

PC WORLD

October 1984
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The Comprehensive Guide to
IBM Personal Computers and Compatibles

\$3.75 Canada

Understanding Integrated Software



**Reviews: DesQ,
MIST+, the Sperry
and Leading
Edge PCs**

**How to Choose an
Accounting Package**

**What's New:
Idea Processing!**

**Who Is the Chess
Champion of the PC?**

PC WORLD

Volume 2, Number 10

Project Management



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Now PC networking is as easy as plugging-in your phone.

The advantages of Local Area Networks (LANs) are well known. Existing personal computers can be tied together to share information and expensive peripherals such as disks and printers.

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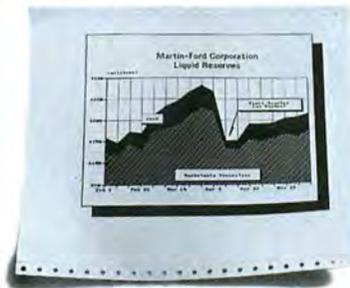
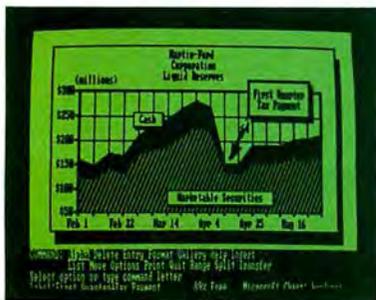
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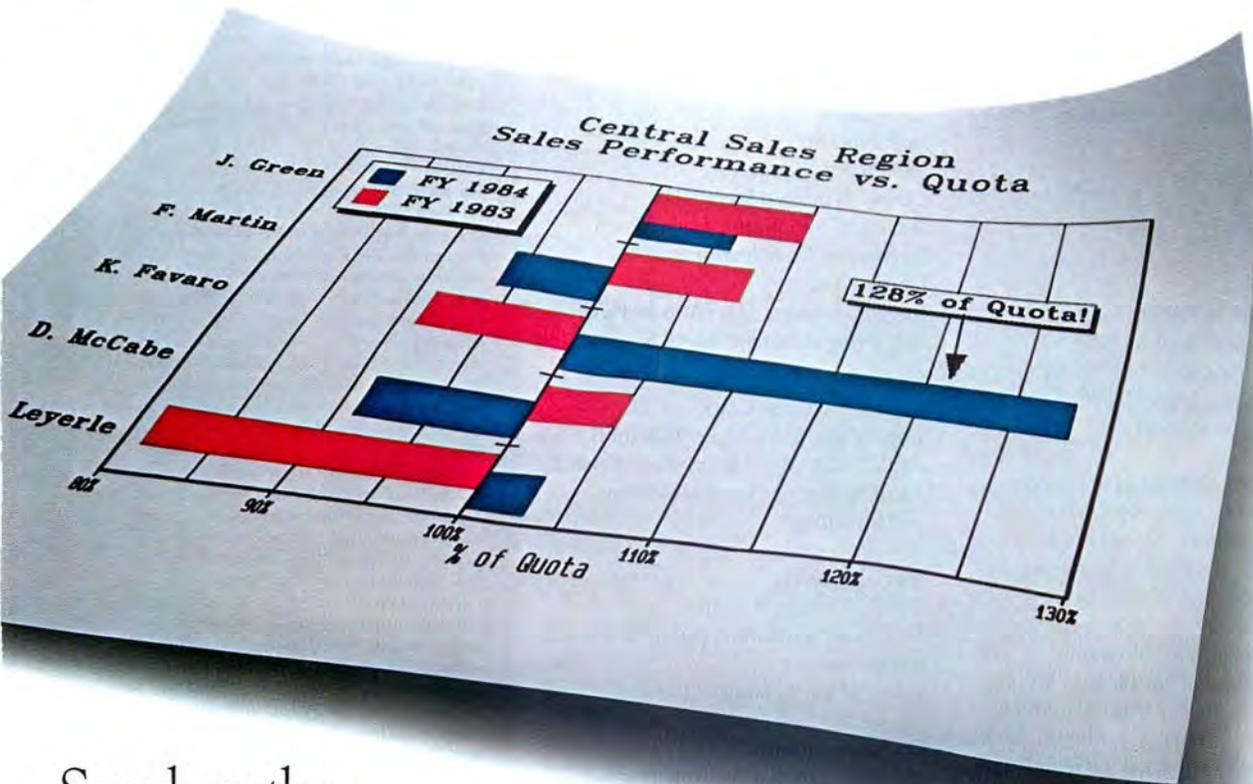
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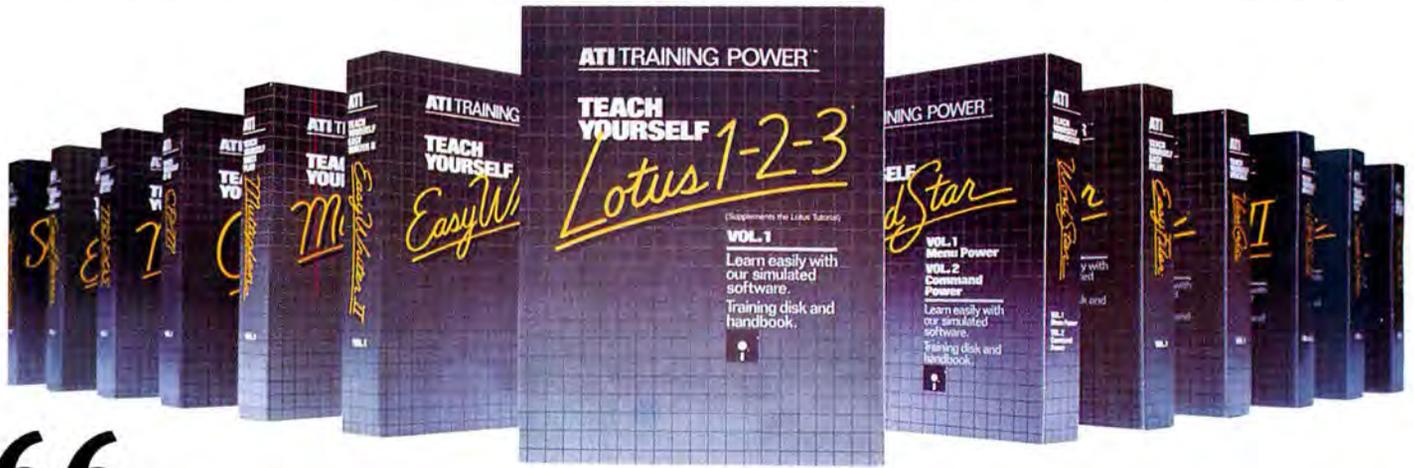
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PC WORLD

*The Comprehensive Guide to
IBM Personal Computers and Compatibles*

● Getting Started

56 How to Choose an Accounting Package, *Michael K. Guttman*

Looking for accounting software? Here's a simple and straightforward guide that discusses when to automate your books, what tasks accounting software can perform, and how to separate the essential features from the fluff.

72 What Is Integrated Software? *Phillip Gordon* *Integration* is a much-banded buzzword in today's software market, but what does it mean? An explanation of the three basic types of software integration and the pros and cons of each.

● State of the Art

98 Interactive Video: Calling the Shots, *Wayne Parker*

Lights! Camera! Software! Interactive video programs on the PC can sell homes, teach physics, and help land jets on aircraft carriers. Putting together the images, sounds, and text for these programs used to be the job of the video professional. Now menu-driven authoring programs for the PC can help you call the shots.

Photo/illustration credits: David Bishop, 168; Don Day, 179, 180; John Hersey, 233; Michael Jang, Aurora Systems, PC World cover, 72-3, 134-7; David Johnson, 41, 42; John Littleboy, 144; Jeffrey Newbury, 132-3; Stevan Nordstrom, 56; James Stagg, 214-15; George Steinmetz, 13, 98-9, 103, 117, 119, 120, 279-85; Fred Stinson, 40, 43-5, 158-59, PCjr World cover, 194, 196, 201, 245.

● Review

132 A DesQ With Nine Views, *Bill Crider*

Quarterdeck's new windowing environment, *DesQ*, lets you enjoy the benefits of integration without having to give up your familiar and full-featured stand-alone applications.

144 The Communicator's Tool Chest, *Jack Powers*

Data management and communications are married in an ambitious integrated package called *MIST+*. With *MIST+* you can manage information and then share that information by setting up your PC as a bulletin board system or as a clearinghouse for a closed electronic mail system.

158 Family Resemblance, *Ricardo Birmele*

Sperry, the mainframe giant, and Leading Edge, the four-year-old computer jack-of-all-trades, have entered the IBM-compatibles lists with nearly identical machines. Designed by Leading Edge and manufactured by Mitsubishi, the Sperry and Leading Edge PCs are highly compatible and worth a try if you're looking for alternatives to IBM.

168 A New Idea in Word Processing, *William Usim*

IdeaWare's *The Idea Processor* is a word processing program with a unique Cardfile system that lets you search and sort text and graphics files as if you were using a data base management system.

● PCjr World

194 Off to a Good Start: PCjr Add-Ons, *John Heilborn*

The PCjr's 128K memory limitation needn't limit you anymore. Add-on modules from Tecmar and Legacy bring the PCjr as much as 640K of computing power.

October 1984

- 200 **Challenging the Chiclets**, *Rick Altman*
Once again IBM's oversight is someone else's windfall as Key Tronic and Colby Computer move to cash in on dissatisfaction with the PCjr keyboard. *PC World* puts these two professional-style keyboards to the test.

● Hands On

- 214 **Enhancing the IBM Personal Editor**, *Steven J. Lagreca*
There's still a lot of life in IBM's classic text editor. With a little help from the *Personal Editor's* macro feature, you can turn the old workhorse into a sophisticated word processor and a program editor that's customized to your tastes.
- 232 **Take Command of dBASE II**, *David Jenkins*
Its command files distinguish *dBASE II* from other data base management systems, enabling you to automate complex command sequences. Learn to use *dBASE II's* programming language while you create an automatic invoicing system.
- 244 **The Single-Button Menu**, *Raymond DeMers*
Use simple BASIC commands and DOS 2.00 batch files to build a single-menu system that calls both BASIC and DOS applications with the touch of a key.

● Community

- 278 **Chess Champion of the 8088**, *Stuart R. Schwartz*
Who plays a better game of chess, man or machine? To find out we pitted three PC programs against each other and then gave the 8088 champion a shot at international chess master Julio Kaplan.

Departments

- 13 **David Bunnell**
AT&T: from phones to clones.
- 19 **REMark**, *Andrew T. Williams*
A dismal scientist's rosy view.
- 25 **Letters**
- 40 **PC World View**, *Katie Seger*
News and notes for the computing community.
- 83 **The Help Screen**, *Karl Koessel*
Your PC enigmas unraveled.
- 116 **Compatibles Update**, *Ken Greenberg*
News from the world of PC work-alikes.
- 178 **From the Software Shelf**, *Edited by Robert Luhn*
First impressions of recently released software products.
- 262 ***. ***, *Edited by Steven Cook*
A global exchange of personal computer discoveries.
- 309 **Just Announced**, *J. Schaffner*
The wide world of IBM PC products.

Indexes

- 324 **Products**
- 326 **Advertisers**

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Programs in IBM's Assistant Series are like actors in a play. Alone, each gives an outstanding performance. Together, they've been directed to act well as a troupe. (In the software world, this interaction is called "integration.")

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How integrated software works.

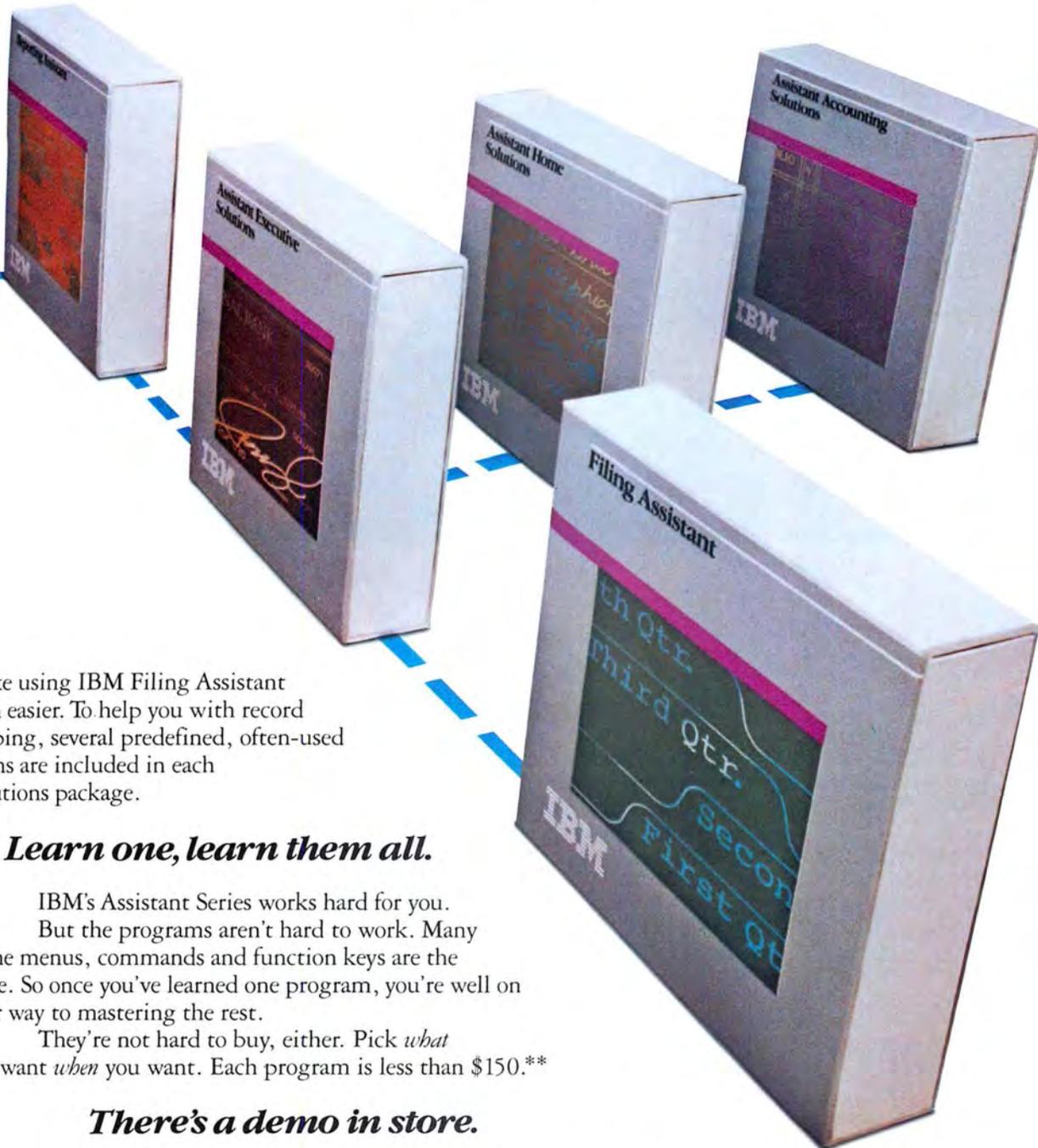
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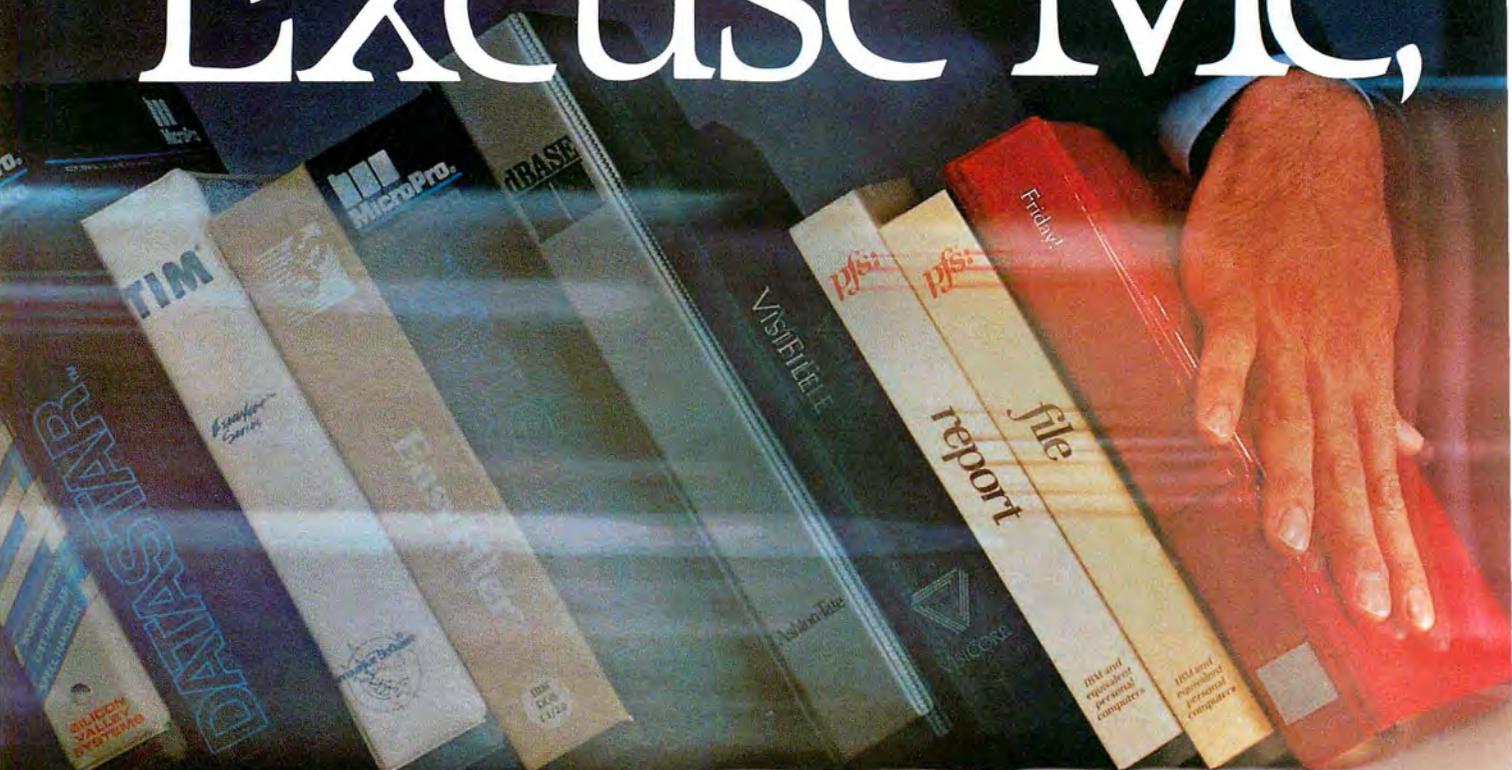
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Say you're looking for an efficient

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Want last month's total in a particular region? Press a few keys and it's yours! A few more keystrokes and you'll know who's moving product, and what's your biggest seller.

Please will supply you with labels for a mailing to selected customers. It can send customer information to your word processor for a promotional letter. And it can receive data from

your spreadsheet program. *Please* will even look up a name and company for you, your Hayes Smartmodem* will dial the phone number, and you're ready to talk!

Taking this same sales database, you might also want to define special

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"Make it snappy, Please!"

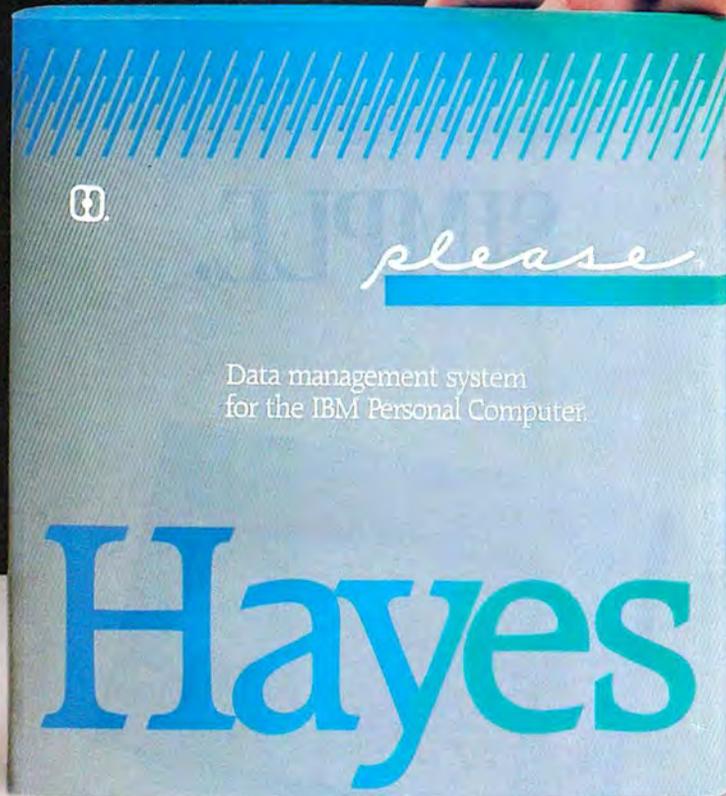
Need a report fast? You and *Please* can put together a Quick List in a matter of seconds.

Please can automatically compute each salesman's commissions, and print them out in a report of your own design. All this and more, just for saying "Please!"

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“Put it here, Please.”

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knowing all that storage power is there?

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Does AT&T Still Ring True?

During the past few months I have been invited to make several speeches. One of my favorite lines to break the ice is, "Everyone is so intent on introducing IBM PC compatibles, I imagine Safeway will announce a PC soon." This line hits a little too close to home now that AT&T—after all its promises to make UNIX a software standard that everyone will bow down to—has introduced a ho-hum PC compatible that doesn't even run UNIX. With a precedent like that, Safeway, General Motors, and US Steel can't be far behind. AT&T has a solid reputation and great technological expertise—mimicry doesn't become it.

The reason AT&T is stooping to copy a competitor's machine and neglecting the share of the market it could take by developing a low-cost UNIX-based machine is really quite simple. Over the next four years approximately 10 million IBM PCs will be sold to corporations, and AT&T decided it wanted a piece of this action. The easiest (and least creative) way to accomplish this is to produce a computer that runs IBM-compatible software. This method also saves the time and money necessary to convince people to use a UNIX-based personal computer that can't even run a spreadsheet.



You see, there is virtually no applications software for UNIX, and the operating system is actually too cumbersome to be implemented effectively on 16-bit personal computers. To enter the PC market quickly, the phone giant had little choice but to ignore this prize operating system when developing its personal computer. UNIX is praised as a multi-tasking operating system with vast capabilities by software gurus who have very little feel for the practicalities of using computers for productive purposes. It's a great system for people who like to play chess and wish everything in life were equally complicated.

In spite of all contrary evidence, some people argue that AT&T's UNIX will bring the minicomputer

to your desk top. My instinctive response is that this is like putting a semi truck in your garage.

Heady pronouncements from AT&T's corporate executives set up big expectations for what turned out to be just another clone. For exam-

UNIX is a great system for people who like to play chess and wish everything in life were equally complicated.

ple, in the July 1984 issue of *Personal Computing*, John Boyd, AT&T's national director for distributor sales, is quoted as saying that AT&T is "on the verge of leading the computer industry." If you believe that, then you probably believe that Perfect Software's software is perfect, that *WordStar* and the Apple II will live forever, and that Osborne Computers will be resurrected from its 1983 crash.

GATO™

David Bunnell

While James Olson, vice chairman at AT&T, claims that AT&T is "drawing on its historic strengths in voice and network management," all AT&T has done is put its logo on an already existing Olivetti clone that utilizes a slightly faster chip and has somewhat better screen resolution than IBM's three-year-old PC. These advantages, which are useless for most applications, will be temporary, because IBM will inevitably upgrade the PC with an even faster chip (the Intel 80286) and will most likely add better graphics than the AT&T clone has.

Meanwhile, the phone company has expressed great displeasure with *Personal Computing* because the July issue jumped the gun on the AT&T announcement by a few days. Although other publishers may gloat over *Personal Computing's* predicament, my impression is that AT&T thinks it can ride roughshod over the personal computing industry and get its way. While the phone company does have lots of bucks to back its position and ultimately has a built-in technological advantage, so far it has shown an incredible lack of sophistication about what makes this market work.

I would applaud the *Personal Computing* article as fearless reporting, but the publisher claims that distribution timing was the cause of the premature announcement. The articles in the magazine about AT&T's PC lack objective criticism and seem to be geared toward pleasing a potential advertiser.

The time has come for computer publications to start calling the shots as they see them. I am shocked and disappointed by AT&T's PC. If AT&T wants to wow personal computer enthusiasts, they will have to come out with something truly innovative. I know they have the potential to outdo IBM, and perhaps with a future generation of PCs they will. Meanwhile, IBM and Apple remain the only two great hardware innovators in personal computing. ●

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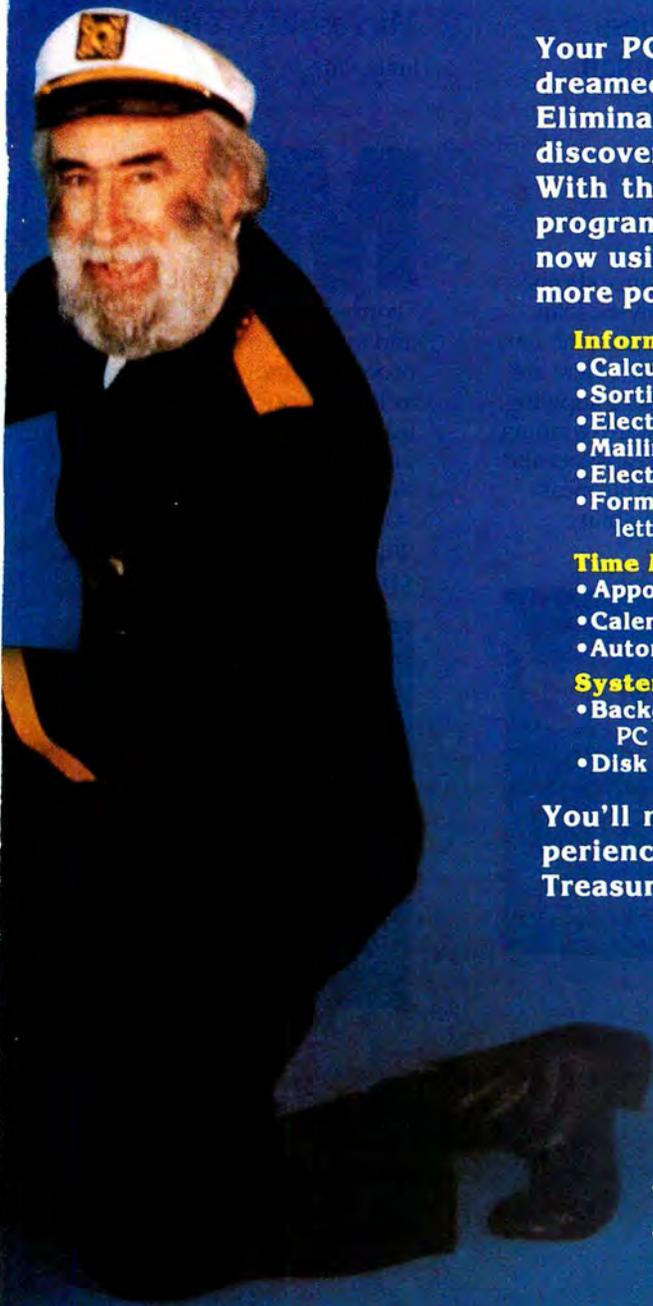
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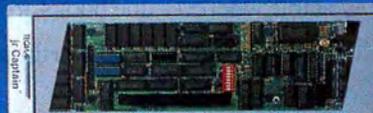
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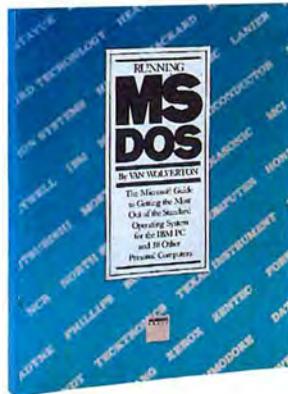
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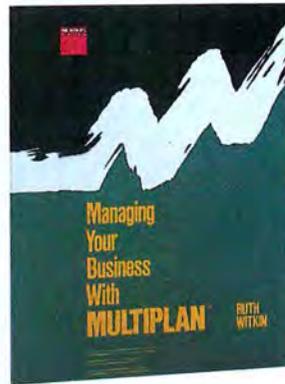


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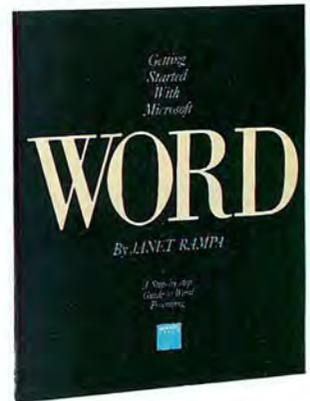


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Predators, Inc.?

The uncertain future of the micro-computer industry has become a staple of cocktail party conversation. Much of the concern about the industry comes, predictably enough, from manufacturers, dealers, publishers, and other insiders—people for whom an uncertain future may mean the difference between a new Mercedes and an old Chevrolet. A great deal of speculation is being lavished on the possibility of one entity or another taking over the personal computer industry in a brave new world of personal computing (Japan and IBM are the favorite predators).

The Dismal Science

My vision of the future is considerably brighter than that of the industry pundits. This rosy outlook comes partly from my training as an economist and partly from my inherently optimistic nature. My optimism is bolstered when I assume the perspective of the consumer—the “person” in “personal” computer.

Economics, often called “the dismal science,” is the study of products, markets, and the evolution of technological change. As important and far-reaching as it may be, the



personal computer is simply the latest in a long line of technological innovations. General lessons from other markets and other products can be portents for the personal computer industry, even if some of the details are, for the time being, sketchy.

The personal computer market is ripe for economic analysis because that market satisfies the major requirements of perfect competition. The market consists of a large number of buyers and sellers and—most important of all—does not present new firms with significant barriers to entry.

That buyers and sellers of personal computer hardware and software abound is obvious to those who have attended a trade show or leafed through a computer magazine, many

of which rival the Sears catalogue in girth. The proliferation of new firms and the pervasiveness of venture capital attest to the personal computer industry's wide-open character. Because there are few major barriers to entry, no single company is free from the constraints imposed by competition. Some firms are larger and more successful than others, but no one entity exerts the control over the market needed for a true monopoly.

Even IBM, frequently criticized for its allegedly monopolistic behavior, does not possess the unfettered price-setting power required to be a true monopolist. It is undeniably a powerful competitor and does have resources unavailable to other companies, but IBM does not control the market in the way Polaroid and Xerox dominated their markets before their basic patents expired.

IBM's resources enable it to survive all but the largest mistakes, but it can't force products on unwilling consumers. A significant marketing effort wasn't able to turn the Displaywriter, IBM's first entry in the word processing field, into a success. Neither does it seem likely that IBM's deep pockets will keep the PCjr from becoming the high-tech equivalent of the Edsel.

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Profit and Loss

Vigorous competition in the marketplace has both short-term and long-term implications. Over the short haul—a month to a year or two—firms introducing innovations that meet consumer needs will be justly rewarded with substantial profits. Apple Computer's Macintosh and Lotus Development's 1-2-3 are prime examples. Conversely, companies that offer products the consumer doesn't want will show it in their ledgers; it won't matter in the slightest who that company is or how much clout it supposedly wields.

As recent history has shown, one company's big success has an uncanny knack of attracting other firms looking to make a similar killing—and voilà, the market witnesses competition. The later arrivals tend to offer products resembling the original but with more features and at lower prices. By responding to these basic profit signals (as PC-clone makers and Lotus emulators have done), manufacturers give consumers more of what the consumers want.

Over a longer period of time—the “future” that has so many industry observers worried—the freedom with which new companies can enter the marketplace will have some predictable results. First, prices will fall. Over time, prices will come to reflect the actual costs of production and distribution and include a profit margin comparable to those in other industries. It is a key precept of the perfectly competitive market that competition and free entry reduce profits by forcing prices down to meet costs.

That scenario transformed the markets for pocket calculators and digital watches, and it's a safe bet that the personal computer market will be next. In the not-too-distant future, spreadsheet and word processing programs, hard disks, and color monitors will sell for a fraction of their current prices.

As a result of declining prices, software and hardware sales will rise markedly. At the same time, the prof-

its that everyone initially found so exciting will be reduced. Attempts to keep profits high by automating factories or relying on cheap foreign labor will ultimately fail, although these and other cost-cutting measures will be necessary to prevent firms from sinking in great pools of red ink. The result of tumbling profit margins will be cheaper, more powerful products for the consumer.

Buyer Prepare

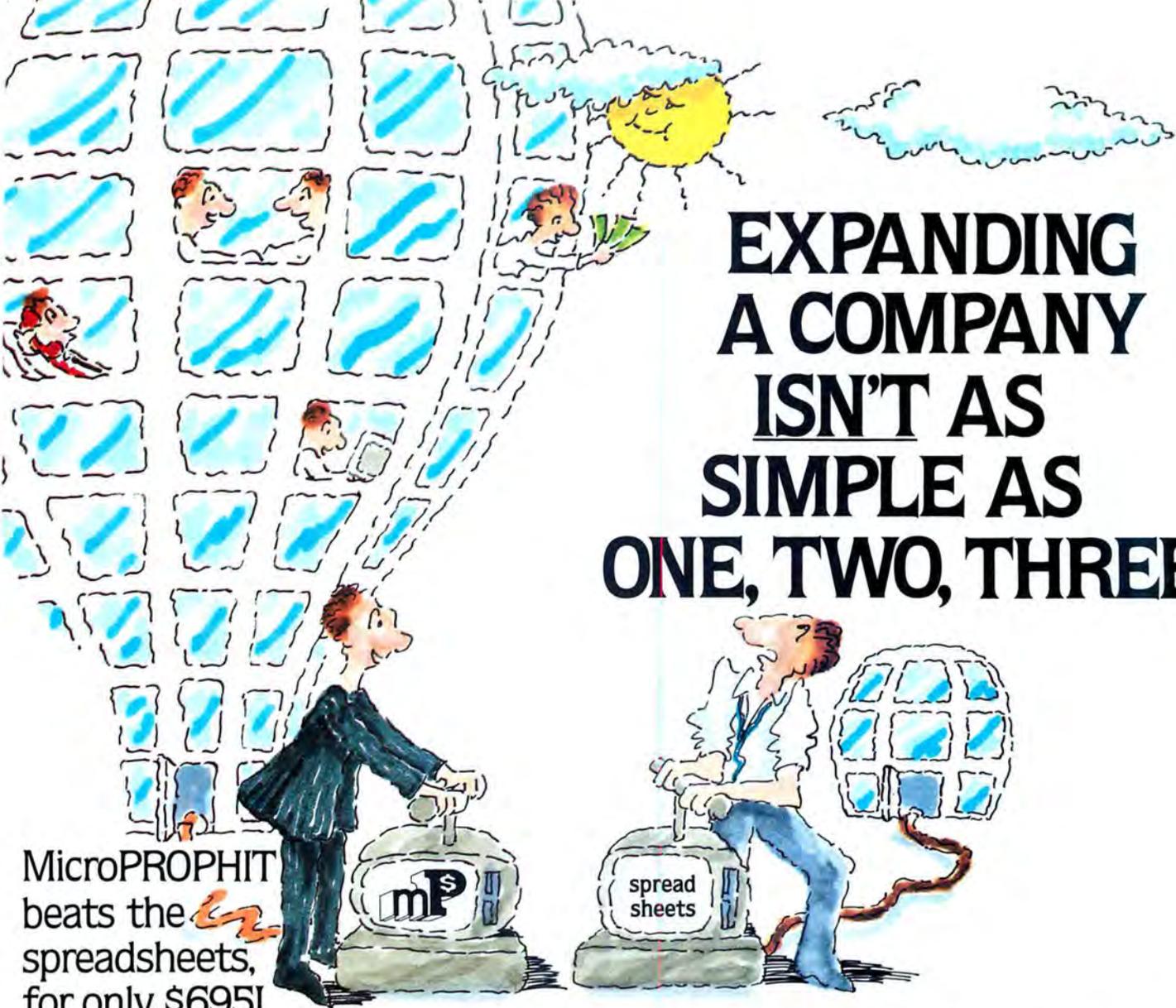
For the typical manufacturer in the personal computer industry, the “new world” may indeed require a certain amount of bravery. Continuing competition means a perpetual profit squeeze. The market will be increasingly unforgiving. Firms that make mistakes—whether in management practice, quality control, or the timing of a product offering—will almost certainly fail.

But as consumers we shouldn't worry excessively about the plight of hardware and software manufacturers. Many firms, after all, will have made tidy profits before market forces finally work themselves out. If one side of the economic coin is the chance to fail, the other is the chance to profit. And profits tend to be most plentiful in industries where risks are greatest.

From the consumer's vantage point, the personal computer industry faces a glowing future. We can all expect more and better products because the market will continue to reward successful innovators with pots of money. At the same time, the standard product—the unadorned personal computer and its basic software—will become ever more affordable. In this brave new world, one person's slim profit margin is another person's bargain. ●

Andrew T. Williams is a Contributing Editor for PC World and has taught economics at Stanford University, Williams College, and the University of California, Berkeley.

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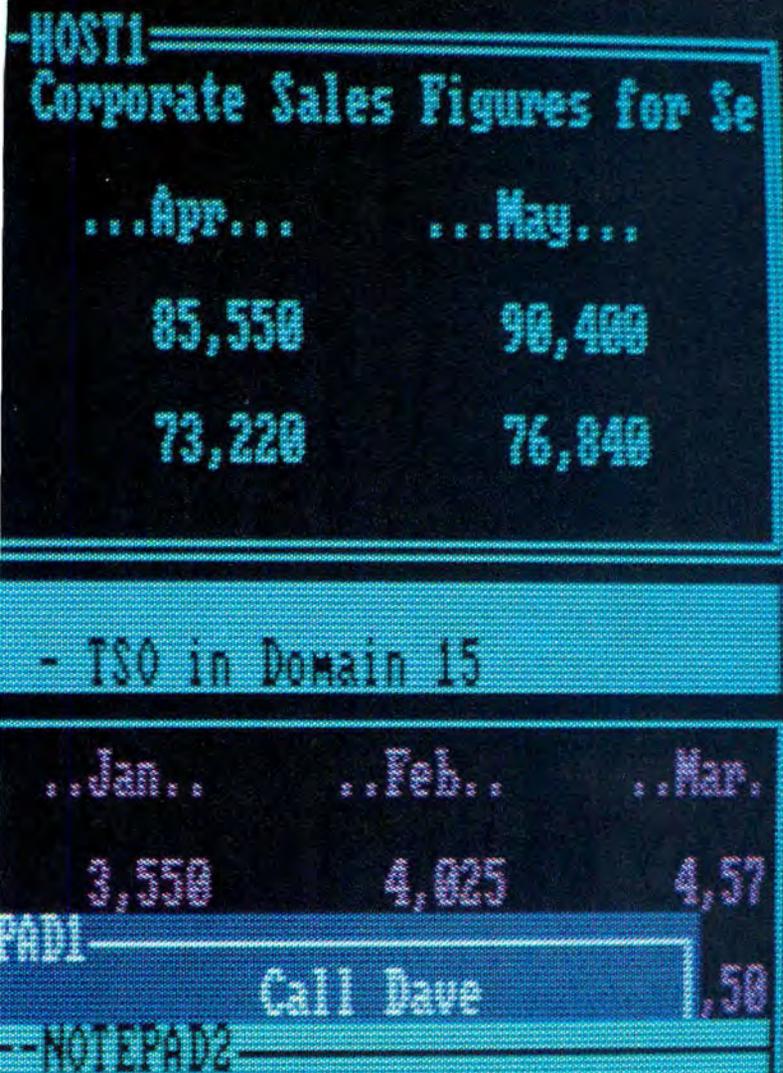


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Letters

DOS Fix

In recent attempts to reformat my disks, I have been plagued with error messages saying that the disk contains bad sectors. I have also experienced a loss of records while using DISKCOPY. When I inquired about this problem, my dealer asked if I was using PC-DOS 2.00. He said that about every DOS 2.00 that the store had sold was later returned with the complaint that formatting caused bad sector errors. When DISKCOPY was used, records were often lost for no apparent reason.

The store manager said that they had had the same problem with their hard disk at the store. The solution was a disk containing a so-called FORMAT update that the store received, presumably from their IBM representative.

When I told a friend about this, he checked with another dealer about this problem and the fix, but none of the employees of that store was aware of any problem with DOS 2.00. Both of these stores are authorized IBM retail stores and repair services.

My friend and I keep current on almost all of the articles and information in the leading personal computer magazines, but we have not heard of this apparent flaw in the FORMAT command in DOS 2.00.

I would welcome some comments on the subject.

Walter R. Illston

Jefferson City, Missouri

Last December IBM issued a user update to its dealers that included a disk containing a patch to the DOS 2.00 FORMAT command. If you encounter erroneous 'bad track' messages when using FORMAT, bring a copy of your DOS 2.00 to your IBM dealer.—Ed.

Spy Stopper

In your July *World View* [PCW, Vol. 2, No. 7], Mr. Shawn Patrick implied, with tongue in cheek, that Uncle Sam had done it again in spending a lot of money for TEMPEST IBM PC computers to ensure their survival post-Armageddon, that is, to protect them from electromagnetic pulse (EMP) or radiation from a nuclear explosion. I'm afraid someone has misled Mr. Patrick, probably with their tongue in their own cheek. A TEMPEST machine is one that has been shielded so that it will not give off electromagnetic emissions, which could be intercepted at some distance and read. If you don't have a TEMPEST PC, you may be on a "party line" and not know it. How about that, 1984 fans?

We have such machines in the Pentagon for word processing and printing classified documents (the printers are also shielded). The shielding is relatively simple, relatively inexpensive considering the service, and about as sophisticated as a "secure" telephone line. There are defense-related command communications systems and computers that have been shielded from potential EMP, but they are rather sophisticated and are few and far between. The Pentagon is an organization that spends a large portion of its time thinking about unpleasant futures and how to keep them from happening; I've found it to be surprisingly free of the frivolities suggested by this *World View* item.

Millard E. Carr

Vienna, Virginia

Worried About Jr

I recently purchased an enhanced PCjr and am just starting on the road toward computer literacy. I look forward to *PCjr World* each issue and had hoped it would expand. I am aware that there are several magazines devoted solely to the PCjr, but I am more interested in how the Jr fits into the IBM personal computer family rather than in the machine as a totally separate computer.

The June issue [PCW, Vol. 2, No. 6] seemed to show that *PCjr World* may be downplayed. I hope that this is a false impression and that *PCjr World* will grow as the Jr grows in capability and use.

M. L. Hawkins

Mountain Home, Arkansas

PC World's publisher, David Bunnell, is an official member of the Save the PCjr campaign, and we have every intention of continuing to cover the PCjr.—Ed.

Piracy and ROM Keys

I must take vigorous exception to David Bunnell's column regarding the proposal to encode the serial number of each personal computer in ROM [PCW, Vol. 2, No. 6].

There is a new generation of applications ready to move to the PC. This generation is already running on the "work station" computers of the Apollo and HP 9000 class, and the major reason we are not providing this level of software for the PC environment is our perception (accurate, it appears) that to sell to the PC market is to lose all control of our products. Although I have initiated the conversion of large-scale engineering analysis software to a PC

Letters

processor, I have also made it quite clear to IBM and others that we cannot offer the product for the PC until they provide us with a mechanism for securing our software.

I am amused by Bunnell's idea that a ROM serial number would put a "burden" on hardware companies. I suspect that a cost of \$1 per machine is a high estimate. If there is a problem with assigning a serial number, we would be quite happy with a 16-bit random number.

We have requested that all workstation manufacturers provide us with machine-readable identifications and have received uniform acceptance of this as a requirement for high-performance software conversion. The random number option has been considered by only one vendor; others find serial number identification valuable for themselves. Indeed, as networking reaches the PC level, there will be considerable need for unique file identification across the network.

Regarding Bunnell's statement that machine identification would be unacceptable to software users who own more than one computer (one at home, one in the office, one portable, and so on), there is no difficulty in licensing the same version of a program for multiple machines.

Bunnell says, "Personal computer users needn't be too worried about this proposal going into effect. It seems unlikely that IBM and other hardware companies will agree to a solution to software piracy that would limit the number of personal computers they can sell." My perspective is quite different. I feel that

IBM will focus on the corporate environment, where hundreds of machines are sold to a single customer. The customers in this market want the reliability, quality assurance, support, and service that come from established software houses and [the manufacturers] will make the low-cost addition that will open that market. In our view, this enhanced market will more than justify the minor cost of processor security.

I feel Bunnell's attitude is a disservice to the PC community, because it would keep that community from ever realizing the full potential of its investments.

John A. Swanson
President, Swanson Analysis
Systems
Houston, Pennsylvania

Four for Ivan Strand

Your reader Ivan Strand wrote a letter requesting your assistance [PCW, Vol. 2, No. 7]. He wrote: "What I would like to have is a word processor that not only shows what I am going to get on the screen but also autorenumbers."

Samma Word III will more than satisfy Mr. Strand's needs.

Bud Blate
Western Regional Manager, National Accounts
Samma Corporation
Santa Clara, California

This letter is in response to the letter from Ivan Strand in the July issue [PCW, Vol. 2, No. 7]. I use *Perfect Writer* with a technique that comes pretty close to what Mr. Strand wants. You can come close to on-screen formatting with an intermediate step.

Perfect Writer normally formats text into an intermediate file that can only be read by *Perfect Printer*. If, however, you direct the formatted output to a device called File, a formatted ASCII file will be produced instead. This file will have the .FIN suffix and can be viewed with the Type command or edited with *Perfect Writer* just like any other ASCII file.

Since the document has already been formatted, what you see is what you get. All margins, indents, and page breaks are included. You then have the option of editing the formatted copy and printing it with DOS or editing the original text and reformatting it for your printer.

Formatting to disk and reloading the editor is not as nifty as having an on-screen formatter, but it comes close.

Laurence W. Coen
Overland Park, Kansas

In answer to the letter from Ivan Strand [PCW, Vol. 2, No. 7], *EDIX + WORDIX* might fill his needs.

C. J. Handlogen
Dallas, Texas

Emerging Technologies confirms that EDIX + WORDIX provides the ability to autorenumber and preview formatting. Be aware, however, that these are two separate programs. To make changes in a document you are previewing, you must first exit WORDIX and then invoke EDIX.—Ed.

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Letters

Regarding Ivan Strand's letter [PCW, Vol. 2, No. 7], *FinalWord* not only has the autorennumber function he wants, but it shows what the final document will look like when printed.

When the document is ready to print, save the material (<Ctrl>-X F S) and then use the Layout menu Verify Advanced Print command (<Ctrl>-X L V). When the message is 'Ver adv. print options', press the <Enter> key. The screen will show the lines and page breaks of the document, so you can change the pages you don't like before they are printed.

Bidley F. Simpson
Milton, Massachusetts

Thoughts on Symphony

I just read Andrew Fluegelman's review of *Symphony* ["Five Complex Pieces," PCW, Vol. 2, No. 7], and it struck a responsive chord. I have had a hot-rod PC for just over a year, and I use Lotus 1-2-3 extensively, at least those parts of it that are understandable to a nonprogrammer.

The big problem with 1-2-3 is the documentation. Sure, the answers are all in there somewhere, but the manual seems to have been written from an engineering perspective rather than from that of a user. It seems absurd that one has to acquire third-party publications in order to understand rather common applications.

Also, it sure would be nice if 1-2-3 had a window that displayed the current status of the print commands or, indeed, of the format commands in

general. I have never understood why this kind of feature has not been incorporated into programs that use the 1-2-3 menu format. I think that some of the problems with *Microsoft Word* are attributable to the difficulty a user has in knowing the current format of the document. *WordStar* may be complex in its command structure and lacking in a few of the new features, but its formatting is always clear and easy, and that is what word processing is all about.

I have looked at the *Symphony* documentation, and not only is the program complex in the ways that Mr. Fluegelman noted, but the documentation shows no meaningful improvement in approach. The computer wizards will do just fine, I suppose, but the guys like me who have to make a living doing other things that make use of computers remain unconvinced.

Michael S. Pecherer
San Francisco, California

Courageous Criticism

I am writing in reference to Andrew Fluegelman's recent review of Lotus's *Symphony* ["Five Complex Pieces," PCW, Vol. 2, No. 7]. I was impressed by the review's thoroughness but principally wish to congratulate you on your courage and forthrightness in criticizing the product of a large advertiser. That takes a great deal of guts and, frankly, most people would have fudged it.

This business needs more critics like Mr. Fluegelman and Harry Miller.

James K. Sweeney
Los Angeles, California

Symphony Supporter

I have been using *Symphony* for the past three months while writing a new book on the subject. Although there are several things about *Symphony* I do not like, and although I agree with your reviewers that the program is complex, on the whole I like *Symphony* quite a lot.

I feel very strongly that your reviews of *Symphony* in the July issue of *PC World* did not give an accurate impression of this exciting new program. First, the articles contained several inaccuracies. For example, the article by Harry Miller said that centering text in the *Symphony* word processor was clumsy. In fact, there is a one-keystroke command to center text in *Symphony*. Errors like this are not so bad in themselves, but when they are used as critical examples in a limited review of a program like *Symphony*, the unstated message is, "This is not so great, and the rest of the program is similarly weak."

The reviews fail to mention some of *Symphony's* strongest characteristics. First, the program offers the best electronic spreadsheet that I am aware of. Fluegelman blows right by the *Symphony* spreadsheet's new functions and commands with the sentence, "Except for the greater variety of functions and commands, the *Symphony* spreadsheet does not pose any conceptual hurdles." Talk about damning with faint praise! Try this as an alternative: "After learning these exciting new functions and commands, the experienced 1-2-3 user should feel right at home in the *Symphony* spreadsheet."

Letters

The similarity between *Symphony*'s spreadsheet and 1-2-3 is significant. The spreadsheet is the first part of *Symphony* that a new user sees. If that new user is familiar with 1-2-3 (as many will be), the *Symphony* spreadsheet offers a familiar base from which he or she can explore the program's other features while making productive use of the program.

The spreadsheet will even help those users who have never used 1-2-3. Since the spreadsheet is the most important part of *Symphony* and the easiest part to learn, most users should be productive with at least this part of *Symphony* after only a few hours.

Fluegelman focuses too much on the integration of numeric tables into documents. Sure, an integrated program should be able to handle this task, and I think *Symphony* does this as well as any other word processor I've seen. But how often do you do word processing that involves embedded numeric tables? The other advantages of *Symphony*'s integration are going to be more important for the average user.

Fluegelman completely misses two of the main advantages of the integration of the word processor and the spreadsheet. First, the two modes share a very similar command structure, making the word processor easy to learn once the spreadsheet is mastered. Second, the integration of the environments makes it possible to jump from the spreadsheet to the word processor to dash off a quick memo. For *Symphony* users who spend a lot of time using the spreadsheet and who occasionally need to write memos, this feature saves time and frustration.

Your reviewers' primary criticisms of *Symphony* are that it is not sufficiently integrated and that it is too complex. Fluegelman claims that he "can't imagine giving this program to the average busy executive . . . expecting [him or her] to make productive use of its integrated features." This is just not true. I've been watching the controller of our company—a 1-2-3 user who is certainly not a computer whiz—learn and use the program over the last two weeks. He thinks the word processor is great, and he loves being able to enter numeric tables in his documents. He is also using the communications mode—it took him less than half a day to learn to transfer files and worksheets.

Criticizing *Symphony* for being complicated is a little like criticizing the Golden Gate Bridge for being long. The length of the bridge is a function of the channel it must span. Similarly, the complexity of *Symphony* is a result of its [designer's] effort to encompass a powerful spreadsheet, four reasonably powerful secondary programs, a windowing system, and a programming language in one box, and then to make that mix as open to the user as possible.

I got the impression that Andrew Fluegelman wished *Symphony* was more like 1-2-3. He seemed to expect that he would be as knowledgeable about and as comfortable with *Symphony* after a few weeks as he is with 1-2-3 after 18 months. I had the same disappointment in the first days of working with *Symphony*. I had

hoped that the program would be a supercharged version of 1-2-3 and was irritated to see the large number of differences between the programs. But as soon as I accepted *Symphony* for what it is—a new program and not a remake of 1-2-3—I began to enjoy using *Symphony* more and more. I think many people will find *Symphony* the perfect program for their diverse computing needs.

Douglas Cobb
Louisville, Kentucky

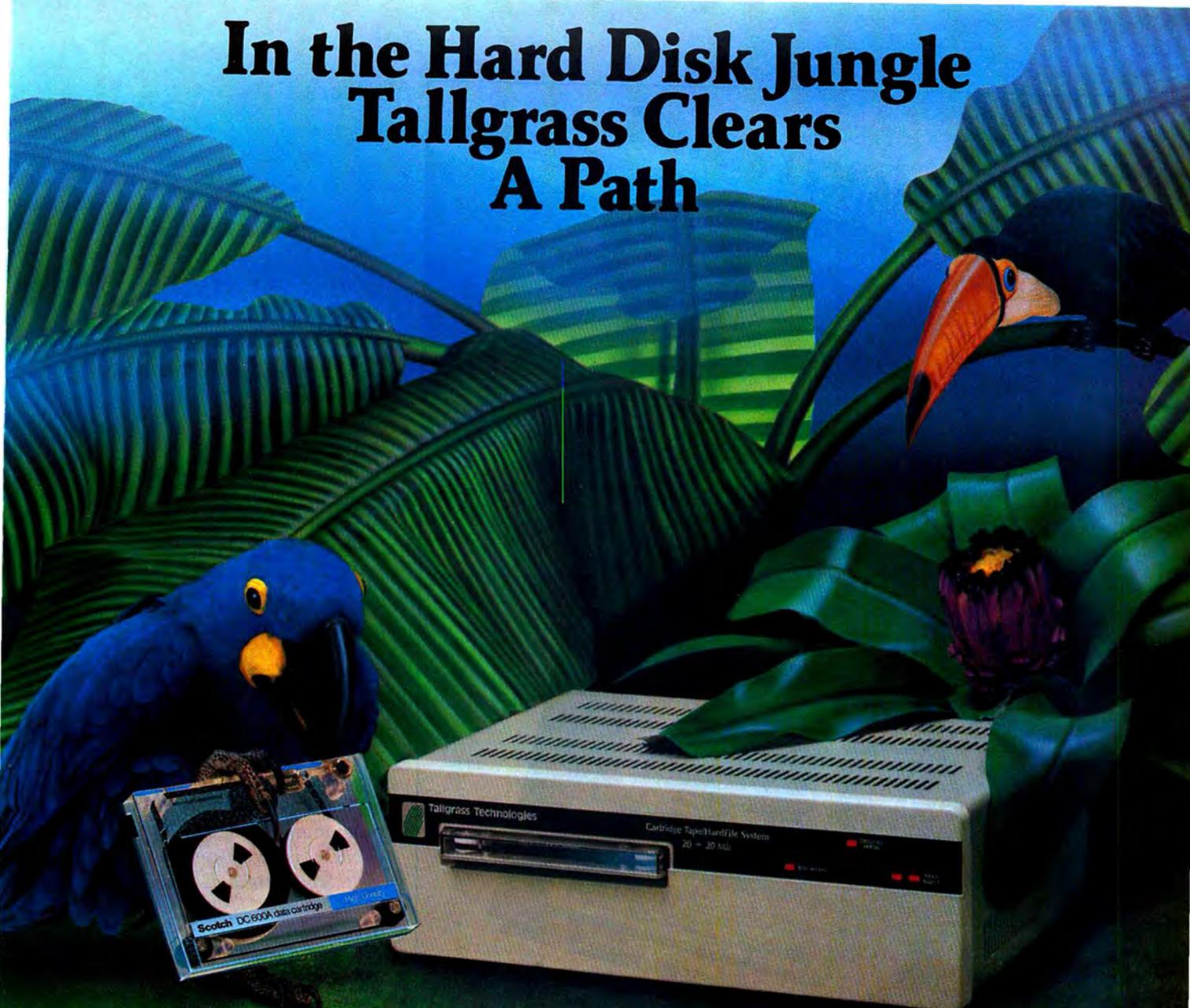
Little Black Book Fixes

I am writing in regard to your Lotus 1-2-3 article, "Little Black Book II," in the July 1984 issue [*PCW*, Vol. 2, No. 7]. I found no bugs in the main program, the data entry part, and the text was easy to read and understand. But when I finally came around to typing in the mailing labels program, I was glad that I had some background in programming (which I acquired last year in the ninth grade).

The major bug I found was in cell B107; this cell was printed as 'R{BS}{DOWN}{RIGHT}{RIGHT}{RIGHT}~G. It should be written as 'R{BS}{DOWN}{RIGHT}{RIGHT}~G. In other words, in this case three rights do make a wrong.

Another bug was obvious only when I tried to print an odd number of labels. The program won't print the last label. This could probably be corrected in a number of ways, but the easiest way for me was to change the contents of cell B102 from 'Xlcounter>=count~/REcounter~ {CALC} {GOTO}criterion~/XQ~ to 'Xlcounter>(count+1)~/REcounter~ {CALC}{GOTO}criterion~/XQ~

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Letters

This prints one blank label, because it drops down an extra row due to the loop in the program. However, because this row is blank, the extra label is blank.

Another minor problem arises in the program when you do the Print Queries command in the menu. It is apparent that someone miscounted when they were setting the margins in cell D124. To make the queries fit, it is necessary to either add six spaces to the right side or subtract six from the left side.

After these changes the program runs fine, and it has become quite useful to my family. The article was a good lesson for me because I had never used 1-2-3 before, and it helped me learn quite a bit about the 1-2-3 programming language.

