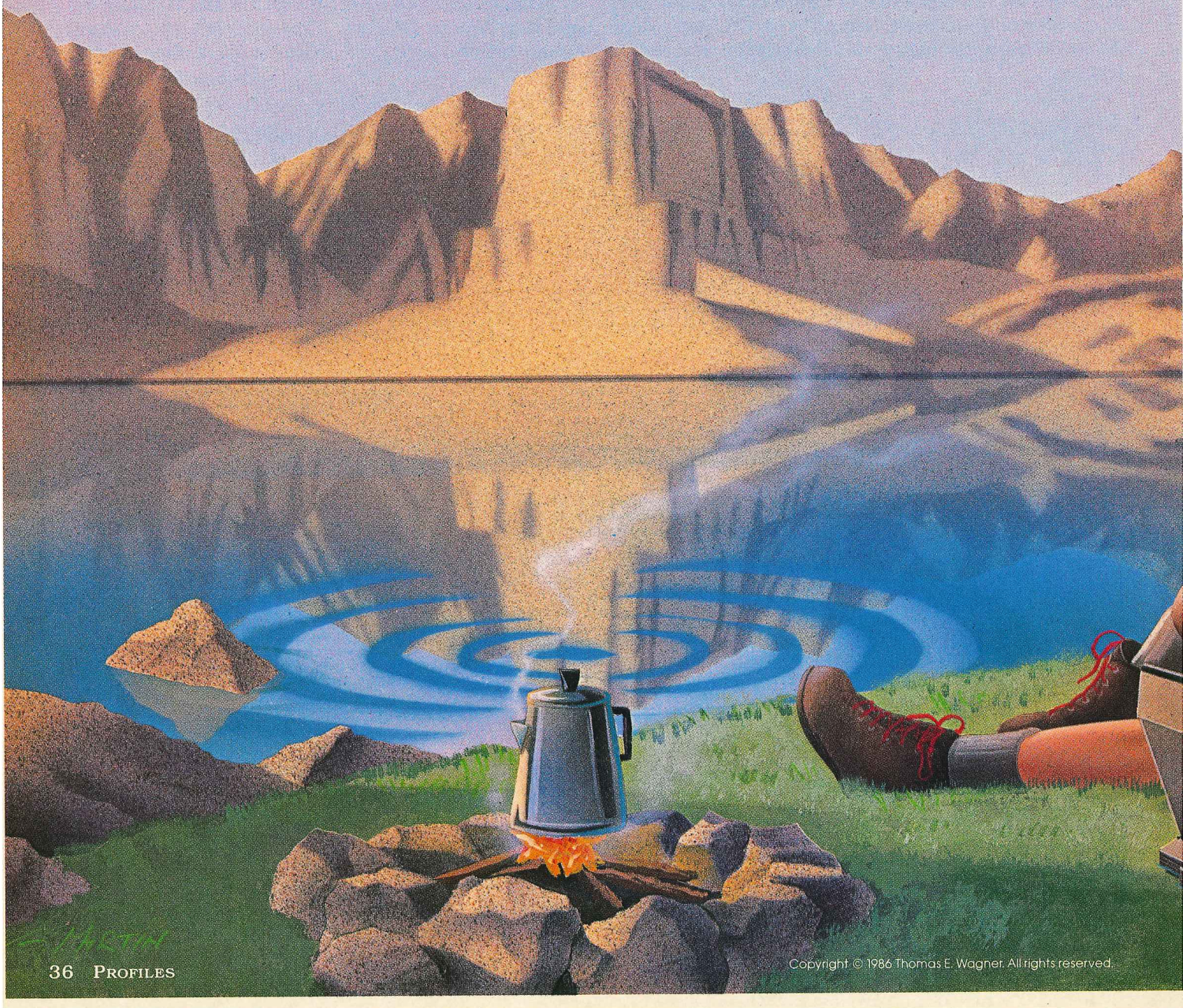
(continued on page 58)

General 8/16

Learning to Recognize the Landmarks

Elements common to high-level languages

by Thomas E. Wagner



(Editors' note: This is the second in our series of articles on computer programming. It is intended for readers with little or no programming experience. It is meant to enable them to recognize certain program components common to most languages and to understand their functions in a general way, thereby making it easier to learn to use these components when writing programs in a specific language. It should be noted that in any article of this type a degree of oversimplification and overgeneralization is unavoidable, and that no article or book can take the place of hands-on programming practice. This article—and this series—is not intended to stand on its own, but to supplement the study of a good programming text. It should also be noted that there are many implementations of each language, and that the examples contained herein will not operate under every implementation. They are intended to illustrate programming concepts, *rather than to be samples of code that will actually run.)*

No matter what we originally bought our computers for, sooner or later many of us feel the temptation to try our hands at programming. But which of the myriad languages should we invest all that time and energy in learning? They all tell the computer to do the same sorts of things: run a spreadsheet, print a report, calculate a formula. So why couldn't there be just one computer language?

In a sense, there is. There's just a handful of *types* of instructions used in all computer programs, regardless of the language in which they're written. Learning to recognize these distinct types when they appear and knowing what their functions are gives a tremendous boost to the novice. It's like having an outline of the plot of a story—you know the basic actions and actors, even if you don't know all the details.

The intent of this article is to give you that boost—to enable you to look at a program, recognize the outline, and thereby get a general sense of what is going on.

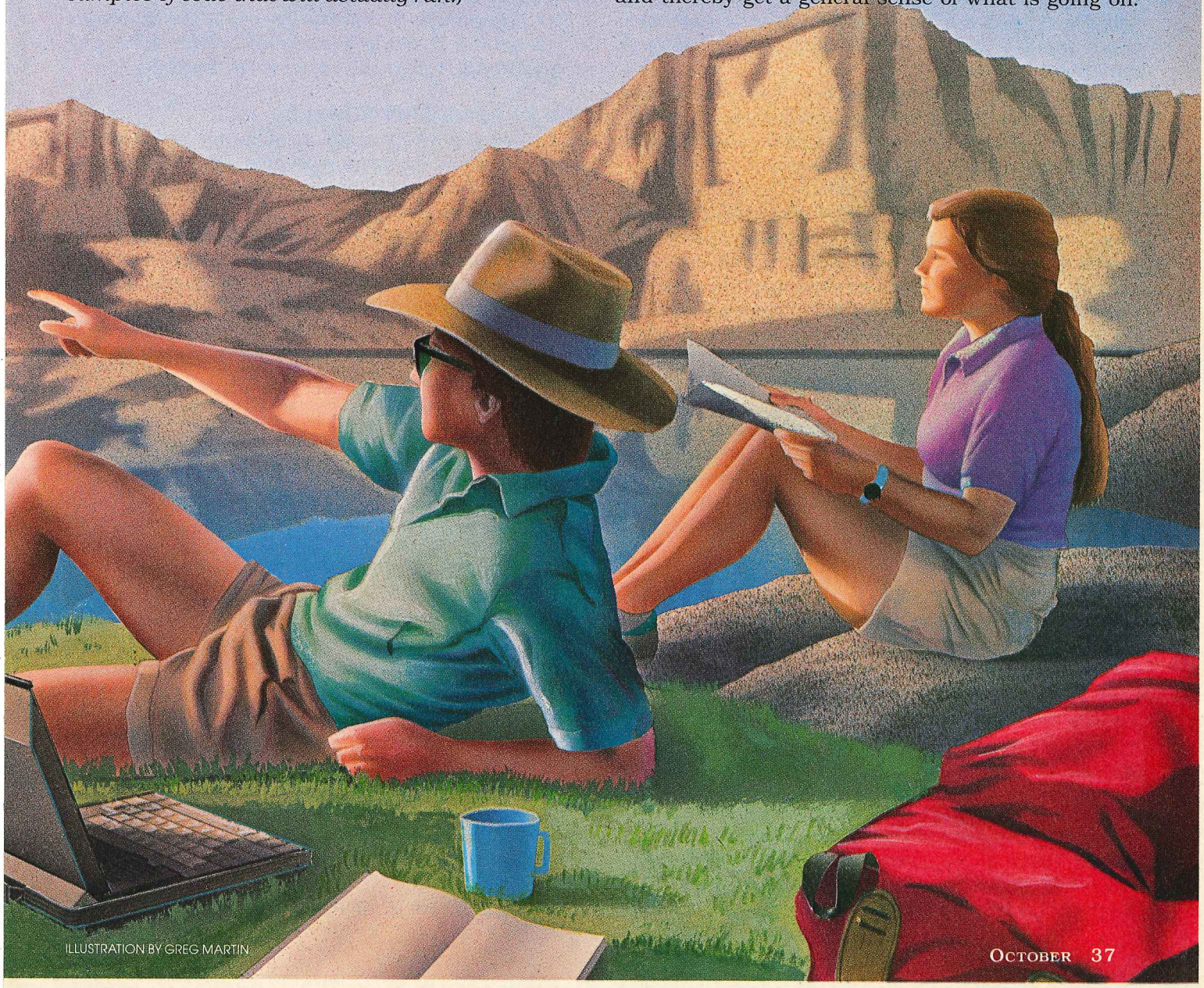


ILLUSTRATION BY GREG MARTIN

Also, this is intended to help you understand the next two articles in this series, which will be about writing pseudocode and flowcharts.

It's an ambitious goal, so don't be dismayed if you can't follow all the examples, or the explanations aren't all crystal clear right now. Programming is difficult to explain—you have to see it in action. What we discuss here will no doubt become clearer once you decide what language you want to study, choose a text, and start practicing, so you may want to come back to it again in a few weeks or months.

But before we start discussing the types of instructions common to higher level languages, let's first discuss what a program is and some other "background" material.

What a program is and does

A computer program is a series of instructions, written in a programming language, that tells your computer how to perform some task. Each instruction, properly called a "statement," accomplishes one of two basic tasks: input or output (I/O) of data (information), or manipulation of data.

An I/O statement moves data to or from your screen, keyboard, disk files, printer, or other peripheral device. Raw data is put into the program and the finished data is communicated to you by I/O statements.

Between the raw input and finished output are data manipulation statements. A data manipulation statement calculates numbers or assembles letters and words into intelligible sentences. When the data manipulation statements have massaged the data into its final form—that is, accomplished the purpose of the program—I/O statements communicate that finished data to you. I/O statements merely move data into or out of the program; data manipulation statements are its core.

We can classify data manipulation statements into three broad categories: Assignment, Decision, and Iteration. You can construct any imaginable computer program with these basic types of instructions, though the rules for using them vary from language to language.

Statements in general

Before we discuss what the three types of statements look like and what they do, let's define in more general terms what "statements" are.

A statement in a programming language corresponds almost directly to a sentence in English and serves the same purpose—it expresses a complete thought according to the rules of the language. Statements instruct the computer to *do* something, to perform an action. All the individual statements that comprise a program are its "source code."

The rules of grammar and construction are as important in programming languages as they are in English. Luckily for the would-be programmer, computer grammar is not only simpler than English grammar, it uses most of the same symbols.

Each statement usually starts on a new line and ends with a period, a semi-colon, a colon, or just the end of the line. For example, in Turbo Pascal the statement "WRITE('cat');" tells the computer to print the word "cat."

Statements that are grouped together and executed all at once form a compound statement, which is used when more complex operations are needed to accomplish a task. You can spot a compound statement because it is marked with paired words or symbols called "delimiters," which are placed at its beginning and end. The words BEGIN and END, parentheses, or curly brackets are the most commonly used delimiters.

By convention, compound statements are often indented to set them apart from the rest of the program, making it easier to visually keep track of what's going on. (Iteration statements, described later, are often compound statements.)

Keep these rules in mind as you study the examples in this article. It will help make the entire subject of programming logic much easier to understand.

Components of statements

English sentences are made up of nouns, verbs, adjectives, and so on. Program statements are made up of variables, values, operators, and other elements. We'll explain some of them here.

Variables are used in a computer program in much the same way letters are used to represent numbers in algebra. A variable is a symbol that represents a value stored somewhere in your computer's memory. You decide the name of each variable when you write your program. You can use variable names as cryptic as "X" or as meaningful as "TOTALINCOME."

Each language has a list of "reserved words" that you cannot use as variable names.

Each programming language has different rules about which variable names are "legal," as well as restrictions on their length. Generally, each language has a list of "reserved" words and characters that you *cannot* use as variable names. As long as you don't use these, the variable names in your statements can be whatever you want, within length restrictions.

The value assigned to a variable can be a number or string of characters. The number 22 and the character string "111 Baker Street" could both be values; you choose values depending on what you want your program to do.

A good example of variables and values is a dollar

bill. The paper it's printed on isn't worth much, and neither is the ink. So what makes it valuable? We have assigned the value of one dollar to that scrap of green paper. If we were assigning value to that paper in a computer program, the command might read, "LET ONEGREENPAPER = $1." The variable name is ONEGREENPAPER and the value is $1. You could change (vary) that value to $5 later in the program, and the program would do different things. That's why the symbols to which values have been assigned are called variables.

Other elements you're likely to encounter are called "operators." Operators are symbols that specify operations to be performed on variables. These include Boolean operators and arithmetic operators.

The arithmetic operators are simple to understand. They're +, – , *, /, and n^: addition, subtraction, multiplication, division, and powers of 10 (10^2 means 10 to the second power, or 10 squared).

Other arithmetic operators include the *relational* symbols =, >, <, <>, >= and <=, and their functions should be familiar from high school algebra classes. Note that these operators can be used in relation to words (character strings) as well as numbers.

The Boolean operators, also called "logical operators," are AND, OR, XOR, and NOT. Boolean operators perform logical comparisons and are usually seen in Decision statements, although they're occasionally used in the other types of statements as well. They'll be discussed in further detail in the section on Decision statements.

Types of statements

As we have said, there are three types of statements at the heart of a computer program: Assignment, Decision, and Iteration. Each type of statement has a tiny set of English-like words or symbols associated with it, and each follows a particular format, or "template."

Thus, whenever you see certain words used in a certain format in the source code for a program, you'll have a pretty good idea what type of statement you're looking at. If you also know the function of each type of statement, you'll have an idea of what is going on in the program at that point. And if you can follow a program readily, it should become easier to write your own.

The specifics of program design vary from language to language and are beyond the scope of this article—that's something you'll have to learn from a book on the language you choose to learn. But we'll examine each of the three types of data manipulation statements in depth. We'll give examples of how they are expressed in four different languages: BASIC, Pascal, C, and dBASE II, and we'll describe the function of each type of statement.

Begin by examining Figure 1. It shows the templates for each of the instruction types.

As you can see, each type of statement uses certain characteristic words and symbols. These may vary

```
Assignment  LET...=...
       or      ...=...

Decision    IF...THEN...ENDIF
       or   CASE...ENDCASE

Iteration   DO WHILE ... ENDWHILE
       or   FOR X =...TO...DO...
       or   DO...UNTIL
```

Figure 1: Statement Templates.

slightly from language to language, but the templates are usually quite recognizable once you know what to look for. The ellipses (. . .) indicate that which is not part of the *generic* statement. When you write a program, the ellipses are replaced with variable names and other symbols or data pertinent to your program.

Assignment statements

The internal memory of a computer is a series of cubbyholes waiting to receive data: either the result of a computation involving the contents of other cubbyholes, or data input from the keyboard, disk drive, another computer, etc. Assignment statements are one way that data is put into these cubbyholes. In high-level programming languages we assign a value to a variable and let the compiler or interpreter worry about where in memory that value is stored. (See "A Survey of Programming Languages" in the September 1986 issue for an explanation of compilers and interpreters.) Once a value is assigned to a specific variable name, the computer can recall and manipulate that data simply by using the variable name in another statement.

Assignment statements are fairly easy to recognize. The almost universal symbol for assignment has been borrowed from arithmetic: the equals sign (=). It is sometimes coupled with the word LET, SET, or, more descriptively STORE, depending on the rules of the language you are using. Figure 2 contains examples of Assignment statements.

```
        BASIC                          PASCAL
10 LET ALPHA = 10              alpha  := 10;
20 LET BETA = ALPHA            beta   := alpha;
30 LET SUM = ALPHA + 1         sum    := alpha + 1;
40 LET STRING = "LET IT BE"    string := 'Let it be';

          C                        dBASE II
alpha  = 10;                   STORE 10 TO ALPHA
beta   = alpha;                STORE ALPHA TO BETA
sum    = alpha++;              STORE ALPHA + 1 TO SUM
string = 'Let it be';          STORE 'Let it be' TO STRING
```

Figure 2: Assignment: The = Template.

In Assignment statements, the variable's name nearly always comes first in the statement, followed by the value being assigned. Notice that dBASE has opted for a more verbose style than the other languages and reverses that order, but the idea is still the same and is clearly expressed.

In the C example, a shorthand form for adding 1 to the current value of a variable is shown (++). In this case the value "Alpha + 1" is being assigned to the variable name "sum." The C language is rich in aids like this, a legacy from earlier days when few programmers could touch-type. Don't let wrinkles like this confuse you. If the equals-sign equation format is there and the equation is by itself on a line with no IFs, DOs, or WHILEs, you're looking at an Assignment statement.

Decision statements

As far as a computer is concerned, the answer to any question is either "true" or "false," never "sort of" or "just about." This is because, to a computer, the answer to a question determines whether a particular switch is on or off—those are the only two possibilities; there's nothing in between.

Decision statements are used when there's a decision to be made in the program's logic. Basically, Decision statements test a condition—that is, determine whether something is true or false—and then take an action depending on the result.

Most programming languages use the word "IF" to signify a Decision statement. The IF is followed by a proposition, which is normally a comparison of two or more data elements. The proposition is either true or false.

After the proposition, a Decision statement must specify an action to be taken if the proposition is true. For example, the statement IF X>0, PRINT "OK" means that if the value of the variable X is greater than zero, then "OK" will be printed. If the proposition is false, the rest of the statement is skipped and the next statement in the program is executed.

An example of a Decision statement in English is: "If the bus arrives at 5 p.m., get on it." This is a conditional instruction—if the condition is fulfilled (the bus arrives on time), an action takes place (you get on the bus).

The proposition part of a Decision statement uses a small set of arithmetic relational operators, shown below in Table 1.

Symbol(s)	Relation	Usage
= or ==	equals	a = b
>	greater than	a > b
<	less than	a < b
<> or !=	not equal	a <> b
>=	greater than or equal to	a >= b
<=	less than or equal to	a <= b

Table 1: Arithmetic Relational Operators.

We call them *relational* because they describe a relationship between two values that is either true or false. In the above example, the bus either arrives at 5 p.m. or it does not. For the proposition to be true, the bus would have to arrive at 5. Otherwise the proposition would be false. In a programming language, this statement might be "IF Bus_arrive_time=5 THEN Get_On_It." The equals sign is the relational operator in the statement.

Each of the operators in the table above describes a relationship between A and B. This relationship is either true or false. If it's true, then whatever action is specified will be taken; if it's not true, then no action is taken. The action to be taken when a relationship is true is usually denoted by the key word "THEN." An examination of the examples in Figure 3 should make things clearer.

```
      BASIC
10 IF TWO > THREE THEN
   PRINT "SOMETHING WRONG"
20 IF TWO < THREE THEN
   PRINT "ALL OK"

      C
if (two > three)
  printf("Something wrong");
```

```
      PASCAL
If two > three then
   write('Something wrong');
if two < three then
   write('ALL OK');

     dBASE II
IF two > three THEN
   ? "Something wrong"
ENDIF
```

Figure 3: Decision: The IF...THEN...ENDIF Template.

Boolean operators are commonly used in Decision statements. They take their name from George Boole, an English mathematician of the mid-19th century, who attempted to create a "calculus of logic" that could mathematically express and analyze the process of deductive reasoning.

Like the relational operators described above, Boolean operators also yield a value of "true" or "false," and you can use Boolean operators to "relate the relations" in a Boolean expression. That is, elements that contain arithmetic relational operators can in turn be connected by Boolean operators.

Here's an example. The Boolean expression "A<B AND C>D" takes the two relations (A<B and C>D) and relates them with the Boolean AND operator to yield a single True or False value. Let's assign these values to the variables: A=2, B=3, C=5, D=4. For these values the expression "A<B AND C>D" will yield a True value. As long as A remains less than B *and* C remains greater than D the expression will yield a True value. Now let's change the values slightly and let A=4. The expression "A<B" now yields a False value, so since the Boolean AND operator was used the same expression "A<B AND C>D" now yields a False value.

There are six Boolean relations, including AND, but only four are in general use as operators in program-

ming languages. They are: AND, OR, XOR (eXclusive OR), and NOT. When you see these words in a program, you're looking at a decision statement of some sort. An IF will be somewhere nearby, waiting for a True value to bring meaning to its existence.

Figure 4, below, is a brief description of each of the Boolean operators.

AND True only if both relations, or "operands" as they are sometimes called, are True. This and OR are the most commonly used Booleans.

OR True if any of the relations is True.

XOR Differs from OR in that the case in which both relations are True is "excluded." XOR will yield a True value only if one or the other relation is True; if both are True the result is False.

NOT Returns the opposite of a single relation's value, or the result of Boolean comparison of two relations by one of the other Boolean operators.

Figure 4: Boolean Operators.

Expanded Decision statements

Most languages also allow you to extend the IF-THEN decision to encompass an ELSE modifier. The ELSE modifier lets you specify an action to be taken when an IF proposition is false. Like THEN, ELSE is followed by one statement, or a block of statements bounded by delimiters. These statements can themselves be IF-THEN-ELSE statements, creating a "nested" sequence whereby complex processes can be expressed.

In Figure 5, the BASIC example works this way: First CARP and FISH are compared to see if they are equal. If that proposition is true, then the BASIC interpreter checks to see if DEAD is true. Only if all comparisons are true is the value of SINK assigned to the variable MOVE, which stands for "movement."

If CARP is equal to FISH but DEAD is *not* true, the value of SWIM is assigned to MOVE.

The C example is the same, except that it is phrased with nested IF statements (one IF statement within another one).

Both the Pascal and dBASE examples show a more complex series of decisions. You don't necessarily need to understand them, but they are included to give you an idea of how convoluted Decision statements can become.

When you start writing programs, you will eventually reach the point where complex decisions will need to be made. By that time you will be familiar enough with the language of your choice to begin working out the logic of decisions as complex as the Pascal and dBASE examples illustrated in Figure 5.

BASIC

```
10 IF (CARP = FISH) AND DEAD THEN
     MOVE = SINK ELSE MOVE = SWIM
30 END
```

C

```
if (carp == fish)
   {
   if dead
      move = sink;
   }
else
   move = swim;
```

PASCAL

```
If ((carp = fish) and
   dead) then begin
     move := grind;
     make_fertilizer(move);
end
else begin
  if (carp = complain) then
     move := whine
  else
     whatis(carp);
  end;
end;
```

dBASE II

```
IF (carp = fish) .and.
 dead then
   STORE grind TO move
   DO Make_Fertilizer
ELSE
   IF (carp = complain) then
      STORE whine TO move
   ELSE
      DO whatis_carp
   ENDIF
ENDIF
```

Figure 5: Mutually Exclusive Decisions: The IF...THEN...ELSE Template.

Advanced decisions

IF-THEN-ELSE-IF nesting is so common in programming that it has acquired a "shorthand" form in most languages: the Case statement. Case statements exist to give structure to situations where multiple choices are possible and correct. A Case statement gives the same *results* as a series of IFs, THENs and ELSEs, but in a more compact and clearer form. Generally, it is signaled by the word "case" and is limited to making a decision based on the value of a single character or integer. Figure 6, on next page, shows some examples.

BASIC has one of the most limited and difficult to grasp implementations of the Case statement. It does not actually use the word "case," but it offers a way to achieve some of the same ends. In the BASIC example, "R" is the controlling variable. Its value is assigned *before* the code segment shown is executed. The value of R must be a number between one and four, because that's the number of action choices possible. These choices are called "target lines"—lines that can be jumped to depending on which choice is made.

The program jumps to line 100 if R is 1, line 200 if it's 2, and so on.

This has the same effect as a series of IF statements: "IF R = 1, jump to line 100; IF R = 2, jump to line 200," and so on. (BASIC does not allow for an ELSE clause in the Case construct, but other languages do.)

The Case statement in other languages is intuitively clear and powerful. Notice in the Pascal example that

BASIC

```
10 ON R GOTO 100,200,300,400
100 ACTION = "1ST CHOICE":
    GOTO 500
200 ACTION = "2ND CHOICE":
    GOTO 500
300 ACTION = "3RD CHOICE":
    GOTO 500
400 ACTION = "4TH CHOICE":
    GOTO 500
500 . . . Rest of program
```

PASCAL

```
Case c of
   '1' : message := 'No. 1';
   '2' : message := 'No. 2'
  Else
   message := 'Neither!';
  {EndCase}
  Writeln(message);
```

C

```
switch(action)
  {
  case '1':
    message = "No. 1";
    break;
  case '2':
    message = "No. 2";
    break;
  default:
    message = "Neither);
    break;
  }
printem(message);
```

dBASE II

```
DO CASE
  CASE option = "1"
    STORE "No. 1" to message
  CASE option = "2"
    STORE "No. 2" to message
  OTHERWISE
    STORE "Neither" to message
ENDCASE
? message
```

Figure 6: The Case Statement: The CASE...ENDCASE Template.

you will get one of three messages, depending on what value has been assigned to "c." IF "c" has a value of 1, THEN string "No. 1" is assigned to the variable MESSAGE. IF "c" is 2, THEN "No. 2" is assigned to MESSAGE; and IF "c" is neither 1 nor 2, THEN the string "neither" is assigned to MESSAGE. At the end of this decision sequence, whatever's been assigned to MESSAGE is printed out on the screen.

Iteration statements

An Iteration statement, commonly called a loop, is just an extension of a Decision statement through time. In a loop, a statement or block of statements is repeated a set number of times, or until a certain condition is met.

Say, for example, you want a program to check a list of names for the name Dave Jones. You'd use a loop that would read the first name and check to see if it's Dave Jones. If it isn't, a value of one is added to the name variable. This makes the name variable equal to the second name on the list. The loop continues executing until the name variable becomes Dave Jones. Then some action is performed, such as printing "DAVE JONES" on the screen.

There are three types of loops: FOR, WHILE and UNTIL. The same Boolean and relational operators are used in loops as are used in decision statements.

However, the decision is whether to *repeat* a task or to perform it *at all*.

The FOR loop is the simplest. In a FOR loop, the statement or block of statements is repeated *for* a set number of times. FOR loops are used when you know—or can compute—exactly how many iterations (repetitions) you want to perform. Figure 7 shows some examples of simple FOR loops.

```
     BASIC                          C
10 PRINT "HOW MANY SHEEP";  for(i=0; i<flock; ++i)
20 INPUT NUM                  printf("%d Sheeps...\n",i);
30 FOR I = 1 TO NUM         printf("zzzzzzzzzzzz");
40   PRINT I," SHEEP..."
50 NEXT I
60 PRINT"ZZZZZZZZZZZZZZZZ"
```

Figure 7: Iteration: The FOR X=...TO...DO...ENDDO Template.

In the BASIC example, line 10 asks you to enter how many sheep you want to count (how many times to repeat the loop). Let's say we want to count 10 sheep. The first time line 30 executes, I, the loop control variable, is set to a value of 1. Then line 40 prints the value of I followed by the word "sheep." Line 50 signals the end of the statements that are a part of the loop, so the program goes back to line 30. This time 1 is added to I and the value of I followed by "sheep" is printed again. This continues until I is equal to 10. At that point incrementing I gives a value of 11, which is above the ending value for the loop. The program then skips all lines that are part of the loop and continues on the line following line 50. Notice that the loop control variable, I, is not changed by any statements within the loop. Incrementing the value of I is handled by the FOR statement itself and is not altered—although its current value may be used—by statements within the loop boundaries.

Pascal has a FOR construction too, very like BASIC's. The C example gives another view of C's density and economy of expression (some would say unintelligibility and obscurity). In the C FOR loop, all the action is between the parentheses. First the counter, i, is initialized (set) to zero; then the counter is tested to see if it is out of bounds; and finally, one is added to the counter before the statements in the loop are executed.

In the more sophisticated Iteration statements (WHILE and UNTIL loops) the repetition continues until some condition controlled by statements within the loop is met. In other words, WHILE a certain condition exists, do this. Or alternatively, UNTIL a certain condition exists, do that.

Unlike FOR statements, the loop control variable in WHILE and UNTIL statements must be initialized (that is, a starting value must be assigned) before the loop begins. The controlling data element is checked at the end of each pass to determine whether or not the task is complete. (This is called a "test of completion.")