Nicholas E. Grynkewich III
St. Simons Island, Georgia

Thank you for your corrections. Another option for fixing cell B102 is simply to remove the equal sign. Regarding the margins, it's not necessary to include column BD when you print the Data Query section. However, if you do want to print it, change the contents of cell B124 to OML6~MR132~.—Paul McDermott

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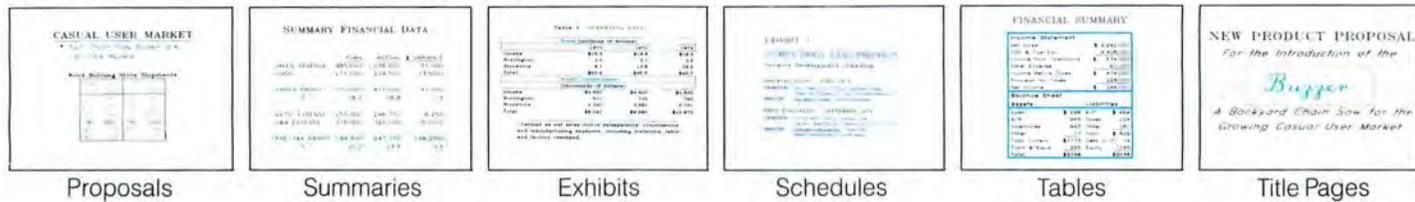
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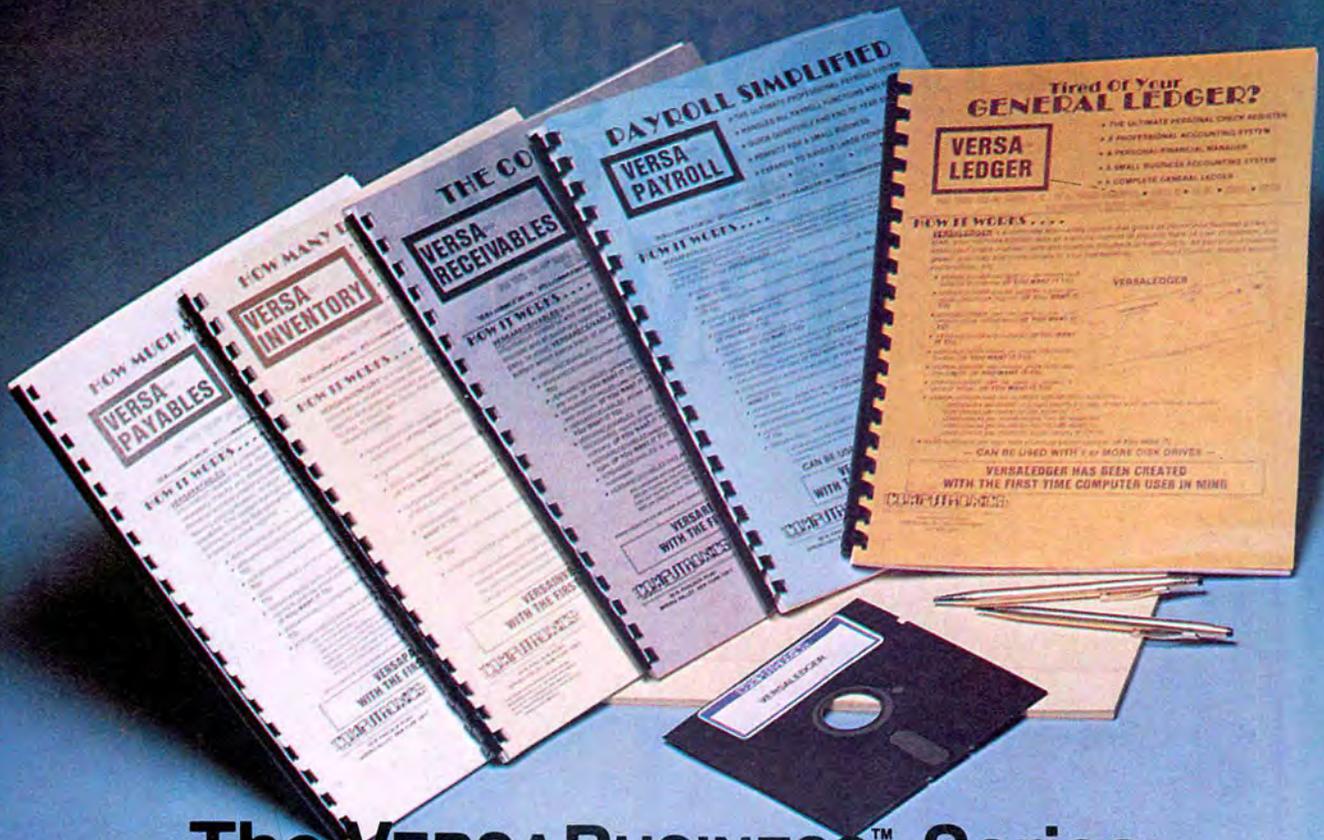
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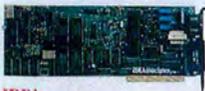
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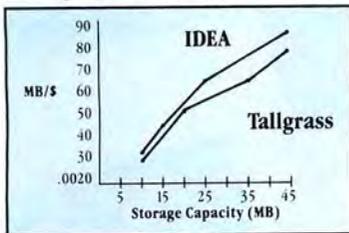
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SNIPETTES SALARES	8	64,000
TEAM HYPNOTIST	1	51,000

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ITEM	QUANTITY	COST
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SNIPALIZED SOCKS	27	4,706
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PC WORLD

Grapevine

Rumors, Tidbits, Speculation

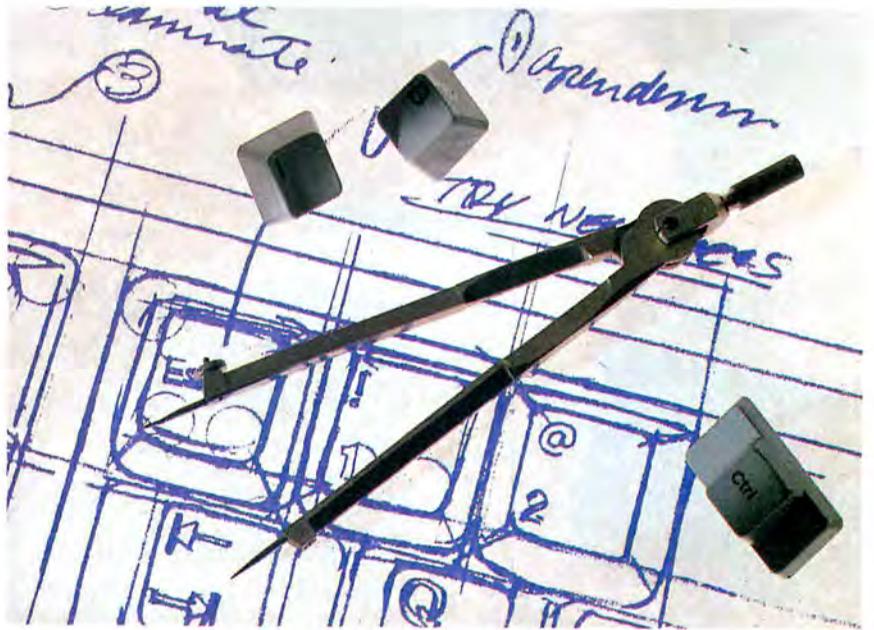
* ————— *

Key Changes?

The PC keyboard has been a favorite whipping boy of computer writers and reviewers, who say that the <Shift> keys are in the wrong place and the <Enter> key is not big enough. IBM received even more criticism for its PCjr keyboard and acknowledged the need for some keyboard changes.

An anonymous correspondent told us that apparently Big Blue hasn't forgotten the earlier keyboard disapprobation. The correspondent was told that IBM was "planning to address the keyboard needs of low-end computer users." The correspondent's source also said that the planned keyboard would have the same feel as the PC's present keyboard, but that the layout and the size of certain keys would be changed.

PC World View reports new developments in computer technology, items of interest to computer enthusiasts, and the most significant and enticing speculation about industry trends and personalities. We've reserved the "Grapevine" section of this column for industry reports that are still at the speculative stage.—*Katie Seger*



* ————— *

The New DOS

According to the rumor mill, Microsoft has completed DOS 3.00, and this latest update is said to be a multi-user, multitasking operating system called MS-NET. The scuttlebutt is that the new version is too slow for IBM's tastes and that Microsoft workers are burning the midnight oil trying to improve MS-NET.

* ————— *

Clam Up, Fellas

Reports keep surfacing about an IBM notebook-size computer. So far, we've heard that bubble memory boards and 3½-inch disk drives are destined for the machine. The latest rumor calls the portable computer "Clamshell" and says that a government agency is supplying IBM with design information for the machine. An industry source says that the CIA and the National Security Agency are frequent purchasers of notebook-size computers like the GRiD Com-

View

News and notes for the computing community

pass, so it is plausible that a government agency is working with IBM on the Clamshell.

The same source says that IBM is experimenting with both electroluminescent displays (ELDs) and liquid crystal displays (LCDs) in mock-up notebook-size computers. Currently, because of their low price and low power use, LCDs are the norm in small computers. However, LCDs usually have 16 or fewer screen lines, while ELDs offer 24 lines and better resolution.



Software Goes Hollywood

Large software firms have started advertising their products on television. The campaigns are expensive, but the firms hope to increase public awareness and boost future sales.

In the past few years personal computer manufacturers have spent substantial amounts—more than \$185 million in 1983—to advertise their hardware on television. So it isn't surprising that software firms have gotten into the act. Lotus Development and Ashton-Tate kicked off television advertising campaigns this summer.

"We have the first truly integrated TV spots," said Joyce Bartlett, Lotus's director of marketing communications. The two 30-second commercials tell about the company as well as its two programs, *1-2-3* and *Symphony*. Bartlett would not comment on how much money was spent producing or airing the commercials, which were scheduled to run during the Olympics and the U.S. Open tennis tournament, but industry sources say it was a multimillion-dollar campaign.

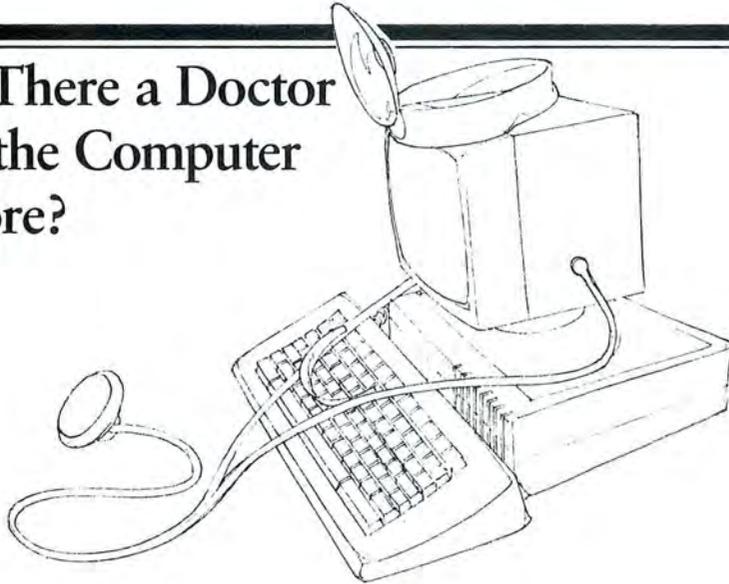
"The television ads are not taking away our print dollars," Bartlett stressed. She thinks that other software firms should investigate all advertising avenues before following Lotus's lead. "Television fits in well with our plans. But I would hate to think that other companies are spending money on TV at the expense of other media—such as print—that could better serve them."

Ashton-Tate advertised *Framework* in a commercial scheduled for the Olympics and the Democratic National Convention. Charlene Margaritis, Ashton-Tate's director of public relations, said that the advertisement had a seven-figure budget. Margaritis acknowledged that Ashton-Tate is planning more television spots in late 1984 and early 1985, but she would not comment on whether the advertisements would focus on the company's new product, *dBASE III*.

O'Hanlon Computer Systems' television ads actually beat Lotus and Ashton-Tate to the screen. The Bellevue, Washington, systems and software house aired its first commercial, with actor Ernest Borgnine as

(continues on page 46)

Is There a Doctor in the Computer Store?



Physicians Practice Management (PPM), an Indianapolis, Indiana, software firm, has introduced a unique marketing service for *Threshold*, a financial management insurance-filing package for doctors. Robert E. Ivancevich, PPM's vice president of marketing, explained that the service allows a retailer with a physician customer to make a toll-free modem call with a PC and a toll-free voice call to PPM's headquarters. *Threshold* then appears on the retailer's PC screen, and the physician watches and participates in a demonstration of the software while talking with a PPM representative on the telephone. "Our remote demonstration lets the retailer leave the doctor in our hands, so the retailer can attend to other customers in the store," Ivancevich said.

PPM inaugurated the service because "retailers have trouble selling vertical software, especially medical

software," according to Ivancevich. Most computer stores can't afford to train salespeople in specialized medical software because the demand for programs is low. However, without the specialized knowledge, the retailer often loses not only substantial software sales—*Threshold* costs \$5500—but often the large hardware sales that commonly accompany vertical software sales.

PPM's *Threshold* experts have been on call since early spring, and Ivancevich said that the marketing scheme is going so well that PPM is working with several retailers to set up invitation-only demonstrations in stores across the country. Perhaps other vertical software makers will follow PPM's lead.

Hook, Line, and Sinker

If a "Gone fishin'" sign was hanging in the ComputerLand of Atlanta window this spring, it had nothing to do with closing the store early. The store's staff was busy helping the Atlanta Boys Club with its annual bass fishing tournament. Tournament results were tabulated on a Texas Instruments Professional Computer in the store. Jeff Godwin, director of public relations for the ComputerLand store, wrote a customized program that determined which angler caught the largest fish, hooked the most fish, and had the highest stringer weight. The program also gave bonus points for keeping fish alive. In contrast to past tournaments, in which officials had to wait up to 2 hours before declaring the winners, this year's list of winners was produced less than 5 minutes after the final fish was weighed in.



Boscom Layoffs

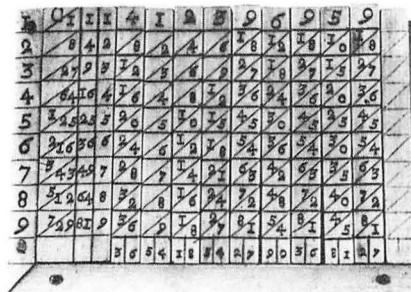
Last month *PC World View* reported that computer shopping centers, such as Boston's Boscom and San Francisco's Datamart, were having trouble leasing display space to computer hardware and software companies. Boscom, with only 30 percent of its exhibition space leased, laid off 34 of its 45 employees in early June. "Our sales started lagging," Alice Jelin, Boscom director of public relations, said. "We had to cut our costs." Jelin said that Boscom would still open next year, but the opening has been pushed ahead from the spring to the end of 1985. "There is no official opening date," Jelin said.

Stake Out a Software Claim

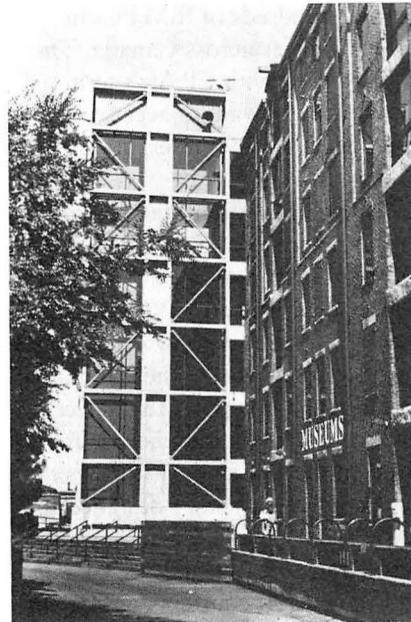
The Realtors National Marketing Institute is looking for some good software. The Marketing Institute evaluates, reviews, and distributes real-estate-oriented software to its members and members of the National Association of Realtors; it currently distributes five programs. Members of the institute's computer committee are accepting program submissions. Real estate accounting, investment analysis, data base management, and sales management programs are of particular interest to committee members.

Programmers interested in receiving more information or submitting software for review should write to the Realtors National Marketing Institute, Software Products Review, 430 N. Michigan Ave., Chicago, IL 60611.

Saving Our Past



One of the artifacts from the Computer Museum, an original set of Napier's Bones. This palm-size calculator was designed by John Napier in 1617.



The new home of the Computer Museum in Boston

While Boscom is weathering financial difficulties, another Boston institution appears to be doing very well. The \$10 million pledge campaign to buy new quarters and underwrite new exhibits for the Computer Museum is off to a good start. The Computer Museum, which has moved to new quarters at Boston's historic Museum Wharf, is scheduled to reopen November 14. More than \$1.6 million in corporation pledges had been raised by early May, and a museum spokesperson said that the five-year campaign "has every reason to succeed."

The Computer Museum began in 1979 as a private museum sponsored by Digital Equipment Corporation. It became a public, nonprofit institute in 1982. The museum's new home has eight galleries, five of which will be open in November. Exhibitions will cover the history of the computer from the abacus to the silicon chip.

The Computer Museum's Board of Directors and Trustees includes some big names in the computer world: Erich Bloch of IBM; Mitch Kapor of Lotus Development; Robert N. Noyce of Intel; and CW Communications Chairman Patrick J. McGovern.

Flick Your PCjr



James E. Korenthal of New York City wrote to say that he discovered an input device for the PCjr that comes fully assembled, requires no interface cables, is easy to run, and costs less than a dollar. The device is a disposable cigarette lighter.

When the keyboard cable is disconnected, the PCjr reads the lighter's spark as an invalid keyboard code and emits a high-pitched beep. Although Korenthal wouldn't guarantee that every lighter would confuse the PCjr, he had success with Bic and Cricket lighters. Keep the lighter within two feet of the computer, Korenthal advised. Just remember, the Surgeon General has determined that smoking cigarettes is dangerous to your PCjr.

Southern Discomfort

Back in November 1983 (*PCW*, Vol. 1, No. 8), *PC World View* reported that Southwestern Bell, relying on a 1965 law aimed at owners of modem-equipped mainframe computers, had started charging owners of personal computer modems a hefty \$44.90 per month to telecommunicate over telephone lines. Computer owners in Southwestern Bell's terri-

tory of Missouri, Texas, Kansas, Arkansas, and Oklahoma didn't take kindly to the surcharge and organized to fight the telephone company. Bowing to the pressure from groups such as the Oklahoma Modem Users Group, Southwestern Bell reversed its decision after less than a year. Chalk one up for the little guys.

PCs Take Flight

Canadian Pacific Airlines (CP Air) is putting hundreds of IBM PCs in travel agencies across Canada. The PCs are used with CP Air's terminal emulation software to access the airline's Pegasus 2000 reservation system.

"Most airlines rent dumb terminals for on-line reservations," said Rick Orr, a manager in CP Air's computer service department. CP Air's rent-to-own PC system not only offers travel agents a reservation system but also gives them a computer that covers their office automation needs. To sweeten the deal, CP Air throws in an accounting package designed for travel agents. The PC offer began in April, and by early summer CP Air had signed 190 contracts with Canadian travel agents.

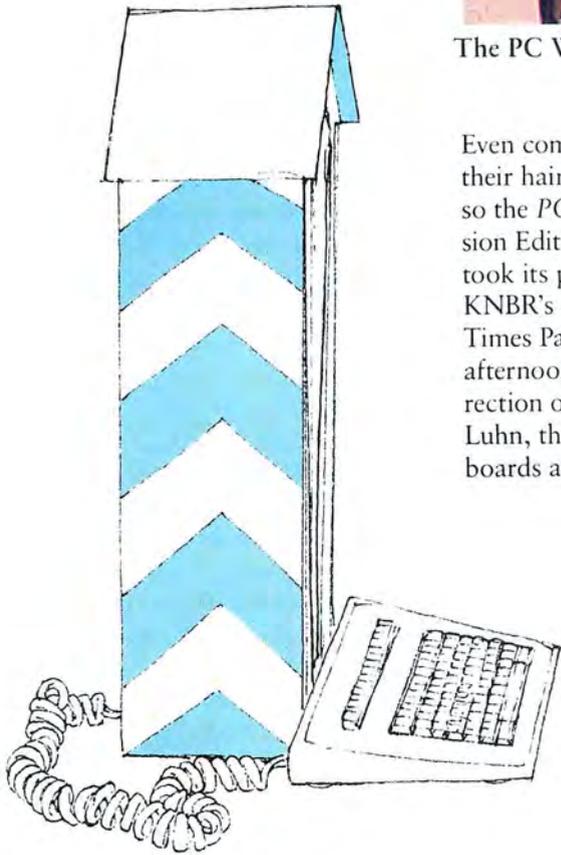
¿Habla DOS?

The market in Latin America for desktop computers will grow to over \$1 billion by 1987, according to a study conducted by the Center for International Technical Cooperation. Despite the economic uncertainty in Central and South America, the study revealed that United States firms—especially IBM and Apple Computer—are working hard to develop marketing strategies for the area in an attempt to head off Japanese computer sales.

Computer sales in Latin America accounted for only \$113 million in 1982. The study attributes the projected increase in computer sales to the growing number of small- to medium-size businesses in Latin America and to the emphasis on modernizing management and production techniques within the region.

Playing the Palace

A Buckingham Palace official told a London *Times* reporter that the staff doesn't "sit here with feather quills and leather ledgers." Instead, Buck House workers are using computers to keep the accounts and run the household. The official didn't say what brand of computer equipment is installed in the palace, but it appears that no expense was spared. This year's Civil List (the Royal Family's public expense account) says that the Windsor clan spent \$186,000 in the last two years to purchase computers, word processors, and peripherals.



Before the Parade Passes By



The PC World High-Altitude Precision Editing Squad and Drill Team

Even computer magazine editors let their hair down once in awhile. And so the *PC World* High-Altitude Precision Editing Squad and Drill Team took its place in radio station KNBR's second not-so-annual Good Times Parade on a very warm Sunday afternoon this spring. Under the direction of Associate Editor Robert Luhn, the Squad—armed with clipboards and blue pencils—marched

through beautiful downtown Pleasanton, California. Assistant Editor and French horn virtuoso Eric Brown provided the marching music, while Melisa Koessel, Technical Editor Karl Koessel's 7-year-old daughter, lead the way with printout paper pom-poms.

Our intrepid group had barely started marching when two burly louts in the crowd began chanting "Ap-ple, Ap-ple." "Macworld didn't want to come," Karl Koessel informed them. "Besides, you don't want a one-disk-drive magazine."



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PC World View

Software Goes to Hollywood (continued)

spokesperson, in April. The company has produced two 60-second commercials at a cost of \$1 million, according to Dennis Sullivan, O'Hanlon's director of marketing. The commercials are airing during regional and national news broadcasts and shows like "60 Minutes" and "Good Morning America." "We plan to continue with television in 1985, but we will augment the ads with a nontraditional form of merchandising," Sullivan said. He would not give any details about the 1985 campaign.

Other large software firms are steering clear of television—for the time being. Microsoft's senior public relations manager Marty Taucher said, "We are exploring all advertising avenues, but we don't have any plans for radio or television ads at this time."

"The print media have been very successful for us," said Nancy Baumgartner, public relations director for Spinnaker Software. According to Baumgartner, the educational software firm is spending \$6 million in advertising this year. "We talked about television ads, but nothing is on the drawing boards," she said.

"We are definitely not planning any television advertising in the short term," said Candace Engelsen, MicroPro's manager of advertising.

"Our audience tends to be made up of readers rather than TV watchers.

We will continue to reach them where we normally reach them—in the magazines." Engelsen also observed that "if their [Lotus and Ashton-Tate's] strategy is to promote brand name awareness, then television accomplishes that rather quickly, but I don't see their move to television forcing our hand."

Richard Rabins, president of Alpha Software, said he didn't foresee a mass move to television advertising by software companies. "There's no use doing it halfheartedly. Unless you are prepared to throw lots of money into it, television advertising isn't worth doing," he said. Alpha Software's marketing plan is "dealer-oriented," Rabins said. "We are delighted that Lotus and Ashton-Tate are spending the money on TV, because it will bring more people into the stores." Rabins thinks that his company's dealer training will help promote *Electric Desk* as a lower-priced alternative to the software that Lotus and Ashton-Tate are advertising.

PC World View welcomes contributions from readers, and we'll pay up to \$50 for the items we use. Please include your name, address, and phone number with your contributions; send them to PC World View, PC World, 555 De Haro St., San Francisco, CA 94107. ●

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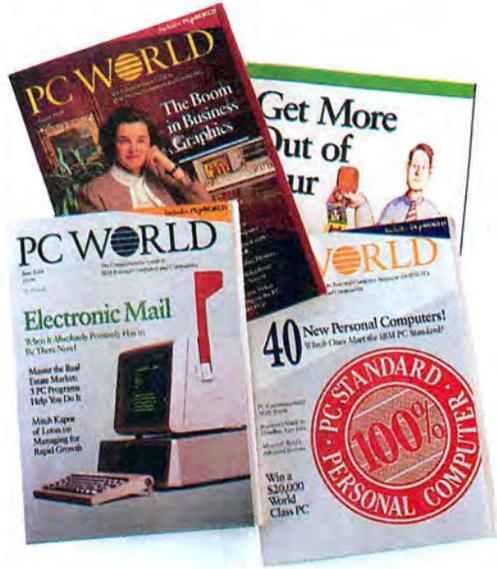
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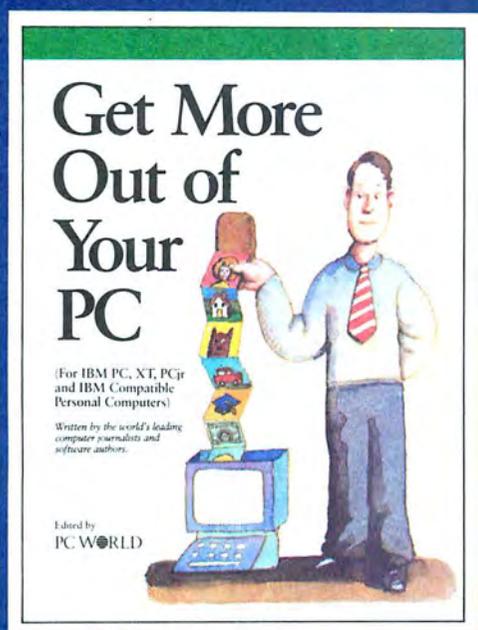


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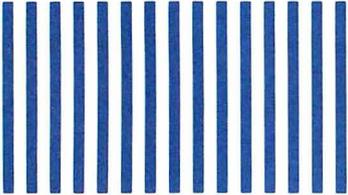
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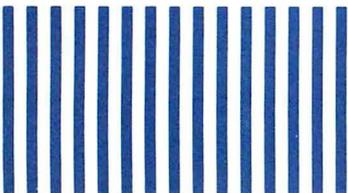
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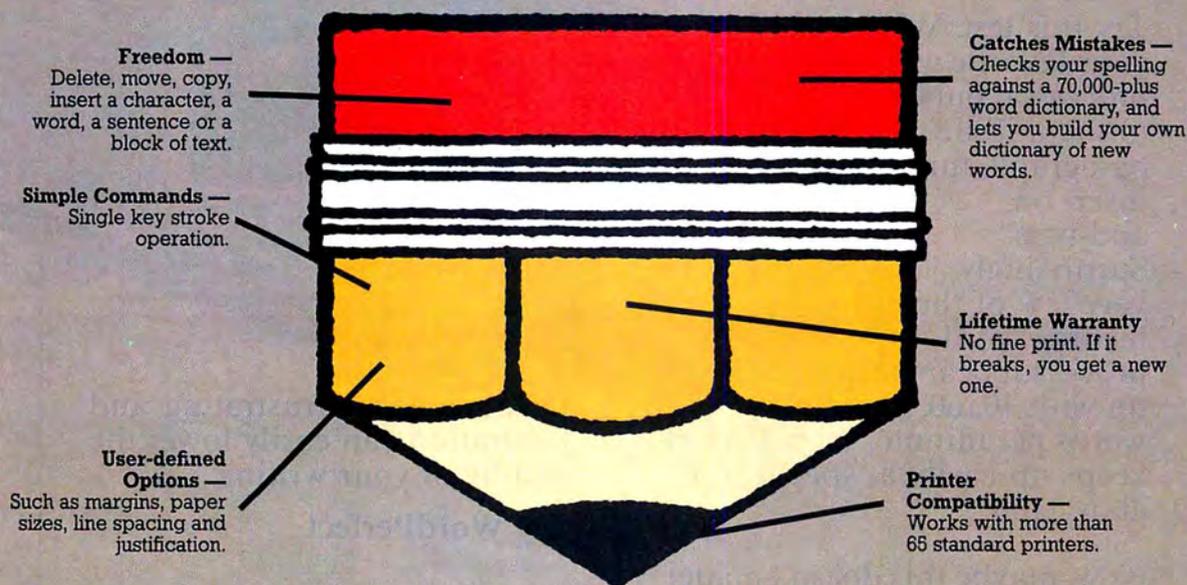
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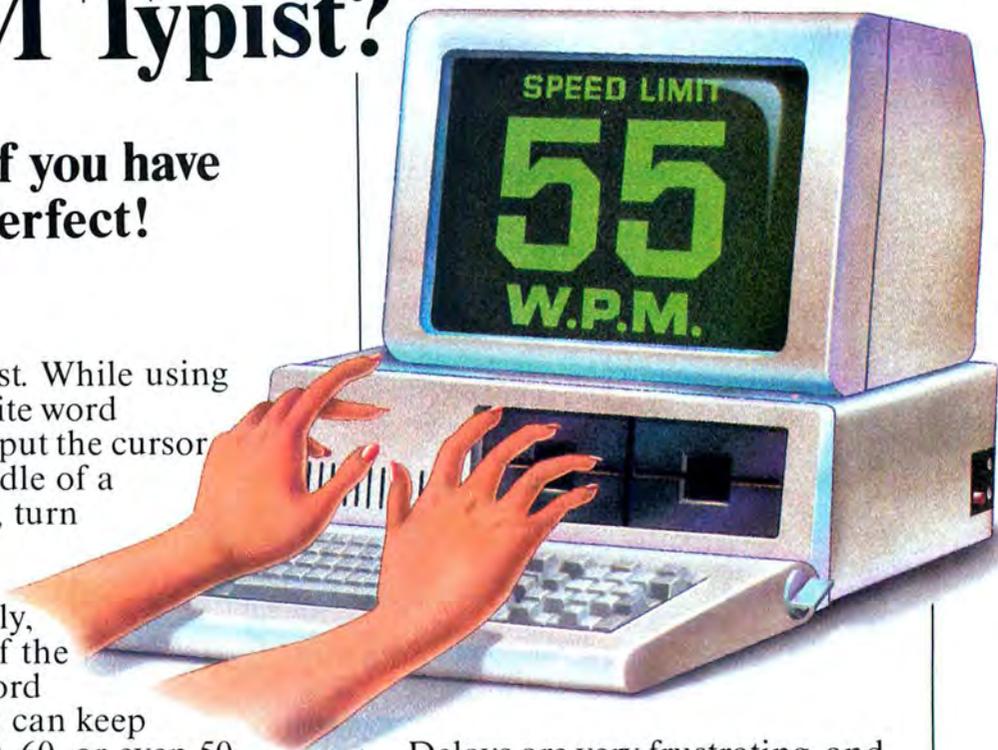
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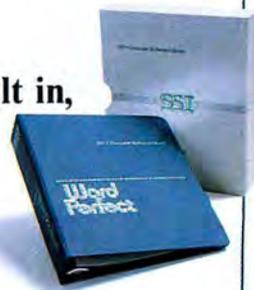


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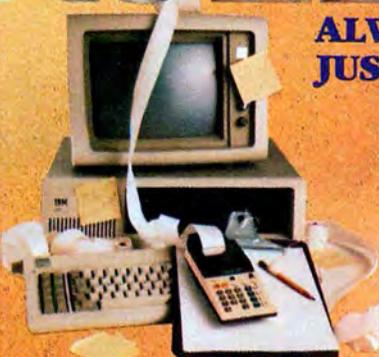
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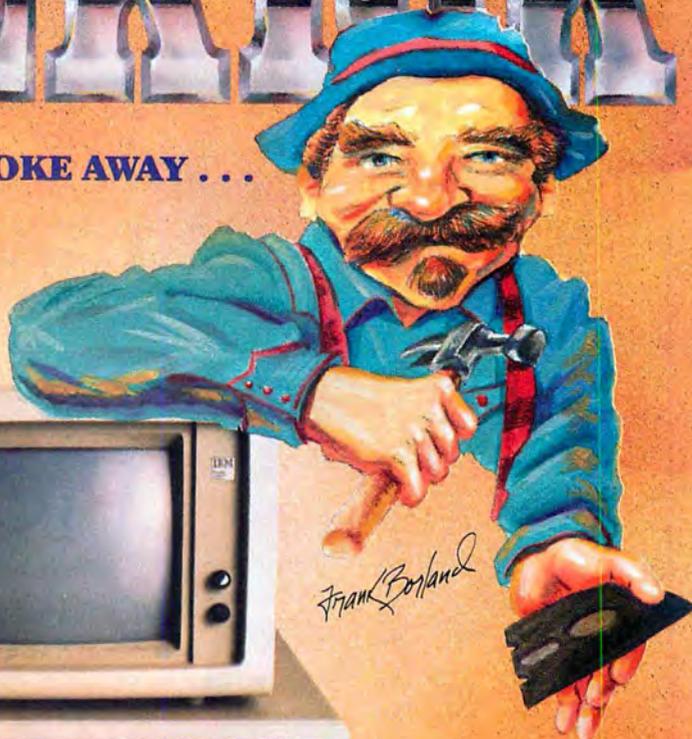
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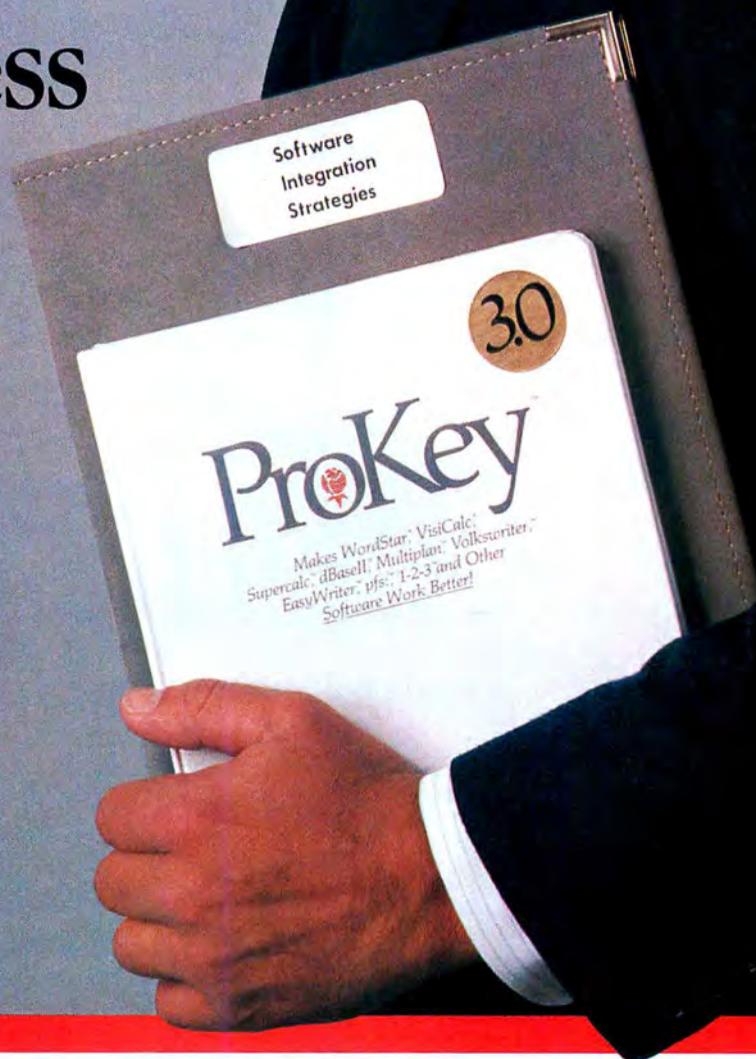
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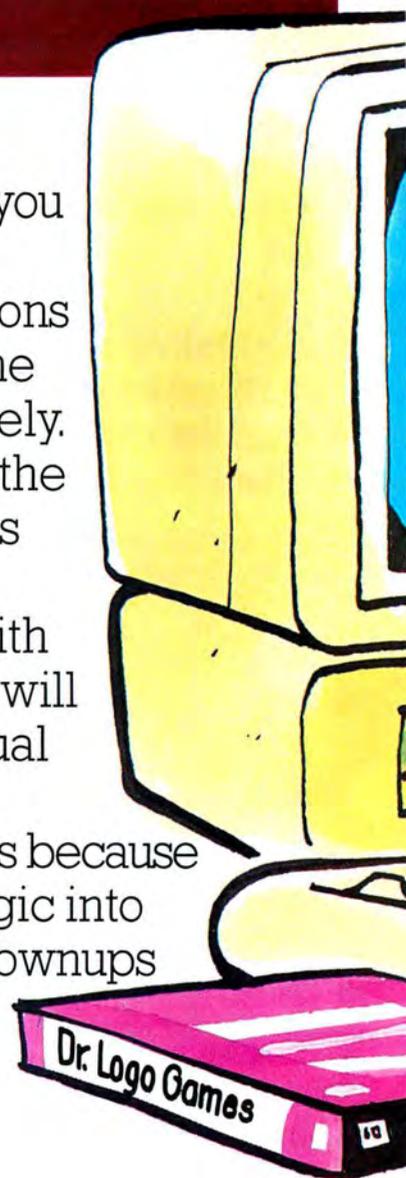
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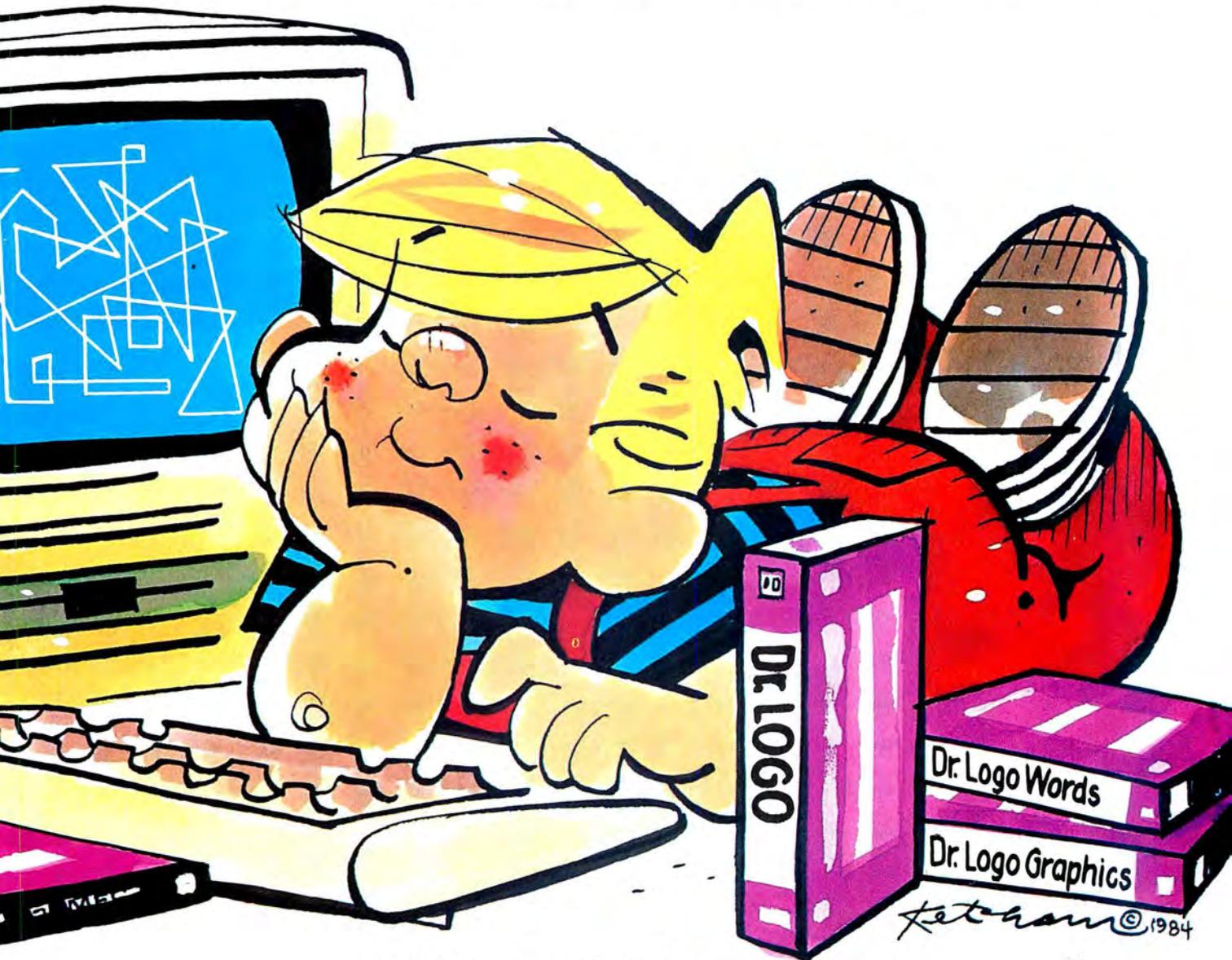
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GENERAL LEDGER—DR.

expensed out

ACCT.	AMOUNT	V	V
1 A	53 32		24 86
2 C	24 25 16		25 7 60
3 D	34 35		
4 I	65 86	✓	85 4 10
5 K	44 34 14	✓	6 7 9
6 L	40 41		34 5
7 M			12 5
8 Q	6 54 4 03		
9 P			
10 R	3 59 6 80	✓	

How to Choose an Accounting Package

Michael K. Guttman

Although computers have traditionally been called on to “do the books,” accounting software generally takes a backseat to more glamorous applications such as spreadsheets, word processors, and graphics and data management programs. If you’re thinking of automating your accounting system, you’ll need to balance the pros and cons of different options to find suitable accounting software.

Accounting is a subject as complex as computers themselves. While the marriage of the two often makes good sense, if you’re a prospective buyer you should assess your needs. What features should you look for in an accounting system, and how much should you expect to pay? These aren’t easy questions to answer because much depends on the type of business being automated, your specific requirements for financial information, and your pocketbook.

Deciding to Automate

Before you start shopping, first consider whether you are ready to automate. The cost of automating an existing accounting system generally far exceeds the purchase price of the software. The time and effort needed to learn a new accounting system and set up the chart of accounts, account balances, vendors, customers, payrolls, and other necessary information can be substantial. You’ll also have to run the automated and manual systems in parallel until you’re fully at home with the software you’ve selected.

Your effort will more than pay for itself if the installation is done well. If, however, your business is not prepared to make the commitment of time and energy needed to automate properly, postpone the implementation until it is ready to do so. Trying to automate on the fly can be a frustrating experience.

Be aware that the features and performance of the accounting system you select may require that you upgrade your current hardware, possibly by adding a hard disk or more memory. If several people need access to the system, extra PCs may be required, possibly in some

Trying to automate on the fly can be a frustrating experience.

sort of network or multiuser configuration. If such upgrades are necessary, expect additional cash outlay.

You should proceed only when your goals are reasonably clear and realistically reflect your financial resources. What are realistic goals? Using the PC to handle customer billing now done by hand so that you can collect bills faster and keep better track of overdue accounts, for instance. Or relying on the computer to monitor how much you owe your vendors and to inform you when bills are due so that you can take advantage of discounts, avoid finance charges, and better plan your cash flow. Automated systems routinely help generate payroll and vendor checks, invoices, and customer statements. Whatever your circumstances, try to quantify the savings accrued by having an accounting package perform a specific task or set of tasks, so that those gains can be weighed against the costs of computerization.

● Getting Started

Getting Help

The next major hurdle is finding someone who can help you select a suitable accounting package—and who is prepared to support you fully. Of course, you can buy a package by mail and hope that someone is at the other end of the dealer's hot line, but such an approach takes too much on faith, especially when your questions go beyond the basics. Shop around for someone who knows something about both computers and accounting and who is willing to train you and your staff (and even hold your hand through the inevitable difficulties).

If you're already a computer owner, the first place to look for help is at your computer retailer. Be aware, however, that not all dealers are sufficiently adept at business and accounting to steer you through a complicated installation. Another source of assistance might be your accountant. Again, the same precautions apply: accountants vary in their understanding of computers, even if they own and use them. If you see your accountant only once or twice a year, he or she may not have the thorough grasp of your business needed to help you switch to computers effectively.

Yet another approach is to find an independent consultant who specializes in guiding businesses like yours through the conversion from manual to computerized accounting systems. For some small businesses, however, the fees that such consultants charge can be prohibitive. A better bet is to canvass computer vendors until you find one who has expertise in accounting problems, particularly in your type of business. That dealer will be able to recommend the best combination of hardware and software to satisfy your specific needs. This is a particularly sound strategy if you plan to purchase additional hardware, since the dealer will have an added incentive for keeping you satisfied.

Before you make any decisions, take stock of your understanding of basic accounting principles (see "Accounting in a Nutshell"). If you feel a little shaky, brush up; read some books and articles, or take a course or seminar at a local college. Time invested in education now will pay off in both time and money later on. Also, when considering accounting software, don't neglect documentation; if the manual obfuscates, you're probably not looking at a well-structured package.

Considering Specific Features

There is no dearth of bells and whistles to choose from when buying accounting software. Packages boasting snazzy features and world-beating capabilities number in the hundreds. The trick is separating puffery from performance. Many features may be very useful, even criti-

cal, to your business. Others may be superfluous, cosmetic, or even counterproductive, depending on the type and size of your business. As with other kinds of software, just because you pay more doesn't mean you get more.

Take a package that requires a precise accounting of the price, location, and quantity of every item in a company's inventory. Such a program might be perfect for a business, such as a computer store, that stocks relatively

The trick is separating puffery from performance.

few but high-priced goods. The same package would probably be an expensive headache for the local hardware store, which would have to log a computer transaction for every box of nails bought, sold, or moved around the store. Similarly, a business that is strictly cash-and-carry would probably get very little from the elaborate accounts receivable feature prized by the professional office next door. Integrated programs that combine a number of accounting functions in one package are also available, but they may not be the ticket for every company (see "Another Kind of Integrated Package").

With the understanding that not all features are appropriate to all businesses, we offer the following descriptions of useful components of an automated accounting system. (See Figure 1 for a summary of these features.)

General Ledger

The general ledger lies at the heart of all accounting systems, automated or manual. It enables you to maintain a chart of accounts, make standard bookkeeping entries, and print financial statements. If your business has relatively few transactions per month, a general ledger feature may be all you need.

Flexible formatting. Virtually every accounting system generates a simple balance sheet and income statement, but some systems excel at allowing you to design your own financial statements. This capability usually means that you can show activity for different cost centers (departments), which may be grouped in various ways, and create budgets for those cost centers. You can then produce reports comparing budgeted figures to actual ones or comparing actual figures among several reporting periods. If you need maximum flexibility in your financial reports, you should consider a handy feature available in some packages that enables you to send the results of the reports to a file that can be used to integrate the data into a word processing document.

Accounting in a Nutshell

In order to evaluate various packages and develop a successful automation strategy, you'll need to know a bit of accounting theory. The PC can't make judgments about what does and doesn't conform to good accounting practice; ensuring the integrity of data is up to you.

Virtually all automated systems use the "double-entry" method of bookkeeping. This involves maintaining a chart (list) of accounts divided into five general categories: assets, liabilities, expenses, income, and owners' (or stockholders') equity. This collection of accounts is called the general ledger.

Ledgers and Journals

The governing principle of the general ledger is that the total of all accounts must always equal zero. In order to change one account, a corresponding change must be made to some other account—hence the description double entry. In this way accounts are always in balance, a good check that all transactions were properly recorded.

Each transaction recorded against the general ledger is entered into a file called a "journal." If your business is relatively simple and the number of transactions small, one journal, the general journal, may suffice. As the number and type of transactions proliferate, recording the data in different journals, by category, becomes the norm (e.g., sales journal, cash receipts journal, and cash disbursements journal). Dividing transactions into journals makes reconciling, auditing, and reporting similar transactions much easier.

A natural outgrowth of the double-entry method is the transaction log, or audit trail. Some accounting systems require that you print a daily journal, which then serves as a kind of audit trail, before you do anything else. Other systems permit you to change balance figures, which technically negates a pure audit trail. To ensure data integrity, the better accounting systems include password security measures and record who was using the system when the transaction was made.

Closing the Books

After recording all transactions for a given period—usually one month—it is time to "post" them to the general ledger. When all transactions are posted at month's end, the books are "closed" and a new period begins. At fiscal (financial) year-end, businesses make offsetting entries to the income and expense accounts, thus driving their balances to zero. Then the difference between expense and income (profit or loss) is posted to the owners' equity accounts. Owners make a profit or take a loss, and a new fiscal year begins.

While the general ledger conveys a company's overall financial picture, not all of the financial information needed to run a business resides there. For instance, the general ledger includes a single account that lists "accounts receivable," the money outstanding from the firm's customers. Separate customer balances, however, are maintained in another file, the accounts receivable "subsidiary ledger." The same holds true on the debit side, with an accounts payable subsidiary ledger.

Accounts that require subsidiary ledgers are sometimes called "control accounts." Maintaining control accounts is the bane of any bookkeeper working by hand. Each transaction must be posted to both the general and subsidiary ledgers, and often detailed reports must be prepared for such activities as customer billing, vendor payments, bank reconciliation, payroll, and inventory control.

Monitoring control accounts is one area in which automated accounting systems are of undisputed value, saving substantial amounts of time and money. Because the PC can automatically post control account transactions and then immediately reorganize and report that information, an automated system provides management with a level of speed and control simply not possible using manual procedures.

● Getting Started

Recurring entries. Most businesses have a set of recurring monthly journal entries. If your company has a number of recurring entries, the accounting system should let you maintain them in a file for submission to the appropriate journal on request.

Simultaneous posting. Orchestrating late payments and incoming new orders can be a bread-and-butter assignment for accounting software. Many firms can't close a month's books until well into the following month; in the meantime, entries for the new month pile up. Some automated general ledgers let you begin a new accounting period without first closing the current period. If your prospective system doesn't allow this, prepare for some anxious moments at the end of each reporting period.

Accounts Receivable

Open item and balance forward. Everyone likes to get paid, and a good accounts receivable system can abbreviate the time between billing and payment. Your big decision here is whether you choose to store your customers' purchases in detail until each is paid off ("open item") or merely summarize the detail at the end of the month, carrying forward only the total balance ("balance forward"). Open item billing is more demanding, since each

Keep an eye out for a feature that lets you set a credit limit for each customer—but see to it that the system allows you to override the limit.

payment received must be credited against the item or items purchased. Some accounting systems allow you to maintain open item and balance forward customers in the same file, which can be a very useful feature.

Invoices. Many businesses collect invoices for each buyer, sending only a month-end statement listing invoice numbers and amounts. For many businesses, having the computer print the invoices as well as the statements can be a real plus. Some businesses, however, generate handwritten invoices at a variety of locations,

which then need to be entered into the PC at some later date. Unfortunately, some accounting systems compel you to print invoices on the computer before statements can be run. Unless printing invoices before statements is your standard practice, avoid systems that link invoices and statements.

Mailing. Choose a system that lets you print invoices and statements in zip code order. Arranging mail accordingly enables you to use bulk-mail rates and may mean substantial savings on postage. The system should also permit you to print customer mailing labels or readily transfer name and address information to another mailing list system.

Finance charges. Many businesses impose a finance charge on overdue balances. If your company does, make sure that the system properly supports the procedure. The program should allow you to vary the interest rate (and the overdue period to which the rate applies) and generate a minimum finance charge. It should also enable you to exclude preferred customers and other special cases from finance charges.

Credit limits. Keep an eye out for a feature that lets you set a credit limit for each customer—but see to it that the system allows you to override the limit. You may also want the option of establishing recurring charges or discount rates for certain customers. In addition, some systems maintain historical information on each customer, permitting analysis of the individual's buying needs and credit-worthiness.

The accounts receivable function is often tied to point-of-sale and inventory systems. In such cases, receivables files can be merged with pricing information and open order and back order files. This feature lets you display such information along with a customer's billing record to determine the true status of the account.

Accounts Payable

Accounts payable, the flip side of accounts receivable, is just as ripe for automation. Keeping track of your bills can be a real headache, especially when each comes due at a different time and reflects different discount terms. Automating your accounts payable system enables you to know the exact status of all outstanding invoices, complete with discount terms and due dates. The PC can help you pick the invoices you wish to pay according to the due date, then print the checks and post the payments to each vendor's account. A sophisticated system can quickly juggle a variety of discount terms and even figure them into the payment selection cycle.

Flexible payment. Every accounts payable system should have a flexible means of choosing which invoices to pay. Typically, the system examines the due date and discount terms of each outstanding invoice and selects those that require immediate attention. It's especially

(continues on page 63)

Another Kind of Integrated Package

“Integration” is the buzzword of the hour. Integration usually means combining a computer office system, including data management, spreadsheet, word processing, graphics, and communications functions, in a single package, such as *Symphony* or *Framework*. But there’s another kind of integration unique to accounting software. In this context integration means that the various accounting features—general ledger, accounts receivable, accounts payable, payroll, and inventory—are consolidated.

With this kind of integration, an entry into one module (or function) automatically updates information in the others. The sale of goods, for example, may affect the accounts receivable and inventory functions, while receipt of an order from a supplier may affect accounts payable and inventory. Both transactions will also affect the general ledger. In addition, within an integrated accounting package, the same methods and vocabulary for input, output, and processing are usually used for all of the accounting functions.

Backing Out

Integrated systems have significant virtues and drawbacks. The chief problem concerns adjusting (or “backing out”) an erroneous entry made in one of the accounting functions. When functions are separate an error can be corrected easily. With an integrated program you might have to search the system for all affected functions, then construct an elaborate scheme for error correction.

In addition, different individuals may be responsible for maintaining the various accounting functions. If an accounting package is truly integrated, temporary aberrations in one function might have a rippling effect on the other functions, so none really shows the company’s true position.

Like stand-alone software, integrated packages may be of uneven quality. There’s also a chance that you’ll buy more software than you need; only certain modules may be applicable to your business. Sometimes the modules are sold separately; if not, these difficulties can be overcome if the package permits you to alter or sever the links among the different functions.

Tool for Learning

Integrated accounting packages usually work best when they’ve been designed with a particular type of business in mind. An integrated system can be designed to address the special problems of dentists, for example, in a much more consistent and comprehensive way than a general purpose packages can. An integrated package can also be a solid bet if you’re a first-time buyer. Because it is both simple and basic, you can use it as a learning tool. Pending a thorough survey of your needs, a relatively inexpensive, elemental package will spare you a lot of hard decisions about what functions to acquire.

By contrast, high-priced, fully featured integrated packages are most appropriate if you have substantial previous experience with automated accounting systems. High-end programs tend to be extremely flexible: you can define the degree of integration you want, and that assumes that you know your needs very well.

● Getting Started

General Ledger

- Reports on activity for various cost centers
- Generates budgets and compares them to actual performance
- Compares performance among several accounting periods
- Permits customized income statements and balance sheets
- Allows conversion of output to word processing files
- Provides for automatic input of recurring entries
- Accepts input of new period entries before closing old period

Accounts Receivable

- Supports open item and balance forward billing of customers
- Automatically generates finance charges, supports minimum finance charge, and suppresses charges for preferred customers
- Sets credit limits and discount rates for customers
- Provides for automatic input of recurring charges
- Maintains historical information on each customer for credit and marketing purposes
- Supports zip code sorting and label printing and/or an interface to mailing list utilities

Accounts Payable

- Monitors a variety of discount terms and selects the most favorable terms
- Reports anticipated cash flow by date
- Provides comprehensive and flexible payment selection criteria
- Permits automatic input of recurring charges
- Supports mailing list functions
- Handles multiple checking accounts
- Handles posting of handwritten checks

Inventory

- Supports various methods of inventory costing
- Maintains multiple pricing and discount levels
- Maintains open orders and back orders
- Allows user-defined reorder points and minimum inventory levels
- Generates reorder reports and purchase orders
- Permits integration with accounts receivable and accounts payable functions

Payroll

- Calculates gross pay for hourly, weekly, semimonthly, and monthly pay schedules
- Supports piece work and incentive pay
- Allows for immediate payoff against accumulated hours
- Handles local, state, and federal reporting requirements
- Permits multiple deductions and variations in type of deduction
- Assigns payroll expenses to general ledger accounts
- Assigns payroll expenses to cost centers
- Links payroll expenses to cost of goods (manufacturing only)

General Features

- Maintains all data through common data base structure to limit sorts and to simplify searches
- Provides a clear and consistent method of data entry and function selection
- Allows spooling of reports
- Offers a comprehensive data backup and recovery facility
- Includes a data security (password) facility
- Contains flexible reporting and query facility
- Supplies program source code and permits customization of program and/or data base manager

Figure 1: Key attributes of accounting software
(items are listed in order of importance)

(continued from page 60)

handy to be able to note the total amount to disburse and then have the system pay the bills that offer the most advantageous credit terms. After the system has chosen invoices based on the criteria you specify, you should be able to modify or override its choices.

Recurring entries. Like accounts receivable, the payables system should handle recurring entries such as rent or loan payments and generate mailing lists from a file of vendors. More importantly, the payables function should support multiple checking accounts and include a process for properly recording handwritten checks not paid through the computer.

Inventory

A number of automated accounting packages include an inventory function. For some businesses inventory control is almost all that is asked of an accounting system. But you should recognize that there are at least three kinds of inventory features—manufacturing, wholesale, and retail—and they cannot be used interchangeably. The best inventory modules permit integration of the inventory function with the accounts payable and accounts receivable functions.

Retail inventory. This is the least complicated function of the three, since each item of merchandise in a retail operation has a precise cost to the retailer and a retail price. A retail inventory system should support maintenance of back orders for customers, various methods of inventory costing, user-defined reorder points for merchandise, and generation of reorder reports and purchase orders.

Wholesale inventory. Wholesale business demands a system that can handle far more complex discount structures, scheduling, and ordering functions than are required in a retail setting. Retailers tend to sell from stock, while wholesalers generally back order. Because inventory control is a fairly sophisticated matter, look for packages that are strong in the areas of ordering, pricing, delivery scheduling, and discounting. A feature that maintains multiple pricing and discount levels is particularly useful. If you do both wholesale and retail business, the more elaborate wholesale component is apt to better meet your overall needs.

Manufacturing inventory. Manufacturing systems must cope with complexities similar to those of wholesale and retail inventory systems, but even further magnified. Such systems must also separate inventory into finished goods, work in progress, and raw materials, and must provide a means of including labor in the cost of goods produced. Customer back orders and reorder points are affected by the manufacturing process itself;

many components are assembled from parts that may themselves have to be assembled. This links the inventory system with production scheduling, which is likely to vary substantially among firms even within the same industry. For this reason, manufacturing firms rarely use canned inventory packages but tend to develop their own inventory and production systems.

Payroll

If your business has a large number of employees, payroll may be the most immediately rewarding area to automate. A computerized payroll is actually two systems: one that computes gross pay and another that monitors withholdings and performs the required periodic reporting to various government agencies. Payroll regulations change often, so look for a system that is likely to be properly supported for a good length of time.

Customization. Most payroll systems generate hourly, weekly, semimonthly, and monthly pay rates and standard payroll deductions. If you have other requirements—such as piecework, incentive pay, or specially

If your business has a large number of employees, payroll may be the most immediately rewarding area to automate.

calculated deductions—make sure that the package can be tailored to meet them. If your work force is casual or seasonal, your system should allow you to pay off a worker prior to the end of a normal payroll period.

Separating expenses. Keep in mind that some payroll systems calculate certain expenses (such as net pay, taxes, and insurance payments) that must be charged against expense accounts and other expenses that will be accrued (deferred for later payment) to liability accounts. These transactions must, of course, be posted to the general ledger, an action that may or may not be automatic. In addition, it may be necessary to assign payroll costs to different cost centers or to certain budgeted projects (job costing). In manufacturing, employee pay rates may also depend on the cost of finished goods.

(continues on page 66)

Doing the Books

Because the PC is particularly adept at handling accounting and bookkeeping tasks, the market is bulging with accounting packages. Most accounting packages consist of modules—programs that perform a specific chore and are sold individually. Several of the most popular offerings are listed here.