Figure 8 illustrates both WHILE and UNTIL loops in our four example languages.

```
        BASIC
10 WHILE SIZE > WAIST
20   PANTS = LOOSE
30   BELT = LARGE
40   SIZE = SIZE - 1
50 WEND
60 PANTS = SIZE
70 BELT = SIZE
```

```
        dBASE II
DO WHILE size > waist
  STORE loose TO pants
  STORE large TO belt
  STORE size - 1 TO size
ENDDO
STORE size TO pants
STORE size TO belt
```

```
          C
do
{
 test_eyes(blue,age,res);
 test_eyes(green,age,res);
 test_eyes(brown,age++,res);
} while (res != blind
          && age < 100);
```

```
          PASCAL
Repeat
  test_eyes(blue,age,res);
  test_eyes(green,age,res);
  test_eyes(brown,age,res);
  age := age + 1;
Until (res = blind) or
      (age => 100);
```

Figure 8: Iteration: The DO WHILE/UNTIL...ENDDO Template.

The BASIC example is a WHILE loop. As in the BASIC example in Figure 6, the variables SIZE and WAIST are assigned values earlier in the code. In line 10, SIZE is compared to WAIST; if SIZE is larger, lines 20 through 40 are executed. Then line 10 compares SIZE and WAIST again. As long as SIZE remains larger, lines 20 through 40 will continue executing. When SIZE is no longer larger than WAIST, the value of SIZE is assigned to PANTS and BELT. If SIZE was initialized as equal to or smaller than WAIST, lines 20 through 40 would never have executed.

In an UNTIL loop the completion test is at the bottom of the loop, instead of at the top as it is in a WHILE loop. The C and Pascal examples in figure 8 are UNTIL loops. In both examples the series of tests will continue until "result" equals "blind" or "age" is greater than or equal to "100."

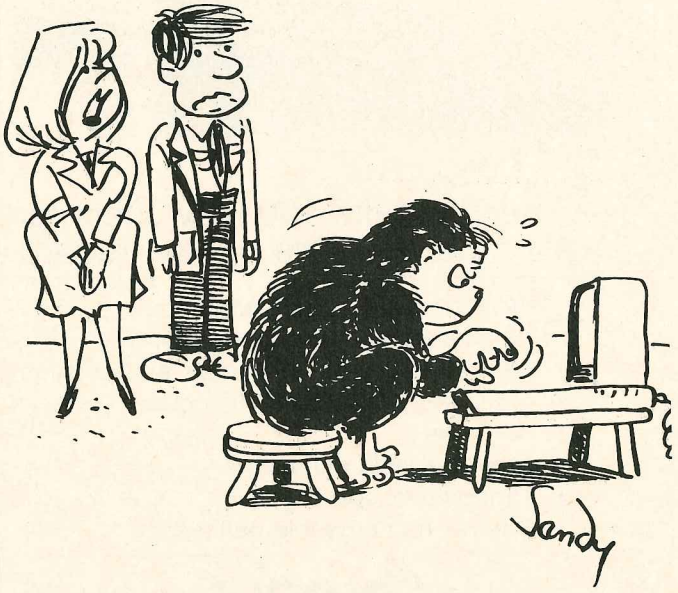
It is important to know *where* you want the completion test to occur in the loop. If you test at the top of the loop, and the conditions have already been satisfied, none of the code in the loop will be executed. This requires a WHILE loop. On the other hand, you may need to have the code in the loop execute at least once, no matter what the result of the completion test. In this case you'll want to use an UNTIL loop that makes the completion test at the bottom of the loop.

In conclusion

The structures we've been describing are the building blocks of program source code. Alone they are static and uninteresting. It's when they are put together to cause some meaningful action that they truly come to life. What we hope we've accomplished here is that we've taught you how to recognize these structures when you see them.

Now you have a feeling for the language behind the languages. Next month, Jerry Houston will teach you to use these basic types of statements to write pseudocode, a method of program planning used by some professional programmers. Clear, concise planning can cut your programming time significantly. It also lets you understand your code, or someone else's if they use the same methods, two or three months later when you want to change a program.

Tom Wagner is a freelance consultant in micro/mini-computers. He works on a wide variety of machines, from PDP 11/70s to Commodore 64s, in a variety of languages.



"After I taught her language, she demanded a word processor to write an expose on the treatment of lab animals."

A Program to Rename DOS Directories

Not just a nicety – a necessity

by Allen M. Lewis

Those of you who own IBM-compatible Kaypros with hard disk drives know the value of using the tree-structured directories of MS-DOS to organize your disk. But what do you do if a vendor sends you a software update that requires you to have your files under a specific directory name before it will work?

If you are lucky, you have enough disk space to make the new directory and copy your old data files into it. If you are like most of us, however, there will not be enough room for that. You will have to back up your old files and delete the old directory, then create the new directory and restore your files. With a good-sized software package, this can take several diskettes and a lot of time. Wouldn't it be nice if you could just rename the directory and be done with it?

Perhaps the above scenario seems unlikely to you, but I assure you that it can, and has, happened. As a consultant, I have run into this situation often enough to be convinced that being able to rename a directory is more than just a nice feature to have—it is a *necessity*! For that reason I offer you the assembly language program RENDIR.COM, a utility to rename directories.

The origin of the problem

Figure 1A (on next page) shows the layout of the directory entry for a file in MS-DOS. Notice that there is no byte for the user area of the file, as there is in CP/M. Note, too, that only the starting allocation unit is kept in the directory. This means that only one directory entry per file is required.

Normally, this would mean there is plenty of room for file entries, and on a floppy disk this is usually true. With hard disks, though, you will often find that you run out of directory space before you run out of file space (even with 480 available directory slots!). Version 2.0 of MS-DOS attempts to solve that problem with the subdirectory entry. (Note that all information supplied here also applies to version 3.0 of MS-DOS.)

The subdirectory is really a data file—a data file consisting of nothing but file directory entries, just as you would find them in the main (or root) directory area. Since the subdirectory is a file, the only limitation on the number of entries is the limit on file sizes. You'll run out of disk space long before you run out of file space.

Since accidental erasure of a subdirectory would be disastrous, the makers of DOS protect you from yourself by making a subdirectory immune to the normal commands, such as DEL and COPY. Unfortunately, this also makes them immune to the RENname command.

The extended FCB

When version 1 of MS-DOS was introduced, the authors implemented the idea of the hidden file and the system file. These could only be accessed through use of an extended file control block (FCB). The extended FCB added seven bytes to the beginning of a normal FCB (the structure of the normal FCB is given in the program listing found on page 48). The first byte has a value of FFh (-1 decimal) to flag this as an extended FCB. The next five bytes are zero, and the last byte is the attribute for the file. In this way, hidden and system files could be created, written to, erased, renamed, and so on.

Version 2 continues to support the extended FCB, with the addition of other attributes: read-only, volume identification, directory and archive (see Figure 1B, on next page, for the details for these attributes). This is the basis for the RENDIR program: It utilizes the extended FCB to rename a file with the subdirectory attribute. However, before we plunge into the program,

let's take time to look at the 8088. You 8080 programmers will be pleased to know how similar it is to both the 8080/8085 and the Z-80.

Through the 8088 with gun and camera

To begin with, there are four general-purpose 16-bit registers named AX, BX, CX and DX. Each of these can be split into two 8-bit registers, which are designated by the letters H (for high byte) and L (for low byte). For example, AH refers to the high-order 8 bits of AX, and AL refers to the low-order 8 bits of AX.

Figure 1A: Format of an MS-DOS Directory Entry

Byte Offset	Description
0-7	Primary file name: padded with spaces if less than 8 characters long
8-11	File name extension: padded with spaces if less than 3 characters
11	Attribute byte: Marks file as read-only, hidden, system, volume label, directory or archive. See FIG 1B for an explanation of this byte.
12-21	Reserved for MS-DOS
22-23	Time of last write: decoded as follows: Byte 23 / Byte 22 15 14 13 12 11 10 9 8 / 7 6 5 4 3 2 1 0 h h h h h m m m / m m m s s s s s hhhhh is binary number of hours (0-23) mmmmmm is binary number of minutes (0-59) sssss is binary two-second intervals (0-29)
24-25	Date of last write: decoded as follows: Byte 25 / Byte 24 15 14 13 12 11 10 9 8 / 7 6 5 4 3 2 1 0 y y y y y y y m / m m m d d d d d yyyyyyy is binary year from 0-119 which indicates 1980-2099 mmmm is binary months (1-12) ddddd is binary days (1-31)
26-27	Starting cluster: first allocation unit assigned to file. The allocation table (FAT) points to any other units used. Stored with the least significant byte first.
28-32	File size in bytes: stored with least significant byte first; this is a four byte value.

Two of these registers, BX and CX, have special uses. BX can be used as a pointer to memory in the same way that the HL register pair in the 8080 (or Z-80) is used. The CX register is used as a counter in some instructions. (Some of these are used in the accompanying program.)

The two index registers, SI (Source Index) and DI (Destination Index), are normally used as pointers to memory. Used with the repeat prefixes (described later) they simplify moving blocks of data, comparing memory blocks, and scanning for particular characters. They correspond roughly to the IX and IY registers of the Z-80. They can also be used as general 16-bit registers.

The SP (Stack Pointer) register points to the top of the stack, just as it does in the 8080. The BP (Base Pointer) is used to indirectly address values on the stack. If BP is loaded with the SP value, then [BP] points to the value on the top of the stack, [BP+2] points to the previously pushed value, and so on. (In 8088 assembly language, the square brackets around a register indicate that the register is being used as a pointer.)

The 8088 has a 16-bit flag register (although not all the bits are used). The zero, carry, parity, sign, auxiliary carry, and overflow flags are the same as in the 8080 (Z-80). The interrupt flag controls whether the 8088 responds to hardware interrupts. The direction flag is used in the string instructions. If it is clear (DF=0), then the string primitives move from low to high memory (SI and DI are incremented); if it is set (DF=1), then the movement is from high to low memory (DI and SI are decremented).

Figure 1B: Format for the Attribute Byte

Dec	Hex	Binary	Meaning
01	01	00000001	Read-only: cannot be erased with DEL. Cannot be written to with function 3Dh.
02	02	00000010	Hidden file: excluded from directory searches.
04	04	00000100	System file: same as above
			The above attributes may be set in any combination.
08	08	00001000	Volume label: entered during FORMAT. Cannot be set with any other attributes.
16	10	00010000	Subdirectory: excluded from directory searches. Should not be combined with any other attribute.
32	20	00100000	Archive: set when file is written to and closed. Used with Backup's /S switch. May be set with any of the first three attributes.

For example: if the attribute byte is 07h or 00000111 binary, then the file is read-only, hidden and a system file.

The IP (Instruction Pointer) keeps track of the next instruction to execute. It operates in exactly the same way as the IP in the 8080.

We still have not talked about how the 8088 can address up to one megabyte of memory with 16-bit registers. (You recall that the maximum address in 16 bits is 64K. To address one megabyte requires 20 bits.) This is where the segment registers come into play. There are four of these in the 8088, designated CS (Code Segment), DS (Data Segment), ES (Extra Segment) and SS (Stack Segment). Each of these is really a 20-bit register. This is because the segment registers address paragraphs rather than bytes. A paragraph is a 16-byte block of memory starting at any address that is a multiple of 16—for example 0 (00h), 16 (10h), and 256 (0100h).

Note that in each case, the rightmost hex digit (the least significant four binary bits) is zero. To compute the actual address from the segment value, you would

multiply the segment value by 16 (which is equivalent to shifting it left by four bits). Effectively, then, you have a 20-bit value.

To compute the effective address of an instruction or a variable, the 8088 takes a segment value and then adds a 16-bit offset value to it. The offset value represents the distance from the base address of the segment. The offset values can range from 00h to FFFFh, or 0 to 64K. Thus a segment can be considered a 64K block of memory beginning at its base address.

Typically, 8088 addresses are given in segment-offset form: The segment value in hex is given, and then the offset value. These two values are separated by a colon. For example, 0040:0050 points to the byte 50h bytes from the start of the 40h paragraph, which in decimal is 80 bytes from byte 1024, or 1104 absolute.

How does the 8088 know which segment register to use in computing an address? There are defaults built in. If the offset is from the IP, then CS is the default register. When a memory variable is addressed, or when BX, DI or SI are used as pointers, then DS is the default. When BP is used to address the stack, then SS is the default. For the string instructions, where SI and DI provide the offsets, SI defaults to DS and DI defaults to ES. This is probably the hardest part to learn in 8088 programming. Fortunately, in RENDIR, all the segment values are the same, so we don't have to worry about segmentation. (To find out more about this, see the bibliography at the end of this article.)

The program—at last

Listing 1, on pages 48-49, is formatted for assembly by the Microsoft macro assembler, MASM. The line numbers are only for reference—they are not required. Those of you who are familiar with Macro-80 will readily understand some of the directives used. I'll try to explain any obscure ones as we go along.

Briefly, the program works like this. The assumption is that the program is invoked by typing: **RENDIR oldname newname**, where "oldname" is the name of the directory to be renamed (you may also supply a drive letter) and "newname" is the desired name for it. Neither name can contain any wildcards (the ? or *). The program will first check to see that an old name was entered. It will then check to see that no wildcards were used. A directory search using the extended FCB insures that a directory entry with that name exists. If the entry exists, the program checks to see that a new name with no wildcards was entered. If so, the program tries to perform the rename function. If the rename is successful, it prints a success message and terminates. Any errors will trigger the display of an appropriate message and will terminate the program.

Surprise! MS-DOS behaves just like CP/M when you type in a command.

Lines 19-22 define some useful memory equates. Surprise! MS-DOS behaves just like CP/M when you type in a command. If you type in a file name (or two file names) after the program name, MS-DOS will set up two partial FCBs at memory locations 5Ch and 6Ch and will also map any lower case letters to upper case. There is also the familiar command tail buffer at location 80h, with the byte at 80h giving the count of the characters entered after the program name. Figure 2, below, shows the results after entering a command such as "RENDIR oldname newname."

Lines 25-30 define the DOS functions. With the exception of "dosf," the function numbers are the same as the corresponding CP/M functions. Lines 33-35 are codes for return, line feed and the warning beep.

Lines 54-64 define the extended FCB, which contains a normal FCB as part of the definition. The normal FCB differs from the CP/M FCB in only a few areas. The record size, file size, and date and time fields are new. The random record field has been expanded to four bytes, rather than CP/M's three.

Lines 72-150 comprise the actual program. Lines 153-190 define the error messages used. Note that they all end with a dollar sign ($). This is the terminator DOS expects when messages are displayed using function 9 (the same as CP/M). (The final single quote mark must also be added as it's the delimiter for strings in assembly language.)

Lines 146-150 are the common exit code for the program. At 146, DX will contain the starting address of the message to display. AH is loaded with the display-message code and DOS is called via an INT 21h instruction. This is similar to the CP/M convention of loading the DE pair with the message address, putting the

Figure 2: Dump of the Default FCBs and Command Tail

```
0E2C:0050  CD 21 CB 00 00 00 00 00-00 00 00 00 00 4F 4C 44  M!K.........OLD
0E2C:0060  4E 41 4D 45 20 20 20 20-00 00 00 00 00 4E 45 57  NAME .....NEW
0E2C:0070  4E 41 4D 45 20 20 20 20-00 00 00 00 FF FF FF FF  NAME ........
0E2C:0080  10 20 6F 6C 64 6E 61 6D-65 20 6E 65 77 6E 61 6D  . oldname newnam
0E2C:0090  65 0D FF FF FF FF FF FF-FF FF FF FF FF FF FF FF  e...............
0E2C:00A0  FF FF FF FF FF FF FF FF-FF FF FF FF FF FF FF FF  ................
0E2C:00B0  FF FF FF FF FF FF FF FF-FF FF FF FF FF FF FF FF  ................
0E2C:00C0  FF FF FF FF FF FF FF FF-FF FF FF FF FF FF FF FF  ................
```

DEBUG dump of the default FCBs and the command buffer, showing the padding of file names and the mapping from lower to upper case. Note the byte count at byte 80h includes the space between the program name and the first parameter.

```
1                       page ,132
2                       title RENDIR: Rename a directory
3
4       COMMENT -
5                       ************************************************
6                       *                                              *
7                       *                    RENDIR                    *
8                       *                                              *
9                       *              (C) 1986, A. M. LEWIS           *
10                      *                                              *
11                      *  May be freely copied, modified and given    *
12                      *  away, but not commercially or for profit    *
13                      *                                              *
14                      *  Renames a subdirectory entry                *
15                      *                                              *
16                      ************************************************
17      -
18      ;*****************************************************
19      ;useful equates
20                      dfcb1           equ     05Ch    ;default FCB
21                      dfcb2           equ     06Ch    ;second default FCB
22                      dbuffr          equ     080h    ;default buffer
23                      tpa             equ     0100h   ;where COM files start
24
25      ;DOS equates
26                      dosf            equ     21h     ;DOS function request
27                      conin           equ     01h     ;console input
28                      conout          equ     02h     ;console output
29                      wbuff           equ     09h     ;write message to console
30                      srchfst         equ     11h     ;search for first match
31                      renfile         equ     17h     ;rename file command
32      ;
33      ;ASCII equates
34                      cr              equ     0Dh     ;carriage return
35                      lf              equ     0Ah     ;line feed
36                      bel             equ     07h     ;beep
37
38
39      cseg    segment
40
41                      assume  cs:cseg,ds:cseg,es:cseg
42
43                      org     tpa                     ;COM file structure
44
45      start:
46                      jmp     begin                   ;jump around data
47
48      ;data area
49
50      dir_fcb                 db      0FFh            ;flagged as extended
54                              db      5 dup(0)        ;5 bytes reserved
55      attrib_byte             db      10h             ;directory attribute
56      norm_fcb_drive          db      0               ;drive code for file
58      norm_filename           db      '               ;11 chars for filename.ext
59      current_blk             dw      0               ;current block
60      record_size             dw      0               ;size of record
61      file_size_low           dw      0               ;low word for file size
62      file_size_hi            dw      0               ;high word for file size
63      file_date               dw      0               ;date last written
64      file_time               dw      0               ;time last written
68                              db      8 dup(0)        ;reserved for DOS
69      current_rec             db      0               ;record in current block
70      random_record           dw      0               ;low word of random record
71                              dw      0               ;high word of random record
72
73      begin:
74                      mov     si,dbuffr               ;point to the buffer
75                      cmp     byte ptr[si],0          ;anything on command line?
76                      jnz     check_source            ;check the source
77                      lea     dx,msg_no_source        ;point to error message
78                      jmp     errex                   ;show error & quit
79
80      ;at least one name entered - see if any wildcards used
81      ;
82      check_source:
83                      mov     di,dfcb1                ;where old name is
84                      mov     cx,12                   ;characters to scan
85                      cld                             ;set direction
                        mov     al,'?'                  ;character to look for
```

```
86                repne     scasb                    ;see if wildcard used
87                jnz       no_question              ;now see if the name exists
88                lea       dx,msg_nowild            ;show no wildcards allowed
89                jmp       errex                    ;show error & quit
90     no_question:         ;no wildcard - see if valid name
91                lea       di,norm_fcb_drive        ;where to move it
92                mov       si,dfcb1                 ;source of move
93                mov       cx,12                    ;number of characters
94                rep       movsb                    ;move them in
95     ;now to see if the directory exits
96
97                lea       dx,dir_fcb               ;point to extended fcb
98                mov       ah,srchfst               ;see if can match it
99                int       dosf
100    ;if AL=0 then a match was found - otherwise 0FFh
101               inc       al                       ;add one to AL
102               jnz       source_match             ;found a valid source
103               lea       dx,msg_not_found         ;show directory not found
104               jmp       errex                    ;show error & quit
105    ;
106    ;the directory was found - now see if second name was entered
107    ;
108
109    source_match:
110               mov       si,dfcb2+1               ;where it would be
111               cmp       byte ptr[si],' '         ;if a space, none entered
112               jnz       new_name                 ;got a new name
113               lea       dx,msg_no_newname        ;show no new name entered
114               jmp       errex                    ;show error & quit
115    ;
116    ;name was entered - check for wildcards
117    ;
118    new_name:
119               mov       di,dfcb2                 ;where second name is
120               mov       cx,12                    ;number of characters to scan
121               mov       al,'?'                   ;wildcard
122               repne     scasb                    ;check them all
123               jnz       rename_now               ;second name checks out
124               lea       dx,msg_nowild2           ;error message
125               jmp       errex
126    ;
127    ;now move the new name into position for rename function
128    ;
129    rename_now:
130               lea       di,file_size_low+1       ;where to place it
131               mov       cx,11                    ;number to move
132               rep       movsb                    ;move it into place
133
134    ;the internal fcb is now set for the rename function
135               mov       ah,renfile               ;rename a file function
136               int       dosf                     ;let DOS do it
137
138    ;if AL=0 a success, otherwise AL=0FFh
139
140               inc       al                       ;add one
141               jnz       success                  ;show completed
142               lea       dx,msg_error             ;show a rename error
143               jmp       short errex              ;finish up
144    success:
145               lea       dx,msg_done              ;show success
146    errex:
147               mov       ah,wbuff                 ;display buffer on console
148               int       dosf                     ;error message
149    exit:
150               int       20h                      ;exit
151
152
153    msg_no_source     db     bel,cr,lf,'A directory name must be entered! $'
160    msg_nowild        db     bel,cr,lf,'No wildcards allowed in source! $'
166    msg_not_found     db     bel,cr,lf,'Directory was not found! $'
171    msg_no_newname    db     bel,cr,lf,'No new name was entered! $'
176    msg_nowild2       db     bel,cr,lf,'No wildcards allowed in new name! $'
183    msg_error         db     bel,cr,lf,'Error renaming directory - Not done! $'
190    msg_done          db     bel,cr,lf,'Directory renamed! $'
196    cseg      ends
197    ;*************************************************************
198    end       start
```

function code in C, and using CALL 0005h to let CP/M display the message. The INTerrupt 21h is a special kind of subroutine call. The flags are pushed on the stack and the CS register and the IP are pushed. The new CS:IP values are loaded from the interrupt vector table located in the first 1K of memory. Each interrupt type has a corresponding double-word value that points to the segment and offset of that interrupt routine in memory. DOS uses interrupt 21h to process functions. This routine will always preserve the registers and restore them upon return, with the exception of any registers or flags used to return a status code for the particular function. This eliminates the need for saving your registers before calling DOS, something every prudent CP/M programmer learns to do early on. For the calls used in RENDIR, the status (if any) is returned in AL. A value of 00h indicates success and a value of FFh indicates failure.

The details

The PAGE directive in line 1 sets the page length and width for the listing file. The default of 50 lines per page is used along with a width of 132 columns (the default is 80). The TITLE directive provides an appropriate heading for each page of the listing.

The SEGMENT statement in line 38 tells MASM that this is the start of a program segment. The ASSUME and the ORG statements tell MASM that the program code will start at location 0100h in the code segment. This will leave 256 bytes for the default FCBs, the command buffer, and other information DOS needs to access a program. The ASSUME also tells MASM that any variables defined in this segment can be accessed using either the CS, DS, or ES registers. Note that there is no ASSUME for the SS register. This is because RENDIR is intended to be a COM type program, rather than an EXE type. In a COM program the stack segment is the same as the code segment and the top of the stack is placed at the end of the segment. (The other differences between COM and EXE programs are best left for another time.) Note that the program ends with the directive CSEG ENDS. This tells MASM where the end of the segment is. The END START command signals the end of the assembly language file and tells MASM the first statement begins with the label START.

Line 73 begins the actual program. SI is loaded with the address of the command buffer at 80h, and the byte there is compared to zero to see if any parameters were entered. The BYTE PTR directive is necessary to tell MASM to generate the code for a byte comparison rather than a word comparison. If the byte at 80h is not zero, then we have at least one parameter and we jump to check it (the JNZ at line 75). Otherwise, we set up our error exit.

Lines 82-94 check the first parameter for wildcards. We make use of a repeated string instruction here. If a wildcard was used, there will be a "?" character in the name. We point DI to the default FCB and load CX with

12 (the number of characters to check). The CLD clears the direction flag and AL is loaded with the code for a question mark. SCASB (SCAn String Byte) will compare AL with the byte pointed to by DI, set the flags accordingly and increment DI for the next comparison. The REPNE prefix will decrement CX and cause the action to be repeated only if CX is not zero and the comparison does not result in a zero condition (indicating the two bytes were the same). Line 85 checks to see if a question mark was found. If not, we continue; otherwise, we initiate the error exit.

In lines 91-94 we use the repeat move instruction. SI is pointed to the name to move (including the drive code) and DI points to the destination. CX is initialized and the REP MOVSB moves CX bytes. Lines 97-104 use the search command to locate a directory entry with the same file name and attribute. Note that DX points to the extended part of the FCB. AL returns the status, and we branch accordingly.

Lines 97-104 use the search command to locate a directory entry with the same file name.

Lines 110-125 check for the presence of a second name by checking for a space code as the first character in the second default FCB. A space would mean no new name was entered. Lines 119-125 check for a wildcard in the second parameter as we did before.

We are now ready for the rename. We first move the new name to a position 16 bytes from the beginning of the old directory name (at file_size_lo+1). Since DX already points to the extended FCB, all we need do is load the rename code into AH and call on DOS to perform the rename. If there is a file with that name already existing, AL will return FFh; otherwise AL will be zero on return from DOS. We check for this and set up our message accordingly. We then display the message and quit gracefully via interrupt 20h (the terminate interrupt).

Putting it together

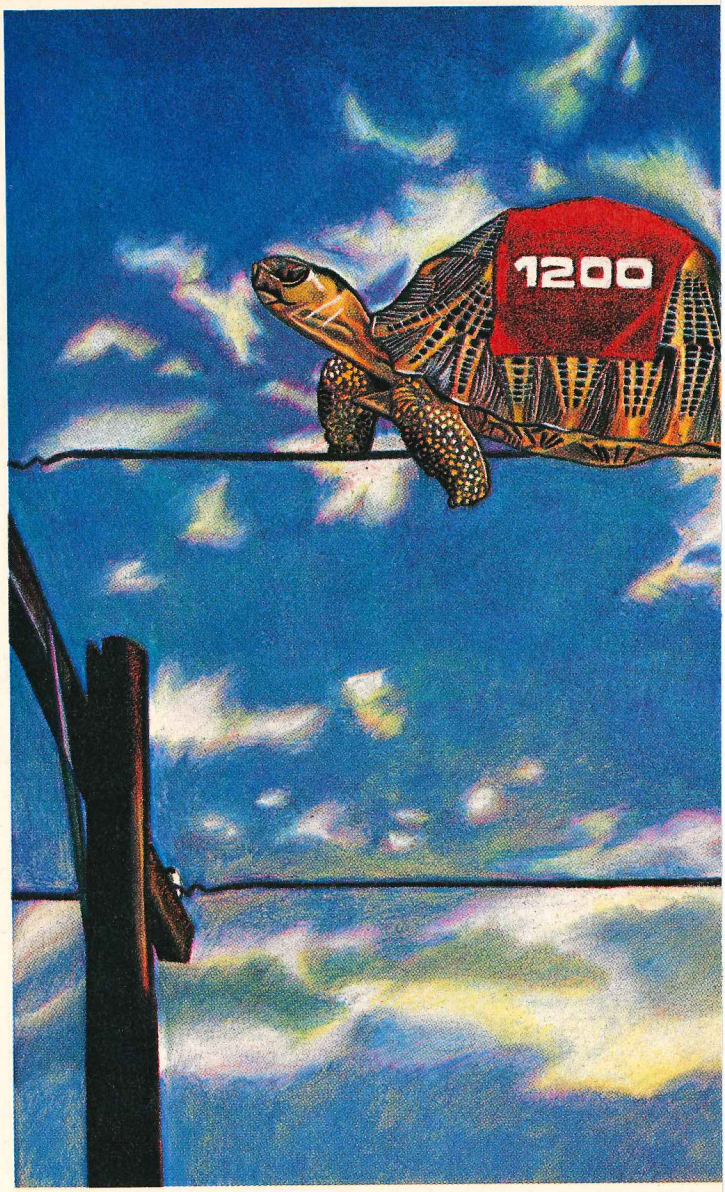
To assemble your own copy, fire up your word processor in non-document mode and type in the program as listed (you can skip the copyright notice, if you like). Give it the name RENDIR.ASM. The command **MASM rendir;** will assemble the program. (If you want a listing file with line numbers, type in **MASM rendir,,,;**.) Once it assembles with no errors, type in **LINK rendir;**. To complete the process, type **EXE2BIN rendir rendir.com**. This will produce the file RENDIR.COM. Don't forget to delete RENDIR.EXE.