BOOKS! The Electric Ledger
Systems Plus, Inc.
1120 San Antonio Rd.
Palo Alto, CA 94303
415/969-7047

List price: General Ledger \$395, Enhanced Budgeting \$150, Invoice Printing \$100, Recurring Entries \$75, Check Writing \$75

Requirements: 64K, two disk drives, DOS 2.00 or 2.10

BPI Business Series
BPI Systems, Inc.
3423 Guadalupe
Austin, TX 78705
512/454-4677

List price: Inventory Control, Job Cost, Time Accounting, Association Management, Church Management \$795 each; General Accounting, Accounts Receivable, Accounts Payable, Payroll \$595 each; Personal Accounting \$99; Self-Training Series: Accounts Receivable, Accounts Payable, General Accounting \$72 each

Requirements: 128K, two disk drives or one disk drive and a hard disk, DOS 2.00 or 2.10

The Business Library Series
The Business Library Corporation
P.O. Box 9363
Walnut Creek, CA 94598-0963
800/221-1985, 800/451-1973 California

List price: The Librarian (required to run all modules) \$695; The Accounting Library: General Ledger, Accounts Receivable, Accounts Payable, Payroll \$695 each; The Manufacturing & Distribution Library: Inventory Control, Sales Order Entry, Purchase Order Tracking \$795 each

Requirements: 192K, two disk drives or one disk drive and a hard disk, DOS 1.10 or later release

Dow Jones Accounting Series
Dow Jones Software
P.O. Box 300
Princeton, NJ 08540
800/821-8079, 800/441-5566 California
List price: General Ledger, Accounts Receivable, Accounts Payable, Inventory, Management Analysis, Sales Order Entry, Purchase Order Entry \$995 each

Requirements: 128K, one disk drive and a hard disk, DOS 2.00 or 2.10

Easy Business Accounting Series
Sorcim/I.U.S.
2195 Fortune Ave.
San Jose, CA 95131
408/942-1727

List price: Payroll \$745; General Ledger, Accounts Receivable, Accounts Payable, Inventory Control and Analysis, Order Entry \$595 each

Requirements: 64K, two disk drives or one disk drive and a hard disk, DOS 2.00 or 2.10

Great Plains Hard Disk Accounting Series
Great Plains Software
1701 S.W. 38th St.
Fargo, ND 58103
701/281-0550

List price: Job Cost \$695; General Ledger, Accounts Receivable, Accounts Payable, Payroll, Inventory \$595 each; Rapid Transfer \$295; Multiuser Version to allow use of modules with Corvus Omninet local area network \$895

Requirements: 128K, one disk drive and a 5MB hard disk, DOS 2.00; Multiuser Version 192K, one disk drive and a 5MB hard disk, Corvus Omninet local area network

Jewell Advanced Business Software
Heritage Holdings, Inc.
19600 Fairchild #270
Irvine, CA 92715
714/833-2450

List price: General Ledger \$975; Accounts Receivable Billing/Inventory Control \$850; Job Cost \$725; Fixed Assets, Accounts Payable, Multi-state Payroll Purchase Order \$525 each; Word Processing/Query System \$500; Order Entry, Accounts Receivable Billing/Manufacturing \$425 each; Spreadsheet Data Base Interface \$250

Requirements: 256K, one disk drive and a hard disk, DOS 2.00 or 2.10

MAI Integrated Accounting Software
MAI/Basic Four Business Products
601 San Pedro NE
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Houston, TX 77081
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List price: TCS Receivables V3, TCS Inventory V3, TCS Sales, TCS Materials \$795 each; TCS Ledger, TCS Payables, TCS Payroll, TCS Assets \$595; TCS Q*Word \$450; TCS Q*Label \$295 each; Q*Net for 3Com EtherNet local area network \$795

Requirements: 88K, two disk drives or one disk drive and a hard disk, DOS 2.00 or 2.10

● Getting Started

(continued from page 63)

Special Considerations

Fund accounting. Some organizations rely on certain accounting functions that aren't included in most accounting packages. Governments, public schools, and non-profit agencies, for example, require that all transactions be broken down by account, cost center, and the funding unit that pays the bills. Funds for these organizations may require special authorization, suffer impoundment, or be subject to very elaborate budgeting requirements. These institutions need a special kind of accounting software, called "fund accounting," to meet their particular requirements.

Professional billing. Billing systems for medical professionals represent another category of specialized accounting. Systems for doctors, for instance, must be able to handle the necessary paperwork for private and public insurance plan billing, which greatly affects the processing and reporting of receivables.

Overall Performance Features

Some accounting packages decked out in frills perform poorly because of clumsy, slow, or restrictive data entry and report generation procedures. Fortunately, there is a growing number of high-performance systems that have resolved or at least mitigated some of the flaws of the top-heavy packages.

Data base managers. A well-designed accounting system will allow you to post entries or generate reports without requiring a lengthy sort of the data. Ideally, all of the major processing and reporting steps in a system should work without a sort because all pertinent information is automatically kept in the proper logical sequence. For this reason an increasing number of systems are built around a data base manager, a program that files and organizes data in a consistent and efficient manner. Such systems are generally faster and more flexible than those written strictly in such programming languages as Interpreted BASIC and Pascal.

Data entry. A good accounting system must have a clear, quick, and concise method of data entry. Some systems require that you be familiar with a complex set of entry codes merely to perform simple operations. Other systems pose scores of apparently irrelevant questions or generate seemingly endless menu screens before you can enter a single transaction. Such systems show poor design and are not necessarily typical of accounting software.

Continuous printing. Some systems allow you to select a series of reports and print them in the desired sequence without additional intervention on your part. This is preferable to selecting each report, waiting for it

to print, selecting another, waiting again, and so on. If a system does not have this report feature, however, you may be able to improvise by obtaining a print spooler, which is a program that enables you to print files while working on another document, or a large print buffer, which is a holding area that funnels large amounts of data to the printer at a speed it can accept.

Recovery. The system should include an easy way to recover from a power failure or disk read-write error. No such recovery system, however, is foolproof, so look for a package that allows frequent backups. Be sure that this backup feature is fairly quick and easy to use so that you or your staff are not tempted to bypass it to save time. Protecting accounting data is, of course, vital.

Security. Some packages have a password system that limits access to sensitive data (such as payroll or financial statements). Unfortunately, many of these systems are either too simple to thwart a knowledgeable intruder or too complex and restrictive to be used comfortably by authorized people. In any case, check to see that the level of security offered fits your organization's needs.

Patching. A few accounting systems come with the actual source code, although most disclose only the unreadable, compiled machine code. If your specialized accounting needs require a modification or extension of the existing package, access to the source code could be a real blessing. One precaution: Make sure that the documentation is adequate, otherwise the code could be nearly impossible to use. Even with well-documented code, you'll probably need to call in a skilled programmer to make any significant changes to the system. In addition, expect to pay extra for the programming tools (such as language compilers and data base managers) that permit these modifications.

Making the Conversion

The right software can do more than pay for itself by saving time and effort, it can also improve a company's service quality, resource management, and prospects for growth.

Automating your books, however, may require some changes in the way you do business. Convert to the new system function by function, so that disruptions are kept to a minimum, and allow sufficient time to adjust to new methods and procedures. Whatever the temptations may be to forge ahead, only a careful approach to automating your accounting system will yield maximum benefits in the shortest amount of time. ●

Michael K. Guttman is an independent computer consultant based in Chico, California.



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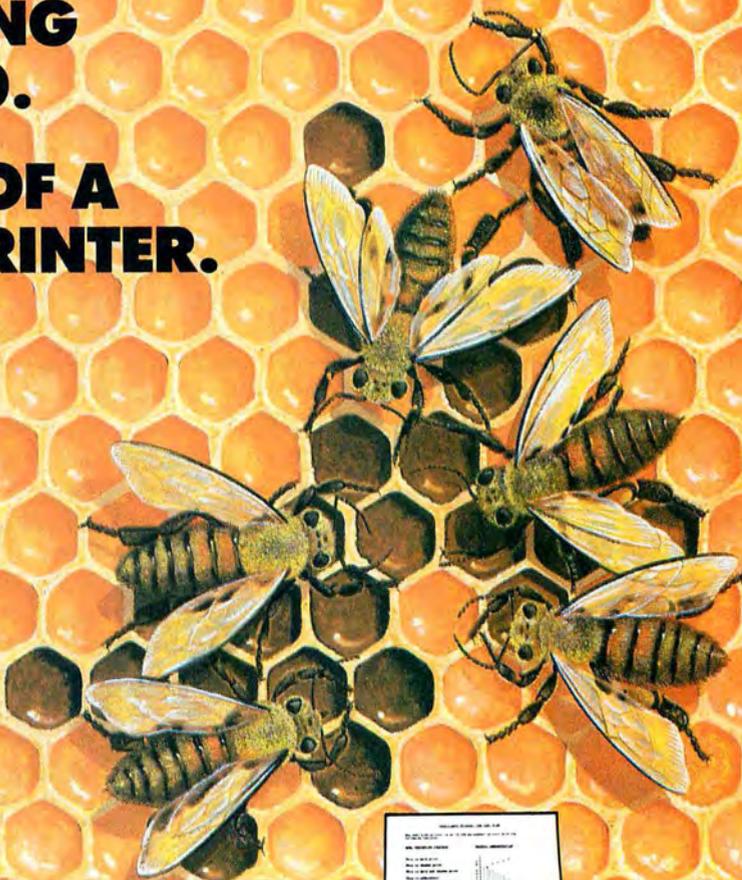
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What Is Integrated Software?

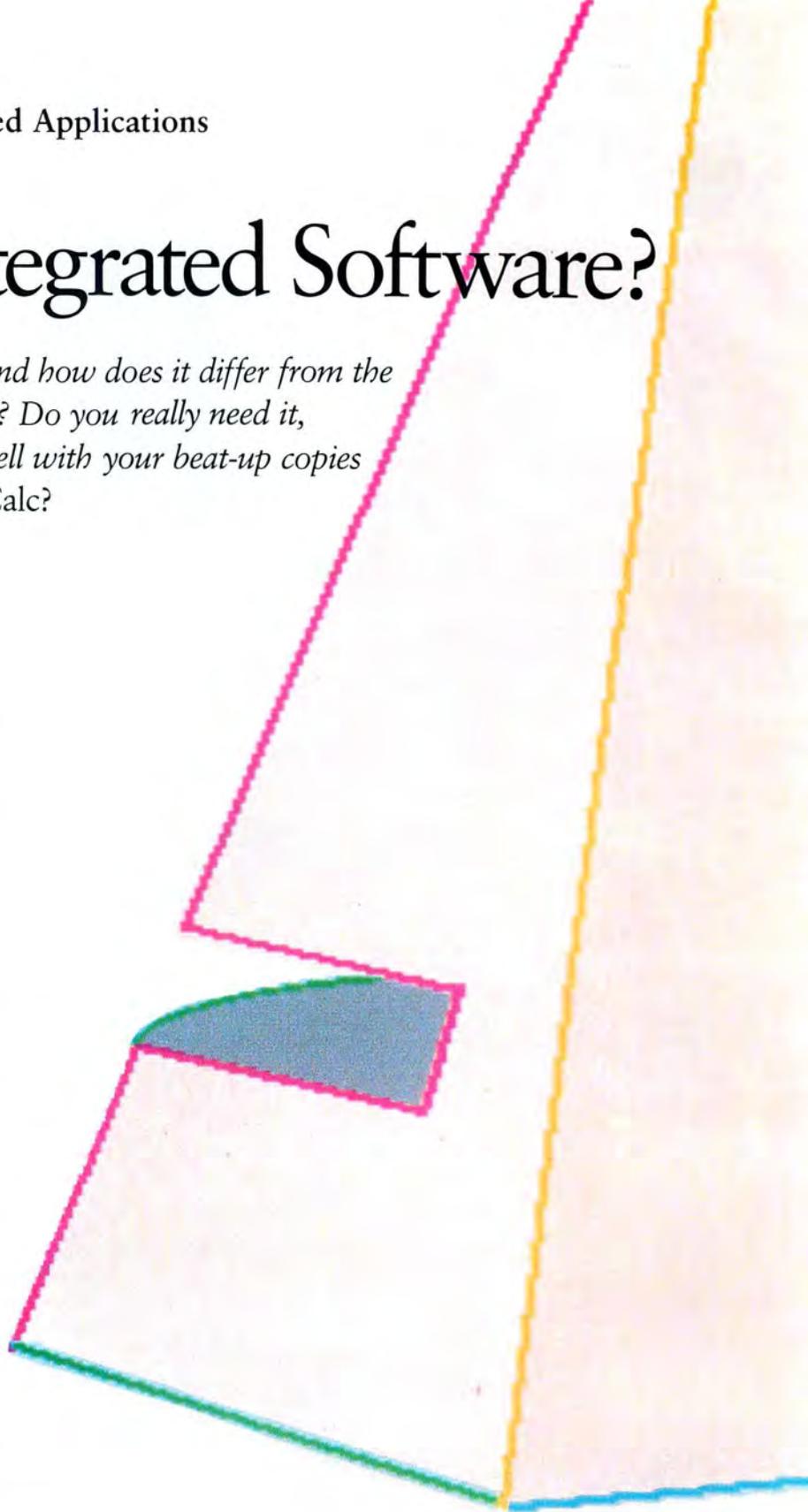
What is integrated software, and how does it differ from the ordinary, unintegrated variety? Do you really need it, or can you get along just as well with your beat-up copies of OldWord and YetAnotherCalc?

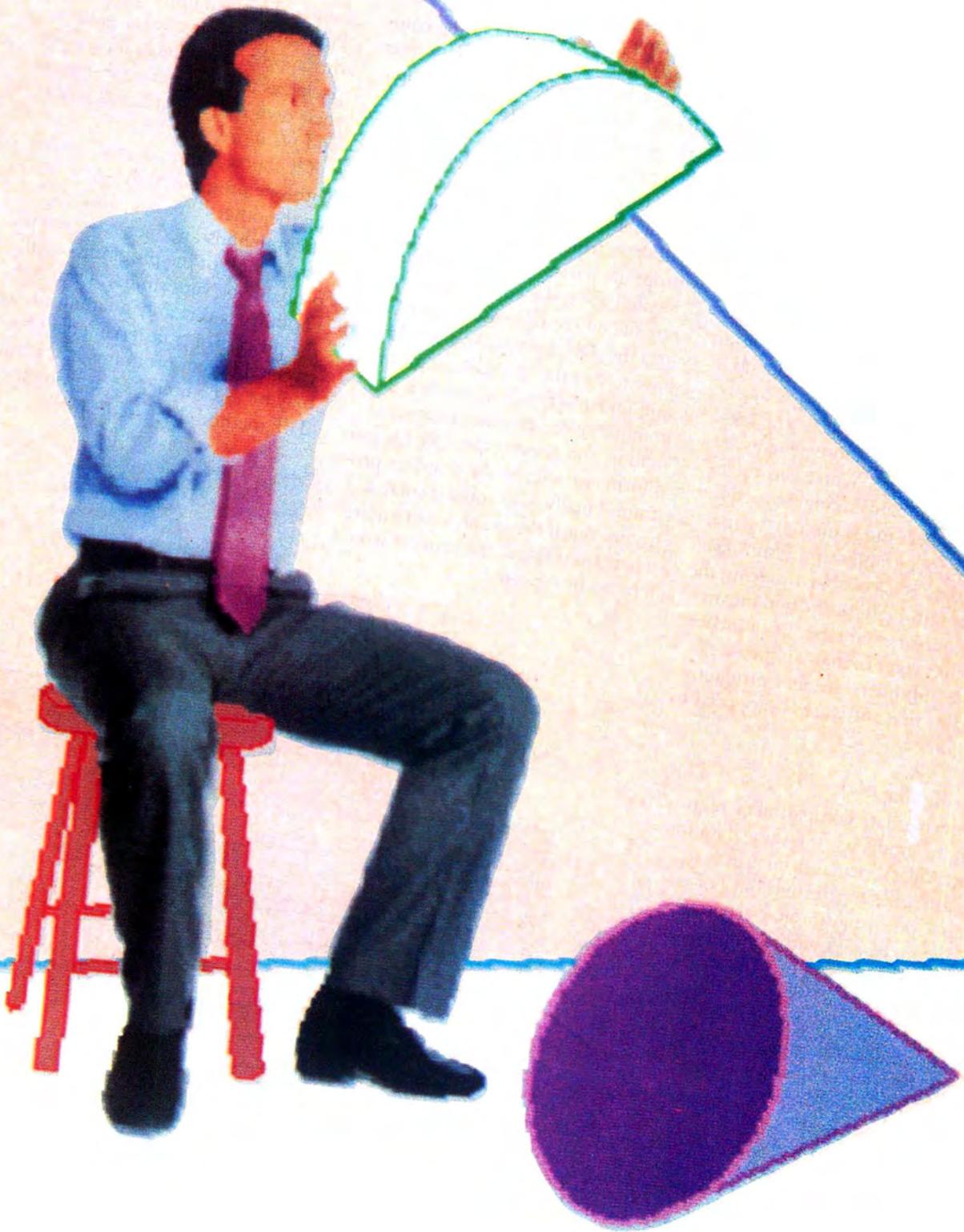
Phillip Gordon

It's hard to pick up a computer magazine or business journal these days without reading about the latest advance in "integrated" software. Articles tout integrated software as a panacea for improving productivity; market gurus talk knowingly about "windows," "mice," and "intuitive design"; others simply wonder if another tidal wave of technoconfusion is about to descend.

In a sense, all the thousands of programs that run on the PC are integrated to a certain extent. Most programs that run on a PC adhere to the rules set up by DOS, the PC's operating system. The operating system gives programs access to the PC's resources—its disk drives, memory, and processing power—in a set, standardized manner.

The basic level of integration provided by an operating system has some distinct benefits. Certain functions performed only by the operating system, such as copying or formatting a disk, are accessed with a single set of commands. When an applications program is used, be it word processor or spreadsheet, the user needn't worry about such arcane details as moving data to and from the PC's disk drives.





● Getting Started

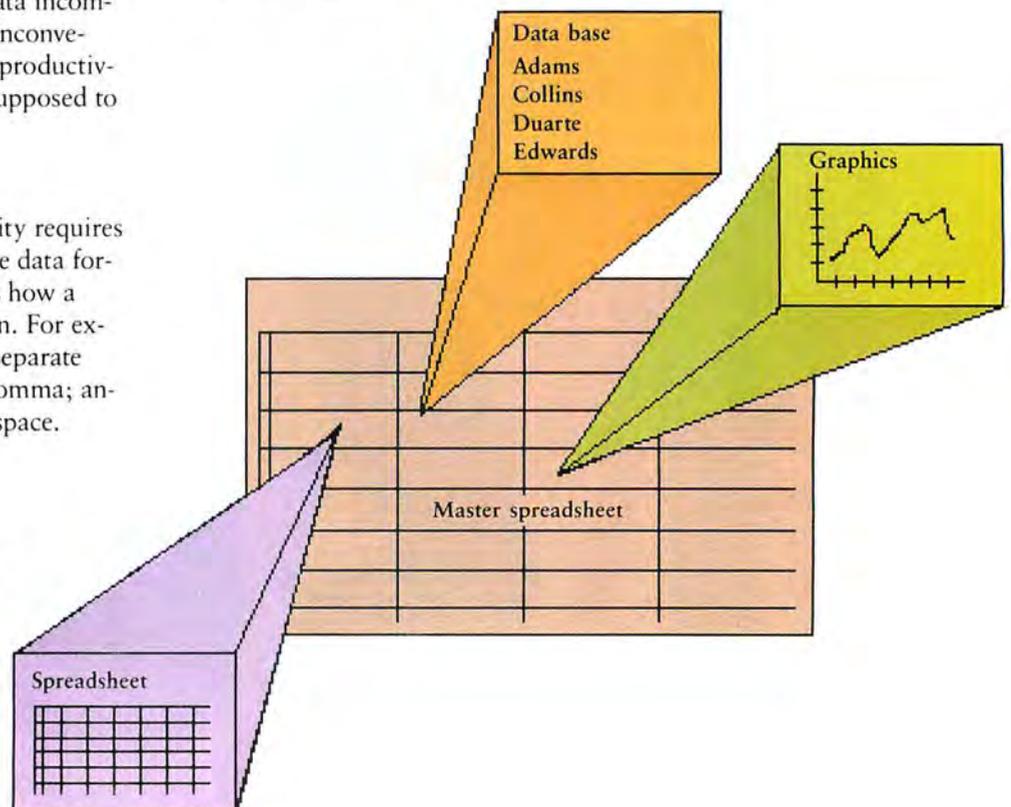
Unfortunately, almost every applications program has its own “user interface,” or way of presenting itself to the user. Even similar programs exhibit this superficial incompatibility. For example, <Ctrl>-K D saves a document in *WordStar*; another word processing program might require <Alt>-S. Such differences seem minor until you start using more programs and discover that you must master each program’s commands, menus, and other conventions.

But the most serious problem with using separate applications programs is data incompatibility, the inability of programs to share data with one another. A word processing program is great when it’s time to write up a financial report for the boss, but chances are it can’t create graphs—much less include those generated by another program. Worse yet, the financial data painstakingly typed into a spreadsheet program may be inaccessible to a graphics program. Even if the data is accessible, inserting the graphs into the report often means using scissors and tape. Data incompatibility is more than an inconvenience; it hinders the very productivity gains that software is supposed to promote.

Sharing Data

Achieving data compatibility requires that programs use the same data format. A data format defines how a program treats information. For example, one program may separate each item of data with a comma; another program may use a space.

Figure 1: Tightly integrated packages base all applications on one major function. In the case of 1-2-3, spreadsheet, data base, and graphics features all spring from an underlying master spreadsheet.



When formats match, data can do useful work in more than one place: a mailing list data base can be used by a word processor; spreadsheet numbers can be sent to a graphics program and turned into a pie chart; the chart can in turn be electronically inserted into a word processing document.

Many programs meet at the common ground of .DIF—the data interchange format used and made popular by *VisiCalc*. Programs such as 1-2-3 and *dBASE II* can send or receive data in this format, but the process is not particularly easy. For example, if you wanted to graph some numbers from a spreadsheet, the appropriate part of the spreadsheet would have to be copied into a separate file on the disk and converted into the .DIF format. You would then have to exit the spreadsheet program and take out the disk, put in a disk containing the graphics program, load it, and convert the .DIF file into a format usable by the graphics program. Finally, you could display a graph. But if the graph wasn’t quite what you wanted, the process would have to be repeated.

All in the Family

Some software publishers, in an effort to sell an entire product line, produce a family of products that share a common data format and user interface. Each application—word processing, data base management, accounting, and so on—can work separately or as part of the family. The *pfs* family from Software Publishing is a successful example of this approach and includes several packages that are software stars in their own right: *pfs:file*, *pfs:report*, and *pfs:write*.

Of course, once you are familiar with one program in a family, learning the others is easier, since the use of commands and menus—even the actual look of the programs—will probably be very similar. Data compatibility is certainly guaranteed, but the process of transferring data between different programs in a family may be as complicated as using the .DIF method discussed earlier.

All in One

One approach to sharing data is to fuse the family members into a single disk or into disks that can be loaded into memory simultaneously. In a sense, this adds another layer of integration on top of the operating system, one that provides a common interface to data. In such tightly integrated software, one application serves as the foundation for the others. In *1-2-3* and *Symphony*, for example, the data management and graphics functions “sit” on an underlying master spreadsheet (see Figure 1). In *Jack2* the word processor is predominant, and all other functions spring from it. Sharing data is simple in tightly integrated software, sometimes to the point where changes in a spreadsheet are instantly reflected in a graph.

The appeal of tight integration doesn't lie solely in the ease of sharing data. By providing some or all of the most commonly used functions in one package—word processing, spreadsheet, data base management, graphics, and communications—a complete working environment is created. There is no need to convert files or switch disks to get a different program. An integrated software package becomes in effect an electronic desk, holding all the essential business tools needed to start and finish a job.

Ecological Integration

Another approach to integration is to create an environment in which different applications programs can be integrated. Examples of such environments are *Visi On*, *DesQ*, and *Microsoft Windows* (see “Window Talk,” *PCW*, Vol. 2, No. 7). Each achieves essentially the same effect in a different way.

Visi On exemplifies the broadest integration philosophy. It submerges—some would say replaces—the operating system, so that a PC looks and acts like a *Visi On* machine. Not surprisingly, programs must be written specifically for *Visi On*, but the resulting environment is

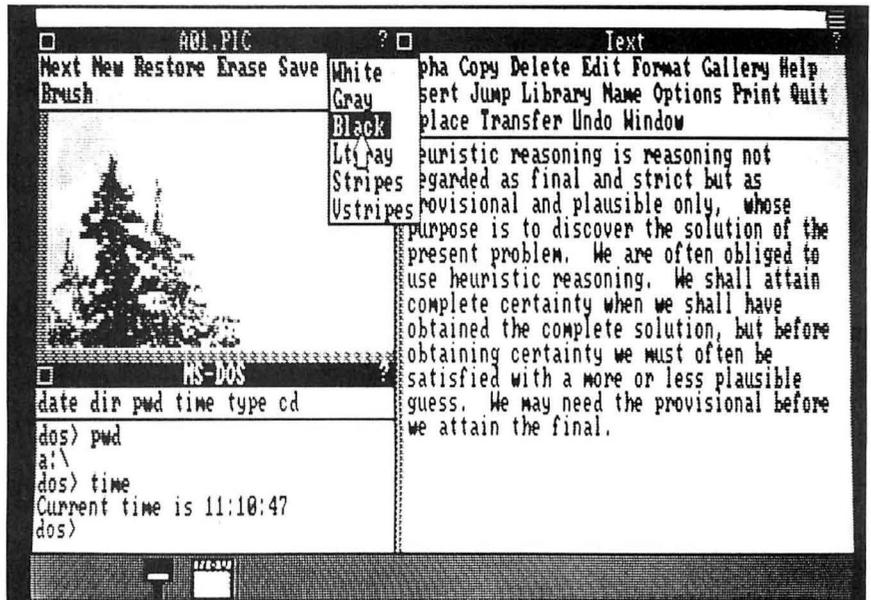
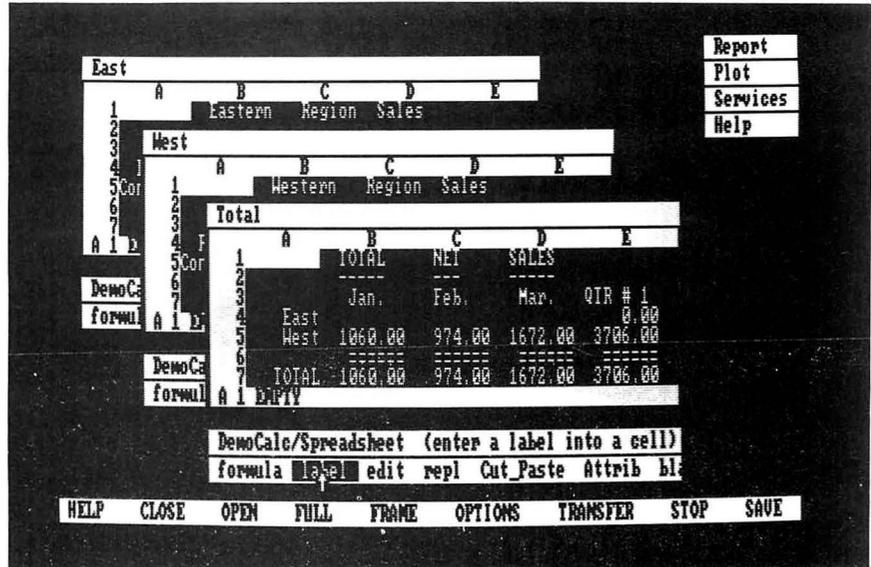
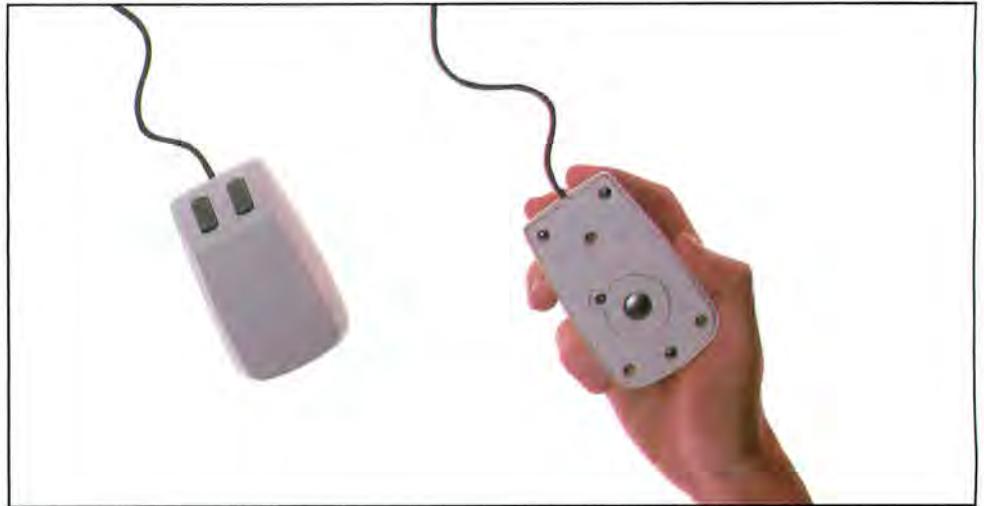


Figure 2: Windows by any other name: *Visi On* (top) overlaps windows but leaves enough of each visible for identification. *Microsoft Windows* (bottom) “tiles” windows to prevent overlapping so that all the information in a window can be seen. Windows can be overlapped if desired.

● Getting Started

Figure 3: A Microsoft mouse in hand. The buttons are used for making program selections. The encased metal ball on the underside of the mouse rolls, and its movement is translated into cursor movement.



the most consistent; commands are very similar from application to application, and data is easily shared. The *Visi On* approach has an extra benefit: you add applications only as you need them. Unlike tightly integrated packages such as *1-2-3*, you aren't saddled with applications you don't need or can't use.

But *Visi On's* method of software integration has its drawbacks. If you don't like the way an environment works, you can't alter it, and you may need applications that aren't available for the environment. If this sounds familiar, it's because the same problems face anyone choosing an operating system.

Like *Visi On*, *DesQ* provides a consistent interface between the user and up to nine applications (see "A *DesQ* With Nine Views" in this issue). But instead of submerging DOS, *DesQ* relies on the operating system to provide the applications program with essential services, such as use of the screen, memory, disk drives, printers, and so on. *DesQ* is not restricted to specially written programs but is designed to integrate many off-the-shelf PC programs. Thus, you can continue to use the packages you already have and to add the new ones that most closely match your needs.

While switching from program to program is easy in the *DesQ* environment, data sharing among programs is somewhat limited; it would have been impossible to have included in the environment the hundreds of data formats used. Another drawback is that programs that don't need DOS for certain essential services cannot appear in the same environment with programs that do. For example, *WordStar* version 3.3 does not use DOS for screen display; it bypasses the operating system and requests this service directly from the PC's hardware. When *WordStar* (or a similarly independent program) is requested in the *DesQ* environment, it overrides *DesQ* and takes over the computer and the display. The screen cannot be shared with other applications, and you must exit *WordStar* to return to *DesQ*. However, when not active, the *WordStar* file can be shrunk to a smaller window for reference.

Microsoft Windows stakes out a middle ground between an operating-system-like environment such as *Visi On* and an applications integrator such as *DesQ*. *Microsoft Windows* can run both off-the-shelf software and programs written especially for it by Microsoft and other vendors. Data sharing is naturally easier

with products crafted for the environment. Like *DesQ*, *Microsoft Windows* surrenders the computer to programs that are not dependent on DOS for certain functions.

Of Mice and Windows

Mice and windows are two highly publicized features that are closely associated with integrated software. Windows and mice are designed to help you juggle and keep tabs on the various programs in an integrated environment or package. Both are attractive in a flashy sort of way, but neither is essential. They may make a product easier to use, but this has not been conclusively proven.

A window is a screen partition that can be devoted to a particular application. Windows can be enlarged or shrunk; most environments allow you to divide the screen into as many different-size windows as you desire—though there are logical limits to using this feature. A typical use for windowing might be to halve the screen vertically and use the left side for word processing and the right to get information from a spreadsheet.

Some programs, such as *Visi On*, overlap windows; others, such as *Microsoft Windows*, “tile” a screen with windows that never overlap (see Figure 2).

A mouse is a rolling, hand-held box with one to three buttons and a cord (the “tail”) that connects it to a computer (see Figure 3). The mouse’s movements are translated into cursor movements on the screen, so instead of keystrokes, a quick roll of the mouse moves the cursor to wherever you want it to go. With the click of a mouse button you can make a menu selection, move a window, or change a window’s size.

Windows and mice have their limitations. As the number of windows on a screen increases, the visibility of data decreases. It’s hard to edit a document or find a column of numbers in a spreadsheet in a 2-inch-square window. Positioning a cursor with a mouse is not always a breeze either, and of course, using a mouse means constantly taking one hand off the keyboard.

Using Integration

A lot of people beat the drum for the PC, calling it the answer to productivity woes. But it’s not appropriate for every situation. The same is true of integrated software. Don’t buy an integrated package without carefully considering its cost, what it can and cannot do for you, and how it may alter the way you work. Using integrated software won’t turn you into an overnight sensation, churning out reams of great-looking reports full of charts and graphs. It may make your work easier and improve its quality, but integrated software takes time to master and to apply to your job.

Consider the various forms integrated software takes and ask yourself which is the most appropriate. Does a particular software “family” provide all the applications and inte-

gration you need? Does each program have a full set of features? How difficult is data transfer? Does the cost of all the packages you need exceed that of a similarly configured, tightly integrated product?

If you decide on a tightly integrated product, determine whether each application has enough features to produce the quality of output you desire. If a feature is missing, will it be included in a future version of the product? Will the product share data with a separate program you already own or with one you intend to purchase? What application is the product based on? This is a less obvious question, but it’s important if one function is particularly crucial to your work. For example, *Metafile* and *1-2-3* both include a data base function, but *Metafile* is based on the data base while *1-2-3* is based on a spreadsheet. Not surprisingly, *Metafile*’s data base management is superior—a crucial fact to consider if this function will play a large part in the work you do.

If an integrated environment attracts you, the questions are more complicated. Do you buy a product that integrates existing off-the-shelf software, one that requires specially written programs, or one that allows you to use both? Cost is a bigger factor with an environment like *Visi On* because custom programs must be used—a price that must be paid for greater data compatibility.

Despite some unresolved questions and limitations, integrated software is a significant attempt to make personal computers easier to use while expanding their powers. Integrated software—particularly tightly integrated packages like *1-2-3* and environments like *DesQ*—is still in the early stages of development. While this dictates a cautious “try before you buy” approach, it pays to become familiar with this new breed of software. It just may revolutionize the way you work. ●

Phillip Gordon connects micros to mainframes at a large financial institution in San Francisco.

Microsoft Windows
Microsoft Corp.
10700 Northrup Way
Bellevue, WA 98004
206/828-8080
Requirements: 192K, two disk drives

Visi On
VisiCorp
2895 Zanker Rd.
San Jose, CA 95134
408/946-9000
List price: \$495
Requirements: 256K, 5MB or larger hard disk, color graphics board, graphics monitor

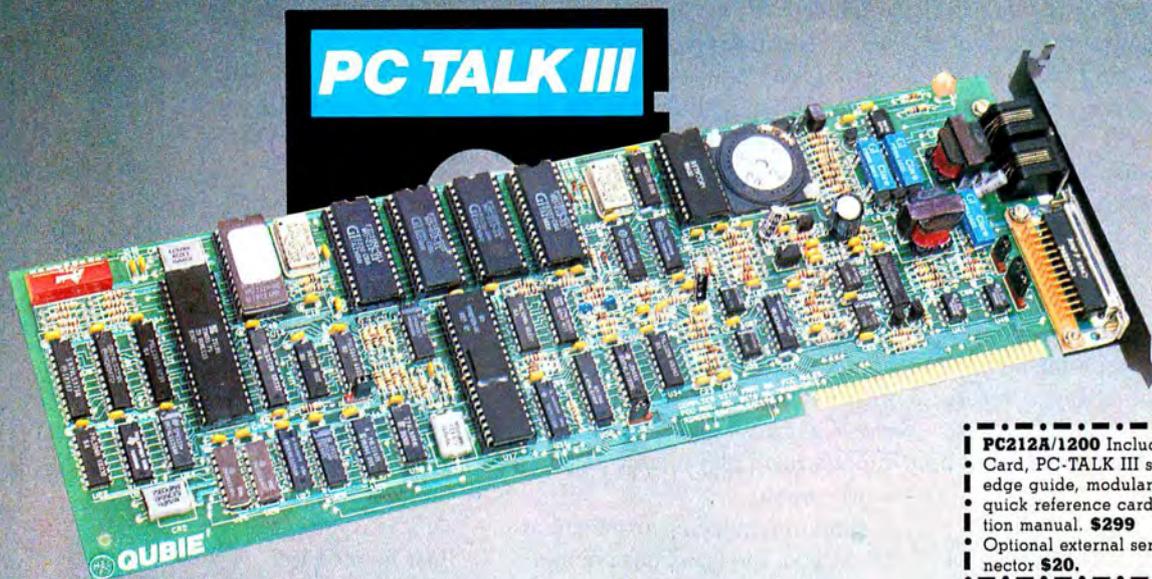
DesQ: The Multiwindow Software Integrator, Release 1.0
Quarterdeck Office Systems
1918 Main St. #240
Santa Monica, CA 90405
213/392-9851
List price: \$399
Requirements: 256K, one disk drive, 5MB or larger hard disk, DOS 2.00 or 2.10

Metafile
Sensor-Based Systems
401 16th St. SE
Rochester, MN 55904
507/289-8967
List price: \$995
Requirements: 128K, two disk drives

1-2-3, version 1A
Lotus Development Corp.
161 First St.
Cambridge, MA 02142
617/492-7171
List price: \$495
Requirements: 192K, two disk drives

Thinking of buying a modem? You owe it to yourself to check

Inside



PC212A/1200 Includes: Modem Card, PC-TALK III software, card edge guide, modular phone cable, quick reference card, and instruction manual. **\$299**
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Just a few years ago, computers needed big air-conditioned rooms to operate in, balefuls of money to buy, and a team of wizards to keep them running. The constant march of technological progress has given more and more powerful machines which cost less and less. Desktop computers more powerful than the early mainframe computers are the result of the evolution. The Qubie' modems represent the latest extension of this progress. Because up until now, a 212A compatible modem cost at least \$500. Through the use of four low-cost, state of the art microprocessors, we can now offer two versions of our full featured 212A modem at prices the competition sells 300 baud modems for.

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In September of 1983 we introduced the first 212A

modem card for the IBM PC available for under \$300. The PC212A/1200 is a complete communications package including PC-TALK III software, modular phone cable, card edge guide, and instruction manual. The modem is an auto-dial, auto-answer type, which uses all the Hayes software commands so it can be used with any of the popular software packages including Crosstalk™ and Smartcom™.

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Our standalone modem, the 212E/1200 can be used with any computer or terminal with a RS-232C serial port. You can use any Hayes compatible communications software on anything from an Apple to a Zenith. Many owners of IBM PC's are using it because they lack available expansion slots, or have more than one computer they want to use their modem with.

It's attractive gold anodized case houses seven status lights (who says low prices means a shortage of features). It fits comfortably under a standard telephone. It is also a 212A compatible auto-dial, auto-answer modem which supports all Hayes software commands. Even the switch settings are the same, so any software giving recommended switch settings for a Hayes modem can be used, without knowing

Outside

out the Qubie' 212A modems.

212E/1200 Includes: Standalone modem with cable (specify male or female), modular phone cable, and instruction manual. **\$329.**



what the switches do. There is a volume control knob for easy adjustment of the speaker's output. Included in the package is modular phone cable, a cable to hook it to your computer or terminal, and instruction manual. Choose the communications package right for your needs, and you're ready to go!

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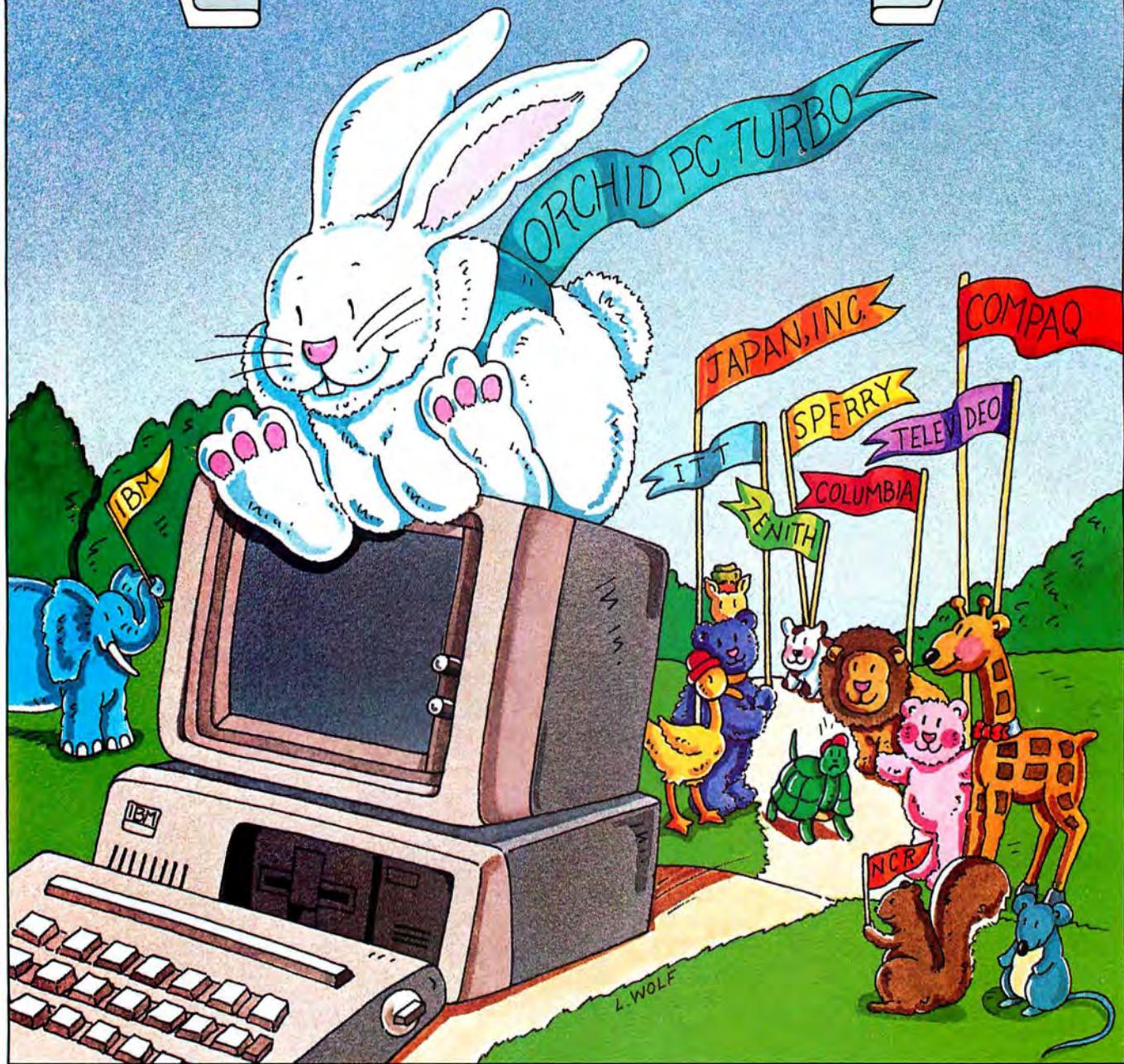
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software,

the more you'll
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about to read.

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For the IBM®PC and selected compatibles.

Today, buying integrated software is a bit like going through a maze. Full of promising starts and disappointing dead ends.

One package has the functionality but operates at a snail's pace. Another has a good spreadsheet but a weak DBMS. Still another integrates well but not without 512K and a hard disk.

Compromises abound.

But now, there's one system that is without compromise. One system that provides such a totality of performance, it will lead you out of the maze.

That system is Enable.

What you get with Enable will *sound* familiar: an integrated package with five modules—word processing, spreadsheet, database management, graphics, telecommunications.

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The Enable integrated system is based on design concepts previously found only in much larger computer systems.

At the heart of Enable is a Master Control Module which is similar to supervisory programs that run the most advanced mainframe computers. This Master Control Module (MCM) contains all services and facilities for Enable. And all functions common to all modules—eliminating system redundancies.

Windowing is easier and faster than ever before. "Cut and paste" data from one module to another cleanly, precisely, with a minimum of keystrokes. And do it in a split-second (others can keep you finger-tapping for a small eternity). Up to 8 windows can be moved, shaped, overlapped or zoomed to full screen size.

Integration: So much, so easily.

You can create a graph from a spreadsheet or database. Then insert the graph and the spreadsheet between text in a single word processing document *right on the screen*.

Select DBMS data using Enable's powerful query language and copy that data into a word processing document. Or insert that data into a spreadsheet and Enable will automatically expand column length and modify formulas.

Using DBMS with word processing, you can automatically include selected DBMS fields—or embed calculated fields—within the text of a letter or report.

Combining word processing with telecommunications, you can write anything from an electronic mail message to an annual report and transmit it across town or around the world.

Since the MCM handles all full-screen text editing, you can use that important feature in any module.

Greek, foreign and special character sets are available—not only in word processing—but for putting labels on top of your graphs, creating DBMS data entry forms and producing customized reports.

Functionality: All you could ask for.

Unlike other integrated software, every one of Enable's modules gives you virtually everything you'd expect from the better stand alone programs. And, often, more than you'd expect.

Enable Word Processing is very much like a dedicated word processor. Going beyond all the standard features to include such things as:

- positioned headers and footers
- pagination
- automatic footnoting
- mail merge
- multiple character sets
- document size limited only by available disk space.

The Enable Spreadsheet is comparable to Lotus 1-2-3™ both in functionality and speed. With such special features as:

- variable column length for loading of DBMS data
- highlighting of all related cells
- step feature for changing value in target cell
- can take advantage of your optional 8087 math co-processor.

Enable Database Management is, without qualification, the most powerful DBMS available in an integrated system. So powerful, you can generate specialized applications *without the need for any programming*. The DBMS includes:

- Menu-driven field definition using an external data dictionary
- comprehensive "paint the screen" input and report forms design
- full screen data entry with extensive and automatic field editing and validation
- over 65,000 records per database
- rapid search and retrieval using Boolean logic, arithmetic and relational operators, and "wild cards"
- powerful menu-driven report generation including virtual and calculated fields, and up to 16 break conditions with running, break, conditional and grand totals.

Enable Graphics draws *presentation-level* graphs. Its many special features include:

- sizing, shaping and positioning of graphs using

windowing • writing labels right on the graph • 7 graph types with 8 fonts.

Enable Telecommunications gives you easy access to online services, your company's big computer and other personal computers. With automatic sign-on using stored "set-ups" enter your connection protocol just once and then press a few keys to make that connection again and again.

192K? Yes, 192K.

Enable's highly efficient, non-redundant system architecture—which makes use of virtual memory as well as reentrant Assembler coding—gives it the ability to run with as little as 192K and two double-density disk drives. And we do mean *run*. Which means you won't have to add lots of expensive memory or a hard disk to your hardware to enjoy a fully-integrated, full-function system.

Speed you've never seen.

This major shortcoming of many integrations is a major asset of Enable.

With Enable, when a word processing document is revised, the entire document is reformatted in an eyeblink (no "ripples").

In a spreadsheet, even as numbers, formulas, rows and columns grow more complex, Enable re-calculates at lightning speed.

Enable's DBMS can rapidly retrieve records according to even the most complex parameters and sort them on up to 8 fields.

Critical Compatibility.

Here's another enormous advantage: all the time and money you've invested in first generation packages won't go to waste. Files created by dBase II™, Lotus 1-2-3™, WordStar™, VisiCalc™, EasyWriter I™, or Volkswriter™ can be used automatically in Enable without conversion or rekeying. Similarly, Enable can *create* files in the proper format for all the above as well.

Enable = Power.

The MCM internally directs traffic, making it possible to run one main program, one communications program and one printing program concurrently. So you can do spreadsheet analysis, print a monthly report and receive

stock quotes over the wire—all at the same time.

Enable's powerful macro facility saves you time and keystrokes in all modules. Macros may be automatically recorded as the steps are executed; even edited using full word processing capabilities. You can, for instance, create a macro which produces a report containing data selected from your DBMS file. Every time the macro is executed, the resulting report is updated with the latest information from your database.

Ease you've never experienced.

As for being "user-friendly" (the most abused phrase in all of computing), the proof, of course, is in the using. Here, you'll discover, Enable shines. Whether you're a beginner or an expert.

Since the MCM is the sole interface between you and all the modules, you only have to learn one uniform set of commands and menus to use the entire system.

You may not even need to open a manual first. Clear, English language menus—complete with explanatory messages—are available in every module. Menu options may be selected by the traditional cursor method, or with a single keystroke short-cut. As you grow more experienced, expert commands bypass the menus. And there are convenient macro commands for the really sophisticated.

For those just getting started, Enable has a tutorial disk distinguished by its clarity and depth. And the manual teaches you, step-by-understandable-step, how to use all that the system provides. For online assistance, at any time, just push the F1 key to get all the help you need.

Support. Then more support.

As an Enable owner, you've got a continually evolving software system. *One complete*

update, with significant new features, will be sent to you—at no cost.

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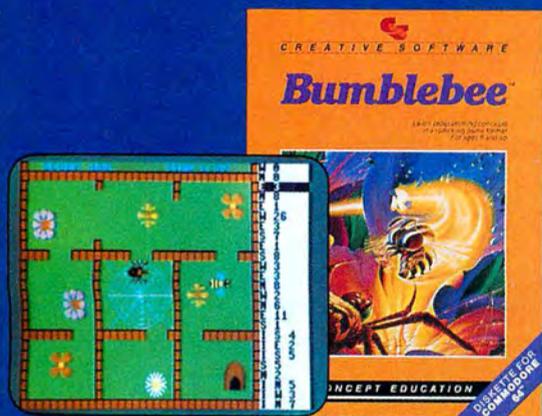
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Circle 20 on reader service card

The Help Screen

PC World offers answers and advice at every level.

Karl Koessel

Are you looking for books with ready-to-type BASIC programs or commonly used BASIC routines to incorporate into your own programs? Maybe you'd like to have an off-the-shelf encryption program to protect your data files from prying eyes. Want to be able to define, in Interpreted BASIC, areas of the screen that do not scroll? Or do you need a simple .COM program that swaps the port address values for LPT1: and LPT2: and for COM1: and COM2:?. These are the topics of this month's *Help Screen*.

BASIC Routines

Q. I purchased my IBM PC early this year and am now attempting to do some programming in BASIC. Do you know of any books that include common BASIC or BASICA sub-routines and programs written specifically for the PC? I would like to be able to search in both uppercase and lowercase, that is, search for 'John' and find 'john' and 'JOHN' as well as 'John'. I would also like to sort on multiple fields: for example, by last name and then first name. It would also be helpful to have a routine that calculates the number of elapsed days when given a start date such as 10-29-1952 and a finish date such as 7-31-1984. I am also interested in financial formulas—for instance, those that calculate interest payable and interest earned.

I keep checking the local bookstores but have been unable to find any publications of this nature. Isn't something available to help me with these needs?

*Jere D. Cox
Rescue, California*

A. I am not aware of any books containing case-insensitive search routines, but since you are writing your own programs, you could convert input to uppercase, and searching would then be a simpler matter. Another alternative is to use a word processing or data base program (depending on the storage format of the data) to do your searching; most have a case-insensitive search mode.

Two of the best books of ready-to-run programs (which include the other routines you're looking for) are published by Osborne/McGraw-Hill: *Some Common BASIC Programs/IBM PC Edition*, by Lon Poole, Mary Borchers, and Peter M. Burke (containing 76 programs), and *Practical BASIC Programs/IBM PC Edition*, edited by Lon Poole (40 programs). You can write the publisher at 2600 Tenth St., Berkeley, CA 94710. Sybex publishes *Useful BASIC Programs for the IBM PC*, by Stanley R. Trost, which contains over 65 programs and subroutines. Sybex is located at 2344 Sixth St., Berkeley, CA 94710.

Although bookstores are carrying more and more computer titles, I suggest looking in software stores such as Software Centre International. If you'd like the location of their nearest store or latest catalog, which includes a price list of the hundreds of book titles they carry, write to them at 5850 Hannum Ave., Culver City, CA 90230, or call 800/621-5060 (in California call 213/642-7535). If you write to any of the publishers listed here, be sure to ask them to send you a catalog of their IBM PC titles.

In addition to books of ready-to-run programs, consider reading the following books to learn more about programming in BASIC on the PC. Often the programming examples

used in such books to teach BASIC are also useful routines, especially those in the advanced portions of the books.

BASIC Primer for the IBM PC & XT, by Bernd Enders and Bob Petersen, New American Library, The Waite Group, 1633 Broadway, New York, NY 10019.

Using Your IBM Personal Computer, by Lon Poole, Howard W. Sams & Co., Inc., 4300 W. 62nd St., Indianapolis, IN 46268.

Your IBM PC, A Guide to the IBM Personal Computer, by Lyle J. Graham, Osborne/McGraw-Hill, 2600 Tenth St., Berkeley, CA 94710.

Microcomputer Programming with Microsoft BASIC, by Robert G. Crawford and David T. Barnard, Reston Publishing Company, Inc., 11480 Sunset Hills Rd., Reston, VA 22090.

IBM PC Data File Programming, by Jerald R. Brown and LeRoy Finkel, John Wiley & Sons, Inc., 605 Third Ave., New York, NY 10158.

Encrypting Sensitive Data

Q. Do you know of a program that will encrypt my files to protect them from unauthorized persons who might try to read them? I have friends who can program, but I would prefer an off-the-shelf program. My word processing program is Volkswriter 1.2, which I use at work on an IBM PC with DOS 1.10 and at home on a Hyperion PC with its DOS 1.25. I would also like to protect data files generated by Meca Software's program Managing Your

The Help Screen

Money. Also, I would prefer an encryption program that will also run under DOS 2.00, as I intend to upgrade my system soon with a hard disk.

Scott J. McCorkell
Riyadh, Saudi Arabia

A. Data and program security via encryption is available in a number of forms. Software-implemented encryption programs use techniques such as the Payne-Lewis-Tausworth-based cipher algorithm and the United States Government Data Encryption Standard (DES) to protect files. There are even schemes that incorporate hardware with software, most of which, in addition to encrypting single files, protect entire disks, file groups, and hard disks from unauthorized inspection, use, or duplication. *SafeWord Data Access System* uses a small, calculator-like decoder, *SoftGuard* employs a plug-in module for the PC, and *PC Lock III* has a special expansion board that not only allows an individual to secure files but allows an administrator to allocate (and restrict) the "rights" of users to files in a networked system. Although more expensive than software-only solutions, combined hardware and software encryption techniques provide added protection against those who are able to work their way into the code of your encryption software. Prices range from \$50 to \$700.

Pack & Crypt is a three-program package from Norell Data Systems Corporation, 3400 Wilshire Blvd., Los Angeles, CA 90010. *Crypt* enciphers data files based on a user-provided password. The package also includes a program, *Pack*, that com-

presses text and source code files using Huffman coding (providing a 20 to 60 percent disk space savings) and a program to format encrypted or compressed files for telecommunications.

Super Encryptor, a single-user, single-file protection system, and *Disk Scrambler*, a multiuser, entire disk or file group encryption program, are available from Obsidian Computer Systems, 236 N. Santa Cruz Ave. #243, Los Gatos, CA 95030.

SafeWord Data Access System, which includes software and the SafeKey Decoder, is sold by Enigma Logic, 2151 Salvio #301, Concord, CA 94520. The decoder can be disabled by removing a 1-inch "key" and can also be programmed to be inoperative (even with the key left in) between certain hours or to allow a user only a set number of accesses to data.

SoftGuard, from Advanced Computer Security Concepts, 4609 Logsdon Dr., Annandale, VA 22003, uses a proprietary algorithm implementing the United States Government DES. The combination hardware and software system provides communications security, prevents software piracy, and regulates program use in a network as well as protecting stored data.

PC Lock III is another hardware and software security system, available in both a full-featured version that provides centralized, "security administrator" control to networked PCs and a low-cost, single-user version, *PC Lock III.3* (upgradable to the full-featured version). Offered by MPPi, Ltd., 2200 Lehigh Ave., Glenview, IL 60025, both versions of this system use a short board and so may be used in the PC, the XT, or the 3270-PC.

Scroll Protection

Q. I have a Tava PC, running Columbia's BASICA version 1.90 under MS-DOS 1.25, and have been unable to find out how to "scroll protect" the screen of my Amdek 300A monochrome monitor.

My previous computer was a TRS-80 Model III, running Tandy's TRS-DOS and Model III BASIC. I could prevent up to eight of the lines at the top of the monitor from scrolling along with the bottom portion or clearing when a CLS command was issued. To accomplish this I would simply POKE the desired number of scroll-protected lines (one to eight) into address 16916. Using this system for four years, I designed and wrote a large number of application programs (approximately 45 16K programs) in my discipline (land/construction surveying). Almost all of the programs made use of the scroll-protect feature; menus, instructions, column headings, and so on could then be placed permanently at the top of the screen.

Although I developed proficiency and expertise in programming with the commands and the features provided by TRS-DOS and Model III BASIC, I evidently did not learn enough about what goes on behind the commands. I had anticipated converting these programs to the Tava PC easily using the TRS-to-IBM utility Transfer, from Michtron Inc., Pontiac, Michigan, along with doing a small amount of rewriting. Apparently scroll protection is not an easy-to-use feature of MS-DOS or BASICA, and I have been unable to figure out how to do it on the Tava.

The traditional information sources are at a loss: the local PC club members do not think it can be

done; IBM suggested I PEEK around in memory; the local computer dealers have "never heard of such a thing"; and Microsoft advised that it couldn't help since original equipment manufacturers (OEMs) design their own Basic Input/Output System (BIOS) to implement the operating system. I was advised that scroll protection might be possible, but not without some very messy assembly language routines. This is of no use, though, since BASIC is the only language I know, and assembly language eludes me.

At the risk of sounding like someone who refuses to take no for an answer, I can't believe that a function as useful and simple as scroll protection selected lines of the screen is unattainable. Have you any suggestions as to how this can be accomplished?

Raymond E. Havey
Philadelphia, Pennsylvania

A. Not only is scroll protection useful and simple, it's common. Every spreadsheet package allows you to scroll its cells left and right and up and down without scrolling its column and row identifiers; they are scroll-protected. Most word processing programs keep a nonscrolling menu on screen; your document will scroll, but the menu does not. In fact, BASIC itself scroll-protects the 25th line of the screen so that the function key definitions can be displayed but not scrolled.

Unlike TRS Model III BASIC, which uses one value to designate the number of top screen lines that are scroll-protected, the BASICs commonly used in PCs and compatibles keep two values—1 and 24—to define the range of screen lines that do scroll. The first value specifies the top

screen line of the scroll "window," and the second specifies the bottom screen line of the window. (The lines outside this range are scroll-protected.)

These values are kept in a section of memory, known as the BASIC Interpreter work area, just before the area of memory into which BASIC programs are loaded (see Appendix I of the second edition BASIC manual). However, OEMs not only design their own BIOS but also set up their own BASIC Interpreter work area, and thus each manufacturer stores these values in a different place within the BASIC Interpreter work area. For the PC and its BASIC, the scroll window's top and bottom line values are kept in the default data segment at offsets 91 and 92 (see "Scroll Window" in **,**, PCW, Vol. 1, No. 5). Thus, the BASIC command `DEF SEG:POKE 91,5:POKE 92,21` will create a 17-line scroll window and protect the top and bottom 4 lines (lines 1 through 4 and lines 21 through 25); you can, of course, poke other values into these memory locations of the default data segment to create different scroll windows. For Columbia's BASICA the values are kept at offsets 2261 and 2262. For Leading Edge's BASIC they are at offsets 2992 and 2993, and Compaq's BASIC uses offsets 1845 and 1846.

I have two closing points. Although the procedure described will create the scroll window you need, `CLS` will still clear the entire screen. Also, remember that Compiled BASIC does not have a BASIC Interpreter work area, so this technique

will not work for Compiled BASIC programs. In fact, POKEing into this area with a Compiled BASIC program will probably have disastrous effects.

Swapping Ports With Assembly Language

Q. I have been using a BASIC port-switching program similar to the one that appeared in The Help Screen (PCW, Vol. 1, No. 8) to switch output between two printers. Most of my need to switch printer ports arises from extensive use of dBASE II, version 2.4. Having to keep BASIC on my dBASE II disks to run one very small program is a terrific waste of space. I would like to be able to utilize a .COM program assembled with DOS 2.00's `DEBUG A` command. I would also like to be able to call the .COM program while running dBASE II. Any suggestions?

Stuart A. Tobin
Chicago, Illinois

A. Listing 1 shows the commands to use with DOS 2.00's `DEBUG` to assemble `SWAPPRTS.COM`, a simple program that swaps the port address for `LPT1:` with the port address for `LPT2:` and swaps the port address for `COM1:` with the port address for `COM2:`. With `DEBUG.COM` in the default drive, carefully enter the commands; the screen should appear as shown in Figure 1. `SWAPPRTS.COM` will be written to the disk in drive A:.