(continued on page 57)

Life in the Fast Lane

2400-bps modems: Do you need the speed?

by Brock N. Meeks



Historically, we have always pressed for a faster means of communication. If this was not so we would still be using carrier pigeons instead of satellite-assisted, packet-switched carrier networks. The faster the better—or so it seems.

If your modem is a couple of years old, it's a safe bet that you've cast more than a curious eye at 2400-bps (bits per second) modems. (Although the term "baud" is freely interchanged with "bits per second," it is technically incorrect to do so. You won't be laughed at if you refer to these new modems as "2400-baud," but for the sake of accuracy we will use "bits per second.")

The idea of telecommunicating at 2400 bps is indeed tempting, but do you *really* need one of these modems?

The answer is a resounding "maybe."

Fast modem, slow acceptance

Before the summer of 1984 most introductory articles on telecommunications claimed that 1200 bps was the fastest possible speed for data communications over normal telephone lines. Ironically, 2400-bps modems were already available, and had been since 1982. The industry's best kept secret is now out, and the market is being flooded with 2400-bps modems.

With the rapid introduction of the 2400-bps modem into the consumer marketplace, industry analysts were quick to toll the bells for the 300/1200-bps modem. In December 1984 a report from the market research group Dataquest stated: "The 2400-bps market will erode the 1200-bps market, just like the 1200-bps market cut into the 300-bps market."

Those predictions were further strengthened by some reports from International Data Corporation, a research firm based in Framingham, Massachusetts, that claimed sales of 2400-bps modems would increase 18 percent each year through 1988, from 217,000 units (estimated number shipped in 1984) to 420,000 by 1988. But a funny thing happened on the way to the funeral—someone forgot to invite the 300/1200-bps modem. To paraphrase Mark Twain, reports of its death were greatly exaggerated.

Market research aside, consumers have dictated the bottom line—and they have been slow to embrace the 2400-bps modem, which hasn't yet come close to establishing itself as industry standard.

"The market for 2400-bps modems hasn't panned out," said Karl Zorzi, vice president of data communications products for modem manufacturer Racal-Vadic. "Surveys predicted the 2400-bps market would grow at an incredible rate, but the market didn't materialize as quickly as the research predicted."

According to Zorzi, Racal-Vadic was shipping four times as many 1200-bps modems as 2400-bps modems

at the end of the 1985 fiscal year. However, that ratio has closed to three to one during the 1986 fiscal year. The reason, says Zorzi, is that several corporations are beginning to take up 2400 bps as their standard.

"The bulk of our 2400-bps market is from the corporate environment," says Zorzi. "The primary purchasers are insurance companies and manufacturing companies like General Motors and Ford."

Life in the status quo

But not all companies are embracing the 2400-bps standard. Lynn Geissler, systems officer at the Shawmut Bank in Boston, Massachusetts, says the bank has decided on two standards, 1200 bps for interactive work such as accessing online data bases and 9600 bps for internal company communications. "It's because of the incremental speed," said Geissler, explaining the dual standard. "There's a big difference between 300 and 1200 [bps], which we changed to three or four years ago. We decided against going to 2400 bps because the speed difference is just not that great.

"The other reason [for not moving to 2400 bps] is that we are starting to install a lot of 9600-bps modems for internal data communications from PC to VAX. For interactive data communications, 1200 bps is still where it's at."

Other large corporations, such as BMW of North America, Time, Inc., and Chemical Bank of New York, are also shying away from the 2400-bps modems. Reasons cited include infrequent transfers of large amounts of data and the fact that when online services are accessed through local calls, telephone costs are insignificant.

Sherwin Levinson, a well-known data communications consultant in Atlanta, Georgia, and a writer for *InfoWorld*, points out that "the bottleneck in accessing public data bases is usually the computer at the other end, not in the downloading time. Taking that into consideration, using a faster modem doesn't mean the speed of the remote computer is increased." Levinson says that most companies are satisfied with their 1200-bps modems. "Why should they spend more money [for 2400-bps modems]? It's a large additional expense for a relatively small return."

ILLUSTRATION BY ALICIA TIRADO

Ken Costello, manager of international data collections for Chemical Bank, feels that modems faster than 2400 bps "will become popular within a year." In the meantime he's waiting to convert from the bank's standard of 1200 bps. "At 4800 bps and higher you could see substantial savings," said Costello, "and that's just not the case with 2400 bps."

Levinson doesn't see the increased speed of 2400-bps modems as a significant payoff. "At best, transmissions are at twice the speed. In reality I don't think that's anywhere near the truth," he says. "The response time from a host computer slows down the communications rate so much you see very little effective increase in speed."

Performance, price, and patience

A year ago, Ken Krechmer, designer of the Popcomm modem and now president of Action Consulting of Palo Alto, California, said in an interview: "In large measure, 2400-bps communications is an emerging technology. It's not at all ready for the average consumer."

Today he feels differently.

"In the last year things have changed. Many early problems with standardization and design have been resolved," says Krechmer. "The reason, in large part, is the implementation of the Rockwell chip set." (The Rockwell chip set allows a modem to be manufactured with about 50 fewer chips than previous designs.) "Because most modem manufacturers have adopted the Rockwell chip set as their design standard, it means that most 2400-bps modems are basically the same design, and that makes them more compatible."

But compatibility is only one consideration in deciding whether to make the move to 2400 bps. General performance—which, to a large extent, means how well a modem handles telephone line irregularities—is tremendously important in data communications, and to date 2400-bps modems have come under fire in this department.

No runs, no hits, 2400 errors

"The performance of a 2400-bps modem is significantly worse than 1200-bps performance on equivalent circuits," says Krechmer. "Given a specific line, the device that transmits twice as fast will make far more than twice as many errors."

When pushing data at 2400 bps, your modem has to pack twice as many bits into the same second of time as it does at 1200 bps. The tradeoff is that each bit must occupy less time, making it susceptible to smaller (shorter) bursts of electrical noise or interference. So any interference—given the same amount of time—will affect twice the number of bits at 2400 bps as at 1200 bps. If phone line quality is poor, it makes severe error rates even more likely.

Most modem owners are interested in one of two types of applications: error tolerant and non-error tolerant. The first group is the largest. These users access local bulletin boards or make regular "short haul" connections, such as interoffice PC-to-mainframe connections.

The other group consists of users who transmit large amounts of data over long distances, or users such as financial or insurance institutions, which transmit highly critical data. Because of concerns voiced by this growing segment of modem users about the 2400-bps modem's susceptibility to errors, manufacturers have sought to implement better error-checking protocols.

The Xmodem protocol is currently the de facto standard for data transmissions. But, according to Krechmer, several newer protocols with names like X.PC and MNP have been developed. These new error-correction protocols are not a function of software—modem manufacturers are designing them right into the modem. However, even these newer protocols are no panacea.

"There is nothing better than a correctly implemented Xmodem protocol," says Bill Blue, developer of the popular ASCII Express communications software and the People's Message System bulletin board software. "Too many software authors don't adhere to the specs in Xmodem, which accounts for some of the bad rap that Xmodem has received. I think it's still a very good way to go."

According to Blue, protocols like X.PC and MNP are designed to error check *everything*—including each keystroke. This slows down a modem's effective "thoughput"—the actual measured rate of data transmission. "It doesn't make sense to transmit at 2400 bps and then automatically slow everything down with error checking," said Blue.

With the development of the 2400-bps modem came a unified standard.

A standing standard

Until the 2400-bps modem was developed, the world was at odds with itself. People in the United States and Canada used 300/1200-bps modems operating on the Bell 103 and 212 standards, while the rest of the world operated on standards set up by the Consultative Committee for International Telephone and Telegraph (CCITT).

Although other Bell standards were available for transmitting at higher rates, these entailed the use of leased phone lines. This accounted for the de facto 1200-bps "upper limit" that analysts cited few years.

Then came CCITT's V.22 bis protocol standard. The V.22 bis standard made 2400-bps transmissions reliable over regular phone lines.

Developed in 1981 with the participation of AT&T,

(continued on page 56)

Super Modems

You've probably heard tantalizing tales of modems that operate at the incredible rate of 10,000 bps. Well, what you've heard is probably inaccurate, but not in the way you might think. These modems can really operate at even *higher* rates. They hit 20,000 bps during peak performance, with average transfer rates in the 12,000-bps to 15,000-bps range.

These modems are manufactured by the Telebit Corporation of Cupertino, California, and are sold under different brand names, such as FastLink from Digital Communications Associates. They operate on a principle called *orthogonal multiplexing*. This is a mathematical principle that defines a revolutionary way of handling a telephone line's frequency range. First proposed in the 1950s, orthogonal multiplexing has only been implemented in this decade because of advancements in digital processors.

Most modems use only two or four frequencies to send and receive data. A Bell 212 (1200-bps) modem, for example, uses 1,200 Hz to "originate" (send) data and listens for the other modem on the 2,400 Hz frequency.

By comparison, these super-fast modems can use up to 512 frequencies spanning the entire bandwidth of the phone line (from 0 Hz to 4,000 Hz). But there's more.

A standard modem operates "blind." That is, it accepts data from the remote computer, encodes the carrier, and blindly sends the data out along the telephone line using a prearranged frequency. Super modems actively analyze the quality of the phone line and adjust the transmission frequency and rate according to the quality of the line.

According to Mary Schaller, marketing manager for Telebit, the modem "takes a snapshot of the entire frequency range" and then decides which frequencies it will use.

"Of the 512 frequencies available," said Schaller, "the modem typically finds about 400 are usable at any one time."

There is a catch: there must be a super modem on each end of the line.

When the modems hook up they start generating 512 carrier tones that saturate the phone line's bandwidth. Each modem then listens for the tones generated by the other and checks each tone for distortion, noise, and other signal irregularities. Based on these findings, the modems will decide which frequencies can function as carriers and how many bits per second each carrier can handle.

To maximize transmission, each modem can operate at a different rate. This is due to the difference in line quality at each end of the connection. The modems analyze how much data is flowing in each direction and compensate accordingly. So at any given time, the modems may be operating at different transmission rates. **—Brock N. Meeks**

(continued from page 54)

the V.22 bis standard is the basis for 2400-bps design worldwide. This puts an end, at least theoretically, to incompatible transmissions between North America and the rest of the world. (In actuality, many early 2400-bps modems were based on a loose interpretation of the V.22 bis standard, which caused incompatibility problems. Once the industry realized this, changes were made and 2400-bps modems today are much more compatible across brand lines.) That result is that in addition to a modem compatible with others worldwide, a 2400-bps user gets the benefit of substantially upgraded technology.

To ensure that a dial-up phone line would be strong enough to handle 2400-bps data transmissions, modem developers built in some sophisticated line conditioning functions. These functions involve a process of "adaptive equalization"—according to Racal-Vadic's Zorzi, the modem tests the quality of the line before starting its transmission. The modem will attempt to condition the line to a certain standard, depending on carrier line quality. All this "makes for a more intelligent and better built modem" said Zorzi, adding that if you only use a 2400-bps modems at 1200 bps, you will get a better signal than you would with a standard 1200-bps modem. (It should be noted that using a 2400-bps modem no way impedes you from accessing data at the slower speeds of 300/1200-bps.)

The great wait debate

No one interviewed disputed that working at 1200 bps as opposed to 300 bps is a definite advantage. When it came to making the jump to 2400-bps, however, opinion was split and was based on the issue of users' particular applications.

This is the bottom line, according to telecommunications consultant Levinson: "I could recommend moving to 2400 bps any time you can have some assurance of getting the real speed increase. It's really a simple matter of arithmetic, comparing phone rates per minute with the difference in speed and cost of access. Compare those rates with your current costs to see what payback you can expect."

Another consideration is price. Many higher speed modems, 4800 bps and beyond, are poised to enter the market in a big way. For example, the market research firm Future Computing predicts that by 1988 there will be a big increase in demand for 9600-bps modems. This is sure to make the price of 2400-bps modems drop, just as the introduction of 2400-bps modems drastically reduced the price of 1200-bps modems. And last year, when the market was flooded with several different 2400-bps modems, the high supply coupled with flagging consumer demand eroded prices in the 2400-bps market.

If prices continue to drop, the 2400-bps modem may be too good a deal to pass up. Ironically, that may turn out to be the best reason to buy a 2400-bps modem.

(continued from page 51)

Odds and ends

One byproduct of all this was the discovery of a non-documented feature of DOS. A directory can have a name up to 11 characters in length. To do this, enter the name as you would a file name with an extension. For example, the command **MD SUBTREE.ONE** results in a directory name like this: SUBTREE ONE. Also note that you could modify this program to create, rename or delete volume IDs. Just use the extended FCB with an attribute of 08h and be sure you are in the root directory.

This was not meant to be an exhaustive tutorial on programming the 8088, but I do hope it will serve to whet your appetite (if you like this sort of thing), as well as provide a useful utility. For those of you who would like to know more about 8088 assembly language, I have listed the books I found most useful in learning to program the 8088.

Bibliography

Lafore, Robert. *Assembly Language Primer for the IBM PC and XT*. New York. The Waite Group (New American Library), 1984.

A good introduction to 8088 assembly language and MS-DOS. There are numerous examples for graphics and sound for your Kaypro PC. Also an excellent guide for hooking in your own assembler routines to GW-BASIC and Pascal.

Bradley, David J. *Assembly Language Programming for the IBM Personal Computer*. Englewood Cliffs, New Jersey. Prentice-Hall,Inc., 1984.

Covers binary and hexadecimal numbers and assembly language in general. It fully describes the addressing modes and segmentation for the 8088. Also a good reference on the Macro Assembler features, such as macros, conditional assembly, structures, records, and the external and public directives. Has a good introduction to the 8087 numeric co-processor. If I could afford to buy only one book on the 8088, this would be the one.

Allen M. Lewis started programming in 1967 on an IBM 1620 in FORTRAN and has been programming ever since in several languages. He began working with microcomputers in 1982 learning CP/M, MS-DOS, and assemblers for the 8080, Z-80, and 8088.

(continued from page 35)

the appearance of the line would now be:

```
Other methods were also suggested.@+(4@COMMENT
[Smith, Nifty])
```

When printed, the line will appear with only the superscripted 4, as shown below.

```
Other methods were also suggested.4
```

However, if the original disk file of the manuscript is ever needed again, each such superscripted number can be identified with the correct @COMMENTed reference. And that's the real beauty of my referencing system—it allows you to have your cake and eat it too.