If you wish to swap only the parallel ports, leave out the four lines whose comments indicate that they are for the COM ports. Also enter 19 instead of 27 (the file size of `SWAP-`

The Help Screen

```
A>debug <Enter>
a 100 <Enter>
mov ax,40 <Enter>
mov ds,ax <Enter>
mov ax,[0] <Enter> ;current COM1:
mov bx,[2] <Enter> ;current COM2:
mov cx,[8] <Enter> ;current LPT1:
mov dx,[a] <Enter> ;current LPT2:
mov [0],bx <Enter> ;new COM1:
mov [2],ax <Enter> ;new COM2:
mov [8],dx <Enter> ;new LPT1:
mov [a],cx <Enter> ;new LPT2:
xor ax,ax <Enter>
int 21 <Enter>
<Enter>
n a:swapprts.com <Enter>
r cx <Enter>
27 <Enter>
w <Enter>
q <Enter>
```

Listing 1: DEBUG commands for DOS 2.00 to assemble SWAPPRTS.COM

```
A>debug
-a 100
xxxx:0100 mov ax,40
xxxx:0103 mov ds,ax
xxxx:0105 mov ax,[0] ;current COM1:
xxxx:0108 mov bx,[2] ;current COM2:
xxxx:010C mov cx,[8] ;current LPT1:
xxxx:0110 mov dx,[a] ;current LPT2:
xxxx:0114 mov [0],bx ;new COM1:
xxxx:0118 mov [2],ax ;new COM2:
xxxx:011B mov [8],dx ;new LPT1:
xxxx:011F mov [a],cx ;new LPT2:
xxxx:0123 xor ax,ax
xxxx:0125 int 21
xxxx:0127
-n a:swapprts.com
-r cx
CX 0000
:27
-w
Writing 0027 bytes
-q
A>
```

Figure 1: Screen display after assembling SWAPPRTS.COM. The xxxx will vary on different machines.

PRTS.COM, shown shaded) in response to the colon prompt of the register command 'r cx'. To switch only the serial ports, leave out the four lines whose comments indicate that they are for LPT ports, and use 17 as the file size in answer to the register command prompt.

DOS keeps a table of port address values for its three parallel ports, LPT1:, LPT2:, and LPT3:, and its two serial ports, COM1: and COM2:, in a part of memory called the ROM BIOS Data Area, which begins at segment 40 hexadecimal, that is, absolute memory address 400 hex. The port address values are each 2 bytes long and stored in the 8088's standard format: the low byte is first, followed by the high byte. To see the values, insert DEBUG.COM into the default drive and type:

```
DEBUG <Enter>
D 40:0 F <Enter>
Q <Enter>
```

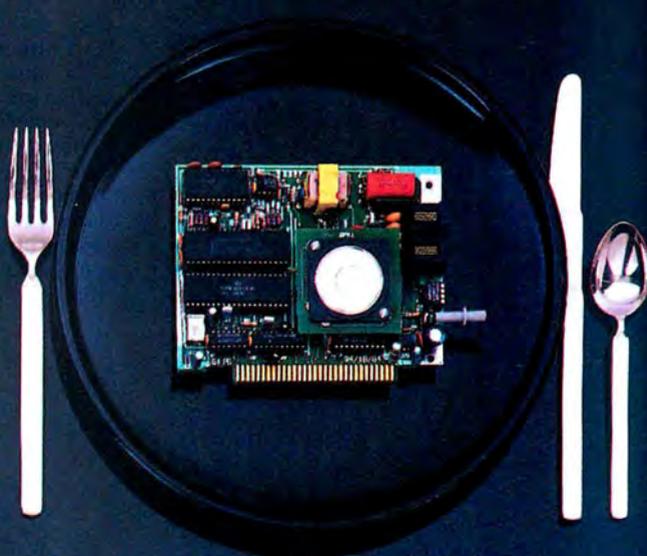
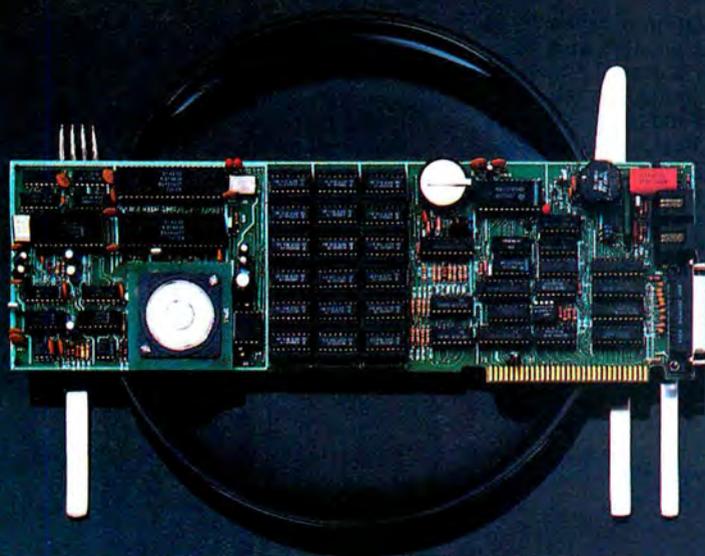
The port address value for COM1: is in the first 2 bytes (offsets 0 and 1 of segment 40 hex), and for COM2: it is in the next 2 bytes (offsets 2 and 3). The port address value for LPT1: is in the 9th and 10th bytes (offsets 8 and 9); for LPT2: it is in the 11th and 12th bytes (offsets A and B); and for LPT3: it is in the 13th and 14th bytes (offsets C and D). The port address values for ports that are not actually installed are set to zero.

If you upgrade to *dBASE III*, you will be able to run SWAPPRTS.COM while in *dBASE*. Otherwise you will have to use SWAPPRTS.COM from DOS. Simply put the disk containing SWAPPRTS.COM in the default drive, and type SWAPPRTS <Enter>. To swap the port address values back to their original settings, issue the command again.

Do you have any questions concerning the IBM PC or compatibles? Send them to The Help Screen, PC World, 555 De Haro St., San Francisco, CA 94107. ☎

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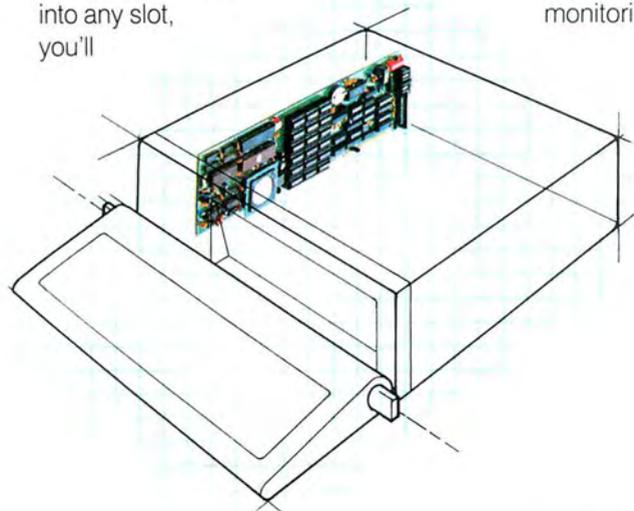


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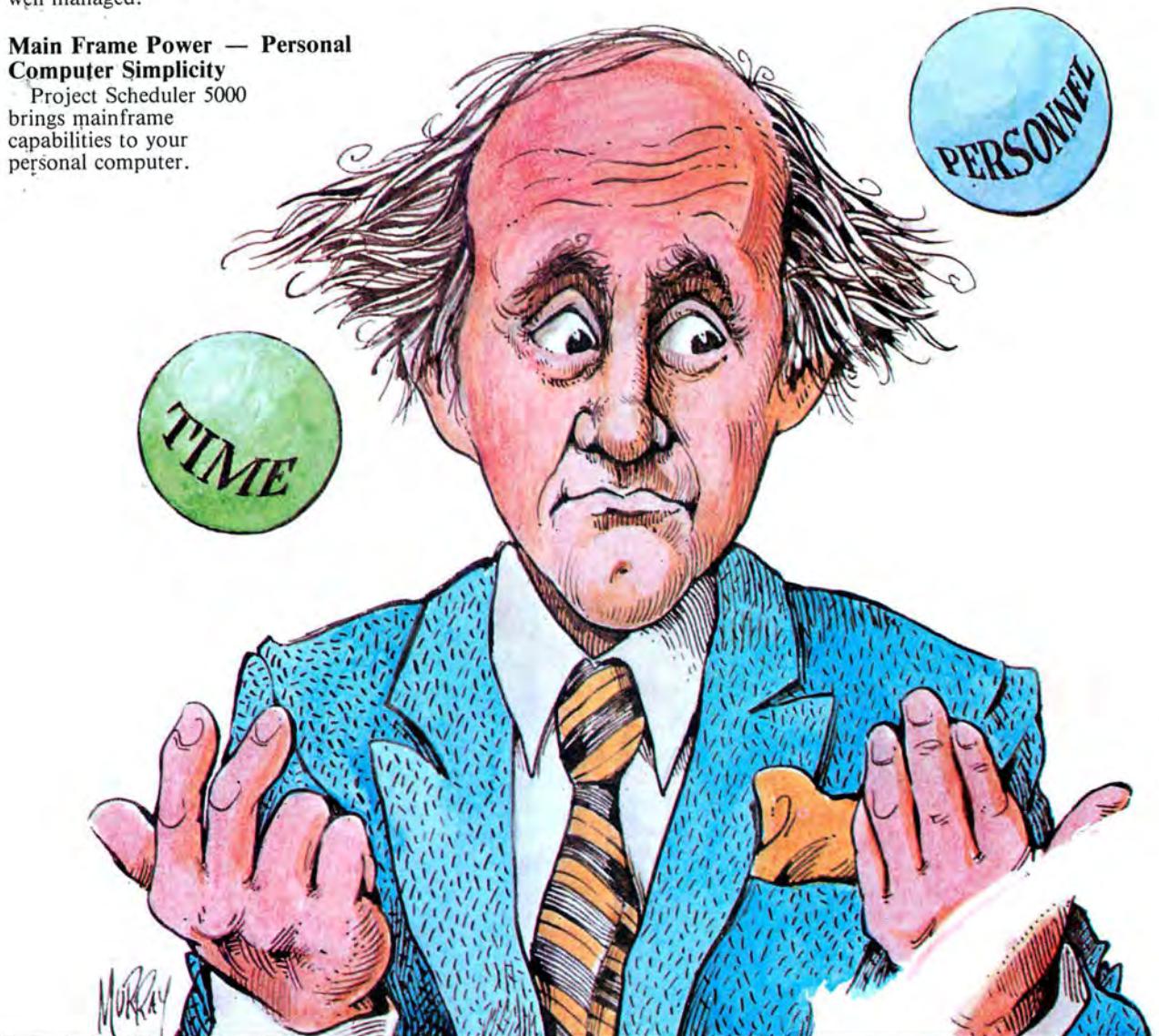
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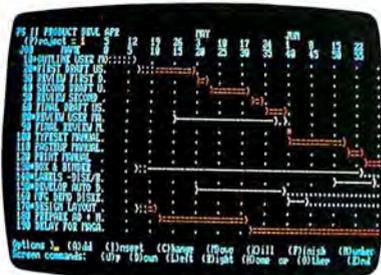
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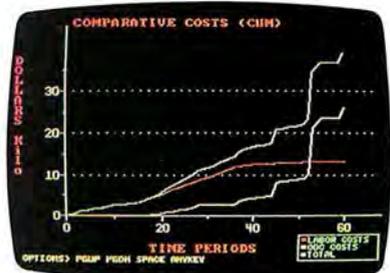
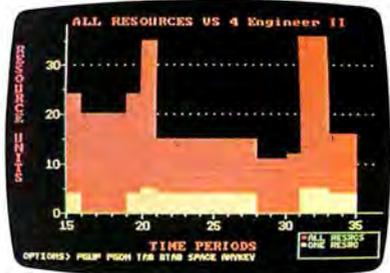
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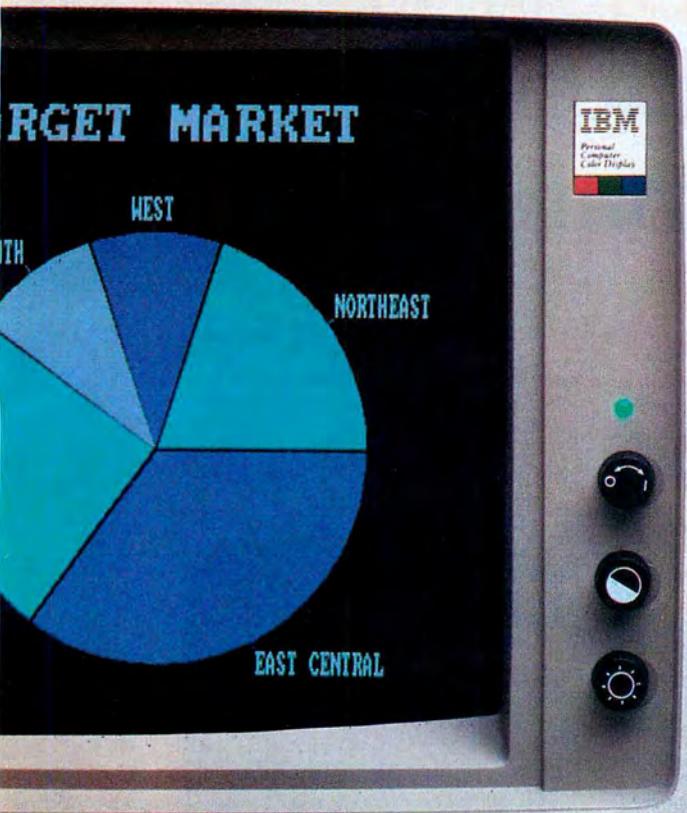
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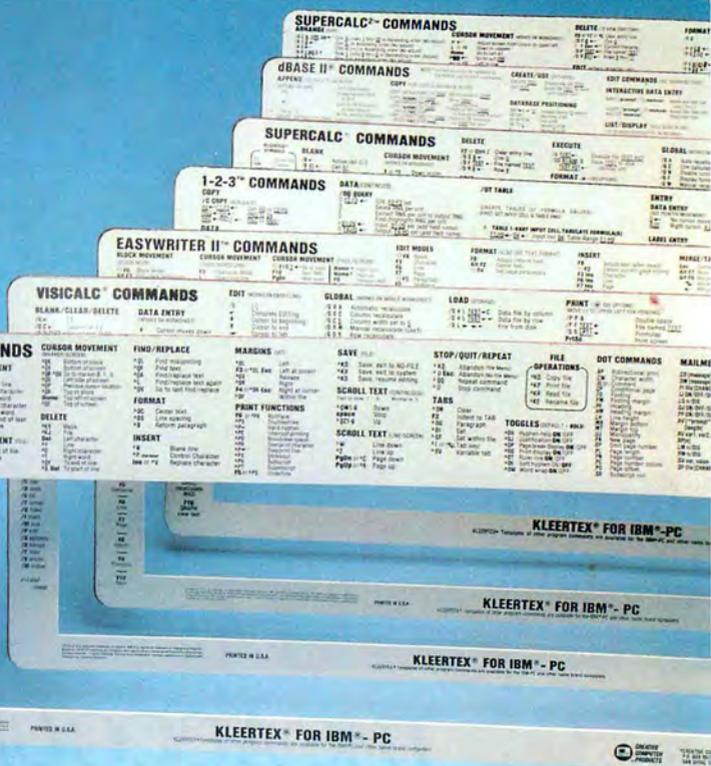
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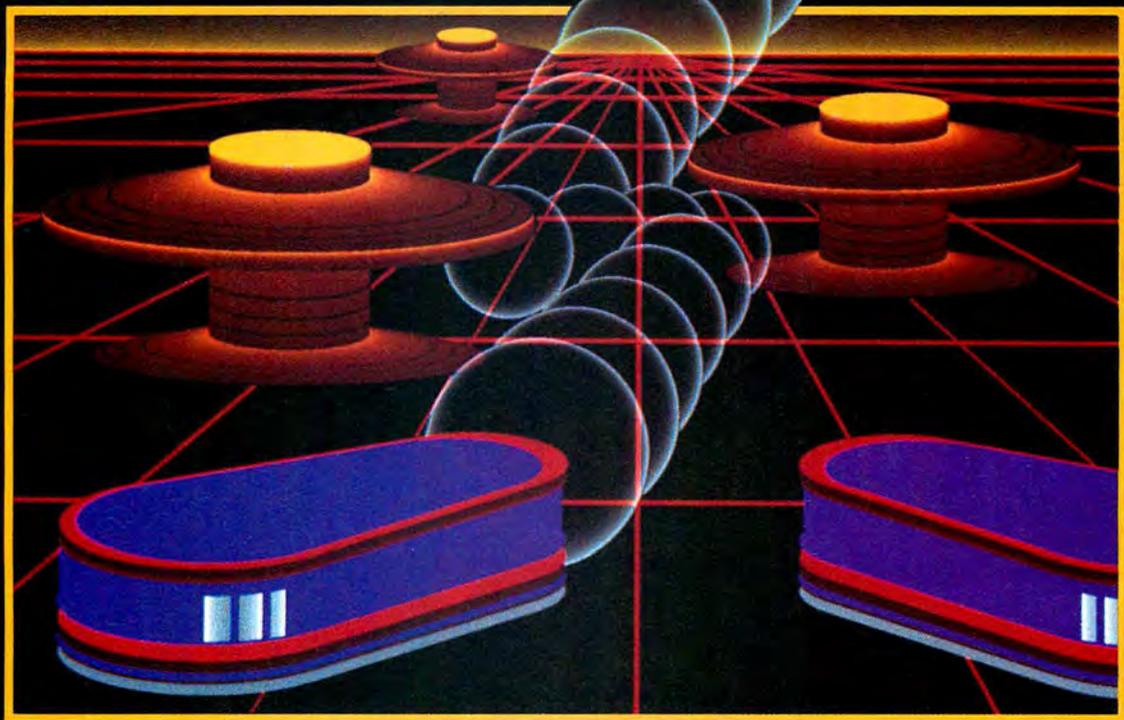
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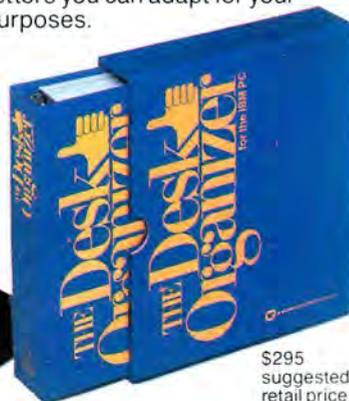
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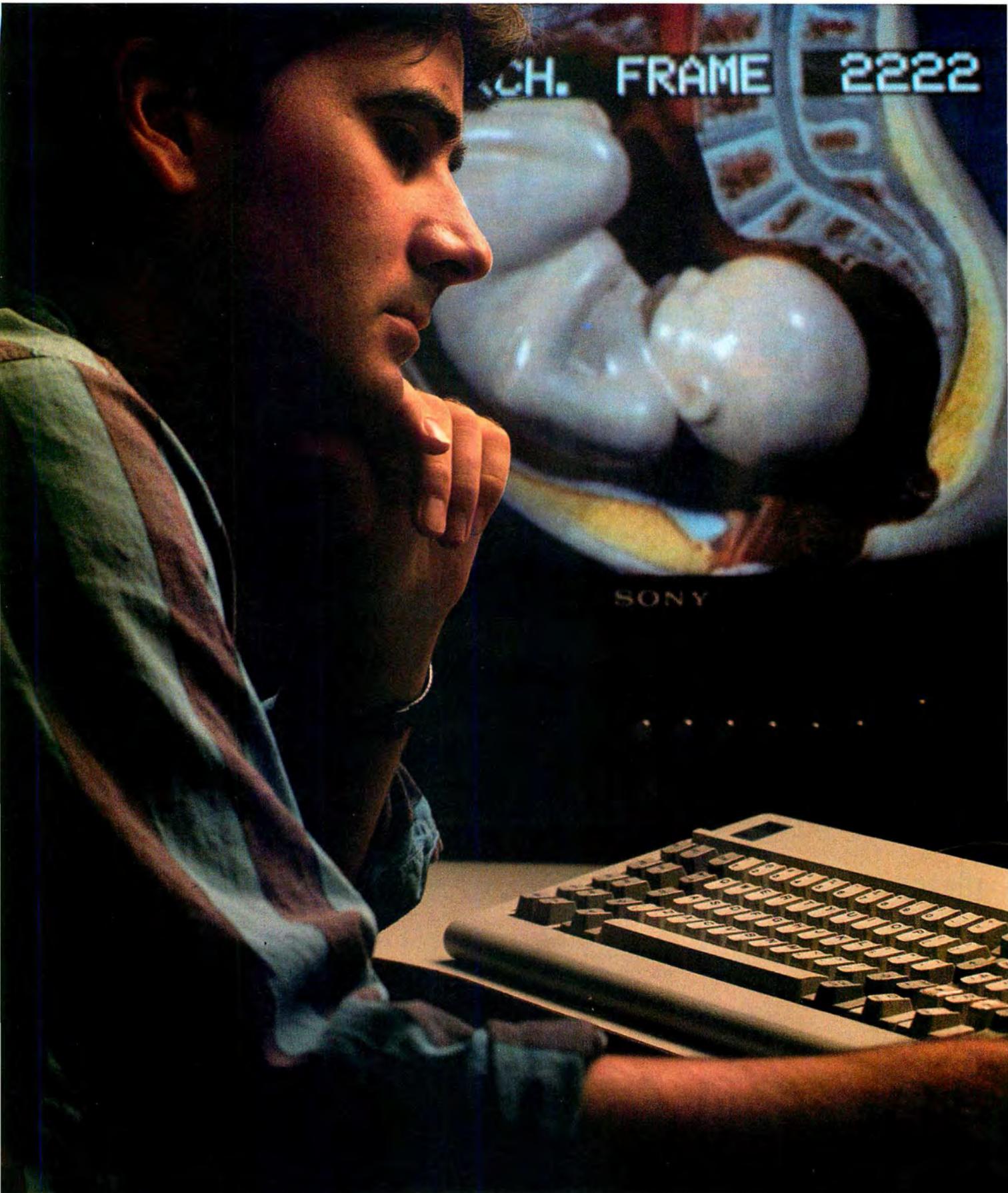


\$295 suggested retail price

Requirements: For the IBM PC or XT • Needs 128K memory

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● State of the Art: Video

Interactive Video: Calling the Shots

Wayne Parker

Interactive video programs can teach French, demonstrate the intricacies of jet engine maintenance, or sell houses. Until recently, creating these programs was the preserve of the programmer and the video professional—but no longer. Menu- or command-driven authoring systems for the IBM PC allow the nonprogrammer to control computer and video hardware and artfully integrate the computer's graphics and text with the video equipment's images and sound to produce a professional, interactive program.

An interactive video program can be many things to many people. It can have all the color and action of a TV show and, as the name suggests, interact with a user—asking questions, keeping track of answers, vividly illustrating points, gauging responses, and appropriately adjusting its presentation of information to a user's demonstrated knowledge and level of experience. Adding the

Nelson Whitney of Whitney Educational Services creates an interactive video biology lesson with InsightPC. Videodisc segments are combined with PC-generated text and graphics to produce a complete, interactive program.

● State of the Art

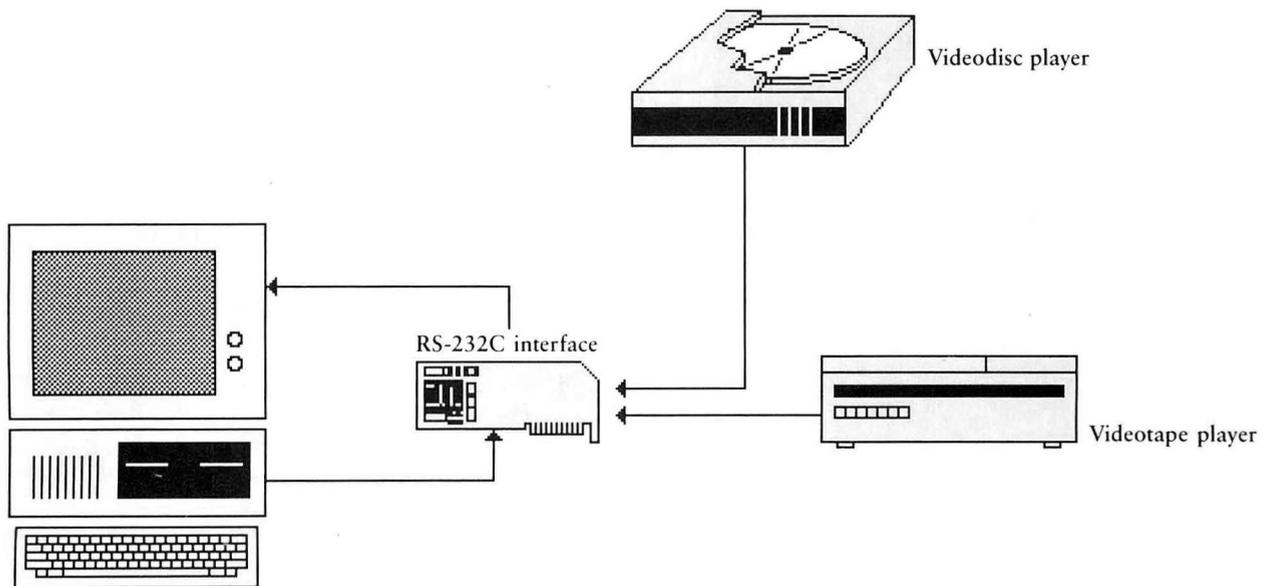


Figure 1: A typical interactive video authoring or viewing setup. Both videodisc and videotape players are controlled via an interface, in this case an expansion board that slots into the back of the PC. Images, graphics, and text are displayed on a color TV or special color monitor designed to handle input from both video players and the PC.

essential video equipment to a PC—a videotape or videodisc player and an interface board—costs little more than a good letter quality printer. As a result, the popularity of interactive video is gaining momentum; interactive video programs are already teaching biology to high school students, demonstrating sales techniques to investment brokers in St. Louis, promoting Louisiana to World's Fair visitors in New Orleans, and, naturally, teaching people how to use the PC.

Authoring systems, which allow nonprogrammers to develop these interactive learning programs, are essentially very high-level programming languages. But instead of bothersome PEEKs and GOSUBs, menu selections or simple English-like commands generate all the computer code necessary to assemble video, graphic, and text elements into a final program. For some applications, particularly those involving complex simulations, an authoring system may not be flexible enough. But for most, an authoring system is a welcome guide.

Even programmers save hours of tedious work with authoring systems, according to Thomas Donahue, president and founder of MicroMentor. The company uses the *Insight PC* authoring system from Whitney Educational Services to create interactive video training programs for the PC because, says Donahue, “the system

generates a BASIC program very quickly from simple commands. We may modify the code in that program for special needs, but much of our time is saved for the important, creative development of our program.”

MicroMentor programs have been used by Ares Schools, a computer training organization, to teach hundreds of management and clerical staffs the use of the PC. Dee Dibido, an Ares instructor, notes that interactive video has “really reduced the expense of computer training by making an instructor’s time more productive.” Ares found regular videotape programs “too passive. . . . Our clients really respond to interactive video much better.”

The MicroMentor interactive program requires a color TV (or a special monitor, such as the Sony Profeel, that can handle both computer and video input) to display video images and computer text or graphics. A student using the program first watches an instructor explain the PC’s various functions; then multiple-choice questions appear. The student answers by typing *a*, *b*, or *c* on the PC’s keyboard. If the answers are correct, the

instructor appears on the screen and congratulates the student, then launches into a new topic; if any answers are wrong, the related information is discussed again and the student gets another chance at the questions. The program records each attempt and the results and keeps track of the time taken on each segment. This information can later be reviewed by the student or an instructor.

First-Time Authoring

Authoring systems got their start on mainframe computers, where they were used to create software (without a video component) for computer-aided instruction or training. Like their interactive video descendants, these authoring systems—available for many personal computers for several years—use menus and simple commands to assemble complete interactive computer programs. Only recently has it become popular and economically feasible to include video as part of an interactive presentation run by a personal computer. There are currently more than 30 authoring systems available for personal computers, many of which support the use of video. (For more information, see “Interactive Video Authoring Systems.”)

“Two things make an interactive video authoring system different from standard computer languages,” according to John Ittelson, an interactive video expert at Chico State University. “It not only controls video resources—a videotape or videodisc player—but creates programs that evaluate user answers and accordingly display material stored in the computer and the video player.” The availability of relatively inexpensive personal computers, combined with the decreasing cost and increasing quality of video equipment and production, is fueling the growth and development of interactive video programs and authoring systems (see Figure 1).

Using Authoring

To Mike Esser, a general partner at Edward D. Jones & Co., an investment brokerage firm in St. Louis, the marriage of computer and video seemed natural. In addition to 35 PCs, the company had several Panasonic videotape players scattered throughout its 40 Missouri offices. The company purchased \$1200 interface boards from BCD Associates, hooked up its PCs to the videotape players, bought the Interactive Authoring System from McGraw-Hill, and began developing three interactive video programs to train employees how to sell investment packages. The results have been positive for the program designers as well as for the company’s trainees.

“Interactive video has dramatically improved the learning experience,” says Esser. Andrea Krismer, a principal author at Edward D. Jones, says, “Authoring system

Interactive Video Authoring Systems

There are over 30 authoring systems for the PC. Those listed below support interactive video. Some of these systems may not be bought outright but are leased, like development software.

Micro Visual Authoring (MVA)

Bell & Howell
7100 McCormick Rd.
Chicago, IL 60645
312/673-3300
List price: \$250

InsightPC

Whitney Educational Services
1777 Borel Place #416
San Mateo, CA 94402
415/341-5818
List price: \$990

Interactive Authoring System (IAS)

McGraw-Hill Book Co.
Microcomputer Software Unit
1221 Avenue of the Americas
New York, NY 10020
212/512-6584
List price: \$1500

PILOTplus

Online Computer Systems, Inc.
20251 Century Blvd.
Germantown, MD 20874
301/428-3700
List price: license for each program developed
\$500, run-time fee for each licensed computer
\$50

PC Pilot

Washington Computer Services
3028 Silvern Ln.
Bellingham, WA 98226
206/734-8248
List price: multi-use license \$550, single-computer
license \$100

The Educator

Spectrum Training Corp.
18 Brown St.
Salem, MA 01970
617/741-1150
List price: annual license fee \$3500

● State of the Art

menus are easy to use. We start with a basic lesson, decide on the format of the computer screens, and then follow a ten-step procedure to develop the programs."

Can an interactive video program replace an instructor? Probably not, says Marsha Lagrange, a training instructor at Intel, but it can teach many basic concepts. Lagrange teaches semiconductor chip manufacturing and business procedures to assembly-line workers at Intel's Livermore, California, training facility. These workers must learn how to use new test equipment, operate leak detectors and ion implanters, and fill out the inevitable company forms.

"We were looking for an effective form of self-paced instruction," says Lagrange. "Interactive video is good for skills training because we often must use a picture of the equipment, such as a semiconductor wafer, when showing employees how to recognize defects. You can't show that effectively with computer graphics."

Intel is currently testing the comparative effectiveness of interactive video versus classroom study. The company's original program was developed using Panasonic hardware with Panasonic's own authoring language. Intel has since switched to the PC and is currently evaluating other authoring systems.

Interactive video has even plunged into the world of real estate. Two of the cofounders of Peachtree Software recently set up a company in Atlanta that helps people find homes without having to leave the real estate office. Comsell supplies realtors with an IBM PC XT, a videodisc and a videodisc player, and the necessary software. Customers looking for a house answer the program's questions about acceptable price range, number of bedrooms required, and so on. When the computer has the basic information on the customer's concept of the ideal home, it instantly shows pictures of homes meeting those criteria on a color TV. The customer can see as many as five pictures of each house and views of the surrounding neighborhood. Only after the choices have been narrowed down does the customer actually drive out to see any homes.

Comsell nightly updates every XT's data base of house listings via modem and sends out new videodiscs once a week. To create a videodisc, slides of the listed houses are mastered onto videotape and sent to the 3M company, which presses a videodisc master and makes copies of the disk for Comsell's clients. It is too early to tell how successful this service will be, but when the cost is compared to traditional multiple-listing services, Comsell looks very attractive.

This unusual application of videodisc technology required Comsell to develop its own authoring system. Continued expansion of commercial systems and further use of videodiscs as visual data bases will likely result in authoring systems that can serve this type of need.

Even the medical field is using interactive video; it is not only helping hospitals cope with employee turnover but it is helping them save their dollars. Like all large hospitals, Mercy Hospital in Sacramento, California, hires many new employees—nurses, pharmacists, medical technicians—each year. Training is crucial, because there is often little margin for error in the tasks these employees perform, but instructors are expensive. Mercy's solution was to add interactive video to its training program, with a PC, a videotape player, and an interface and authoring system from Whitney Educational Services.

"Our interactive video program shows pharmaceutical procedures just as the employee will see them at work," says Pete Seel, media specialist at the hospital. The program was filmed at Mercy using the hospital's video equipment and instructors. "The program is mastery-based, so an employee must demonstrate comprehension of the material before going on to the next section." The demand for this kind of instruction in medicine is growing, and Seel anticipates selling or leasing this and future programs to other hospitals.

For Mercy Hospital, authoring systems can satisfy unique training needs and produce programs that can be used by other institutions. Health Edutech, a recently

A company in Atlanta helps people find homes without having to leave the real estate office.

formed company in Minneapolis, anticipates this demand for interactive video medical programs and is producing videodisc-based instruction for sale to health care institutions. The company's first programs, produced with the McGraw-Hill authoring system, will teach control of staph infections, relief of lower back pain, and use of bandages and dressings. The company has opted to sell its programs on videodisc instead of videotape, because discs are more durable and videodisc players can access information more rapidly.

Howard Casmay, chairman of Health Edutech, is an unabashed booster of interactive video; he dismisses computer-based training programs without video as "page turners." Text and graphics can more easily—and

cheaply—be put in a workbook. But with the addition of video, Casmay maintains, better learning is possible. And the applications in the health field? Casmay says, “We will soon see an explosion of training programs on all kinds of medical procedures—handling hazardous materials, drug abuse, and many other topics. Most hospitals have PCs, and the cost of videodisc players continues to drop.”

Hardware

A number of personal computers support interactive video, but the most widely used machines are the IBM PC, the Apple II, and the Sony SMC-70, and most video interfaces are designed for this group. (For a list of interfaces, see “Computer-to-Video Interfaces.”) Most videotape and videodisc players used in interactive video setups are “industrial” units—they can sustain continual use and have the Centronics or RS-232C port needed for interfacing with a computer. These video machines can cost as little as \$1000; some can also be programmed with up to 1K of instructions, and several of them allow single-frame access.

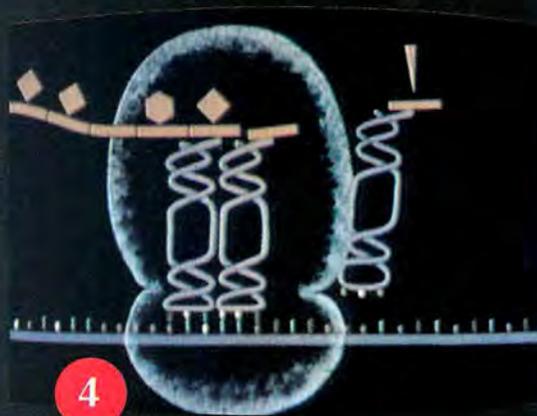
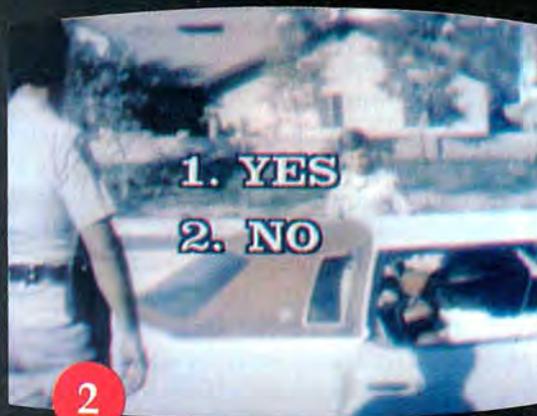
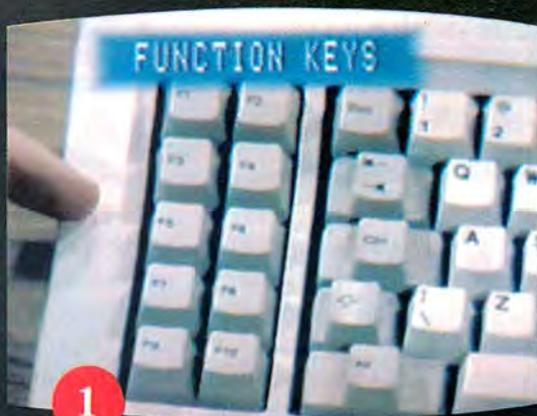
To ensure high-quality images, most interactive programs are assembled or produced on professional videotape machines that use ¾-inch or 1-inch tape. This is particularly necessary when a final version of a program is to be mastered onto a videodisc—a storage medium that picks up any visual imperfections. Many programs are produced on videotape, but the declining cost and advantages of videodisc players and videodisc mastering are making this technology much more appealing (see “Tape Versus Disc”).

Authoring a Program

“Most people underestimate the amount of work that should go into the instructional design of a program,” says Greg McKensie, a program developer at Whitney Educational Services. “Some people expect the computer to tell them what to do.” This theme is echoed throughout the industry—and reflected in the many poor interactive video programs on the market. The message from experts: an authoring system can’t produce a quality product if the program’s original design is not thorough and consistently implemented.

An authoring system won’t make a novice a successful instructional designer, any more than a spreadsheet program will make him or her an accountant. Gloria

1: Learning to use the PC by TV: an interactive video tutorial designed by MicroMentor on the InsightPC authoring system. 2: Biology teachers are bullish on interactive video. A recent videodisc-based biology program. 3: An interactive program that combines stock videotape footage with computer text. This program is used for training police officers. 4: The mysteries of DNA unraveled via interactive video.



Tape Versus Disc

Almost all interactive video programs are produced and edited on videotape. This assembly process requires a great deal of flexibility, and videotape is easy to manipulate. Once a program has been finished, it can be distributed either on videotapes or videodiscs. Until recently, the wide availability of industrial-quality videotape players dictated that videotape be the preferred medium for interactive video. But videodisc players and videodisc production are cheaper than they once were, and they offer added opportunities for the interactive video designer and user.

A typical videodisc contains 54,000 discrete frames; a videodisc player can randomly access a single frame within a second or two. Finding a frame on a videotape—inherently a sequential process, since the tape must spool past the player's read head—can take ten times longer. Freezing a frame and displaying it can damage a tape, but a videodisc never comes into contact with a read head—a single frame can be frozen in place indefinitely.

This ability to access images rapidly and to freeze them is particularly appealing; a user doesn't have to wait 15 or 30 seconds for a program's response. Videodiscs, unlike videotapes, can also be handled extensively without suffering ill effects.

Videodisc production is more widely available and, best of all, it is now no more expensive to produce in quantity than videotapes. The cost of mastering an interactive program to disc has dropped from \$20,000 to as little as \$1800; copies of a master cost as little as \$20 a copy. 3M, a major manufacturer of videodiscs, offers overnight videodisc duplication, which is a boon to companies like Comsell that supply time-sensitive information.

The videodisc is thus becoming an important tool for creating visual data bases. It can store images of things as diverse as homes, patents, travel destinations, industrial development sites, artwork, and animal species. These images can be still-frame or live-action video segments. Laser technology makes all this possible, and a typical 12-inch videodisc can hold enough information for 30 minutes of video. Storage capacities will no doubt increase in the near future; the ability to master videodiscs—once the domain of companies like 3M—will soon be available to anyone willing to spend \$30,000 on a Panasonic videodisc recorder. While videodisc technology may not be a hit in the home market, it is making a name for itself in interactive video.

Gery, a consultant in computer-based training, notes that any program developer "must understand human learning." Since that skill is rare, Howard Casmay of Health Edutech believes that "instructional designers who understand interactive video will be in big demand."

Instructional design is not the only skill needed in producing a useful interactive program. The better the camera work and production—the editing and mixing of the sound, text, and images that go into a program—the more effective the program. If nothing else, our exposure to TV has accustomed us to a visually high-quality product. If an interactive program varies too much from this standard, the viewer's interest and concentration will sag.

"With authoring systems, you don't have to be a programmer, but it helps," says Alan Woontner, an interactive program developer in San Francisco. "You have an idea of what the computer is capable of and some exposure to designing something quite complex." Authoring systems are not always adequate for very demanding applications, such as detailed flight simulations, and the need for computer programmers who can customize video authoring systems is growing.

To create an interactive video program, an author outlines a clear statement of the program's goals and diagrams the material to be presented in a flowchart (see Figure 2). The flowchart includes the program's questions and its responses to various answers. Once this path of interactivity is established, video segments are ei-

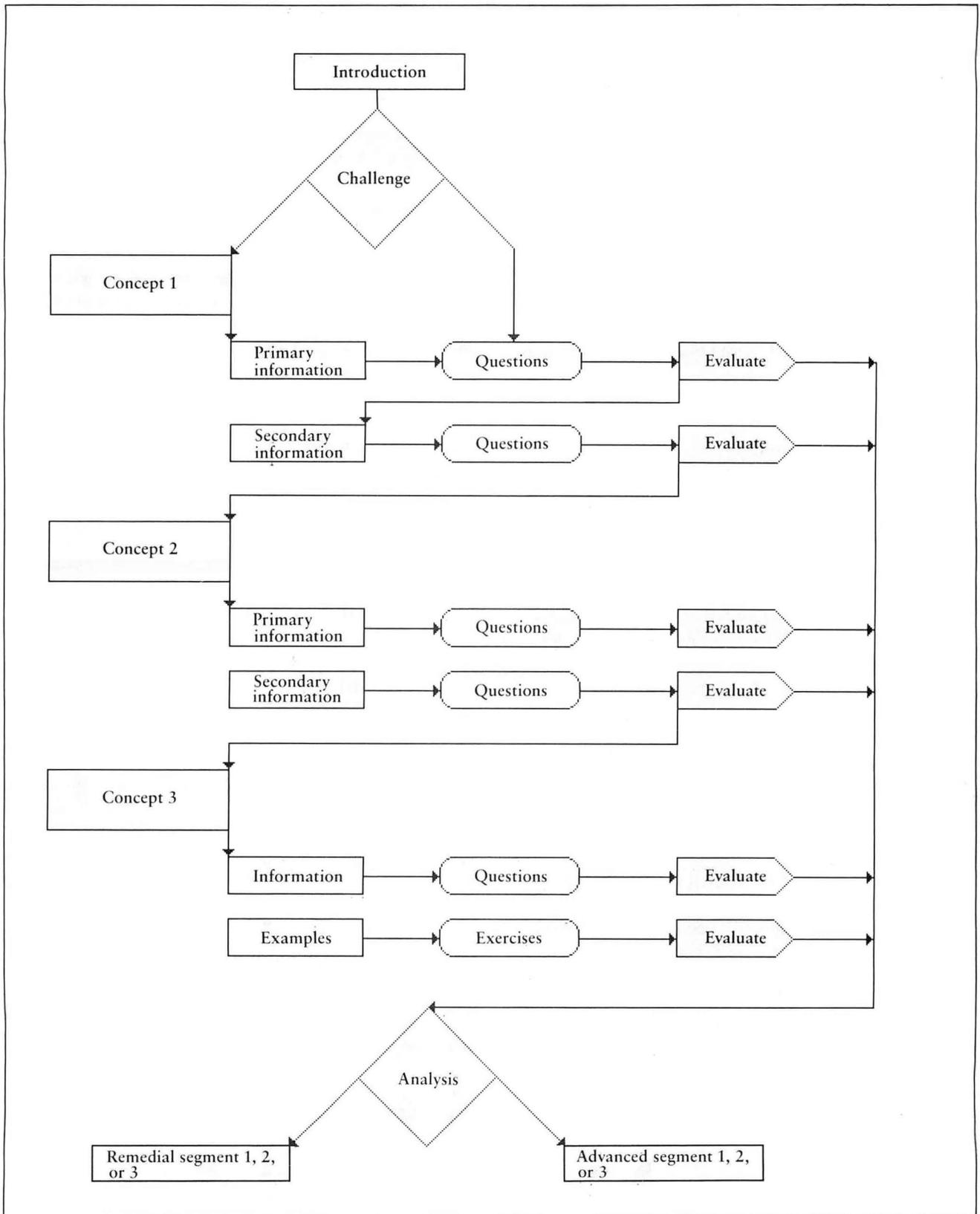


Figure 2: A flowchart for an interactive video program segment. The chart plots out materials to be covered, questions, evaluation of user answers, and the program's response. Depending on the user's answer, the machine may "branch" to remedial material or move the user on to the next segment of the program.

● State of the Art

ther shot or obtained from an existing source. (Many schools, for example, already have a wealth of videotape programs that can be integrated into an interactive program.) Text and graphics are produced by the computer to explain the subject matter; each of these presentation techniques is interwoven by the authoring system into a clear and attractive continuum of information, questions, and responses.

Most authoring systems prompt this structured presentation, but as Gloria Gery warns, "Prompts can be like training wheels; once you've mastered the authoring system, you want to take them off." Ideally, an authoring system should include prompts but be flexible enough to allow a programmer to bypass the prompts and edit the computer code generated by the system and insert additional code.

Working With Authoring

The approach to creating an interactive video program varies little from system to system, according to Bob Whitney, a pioneer in interactive video. "Creating text pages is often the first step. These are stored by page number. Then computer graphics may be generated, which help explain some concepts better than video. The next step is to find the beginning and ending addresses of each video segment. With all of this information, an author can then create interactive events that challenge the user and guarantee that the material is understood."

Not surprisingly, a variety of computer languages has been used to create authoring systems and interactive programs. Authoring systems are generally written in assembly language and, increasingly, in C. Interactive video programs developed without an authoring system have been written in Pascal, FORTH, assembly language, and Compiled BASIC.

Steve Laliberte of Educational Management Systems in Minneapolis wrote much of the McGraw-Hill authoring system. (The firm has since been bought by the publishing giant.) When he began this task two years ago, he chose UCSD p-System Pascal for its portability, the richness of its development environment, and its comprehensive software libraries. The McGraw-Hill system also includes a Delivery System disk that runs a program once it's been authored. Laliberte wrote the program in assembly language to achieve a higher execution speed than the p-System allowed. But if he were writing the same system today? Laliberte responds that he "would definitely write it in C" because of the increased portability and execution speed.

The use of graphics varies from system to system as well. Whitney's *Insight PC* can link to external BASIC programs that create graphics; other systems create medium- or high-resolution bit-mapped graphics on their own—though these require a great deal of computer memory. A common alternative is to use character graphics—the draw, line, and box functions included in the PC's upper ASCII character set.

Despite these differences, authoring systems have most of the following features in common.

Presentation. Arresting presentation is interactive video's strongest feature. Video commands, such as Show 100 to 200, tell an authoring system to show a certain frame of video when needed. Because videodiscs and videotapes have audio tracks, any section of video, text, or graphics can be accompanied by music, sound effects, or narration. Text screens can either be created by the system's text editor or by a separate word processor. Each text screen is numbered and can be retrieved with commands as simple as Text Page 2. Computer graphics, as mentioned earlier, can be generated with the system's internal routines or come from external programs, including those generated by a KoalaPad or another digitizing tablet.

Authoring systems are generally written in assembly language and, increasingly, in C.

Testing. An authoring system can create a program that accepts user responses from several different devices and in several formats. A response can be received via a keyboard, a touch screen, a digitizing tablet, a mouse, a light pen, or a keypad; the format can be multiple choice, matching, or fill-in-the-blank.

The multiple-choice form is easy to understand and commonly used in both learning and marketing programs. It can take advantage of keypads or other simple input devices, reducing the anxiety sometimes associated with computer keyboards. Like multiple-choice formats, matching requires the user to respond with only letters or numbers and accommodates the use of many different input devices. With the fill-in-the-blank format, an author's options are broader, since a program can be de-

Computer-to-Video Interfaces

Personal computers and videotape and videodisc players don't yet work together without some kind of interface device. Most interfaces are either expansion boards installed in the PC or are external boxes that connect the PC to a video device.

Universal Video Controller

Allen Communication
140 Lakeside Plaza II
5225 Wiley Post Way
Salt Lake City, UT 84116
801/537-7800

List price: \$995 (links two videotape or videodisc players to computer)

Requirements: RS-232C serial port

Model VIPc interface board

BCD Associates, Inc.
5809 S.W. 5th St. #101
Oklahoma City, OK 73128
405/948-1293

List price: \$1195

Will interface with Sony, Panasonic, and JVC videotape players and Pioneer, Sony, Magnavox, and Sylvania videodisc players

Intermedia Universal Video Controller

Cavri Systems, Inc.
26 Trumbull St.
New Haven, CT 06511
203/562-4979

List price: \$1800

Requirements: RS-232C serial port

Will interface with Sony and Panasonic videotape players and Pioneer 4000 videodisc players

Red Max Interface

Digital Controls, Inc.
5555 Oakbrook Pkwy. #200
Norcross, GA 30093
800/441-3332

List price: \$865

Requirements: RS-232C serial port

Will interface with Pioneer and Sony videodisc players and Sony and Panasonic videotape players

DiscMaster 1000

New Media Graphics Corp.
279 Cambridge St. #5
Burlington, MA 01803
617/272-8844

List price: \$395

Requirements: RS-232C serial port

Will interface with Pioneer, Magnavox, and Sylvania videodisc players

PC-500 interface board

Whitney Educational Services
1777 Borel Pl. #416
San Mateo, CA 94402
415/341-5818

List price: \$990

Will interface with Sony or Panasonic videotape players

signed to account for misspellings, synonyms, and so on and to respond accordingly. For example, a history lesson might conclude with the question, "Who was the 6th U.S. president?" If the response is "Lincoln," the program can reply "Yes, Lincoln was president, but he was the 16th." This approach teaches more effectively than the typical computer response, "Incorrect."

Applications simulation. Some interactive video programs simulate an actual applications program. For example, a spreadsheet can be displayed on the screen while a voice describes how to enter formulas. Simulations can be presented with video, computer graphics, or

an applications program. Some systems, such as McGraw-Hill's, allow any PC-DOS program to be loaded into the computer as part of a presentation.

Record keeping. An author designing a learning or marketing program may want to keep detailed records of user responses. How many people chose to see certain products or commercial properties? Which question in a test was missed most often? Most authoring systems can enroll users, track response times, and keep the information confidential.

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Software Digest Ratings Newsletter, January 1984

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Charles Spezzano, Whole Earth Software Review, January 15, 1984

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Washington DC Capital PC User's Group Vol. 3, #4

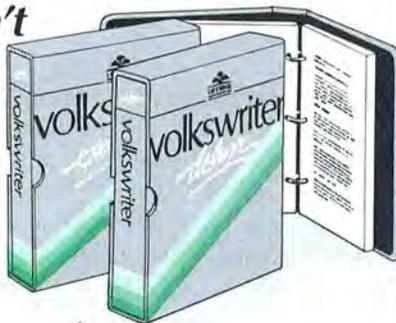
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“In sum, this is a unique word-processing program.”

John Lombardi, Reviewer, InfoWorld, April 16, 1984

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● State of the Art

Future Authoring

The growth in the personal computer business has demonstrated the need for programs that are “portable”—that can be used on a variety of systems. With this in mind, Steve Booth of Electronic Information Systems in Sandy, Utah, wrote a portable version of *CDS*, a powerful menu-driven authoring system that can also be customized by a programmer. James Schuyler had developed *CDS* in the mid-1970's, and Booth rewrote it in C for the Sony SMC-70 personal computer, later converting it for the PC in less than two weeks.

Another approach to authoring has been developed by Bill Thorpe, a consultant and instructor at Sacramento State University. Thorpe wrote one of the first in-

Each text screen is numbered and can be retrieved with commands as simple as Text Page 2.

teractive video authoring systems and believes that “the greatest potential for authoring is the coordination of video, audio, graphics, and text.” His current authoring system is like a video equivalent of *Microsoft Windows*; not only does the system assemble interactive programs, but it works as an environment that can simultaneously integrate dozens of them. Thus, instead of being confined to viewing one interactive video program, a user can change programs on a player or switch between programs on different video machines without having to re-start the system.

The opportunities created by interactive video seem unlimited; we are just now seeing the promise of the first wave of software or, if you will, videoware, that takes advantage of this remarkable tool. Though trends in anything related to computers are hard to get a handle on, it seems likely that authoring systems are moving toward greater portability, power, and flexibility—all at a lower cost. ●

Wayne Parker is an interactive video consultant and freelance writer in Sacramento, California.

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 dBase III 375.
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 Dr.LOGO (requires 192k & RGB monitor) 69.

Financier
 Financier II 115.
 Financier Tax Series 97.

Funk Software
 Sideways 45.

Hayes
 Smartcom II 99.

Lifetree
 Volkswriter 115.
 Volkswriter International 135.
 Volkswriter Deluxe (with TextMerge) 169.

Living Videotext
 ThinkTank 139.

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 1-2-3 (version 1A) call
 Symphony call

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 CAI training disk and tutorial disk*
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Compatibles Update

New and notable developments in the world of PC work-alikes

Ken Greenberg

Compatibles Update keeps tabs on the growing market of personal computers that emulate the IBM standard. The column features news on hardware and software as well as insights into the legal and marketing issues that affect compatibility. *Compatibles Update* also goes behind the headlines and talks to the newsmakers who guide this volatile industry.

Computers

For Whom the Bell Tolls

An old joke poses this naive query: Where does a 3000-pound elephant sit? (Anywhere it wants.)

The elephant in this case—AT&T—is perhaps the only creature in the corporate jungle capable of taking on IBM. This well-heeled pachyderm (with pre-divestiture revenues of \$64 billion) has chosen to sit beside Big Blue (1983 sales: \$39 billion) and perhaps on top of several smaller makers of PC work-alikes as well.

AT&T has been trumpeting the PC 6300, its PC-compatible personal computer, since the product was unveiled last June. Although AT&T Information Systems chairman Charles Marshall acknowledged then that the company's entry into the MS-DOS thicket was "a bit tardy," AT&T came out charging with this slightly redesigned Olivetti M24 personal computer that has communications options designed to tap AT&T's UNIX and networking expertise.

Conceding nothing to IBM—not even its vast installed base—Marshall and his team talked of marketing this speedy, high-resolution PC clone as a stand-alone computer or an intelligent work station in AT&T's new Information Systems Network (ISN). AT&T brass has greeted the inevitable showdown with IBM by invoking a metaphor of the Old West; says Marshall, "Welcome to the electronic *High Noon*."

Since the Justice Department carved up the phone company, AT&T has been dickering with various lights in the computer field, buying technology rather than relying on a somewhat leaner Bell Labs to develop products internally. As the PC 6300's introduction emphasizes, the elephants have taken up chess, and suppliers are the pieces: IBM acquired a 20 percent chunk of Intel—thus guaranteeing IBM first dibs on scarce chips—and AT&T paid \$260 million for 25 percent of Ing. C. Olivetti & Company of Italy, producer of the 6300. (AT&T may yet exercise its option to buy another 15 percent of the company.)

The 6300, which differs only cosmetically from the Olivetti M24, is powered by Intel's 7.14-MHz 8086 microprocessor. The machine comes with 128K installed on the motherboard, expandable to 256K (or 640K using 256K RAM chips), seven expansion slots, a 160-watt power supply, an 8087 socket, parallel and RS-232C serial ports, a floppy disk controller, a high-resolution color graphics video controller, and a clock/calendar. The entry-level 6300 features a single half-height, 360K, 5¼-inch floppy disk drive, a tilt-and-swivel nonglare monochrome graph-

ics monitor, and a detachable PC-style keyboard that sports LEDs on the <NumLock> and <CapsLock> keys. Olivetti built the keyboard to AT&T's specifications; a mouse can be plugged directly into it. The 6300 shows attention to detail; the front of the unit contains a system reset button, the disk drive doors can be locked, and the unit's footprint is two-thirds the size of the PC's.

The 6300 supports the PC's text mode and medium- and high-resolution color graphics modes. AT&T has also developed proprietary 640-by-400-pixel monochrome and color graphics. Because the video controller is located on the system board, a color monitor can be added without installing a color board.

Options for the 6300 include an Olivetti RGB monitor, a second floppy disk drive, and an internal 10MB hard disk (which leaves six expansion slots free). AT&T also plans to market a slim external 50MB hard disk drive, with its own power supply, that is coupled to the side of the machine. This "outboard" chassis features eight expansion slots, accepts a streaming tape backup unit, and costs \$2500.

Overall, the 6300 series is priced 5 percent below the PC: \$2810, for example, buys 128K, two floppy disk drives, a keyboard, a monitor, and MS-DOS; the hard disk version with 256K, MS-DOS, a keyboard, a monitor, and a single floppy disk drive lists for \$4920.

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key tronic

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AT&T breaks into personal computing with the PC 6300.

Even as AT&T made its obligatory nod to the PC standard, it began to fashion a standard of its own—by encouraging the production of 16-bit expansion boards for the 6300's two true 16-bit slots. The 6300 relies on a built-in data bus converter that enables the machine to accept 8-bit and 16-bit expansion boards. All seven expansion slots can accept the 8-bit PC-compatible boards, but two have been modified to handle 16-bit boards as well—and that means faster processing and even better performance from the 8086. Such 16-bit

boards weren't available prior to AT&T's decision to produce them.

Although the 6300 doesn't run UNIX, AT&T is offering ample links to its UNIX universe and to a number of dissimilar hosts. Foremost is the *Context Switch*, a terminal emulation package, activated by a key combination, that puts an MS-DOS session "on hold" while the 6300 becomes a work station for the 3B2/300 series supermicro running a UNIX application. The 6300 also accepts AT&T's PC Interface, a board that links PCs and PC compatibles with the UNIX-based 3B2 computer. Both the *Context Switch* and the PC Interface include file transfer capabilities, and each lists for \$100. In addition to being a key cog in AT&T's new "short bus" ISN local area network, the 6300 can work in EtherNet and Omnet LANs.

AT&T is claiming PC compatibility on four fronts: data, hardware, disk, and "human interface." Future Computing, the Texas-based market research firm, rated the 6300 "operationally compatible"—the highest of its four levels. But the 6300 lacks the dual-speed option featured on several recent 8086 machines, among them Compaq's Deskpro and Eagle's Turbo. Accordingly, some copy-protected software—games in particular—won't run. (One AT&T representative dismissed the problem, wryly noting that the 6300 isn't designed for games.) Nonetheless, Microsoft's *Flight Simulator*, the traditional acid test of compatibility, runs flawlessly. The PC 6300's initial software library includes *1-2-3*, *WordStar*, *Multiplan*, *Microsoft Windows*, *Microsoft Word*, *dBASE II*, *DR Draw*, *DR Graph*, *SuperCalc 3*, and a host of languages, terminal emulation packages, and compilers.

With the 6300, AT&T moved quickly from a negligible retail presence in the computer market to a formidable one. The machine made its debut at 250 computer specialty stores—including Sears Business Centers, ComputerLand, MicroAge, Genra, CompuShop, and Amerisource—on the day it was announced. AT&T expects to tally 1000 retail locales by year's end and plans to sell 60 percent of the machines through retail channels. (And that's without relying on its Phone Center stores.)

Compatibles Update

Checking Out NCR

Convinced that it's never too late to enter a thriving marketplace, NCR has jumped into the PC compatibles fray with both feet—and in this case the feet belong to comedian Dom DeLuise, the company's TV pitchman.

DeLuise is the most visible part of a \$20 million ad campaign designed to offset the company's somewhat belated decision to go fully into MS-DOS. NCR established an 1100-member personal computer division only this past spring, although the Decision Mate V—a dual-processor machine—has been available for more than a year.