Citing more than one reference per statement

I have not yet explained what to do if the reference numbers within your text are superscripted and you wish to cite more than one reference for a given statement. You *cannot* just use two @NOTE commands—as in "Two other studies confirm this.@NOTE(Smith)-@NOTE(Jones)." If you tried to do it that way, when the document was printed (assuming Smith was reference number 1 and Jones was reference number 2) it would appear as follows:

```
Two other studies confirm this.12
```

It appears as if you're citing reference number 12, rather than reference number 1 *and* reference number 2. What you need is a comma between the two numbers. How do you insert a comma up there? Why, with our old friend, the @+ command. In the above example, type the line as follows:

```
Two other studies confirm this.@NOTE(Smith)@+(,)
@NOTE(Jones)
```

Note that there are no spaces between these three commands. This causes the printed document to look like this:

```
Two other studies confirm this. 1,2
```

Let me just cover one or two other points of neatness before explaining how to print the whole thing out. Do *not* leave a space between the period at the end of the sentence and the @NOTE or @+ command; if you do, the superscript will be too far to the right. *Do* leave a space after the closing parenthesis of the @NOTE or @+ command and the beginning of the next sentence.

Producing the polished product

You're now ready to put the whole thing together and arrange for the final printout. You'll start with the SURG.REF manuscript, which will have as its initial commands the various @STYLE margins and headings that the publisher or journal requires. Next, you'll want the references to be listed in full, and to begin on a new page. Page numbers, however, should be numbered consecutively so that the pages of the reference sheets are numbered in sequence *after* the sheets of the main manuscript they follow. Finally, you'll want to check the abbreviated list of references that appear at the end of your formatted printout, and you'll need *that* on a separate page (or pages) at the end, which can then be discarded.

Fortunately, it's easier to accomplish this than it is to explain it. At the end of the main manuscript, SURG.MSS in our example, type:

```
@NEWPAGE
@INCLUDE(surg-ref.mss)
@NEWPAGE
```

After saving SURG.MSS to the disk, format it in the usual way by selecting the **F** option from the main menu. Perfect Formatter will format SURG.MSS and then go on without further instructions to also format SURG-REF.MSS.

When the paper is printed, the complete references from the REF file will appear following the main manuscript, beginning on a new page. The "end space" abbreviated references will follow them, also on a new page, with that annoying line of nine dashes. This abbreviated list of references, you recall, was generated from the abbreviated comments contained within each @NOTE command. You should compare the abbreviated and complete reference lists to confirm that the reference numbering corresponds. For example, reference 4 on the abbreviated list might look as follows:

4. Kelly, Use of

You should re-check the complete list of references, which precedes the abbreviated list, and note number 4:

4. Kelly, J.R.: The Use of Scissors in Removing a Diseased Appendix. Journal of Technical Surgery, 45: 78-84, 1982

Cross checking the two lists like this provides a double confirmation that the references are indeed listed and numbered correctly. Once you're assured of this, the list of abbreviated references, which will *always* be at the very end of the document, can be discarded. Since this abbreviated list is the final part, it can be discarded without disrupting any of the other page numbering.

Robert Schechter is an eye surgeon in Los Angeles, California. He also is finishing a book on the humorous side of computers, titled Terminal Diseases.

Beginner's Luck

by John G. Sandell

Maintenance and repairs

What do you do when your computer fails?

This is a question almost every Kaypro buyer asks—and a problem veteran owners hope they never have to face, because they come to rely on their machines and don't want to be without them.

Computers are actually quite reliable, but problems do occur. What follows is a guide on how to cope with trouble, including tips on preventive measures and advice on how to spot problems early so you can get the repairs done as painlessly as possible. It is based on my two years' experience as a Kaypro dealer.

Before you buy

The process of coping with repairs should begin before you even buy your computer. Although most people who receive *PROFILES* have *already* bought computers, the following information may still benefit them, and it should be of value to anyone considering an additional computer purchase.

Where you buy your Kaypro matters. Buyers often say, "If I can get it for $100 less by mail order, why shouldn't I save the money?" Or they'll try to find a Kaypro dealer who'll give a discount.

A good dealer will unpack every new Kaypro when it arrives, plug it in, and *run it*. He or she will test it with WordStar and other programs and make working copies of two or three of the master disks. These operations test the keyboard, video, main board, and disk drive read and write functions.

The computer was tested by Kaypro before it was shipped, but then it probably took an airplane ride and one or two truck rides. And it may have been loaded and unloaded on a fork lift or package conveyor belt. Some of this handling may have been quite rough.

The object of testing at the dealership is to discover if the trip caused any problems—knocked anything out of adjustment. And, yes, sometimes a new machine can have flaws. The video brightness adjustment may be off, or the keyboard may hang up after a few hours of use, or a disk drive may not read or write properly.

I would rather have as my own computer one that *did* fail the initial testing on arrival and *was* worked on. Why? Because in the course of the repair, everything would have been looked over thoroughly. (Once the cover is off to replace a disk drive, the dealer might as well check the video settings, make sure all cables are tight in their connectors, check that the chips are tight in their sockets, etc.)

One of the risks in buying a bargain is that this testing may not have been done. You could receive a computer in which something was knocked a bit out of place during shipment, and you might not recognize the little signs that something is wrong until later—after the warranty has expired. Then you'd go to your local dealer, upset at the notion of paying to fix something that's practically brand new.

The first rule in buying a computer is to make sure you go to a reliable dealer.

The first rule in buying a computer, then, is to make sure you have gone to a reliable dealer.

Here are a few helpful things to ask and to look for before you buy:

- Ask, "Do you test the computers you sell?" If the answer is "Yes," but you're offered a sealed box, be cautious. Look at the sealing tape. If it says it was sealed by a factory-authorized dealer, it may have been opened, tested, and resealed. Otherwise, it hasn't been opened. Have the dealer unpack the computer, plug it in, and run it. He or she should show you how to use the machine anyway, so why not get a lesson on the computer you'll be buying?
- While the computer is being demonstrated, listen and look for anything wrong. Ask questions and make sure the answers sound reasonable. Compare the operation of the one you're buying with the one the dealer usually uses for demonstrations.
- Ask, "Do you supply loaners if a repair is needed?" Some dealers will try to supply a loaner machine while yours is being repaired.

An ounce of prevention

Once you've purchased your computer, there are some steps you can take to forestall problems. I'll go over a couple of them here; for more tips on preventive maintenance, see "Beginner's Luck" in the July/August 1985 *PROFILES*.

Cooling fans. Manufacturing variations or hardware additions such as modem boards could cause your computer to be vulnerable to heat-related failures.

If your computer operates well for the first few minutes it is on, then fails, that might be a heat problem. When your CP/M Kaypro has BDOS errors, and you *know* that the drives work fine, then that is probably a heat problem.

As a general rule, electronic equipment tends to last longer if it runs cooler. If you own a Kaypro without a fan (1, II, 2, New 2, 2X) and heat seems to be a problem, consider installing a fan to keep things cool inside. This is not a difficult project; your dealer can do it or advise you how to do it yourself.

Surge suppression. A surge suppressor is a device that stops

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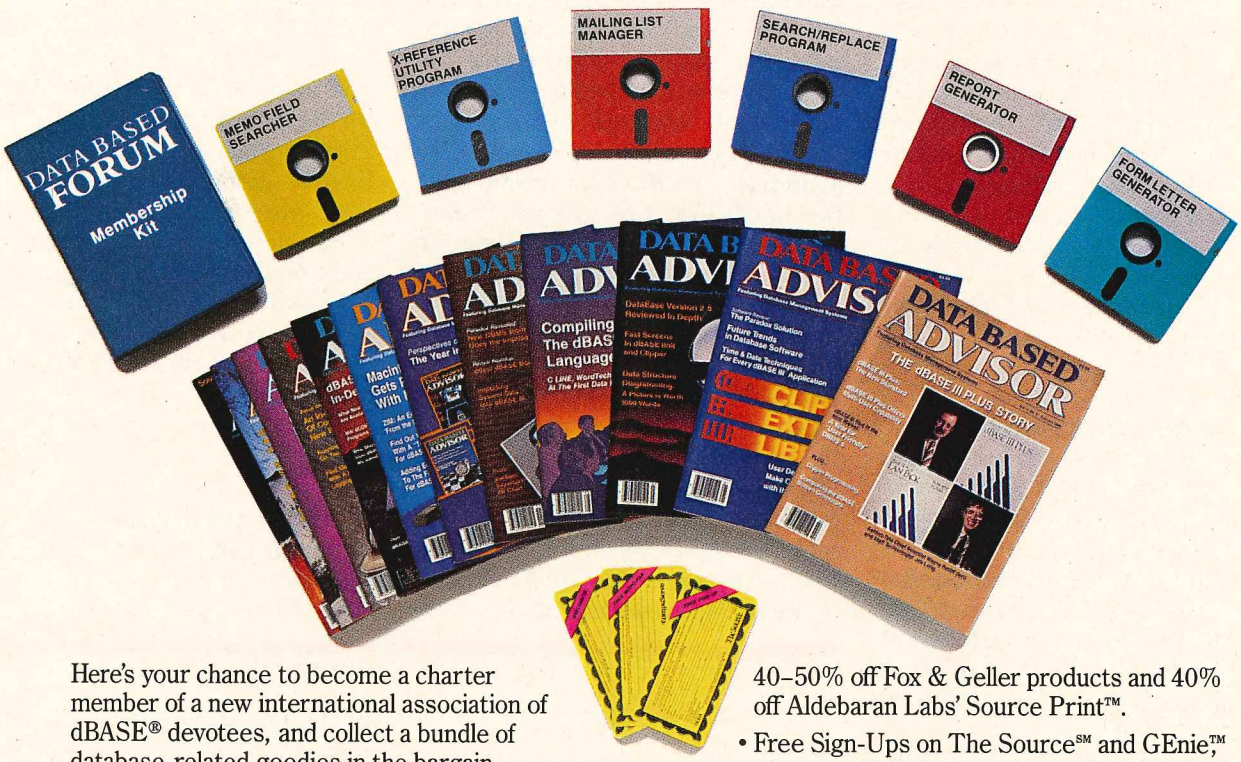

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† All programs are compiled and/or written for use with dBASE III. Alternate package for dBASE II available upon request. All disks shipped in IBM PC format only. Programs may be combined on fewer diskettes than shown. All membership rights subject to change without notice.

*Canada/Mexico $55. Overseas $95 (U.S. Currency Only)

sudden surges in electrical power from getting to your computer. Power surges can ruin a disk, or severely affect a program while it is running, or even harm your computer's internal circuitry.

Surge suppressors aren't a cure-all for power line problems, but they may help and can't hurt—although you can't expect them to protect your machine against a nearby lightning strike. When thunderstorms are raging and crashing all about you, shut the computer down and *unplug it*. Also unplug the phone line connected to your modem. There have been cases in which computers were "fried" by lightning because they were unplugged from the power but not from the phone line.

Things you can check

In addition to taking the preventive steps outlined above, check your machine periodically for developing problems.

First, listen for unusual sounds. You should know how your drives (and fan in some models) sound during normal use; anything out of the ordinary could be a sign of impending trouble.

From time to time, carefully inspect the disks you use most. Look at the area of disk surface exposed by the pill-shaped slot. You should see a smooth surface, or at most a smooth surface with fine, light, concentric scratches. These scratches are made by the head riding on the disk surface. If they start to get wide or deep, it's either because you have an inferior disk and the recording medium is soft and is coming off, or the drive head is applying too much pressure and is scraping off the medium.

If you avoid "bargain" brand diskettes with soft coatings and you still get these scratches, it's a sign that you're headed for trouble. Get the disk drives checked promptly, before they scrape off enough of the recording medium to destroy your programs or data. You might consider purchasing a disk drive diagnostic disk to periodically check your drives.

If you know someone who has a Kaypro with the same disk format, once in a while you should take a data disk to that machine to see if it can read it. If a disk can be read by the machine it was made on but not by other machines, it's an indication of an alignment problem.

Owners of hard-drive Kaypros should always keep spare boot floppy disks on hand, in case they somehow lose the boot tracks from the hard disk. Consult your manuals for the procedure to make such a disk. Note that if you rely on the autoload kit supplied with most hard-drive models to restore your boot tracks, it might reformat the hard disk and wipe out *all* of your files.

The most common problems

Despite your best efforts at prevention, things can go wrong. Some are just accidents of everyday use: One of the most common problems I see is broken keycaps. Usually, one or more of the arrow keys has been broken off because the owner lost his or her grip on the keyboard while fastening it to the front of the computer—the keyboard dropped, the arrow keys hit the ledge at the bottom front of the computer and were knocked off. Repair involves opening up the keyboard, desoldering the key switches of the broken keys, soldering in new switches, and putting on new keycaps. This repair can cost from $20 to $30, depending on how many keys need replacing.

The next most common problems involve disk drives. Although Kaypro disk drives rarely go out of alignment, they can cause all sorts of other problems. (Hard disk drive failures on the Kaypro 10, 16, and PC are relatively rare, by the way.) I've seen floppy disk drives that erase the contents of the disk, and even drives in which the head cuts grooves in the magnetic medium on the disk.

This happens for many reasons; dirt and dried lubricant can gum up the rails on which the head positioner slides, or the drive head may have been damaged when the computer was moved.

(Contrary to the recommendations on the packages of head cleaning products, you should *not* clean your drive heads once a week or even once a month, unless you work in a very dusty environment. Once or twice a year is usually quite sufficient.)

What to do if you have a problem

If something does go wrong, there are things you can do to help ensure that your machine is repaired quickly and efficiently. First, list the symptoms. If you get a BDOS error on B, for example, is it accompanied by any noise from the machine? Does it happen early in the work session or after several hours? Does it occur with all the programs you use, or only one? Write it all down. Any information you can supply about the symptoms and the circumstances is helpful to the dealer.

Second, when you take the machine in for repair, ask if the dealer has the most recent updated version of the *Kaypro Technical Manual*. This manual lists the

Any information you can supply your dealer about your ailing Kaypro's symptoms can be helpful.

most common computer problems and how to fix them and should be on hand at every Kaypro dealership.

Also, the dealer should have the Kaypro diagnostic disks for CP/M Kaypros. These help diagnose disk drive problems. On the Kaypro 16, 16/2, and PC, the dealer should check video, memory, and the keyboard as well.

Third, ask if the dealer has the Kaypro technical support phone number. Kaypro maintains a toll-free number so that dealers can call for repair assistance. If your dealer can't diagnose the problem from your list of symptoms or by examining the computer itself, he or she should then call Kaypro for technical help.