The NCR PC comes in several configurations. The basic machine starts at \$2844 and includes an 8088 processor; 128K RAM expandable to 640K; one vertically mounted, half-height, 5¼-inch floppy disk drive; a detachable IBM-PC-style keyboard; an RS-232C serial port; a parallel port; five expansion slots for standard PC boards; and a built-in, 12-inch, nonglare monochrome monitor. Options include a second floppy disk drive, a 10MB hard disk drive, and a 12-inch, 640- by 200-pixel color monitor. NCR's modified personal computer is dubbed the PRC—Personal Retail Computer—and boasts a built-in 40-column printer and a cash drawer that allows it to replace a cash register.

NCR is packaging MS-DOS as NCR-DOS. Other standard software includes GW BASIC and three tutorials: NCR PAL, NCR HELP, and NCR TUTOR. A demonstration machine at COMDEX Spring was contentedly running Microsoft's *Flight Simulator*, bolstering NCR's tag line, "The computer company that's compatible." NCR's software library already includes such hits as *SuperCalc*, *WordStar*, *Multiplan*, and the Peachtree family of programs.

For more information contact NCR, World Headquarters, Dayton, OH 45479, 800/222-1235.

Have It Your Way

Burroughs Corporation is very big in mainframes and not very big in personal computers. The company is attempting to remedy that situation with an 80186-based modular machine called the B 25. Produced for Burroughs by Convergent Technologies, the B 25 runs under MS-DOS, CP/M-86, and BTOS, Burroughs's own operating system. Configured one way, the B 25 is an intelligent work station; another way, it's a 10MB file server in a five-node local area network; yet another way, it's a desktop personal computer, listing for \$3850.

Standard equipment includes 256K RAM expandable to 1MB, two 5¼-inch floppy disk drives, each with room for 630K, a 12-inch tilt-and-swivel monochrome monitor, and a detachable keyboard. The keyboard layout resembles the PC's but includes 18 additional function keys. Options include a 10MB hard disk, a color monitor, and memory expansion to 40MB. The system box and

memory modules, which are about the size of a hardbound *Webster's*, snap together and can be stowed up to 16 feet from a work space.

What Burroughs has achieved in flexibility, however, the company is forsaking in PC compatibility. The B 25 can read, but not write to, most PC disks. The company estimates that the machine can run roughly 250 programs for the PC, about 5 percent of the PC's total software library. But because Burroughs has clout, the software shortage may be short-lived. Lotus, for one, reportedly plans to introduce a version of 1-2-3 for the B 25 later this year.

The B 25 will eventually replace the B 20, another Convergent Technologies product, which is less powerful but carries a higher price tag. Burroughs is distributing the machine through dealers and its own sales force and intends to tailor its pitch to small business and the Fortune 1000 alike.

That audience may be seeing double, given the nearly simultaneous release of Datapoint Corporation's Vista PC. Datapoint is also marketing its version of Convergent's N-Gen computer, albeit with less of an emphasis on modularity. A Vista PC with two floppy disk drives lists for slightly less than \$4800. An additional \$2200 buys the hard disk version. (Convergent will be busy through the rest of 1984: AT&T revealed that the Silicon Valley company will be producing an as-yet-unspecified "work station" for release before the end of the year under the AT&T logo.)

For more information contact Burroughs Corporation, Burroughs Place, Detroit, MI 48232, 313/972-7000, or Datapoint Corporation, 9725 Datapoint Dr., San Antonio, TX 78284.

Looking to Morrow

Much of COMDEX Spring was abuzz about the HP 110, Hewlett-Packard's \$3000, 9-pound portable with 384K of ROM and a scad of other notable features. But the sleeper of the show may have been



Morrow's 9-pound Pivot

the Pivot, another very mobile machine, from Morrow Designs.

Also weighing in at slightly less than 9 pounds, the Pivot shares a few things with the HP 110: a CMOS 8086 processor, a 16-line by 80-column LCD monitor, and a 300-bps modem. In addition, it features two one-third-height, 5¼-inch floppy disk drives; 128K RAM expandable to 512K; a built-in clock/calendar and calculator; a flip-down keyboard

with ten membrane function keys and four icons; 480- by 128-pixel, bit-mapped graphics; a parallel port; a serial port; and a port that links the modem to phone lines. Terminal emulation software is etched in ROM, and the Pivot even displays time zones on a world map. Battery life is 5 hours on a single charge. The basic one-drive unit lists for \$2500.

The unit is heftier than a briefcase and is opened by releasing the keyboard from its upright position. The Pivot runs under MS-DOS 2.00 and accepts off-the-shelf PC programs—including 1-2-3—that do not include screen graphics routines. But even that may change; Vadem Company of

Milpitas, California, which designed the computer for Morrow, has allowed for eventual conversion to a 24-line screen.

Morrow's first 16-bit machine, the Pivot, may enable the scrappy San Leandro, California, company to leapfrog some of its competitors by placing the machine on the shelves of Morrow's 700 dealers.

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Business

The Empire Strikes Back

It was a long, hot summer for PC-compatible makers. Events collided: IBM slashed prices, forcing clone makers large and small to follow suit. Eagle teetered on the edge, while Franklin Computer—an Apple work-alike manufacturer that had just plunged into MS-DOS—slipped altogether, filing for protection under Chapter 11 of the bankruptcy laws. Gavilan furloughed 30 percent of its work force, and Vector Graphic cut staff by 20 percent. AT&T introduced its PC compatible, but the machine's emulation of the PC standard took a back seat to the marketing confrontation that it signaled.

IBM got things rolling with its first price cut in two years, reducing tags on its entire line by 18 to 23 percent—somewhat less than the 25 to 30 percent that some industry analysts had anticipated. Still, coupled with an increase in standard RAM to 256K, the reduction was sufficient to make clone manufacturers sweat.

A dozen companies, offering various rationales but painting rosy scenarios, responded immediately:

Columbia. Cut prices on its portable and desktop lines, retaining its 10- to 15-percent price advantage over IBM and stressing its commitment to software bundling.

Compaq. Trimmed prices on portables by \$500 on April 2, and in mid-June cut \$300 from the original list price of each of its four Deskpro models two weeks before the line of machines was announced. Compaq spokesperson Ken Price said that the cuts represented one of five “pricing scenarios” for the Deskpro series and were not a response to IBM’s move.

Corona. Reduced prices from 11 percent to 20 percent on all models and from 22 to 34 percent on peripherals and expansion devices. The entry price for a Corona PC is now \$1950. The firm claims it was insulated from the IBM cuts by OEM agreements, a new plant in Southern California, and its decision to farm out much of its production to a South Korean concern.

Eagle. Cut list prices on the Spirit XL hard disk portable by 17 percent and on the PC Plus II by 12 percent but left prices on the Turbo line unchanged. Eagle announced similar reductions on monitors and adapter boards.

ITT. Trimmed its list prices on Xtra models by 17 to 24 percent. ITT also beefed up RAM to 256K on intermediate models and added a model with 640K and a 10MB hard disk.

Leading Edge. Reduced the price of its basic machine by \$200 and announced color graphics capability and a hard disk option for the Leading Edge PC.

NCR. Trimmed prices by 5 to 8 percent on its new line of PC compatibles and, in a spokesperson’s words, “retained our price/performance advantage” over IBM.

North Star. Raised the price of its multiuser PC XT-compatible Dimension by 5 percent (to \$7350) and pronounced the compatibles derby over: the IBM price cuts, crowed a North Star press release (mixing its metaphors), mark “a kiss of death by slow torture for IBM clone companies.”

Seequa. Cut by 18 to 23 percent prices already as much as \$800 below IBM's and emphasized its policy of offering software with its machines.

Tava. Cut \$400 from its complete system, a reduction of 17 percent.

TeleVideo. Reduced prices by 25 percent on its line of PC compatibles.

Zenith. Cut 10 percent on its Z-150 desktop models and 15 percent on its Z-160 line of portables.

But what's behind IBM's price cut? A glut of PCs? IBM has reportedly tripled PC production, yet its retail market share has slid from 21 percent to 16 percent. After months of shortages, supply is finally catching up with demand. Word is that the company will ship 2 million units this year. IBM's ability to churn out PCs, so the thinking goes, has removed much of the consumers' motivation for turning to stopgap products, PC compatibles, which can no longer compete on price alone.

Sounds grim for the work-alikes, but consider IBM's dominance before the price cut. Future Computing, the Texas-based market research firm, recently estimated that each month the typical computer specialty store sells 20 PCs and XTs, 6 Compaqs, 3 Columbias, 2 Eagles, 2 Coronas, and a TI Professional. The corporate marketplace is even more enamored of Big Blue. Newton-Evans Research found that 95 percent of the Fortune 1300 use IBM PCs, 12 percent use Compaqs, and 9 percent each use Wangs and DEC's. (Outside the PC-compatible realm, Apple, Tandy, and HP were, respectively, the choice of 51 percent, 27 percent, and 15 percent of those surveyed.)

InfoCorp analyst Sandra Gant says, "Clone makers are probably OK for this round of price-cutting. They're still able to sell the product for more than it costs them to make it. But the next round of price cuts will be devastating. They just haven't got the volume, and their costs of production are higher. Dealers don't want another PC-compatible product."

An Emptying Nest

If one PC-compatibles manufacturer has been hitting sour notes lately, it's probably Eagle Computer. Since IBM's February lawsuit alleging that Eagle infringed on IBM's copyrighted BIOS ROM, news from the company's Los Gatos, California, headquarters has had a downbeat tone. The suit, settled by a consent decree, sent Eagle's engineers back to the drawing boards, halted shipments for two weeks, triggered a \$9.8 million quarterly loss, and resulted in layoffs for 135 employees—nearly half of the company's work force. And just as the roof really began to sag, IBM slashed prices.

In the wake of its failure to meet certain obligations, a dozen of Eagle's major creditors—including Intel, Teac, and Miniscribe—convened a committee to restructure the company's nearly \$11 million debt. At the

same time, a group of shareholders filed a class action suit alleging violation of securities laws during the company's initial public offering in June 1983. That chain of events was followed by an exodus of key executives, including six vice presidents and two members of the board. As part of the shake-up, company president Ronald Mickwee formed a Strategic Markets Group to pursue OEMs, international sales, and value-added resellers. An Eagle spokesperson said the company would henceforth be cultivating "the high-end market" and emphasizing its new Turbo line. Bright spots amid a glum summer came with major sales to school boards in Quebec and to a group in the People's Republic of China.

With 800 dealers nationwide and an installed base of some 43,000 machines, Eagle has been considered a major PC-clone manufacturer. Ironically, the company's woes increased just as its Turbo series began to enter the market.

If you're an Eagle owner, continued service should not be among your worries, according to David Hallquist of Bell & Howell, Eagle's national service organization. "Our agreement with Eagle is to support them," says Hallquist. "We've signed agreements directly with end users, [and will back them] despite what happens or what may happen to Eagle." Under a new arrangement, Bell & Howell will act as the supplier of Eagle machines for distributors around the United States, enabling

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291

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Compatibles Update

Eagle to focus on production. "We feel comfortable with Eagle," Hallquist adds, describing the company's machines as "extremely reliable."

But InfoCorp's Sandra Gant is less optimistic about Eagle's future. "Eagle machines are not moving through retail channels at all," she reports. "They've got less than 1 percent of the retail market. And once you start going down, it's so hard to pull out. Dealers don't know if you'll be around."

Software

Lotus Says Yes to Zenith

Software support from Lotus Development can represent a vote of confidence in a new machine. Consequently, officials at Zenith have reason to smile: Lotus has modified 1-2-3 for two models in Zenith's Z-150 series of PC compatibles. The popular integrated package will run on the dual-disk-drive and hard-disk-drive Z-150s, although both machines may require upgrades of the standard 128K RAM for the program. Zenith is offering additional memory in 64K increments for \$165.

Xtra Taps Mainframe

Capitalizing on its communications savvy, ITT plans to introduce a mainframe terminal emulation package for its Xtra personal computer this fall. The program, which will provide the Xtra with 3270 SNA communications to an IBM mainframe, features windows and color

and graphics capabilities and does not require a special keyboard. ITT claims that the package will permit the Xtra to run an application and fetch information from a mainframe data base simultaneously.

Fujitsu Sans Software

Fujitsu Microelectronics has shaved \$1200 off the price of its Micro 16s by eliminating bundled software. The Micro 16s, a Z80/8086-based machine, no longer includes CPM-86, GSX graphics, *WordStar*, and *SuperCalc 2*. The basic unit comes with two 5¼-inch floppy disk drives, a detachable keyboard, and an RGB monitor, and it lists for \$2795.

At the same time, Fujitsu has bolstered the software library for the Micro 16s by completing a deal with Softeam. Under the agreement Softeam will supply some 50 popular programs, tailored to run under versions of MS-DOS and CP/M for the Micro 16s, as part of its "Ready-to-Run" program. Neither firm identified the programs ripe for modification.

For information on products cited in this column for which addresses and phone numbers are not given, please consult the 1984 Annual Hardware Review.

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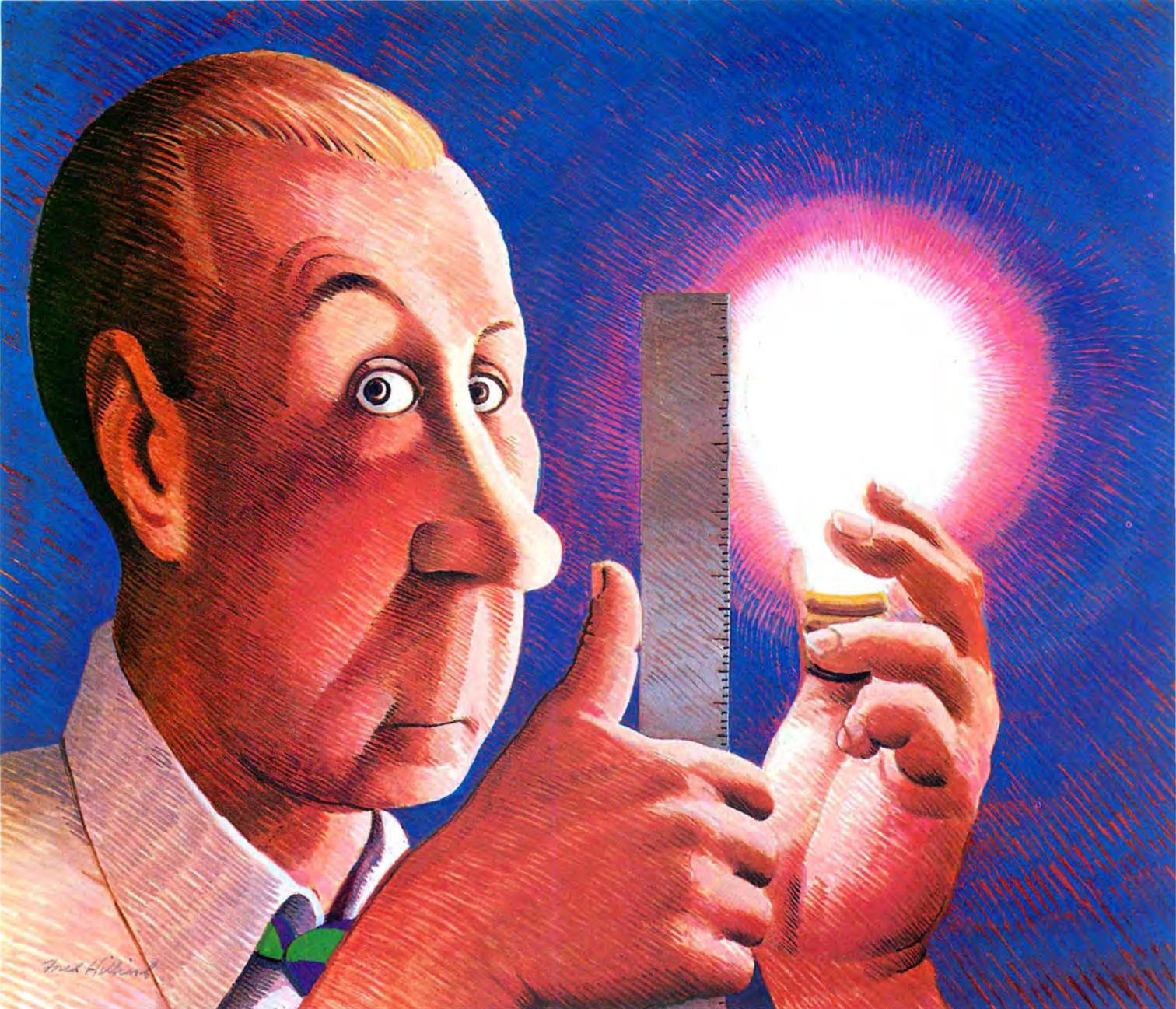
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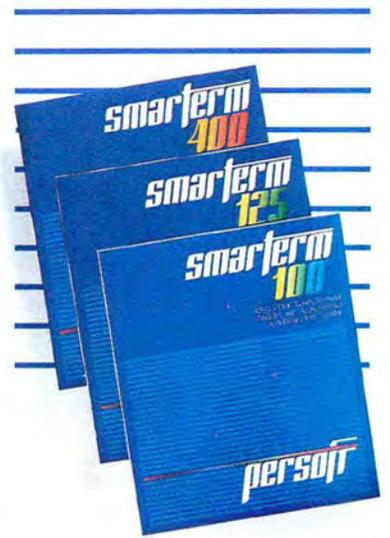
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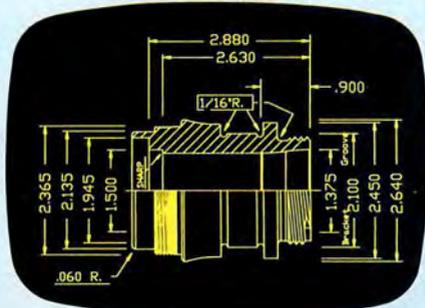
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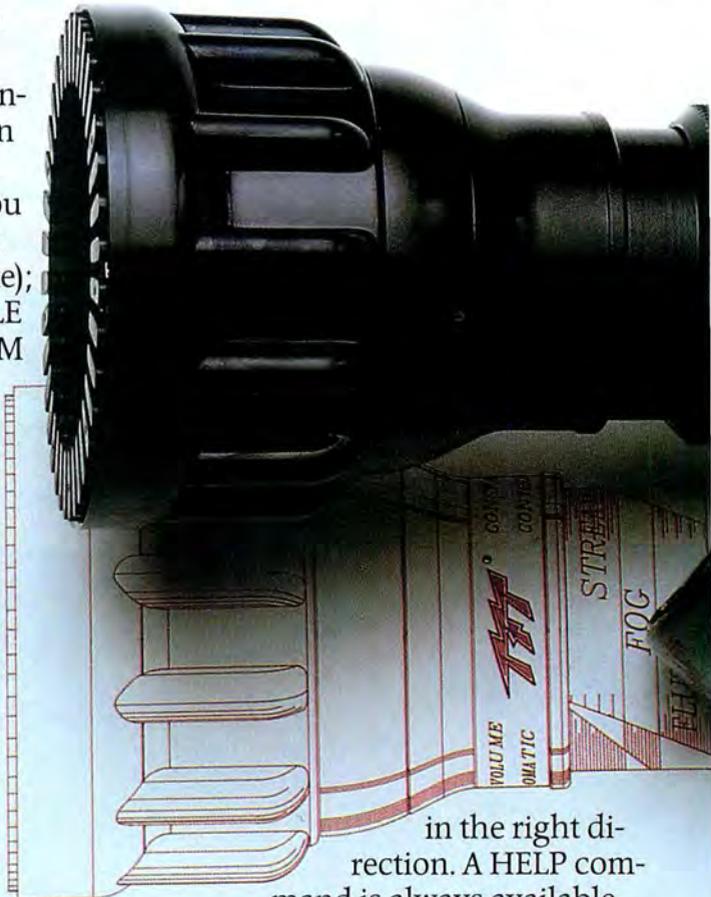
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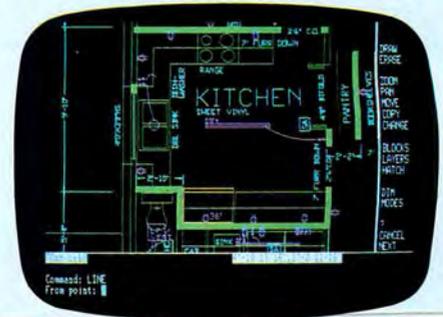
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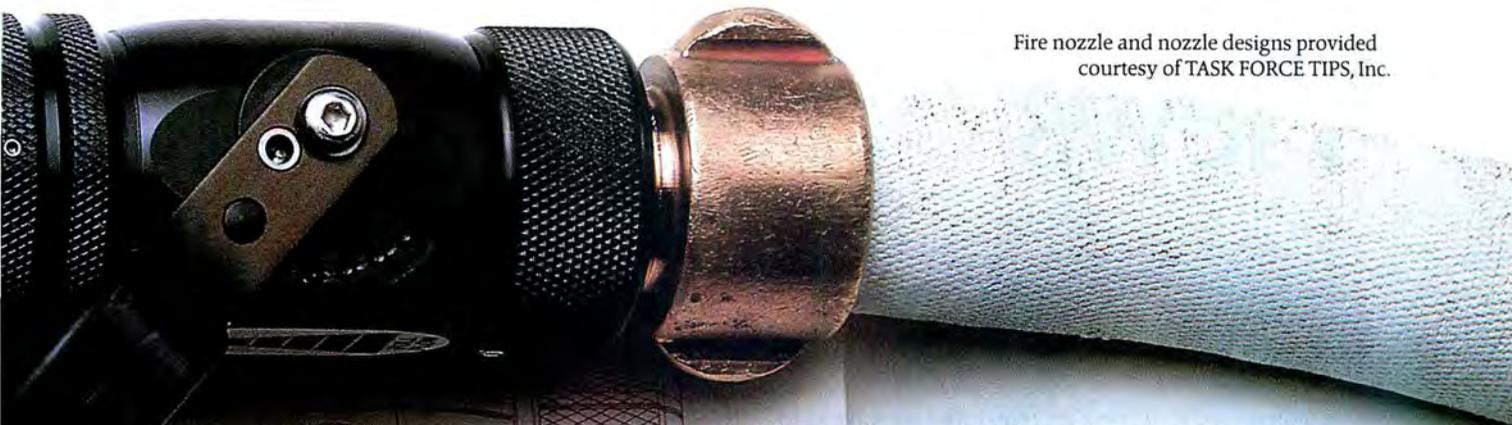


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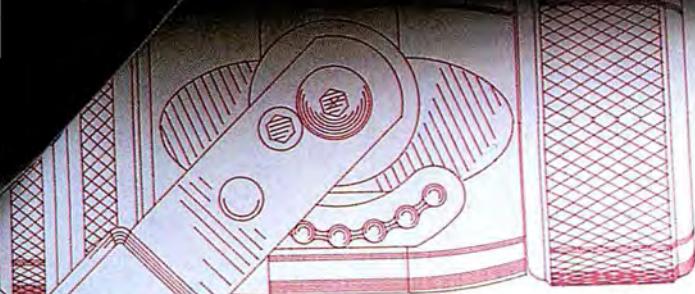


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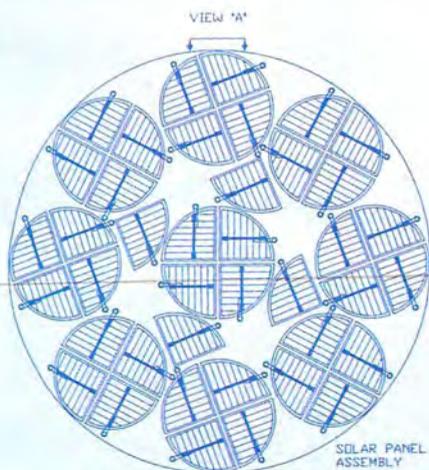
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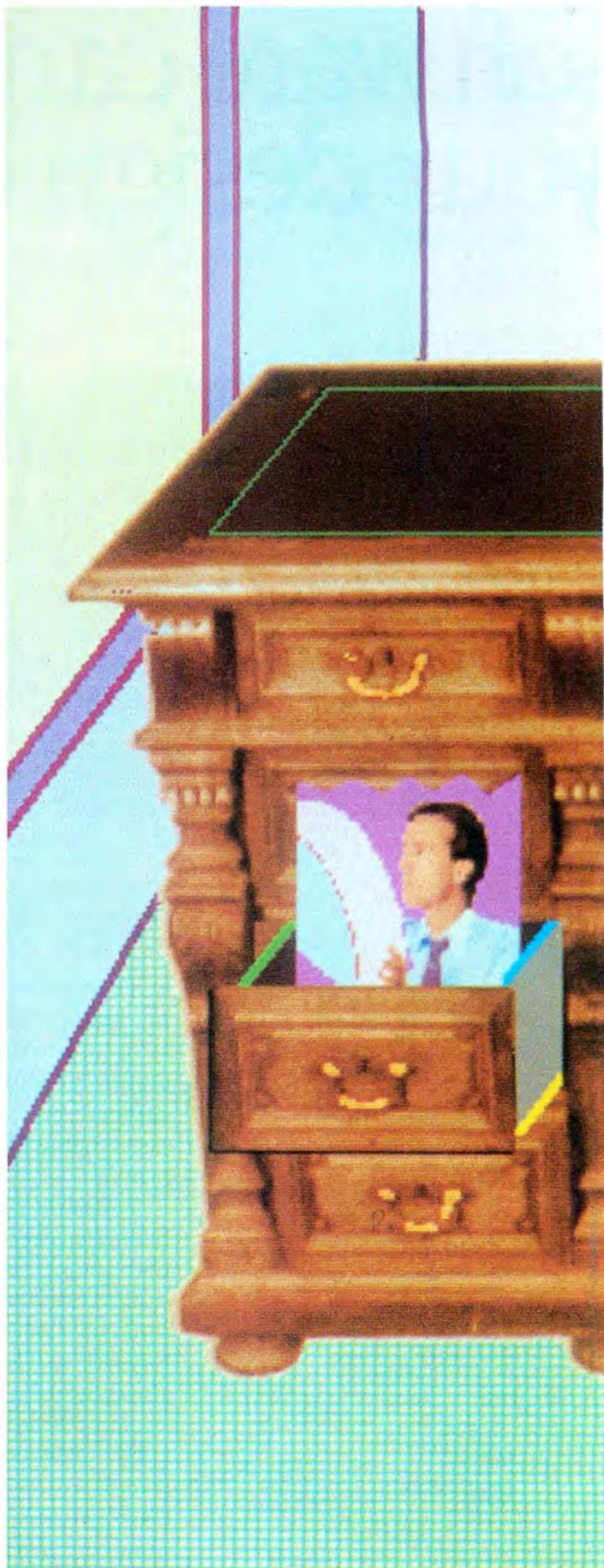
A DesQ With Nine Views

Bill Crider

One alternative to buying an integrated package is to buy a software integrator, a windowing environment that enables you to tie together software you already own. DesQ provides a tightly knit environment that integrates stand-alone applications and enhances their performance. With DesQ you can view up to nine windows at a time and quickly move and swap data between applications.

Sooner or later we all get the urge to do something our software was never designed to do. Usually the longed-for activity relates to state-of-the-art gimmicks like mice, macro languages, or windows. If you are like me, you are probably eagerly following the development of the new integrated packages, which if you believe the advertisements, will solve all the problems of the world except the common cold. You are probably also dreading having to learn a whole new set of commands and converting all of your existing data files to a new format. Wouldn't it be nice if an integrated package would allow you to keep all of your existing data files and software?

Now you can. The long-heralded but much-delayed *DesQ* has arrived. *DesQ*, like *Microsoft Windows* and *Visi On*, is a software integrator, not integrated software (see "Window Talk," *PCW*, Vol. 2, No. 7). Unlike *Microsoft Windows* and *VisiOn*, it lets you decide what will be integrated. It steps between application programs and DOS, the operating system software, and adds advanced





Review

capabilities to existing stand-alone software. The programs you already own can be used in new and exciting ways. All you need is a hard disk and 256 extra kilobytes of RAM for *DesQ* to step into. A mouse is a desirable addition, but it is not necessary.

Windows and Mice

All *DesQ* menus are displayed in windows, as are the applications you are running (see Figure 1). An application that addresses the screen directly instead of through standard DOS function calls takes over the full screen when it is active. When not active, such an application can occupy a smaller window.

You can keep up to nine program windows open at a time, plus menus and help screens. Moving from window to window takes only two keystrokes (or one mouse

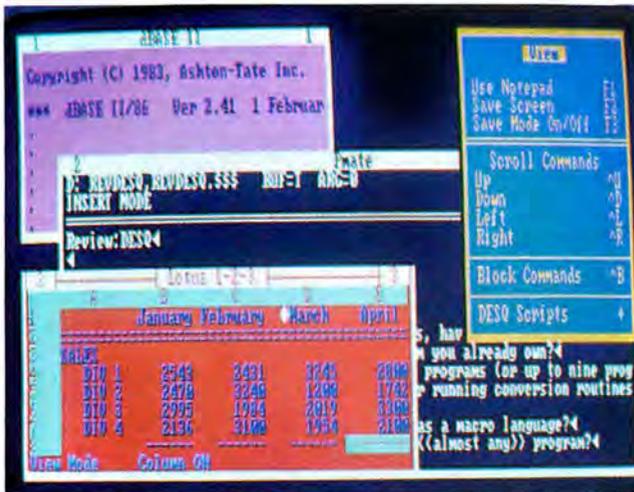


Figure 1: The main *DesQ* menu with *dBASE II*, *1-2-3*, and *PS Technical Word Processor* displayed simultaneously. *DesQ* integrates stand-alone applications software and upgrades it with windows, mouse support, macros, and help screens.

click). Program execution halts in the window you leave and picks up exactly where you left off when you select that window again.

There are nine possible default window locations to choose from—top half, bottom half, top third, bottom right, and so forth. Once a window is open, you can move it anywhere on the screen. You can also change its size, selecting any measurement from one character to a full screen. Windows can overlap and can take advantage of the default colors used in most programs. Changing the colors is easy; you just move the cursor to the color you want in *DesQ*'s Change Color menu and press <Enter>.

There are some limitations to *DesQ*'s windows. If you display different parts of a single file in separate windows, *DesQ* does not automatically update one window when changes are made in the other. For example, I used the *Word Proof* spelling checker to check this review in one window and then returned to another window where I was editing the same file with my word processor. When I saved the file in the second window, all the spelling corrections were lost. If I had saved the other file first, my spelling corrections would have been intact, but the editing I had done with the word processor would have been lost. Also, if an application uses fixed temporary file names, data from one window can accidentally be inserted into another window or into a saved file if the other file has the same name.

DesQ supports mice from three manufacturers: Microsoft, Mouse Systems, and Logitech. Use of a mouse is optional; you can execute any command from the keyboard. Using a mouse is usually faster for the beginner, but an experienced *DesQ* user may find the keyboard faster. Since you can give commands faster with a keyboard than the screen can display results, you can skip menus. With a mouse, you click along one menu at a time. If an application does not support a mouse, you can teach it mouse commands using *DesQ*'s Setup Agent menu.

You can use a mouse to move the cursor, point to menu choices, scroll the screen, and copy words or letters. For both two-button and three-button mice, button 2 is devoted to calling *DesQ* menus. Click button 2 once to bring up the menu for the program you are using, twice for the main *DesQ* menu. Once inside a menu, button 1 is used to select menu options and to move to other menus or windows. Placing the mouse cursor at the top border of a menu and clicking button 1 brings up the next menu. Placing the cursor in another window and clicking button 1 activates that window.

Scripts

Instead of using macros to make program operations automatic, *DesQ* uses a similar method called "scripts." While you are in *DesQ* or an application controlled by *DesQ*, you can go into the Learn mode by typing an equal sign from any menu. You will be prompted for a script name and a one- or two-letter identifier. After you supply the name and identifier and press <Enter>, all further keystrokes will be stored in a script file. While you are in the Learn mode, the sound of the key click changes to remind you that you are typing a script. Mouse commands can also be used in a script file, but the documentation warns that there may be some cases in which they will not work perfectly.

DesQ enables you to put a pause in a script so that the user can type in data. You can end the script by typing another equal sign and selecting the Finish Script option. To implement the script, select the menu you started from and type the identifier. The series of commands will usually be executed exactly as you entered them. Some programs have unusual values for a variable called Number of Times to Test; these values prevent script implementation. *DesQ* provides a trial-and-error method of fixing the Number of Times to Test variable; the method worked fine for all the programs I ran except the *PS Technical Word Processor*. *PS* directly addresses the screen and memory, apparently causing scripts and mouse cursor positioning to be erratic. Otherwise, the Learn command and *PS* performed perfectly.

Scripts are excellent keystroke savers. Suppose you frequently use *MultiMate* and *dBASE II* at the same time. You can set up a script that loads *MultiMate* into a window on the left side of the screen, configures it the way you want it, pauses to let you type in a file name, loads the file, loads *dBASE II* into a window on the right side of the screen, pauses to let you type in the name of a program, and then begins running the program. All this can be accomplished with one keystroke.

Another useful script could search and replace multiple strings using a word processor. You could set up a list of any number of words, search and replace them in one file, then press two keys to search and replace them in another file.

You can also create demonstration programs for software using scripts. Simply save an entire session as a script, with appropriate pauses. When someone plays the script back, the program will seem to be running itself. It is surprising that the manufacturer, Quarterdeck Office Systems, did not use this feature to create a tutorial or demo for *DesQ*.

	January	February	March	April	Quarter Totals
SALES					
DIV 1	2543	2431	3245	2800	11019
DIV 2	2470	3240	1200	1742	8652
DIV 3	2995	1904	2019	3300	10298
DIV 4	2136	3100	1954	2100	9290
TOTALS	10144	10755	8418	9942	39259

Figure 2: Since it addresses the screen directly, 1-2-3 takes up the entire screen when active. To move information to another application, first mark the block.

Swapping Data

One of the drawbacks of stand-alone programs is that the data files they produce usually are not compatible with other applications. Some programs attempt to overcome data incompatibility by allowing you to save a file in a number of standard formats or by providing external utilities to convert data files to a format readable by the application. Such conversion is usually one-way. Even when two programs have compatible formats, moving



Figure 3: *pfs:write* with the Mark & Transfer menu. To move the block from 1-2-3, position the cursor in the appropriate spot and press <Alt>, T, and <Enter>.

data between them is not easy. You have to save the file, exit the program, load the new program, and reopen the data file.

DesQ allows compatibility and quick data transfer between most popular programs by capturing information from one window and moving it directly to another window. You can leave both programs loaded and don't have to fiddle with one-way conversion programs—transfer can go either way. The only limitations on the transfer process are purely logical. For example, you can't transfer a graphics image into a word processor that expects only ASCII information.

Suppose you want to transfer a block of monthly report data from 1-2-3 to a letter you are writing with *pfs:write*. First select the window that contains 1-2-3 (see Figure 2). Since 1-2-3 addresses the screen directly, the application will take over the full screen. Mark the beginning and the end of the block with two keystrokes for each mark. Depending on an option you chose from a previous menu, the block either will be a rectangle defined by the two marks (column mode) or will consist of the lines between the two marks, extending all the way to the right margin (stream of text mode).

Review

Next select the *pfs:write* window. Move the cursor to the location where you want the data inserted and press <Alt>, T, and <Enter> (see Figure 3). (Notice that you do not press <Alt>-T in combination, but <Alt> and then T. In *DesQ* you press <Alt> and then release it to initiate *DesQ* commands.)

DesQ will go to the 1-2-3 window and execute a series of commands at lightning speed. Then it will go back to the *pfs:write* window. The data will be entered into the *pfs:write* file as though you had typed it at the keyboard (see Figure 4). The whole transfer can be accomplished in 35 seconds with two mouse clicks and five keystrokes.

Another way to swap data between applications is to use the *DesQ* Notepad. The Notepad is a mini word processor that you can use to make notes, capture data, and edit blocks of data that are to be transferred between applications. If you want to transfer data from one program to another and modify it in the process, you can transfer it to the Notepad, edit it, and then transfer it to the destination program. If your communications program does not have a capture mode, you can use the Notepad to make a record of an entire communications session for later review.

DOS Support

If your software does not support DOS 2.00 subdirectories, you are in for a treat. *DesQ* enables you to create subdirectories by assigning drive names to directories. When you want to find a file, give the program the subdirectory's assigned drive name instead of a path. You can assign up to 16 "logical drives" and use them from within any application.

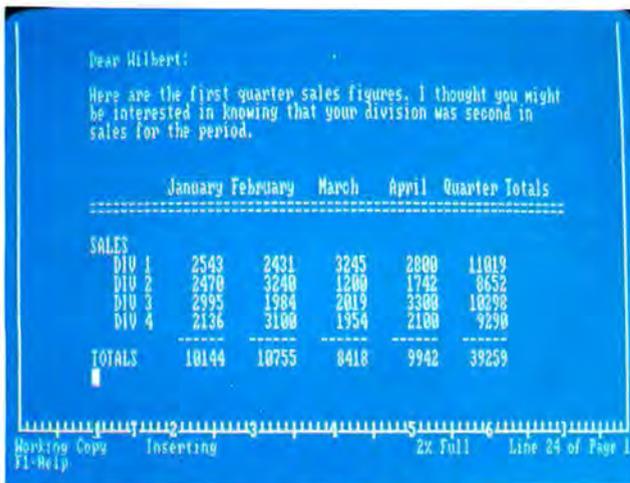


Figure 4: The *pfs:write* window after the move is complete. The transfer process shown in Figures 2, 3, and 4 required five keystrokes and took 35 seconds.

One problem I frequently encounter is the need to format a data disk while I am still inside an application. *DesQ* solves this problem with a menu called the File & Print Directory, which enables you to execute 26 DOS commands (see Figure 5). The DIR command is greatly enhanced. You can scroll the directory up and down; mark multiple files to copy, erase, or print; sort the directory on one or two keys; and leave the directory in a window for reference while using another window.



Figure 5: Twenty-six DOS commands can be called from within *DesQ* or any application with the File & Print Directory menu. *DesQ* improves on DOS's DIR command by allowing sorts on multiple keys, marked copying and erasing, and vertical scrolling within the directory.

Custom Help Screens and Menus

DesQ provides an abundance of help screens. These handy references are available for every menu in *DesQ* (see Figure 6), and some menus have two or three. All you have to do is type a question mark (or click the mouse on the title of the menu), and you are rewarded with ample information for any command. If you ask for help at a main menu, the help feature stays active as you move to submenus. Help is deactivated at your request or when you execute a command.

If you are not satisfied with the help screens in *DesQ* or in an application, you can create your own. As part of the install function, you can name text files to use as help screens inside an application. You can create custom help screens for any software that runs under *DesQ*. If there are commands you have trouble with in BASIC, for example, you can put an explanation in a help screen that will be just two keystrokes away when you need it.

DesQ automatically creates a program menu for each program you install. As part of the Learn function, *DesQ* provides a menu editor that can customize program menus. You can put any program command in the program menu as a script. If you have a series of frequently executed commands, you can create submenus to call from the program menu. For example, using scripts and submenus, you could make your own style sheets in *WordStar* similar to the style sheets provided by *Microsoft Word*.

These features are certain to spur entrepreneurs to design custom systems for offices. Suppose you have written a legal billing package. Using *DesQ* you could package it with a spreadsheet, a data base management program, and a word processor optimized for legal offices. The menus and help screens could even include your customer's company name.

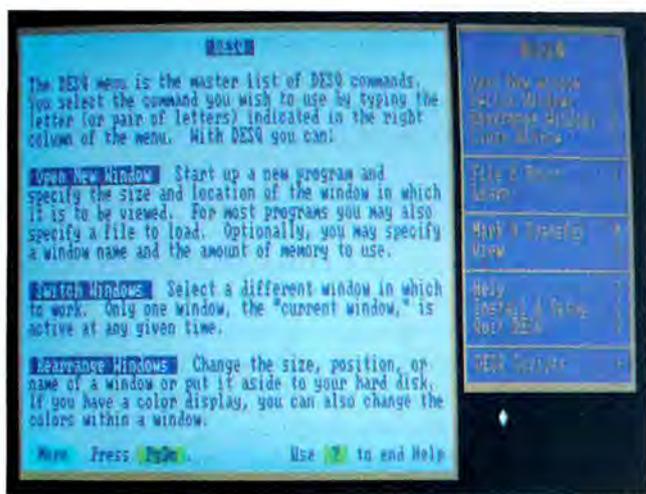


Figure 6: The *DesQ* main menu and a help screen. Help screens are available for every menu in *DesQ*. You can also create custom help screens for any application that runs under *DesQ*.

Installing Software

You can install applications in *DesQ* in two ways: with Agent Support Packages provided by *DesQ* or with agents you create yourself. An agent is a data file that tells *DesQ* what an application requires and what the application does. For example, you would tell the agent how much memory a certain program requires and how to mark blocks, control the cursor, save files, and perform other operations.

Agent Support Packages are programs created by Quarterdeck that are configured for specific applications. They usually include specialized menus and help screens. The Agent Support Packages currently available are listed in Table 1. (Agent Support Packages are designed for particular versions of the software they support, so if you have a version of the application program different from the one supported by the package, you cannot use

the Agent Support Package.) You can modify almost all the elements of an Agent Support Package after you have installed it. I used the Agent Support Packages for *dBASE II*, *WordStar*, *Multiplan*, *pfs:write*, and *1-2-3*, and they worked quite well.

Creating an agent for a program for which no Agent Support Package is available is a little more time-consuming—it takes about 10 minutes. You must manually enter the memory requirements, the program name, and the path and then “teach” *DesQ* the cursor controls, the method of scrolling, the method of marking blocks, the methods of transmitting and receiving data, and other miscellaneous information for the application. This process is similar to developing a script. You tell *DesQ* what function you are defining by choosing a menu selection, and then you enter the proper commands (CursorRight, for example). During this process you can also modify the application to support a mouse while running under *DesQ*.

I expected programs installed under *DesQ* to run more slowly than normal. Happily, this is not the case. I ran several benchmarks under *BASIC*, *1-2-3*, *Multiplan*, and *PS*, and I could discern no decrease in speed. Speed seems to be a problem only when *DesQ* is operating outside an application. The more windows you have, the slower *DesQ* moves between them. Large blocks of data transfer more slowly than small ones.

Documentation

When I first saw the *DesQ* documentation, I was so intimidated I almost refused to read it. The *User's Guide* is 3 inches thick. Fortunately, it is primarily a reference. Quarterdeck also provides a *Getting Started Guide*, which is much less intimidating. It is simple and easy to read and includes a hands-on preview of the program.

Once you have grasped the concepts used in *DesQ*, the *User's Guide* is also simple. The chapters follow the order of the main menu. There are many illustrations and step-by-step examples of each command or procedure, plus a detailed, useful index. Complete descriptions of all Agent Support Packages and all error messages are also provided. Possible problems you may encounter are set off in boxes.

Bugs, Gripes, and Kudos

This description of *DesQ*'s features may have led you to suspect that I think *DesQ* is the ultimate program. Not so. It has its share of bugs and problems. When I used the File & Print Directory menu to look at the directory of a DOS 1.10 disk, the system froze. I could not isolate the exact cause, but it only happens when you format a

Software Package	Releases Supported
dBASE II (Ashton-Tate)	All releases through 1983
Fast Graphs (Innovative Software)	1.1, 1.11
1-2-3 (Lotus Development)	1A
MultiMate (MultiMate International)	3.11, 3.20
Multiplan (Microsoft)	1.06
pfs:file (Software Publishing)	All releases through 1983
pfs:report (Software Publishing)	All releases through 1983
pfs:write (Software Publishing)	All releases through 1983
SuperCalc/SuperCalc2 (Sorcim)	1.12, 1.0
SuperCalc3 (Sorcim)	1.0
VisiCalc (VisiCorp)	1.2
WordStar (MicroPro)	3.2, 3.24, 3.3

Table 1: Software currently supported by DesQ Agent Support Packages. Agent Support Packages teach DesQ how a particular application works. The packages work only with the specific releases of the software listed here.

disk with DOS 1.10, scroll the directory window, and then ask for help. Under those circumstances the program sometimes crashes when you return to the main *DesQ* menu.

I also crashed the program when I tried to use *Microsoft Word*, release 1.1. The application behaved just fine until I tried to return to the main *DesQ* menu. Then the program froze and could only be exited by turning the computer off. Quarterdeck informs me that *Microsoft Word*, release 1.0, works fine under *DesQ*, and the company is working with release 1.1. Since every hang or crash I experienced occurred when I tried to use the main *DesQ* menu, I strongly recommend that you make a practice of updating your data files before using that menu.

The *Getting Started Guide* warns that some software will not run under *DesQ*. I don't mind that too much. What bothers me is that some software appears to run but crashes when you try to leave the window, taking any other windows and files you may have opened with it. In order to save users this frustration, *DesQ* should test each application and not let you open it if it will not be supported. Some of the packages I tested that do not run properly with *DesQ* are *Microsoft Word*, release 1.1, *Ultra Utilities*, *Benchmark Graphics*, *PC-Talk*, and *Chart-Master*.

The documentation warns that an application will probably not run under *DesQ* if the program requires a specific memory location. Limitations are imposed upon programs that do not use standard ROM BIOS function calls for the keyboard or the screen. If they run at all, they will probably work only in full-screen windows and might not be able to run scripts.

I am also disappointed that *DesQ* provides only 12 Agent Support Packages. Surely it would not take too much effort to create agents for IBM BASIC, several popular communications programs, and a few more data base management programs. Quarterdeck says it is work-

ing on new Agent Support Packages, and it has an interesting plan for distributing them. Quarterdeck intends to develop new packages and to accept packages developed by publishers and users. Then it will put the new Agent Support Packages on a telephone data base service for users to download without charge.

Despite its problems, *DesQ* is an excellent piece of software. It deserves praise for its ability to integrate and upgrade existing software. This gives users the benefits of integration without requiring them to give up the features of their stand-alone applications. Even the best integrated packages cannot claim to have the full features in each application found in stand-alone packages.

Furthermore, Quarterdeck has done a good job with the help screens and documentation. Commands are consistent throughout the program; any given key-stroke always does the same thing. And programs running under *DesQ* perform with no speed degradation.

I wouldn't recommend *DesQ* for the novice. You should become familiar with using a computer and application software first. You should get *DesQ* when you start saying "I wish I could..." ☉

Bill Crider is a computer training consultant and freelance writer living in Tucson, Arizona.

DesQ: The Multiwindow Software Integrator, release 1.0
 Quarterdeck Office Systems
 1918 Main St. #240
 Santa Monica, CA 90405
 213/392-9851
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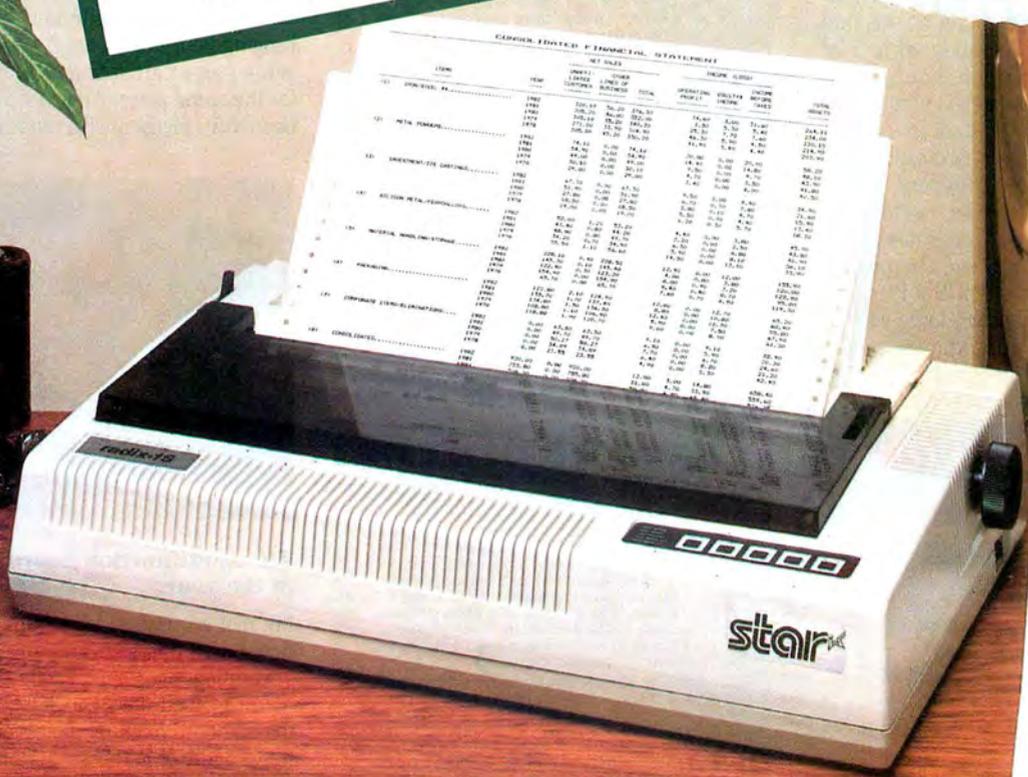
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Up close, multifunction boards look no more complicated than a map of San Francisco.

Glossary

A guide to multifunction board terminology for English-speaking people.

Please excuse the small type. But it was the only way we could squeeze all of these multifunction board basics on two pages. Besides, small type excites some people. So let's get down to business.

Multifunction board. A circuit board that fits into one I/O (input/output) slot and does more than one thing. This ad is about multifunction memory boards—extra RAM, some I/O ports, and other features. There are also multifunction graphics boards. We'll have to save them for another ad.

Memory. The new PC's and the XT have room on the motherboard for 256K. But they can address (a.k.a. find, locate, call up, cope with) 640K. The best multifunction boards have room for an additional 384K. 384K + 256K = 640K. You can add the memory in 64K blocks as needed.

Serial port. a.k.a. "async" or "asynchronous communications port," or "asynchronous adapter." You can hook a mouse, a plotter, a serial printer or any other serial device to this port. A serial device is a gadget that communicates with the computer one bit at a time. Just follow the instructions and the electrons will take care of the rest.

Parallel port. Most printers used with IBM personal computers connect via a parallel port. Parallel devices are gadgets that communicate with the computer eight bits at a time.

Clock calendar. Turn your computer on and it knows what day and time it is. Which is more than you can say for a lot of us when we wake up in the morning.

Game port. Where you plug in your joystick.

Local Area Network (LAN). All of the circuit boards, cables, connectors, and software you need to tie a few IBM's together in one office.

Networking interface. The Orchid BLOSSOM comes with a networking interface. That means that when you slap a PCnet daughterboard on top of it, it knows what hit it and what to do about it.

User transparent. PCnet is user transparent. Each user treats the network as if it were his/her own huge computer with a whole lot of disk drives and memory. There are no complex formulas for going from using only your own computer to using the network.

File allocation table locking. Since DOS is single-user, networks need to protect against cross-locking files on public volumes. PCnet does this by insuring that each disk write request sees a fresh copy of the File Allocation Table. This enables two or more users to write at the same time, and eliminates the need to pre-allocate database files.

Diskless capability. An option with PCnet. Buy this ROM chip. Plug it on to PCnet. Put PCnet into an IBM without any disk drives or disk controllers and boot directly from the file server.

PCnet TALK. Communicate easily with your fellow networkers. Your message on one half the screen. Their message on the other half.

Disk partitioning. On both BLOSSOM and PCnet software. This program allows you to partition any hard disk into multiple volumes, which you treat like extra disk drives (maximum 16 per PC). In addition you can designate any of these volumes as public or private. Keep your public files public and your private files private.

RAM disk. On BLOSSOM, Quadboard, SixPakPlus, and PCnet software. RAM disk lets you designate part of the available memory as additional disk drives. But these "drives" are electronic. In other words, they're fast.

Disk cache. On BLOSSOM, Quadboard, and PCnet software. Disk caching stores frequently used data in RAM. It is an intelligent RAM disk. When your program looks for a data file it first looks at the cache. If the data isn't there it gets it from the drive, and pulls it through the cache, leaving a duplicate there for future quick access. When you save data, a copy is automatically written to the cache at the server PC which flushes the changes back to the disk every 1 to 60 seconds (you choose). You don't have to wait while your data is being written to the disk. The server PC takes care of it.

Print spooler. On BLOSSOM, Quadboard, SixPakPlus, and PCnet software. A print spooler (a.k.a. printer buffer) lets you dump output to the printer as a background process. First the PC dumps the output to the spooler's RAM buffer at high speed. Then the spooler delivers the output to the printer as fast as the printer can take it. You're already back to work at some new project while the printer's still chugging along.

able to do things like: 1. input new data while the printer is outputting hard copy; 2. pretend you have additional disk drives; 3. have faster access to frequently used programs or files; and, 4. automatically back-up your data to a hard disk every few seconds.

Those are some of the reasons why multifunction boards are the hottest thing since the push-button phone. But if you want to be able to go to parties and talk about your new "multifunctionboardwith384KofRAM,parallelport,serialport,clock-calendar,RAMdisk,diskcaching,printspooler,andnetworkinginterface" and actually understand what you're saying, you may have to refer to the very fine print in the glossary. So, whenever you see a term you don't understand, try the glossary.

Which ones work?

PC Connection has sold thousands of multifunction boards. Our two most popular ones have been AST's SixPakPlus™ and the expanded Quadboard™ from Quadram. They both offer a very attractive combination of ingredients: up to 384K of additional RAM, serial port, parallel port, clock calendar, RAM disk, and print spooler. The Quadboard also has a game port, disk caching software, and a "connectall" bracket for arranging your cables neatly. AST offers a game port as an option. We sell both boards for the same price. And our customers have been very pleased with their performance.



The multifunction board breakthrough of the year.

My real inspiration for writing an ad is the new board that just came out from Orchid Technology.

It's called the BLOSSOM™ and it has all the standard features mentioned above, like up to 384K of RAM, serial port, parallel port, clock calendar, RAM disk, print spooler, and disk caching.

me about multifunction I'll write an ad."

—DAVID HALL, C.E.O.
PC CONNECTION



Networking lets your PC's share data, peripherals, and their deepest, darkest, secrets.

But, unlike any other multifunction board, BLOSSOM is designed so that you can piggy-back a networking board on top of it. Without using an additional expansion slot in the PC. (In the picture, that's the BLOSSOM Board on the left and Orchid's PCnet™ piggy-back board on the right.)

At last we have one multifunction board that answers all the needs of your typical basic business PC in just one expansion slot. And it's actually less expensive than SixPakPlus or the Quadboard. To me that's very impressive.

Networking simplified.

If they gave awards for the computer word-of-the-year, "networking" would be a strong candidate in 1984. It seems that suddenly everyone who owns one PC wants to own two or three or more. And they want those PC's to cooperate—sharing data, printers, disk drives, and even in-house software. Networking saves time. And it saves money.

Orchid Technology has been one of the leaders in networking ever since they developed the very effective, low cost Local Area Network (LAN) called PCnet.

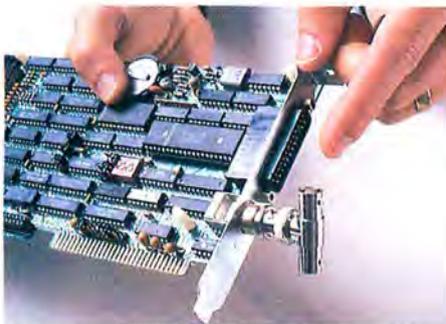
You see other manufacturers selling PCnet as their own product because Orchid licensed it to them. But now you can get Orchid's version along with their most up-to-date version of PCnet software, directly from us. Either alone or, better yet, sitting on top of the Orchid BLOSSOM multifunction board. The picture at the upper right shows how Orchid's new compact PCnet "daughterboard" slips right on top of a set of gold-plated pins on the BLOSSOM board. The coaxial connector for networking is there on the BLOSSOM board, at the right.

Networking complicated.

If you've done some research into networking you know that each system has its own complexities. Orchid's PCnet has a strong reputation for its simplicity and low-cost. PCnet 2.4, the new PCnet software available only on the Orchid versions, puts PCnet right up there as far as speed goes.

The key is intelligent use of PCnet 2.4 software—RAM disk, disk caching, partitioning, print spooling, and multi-sector I/O, all of which can work together to keep your data and programs where you want them, for faster access when you want them.

On closer analysis, PCnet turns out to be a very powerful LAN at a very low price. Other features include: diskless capability,



There's your coaxial connector for networking, right on the BLOSSOM board.

PCnet TALK, and true public file sharing via an automatic File Allocation Table (F.A.T.). Best of all, PCnet is so user transparent, and Orchid's new manual is so straightforward, that it can cure your most computer-timid employee of networkphobia. I promise!

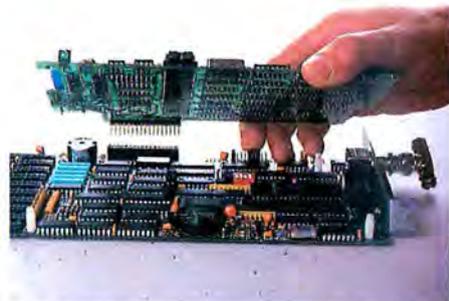
(Networkphobia is not in the glossary—but most of those other fancy words are.)

E Pluribus Unum.

Of the many multifunction boards on the market, I'd definitely choose the BLOSSOM. Because, as far as I'm concerned, if there's one thing in the future of most PC's, it's networking.

1-800/243-8088

For the IBM-PC exclusively. 291



Orchid's PCnet "daughter board" slips right on top of BLOSSOM.

If networking doesn't interest you, the Orchid BLOSSOM is still a powerful multifunction board. And it looks like there are some other impressive "daughterboards" coming down the Orchid R&D pipeline that you could add on later.

And now that I've written this ad, I'm ready to answer some more questions. About the BLOSSOM, SixPakPlus, Quadboard, other multifunction boards, and/or the other hundreds of hardware and software products PC Connection has for your IBM-PC. Just call.

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Optional game port.....39

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Orchid

BLOSSOM, 0K.....199

BLOSSOM, 64K.....259

PCnet daughterboard.....call

PCnet BLOSSOM (64K BLOSSOM

with daughterboard installed)....call

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note: other cable lengths are

available

Diskless boot ROM.....69

Memory

Additional 64K upgrades for

any board.....59

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Personal n

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more people using the same printers, plotters and disk storage, the cost goes down. And you can afford better peripherals. So the content and appearance of your work improves.

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you, individually, far more productive. Multiply that extra efficiency by everyone in the network, and productivity increases company-wide.

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Ethernet has been widely adopted by computer companies as a networking standard. And we've made it even better with the hardware and software packages that make up EtherSeries. Our approach is the choice of Hewlett-Packard, Texas Instruments and Zenith for their own network products. As well as hundreds of companies using IBM PCs and most compatibles, such as COMPAQ,™ TeleVideo™ and Eagle.*

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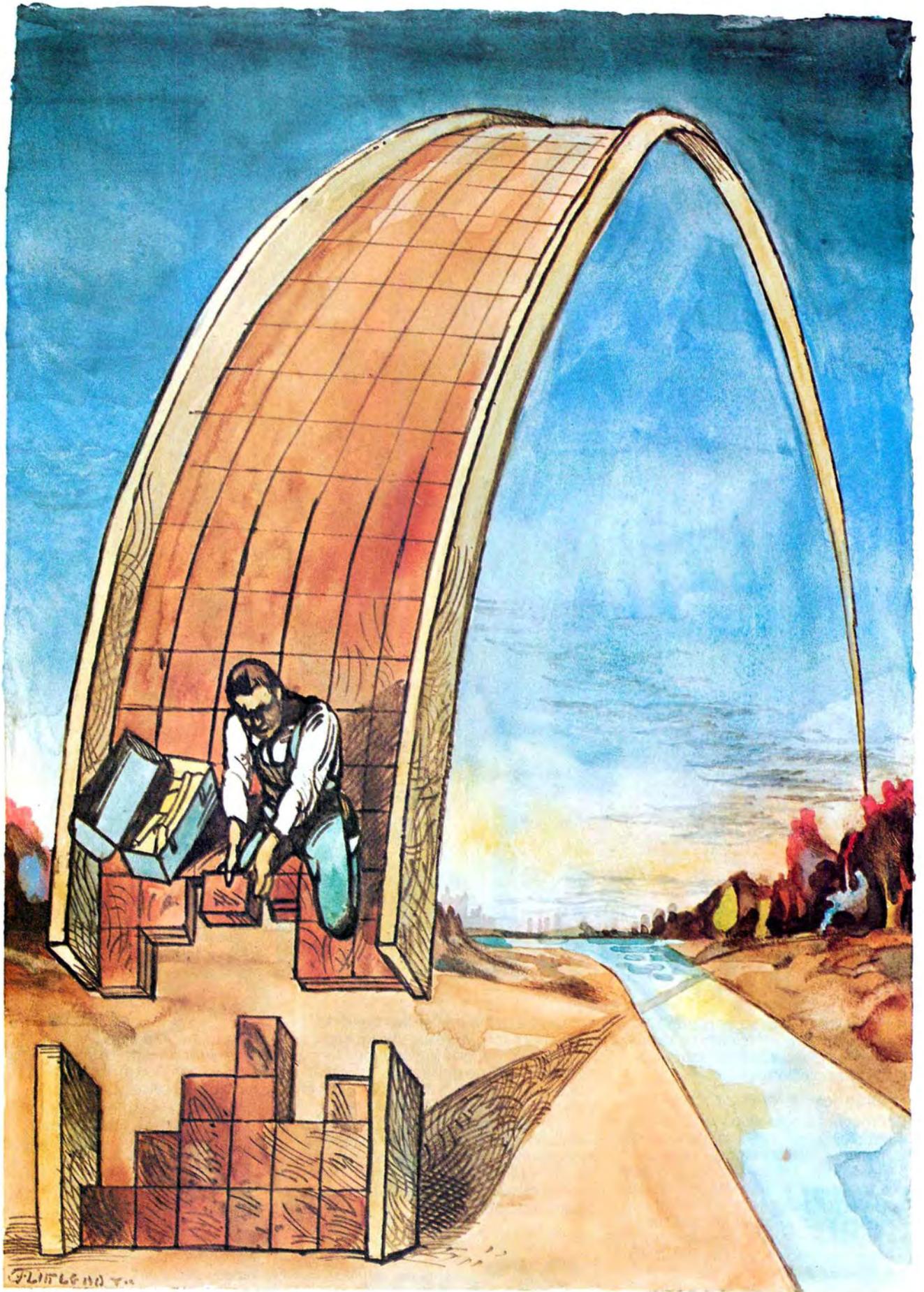
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Mail to: 3Com Corporation, 1390 Shorebird Way, P.O. Box 7390, Mountain View, CA 94039, Attn: Corey Randall. (415) 961-9602.

PCWD 10/1



The Communicator's Tool Chest

Jack Powers

Frequent networking in the land of telecommunications requires more sophisticated communications software. MIST+ combines electronic mail communications, word processing, programming, and powerful data base management features in an integrated package that is a tool chest for the electronic age.

"We are moving toward a world system composed of units densely interrelated like the neurons in a brain rather than organized like the departments of a bureaucracy. . . . Society is likely to be built around a network rather than a hierarchy of new institutions."—Alvin Toffler, *The Third Wave*

Networking is a word commonly used these days to describe both technological and social communications. Technological networking is the electronic transmission of information, usually via telecommunications. Social networking, on the other hand, has been described as "people connecting with people,

linking ideas and resources" (Stamps and Lipnack, *Networking: The First Report and Directory*, Doubleday, New York, 1982). Through social networking, people find and communicate with others who share their interests and concerns.

Both kinds of networking are supported by *MIST+*, an integrated software package that combines electronic mail communications features, text processing, and a data base management system (DBMS) in a customizable package designed to retrieve, organize, and transmit information. The name is an acronym for micro-computer information support tools, which is a good description of the product. The plus sign distinguishes the MS-DOS version from its 8-bit predecessor. Although you can buy the communications program without the DBMS option, this review explores the entire integrated package. The combination of communications with data base management features creates a unique software category that will no doubt become more popular as the complexities of electronic relationships increase.

In *MIST+* terminology a network is a collection of users sharing a single *MIST+* system, whether locally or remotely. *MIST+* can be used to build and search data bases both locally and from remote terminals and

PCs. Remote access may be completely open (a BBS, or bulletin board service) or restricted to authorized callers (a closed network). *MIST+* can also be used as a smart terminal communications program that can automatically log on to a remote host, download data, and add it to the *MIST+* data base.

The combination of remote access communications, password protection, and a shared data base management system gives *MIST+* the unique ability to act as a clearinghouse for a closed (private) electronic mail network. *MIST+* can be a handy tool for an organization with dispersed members who need to communicate and share information. (For more information on setting up a closed electronic mail network, see "In Box Out Box," *PCW*, Vol. 2, No. 6.)

Modes, Routines, and Tailorings

MIST+ comes with three main modes: Connect (communications), Edit (text editing), and Resources (DBMS). The package also includes three customized applications (Message, Commons, and Source) that are called "tailorings." Message enables the program to act as a private elec-

● Review

tronic mail system. Commons is an information exchange application that turns the PC into an unattended BBS. Source provides a simplified interface to SourceMail, The Source's public electronic mail system. Message and Commons can be used both locally and remotely. Remote callers need not be equipped with *MIST+*; they can use any communications package that supports ASCII transmission.

Message uses the identification features of *MIST+* (each authorized user has a number, name, and nickname) to identify the originator of each message automatically; it also records the time and date of entry. You simply type the message text (up to 300 lines) and tell the system to whom it is addressed. Messages are private, are delivered in the order in which they were entered, and may be addressed to several recipients at once.

Commons is a keyword-oriented information exchange system built onto the Resources DBMS. It may be used as a simple public bulletin board containing text and keywords entered by network members. Messages are automatically identified by originator, date, and time and may be retrieved using one or more keywords supplied by the inquiring user or chosen from a list that can be displayed upon demand.

Source may be used with The Source information service to compose, send, receive, and review electronic mail. Instead of memorizing SourceMail commands and procedures, you can respond to menus and prompt messages while the program automatically handles interaction with The Source. By responding to prompts from a few menus, you can dial and log on to SourceMail, send and receive messages to and from the PC's disk storage, and log off. Source allows you to take advan-

tage of the PC's storage and processing power to reduce telephone and connect time charges.

Two more ambitious tailorings of *MIST+*, *MightyMail* and *Conexus*, should be available (at extra cost) by the time you read this. *MightyMail* is similar to, but more comprehensive than, Source. It is designed to simplify and speed up the use of several host-based electronic mail systems, including MCI Mail, ITT Dialcom, Dialog's Knowledge Index, Western Union's EasyLink, NEWSNET, and Dow Jones News/Retrieval.

Conexus ("connects us") is an elaborate message and teleconferencing system much like the Electronic Information Exchange System (EIES) at the New Jersey Institute of Technology. Designed for *MIST+* version 1.3 (currently in testing), *Conexus* builds upon a combination of the Message and Commons tailorings. It includes mail features such as blind copies, pen-named and anonymous messages, assisted reply and forwarding, listing and retrieval of old messages, and tracing of sent messages to see if they have been received.

Conexus's conferencing facilities include public or private conferences, automatic posting of new messages upon check-in, a listing of participants and their last item read, and the ability to use pen names and send anonymous messages. *Conexus* also provides a bulletin board feature, allowing retrieval of items by keyword, text, date and time, and author.

Integration and Customization

MIST+ is a large collection of programs and associated files. Rather than supplying features independently and relying on DOS and batch files to coordinate their use, the developers blended them into a single executable module that presents a coherent, consistent, and (for the most part) friendly face to the user. *MIST+* is integrated in the sense that the user can move between the various modes and levels of its operation without returning to DOS. Also, data from one mode or application can easily be sent to any other.

A principal feature of *MIST+* is its ability to extend and personalize the software by allowing you to code your own commands. Using text files called "routines," which are similar to but more powerful than DOS batch files, you can set up a customized command structure for novices or for special applications. Mixtures

Text in *MIST+* can shape itself to predetermined variable values such as the caller's screen width and security access level.

of text and *MIST+* commands, called "intelligent documents," can respond to keyboard or remote input, allowing you to insulate the user from the details of *MIST+* operation.

MIST+ routines may contain commands that alter the presentation seen by the user according to factors that are not determined until the text is viewed. Text in *MIST+* may be presented just as it was entered, or it can shape itself to predetermined variable values such as the caller's screen width, security access level, or earlier activity in the *MIST+* session. These variables can be filled in by the caller or local user to suit his or her requirements and preferences. *MIST+* interprets text the way the BASIC Interpreter treats BASIC statements, with ordinary text acting like string constants. Character strings and numeric variables are supported, along with the ability to create conditional branches and perform loops.

At start-up *MIST+* is normally in the command mode. Most of the commands in this mode control mode transitions, program options, and DOS file system operations.

From the command mode you can go to any of the three main modes (Connect, Edit, or Resources). Preceding a mode name with a plus sign allows you to make transitions between the three modes without going back to command mode. The program allows several commands to be entered on the same line, separated by semicolons.

The Connect Mode

The Connect mode is *MIST+*'s smart terminal communications program. Connect enables you to send and receive files either in straight ASCII format or using Xmodem (Ward Christiansen's public-domain protocol) error correction. The Connect mode also allows you to set up the PC to log on to a remote host computer automatically. You can instruct the PC to wait for specified prompts or for a certain length of time before it sends a prestored command. You can even instruct the system to wait until a prearranged time of day before automatically calling another system and exchanging data.

Logon commands to access various remote systems may be coded in routines. The programming language available to the *MIST+* user is quite rich compared to that of most communications programs. In particular, the ability to save data in variables and perform looping and branching allows the construction of flexible routines. If you don't have the time or expertise to code these routines, you can always implement one of the customized communications tailorings instead.

The Edit Mode

The Edit mode allows you to compose and edit material in a work space called the "scratchpad." A wide range of commands is available, including copy, move, delete, and global search and replace. Most features are implemented with dot commands that are embedded in the beginning of a line as in *WordStar*. These commands control line spacing, margins, titles, underscoring, boldface text, tabs, justification, and other format options.

The EDLIN-like line editor is adequate for editing simple routines and messages, but you may find it lacking for larger documents. Fortunately, *MIST+* files are in standard ASCII format and can easily be exported to other word processing programs.

The Resources Mode

The Resources mode is *MIST+*'s data base management system. Resources provides powerful features for searching and retrieving, allowing complex searches by combinations of fields (see "A Sample Session With *MIST+*'s DBMS"). Output may be printed or displayed in either system- or user-specified format in alphabetic, numeric, or date sequence. Data can be saved on disk for printing or for exporting to another program. "MIST+'s DBMS Commands" shows the most commonly used Resources commands.

MIST+ uses some new terms for familiar DBMS concepts, and it takes a little mental gear shifting for those who are accustomed to other DBMSs. For example, in *MIST+* lingo, records are called "resources" and fields are referred to as "resource parts."

To create a new data base, you name the file and then describe the type and format of all the resource parts in each resource (fields in each record). You must tell *MIST+* which parts will be indexed for rapid retrieval and whether indexing will occur automatically as the resources are added or updated or only upon request.

After the data base is created, you can add records until you either fill the available disk space or reach the 64,000-record limit. Searching the data base causes a list of resources (called a "find list") to be created. This list may be used to determine the output for a displayed or printed report or to select candidates for updating. The find list can be sent to disk or to the printer either in a standard format or in a format you specify using the Layout command.

(continues on page 150)

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A Sample Session With MIST+ 's DBMS

Imagine that you are the secretary of the HAL 9000 Computer Users Group and you would like to mail a special notice to members who have 1200-bps modems. Having foreseen this challenge, you previously included these addresses and associated information in a data base created with *MIST+*. Each member's resource can be found in the Halug data base; its format is shown in Figure 1.

Figure 2 shows a trace of the *MIST+* session during which you

identify the proper members. To accomplish this you use the commands Resources, Open, Find, and Summarize. Since you recognize the four identified members as the correct ones, you prepare mailing labels using the Layout command and a previously prepared file called Test1, which is an "intelligent mailing label."

Test1 is a routine (a kind of program) that specifies how the desired parts of the resources in the find list are to be presented to

the user (see Listing 1). Essentially, it adds a comma following the last name if the title is not blank, a hyphen following the zip code if there is a four-digit zip extension, and a blank line at the end if address line 2 is blank, keeping the number of lines per label fixed at six. The commands @Begin and @End define the portion of the file that will process each resource in the find list.

(continues on page 150)

```

Format for HALUG data base:
Title: Members of the HAL 9000 Users Group
Number of parts in format: 23
Number of summary parts: 5
Each resource uses 640 characters or 5 sectors of disk space.

```

TYPE	INDEX (CHARS)	ACCESS RD/WR	NAME (PICTURE)
----	-----	---/---	-----
CHAR	Y(08)	00/00	MEMBER ID (8C)
CHAR	N	00/00	TITLE (4C)
CHAR	N	00/00	FIRST NAME (12C)
CHAR	Y(16)	00/00	LAST NAME (16C)
CHAR	N	00/00	SUFFIX (8C)
CHAR	N	00/00	ADDRESS LINE 1 (20C)
CHAR	N	00/00	ADDRESS LINE 2 (20C)
CHAR	Y(12)	00/00	CITY (12C)
CHAR	Y(02)	00/00	STATE (CC)
NUMB	Y(04)	00/00	ZIP CODE (####)
NUMB	Y(02)	00/00	ZIP EXTENSION (####)
CHAR	N	00/00	NICKNAME (8C)
CHAR	Y(24)	00/00	RANK (32C)
CHAR	N	00/00	HOME PHONE (12C)
CHAR	N	00/00	WORK PHONE (20C)
CHAR	Y(16)	00/00	OCCUPATION (16C)
KEYS	Y(24)	00/00	COMMITTEES (32C)—FREE KEY WORD LIST
DATE	Y(04)	60/60	PAID THRU (MM/DD/YY)
DATE	Y(04)	00/00	DATE JOINED (MM/DD/YY)
SLCT	Y(01)	00/00	CHARTER MEMBER? (Y/N)
SLCT	Y(01)	00/00	SEX (M/F)
SLCT	Y(01)	00/00	MODEM? (300/1200/N)
KEYS	Y(24)	00/00	INTERESTS (120C)—FREE KEY WORD LIST

Figure 1: Output of the Format command for the Halug data base. Note the way the parts of the name and address have been separated.

```

COMMAND?resources
Entering RESOURCES subsystem:
RESOURCES COMMAND?open
NAME OF DATABASE?halug
HALUG data base open.
RESOURCES COMMAND?find
FIND BY WHICH PART?modem
Enter single contents or range of contents (ABC...XYZ).
MODEM? (300/1200/N)?300...1200
8 HALUG resources in current list.
RESOURCES COMMAND?find
FIND BY WHICH PART?modem
Enter single contents or range of contents (ABC...XYZ).
MODEM? (300/1200/N)?1200
4 HALUG resources in current list.
RESOURCES COMMAND?summarize

HALUG: 1
MEMBER ID: 21445J
LAST NAME: Foxworthy

HALUG: 3
MEMBER ID: 89743T
LAST NAME: Smith

HALUG: 6
MEMBER ID: 84532L
LAST NAME: Baker

HALUG: 8
MEMBER ID: 23145U
LAST NAME: Hill

RESOURCES COMMAND?layout
FILE CONTAINING LAYOUT?test1
Dr. Joseph P. Foxworthy
223 Midway Lane
Farrington, IL 60611

Mr. Gerald E. Smith, Sr.
345 Maple Lane
Sturbridge, MA 32456

Mr. John Baker, Jr.
54-45 Firmona Way
Los Angeles, CA 23876-3267

Mr. Bunker T. Hill
80 Wimpole Rd.
Sedalia, MO 34572

RESOURCES COMMAND?close
HALUG data base closed.
RESOURCES COMMAND?os

```

Figure 2: Sample MIST+ session selecting 1200-bps modem owners from the Halug data base, followed by production of mailing labels using the Layout command

```

@BEGIN
.LET $A="@ (SUFFIX)"
.LET $C=""
.WHEN $A~"";.LET $C=","
@(title) @(first name) @(last name)@($C) @(suffix)
@(address line 1)
.LET $B="@ (ADDRESS LINE 2)"
.WHEN $B~"";.OVER 0 @ (ADDRESS LINE 2)
.LET $D="@ (ZIP EXTENSION)"
.LET $E=""
.WHEN $D~"";.LET $E="-"
@(city), @(state) @(zip)@($E)@($D)
.WHEN $B~"";.BLANK 1
.blank 2
@end

```

Listing 1: Layout file Test1 for Halug data base mailing label

A Sample Session With Mist+ 's DBMS (continued)

The string assignment command is `.Let`, much like that for the same function in BASIC. *MIST+* character variables are \$A through \$Z. The first assignment, to \$A, is the value of the contents of the resource part Suffix, which is either null (empty) or a short string like Jr. The \$C variable is set to null, a value it will keep unless the suffix is found not to be null in the next line. The \$B variable is set to the contents of the Address Line 2 resource part. It is tested later to see if an extra blank line is required to keep the label exactly six lines (1 inch at six lines per inch) long.

`.When` is a conditional operator similar to IF in BASIC. In BASIC, line 4 might be written `IF A$ <> "" THEN C$ = "`

`.Over 0` is a dot command that causes the contents of the resource part Address Line 2 to be output at an offset of 0 spaces when it is executed (when address Line 2 is not blank). `.BLANK 2` is a dot command that produces two blank lines to separate labels.

Commands like `.Let` and `.When` are only a few of a rich set of interactive/intelligent document formatting commands. These commands constitute a programming language of their own that is optimized for data base and text processing applications.

If you have followed the example this far, you might want to think about the Layout file that would print a complete letter to the selected members of the HAL user group, enlisting their help in the pursuit of some common goal.

picture specification to remind the user that zeros must be present when data is entered.

Selection parts are an easy way to code resources into categories such as gender or response to a multiple-choice question. Selection parts are similar to fixed-list keyword parts in that the data entered must be chosen from a fixed list. However, with selection parts only one choice is permitted.

Text parts may include multiple lines of free-format text, including abstracts of books or technical papers. Text parts may contain dot commands that control the appearance and even part of the content of the final output. Text parts are the only resource parts that cannot be indexed. However, they can be searched sequentially for the appearance of a given character string.

Documentation

MIST+ includes a 400-page reference manual in a three-ring binder and a booklet containing a summary of the commands. The reference manual is quite complete and includes useful cross-referencing and an excellent index. Given the complexity of *MIST+*, a separate tutorial would be welcome. The reference manual suffers somewhat from the attempt to make it serve a second function as a tutorial.

In Summary

MIST+ is powerful and flexible enough to challenge experienced programmers interested in writing custom applications, yet simple enough to be put to work right out of the box. The three tailorings should be worth the purchase price to many potential customers, but the ability to construct elaborate custom applications makes *MIST+* a program you can grow with as you go along.

On the minus side, *MIST+* is somewhat hampered by its history in the 8-bit CP/M environment. For ex-

(continued from page 147)

You can specify the type and length of resource parts during the Add-Format operation. In addition, you can indicate the minimum number of characters or digits that constitutes a valid entry for each resource part, using a "picture" specification. (The term *picture* is borrowed from the COBOL language. It refers to the description of the size and format of data fields.) Finally, you can specify both the read and write security access levels for each resource part.

MIST+ provides seven types of resource part: alphanumeric, date, ID, keyword, number, selection, and text. Alphanumeric parts may be up to 128 bytes long. Date parts are always in either MM/DD/YY or YYYY

format. ID parts are unique identifiers (such as a Social Security number) for the resource in which they appear. ID parts may be up to 128 bytes (characters) long and are usually indexed for quick retrieval.

Keyword parts can contain multiple character strings of up to a specified length separated by semicolons. Keyword parts are often used to store lists, such as degrees earned, names of skills, and committee assignments. With Add-Format you can specify whether or not data to be entered in a keyword part must be chosen from a fixed list. With the help of indexing, keyword parts can become an important part of the Resources mode.

Number parts can contain nine digits on each side of an optional decimal point and can be negative. If leading digits (zeros) are important (as with zip codes), you can use the

MIST+ 's DBMS Commands

The following commands are used to add, search, and update a data base in the Resources mode.

Add. Adds a resource (record) to a data base.

And. Implements an AND statement on a new part in a complex (Boolean) search.

Close. Closes an open data base.

Find. Finds resources that match a search specification.

Index. Displays a keyword index of resources.

Layout. Lays out resources in the current find list as shown in the layout file.

Modify. Modifies resources in the current find list.

Not. Implements a NOT statement on a new part in a complex (Boolean) search.

Open. Opens a data base.

Or. Implements an OR statement on a new part in a complex (Boolean) search.

Remove. Removes resources in the current find list from the data base.

Retrieve. Retrieves and displays resources in the current find list.

Sort. Sorts resources in the current find list.

Summarize. Displays a summary form of the resources in the current find list.

Update. Updates the data base indices (delayed indexing only).

ample, the program makes only limited use of the PC's keyboard and display. No use is made of the function keys or the status line (line 25) of the display. Recent improvements (in *MIST+ 1.1* and later versions) include support for the creation and use of tree-structured directories, a feature of DOS 2.00 and later releases.

MIST+ requires a lot of disk storage space for its data bases because it allocates space for the full length of each field in every record, whether it is filled or not. This allows the Resources mode to run faster than if the data had to be packed and unpacked—a nice characteristic for a system intended for use over the phone. However, if you expect to create large applications with the DBMS, a hard disk is a must.

You should also keep in mind that altering an application supplied with *MIST+* or developing a new one is not a task for a novice; a complex application may require the skills of an experienced programmer. If you don't want to program your own tailorings, you should also buy one of

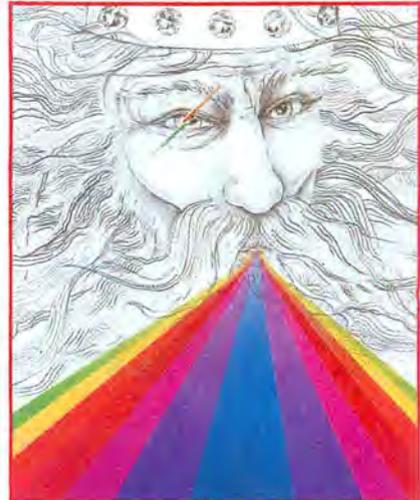
the complete customizations such as *MightyMail* or *Conexus*. Whether you buy a customization or tailor one yourself, *MIST+* is a unique collection of networking tools that can construct useful environments for information exchange. ☉

Jack Powers works with data communications at a large San Francisco Bay Area research organization.

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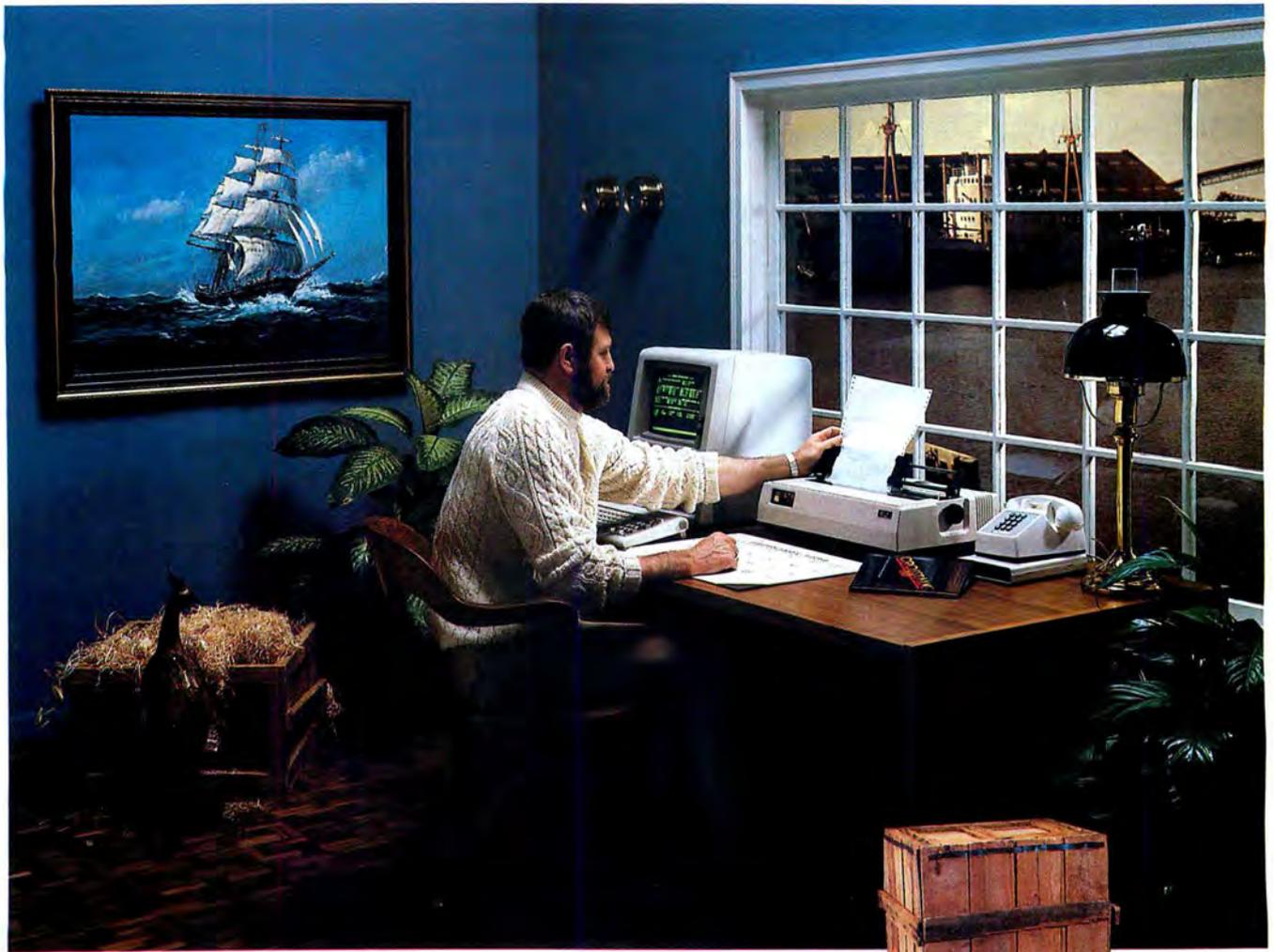
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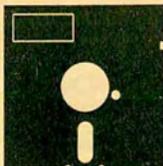
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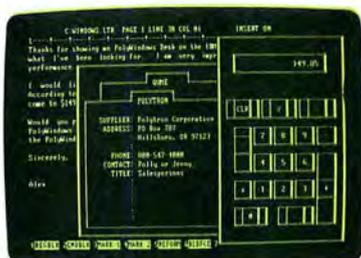
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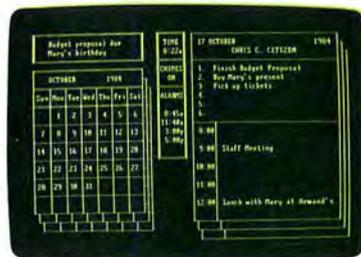
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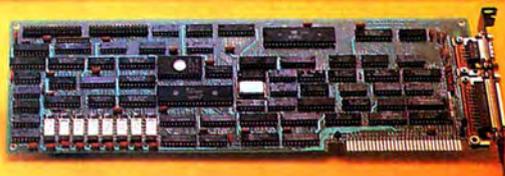
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Family Resemblance

Designed by Leading Edge and manufactured by Mitsubishi, the Sperry PC and the Leading Edge PC are fraternal twins created for two different desk tops.

Ricardo Birmele

More and more personal computer manufacturers are turning out machines that duplicate the operation of the IBM PC while improving on its speed and versatility. Since these compatibles are often cheaper as well, it becomes harder—often impossible—to justify the price of an IBM. This is particularly the case with the Sperry PC and the Leading Edge PC.

Sperry, a long-time maker of mainframe computers, got into the computer business even before IBM; Leading Edge, an upstart barely four years old, has sold everything from Elephant Memory floppy disks to the widely advertised *Leading Edge Word Processing* package and is now

trying the IBM compatibles market with the Leading Edge PC. Sperry's push into this market was a matter of protecting its turf; the move was most likely motivated by the horrifying thought of Sperry mainframe users giving their Fortune 500 desk tops to personal computers made by IBM. Leading Edge, on the other hand, not only wanted to break into



the home and business PC-compatibles markets, but to diversify its product line—a wise move for any software or hardware company in this tumultuous industry.

That Sperry and Leading Edge have staked out two different plots in the business landscape with essentially the same personal computer shouldn't be surprising. After all, the Corona PC is sold under the Olivetti and Wordplex logos. Sperry and Leading Edge have agreed to market their identical wares in noncompeting markets, Sperry restricting itself primarily to national accounts and Leading Edge to the general consumer and business markets.

Given their origin and purpose, it's no surprise that the Sperry PC and the Leading Edge PC resemble portly twins following heavily in the architectural footsteps of the IBM PC. But aesthetic considerations aside, the Leading Edge and Sperry PCs are not only compatible with the IBM PC, they're cheaper and also offer faster program execution.

First Touch

The keyboard is the most important interface between a user and the computer. The first things I noticed when looking at the Sperry and Leading Edge keyboards were the ways in which they followed IBM's not-so-imaginative lead. IBM's keyboard clicks, but it lacks light emitting diodes (LEDs) that light up when the <CapsLock> or

<NumLock> key is pressed. Leading Edge's keyboard, made by Keytech, neither clicks nor supplies LEDs and retains IBM's awkward placement of the backslash key and the left <Shift> key. Sperry's keyboard, made by Key Tronic, rearranges those keys and includes LEDs, but it does not offer the hearty snap of IBM's keyboard. Whether or not you like the feel of either keyboard is a matter of personal taste. I found the Sperry keyboard somewhat spongy, although not irritatingly so; the Leading Edge keyboard has a bit more spring to it, which may appeal to fast typists.

When you press a key on the Sperry keyboard, you are really pressing on a little cylinder of blue foam rubber. A small piece of tinfoil lies under the cylinder; pressing down makes contact with the printed circuit board underneath the key. It is a conventional and reliable way of making the required electrical connection.

Leading Edge's inductive technology is a little more interesting. When you press a key on the Leading Edge keyboard, a small cylinder of magnetic material is pushed through a loop of wire on the circuit board below the keys. The flow of electricity through all the loops is the same until a key is pressed. Then the difference in flow is measured and converted into a keyboard scan code and thus into the appropriate keyboard character. Since there is no physical contact, you don't have to worry about corrosion or shorting out the keyboard if you spill coffee on it. Leading Edge claims that each key will take up to 10 million depressions before failing.

Though both keyboards will work with either machine as well as with the IBM PC, they cannot match the sturdiness and firm response of the IBM PC keyboard. Of the two reviewed, Sperry's keyboard seems more substantial than Leading Edge's and is likely to hold up better under constant use.



● Review

Monitors

The Leading Edge PC comes with a 12-inch amber monitor that features brightness, contrast, horizontal, vertical, and vertical size controls. The monochrome characters are formed in a 7- by 9-dot matrix in a 9- by 14-dot font block and are crisp and easily read even in direct light. The monitor can be driven by an IBM Monochrome Display Adapter. On the minus side, the display is very sensitive to fluctuations in voltage. Plugging the Leading Edge PC and another computer into the same outlet resulted in a wavy display, disruptive enough to prevent work for any extended period.

Sperry's RGB color monitor is made by Mitsubishi and weighs in at a hefty 30 pounds. Like most color monitors, Sperry's is designed primarily for graphics and produces barely readable text at best. Both low-resolution (320 by 200) and high-resolution (640 by 400) modes are supported. The color graphics board that comes with the Sperry PC contains the same 6845 CRT controller chip as the IBM PC, but the resemblance ends there. The board holds 192K of display buffer RAM, which permits the Sperry PC to use animation or display high-resolution color graphics and text at the same time—an ability that's particularly useful in business presentations or for programs using simulation.

System Units

The Leading Edge PC and Sperry PC system units are identical. They are just a fraction of an inch narrower and higher than the IBM PC's. Slipping off each system's shell reveals seven expansion slots; Leading Edge fills up three with a monochrome adapter board, a floppy disk drive controller, and an unpopulated memory board. The Sperry uses four slots, one for a disk drive controller

board, one for an unpopulated memory board, and two for a high-resolution color graphics board. Both machines come with 128K RAM installed on the motherboard.

Two Sanyo half-height, dual-sided, double-density disk drives are mounted one above the other like bunk beds in the right front corner of the system unit. The drives are mounted directly into the system unit's frame using four screws (versus the IBM PC's two). Like the IBM PC's, the drives are not shock mounted, so you can't knock these computers around like you might a Compaq.

The color graphics board that comes with the Sperry PC contains the same 6845 CRT controller chip as the IBM PC, but the resemblance ends there.

While the disk drives never had trouble reading or writing data, they often resisted returning my floppy disks. Once a disk is inserted into a drive, you cannot remove it manually. You must press the bottom half of the drive door, which releases a spring that spits the disk out. However, the process doesn't always work, and more than once I had to do some delicate maneuvering to free a disk.

Both Sperry and Leading Edge had the foresight to install beefed-up power supplies that put out 96.5 watts. This means that adding more power-hungry expansion is a less critical consideration than it is with an IBM PC, whose 63.5-watt power supply may have a hard time coping with seven filled slots. Not surprisingly, both the Sperry and Leading Edge PCs boast larger—and noisier—fans than the IBM PC.

Another wise move was placing important system switches on the outside of the unit, at the back. These switches are used to control the computer's operation and must be set when various expansion boards are installed. One switch is particularly important; it sets the speed of the system's 8088-2 microprocessor. Either computer will run happily at 4.77 MHz—the same speed as an IBM PC—or at 7.16 MHz—almost twice as fast. A faster microprocessor often means faster software; a word processor will format a document more quickly and a spreadsheet will recalculate a financial model in considerably less time at 7.16 MHz than at the IBM PC's 4.77 MHz. If a software package uses a copy-protection scheme dependent on the 4.77-MHz speed, you need only turn the system off, flip the switch in the back, and then turn the computer back on.

These switches are also used to indicate whether or not an 8087 math processor is installed, whether you would like to omit the system's power-on self-diagnostics test, and whether the computer should default to some drive other than drive A:. If you use a hard disk (usually designated C:) or install a bubble memory board in the machine, this last setting is essential.

Manuals

When looking at documentation supplied with any PC-compatible computer, you should remember that it is easy to improve upon what came before. IBM should take a lesson from Leading Edge's extremely well-organized Operator's Guide and Technical Reference manual. Unlike the hastily assembled and jargon-laden manual supplied by IBM, the Leading Edge manual offers useful information without demanding undue effort.

Sperry's user manual sometimes bends over backwards to be simple and winds up being redundant. For example, the guide notes that "the

< + > key may be used to enter a plus sign. The plus sign is often used by software systems to indicate addition." It's hard to argue with logic like that.

Both computers come with MS-DOS 1.25, Microsoft BASIC version 1.0, and a diagnostics disk. The BASIC manual supplied with both computers is superior to IBM's; for one thing, the table of contents and index page references are accurate. The manual tells you just about everything you need to know to use BASIC and explores some subjects, such as <Ctrl> and <Alt> key functions and mapping, in greater detail than IBM's manual. Both DOS manuals are clearly written and printed in two colors. They're accessible to the beginner, yet useful to the more experienced user.

One nice touch for the computer novice is Sperry's inclusion of the *Getting Started* and *How To Use MS-DOS* training disks from American Training International (ATI). If you have never used a personal computer, these two tutorials will get you up and running in no time. Leading Edge also includes the company's word processor.

Testing Compatibility

The issue of compatibility—how well a computer works with off-the-shelf software designed for the IBM PC—is one that no manufacturer of compatibles can afford to ignore. What counts for the user is how well IBM-specific software and hardware work on his or her machine. Can the compatible use any IBM PC word processor, spreadsheet, or expansion board? Can an IBM PC read and write a data disk from a Sperry PC or a Leading Edge PC and vice versa?

To test compatibility and performance on the Leading Edge and Sperry PCs, I used a number of PC versions of programs, including *PC-Talk III* from Headlands Press (the .EXE version), *Flight Simulator*, *dBASE II*, *1-2-3*, SSI's *WordPerfect*, *WordStar 3.3*, and *Keynote*. Both machines were tested under PC-DOS 1.10, 2.00, and 2.10.

PC-Talk III supports the Xmodem protocol and is one of the most popular communications packages for the PC. I used the package with a Hayes Smartmodem 300 to log on to a local mainframe computer; both the Leading Edge PC and the Sperry PC ran the program flawlessly.

With *dBASE II*, I took a data file, added records to it, saved the file, reported results to the screen, and printed a report; I also wrote and ran a command file. All of these tasks were performed with ease on both machines. Files generated on both machines were tested on an IBM PC, which used them with no difficulty.

Lotus Development's *1-2-3*, version 1.0, one of the most capable and popular spreadsheet programs on the market, is a good test of PC compatibility because it handles its own screen display and is particularly fussy about the messages it receives from a disk drive controller. A compatible must closely duplicate the IBM PC's video-mapping memory addresses and its disk drives if it hopes to run *1-2-3*. This program's features—sorting, direct access of video memory, and graphics use—test the inner workings of a compatible.

Both machines easily manipulated a large *1-2-3* commodities application I had created on my IBM PC. New numbers were entered, macros run, the application recalculated several times, and the results graphed in color on the screen. (Since the Leading Edge came with a monochrome monitor, I attached a color monitor and installed an IBM Color/Graphics Adapter.)

A further note on speed: the *1-2-3* commodities data file did not load any faster when the compatibles were running at 7.16 MHz—microprocessor speed doesn't necessarily affect disk drive operation. But time spent recalculating the application was nearly halved at the faster processor speed. *dBASE II* displayed on-screen reports much faster at 7.16 MHz as well.

Like *1-2-3*, *WordPerfect* can write information directly to the screen (called a "flash" mode by SSI) but can also go the conventional route and ask DOS to provide this service. I created and saved a file in the flash mode, and as expected, both machines performed without error at both microprocessor speeds.

Like any computer user, I don't spend all my time plotting graphs or writing up my latest report. I am a pilot as well, and I appreciate Microsoft's *Flight Simulator* for its realistic simulation of what goes on in-flight. The program is considered by many to be a particularly tough test of compatibility, because it is crafted for the IBM PC alone and expects speakers, display, and related circuitry to be located at certain memory addresses. The Sperry PC ran the program from takeoff to landing, as did the Leading Edge PC once I had installed the color graphics board from my IBM PC. Things did get interesting when the compatibles ran in the 7.16-MHz mode. Instead of real-time simulation, I had an arcade game with very fast graphics. I wouldn't recommend this mode unless you have experience flying a Cessna at Mach 1.

Keynote is a popular program that also expects certain routines stored in ROM to be at specific addresses. *Keynote* redefines standard keyboard values, a process that involves a great deal of ROM and RAM manipulation. Both compatibles easily loaded the program, assigned a phrase to a key, and displayed the phrase when the key was pressed.

Several hardware items were also tested in both computers, and all worked as expected. Any combination of IBM, Leading Edge, and Sperry keyboards worked with any machine. As noted earlier, the Leading Edge PC lacked a color graphics board and a color monitor. Once I installed an IBM Color/Graphics Adapter and hooked up Sperry's color monitor, the Leading Edge PC displayed text and graphics just like an IBM's. Both the Leading Edge and

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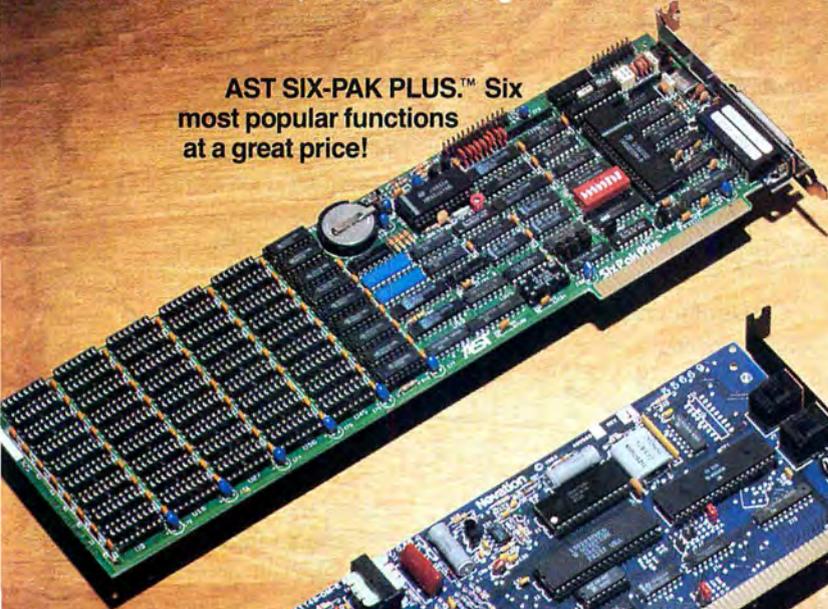
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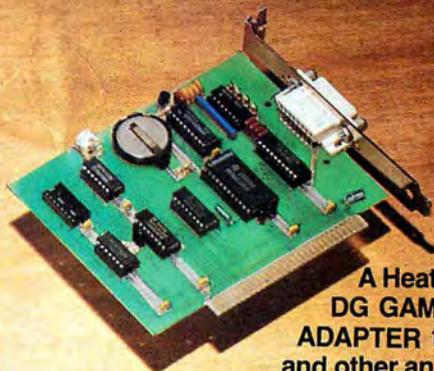
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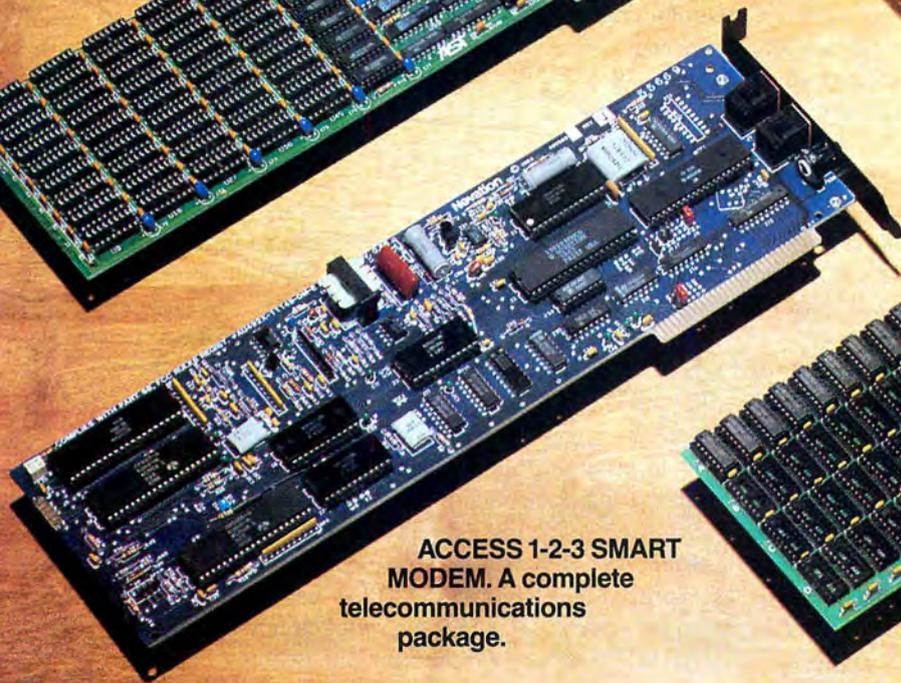
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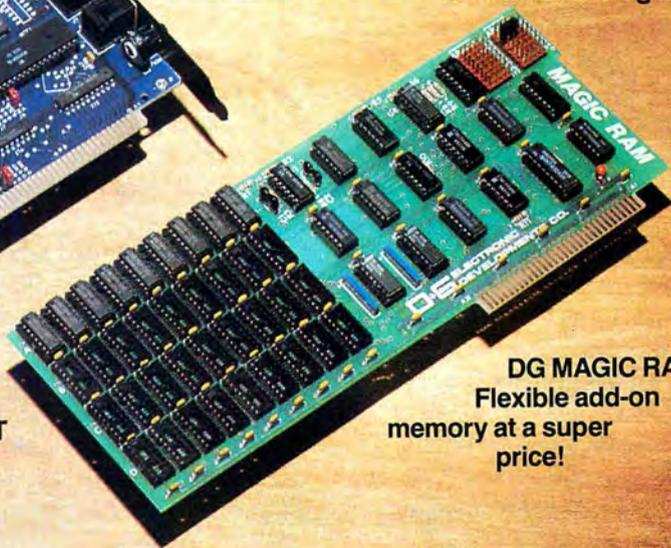
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Review

Sperry PCs can use the IBM monochrome monitor as well. Other hardware, such as my Hayes Smartmodem 300 and AST I/O Plus II clock/calendar board (which also includes parallel and serial ports), performed without a hitch.

Testing Performance

Comparing the performance of personal computers is a difficult art—one that elicits its share of criticism. Thus the benchmark I ran on the Leading Edge and Sperry PCs should be taken only as an informal indication of performance. The benchmark

Rough extrapolation indicates that both compatibles can run programs about 30 percent faster than the PC.

test is a variation of the *Sieve of Eratosthenes*, a program that finds all the prime numbers in a given range of numbers and is used by programmers to measure a machine's performance.

I wrote the program using Borland International's Turbo Pascal because it generates machine code; thus I was not testing the speed of an interpreter but that of each machine. Turbo Pascal allows a programmer to specify memory locations and work with the microprocessor at the register level.

On an IBM PC, the program takes an average of 3.52 seconds to run. Both the Sperry PC and the Leading Edge PC duplicated this time at the slower, 4.77-MHz mode but shaved it to 2.47 seconds when running at 7.16 MHz. Rough extrapolation—and

some actual experience using software such as 1-2-3—indicates that both compatibles can run programs about 30 percent faster than the PC. This may not be the case with programs like *WordStar* that make numerous disk reads. But for programs that calculate or manipulate data in memory a great deal, the results are gratifying.

The Sperry PC and the Leading Edge PC should satisfy the discriminating, and IBM-compatible conscious, user. These nearly identical machines can use the wealth of software and hardware on the the IBM PC market, getting the job done faster and for less. Which you choose depends, of course, on which configuration suits your immediate applications. Sperry's setup starts you off with color and graphics capabilities; Leading Edge's prepares you for text and spreadsheet work. You may find the absence of the IBM logo disconcerting at first, but if you're looking for an alternative to IBM, the Sperry PC or the Leading Edge PC may be your answer. ●

Ricardo Birmele is a computer consultant, freelance writer, and pilot.

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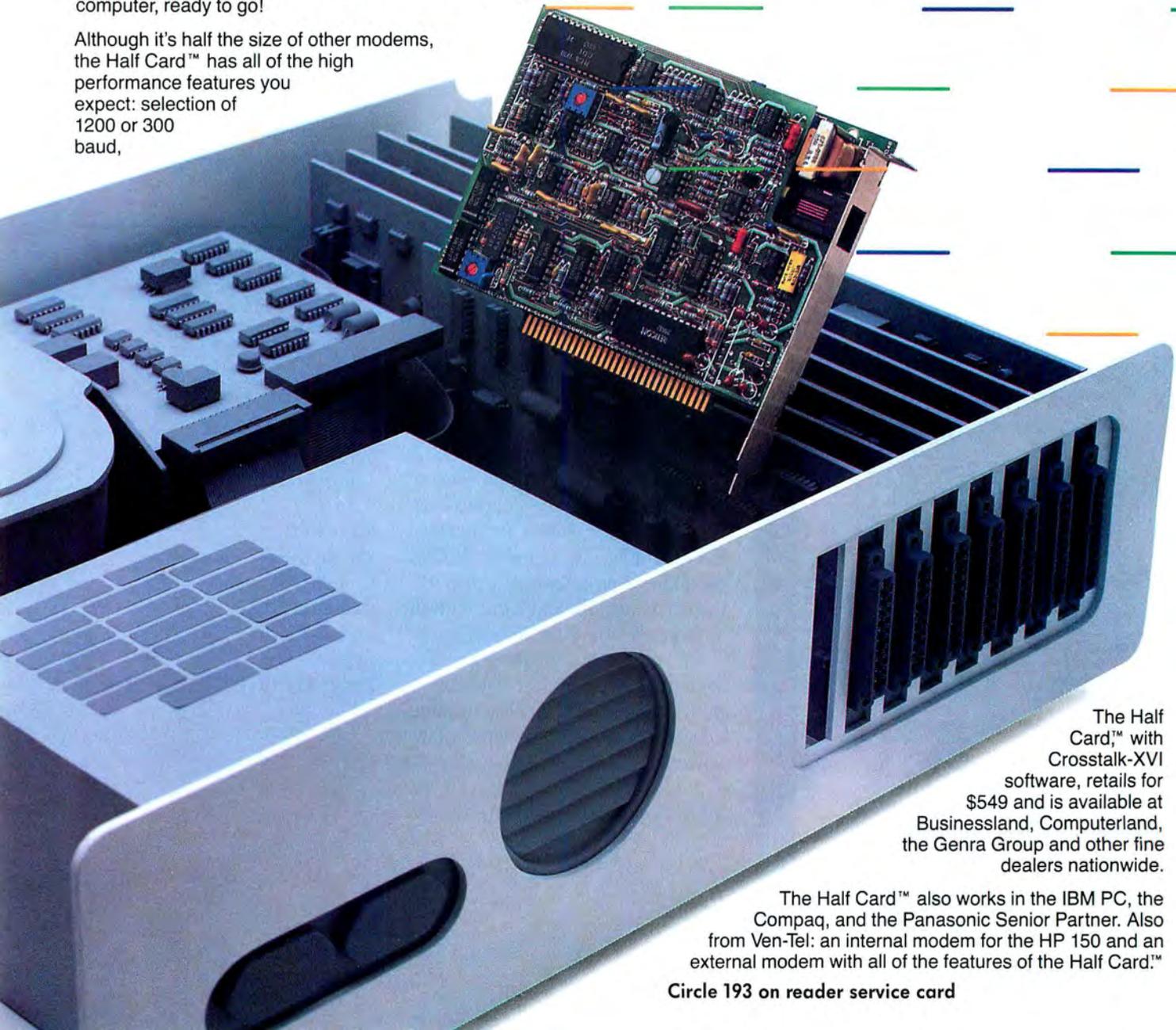
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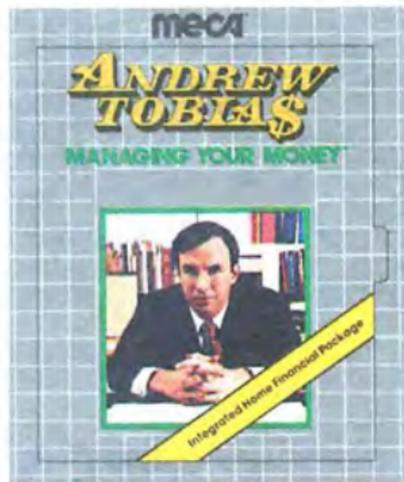
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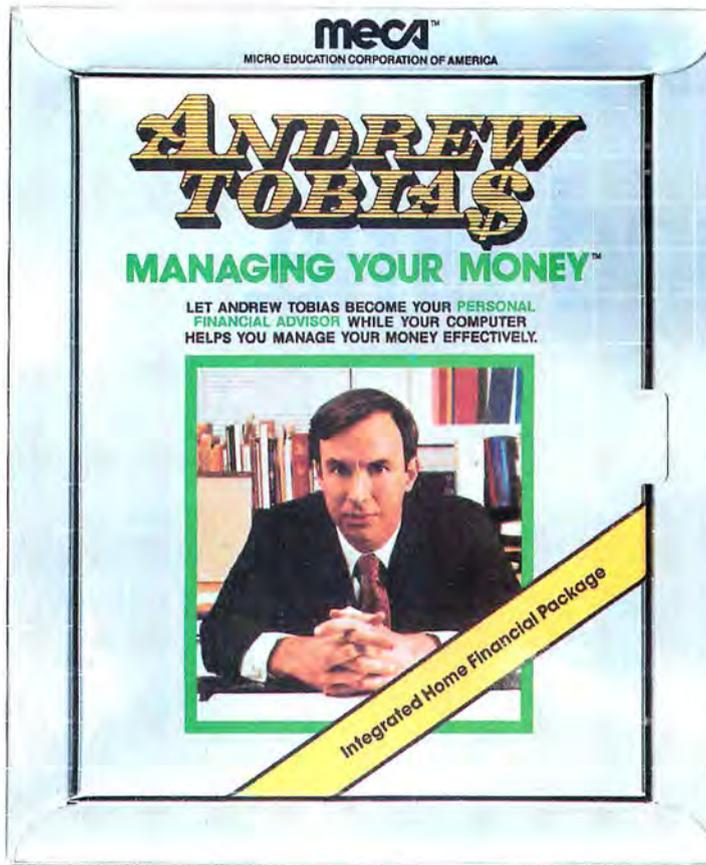
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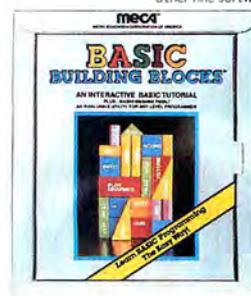
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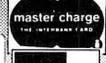
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A New Idea in Word Processing

The Idea Processor is a professional-class word processor with a twist—a built-in text data management system for organizing ideas.

William Usim

The Idea Processor is more than just a word processor. In addition to an editor and a print formatter, it includes a graphics utility for integrating graphics into text documents and a powerful text data management system (TDMS) called the Cardfile. The Cardfile can be used for storing text and graphics material in small files that can be retrieved with keyword and Boolean (*and, or, not*) searches for use in new documents.

Do we really need another acronym—TDMS? Unfortunately, yes. The concept of a text data management system (an “idea processor”) is a new one, shared by only a few products just appearing on the market, like Fastware’s *Thor*. A TDMS generates lists and uses search functions like a traditional data base management system (DBMS), but it is intended for organizing text files rather than searching and sorting a relational data base of data entries pigeon-holed into records and fields. To a TDMS there is no relation between files except for the keywords you have assigned to them. A TDMS also shares some of the traits of list managers, outlining software, and indexing programs.

The combination of a full-featured word processor with a searchable data base of text and graphics files

makes *The Idea Processor* ideal for writers who need to keep track of and combine a number of files and projects. It’s perfect for brainstorming. Don’t worry about where the idea goes. Type it in first, then assign it keywords for later retrieval.

The Idea Processor consists of several parts: a text editor, the Cardfile, a formatting print program, a graphics screen save program, utility programs for printer configuration, and an on-screen help file. In the editor,

After a card is created
it can be indexed with
up to ten keywords.

all text editing operations are activated by function keys, with the exception of a menu that defines the print format. The Print program and the Cardfile program are menu-driven.

The Idea Processor first displays the Idea Ware menu, which lists two programs, Idea and Print. Seven other user-defined programs can be added to this menu. When you select Idea, another menu appears with the choices Cardfile, Directory (which shows a list of files on a disk), Editor, and Quit.

Flipping Through the Cardfile

All the editing features of the Editor can also be used in the Cardfile—the two modules form one integrated program. The Cardfile can be thought of as a library of reference material stored on electronic cards. The cards are stored in “drawers” in an electronic filing cabinet. Each card is capable of storing 8000 bytes (almost 1500 words).

After a card is created it can be indexed with up to ten keywords. Each keyword can contain up to 14 characters. You can assign 120 entries per keyword, and you can include up to 512 keywords per cabinet. The Cardfile is theoretically limited to eight drawers and 64,000 cards per cabinet, but disk capacity is the practical limit to the amount of information that can be stored. The program can be used with a hard disk or a floppy disk system.

Cardfiles, drawers, and cabinets can be created and reorganized in the Cardfile menu, the Drawer Utility menu, and the Cabinet Utility menu. To fetch a card, unlock a cabinet and go to the Cardfile menu. Here you are asked to enter the keyword you wish to use. You can display an alphabetical list of previously defined keywords, or you can display keywords beginning with a certain letter or series of letters.

Review

Select the Fetch command to call up the cards with the keyword you have chosen. This brings up the Card Display menu (see Figure 1). Dominating this screen is the first card that matches the keyword. On the top right a message indicates how many other cards match the keyword. At the bottom of the screen, menu selections allow you to display the next card or the previous card or to exit and search by another keyword. From this menu you can also edit the card, add or delete keywords, or go to other menus. If you have a graphics adapter and a graphics monitor, you can display a graph referenced on one of the cards.

Perhaps you searched by the keyword *businesslet*, which listed 40 business letters, and you want to narrow down the list. You could go to the Selection menu, which allows you to refine the search using the Boolean operatives *and*, *or*, and *not*. For example, you could search for *manufacturers*, then *or dealers*, then *and 07/12/84*, then *not foreign*. Consequently the Selection Menu would provide you with all letters sent to domestic manufacturers or dealers on July 12.

To create a card, you can either type it directly from a selection on the Cardfile menu or mark and transfer text from a document currently being edited in the Editor. From the Cardfile menu you can mark an entire card or a portion of one and transfer it to the Editor. The transfer in either direction is very fast and requires only a few keystrokes. Setting up a keyboard macro for this process can make it even faster.

Integrating Graphics

Although *The Idea Processor* contains no graphics program, the package is easily integrated with Idea Ware's graphics software, *The Grafix Idea*. Even without purchasing *The Grafix Idea*, you can integrate graphics from a wide variety of programs into the Cardfile using *The Idea Processor's* SAVESCRN utility.

Before you load a graphics program, load the SAVESCRN program into memory. When you arrive at the desired image, press <PrtSc>. SAVESCRN will ask you for a file name. Once the file name is entered, the file will be saved to disk in a form accessible by *The Idea Processor*.

The graphics file can then be "referenced" on a card by typing >>gf *filename* on the first line of the card. If you have a graphics monitor, you can display the graphic by choosing the Graph selection on the Card Display menu. The card can then be inserted in a printed document by transferring it to the Editor. A card can also contain associated text along with the graphics. SAVESCRN is guaranteed to work only with PC-DOS files, and you must have a color graphics board.

Cardfile Applications

The best way to organize your ideas using *The Idea Processor* is to generate individual data disks (usually one cabinet per disk) for specific subjects and then separate files into drawers. Although drawers are not recognized in the searching process, they are helpful for gathering together files and sending them to another cabinet.

You can build a data base of useful paragraphs, phrases, and addresses by using the Cardfile to store your own text or letters. Various document formats can also be stored on individual cards and retrieved when needed. For example, you could use the Cardfile to store a reference library catalog, source material for authors, standard paragraphs for use in specifications or contracts, standard forms, and customer lists keyed by items purchased. You can also import spreadsheet files by entering a card, pressing <Alt>-<F4>, naming the file, and pressing <Enter>.

Idea Ware also sells a boilerplate data disk called *The Letter Writer* that can help you piece together a document. This disk contains 200 cross-indexed items, including model

letters and names and addresses of government agencies. It also provides appropriate forms of address, salutation, and closing. Although *The Idea Processor* does not include an automatic mail merge program, it is relatively easy to create personalized letters by combining and editing material from several cards in the Editor.

Aside from creating boilerplate documents, the Cardfile provides other benefits for the busy writer. Say you're a freelance writer working on a magazine article. Suddenly you have an idea for your novel. You could store the article you're working on under appropriate keywords and quickly open another file, write a segment of the novel, and then store the segment under other keywords, perhaps *Fiction*, *Novel*, *08/23/84*, *Chapter4*, *lovescene*, or whatever keywords might help you identify the segment later. Between the time you write this segment and the time you

A card can contain associated text along with the graphics.

pull all the segments together into a rough draft of the novel, you might also write several letters, other novel segments, and notes for a screenplay, all on the same disk. Later, when you're ready to pull the novel together, you could organize the novel cards and drawers into a new cabinet (probably on a separate disk) and create an outline based on the keywords you have used. Then you could search for and transfer the files into the outline using keyword and Boolean searches.