Fourth, give the dealer time. Some problems are obvious, but others can be hard to track down, especially if the symptoms are intermittent. Most Kaypro owners *use* their machines often and don't like being without them for a day, let alone a week or two. But sometimes it takes time to pinpoint the cause of a problem.

And finally, *do not* allow some well meaning friend with a screwdriver and a beginner's electronic text anywhere near your computer. That is a good way to perhaps damage your computer irreparably and certainly void your warranty. Make sure that any repair work performed on your computer is done by a qualified electronics technician using Kaypro technical reference manuals and the correct tools. Kaypro computers are rugged and reliable, but when a problem does arise, careful observation of the symptoms and the circumstances can help your Kaypro dealer diagnose the trouble. Most dealers will do their best to find the problem, but you may have to be patient if it's an unusual one.

John G. Sandell is the president and owner of Sandell Associates, a Kaypro VAR, Cromemco multi-user computer dealer, and custom software house in New Jersey. He also helped found the South Jersey KUG.

"It projects six good years of marriage, then KA-BLOOEY!"

Technical Forum

by Tom Enright

This column is normally devoted to close-up, detailed discussions of technical matters in an effort to help readers increase their expertise. But sometimes it's just as helpful to back off and talk in broader terms about ways users can advance.

For instance, consider people's attitudes toward learning about computers. The microcomputer community, already awash in specialized terminology, even has words for various types of users: appliance users, power users, and hackers.

If you aspire to a higher level of expertise, perhaps this column will give you some ideas about how to get there more quickly.

But maybe some definitions are in order first.

Appliance users

Most of us start out as "appliance users." Appliance users regard the computer as just another tool used to perform a specific task. They rarely use more than one or two programs regularly and find computers convenient, but not fascinating.

The vast majority of personal computer sales are to appliance users. They buy a computer or use one at work for word processing, accounting, and occasionally spreadsheet projections. Menu-driven software is more attractive to appliance users than command-driven programs. They usually are satisfied to learn one fairly easy method of accomplishing a task. Once they have learned that method, they don't usually deviate from it or experiment.

Some appliance users find that figuring out how computers work piques their interest. These people are prime candidates for advancement to power user and possibly, in time, hacker level. All they need is someone to help them learn, or guidance in selecting good computer books.

Power users

In order to gain efficiency, power users become expert with the software they find useful. You may find them studying operating system manuals, finding new uses for their favorite spreadsheet, patching a word processor, using keyboard macro programs, and searching the BBSs for new public domain gems. While hackers entertain themselves with schematics and compilers, power users do the same with existing software.

Power users may know one or more programming languages, but they don't see programming as recreation. They don't program just for the sake of programming. Power users are after efficiency and productivity.

Hackers

A hacker fools around with computer programs or hardware for the sheer love of it. The hacker also, by definition, has a lot of computer expertise. And despite the misconceptions put forth by the media, hackers do *not* break into, take unauthorized information from, or destroy files on other computer systems. A person who does that is a vandal or a thief—some words mean the same thing to everybody.

The finest representatives of hackerdom don't object to helping others . . .

The finest representatives of hackerdom don't object to helping others understand or get more efficient use out of their computers. (Junk food is usually an adequate bribe.)

Learning the game

If you are an appliance user aspiring to join the ranks of power users, there are a number of ways you can learn more about your computer. We've mentioned most of them before, but the advice bears repeating.

Know your system. The operating system is the environment in which every program functions. Sooner or later, expertise in any program depends on a thorough knowledge of the operating system. Read your manual and look for new things: different ways to use commands, new methods of dealing with printers, etc. A few weeks down the road you may confront a problem, and expertise gained from a few moments of reading will pay off.

Practice. Simple curiosity coupled with practice is a major help. Don't be satisfied with using only one program in one way. Study the manuals and experiment with your favorite programs.

When you experiment, do so on practice files, not ones that you need to keep intact. You aren't going to damage the computer—the worst that can happen is that you'll lose or mess up the data file you're practicing on. That's why you should practice on expendable files. Even if you do destroy a file, you've learned what *doesn't* work, and that's valuable in itself.

Take classes. Community colleges have excellent classes on using your microcomputer. Take one or two classes, even if they don't pertain specifically to your computer or the software you use. You'll be able to apply the lessons you learn anyway.

Find a KUG. Find a local Kaypro users' group and attend their meetings. IBM user groups are also good for owners of Kaypro DOS machines. You can pick up a wealth of

information from people who are struggling with the same problems you encounter. Also, most KUGs have several resident power users and maybe even a hacker or two. They're willing to help, so take advantage of the opportunity.

Computer books. Books are by far the most popular method for learning about computers and software. The only problem is that there are vast numbers of books to choose from, and it's not always easy to tell the trash from the treasures. Unfortunately, a large number of books are of questionable value. Many were written as quickly as possible so as to beat other publishers to the bookstore shelves. Others simply substitute a brand name for the word "computer" throughout an extremely generalized text—writing these "customized" books for specific computers sometimes seems to involve no more than performing a simple "search and replace" operation with a word processor. Before you buy a book, take the time to read the first page or so of each chapter. If what the author is saying makes sense, take a chance and buy the book. That's no guarantee the book isn't trash, but it's a fairly quick way of eliminating a lot of bad choices.

No matter how careful you are, you will probably end up buying some useless books, but at least they'll help you learn what to avoid on your next trip to the bookstore.

The rest of this column is a list of books I feel are worth your consideration. They are written for users at various levels of expertise, so read portions of them first before you buy.

CP/M-specific books

CP/M and the Personal Computer, by Thomas A. Dwyer and Margot Critchfield. Micro Computer Books.

Soul of CP/M, by Mitchell Waite and Robert Lafore. Howard W. Sams.

Mastering CP/M, by Alan R. Miller. Sybex Computer Books.

DOS-specific books

Inside the IBM PC, by Peter Norton. Robert Brady Company.

The Peter Norton Programmer's Guide to the IBM PC, by Peter Norton. Microsoft Press.

MS-DOS and PC-DOS User's Guide, by Peter Norton. Brady Communications.

PC-DOS/MS-DOS, by Alan M. Boyd. Bantam Computer Books.

Your IBM PC Made Easy, by Jonathan Sachs. Osborne/McGraw-Hill.

Other reference books

Background Math for a Computer World, by Ruth Ashley. John Wiley and Sons.

Personal Money Management with Multiplan, by Ruth Witkin. Hayden Book Company.

Introduction to WordStar, by Arthur Naiman. Sybex Computer Books.

WordStar Made Easy, by Walter A. Ettlin. Osborne/McGraw-Hill.

The MBASIC Handbook, by Walter A. Ettlin and Gregory Solberg. Osborne/McGraw-Hill.

The Complete Turbo Pascal, by Jeff Duntermann. Scott, Forman and Company.

The RS-232 Solution, by Joe Campbell. Sybex Computer Books.

Microcomputer Graphics Techniques & Applications, by Donald Hearn and M. Pauline Baker. Prentice-Hall Inc.

Understanding C, by Bruce H. Hunter. Sybex Computer Books.

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. The releases must state prices and on which Kaypro models products run. Include black and white photos if available.*

Sending the bills

CPAids Time and Billing is a program that helps professionals track their hours and bill clients more accurately. It features five different methods for creating bills and up to five different billing rates per employee, allowing complete flexibility in billing tasks.

CPAids Time and Billing is designed for firms with between two and 100 employees, and it can handle up to 1,000 clients. Other features include a built-in clock/calendar and onscreen commands that make the program easy to learn.

$995. All Kaypro CP/M and DOS models. CPAids Inc., 1061 Fraternity Cir., Kent, OH 44240; (800) 227-2437.

Learn accounting

Peanuts & Caviar is a kit designed to introduce the principles of accounting and bookkeeping to non-accountants.

The kit includes a 300-page book, worksheets, homework assignments, homework analysis, and software. You are carefully guided through the process of setting up various journals, ledgers, and financial reports.

Peanuts & Caviar can also double as a computerized general ledger system.

$79.95. All Kaypro DOS models. Learn-Ed Software, 8030 E. Girard Ave., Suite 619, Denver, CO 80231; (800) 621-8385 ext. 736.

Telephone mate

TeleMagic! is software for salespeople, telemarketers, and executives. It maintains your data base while keeping your entries (customers, suppliers, etc.) organized. It tells you who to call and when and even dials the phone for you.

TeleMagic! can be either menu driven or command driven, depending on your level of experience. All options are spelled out on the screen, and commands are executed with a single keystroke.

This software also allows you to produce labels, letters, order forms, invoices, and more.

$95. All Kaypro DOS models. Remote Control, P.O. Box 2861, 1320 Ocean Ave., Suite E, Del Mar, CA 92014; (800) 992-9952, in CA (800) 992-5228.

Staying healthy

SuppleMentor uses artificial intelligence to offer you information on vitamins, minerals, amino acids, and herbs.

The menu-driven program can answer questions such as:

- What vitamins can help allergies?
- What amino acids can improve memory?
- What are the symptoms of vitamin A toxicity?
- What is the recommended daily allowance for pantothenic acid?

SuppleMentor can be used to generate a customized nutrition supplement schedule that takes into account your age, sex, and any chronic problems you may have.

$79. All Kaypro DOS models. V WARE, 2509 N. Campbell Ave., Suite 347, Tucson, AZ 85719; (602) 323-7060.

Professional accounting

ACT 1 (Accounting 1) is a single-user, comprehensive professional accounting series. It includes a general ledger that allows an unlimited number of accounts, as well as budgeting. Other modules included are accounts receivable, accounts payable, order entry/sales invoicing, inventory, and payroll.

The series is flexible, allowing you to format and design financial reports, checks, statements, invoices, and W-2s.

The accounts-receivable module allows for open-invoice and/or balance-forward accounting. It handles credit limits, collection status and payment discounts, as well as unapplied payments and multi-company accounts receivable.

$109.50 for CP/M version, plus a separate $5-per-disk formatting charge (eight disks total); $99.50 for DOS version; shipping and handling for either version is $11.50. Cougar Mountain Software, Inc., 2609 Kootenai, Box 6886, Boise, ID 83707; (800) 344-2540.

Something for the 2000

The DISKIT Portable is an auto-booting 20-megabyte hard disk for the Kaypro 2000 that has an average access time of 65 milliseconds.

It fits underneath the Kaypro 2000 like the Multi-Adapter unit available from Kaypro, and it can be powered by 110-220 volts of AC or with a car cigarette lighter adapter for true portability. A one-hour, battery-powered backup is also available.

$995 to $1,095, depending on selected options. Kaypro 2000. Systems Peripherals Consultants, 9747 Business Park Ave., San Diego, CA 92131; (619) 693-8611.

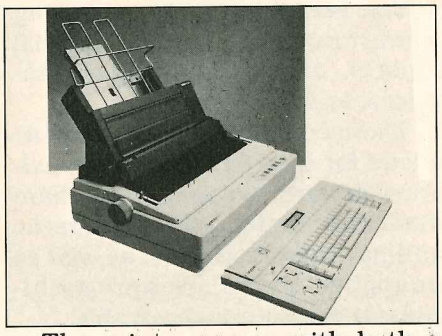
Letter quality in two colors

The Brother HR-20 is a 22-character-per-second, dual-interface daisywheel printer with two-color printing capabilities that allows you to highlight words or phrases.

The text reprinting capability allows you to reproduce documents quickly, with the same second color as the original.

Address labels, short documents, and envelopes can be prepared with the optional keyboard, which turns the printer into an

electronic typewriter, complete with automatic correction capability.



The printer comes with both a Centronics parallel and an RS-232C serial interface and features automatic paper insertion.

Different "modules" for the printer may be purchased separately.

$499 for printer; $169 for forms tractor; $299 for sheet feeder; $299 for keyboard. Brother International Corp., 8 Corporate Pl., Piscataway, NJ 08854; (800) 446-6282.

Screen recorder

The Polaroid Palette is a software-driven film recorder. It can deliver instant color prints, overheads, or slides of any computer-generated image.

The Palette recorder can produce hardcopy with a resolution of up to 920 x 700 pixels, depending on the hardware and software driving it.

The recorder takes Polaroid 35mm instant slide film, conventional 35mm film, Polaroid Polacolor 3-1/4 x 4-1/4-inch print film, and the new Colorgraph Type 691 instant overhead film.

$1,999. All Kaypro DOS models. Polaroid, 575 Technology Sq., Cambridge, MA 02139; (800) 225-1618.

Color-coded disks

Boeder Magnetics, Inc. (BMI), the American subsidiary of West German diskette manufacturer Dobbelin Boeder, is introducing its line of Disky color-coded diskettes to the U.S. market.

The diskettes come in red, blue, yellow, and green to make archive organization easier and are available in single- or double-sided format.

The recording surface is designed to ensure error-free use, and the vinyl disk jacket is the result of a new laminating process designed to ensure smooth seams and precise edges.

$4.40 for a two-disk (DSDD) pack, $19 for a ten-disk (DSDD) pack. BMI, Boeder Magnetics Inc., 828 Hillcrest Blvd., Inglewood, CA 90301; (213) 216-0771.

Business data base

Business Dateline is a full-text data base of regional business news and information. It is available on VU/TEXT Information Services, Inc.

VU/TEXT provides the full text of some of the nation's leading newspapers and other publications. Recently the system began offering the ABI/INFORM business data base to its users.

For more information, contact Jeannene Manning at (800) 626-2823 in the U.S. and (800) 626-0307 in Canada.

File sweep

The MasterSweep File Maintenance Utility is a disk utility that gives you immediate access to disk directories and files. It enables you to find, view, copy, print, rename, move, delete, and tag files easily with single-keystroke commands.

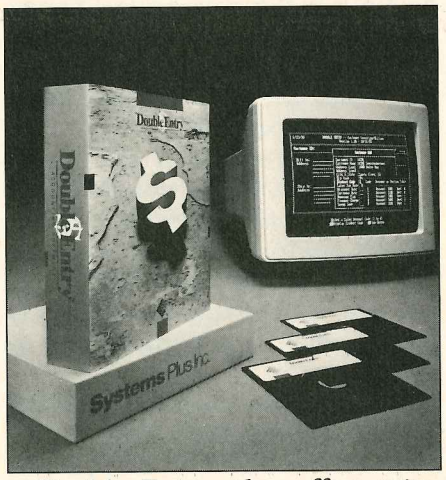
MasterSweep includes no documentation—the directory maintenance functions are all you need to perform your tasks.