Or perhaps you're a busy executive who must keep track of a number of projects concurrently. You're in the process of pulling together data for a report. In the course of a week you may write a number of letters, create several spreadsheets, and prepare graphics that describe the spread-

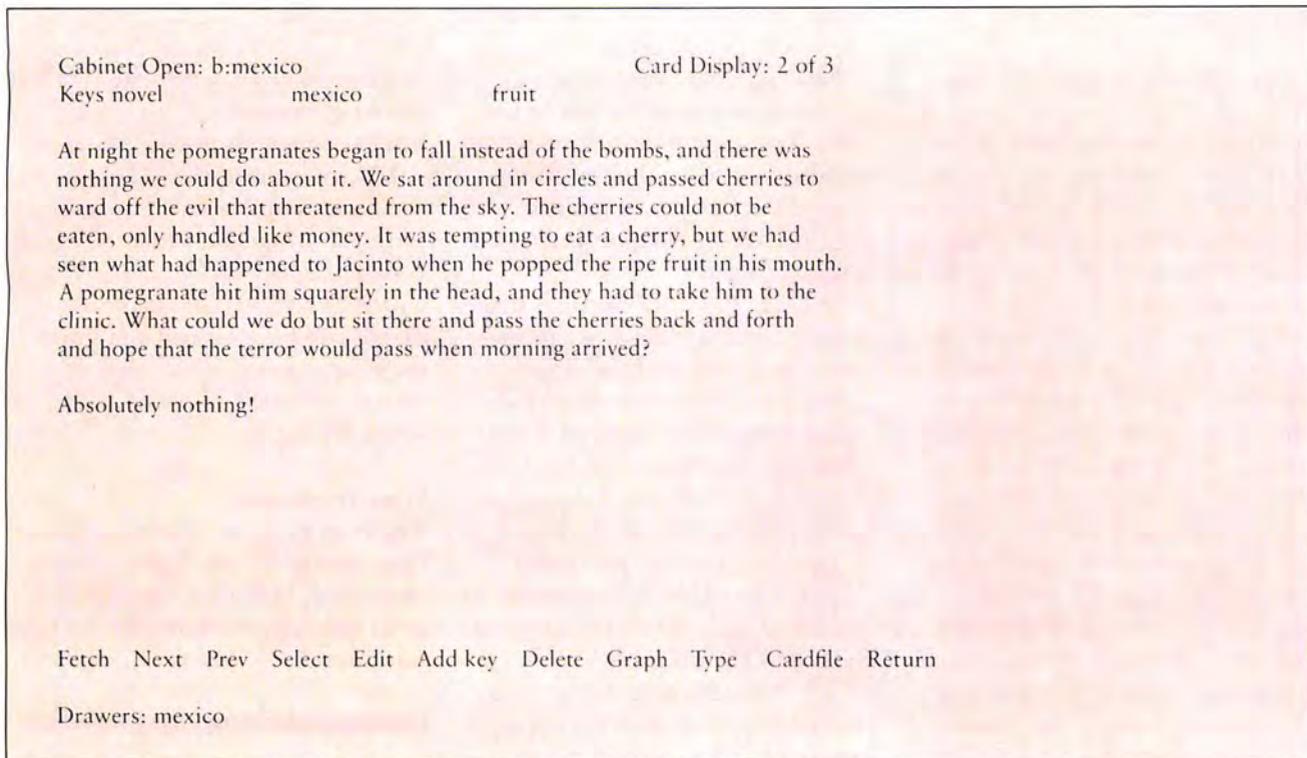


Figure 1: The Idea Processor's Card Display Menu. Cards are small files that can be searched and sorted by keywords.

	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10
	Info	Help	PtSet	TabSet	Refrm	PtCode	Bold	Ulin	WrdWrap ± Lines	
Shft	Info	Help	Srch↓	Srch↑	Rplc↓	Rplc↑	GblRplc↓	GblRplc↑	Rept↓	Rept↑
Ctrl	Info	Help	StrtBk	EndBk	CxIBk	MovBk	CpyBk	DelBk	ChgAtr	ReclBk
Alt	Info	Help	SavBk	InsFil	Rename	SavFil	Dir	Quit	GetCard	↔File

Figure 2: The Idea Processor's function key commands are displayed in the Information Line.

sheet data. When it comes time to write the first draft of the report, you can import spreadsheets and graphics into the Cardfile and create an outline in the Editor based on the keywords you have assigned (perhaps *Intro*, *Background*, *Production*, *Distribution*, *Sales*, and *Future Trends*). Finally, you can transfer the various cards into the outline in the appropriate place, whether they contain text, spreadsheets, graphics, or any combination of the three.

An Old Idea: The Text Editor

If you can live with working on a text screen 80 columns wide and single-spaced, you've just jumped the only major obstacle to accepting *The Idea Processor's* Editor. Like the word processing programs of olden days, the text editing and print formatting functions operate independently. As in most such editor/formatter packages, greater print format flexibility is won at the expense of ease of use. What you see is not what you get, and unless you know exactly what you're doing, you have to go

back and forth between the two programs to achieve the intended result.

However, the Editor provides a full range of editing commands and can compete with the top word processing programs on the market. The function keys are used alone and in conjunction with the <Shift>, <Ctrl>, and <Alt> keys to provide 34 commands. The bottom line on the screen, called the Information Line, displays the available function key commands (see Figure 2).

● Review

Help can be called up with the <F2> key. When you press the key once, you are asked to press the key about which you want information. If you press <F2> a second time, a list of help messages is displayed. The second line from the bottom of the screen always displays the on/off status of four toggle commands: insert, word wrap, underline, and boldface. Insert is controlled by the <Ins> key, and the other three commands are issued from function keys. The screen displays underlined and boldfaced text as it will be printed.

The comprehensive cursor-movement commands make moving around a document a breeze. You can move right and left one word, to the beginning and end of a line, to the top and bottom of the screen, to the beginning and end of a file, and up and down a specific number of lines.

The Editor also supports right and left tab stops and scrolling. Scrolling can be done a line or a screen at a time in either direction and can be made continuous. Continuous screen scrolling displays the text for approximately 2 seconds before the next screen appears.

The insert mode allows insertion of characters or words while the original text is moved to the right. The split-screen insert command (<Ctrl>-<Ins>) blanks the screen past the cursor's position. The first 80 characters that follow the cursor are displayed in a highlighted line at the bottom of the screen. This permits the insertion of large amounts of text without the delay and distraction caused by the continuous shifting of the original text. Repeating the command closes up the text.

The range of available delete commands is also quite complete. You can delete the character at the cursor or to the left of the cursor, the word or space to the right of the cursor, and all words from the cursor to the

end or beginning of the line. You can also delete a marked block or an entire line and move the following text up. Accidental deletions can be undone. Paragraph reformatting is commanded by placing the cursor anywhere within the paragraph and pressing <F5>. No global reformatting is provided.

The Idea Processor provides single search, search and replace, and repeat search options. In addition, global search with or without individual replacement approval is provided along with wild-card and special character searches. All searches can operate forward or backward.

The Idea Processor provides a complete set of block commands. To mark a block, position the cursor at the beginning and press <Ctrl>-<F3>. You can move the cursor to the end of a block with the cursor keys or by typing a character to search for. The cursor will leap to the first occurrence of the chosen character. To mark the end of the block, press <Ctrl>-<F4> and then <Enter>.

Once a block is identified, typical commands are available. The print attributes of the block's characters can also be changed; the choices provided are normal, bold, underline, or combined bold and underline. Marked blocks of text can be transferred easily between the Editor and the Cardfile. Unlike the cards in the Cardfile, documents created in the Editor are stored on disk with conventional file names and can be manipulated with DOS commands.

Macro Commands

The Idea Processor allows the definition of up to ten keyboard macro commands on the number keys. These are defined by pressing <Ctrl>-D and executed by pressing <Ctrl> plus the assigned number

key (0 through 9). Each command can be up to 100 keystrokes long, and commands can be nested (having macro commands call up other macro commands to create a series).

Macro commands can be used for such operations as saving various tab settings, stringing together reformat commands, or quickly saving a file as a card. Several sets of macro commands can be generated and stored under appropriate file names, and any set can be copied to the operating file when needed.

Print Formatting

The Print program interprets format lines entered into the text as print commands. A default format line (a print rule) can be created by the Editor for each document, and unlimited

Footnotes are automatically printed single-spaced.

format changes can be included within each document. The print rule is generated from a menu called up by pressing <F3>. Once you answer the questions and return to the screen, you will see the format line in abbreviated code that the Print program can understand. The <F3> menu allows you to generate complex formatting code without memorizing commands.

Formatting options allow you to define page margins and length, page and line width, the number of lines per page, line spacing, justification, and paragraph indentation. Default values are provided for each item.

In addition to the format options provided on the <F3> menu, you can type in 15 other print format commands anywhere in the text. These "feather" commands are simi-

lar to the dot commands in *WordStar*, but a special feather character replaces the dot so you don't have to worry about losing lines if you begin a line with a period. Print format commands provide for centering, conditional and unconditional page feed, page numbering, odd/even page logic, continuous or single-page printing, and headers and footers. One very useful command allows character strings to be sent to the printer from any line in the document, starting at the beginning of the line. This permits the use of any special capabilities the printer may have, such as double width or compressed printing, italics, or proportional characters.

The Idea Processor excels in its ability to automatically number footnotes and place them at the bottom of the appropriate page. Footnotes are automatically printed in single-spaced format and are limited to 20 lines per page; excess lines are printed on the next page. Marked text can be sent to a disk storage file, which can be used to save all footnotes for printing at the end of the document or to save notes for generating an index.

The Print Program

You can bring up the separate print program by exiting to the Idea Ware menu and selecting Print. On the Print Program menu, you have the choice of printing the file or previewing the file as it will be printed. During the preview, the screen scrolls by quickly, but you can stop and restart the scrolling with a keystroke. When you choose to print the file, the program checks to see if you've included a print rule at the beginning of the file. If you have forgotten to format the file, the screen displays a Print

Format menu so you can set up the print rule. However, if you want to add format lines within a document, you have to return to the Editor and insert the appropriate feather commands.

The printing of graphics screens is supported for the IBM Graphics Printer and the Epson MX-100, FX-100, and FX-80 printers. Idea Ware claims that it will soon support other printers. If the printer you use is not supported, you can go to the Print menu and enter the control characters for the printer for underline, boldface, superscript, and subscript.

Documentation

The manual is well organized and clearly written. There is a lengthy section describing *The Idea Processor's* functions and capabilities. A picture of the screen accompanies the text description of the actions that result from issuing each command.

The reference section of the manual gives a concise overview of *The Idea Processor's* commands and functions. Two tutorials are included—a self-running demonstration disk and a lessons and sample files disk. A glossary and a DOS tutorial are included in appendices, followed by a detailed index.

User support is available via a toll-free number, and registered owners are notified of updates and new products. Updates will be available at a nominal cost. One final advantage is that the program is not copy-protected.

Wishing Out Loud

Since this is the first release of the program, I expected to find some bugs, but none have appeared. Despite the excellence of the program, however, it's difficult to keep from asking for more. One deficit is that the program provides no display of the cursor column. No doubt this capability was deliberately left out in order to provide the fastest possible screen response to input commands.

Also, hyphenation and hyphen-help are not provided, and the program provides no support for widow and orphan control. (Widows and orphans are lines left alone at the top and the bottom of the page, separated from the rest of the paragraph.) Also, no horizontal scrolling capability is provided; text wider than the screen must be printed to be reviewed in its final format. Enough griping.

In relation to its complexity and flexibility, *The Idea Processor* is easy to learn. The intelligent grouping of functions, the use of the function keys, and the on-screen display of function key assignments make it a pleasure to use. I went back to *WordStar* to write this article, but this may be the last time I use it.

Even without the Cardfile, *The Idea Processor* is an excellent word processor. The ability to include graphics screens in printed text is a useful feature. The addition of the Cardfile provides an unusual text data management system and expands the program's horizons considerably. If you could use a text data management system or need to combine text with graphics, there is no better choice. ☉

William Usim is an aerospace engineer at Lockheed Missiles and Space Company in Sunnyvale, California.

The Idea Processor
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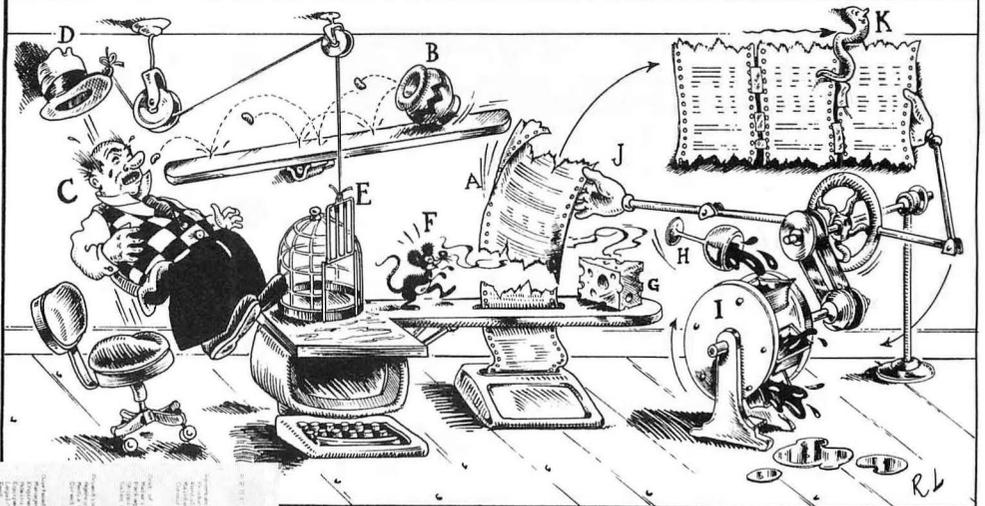
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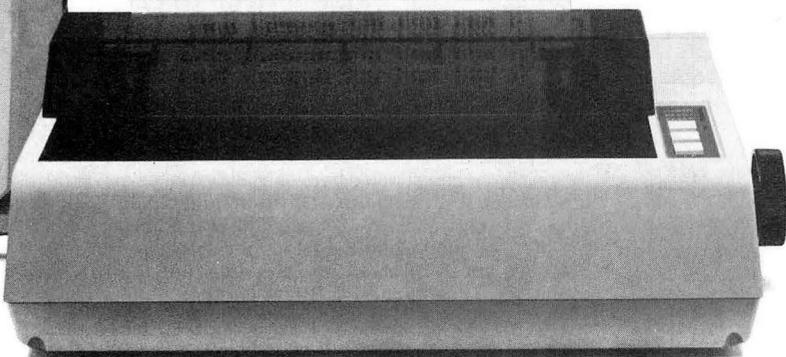
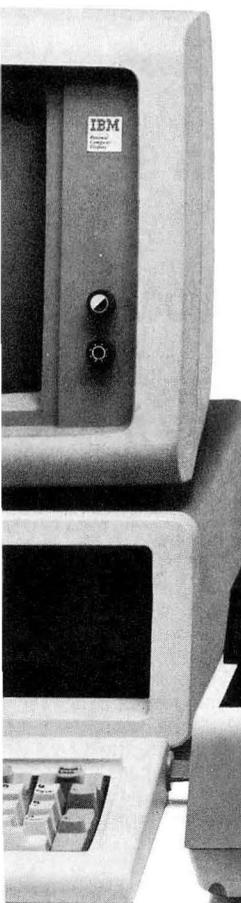
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From the Software Shelf

First impressions of recently released software

Edited by Robert Luhn

From the Software Shelf samples a small portion of the many software programs flooding the PC market. These reviews—written by the staff of *PC World*—provide a brief glimpse of new word processors, spreadsheets, data base management programs, utilities, tutorials, and other products—including new additions to established software families—that might otherwise be overlooked. These impressions are not intended to take the place of a full-length review of the product but rather to keep you informed of new products that we think will be of interest. *From the Software Shelf* examines programs for ease of use and installation as well as for the strong features or more significant weaknesses of these contenders for future software fame.

Preview Pak, Issue 1

An established, if unwritten, rule of American consumerism says that you get to see, test, or at least grasp the object of your materialistic desire before you buy it. With a car, you kick its tires and take it for a spin around the block. If you've heard that a certain \$1200 stereo system is just this side of heaven, you, the prudent buyer, naturally get a chance to fiddle with the turntable, check out the receiver's FM reception, and determine whether the speakers pack enough aural megatonnage to warp galvanized tin at 50 yards.

Not so with software. It's difficult to get much useful information by merely picking up a disk, yet many software dealers and manufacturers are reluctant to let programs be

tested, lest they be illegally copied. Thus for the typical software buyer, finding the right program is a matter of reading reviews in computer magazines or trudging to computer stores in the hope of finding a knowledgeable salesperson who can demonstrate a product. As a last resort the consumer must blindly buy a program and hope for the best.

This scenario need not be played out every time, now that *Preview Pak*, from Preview Publishing, has arrived. For the price of a box of floppy

For the price of a box of floppy disks, you can get ten new BASF double-sided, double-density disks—each holding a different demonstration of a popular PC program.

disks you can get ten new BASF double-sided, double-density disks—each holding a different ready-to-run demonstration of a popular PC program. This first *Preview Pak* issue (a new edition with different software will be released each month) includes software demos of *InSight* (an integrated software environment that uses windows), *SuperCalc 3* (a

spreadsheet), *Palantir* (a word processor), *AutoCAD* (drafting software), *Personal Pearl* (a data base manager), and *The Sales Edge* (business strategy software), plus two for programmers: PC/FORTH and QNX, a UNIX operating system look-alike. *Preview Pak* comes with a small pamphlet containing brief documentation for each demo, plus more than \$200 worth of discount coupons for most of the featured programs.

The *SuperCalc 3* and *AutoCAD* demonstrations are particularly effective because they offer a prospective buyer the opportunity to get hands-on experience with a nearly complete version of each of these programs. For example, the *SuperCalc 3* demo lacks only the Save function; you can create a worksheet, sort entries, use formulas, and produce graphs. The *AutoCAD* demo, although not quite as complete, similarly approximates the functions of the actual program, enabling you to draft images, rotate them, and use color. The demo even supports a mouse.

Preview Pak isn't perfect, however. Some demos, such as those for QNX and *InSight*, are little more than electronic advertising. Documentation on installation and operation is sometimes maddeningly terse. System requirements vary considerably from demo to demo; some need 64K and a monochrome display, others 256K and a color monitor. A hefty memory requirement is understandable for a complete demo such as *SuperCalc 3*'s, but inexcusable for one like QNX's, which consists mostly of text screens extolling the virtues of the operating system.



It's clear that *Preview Pak* is still in the process of finding its market. This first issue's mix of everything from esoteric programming languages to spreadsheets is perhaps too broad. But on the whole, *Preview Pak* hits the bull's-eye more often than not. Short of buying, borrowing, or stealing, *Preview Pak* is the best way so far to take a program out for a spin.—*RL*

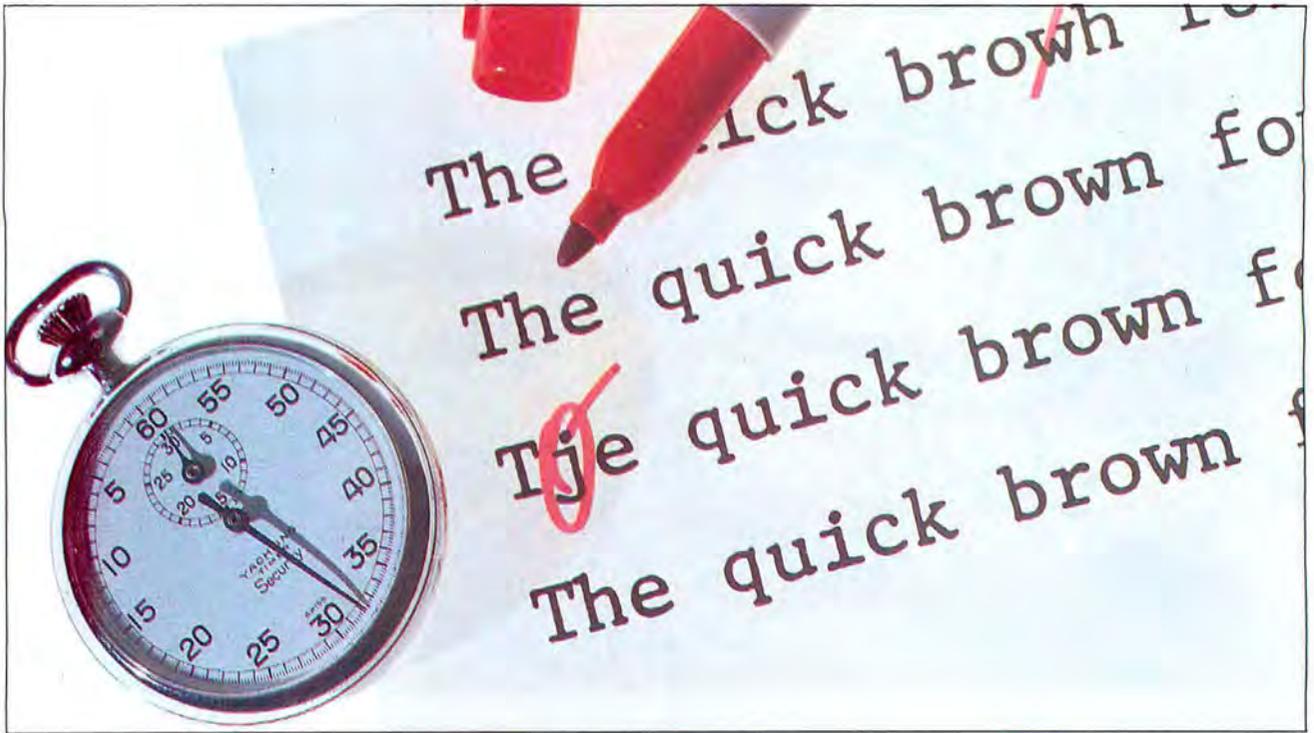
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Preview Publishing
P.O. Box 590359
San Francisco, CA 94159
800/443-0100 ext. 330A
List price: \$39.95 plus \$3 shipping
and handling

FriendlyWriter with FriendlySpeller

FriendlyWriter's demo package effectively conveys its marketing strategy: this word processing package is designed for the computer novice or computerphobe. Opening the pizza-size box uncovers a treasure chest of school supplies. Arranged neatly on white cardboard are two sharpened yellow pencils, a pencil sharpener, paper clips, blunt-edged scissors, a note pad, a nifty red pocket dictionary, and a compact user manual. I have to admit I was a sucker for this ploy; I've loved school supplies since I was in first grade. And when a user manual is a member of such a delightful collection, how threatening can it be?

FriendlyWriter with Friendly Speller is the newest addition to the *FriendlyWare* software series from FriendlySoft. The company has taken

pains crafting *FriendlyWriter's* "user interface" to make the product as attractive and simple as possible. After loading DOS and inserting the *FriendlyWriter* disk, all you have to do is follow the instructions on the screen. During every operation, a discrete, two-line menu of available functions is displayed at the top of the screen. Each function is activated by a single function key, and after a function is selected, the two-line menu displays a revised list of options. By constantly displaying a small, current help menu, *FriendlyWriter* manages the difficult task of supplying extensive on-screen assistance without slowing down an experienced user. The commands are consistent and logical, and the user manual supplies thorough, chatty support.



FriendlyWriter is flexible, accommodating the beginner while offering the experienced user alternate methods of command selection; quick cursor movement past lines, screens, and words; and automatic reformatting and pagination. Like many word processors, *FriendlyWriter's* default mode is overtype—if you place the cursor at the beginning of a word and start typing, you will write over what's underneath. Of course, with a touch of the <Ins> key, you can switch to the insert mode, but this mode is excruciatingly slow.

FriendlyWriter bills itself as a letter-writing program, but its scope is actually a bit broader than that. It's not suitable for extensive business word processing—document length is limited to about 20 double-spaced pages—but its basic word processing

functions are well implemented, and its few options are chosen well. The program can print out documents in 8½- by 11-, 8½- by 14-, and 5- by 7-inch formats (the screen display also adjusts to show the selected format). You can choose either ragged right or justified text. You can't, however, include headers, footers, or page numbers. Tabs are permanently set in five-space increments, so the program may not be up to technical reports using complex tables.

FriendlySpeller, the spelling checker included with *FriendlyWriter*, has a 70,000-word dictionary. When activated, the program notes how many words in a document it failed to find and then immediately positions the cursor at the first sus-

pect word in the document. As with most spelling checkers, you can ignore the word, add it to the dictionary, see alternate spellings for it, or replace it. If you ask for alternate spellings, the program opens a window directly under the suspect word and lists the seven words with the closest spellings from the program's dictionary. You can insert one of those words into the document with a single keystroke.

In its user manual *FriendlyWriter* congratulates itself, and rightly so, for the way it handles files. Instead of limiting you to the eight-character file name permitted by DOS, *FriendlyWriter* allows you to assign a name up to 25 characters long to each document. It augments this identification with the system date and a phrase chosen from the document itself. This filing scheme can be used to advantage, since the program will

search for file names that contain specified character strings, allowing you to quickly call up a list of all letters filed under SALES or NEW CLIENT designations, for example. The name, date, and identifying phrase are all shown in the file directory when you choose Select Letter or File from the main menu.

I was weaned on dedicated word processors and have never really gotten used to the complex commands that *WordStar* demands. I'm impressed that an inexpensive program like *FriendlyWriter* can combine well-implemented basic features with the ease of use I thought I'd given up when I moved to the PC. The cute packaging hides an elegant program that is modest but solid.—DD

FriendlyWriter with FriendlySpeller
FriendlySoft, Inc.

3638 W. Pioneer Pkwy.

Arlington, TX 76013

817/277-9378

List price: \$89.95

Requirements: 64K with DOS 1.10,
128K with DOS 2.00 or 2.10, one
disk drive

Typing Instructor

My mouth was dry; my hands were clammy; my stomach was doing flip-flops. Everything had to be perfect, but things were happening so fast. Could I remember the right moves?

No, I wasn't on a first date. I was getting ready for a *Typing Instructor* typing test. I've hated typing tests since my Typing I class in high school. My teacher, Mrs. Cummings, was great, but I sat next to Mary Beth Lipnoski, who typed 90 words per minute on a bad day. Mary Beth

wore out three Remingtons in the first week of class while I was still trying to figure out where the paper went. Let's just say the class was not the highlight of my academic career.

But my high school memories haven't stopped me from appreciating *Typing Instructor*, a well-designed program that can help both new and veteran typists. Lessons such as Typing Basics for Beginners and Learning the Key Locations take new typists step by step through the concepts that Mrs. Cummings drilled into my head and fingers: good posture, home position, correct fingering. But unlike my old Gregg manual, *Typing Instructor* chided me when I typed a wrong key and told me to try again. The interactive error messages are limited to one or two different phrases, but they are sufficient to stop bad typing habits before they begin.

Typing Instructor's small manual contains setup and installation information. The remainder of the program's information and instruction is provided on screen. Text for tests, for example, is displayed triple-spaced on the monitor, and you type underneath each line during the tests. I liked this feature because I didn't get a crick in my neck from staring at a typing manual sitting next to my keyboard.

Experienced typists will benefit from the program's Building Accuracy and Speed and Typing Skills Evaluation sections. These sections give you a chance to brush up on and hone your typing skills, letting you set the difficulty level of exercises and tests so that seldom-used number and

symbol keys are frequently included in a test. Although *Typing Instructor's* timed tests brought back my high school shell shock, I liked the fact that the program marked mistakes, scored tests, and gave me the option of practicing words I'd typed incorrectly.

For a change of pace the program includes the Lobster Sea Adventure speed typing game. The game starts

Typing Instructor
marked mistakes,
scored tests, and gave
me the option of prac-
ticing words I'd typed
incorrectly.

like a regular typing test, but as you begin to type the words, a lobster sneaks out on the left of the screen and chases the cursor. If the lobster catches it, you lose the game. While this may sound pressure-paced, the program allows you to adjust the typing difficulty level and typing speed (15 to 90 words per minute). But you must be accurate as well as fast, for the game makes you retype misspelled words before you continue.

Typing Instructor also includes Word Processing Concepts, a section that discusses the difference between typing on a typewriter and on a word processor. The program clearly explains word processing features such as word wrap and block moves,

From the Software Shelf

and it demonstrates how the <Ctrl> key is commonly used with editing commands. This is a particularly valuable section for anyone who has cast aside a typewriter for a PC, a PCjr, or a compatible.

Mary Beth Lipnoski probably wouldn't get much out of the program, but then she never needed Mr. Gregg much either. Mere mortals, however, can learn a great deal from *Typing Instructor*.—KS

Typing Instructor
Individual Software, Inc.
1163 Chess Dr., Ste. 1
Foster City, CA 94404
415/341-6116

List price: \$49.95

Requirements: one disk drive, 96K
with DOS 1.10, 128K with DOS
2.00

Speed Reading . . . The Computer Course

Whether it was from *Sesame Street* or *Speak n' Spell*, most of us learned to read by the same methods. We started by sounding out single syllables, progressed to words and then whole phrases, and finally related the sounds to their printed equivalents. The Bureau of Business Practices (BBP) examined these common learning patterns and found that they may not be optimal; the average adult reads only 200-250 words per minute (wpm) but is capable of reading up to 1000 wpm. Though my reading habits are not always productive, I never contemplated improving my speed for fear the remedy would entail enrolling in night school or the Evelyn Wood Speed Reading course. The image of a classroom full of slow

readers, an overhead projector instead of a book, and a teacher with a stopwatch has never been appealing. When I discovered BBP's *Speed Reading . . . The Computer Course*, I was encouraged to shed a few eccentric reading habits.

Speed Reading . . . The Computer Course is a three-disk, interactive speed-reading course that BBP claims will double your reading and comprehension rate in a month. The program contains 4 hours worth of reading tutorials. A manual filled with a large selection of diversified reading material is also included.

Eight lessons make up the complete course; each lesson comprises five segments. You have the freedom to skip a segment or go through an entire lesson, reading through a 2-minute introduction on the values of good reading habits, using all the practice drills, taking a practice timed reading, and finishing off with a final timed reading on the computer. Each lesson has the same basic structure. You control the speed at which you read and progress.

To complete a lesson you read a selection from the screen at your own pace, pressing the <Space> bar when you want to begin a timed reading and again when you have finished. The program times you and calculates your gross reading rate in words per minute. Next you take a comprehension test based on the material you just read. The program recalculates your time based on the number of questions you answered correctly to produce an effective, or net, reading rate. You can record your results on a chart in the manual.

The program uses rapid perception drills to increase your peripheral vision and to encourage rapid eye movement (REM) across the page. A story is flashed across the screen in

four- and five-word blocks at 1/3- to 1/10-second intervals. Of all the practice drills, the REM exercises are the most fun. These drills do not test comprehension, and the reading material is inspirational. For example, the rapid perception drill in Lesson 3 reads: 'Get up immediately after awakening./ Stand with your hands on the back/ of your hips, palms facing upward./ Now, begin to laugh. Keep laughing/ for a few minutes. When you feel comfortable,/ stop laughing. Then proceed with/ your morning routine.'

Speed Reading . . . The Computer Course allows you to move from reading the screen to reading printed material with equally satisfying results. Strangely, my reading rate was faster with the less entertaining selections. I also found that it doesn't pay to lie to the program about your reading rate and comprehension, since the speed and difficulty of your next reading test is contingent upon the skills you displayed in the previous lesson. If you did poorly on a lesson, it is probably best to reveal your ineptness and take the next lesson a little slower.

This course is effective because all that counts is your private ambition to improve and practice. No classmates, no overhead projectors, no competition. And it works.—CH

Speed Reading . . . The Computer Course

Bureau of Business Practices
24 Rope Ferry Rd.

Waterford, CT 06386

800/243-0876

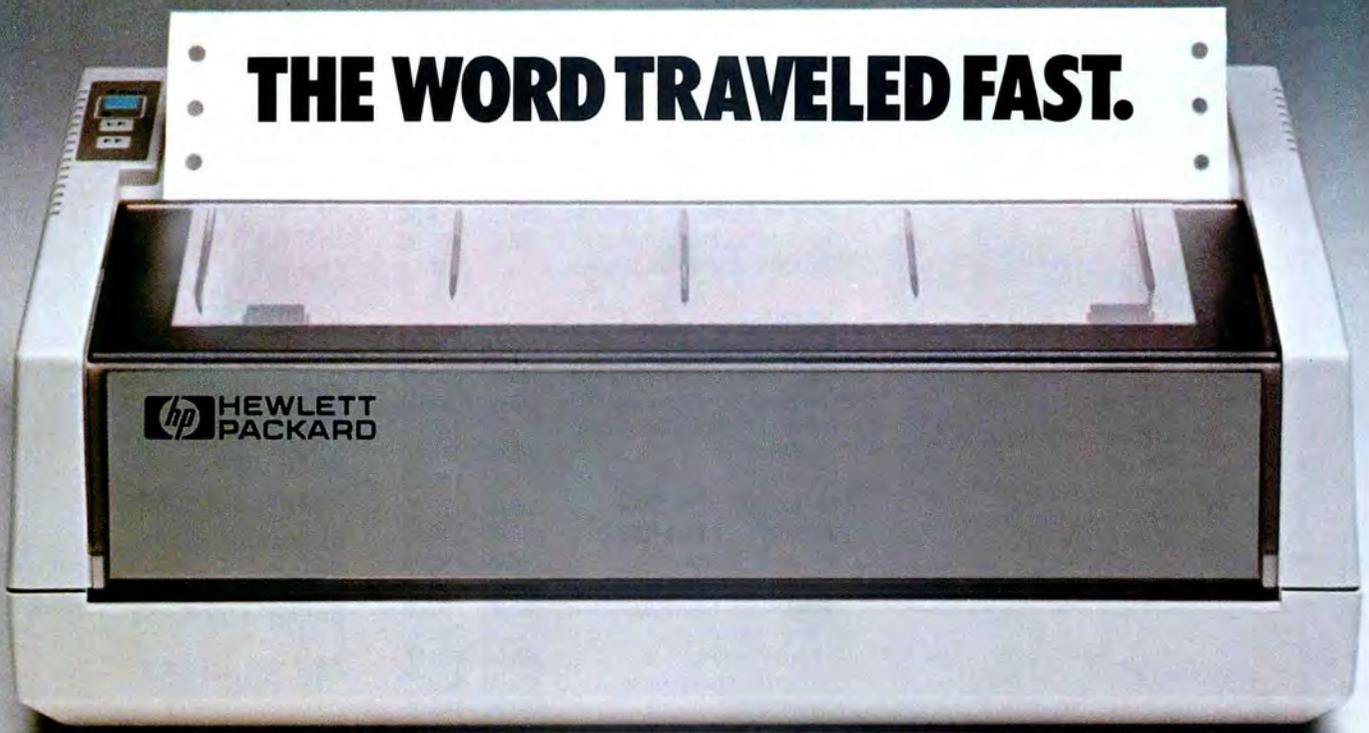
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Requirements: BASICA, DOS

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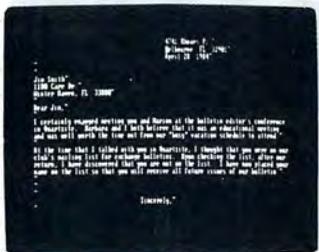
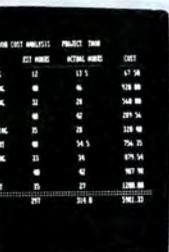
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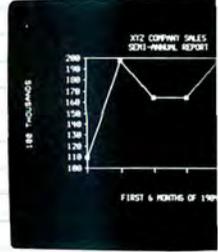
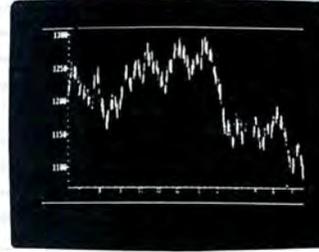
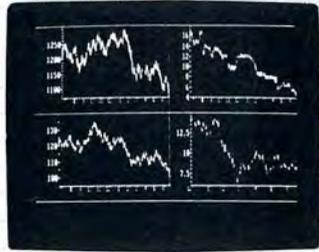
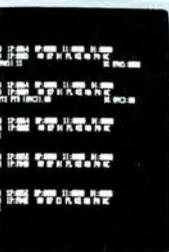
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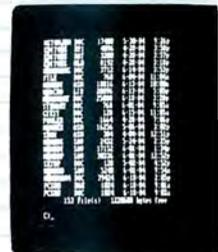
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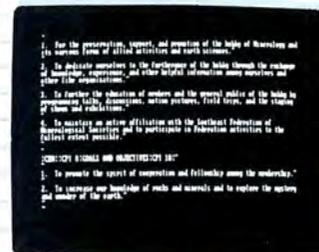
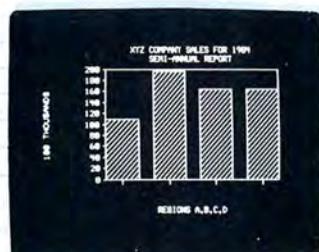


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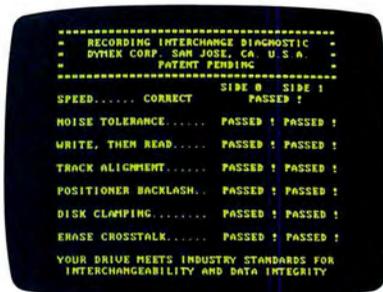
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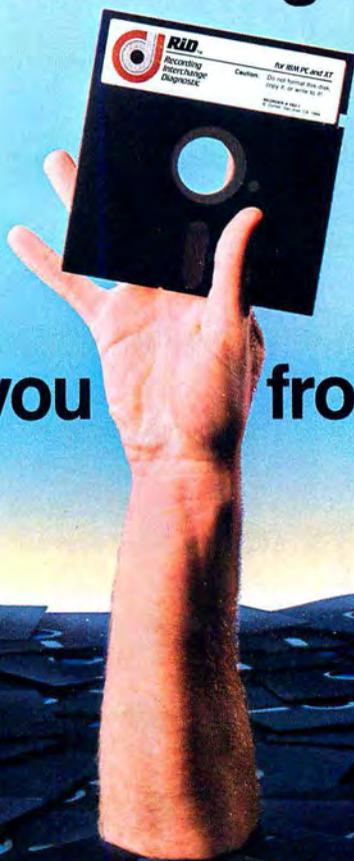
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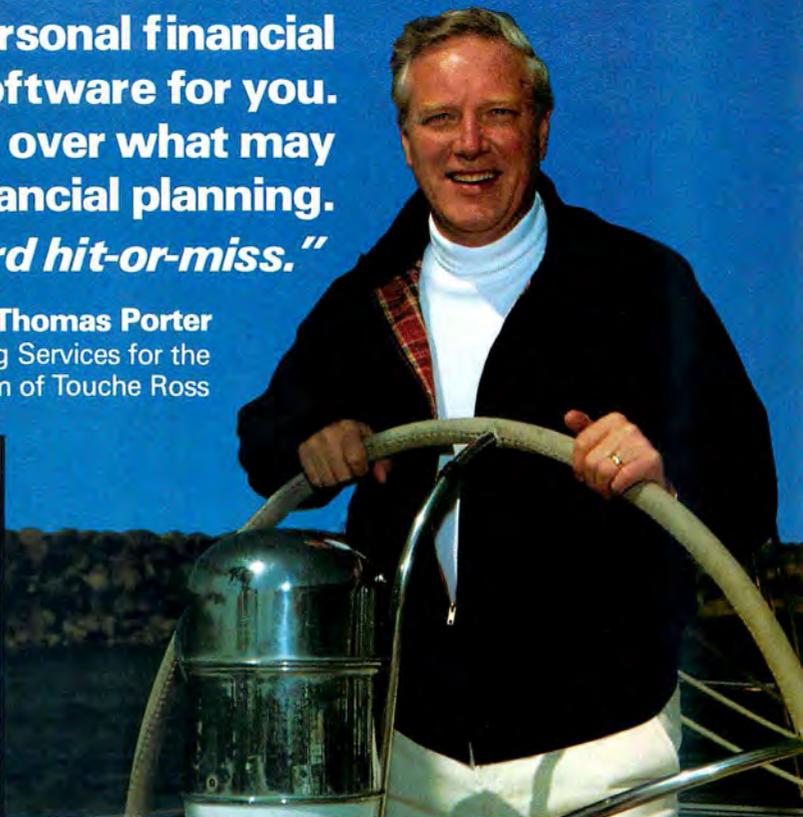
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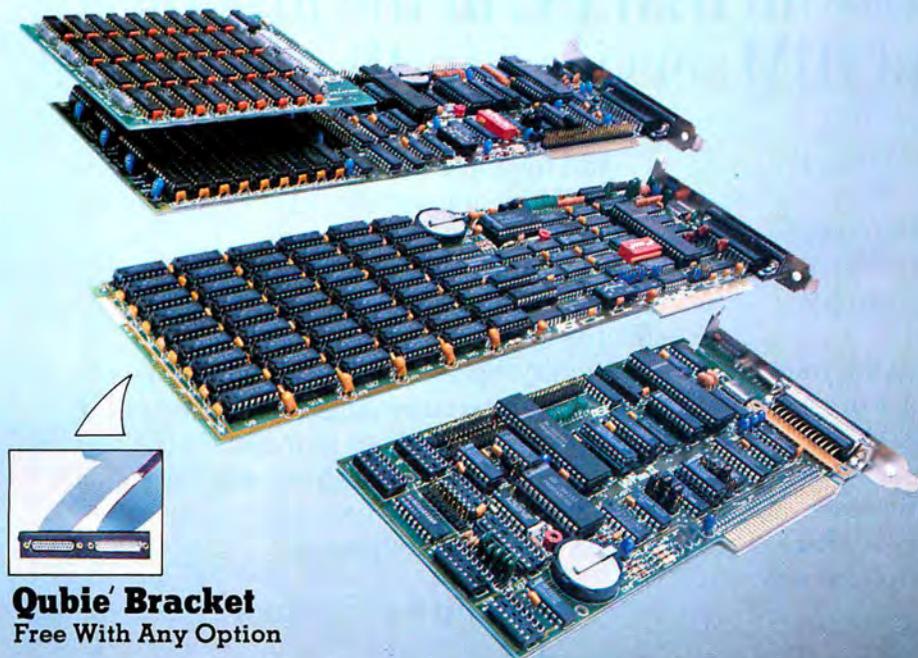
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PCjr WORLD

October 1984

*The Home Computer Magazine
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Off to a
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New add-ons for the PCjr make it as powerful as the PC, but less expensive.

Off to a Good Start: PCjr Add-Ons

John Heilborn



The Legacy unit's plastic casing was designed to match the PCjr's. The unit fits on top of the PCjr.

IBM's advertising campaign for the PCjr describes the machine as the personal computer that "grows with you." To a certain extent IBM's claim is true, since you can upgrade an entry model PCjr to an enhanced model. However, the PCjr was designed with some definite limitations. Specifically, the PCjr's power supply and circuitry make it difficult to expand the machine's memory beyond 128K.

Many hardware and software designers and manufacturers have done their best to design products around those restraints. But others, such as Legacy Technologies, of Lincoln, Nebraska, and Tecmar, of Cleveland, Ohio, looked upon those limitations as opportunities and found ways to expand the "unexpandable." Although the two companies took different approaches, both have produced products that make the PCjr a viable business machine.

The Legacy Expansion Box

Legacy, an 11-month-old company, was one of the first to bring a PCjr expansion product to market. Before the PCjr was available for retail sale, Legacy president Steven M. Jacob made a deal with a local IBM retailer, who allowed Jacob and his partner to borrow and work with the retailer's PCjr display model each night after the store closed. The arrangement allowed Legacy to get a jump on its competitors.

The Legacy I base system is an add-on cabinet built to resemble the PCjr. The \$395 unit attaches to the PCjr's I/O expansion bus and sits on top of the computer. The unit contains a four-slot expansion bus (the proprietary bus accommodates only Legacy expansion boards, not IBM's or any other company's), an auxiliary power supply that supports additional memory and expansion boards, and a front panel with 24 light emitting diodes (LEDs). The LED front panel shows the binary value at the memory address currently being read from or written to. The panel is a

nice troubleshooting tool for programmers; for non-programmers the LEDs are fun to watch and make nice placebos.

The Legacy II, which costs \$795, is the base unit plus a half-height floppy disk drive and a new disk drive controller board for the PCjr. The Legacy III,

Two 256K EXP boards together with a 128K expanded PCjr bring the computer up to the full 640K of user memory.



which was released this summer, is the base unit plus a 10MB hard disk and a hard disk controller board. The Legacy III costs \$1795.

The company also produces two expansion boards, the Legacy EXP and the Legacy CPS, for its base unit. The Legacy EXP is a memory expansion board that holds up to 256K in increments of 64K. You can either purchase the board fully populated or buy it with 64K and add your own memory chips. Two 256K EXP boards together with a 128K expanded PCjr bring the computer up to the full 640K of user RAM. The Legacy CPS provides a clock/calendar and a parallel port and comes with print spooler software.

Setting Up the System

I used a Legacy II module with 256K of memory for this review. Connecting the Legacy Expansion Box to the PCjr was easy. I removed the Legacy Expansion Box cover and the PCjr's top cover and I/O expansion bus side panel. Since the Legacy II system includes a

disk drive, I had to take out the IBM single-disk controller board in the PCjr and replace it with Legacy's dual-disk controller board. I attached the expansion box to the PCjr's I/O expansion bus with a wide ribbon cable and then snapped on the new side panel that Legacy provides. After putting the top covers back on both the PCjr and the Legacy Expansion Box, I placed the expansion box on top of the computer.

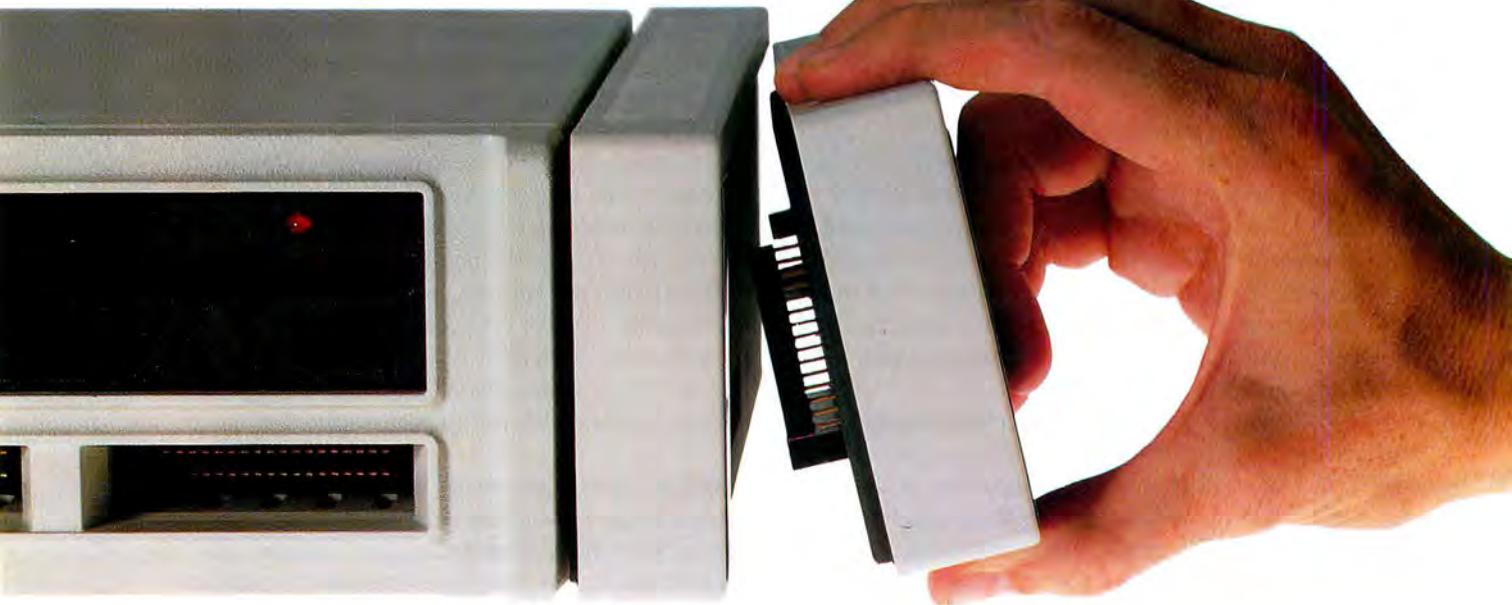
At this point I was almost ready to go. First I had to create a new DOS 2.10 disk to work with my newly upgraded PCjr; DOS 2.10 does not recognize a second disk drive or more than 128K for the PCjr. Therefore, to make the operating system aware of the computer's newfound power, I had to use the SYSFIX program that Legacy includes with the hardware. The procedure is to format a blank disk, run SYSFIX, and then copy all the DOS 2.10 files onto the disk. Unfortunately, SYSFIX does not modify the DOS 2.10 format procedure, so you must run SYSFIX for every newly formatted disk that you plan to use as a system disk.

One hardware problem that is difficult to solve is the incompatibility between the PC's and the PCjr's graphics memory addresses. To help resolve some of these differences, Legacy includes a second program called LEGACY.COM. LEGACY.COM should be

added to program disks to be called by the AUTO-EXEC.BAT file. This program clears up many of the memory problems that cause PC programs such as *dBASE II*, *WordStar*, and *SuperCalc* to crash on the PCjr—even on an expanded PCjr. However, this program is not a complete solution—1-2-3 graphics, for example, won't run—and LEGACY.COM may, in fact, cause some programs that would run on an expanded PCjr to crash. Legacy suggests that you first try a program without LEGACY.COM. If the program works on the PCjr, don't run LEGACY.COM. If a program doesn't work, run it with LEGACY.COM and try again. One final word of caution: LEGACY.COM is incompatible with both the cartridge and cassette versions of BASIC. Therefore, don't run LEGACY.COM when you are planning to run BASIC.

Tecmar's Shipload

Tecmar was one of the first companies to produce expansion boards for the PC when that computer was introduced. The company did a repeat of its fast production when the PCjr was unveiled; within weeks of the PCjr's introduction, Tecmar had announced several PCjr products.



The jrCaptain must be attached to the PCjr I/O expansion bus before other Tecmar modules are attached.

Tecmar's approach to PCjr expansion differs quite a bit from Legacy's. Tecmar offers four PCjr expansion boards: the jrCaptain, the jrCadet, the jrSecond Mate, and the jrWave. Each board is enclosed in a plastic casing designed to match the PCjr's plastic casing. Tecmar's boards are well made, and it's apparent that the company's engineers gave both time and care to the PCjr product line.

The jrCaptain is the major product of the group. The board includes a power supply and adds a parallel printer port and a clock/calendar to the PCjr. It also

Tecmar's boards are well made, and it's apparent that the company's engineers gave both time and care to the PCjr product line.

comes with a program disk called Treasure Chest. The jrCaptain comes in three configurations—unpopulated, 64K, and 128K—and sells for \$235, \$315, and \$395, respectively. The jrCadet is a memory board that adds 64K to 384K to the PCjr and ranges in price from \$195 to \$595; the \$145 jrSecond Mate adds a parallel port and a clock/calendar to the computer. The jrWave is another memory expansion board; it ranges in price from \$295 to \$495. The board comes in memory configurations up to 256K and has its own power supply.

Installing the Tecmar Expansion Boards

The PCjr's limited power supply means that either a jrCaptain or a jrWave board must be included in any Tecmar PCjr expansion. I used a jrCaptain board and a jrCadet board for this review. Connecting the Tecmar boards was a snap. I pulled the side panel off the PCjr and plugged the jrCaptain directly into the PCjr I/O expansion bus. I attached the jrCadet to the first board with screws.

Once the boards were connected, all I had to do was plug Tecmar's small power supply cord into the jrCaptain, plug the cord into a socket, and turn on the

PCjr. Or at least that's what the instructions said. Unfortunately, the power supply cord that came with my system had a mangled cable that required some wire splicing before the system would run.

The Tecmar Treasure Chest

Once the cord crisis was over, I had a chance to look at the Treasure Chest of software. Tecmar claims that these programs, which are all on one disk, have a value of \$1000, and a company salesperson says that first-time computer users will probably not need any additional programs.

The Treasure Chest disk includes Cal, a calculator program; Check, a checkbook program; Memdisk, a disk emulator; Memo, a mini text editor; Printer, a print spooler program; Qsort, an alphabetical sorting program; and Remind, an appointment program.

New computer owners usually want word processing and spreadsheet programs. While the Treasure Chest of software includes the text editor, Memo, the program does not qualify as a full word processor, and no spreadsheet program is among the group. I don't think that a beginner's needs would be completely satisfied with the programs included with the jrCaptain, but some useful utilities are included in the Treasure Chest. The Memdisk program, for example, reallocates 380K of memory to a super-fast disk emulator. With Memdisk my word processing program ran many times faster than it does with two floppy disks. The print spooler program, Print, is also handy.

The Treasure Chest also includes CON-PCJR.EXE, a program similar to LEGACY.COM. CONPCJR.EXE enables many programs, such as *WordStar* and *1-2-3* (without graphics), to run on a Tecmar-upgraded PCjr. CONPCJR.EXE, like LEGACY.COM, should be called by the AUTO-EXEC.BAT file on program disks.

Mixing and Matching

As a final experiment I connected both the Tecmar system and the Legacy system to the PCjr. This configuration produced a 640K system with two floppy disk drives and a disk emulator. The system worked fine until I ran LEGACY.COM; the PCjr screen then filled with flashing, multicolored characters, and the computer would not acknowledge keyboard commands. I righted the situation by turning the computer off and then on again.

Both systems are well designed and come with clear and well-written documentation. The Legacy system requires a longer setup time than the Tecmar system, but you don't need an engineering degree to install either one. If I had to choose between the two, I would lean toward the Legacy system. Although I appreciated the speed of Tecmar's disk emulator software, I liked the ease and safety of a floppy disk drive, with which I could back up my data.

Both the Legacy and Tecmar systems provide a solution to the built-in limitations of the PCjr. While neither provides complete PC compatibility, both make it possible to run a larger amount of existing PC software than a 128K PCjr can run. Remember that many more expensive "PC compatibles" are far less PC compatible than a PCjr equipped with Legacy or Tecmar products.

John Heilborn is a computer book author and publisher. His company, ThinkWorks, is in Castro Valley, California.

*Legacy Expansion Box
Legacy Technologies, Ltd.
4817 N. 56th St.
Lincoln, NE 68504*

*800/228-7257, 402/466-8108 Nebraska
List price: Legacy I \$395; Legacy II \$795; Legacy III \$1795; Legacy EXP 64K \$199, 128K \$299, 192K \$399, 256K \$429; Legacy CPS \$159*

*jrCaptain, jrCadet, jrSecond Mate, jrWave
Tecmar Inc.
6225 Cochran Rd.
Cleveland, OH 44139
216/349-0600*

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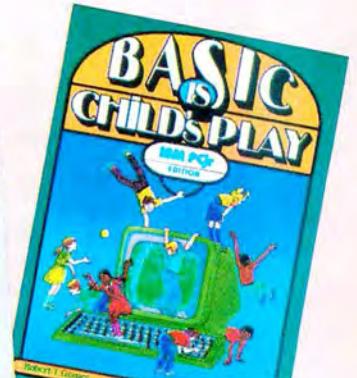
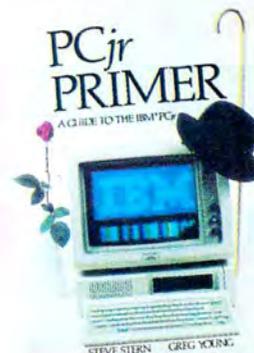
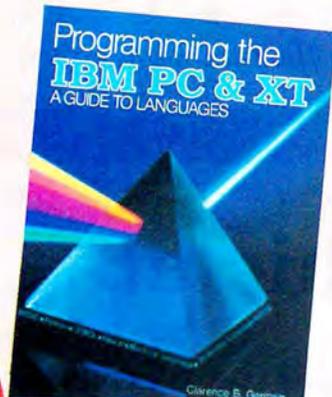
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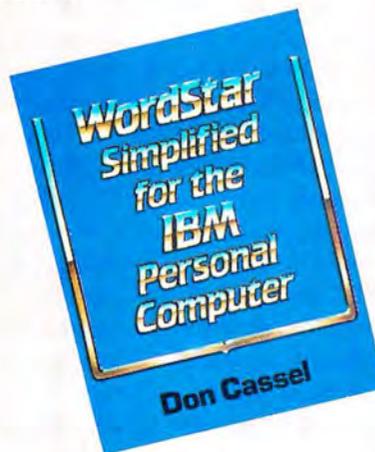
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Two professional keyboards bring the PCjr up to office standards.

Challenging the Chiclets

Rick Altman

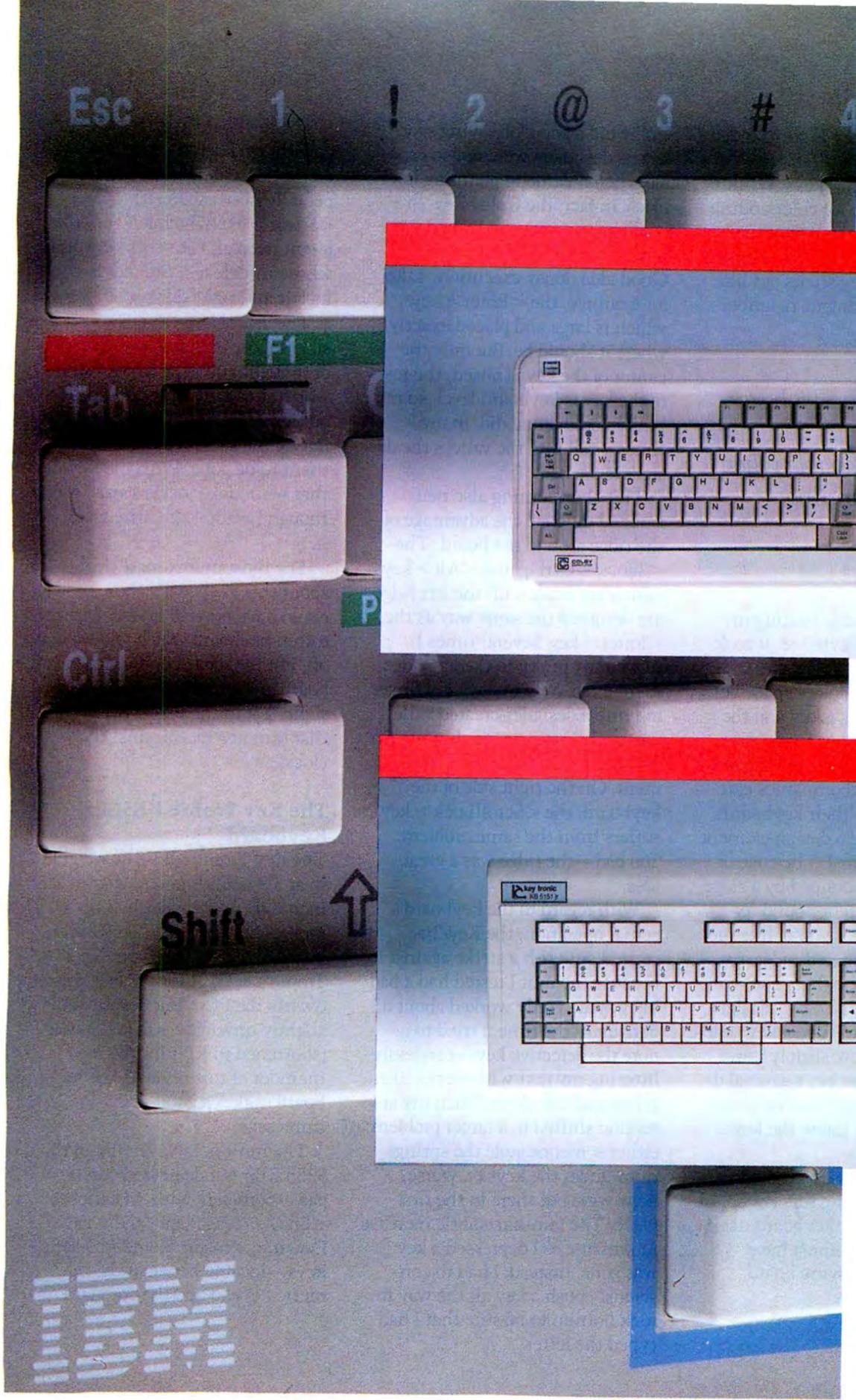
The PCjr keyboard has received much criticism. Critics have labeled the infrared keyboard a "gimmick," and reviewers have warned that its "Chiclets" keys will probably slow down professional typists. The "toy" keyboard might be fine for a children's home computer, they say, but it isn't suitable for most business applications.