$49. All Kaypro DOS and CP/M models. The Software Store, 706 Chippewa Sq., Marquette, MI 49855; (906) 228-7622.

Accounting modules

Double Entry is a full-featured and completely integrated eight-module accounting package designed to provide accounting functions for all businesses.

Modules available include general ledger, accounts receivable, accounts payable, inventory, and payroll. They are menu driven and can operate together or independently.



Double Entry also offers windows, which allow users to quickly review and update accounting data and information in any module directly on the screen.

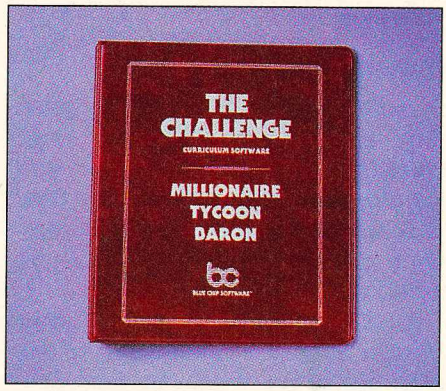
$1,495 for general ledger, accounts receivable, and accounts payable as a set; $595 for modules sold individually. All Kaypro DOS computers. Systems Plus Inc., 500 Clyde Ave., Mountain View, CA 94043; (800) 222-7701, in CA (800) 222-7707.

Starting young

The Challenge is an educational package for use in 5th- through 12th-grade classrooms. It focuses on finance vocabulary, economic concepts, and career alternatives.

The Challenge contains three

games: Millionaire, The Stock Market Simulation; Tycoon, The Commodity Market Simulation; and Baron, The Real Estate Simulation.



The package also includes forms and materials, an outline of learning objectives, a step-by-step curriculum guide, an interview guide for students' use with guest speakers, and a student quiz.

$124.95 All Kaypro DOS models. Blue Chip Software, 6744 Eton Ave., Canoga Park, CA 91303; (818) 346-0730.

Educational package

EPIE Courseware Evaluation Package is a collection of EPIE's listings, reviews and descriptions of educational software.

The package includes:

- A 1986-87 edition of the 956-page *The Educational Software Selector*, containing 3,500 software review citations, plus the descriptions of over 7,800 currently available educational software programs.
- A comprehensive library of over 800 in-depth courseware evaluations from both EPIE's MicroCourseware PRO/FILE service and MicroSIFT—two non-profit, independent evaluation services.
- A one-year subscription to the TESS electronic update service for both The Educational Software Selector and the courseware evaluations, via CompuServe.

$149.95 through December 1986. All operating systems. EPIE, P.O. Box 839-RE, Water Mill, NY 11976; (516) 283-4922.

First Impressions

by Tom Enright

A finance manager and two DOS utilities

This month we'll take a look at two DOS utility programs and a financial management program that comes in both CP/M and DOS versions. The DOS utility programs are Le Menu from Bartel Software (1275 Fort Union Blvd., Suite 160, Midvale, UT 84047; 801/566-5544) and DSBACKUP from Design Software (1275 W Roosevelt Rd., Suite 104, West Chicago, IL 60185; 800/231-3088). The financial manager is Checks & Balances from CDE Software (948 Tularosa Dr., Los Angeles, CA 90026; 213/661-2031 9 a.m. to 1 p.m. and 415/369-2034 1 p.m. to 5 p.m.).

The utility programs are for hard disk-equipped DOS computers. Le Menu ($59.95) puts a front-end menu similar to Kaypro's Master Menu on your DOS machine. DSBACKUP ($69.95) eliminates most of the pain and guesswork from backing up your DOS hard disk onto floppy disks. Checks & Balances ($74.95, CP/M and DOS) is a checkbook and finance management program that has been around, steadily improving, for several years.

Le Menu

Front-end menus for DOS, or even CP/M for that matter, are not a new idea. The idea of presenting the user with an easy-to-use menu instead of an intimidating system prompt has been popular in business systems for a long time. With the growing popularity of hard-disk DOS computers, more menu systems are being marketed.

Le Menu is one of the more sophisticated entries in this category. It runs on IBM PCs, XTs, ATs, or compatibles with 256K of memory and DOS 2.1 or newer and claims compatibility with several local area networks (LANs). Installing Le Menu is simple and can be repeated as many times as you like. Version 2.5 of Le Menu is no longer copy protected; Bartel Software should be commended for this.

When you first install it, a new directory named LEMENU is created on your hard disk and all Le Menu files are copied to this directory. You are also asked to insert your DOS disk so that all files on it can be copied to the Le Menu directory. The installation program then appends a few commands to your AUTOEXEC.BAT file so Le Menu will run automatically.

You create your own menu structure and most commands from within Le Menu. There is little that can be done from a DOS command line that cannot be done from within the program. Batch files, program command lines, and up to five menu levels can all be created from inside Le Menu.

So far so good, but there's a catch: You must already know precisely what you want to do before you can make Le Menu do it for you. That means that to take full advantage of Le Menu's power, you must know enough about DOS to not need a menu system in the first place.

The documentation isn't going to be a lot of help. It's an 8-1/2 by 12-inch document that goes to a lot of trouble to look like a menu for an exclusive restaurant. There is no table of contents or an index. It provides you with a few "appetizers" on DOS and creating your menu system, but otherwise it just expends a lot of space for pictures of the master disk in various poses with food on a lavishly set table. This user's guide is a little too "Madison Avenue" and a little too cute to be of much value.

What all this means is that Le Menu—along with most other DOS menu systems—is just not ready for general use by individual computer owners, although if the gimmicky "restaurant" terminology were removed from the prompts Le Menu would be excellent for business systems. In that environment systems are set up by experts for use by office workers. The experts would know what they were trying to accomplish and could take full advantage of Le Menu's power—and it is a powerful program. But it takes a "power user" to set it up effectively.

DSBACKUP

Backing up the software on your hard disk is probably your least favorite chore. You know that you should back up critical data files and have at least one backup copy of programs. But how often do you really take the time?

DSBACKUP (version 2.4e) from Design Software takes most of the pain out of the whole backup process. It backs up your hard disk to floppy disks, tells you how many disks you'll need, includes or excludes files by file specification, lets you format disks in the middle of a backup, prompts you by directory if you want it to, runs fast, and is not copy protected. The key word in describing DSBACKUP is "versatility."

DSBACKUP and its user's guide come in a disk carrier that can hold five disks. The software is simple to install, and it backed up a 1132K directory with 93 files in two minutes and 20 seconds. (DOS's BACKUP program took four minutes and 38 seconds.)

Backup files created by this program do not exist separately. They are stored within a single file on the backup disk, in a form unusable by the operating system. For this reason backup files must be recovered with DSBACKUP's own RESTORE function.

With DSBACKUP, you can set up lists of files to be included or excluded from a backup operation. A file too large to fit on one disk can be split up and placed on as many backup disks as necessary. You can also set a series of toggle switches to determine whether subdirectories, hidden files, etc., are to be included. You can then save those parameters to a file and avoid entering the options next time. You can create as many of these setup files

as you like.

DSBACKUP has too many options and permutations to cover here. Suffice to say that this program is worth what it costs. It is flexible, powerful, and easier to use than packages costing far more.

Checks & Balances

Checks & Balances isn't a new product. It's been around for several years and has been mentioned in *PROFILES* before. It was covered briefly in the article "Automating Your Books," by Casey Cook and Rick Mattingly, in the November 1985 issue of *PROFILES*, and also by former *PROFILES* columnist David Gerrold in April 1985.

But Checks & Balances is updated and improved regularly—version 3.6 was released about a year ago, and with subsequent revisions the current versions are 3.6-j for CP/M and 3.6-h for MS-DOS.

For that reason, and because I have used it daily for more than two years and prefer it to similar programs, I feel justified in giving it further coverage.

Checks & Balances is a command-driven program. Such programs are usually hard to learn, but this one isn't. Commands are in plain English and are intuitively clear. Commands such as ENTER, PRINT, HELP, and BUDGET don't need much explanation.

You can have as many separate checkbook files as you need. In each file you can name up to 64 account categories using your own mnemonic labels, not hard-to-remember account numbers. Checks can be charged against one or more of these accounts to track your expenses.

The key word with Checks & Balances is "flexibility." It can be as sophisticated or as simple as *you* want it to be. For example, if you want to establish a budget you can, but it's not required. And you can track bank loans, credit card balances, assets such as furniture, different types of income, and just about anything else.

A further example of the program's flexibility is that, in addition to a name, you assign a "type" designation to each account, and you can use as many or as few of these as you want. These designations include income (I), asset (A), expense (E), credit card balance (C), liability (L), savings (S), receivables (R), and several more.

The report feature can also be as simple or as sophisticated as you desire. When the program is running, a status line tells you what "month" you are working with. You decide how long a "month" actually is—an entire year, one or more quarters, or a regular calendar month. All other commands work on data that falls within the currently selected "month." At that point you can look at, edit, or print reports on the entire month, or on a range of check numbers, selected accounts, or checks to particular payees. You can even select checks by their entry in the "comment" field.

Entering and editing checks is the feature that impresses me the most. Accountants will shudder at the thought of being able to edit previously entered checks, but this program is for average people, not CPAs. To edit an existing check you simply search or scan to the check you want to change, press the TAB key (CP/M) or the HOME key (DOS) to enter edit mode, move the cursor to the part you want to change, and type in the new data. When you're through editing, just press the ESC key (CP/M) or the END key (DOS) and your data file is updated and you're returned to command mode.

Checks & Balances is an excellent piece of software that has been underpublicized and underrated as merely a checkbook program, even though a full-featured Rolodex program is also included. In the end, Checks & Balances can handle most of the financial record-keeping an individual would want.

Product Updates

Version 3.1 of **MICA/IC Inventory Control** has been enhanced for the small business. It now includes parts explosion and serialization. Serialization allows you to track individual items in inventory by a specific number. Micro Associates, Inc., Port Arthur, TX □ **Home Money Manager**, a home budgeting and financial management program, is now available for MS-DOS. It allows the use of up to 12 checkbooks or savings accounts and can handle 1,000 checks per year. Nickelodeon Software, Tualatin, OR □ Version 2.1C of **DataFlex**, a multiuser data base system, has been released. New features include windowing and the ability to execute external programs. DataAccess Corporation, Miami, FL □ **RM/FORTRAN** version 2.1 enhancements include the COMPLEX*16 data type, mixed characters and numerics in some statements, an 8087/80287 emulation package, and a simplified assembler interface. Ryan-McFarland Corporation, Rolling Hills Estates, CA □ **Turbo Pascal** version 3.0 now offers Binary Coded Decimals (BCD) and support for the 8087 math co-processor. These had been offered separately and are now bundled in for $99.95. Borland International, Scotts Valley, CA □ Version 2.1 of **Write-Hand-Man** now includes three new functions: cut and paste, auto dialing, and KEYS, a function that allows you to define up to eight keys. Poor Person Software, Palo Alto, CA □ **StatPac Gold** statistical analysis software has been updated to include color and high-resolution graphics for graphs, charts, etc., an enhanced ANOVA module, and the capacity to handle up to 32,000 records. Walonick Associates, Minneapolis, MN

Product Updates provides information about revisions of existing products. Users should contact vendors for more complete information and current prices.

Ad Index

November: Gift Guide and Coupons

Thanksgiving is just around the corner and the holidays aren't far behind. Why don't you get a jump on things and start your holiday gift buying early?

The November issue of *PROFILES* will contain a special Gift Guide, featuring items for your computer owning friends and family. Avoid the holiday crowds and do some of your shopping from the comfort of your own home.

In addition, some of *PROFILES* advertisers will be offering special discount coupons for even greater savings.

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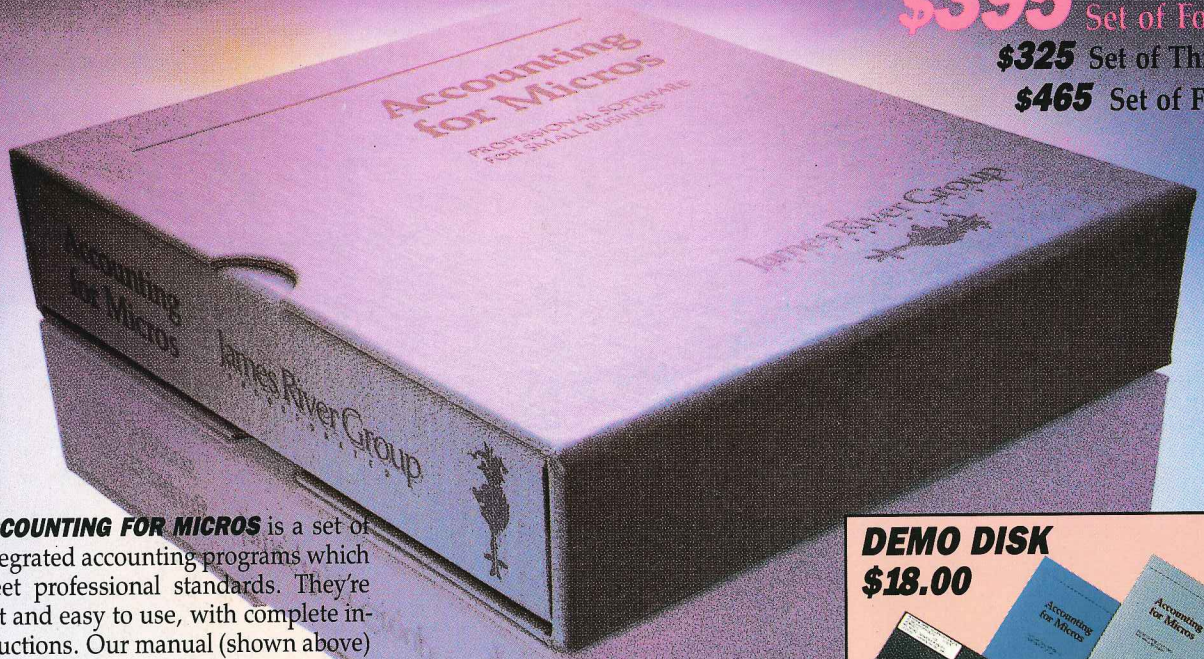

ACCOUNTING FOR MICROS is a set of integrated accounting programs which meet professional standards. They're fast and easy to use, with complete instructions. Our manual (shown above) also includes helpful information on bookkeeping and computers.

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