In light of the criticism, it isn't surprising that two companies—Colby Computer and Key Tronic Corporation—were quick to come up with replacement keyboards for the PCjr. The companies had a head start over the competition, since both Colby and Key Tronic produce alternate PC keyboards, which they modified for use with the PCjr. Both keyboards are a welcome relief for PCjr users who do word or data processing on home computers. However, both keyboards would have benefited from a little more time with the designers.

The Colby Key-2jr Keyboard

Colby Computer's Key-2jr keyboard is a version of the company's PC keyboard, the Key-2, with a different cable and ROM. The \$249 Key-2jr is small (15 inches by 7 inches, sloping from 2½ inches to 1½ inches in height) and light (3½ pounds). The keyboard has a deceptively plastic appearance, but a closer look reveals that the keyboard casing is made of lightweight, but solid, magnesium.

The Key-2jr, with its 88 keys, is a tightly packed keyboard. PC and PCjr users won't get lost on the Colby keyboard, but some layout changes may take a while to get used to. The top row has four dedicated cursor control keys on the left and ten function keys on the right. Colby placed the <Shift> key in its usual non-PC location and made the <Enter> key as wide as two keys. With no other room to spare, Colby buried the backslash key in the lower left corner of the board. Curiously, Colby colored the backslash key white



The Colby Key-2jr (top) and Key Tronic KB5151jr (bottom) keyboards may overshadow the PCjr's original Chiclet keyboard.

even though the key is surrounded by the gray-colored <Tab>, <Ctrl>, and <Alt> keys. While this design makes for color-coding consistency with the rest of the letter, number, and symbol keys, the poor backslash key sticks out like a sore thumb among its neighboring gray keys.

Colby did a good job saving space, but its designers were not so capable when it came to planning luxuries.

I had little trouble finding my way around the keyboard. It took me a few minutes to get accustomed to the lack of space between the <Enter> key and the numeric keypad, but I soon discovered that I didn't need the dead space that many companies carefully design into their keyboards. Colby also added a design element that I found helpful. The edge of the board is surrounded by a ridge that provides a tight boundary around the keys. If you're like me, you've never bothered to learn how to touch-type the <Esc> or key. With Colby's design, when you need to type a key that's in a boundary row, simply move your finger in the key's general direction. When you touch the edge of the ridge, you know the key is right there.

Some conscientious thought went into designing this keyboard. Sadly, though, the keyboard itself is not as nice as it must have looked on the drawing board.

Colby did a good job saving space, but its designers were not so capable when it came to planning luxuries. In fact, the Colby Key-2jr could be succinctly summed up with a familiar sports saying: Good idea, lousy execution. Take, for example, the <Enter> key, which is large and placed exactly where it should be. But only the center of the key is raised; the rest of the key is keyboard level, so my pinky could—and did, many times—fall into the valleys the designers created.

This shortcoming also neutralized much of the advantage of the ridge around the board. The <Tab>, <Ctrl>, and <Alt> keys, which are flush with the left ridge, are designed the same way as the <Enter> key. Several times I moved my pinky to the left ridge to hit a tab, only to have my finger fall into a designer-created valley. Once while typing quickly, my finger actually got stuck for a moment. On the right side of the keyboard, the <ScrollLock> key suffers from the same problem. Too bad—the ridge was a great idea.

With regard to the keyboard's actual operation, the Key-2jr started out with a strike against it because the unit I tested had a bad I key, which only worked about 35 percent of the time. I tried to ignore the defective key—carelessly littering my text with words like *typng* and *disk drves*. Then my attention shifted to a larger problem: either someone stole the springs from under the keys or, worse, none were put there in the first place. The familiar, subtle increase in pressure as I depressed a key was gone. Instead, I had to consciously push a key all the way to rock bottom to be sure that I had typed the letter.

The keyboard's feel was also inconsistent. Each key had its own tactile variation. This was especially noticeable with the <Space> bar, which felt very different from all the other keys and whose middle felt different from its left and right sides.

These problems make it impossible to lose yourself in your train of thought and type for all you're worth. I usually encounter difficulties when I use a new keyboard, but by the second day I expect them to be gone. With the Key-2jr, that second day never came, even though I waited an entire week for it.

The most unfortunate thing about this keyboard is how good it could have been. If it were just a rotten keyboard, you could write it off, but the ideas behind this keyboard are sound. Too many oversights got in the way—oversights that hint at a race against the clock.

The Key Tronic KB5151jr Keyboard

The Key Tronic KB5151jr weighs in at 5.9 pounds and measures 21.9 inches by 8.58 inches by 1.55 inches. Indeed, the 99-key keyboard, which is based on Key Tronic's KB5151 for the PC, almost dwarfs the PCjr. But despite its slightly unwieldy size and name (shortened to KBjr for the remainder of this review), the keyboard makes a good first impression.

The most notable feature of the \$255 KBjr is a dedicated cursor pad—complete with <Home>, <End>, <Page Up> and <Page Down>, <Insert>, and <Delete> keys—located between the numeric keypad and the standard

keyboard keys. The design idea is apparently to give ten-key operators cursor control without the <NumLock> key. A pleasant by-product of this layout is that the designers included two <Ins> keys—one in the numeric keypad and one in the cursor pad. So with your right pinky, you can toggle <Ins> without leaving the home position.

Key Tronic has also designed a <Pause> key that duplicates the <Ctrl>-<NumLock> function and a <Reset> key that takes the place of a <Ctrl>-<Alt>- system reboot. To protect you from the volatile nature of the <Reset> key, the designers included a nice safeguard—you must use extra pressure when pressing the <Reset> key. The designers also put little notches on the F and J keys so your index fingers can feel the home position. Have you ever typed an entire sentence with one hand misplaced? So have I, but I couldn't on the KBjr even when I tried. Those tiny notches make it almost impossible to go wrong.

The KBjr's function keys are located in the top row and are divided into two sets of five, separated by an inch. Another top-row key is completely blank and cannot be pushed down. A phone call to Key Tronic's headquarters revealed that a key in that enclosure will be used to activate a voice recognition system in the company's KB5152 keyboard, which will be released in 1985. I wonder why the key couldn't have been put to use in the meantime—even for something as simple as CLS for BASIC programmers.

That blank key is the only indication that Key Tronic, like Colby, raced the clock to get its PCjr keyboard out to the stores. Virtually all of the standard complaints about the PC keyboard have been

addressed, and several unsolicited improvements were made as well. The <Shift> and <Return> keys are in the right place, and unlike the Colby key, the KBjr's wide <Return> key doesn't cave in on both sides. Not only is the color coding attractive, but it effectively defines each section of the keyboard. The KBjr's designers also banished its backslash key from the main area of the keyboard—Key Tronic placed the key in the lower right corner and colored it gray like all the keys around it.

The KBjr is a success because its designers paid attention to details. Not only are the letters and numbers sharp and the layout easy to use, but the springs weren't stolen

All of the standard complaints about the PC keyboard have been addressed in the KBjr.



from this keyboard. The pressure is right, and the grooves on the keys are right. This is a keyboard that lets you lose yourself in thought and not worry about whether you really pressed the <Tab> key or whether your pinky will find the <Return> key.

But while the design details make this keyboard a success, some intangibles detract from it. This keyboard has ghosts. You don't believe in ghosts? Listen to the manual: "The <NumLock> and <CapsLock> status [of the PC] are maintained in system RAM. It is possible for an application program to overwrite or other-

wise alter the contents of this RAM location. If this should happen, the keyboard <CapsLock> or <NumLock> indicators would be out of sync with the actual status of the PC. This situation can be corrected by pressing and holding the <Reset> key."

Adhering to my solemn vow never to read manuals first, I was happily typing away when all of a sudden THE KEY TRONIC KEYBOARD STARTED TYPING LIKE THIS. In the course of 10 minutes, the cursor pad and numeric keypad traded roles, stopped working altogether, and returned to normal; the function keys stopped working; the number and symbol keys began typing their <Shift> key equivalents; then everything was fine. That's when I read the manual.

I know that some keys return more than one code to the computer, and yes, I was using an obscure program, so you probably won't have my poltergeist problems. But before you buy this keyboard, make sure that your favorite software doesn't produce Casper and his friends like mine did.

Welcome a Board!

Although I was hard on the Colby and was impressed with the Key Tronic, both keyboards are roughly 300 times better than the original PCjr keyboard. I favor the Key Tronic keyboard, but if you can swing a money-saving deal on the Colby, it might be worth your while to buy the Key-2jr.

However, one nice thing about the original PCjr keyboard is how nicely it fits in its IBM carrying case. Neither replacement board fits in the IBM case, and Colby

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and Key Tronic spokespersons say that neither company even considered making a portable keyboard. Perhaps this is another case of expedience winning out, since PC versions of both keyboards were designed long before the PCjr was released.

"We don't perceive the size as a major drawback," says Jim Dooley, keyboard marketing manager for Key Tronic. "I have my doubts about how much people are going to transport the keyboard. I see people with one [computer and keyboard] at home and one at the office."

Well, I have doubts about Jim Dooley's doubts. I have found portability to be one of my computer's strongest points. When you buy a new keyboard for your PCjr, hold off on the ceremonial sacrifice of the original keyboard. If you ever want to go somewhere with your PCjr—and I bet you will—that "toy" keyboard will come in handy.

Rick Altman is the managing editor of a San Francisco Bay Area sports magazine. His articles have appeared in User's Guide, LIST, Women's Sports Magazine, and TENNIS.

Key-2jr
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Mountain View, CA 94043
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Here are five important measurements to help you make the best choice:

IBM forces you to choose:
Buy a monochrome card and monitor for high-resolution text. (Essential for word processing and spreadsheets.)

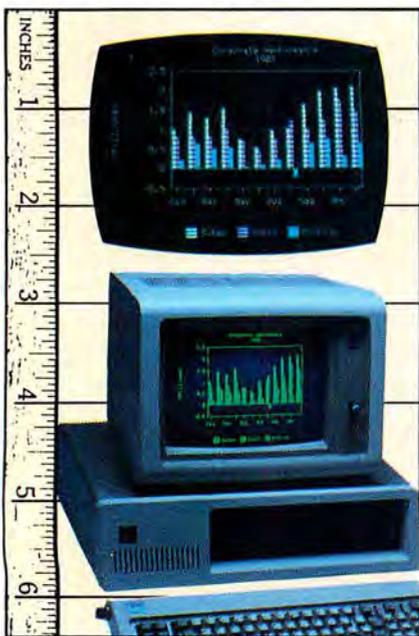
Or buy a color card and color monitor for graphics. (Lotus™ 1-2-3,™ for example, uses lots of graphics, as well as text.)

You can invest in both; you can sacrifice one or the other; you can settle for a non-standard compromise.

Or you can buy Paradise.

Here's how we've measurably eased your job of choosing the best video display (saving you a lot of money in the process).

1. Measure video functions.



The Paradise Modular Graphics Card™ gives you *full screen, 16-shade* graphics on *any* display, including IBM's high-resolution monochrome monitor.

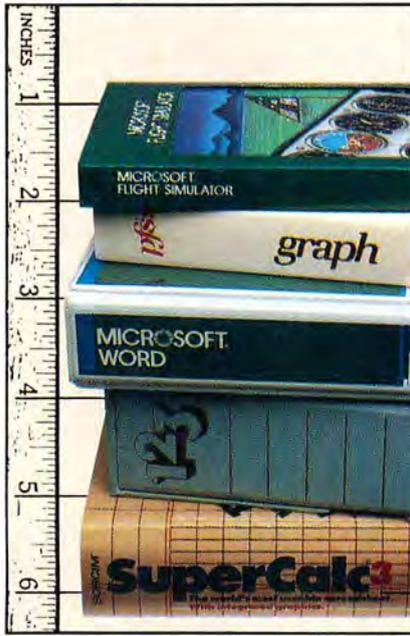
IBM's color/graphics card can display 16 colors on a color monitor.

So can the Paradise Modular Graphics Card.

But that's where the similarity ends. When you use color/graphics software with the Paradise Modular Graphics Card and a monochrome monitor, it translates those colors into a true 16-shade gray scale. With full screen display, flicker-free scrolling and clear, crisp character sets (like those of IBM) in all modes.

Naturally, the best video card fits either the IBM PC or XT, and works with any monitor you choose: IBM monochrome (or equivalent), RGB or composite video.

2. Measure software compatibility.



Many video cards only work with specially modified software. The Paradise Modular Graphics Card runs popular off-the-shelf color/graphics software on your choice of monitors. *Unmodified.*

Most cards that offer graphics on a monochrome monitor force you to

sacrifice off-the-shelf software compatibility.

Paradise doesn't want you to compromise.

Of course the Paradise Modular Graphics Card runs Lotus 1-2-3 graphics on an IBM monochrome monitor.

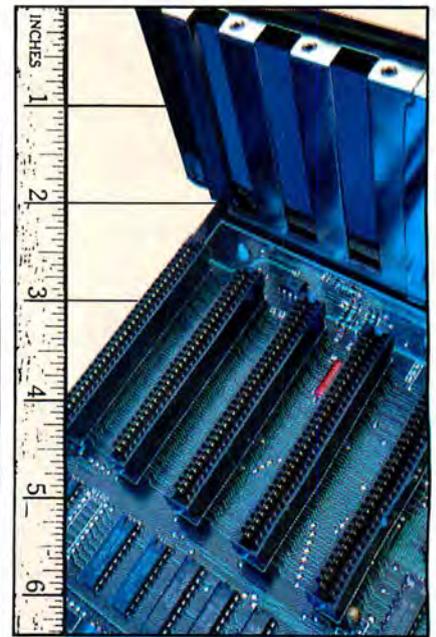
But it also runs almost all unmodified off-the-shelf color/graphics software.

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A menu-driven software system—with a user interface much like that of Lotus 1-2-3—lets you take advantage of all the Paradise Modular Graphics Card's features.

3. Measure slot utilization.



Unlike other video cards, the Paradise Modular Graphics Card gives you *additional popular functions in a single slot*. This may be the only card you'll ever need.

You need to worry about slots for future expansion. Since you *must* use

out choosing a video card.

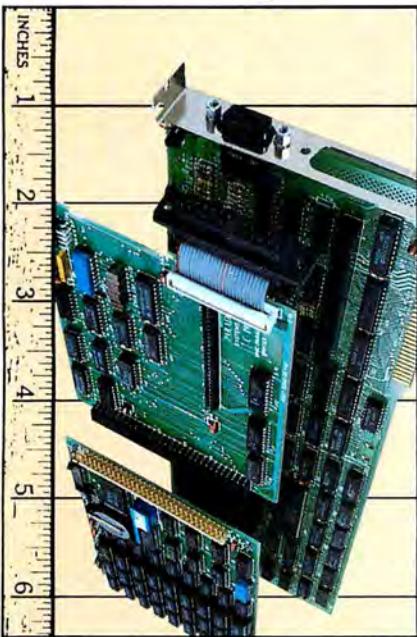
a slot for video support, why not pack it with more functions?

The Paradise Modular Graphics Card puts color and monochrome video support *plus* your choice of the most commonly requested enhancements into one slot.

Enhancements like extra memory, clock/calendar, floppy disk controller, parallel, serial or game ports.

Leaving you measurably more room to expand.

4. Measure cost efficiency.

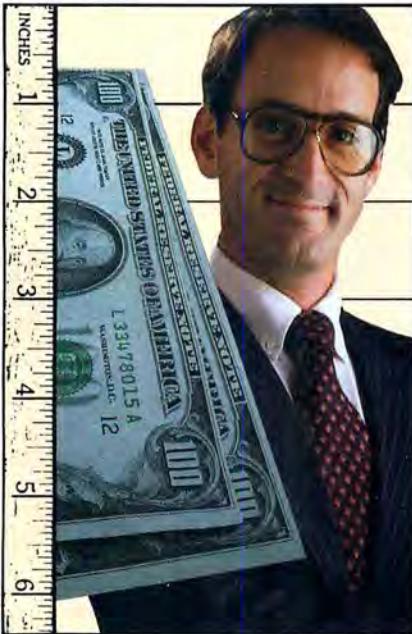


Unlike other multifunction cards, the Paradise Modular Graphics Card lets you choose the options you need, now or later.

You select the features you *want*, when you want them—no more, no less. So you pay only for what you need.

Choose one module from list A, one from list B, or one from each list. The Paradise Modular Graphics Card fits in a single PC or XT slot, even with both modules attached. And without imposing on adjacent slots.

5. Measure value.



Value: the ratio of performance to price. No matter how you configure the Paradise Modular Graphics Card, you get more performance for your money, and more performance for your slot.

You'd have to combine several other cards to even approach the Paradise Modular Graphics Card's functionality.

Obviously, that would take up several slots in your PC.

It would also cost you a lot more money.

And if you review measurements one through four in this ad, you'll realize that no other card—or combination of cards—can give you better PC performance.

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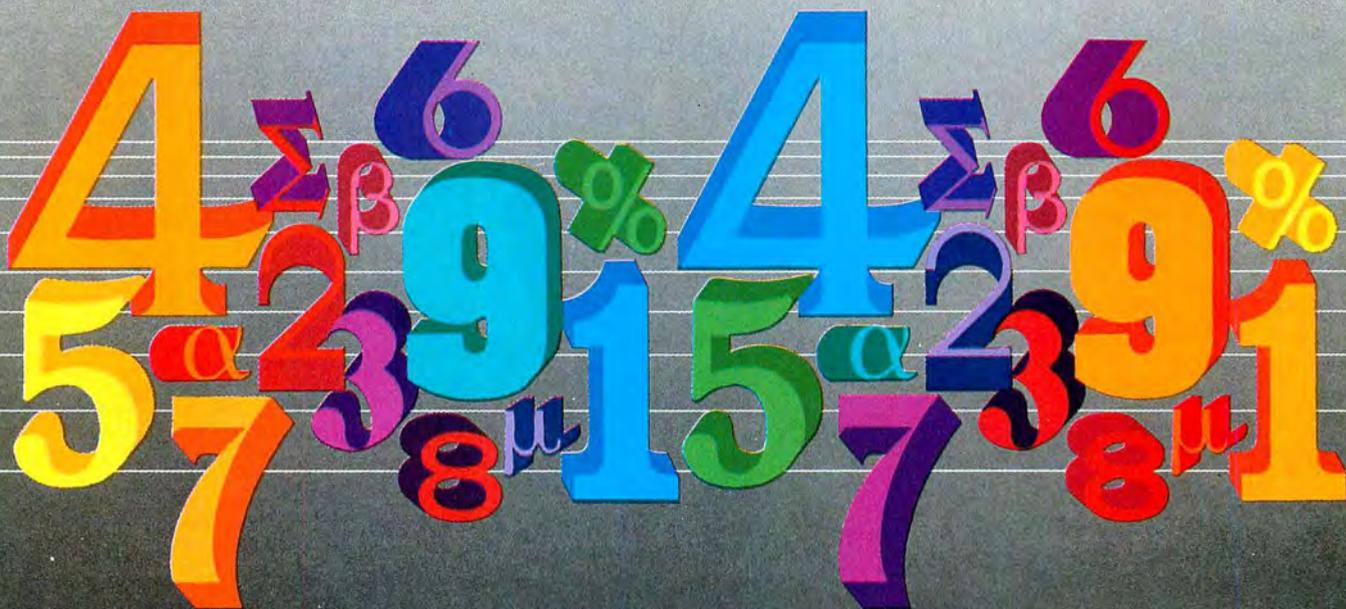
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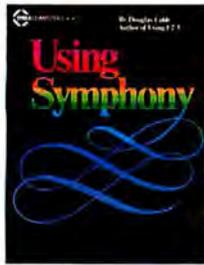
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The Book



Using Symphony, a new book by Douglas Cobb, the author of the number-one best seller, Using 1-2-3, is a complete Symphony tutorial and reference guide in one easy-to-use volume. This book provides thorough

and accurate explanations of Symphony's features and commands, and offers hundreds of examples to clarify the concepts presented.

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The Journal

The Symphony User's Journal is a new monthly publication that provides an ongoing source of in-depth information about Symphony. The Journal is edited by Douglas Cobb, founder of Absolute Reference: The Journal for 1-2-3 Users. You can be sure that The Symphony User's Journal will provide the same high-quality information that Cobb introduced to Absolute Reference.

Regular features of The Symphony User's Journal include:

- Major articles about each of Symphony's components: communications, word processing, spreadsheeting, data management, and graphics
- A monthly column on the Symphony Command Language
- Tips for using Symphony more effectively
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- The Symphony Command Language
- The transition from 1-2-3 to Symphony

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Philadelphia	November 8-9
Detroit	November 12-13
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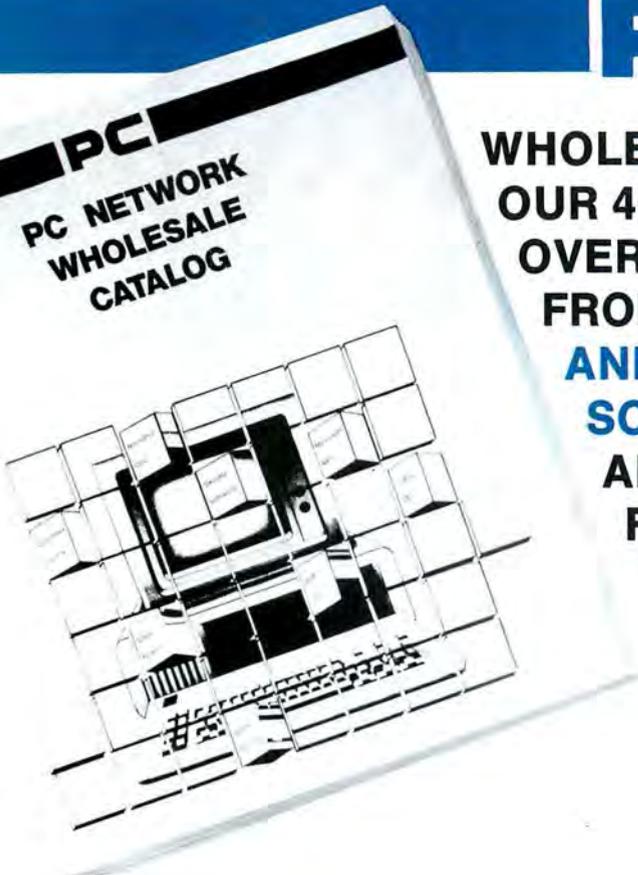
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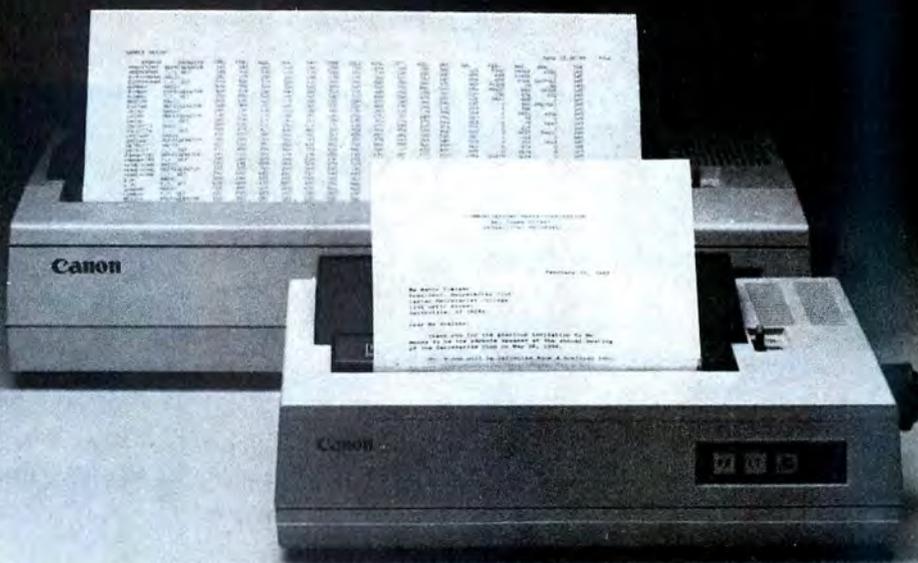
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Enhancing the IBM Personal Editor

Steven J. Lagreca

Are you interested in a package that offers powerful text editing, reasonable word processing, and block graphics capabilities for \$100? With a little effort IBM's Personal Editor can become just that. By adding macro functions (short commands that incorporate and implement a series of commands) to the Personal Editor, you can efficiently process text projects ranging from rough drafts, memos, organization charts, flow diagrams, and overhead projector foils to source code.

Chances are you are using a word processor for text and another editor for programming, each with its own long list of commands to memorize. For graphics, you're probably making do with lines composed of hyphens, equal signs, and asterisks.

Aside from the burden of memorizing an assortment of editing commands, using separate programs causes problems when you attempt to transfer data or documents between them. Word processors don't handle graphics, program editors generally have marginal printing capabilities, and special programs that generate overhead foils have little or no format flexibility. Completing a project requires a juggling act to apply the editing, word processing, and formatting functions of various products to the appropriate portions of the text.

In a world of specialized editing products the *Personal Editor's* forte is versatility. Effort spent enhancing the basic package translates into more utility for your software dollar and less time spent learning (and relearning) additional programs to fill your needs.



● Hands On

Before and After

The *Personal Editor* scores high marks in several areas, a major asset being the capability of creating or revising several files concurrently (see "The Tailor-Made Editor," *PCW*, Vol. 1, No. 4). You can, for example, review program output from *VisiCalc* or *1-2-3* in one work space (file) while composing an accompanying report in another. It's also possible to move blocks of text between two sections of the same file. Using the *Personal Editor*, programmers can review combinations of source code, program output, and debugging information.

Another asset is the ease with which text can be moved, copied, shifted, or overlaid within a document on a character, line, or block basis. The search and replace function is also exemplary. On the other hand, the *Personal Editor* has been criticized for its lack of word processing capabilities, including the inability to reformat a paragraph easily after inserting text, the inability to print only a portion of a document, and the general lack of printer formatting capabilities.

Each of these limitations can be overcome by taking advantage of the program's macro definition function. This powerful facility can also be used to implement additional useful functions. You can use all the fonts available on your IBM or Epson printer to vary style and highlight text without memorizing printer control codes. You can automatically skip over the perforations on continuous-form paper without locating and manually resetting the internal printer switches. Printers with friction feed can be switched between continuous and single-sheet paper. Wide-carriage printers can be switched between 8½- and 13½-inch paper. If your printer is a narrow-carriage model, this feature can ensure that text exceeding 80 columns won't print on the platen.

Another improvement you can implement is the ability to switch between two monitors to increase productivity. This would allow you to compose a document on one while placing help screens or other pertinent data in the other. Additional word processing functions include deleting a word, a line, or all words remaining on a line. A scale line is available to assist in report or screen design. Line spacing options allow white space for marking rough drafts or compressing text to cut paper costs.

Macros to the Rescue

The macro definition facility gives you the ability to create features not supplied with the original product. Defining a macro involves combining a series of simple functions, which when executed as a group produce a new, more sophisticated function. A macro is invoked by typing a function key or a two-key combination.

The *Personal Editor* provides 63 functions and 17 commands that are the building blocks used to create

macro functions. The distinction between a command and a function is that a command can be executed either by typing it on the command line or from within a macro definition, whereas a function can be invoked from within a macro only. The word *macro* is used here to connote any combination of functions and/or commands used to produce additional features.

The enhanced macro functions fall into three broad categories: editing and word processing, printer control, and block graphics. Every attempt was made to assign (or reassign) functions to keys logically. Mnemonic assignments were used wherever possible. For instance, splitting a line is assigned to <Alt>-S. Similar functions were placed on adjacent keys. If the function came with the original product, the former key assignment is provided. In all, 34 significant functions have been added.

Editing and Word Processing

The majority of the macros in this article have been created to enhance editing and word processing. The most important macros have been assigned to the function keys (see Table 1). The first new function (<F2>) is set up to toggle between an editing and a word processing environment. This is accomplished by using the macro command to load a word processing profile from the file WP.PRO or the default editing profile, PE.PRO, from the disk. (A profile is a library of macro definitions.)

Separate profiles are needed for two reasons. Certain functions such as text insertion, margin settings, and tab stops are performed differently depending on whether you are word processing text or editing a program. Also, the number of desirable functions has exceeded the available key assignments, forcing the line-spacing options into the word processing profile.

The macros to delete a line (<F6>), delete a word (<F7>), and delete to the end of a line (<F8>) are grouped together on the keyboard. Their logical counterparts, erase a line (<Alt>-<F6>), erase a word (<Alt>-<F7>), and erase to the end of a line (<Alt>-<F8>) are located on the same function keys for consistency. The delete functions cause remaining text to be shifted left and/or up, whereas the erase functions fill the erased area with blanks. Erase to the end of a line can be used to clear the command line of unwanted text. The vertical center command (<F10>) centers the current line in the middle of the screen.

The next key group, <Alt>-<F1> through <Alt>-<F10>, contains only two new editing functions; switch to a monochrome screen (<Alt>-<F9>) and switch to a color screen (<Alt>-<F10>). Don't forget to use this feature with the switch files (<F9>) option for additional versatility.

The next group uses the <Alt> key plus the alpha keys, A through Z. The first new key assignment (<Alt>-G) changes all text in a designated area to

Function	Key Assignment	
	Enhanced Macro	Original Macro
<i>Editing Environment:</i>		
Help	<F1>	<F1>
Switch to editing or word processing profile	<F2>	-
File (save and quit) current work space	<F3>	<F3>
Quit without saving current work space	<F4>	<F4>
Insert line of text	<F5>	<F9>
Delete line of text	<F6>	-
Delete word	<F7>	*
Delete all characters to end of line	<F8>	-
Switch between work spaces	<F9>	<F8>
Vertically center current line	<F10>	*
Shift marked area left	<Alt>-<F1>	<Shift>-<F7>
Shift marked area right	<Alt>-<F2>	<Shift>-<F8>
Erase line	<Alt>-<F6>	<F5>
Erase word	<Alt>-<F7>	-
Erase all characters to end of line	<Alt>-<F8>	<F6>
Switch to monochrome screen	<Alt>-<F9>	-
Switch to color screen	<Alt>-<F10>	-
Undo changes to current line	<Alt>-A	<Shift>-<F4>
Mark block of text	<Alt>-B	<Alt>-B
Mark character	<Alt>-C	<Alt>-C
Delete marked area	<Alt>-D	<Alt>-D
Move cursor to end of marked area	<Alt>-E	<Alt>-E
Fill marked area with blanks	<Alt>-F	-
Make all characters in marked area lowercase	<Alt>-G	*
Join two adjacent lines	<Alt>-J	<Alt>-J
Display column line	<Alt>-K	-
Mark line	<Alt>-L	<Alt>-L
Move marked area to another area	<Alt>-M	<Alt>-M
Save or file with the no-tabs option	<Alt>-N	-
Overlay an area of text with marked area	<Alt>-O	<Alt>-O
Reformat paragraph	<Alt>-P	<Shift>-<F3>
Switch to unnamed file to salvage text	<Alt>-Q	-
Redraw screen after DOS message displayed	<Alt>-R	<Alt>-R
Split current line of text at cursor	<Alt>-S	<Alt>-S
Make all characters in marked area uppercase	<Alt>-T	*
Unmark marked area	<Alt>-U	<Alt>-U
Move cursor to beginning of marked area	<Alt>-W	<Alt>-Y
Save current work space	<Alt>-Y	<F3>
Copy marked area to another area	<Alt>-Z	<Alt>-Z
Move to next line	<Enter>	<Enter>
Insert text	<Ins>	<Ins>
<i>Word Processing Environment:</i>		
Single-spacing, 8 lines per inch	<Alt>-1	-
Single-spacing, 6 lines per inch	<Alt>-2	-
1½-spacing	<Alt>-3	-
Double-spacing	<Alt>-4	-
Triple-spacing	<Alt>-5	-
New paragraph	<Enter>	*
Reformat paragraph	<Ins>	-
Display next paragraph	<Alt>-P	-

*This function is mentioned in the Personal Editor manual but is not provided in the default profile.

Table 1: Editing and word processing functions provided by macros. Enhanced custom macros (left) provide greater control over word processing and program editing than those provided by the Personal Editor (right).

● Hands On

Function	Immediate (I) Embedded (E)	Enhanced Macro Key Assignments*
Print entire work space	I	<Alt>-<F3>
Print screen	I	<Alt>-<F4>
Print marked area of text	I	<Alt>-<F5>
Skip to next page	I	<Shift>-<F1>
Skip to next line	I	<Ctrl>-<F1>
Skip over perforations	I	<Shift>-<F2>
Reset all printer defaults	I	<Ctrl>-<F2>
Page width 80 columns	I	<Shift>-<F3>
Page width 132 columns	I	<Ctrl>-<F3>
Continuous paper	I	<Shift>-<F4>
Single-sheet paper	I	<Ctrl>-<F4>
Compressed printing font ON	E	<Shift>-<F5>
Compressed printing font OFF	E	<Ctrl>-<F5>
Double-strike printing ON	E	<Shift>-<F6>
Double-strike printing OFF	E	<Ctrl>-<F6>
Double-wide printing ON	E	<Shift>-<F7>
Double-wide printing OFF	E	<Ctrl>-<F7>
Emphasized printing ON	E	<Shift>-<F8>
Emphasized printing OFF	E	<Ctrl>-<F8>
Italics printing ON	E	<Shift>-<F9>
Italics printing OFF	E	<Ctrl>-<F9>
Page break	E	<Shift>-<F10>

* Equivalent function does not exist in the original macro functions.

Table 2: Printer control functions

Function	Enhanced Macro Key Assignments*
Draw a horizontal line	<Alt>-H
Draw a vertical line	<Alt>-V
Vertical backspace	<Alt>-O
Change graphics fonts	<Alt>-I
Graphics character	
Upper left corner	<Alt>-1
Upper right corner	<Alt>-2
Lower right corner	<Alt>-3
Lower left corner	<Alt>-4
Four-way intersection	<Alt>-5
Left intersection	<Alt>-6
Right intersection	<Alt>-7
Up intersection	<Alt>-8
Down intersection	<Alt>-9

* Equivalent function does not exist in the original macro functions.

Table 3: Block graphics functions and fonts

lowercase. Although this key assignment is not mnemonic, the function is located immediately below the change-text-to-uppercase function (<Alt>-T). <Alt>-K produces a highlighted scale line. It can be moved once with <Alt>-M or deleted with <Alt>-D. <Alt>-N appends the word *notabs* to a File or Save command. This saves your work space without using a compression algorithm.

The last five changes made are stored in the Unnamed file, which can be accessed with the <Alt>-Q key. Simply mark the text you wish to restore and switch back to the previous work space using <F9>. The remaining group includes a few key assignments that implement functions differently, depending on whether you're in the editing or word processing environment.

One of the more vociferous criticisms of the original product concerned its inability to wrap text back into a newly inserted line only partially filled with text. Using the <Ins> key in the word processing environment now accomplishes this task in just one keystroke. To be sure that this feature will work properly, always leave a blank line at the bottom of the work space. The original function of the key (shifting text to the right as characters are inserted) has been preserved in the editing environment.

In the editing profile the <Enter> key simply moves the cursor to the beginning of the next line. In the word processing profile the same key prepares a new paragraph by inserting a new line and then indenting.

The confirm change function combination (<Ctrl>-<Backspace>) has been relocated so that it is immediately above the ignore change function macro (<Ctrl>-<Enter>). In addition, either choice will now automatically reexecute the change command until the entire work space has been searched.

Instead of moving forward a page at a time, a macro in the word processing environment allows you to move paragraph by paragraph with <Alt>-P. The same key combination is used in the editing profile to reformat text.

Left and right margins are set to columns 1 and 254 in the editing profile and 5 and 70 in the word processing profile. Tabs advance the cursor a word at a time in the word processing profile and ten spaces at a time in the editing profile.

Printer Controls

Printer and block graphics functions can be used only in conjunction with the IBM Graphics printer or the Epson MX/FX series with Graftrax. Even though these two brands are closely related, subtle differences affect the implementation of some macros. These are noted where appropriate.

Three common printer functions have been located in one function key group (see Table 2). You can print a work space using <Alt>-<F3> and print a screen using <Alt>-<F4>. Any marked area can be printed using print mark (<Alt>-<F5>).

The two remaining function key groups, <Shift>-<F1> through <Shift>-<F10> and <Ctrl>-<F1> through <Ctrl>-<F10>, are used to control printer options. These options are of two types: those that take effect immediately and those that embed characters in the text and are interpreted by the printer as the document is printed.

The macros to skip to the top of the next page (<Shift>-<F1>), advance one line at a time (<Ctrl>-<F1>), and reset the printer (<Ctrl>-<F2>) take effect immediately and eliminate the need to adjust the printer manually. The reset function is available only for the Epson MX/FX series. The function that causes the printer to skip over perforations (<Shift>-<F2>) will remain in effect until the printer is turned off or reset. Column length can be automatically adjusted to accommodate wide paper with <Ctrl>-<F3> or to prevent text from spilling over the edge of narrow paper with <Shift>-<F3>. The single-sheet option (<Ctrl>-<F4>) allows the entire page to be printed; otherwise, the printer's paper-out sensor prematurely aborts the printing.

The remaining printer options control font styles. A particular font is enabled (turned on) with <Shift>-F_x (where *x* is the number of the key assignment) and disabled (turned off) with <Ctrl>-F_x. This arrangement has been consistently implemented and should therefore be easy to remember. As printer control characters are inserted, the text is automatically shifted to the right on the screen, but the document will be properly aligned when printed. The name of the font style invoked is also displayed on the command line as a helpful reminder. The italics font is available only on Epson printers with Graftrax. Page break (<Shift>-<F10>) is the embedded equivalent of the skip-to-next-page macro, which is useful for starting new sections, chapters, or exhibits.

Block Graphics and Fonts

The macros for block graphics can add a new dimension to documents, reports, and screens through the visual representation of ideas (see Table 3). Three basic fonts composed of single lines, double lines, and solid lines have been created. The single-line font is in effect when the *Personal Editor* is started. Fonts can be changed with <Alt>-I. Horizontal lines in the current font are drawn with <Alt>-H and vertical lines with <Alt>-V. Each line is one inch long. <Backspace> is used to shorten horizontal line length. Vertical lines can be quickly trimmed to any desired length with a new vertical back-

● Hands On

space feature, <Alt>-0. The four corners used to form boxes and rectangles are located on <Alt>-1 through <Alt>-4. (See "Building a Box" for an easy way to draw a four-sided figure.) Printing these fonts requires an IBM Graphics printer.

Although the disk must be accessed to load each new font, the small size of the graphics profiles keeps this lag to a minimum. Reducing the waiting time is also the reason that font #1 is duplicated in both the default profile, PE.PRO, and GRAPHIC1.PRO.

Creating the Macros

Since each new macro is given a unique key assignment, the macros are easy to install as a permanent part of the *Personal Editor*. As a precautionary measure, I strongly advise making a duplicate copy of the original profile file, PE.PRO. This can be done using the DOS command COPY PE.PRO PE.BAK. Next, issue the command PE PE.PRO; this loads the *Personal Editor* and starts a work space with the name of the default profile.

Carefully type in the new definitions from those in Listing 1. Each macro begins with *def*, followed by the key assignment, an equal sign, and a compendium of functions and commands. To ensure success, any characters not enclosed in quotation marks must be lowercase. Each macro begins in column one, and the entire macro must reside on one line.

The editing macros require only straightforward typing. However, the printer control and block graphics macros are more complex and involve using the *Personal Editor*'s extended ASCII function. The printer control macros each require sending a one-, two-, or three-control-character sequence to the printer to enable or disable the desired function.

The printer control codes are assigned to <Alt>-<F5>, <Shift>-<F1> through <Shift>-<F10>, and <Ctrl>-<F1> through <Ctrl>-<F10>. All printer control codes are located within single quotation marks and entered by following these steps: press and hold the <Alt> key, then type the letter X. When the 'type a character' message appears at the bottom line, use the keyboard's ten-key numeric pad to type in the ASCII number that represents the control code. Now release the <Alt> and X keys; the character that appears will cause the printer to perform the enhanced function.

Listing 1 contains ASCII numbers rather than the actual control characters that are generated. This eliminates the need for translating the graphics control codes into ASCII equivalents, a tedious process that requires a journey into the more esoteric appendices of the Guide to Operations and your printer manual. Each control

Building a Box

Follow these steps to draw a box around text using block graphics on the IBM Graphics printer:

- 1) Position the cursor at the upper left corner of the text to be boxed. Create the first corner by pressing <Alt>-1.
- 2) Create a horizontal line by pressing <Alt>-H. Use the <Backspace> key, if necessary, to shorten the line.
- 3) Create the upper right corner by pressing <Alt>-2.
- 4) Create a vertical line by pressing <Alt>-V. Use the vertical backspace macro (<Alt>-0), if necessary, to shorten the line.
- 5) Create the lower right corner by pressing <Alt>-3. The cursor will automatically be repositioned to the upper left corner.
- 6) Create a second vertical line opposite the first.
- 7) Create the lower left corner by pressing <Alt>-4.
- 8) Finish the enclosure with a second horizontal line.

character (remember, there can be up to three) is preceded by an X. For instance, the double-strike print option (<Shift>-<F6>) contains the sequence X27X71, which corresponds to the ASCII numeric values 27 and 71. Accordingly, the correct control characters are generated by pressing <Alt>-X, typing 27 on the numeric keypad, pressing <Alt>-X again, then typing 71 on the pad.

Block graphics have been assigned to the keys from <Alt>-1 through <Alt>-9. For reference, the three fonts and their ASCII numeric equivalents can be found in Appendix G of the IBM BASIC manual. The same X notation scheme discussed above has been followed to make it easier to create the graphics fonts.

The final step is to save the work space containing the new macro definitions back to the disk using the File command. From now on each time the *Personal Editor* is used, the new profile containing the enhanced macros will be loaded and available for use.

(continues on page 225)

```

set margins 1 254 1
set tabs 5 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170
      180 190
def up =      [up]
def down =    [down]
def left =    [left]
def c-left =  [left40]
def right =   [right]
def c-right = [right40]
def pgup =    [page up] [top edge] [up] [up]
def c-pgup =  [top edge]
def pgdn =    [page down] [bottom edge] [down] [down]
def c-pgdn =  [bottom edge]
def home =    [begin line]
def c-home =  [top] [begin line]
def end =     [end line]
def c-end =   [bottom] [end line]
def ins =     [insert toggle]
def del =     [delete char]
def enter =   [begin line] [down] [indent]
def c-enter = [execute]
def backspace = [rubout]
def c-backspace = [confirm change] [cursor command] [execute]
def esc =     [command toggle]
def tab =     [tab]
def s-tab =   [backtab]
def f1 =     [cursor command][begin line][erase end line] 'E PE.HLP'
             [execute]
def f2 =     [cursor command] [begin line] [erase end line] 'Macro WP.PRO'
             [execute]
def f3 =     [cursor command] [begin line] [erase end line] 'File' [execute]
def f4 =     [cursor command] [begin line] [erase end line] 'Quit' [execute]
def f5 =     [insert line]
def f6 =     [delete line]
def f7 =     [unmark] [mark char] [tab word] [left] [mark char] [begin mark]
             [delete mark]
def f8 =     [unmark] [mark char] [end line] [mark char] [begin mark] [delete
             mark]
def f9 =     [cursor command] [begin line] [erase end line] 'E' [execute]
             [cursor data]
def f10 =    [center line]
def a-f1 =   [shift left]
def a-f2 =   [shift right]
def a-f3 =   [cursor command] [begin line] [erase end line] 'Print'[execute]
def a-f4 =   [unmark] [top edge] [mark line] [bottom edge] [mark line]
             [cursor command] [begin line] [erase end line] 'E Prntpage'
             [execute] [cursor data] [copy mark] [cursor command] [begin line]
             [erase end line] 'Print' [execute] [unmark] 'Q' [execute] 'Y'
def a-f5 =   [cursor command] [begin line] [erase end line] 'E Prntmark'
             [execute] [cursor data] [copy mark] [cursor command] [begin
             line] [erase end line] 'Print' [execute] 'Q' [execute] 'Y'
def a-f6 =   [erase end line]

```

(continues)

Listing 1: Editing macros—file PE.PRO

```

def a-f7 = [unmark] [mark char] [tab word] [left] [mark char] [begin mark]
          [fill mark] [execute] ' ' [unmark]
def a-f8 = [erase end line]
def a-f9 = [cursor command] [begin line] [erase end line] 'Set Display Mono'
          [execute]
def a-f10 = [cursor command] [begin line] [erase end line] 'Set Display
           Color 80' [execute]
def s-f1 = [cursor command] [begin line] [erase end line] 'E SkipTOF'
          [execute] [cursor data] 'X12' [cursor command] [begin line]
          [erase end line] 'Print' [execute] 'Q' [execute] 'Y'
def s-f2 = [cursor command] [begin line] [erase end line] 'E SkipPERF'
          [execute] [cursor data] 'X27X78' [cursor command] [begin line]
          [erase end line] 'Print' [execute] 'Q' [execute] 'Y'
def s-f3 = [cursor command] [begin line] [erase end line] 'E Width80'
          [execute] [cursor data] 'X27X81X80' [cursor command] [begin
          line] [erase end line] 'Print' [execute] 'Q' [execute] 'Y'
def s-f4 = [cursor command] [begin line] [erase end line] 'E Contin'
          [execute] [cursor data] 'X27X57' [cursor command] [begin line]
          [erase end line] 'Print' [execute] 'Q' [execute] 'Y'
def s-f5 = [insert mode] 'X15' [replace mode] [cursor command] [begin
          line] [erase end line] 'Compressed ON' [cursor data]
def s-f6 = [insert mode] 'X27X71' [replace mode] [cursor command] [begin
          line] [erase end line] 'Double Strike ON' [cursor data]
def s-f7 = [insert mode] 'X14' [replace mode] [cursor command] [begin line]
          [erase end line] 'Double Wide ON for Current Line' [cursor data]
def s-f8 = [insert mode] 'X27X69' [replace mode] [cursor command] [begin
          line] [erase end line] 'Emphasized ON' [cursor data]
def s-f9 = [insert mode] 'X27X52' [replace mode] [cursor command] [begin
          line] [erase end line] 'Italics ON' [cursor data]
def s-f10 = [insert mode] 'X12' [replace mode] [cursor command] [begin
          line] [erase end line] 'Skip to Next Page' [cursor data]
def c-f1 = [cursor command] [begin line] [erase end line] 'E SkipLINE'
          [execute] [cursor data] 'X32 ' [cursor command] [begin line]
          [erase end line] 'Print' [execute] 'Q' [execute] 'Y'
def c-f2 = [cursor command] [begin line] [erase end line] 'E Reset'
          [execute] [cursor data] 'X27X64' [cursor command] [begin line]
          [erase end line] 'Print' [execute] 'Q' [execute] 'Y'
def c-f3 = [cursor command] [begin line] [erase end line] 'E Width132'
          [execute] [cursor data] 'X27X81X132' [cursor command] [begin
          line] [erase end line] 'Print' [execute] 'Q' [execute] 'Y'
def c-f4 = [cursor command] [begin line] [erase end line] 'E Single'
          [execute] [cursor data] 'X27X56' [cursor command] [begin line]
          [erase end line] 'Print' [execute] 'Q' [execute] 'Y'
def c-f5 = [insert mode] 'X18' [replace mode] [cursor command] [begin
          line] [erase end line] 'Compressed OFF' [cursor data]
def c-f6 = [insert mode] 'X27X72' [replace mode] [cursor command] [begin
          line] [erase end line] 'Double Strike OFF' [cursor data]
def c-f7 = [insert mode] 'X20' [replace mode] [cursor command] [begin

```

Listing 1 (continued)


```

def a-1 = 'X218' [left] [mark block] [right]
def a-2 = 'X191' [down] [left]
def a-3 = 'X217' [begin mark] [unmark] [down]
def a-4 = 'X192'
def a-5 = 'X197'
def a-6 = 'X180'
def a-7 = 'X195'
def a-8 = 'X193' [down] [left]
def a-9 = 'X194'
def a-0 = [up] ' ' [left]
def a-h = 'X196X196X196X196X196X196X196X196X196X196'
def a-v = 'X179' [down] [left] 'X179' [down] [left] 'X179' [down] [left]
          'X179' [down] [left]
def a-i = [cursor command] [begin line] [erase end line] 'M Graphic2.pro'
          [execute]

```

Listing 2: Single-line block graphics font—file GRAPHIC1.PRO

```

def a-1 = 'X201' [left] [mark block] [right]
def a-2 = 'X187' [down] [left]
def a-3 = 'X188' [begin mark] [unmark] [down]
def a-4 = 'X200'
def a-5 = 'X206'
def a-6 = 'X185'
def a-7 = 'X204'
def a-8 = 'X202' [down] [left]
def a-9 = 'X203'
def a-0 = [up] ' ' [left]
def a-h = 'X205X205X205X205X205X205X205X205X205X205'
def a-v = 'X186' [down] [left] 'X186' [down] [left] 'X186' [down] [left]
          'X186' [down] [left]
def a-i = [cursor command] [begin line] [erase end line] 'M Graphic3.pro'
          [execute]

```

Listing 3: Double-line block graphics font—file GRAPHIC2.PRO

```

def a-1 = 'X219' [left] [mark block] [right]
def a-2 = 'X219' [down] [left]
def a-3 = 'X219' [begin mark] [unmark] [down]
def a-4 = 'X219'
def a-5 = 'X176'
def a-6 = 'X221'
def a-7 = 'X222'
def a-8 = 'X223'
def a-9 = 'X220' [down] [left]
def a-0 = [up] ' ' [left]
def a-h = 'X219X219X219X219X219X219X219X219X219X219'
def a-v = 'X219' [down] [left] 'X219' [down] [left] 'X219' [down] [left]
          'X219' [down] [left]
def a-i = [cursor command] [begin line] [erase end line] 'M Graphic1.pro'
          [execute]

```

Listing 4: Solid-line block graphics font—file GRAPHIC3.PRO

```

set margins 5 70 5
def home = [begin line] [down] [tab word]
def ins = [insert toggle] [unmark] [mark line] [find blank line] [up]
          [mark line] [reflow] [begin mark] [unmark]
def tab = [tab word]
def s-tab = [backtab word]
def enter = [unmark] [split] [insert line] [down] [mark line] [find blank
            line] [up] [mark line] [reflow] [begin mark] [unmark] [tab]
            [replace mode]
def f2 = [cursor command] [begin line] [erase end line] 'Macro PE.PRO'
         [execute]
def a-p = [down] [find blank line] [begin line] [down] [mark char] [find
          blank line] [begin mark] [unmark] [tab word]
def a-1 = [cursor command] [begin line] [erase end line] 'E Spacing'
          [execute] [cursor data] 'X27X65X10' [cursor command] [begin
          line] [erase end line] 'print' [execute] 'Q' [execute] 'Y'
def a-2 = [cursor command] [begin line] [erase end line] 'E Spacing'
          [execute] [cursor data] 'X27X65X12' [cursor command] [begin
          line] [erase end line] 'print' [execute] 'Q' [execute] 'Y'
def a-3 = [cursor command] [begin line] [erase end line] 'E Spacing'
          [execute] [cursor data] 'X27X65X18' [cursor command] [begin
          line] [erase end line] 'print' [execute] 'Q' [execute] 'Y'
def a-4 = [cursor command] [begin line] [erase end line] 'E Spacing'
          [execute] [cursor data] 'X27X65X24' [cursor command] [begin
          line] [erase end line] 'print' [execute] 'Q' [execute] 'Y'
def a-5 = [cursor command] [begin line] [erase end line] 'E Spacing'
          [execute] [cursor data] 'X27X65X32' [cursor command] [begin
          line] [erase end line] 'print' [execute] 'Q' [execute] 'Y'
def a-6 =
def a-7 =
def a-8 =
def a-9 =
def a-0 =

```

Listing 5: Word processing macros—file WP.PRO

(continued from page 220)

Block graphics font #1 (Listing 2), font #2 (Listing 3), and font #3 (Listing 4) each use key assignments <Alt>-1 through <Alt>-9 for consistency in drawing objects. To reuse these key assignments each font must be stored in a separate profile. These files have been named GRAPHIC1.PRO, GRAPHIC2.PRO, and GRAPHIC3.PRO, respectively. Each file relies on the extended ASCII function to generate the graphics characters, and the now-familiar X notation is used again to reduce installation time.

The remaining profile, WP.PRO, is used to redefine selected key assignments and to add the additional line-spacing options (see Listing 5). Follow the same edit procedure to enter the macros, and save the work space to the disk file. This completes the installation process. Now you can enjoy the power and versatility afforded by the enhanced macros. ●

Steven J. Lagreca is a systems engineer at IBM's National Accounts Division, specializing in work station and office automation communications. The author wishes to acknowledge Chapin Day for providing portions of the original macros used within this article. This article was originally published in Update, an IBM publication.

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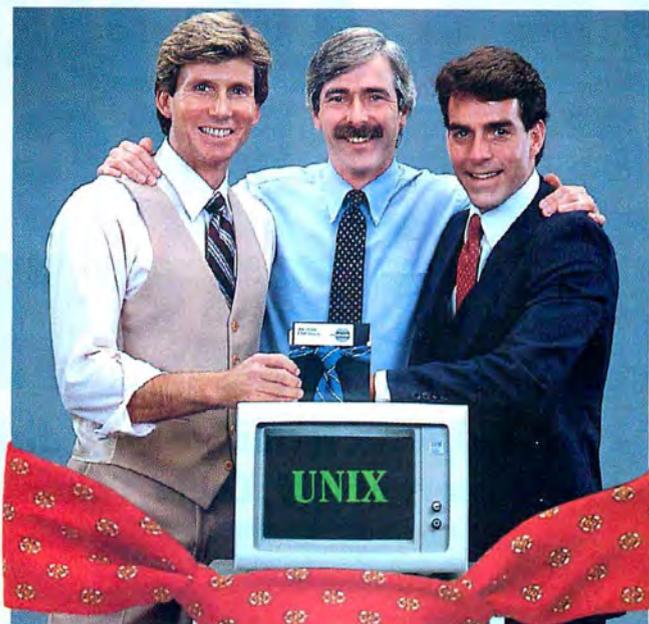
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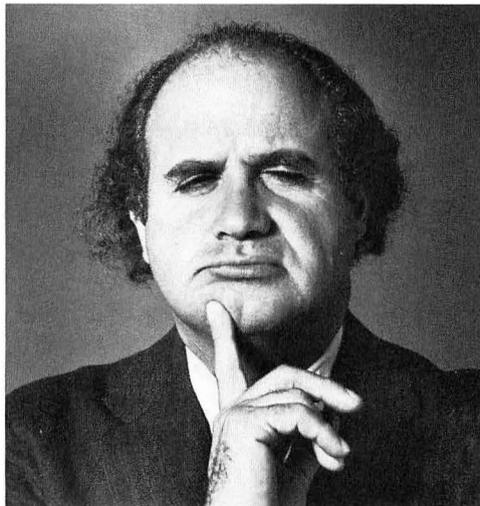


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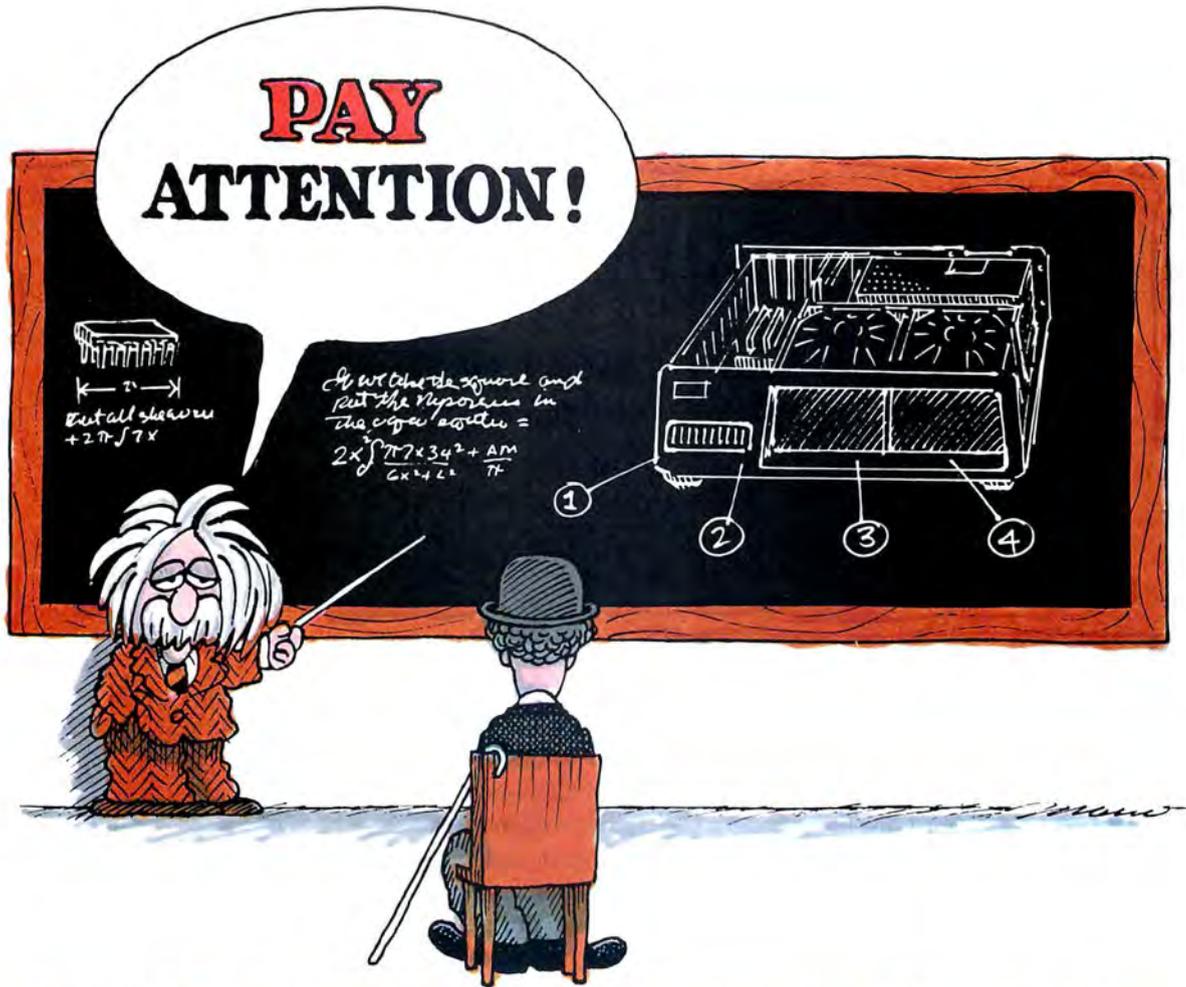


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But most *dBASE II* users hesitate to write command files—perhaps because it smacks of programming. While *dBASE II* can be used as a complete programming language, those with little or no programming experience can learn to set up and

Most *dBASE II* users hesitate to write command files—perhaps because it smacks of programming.

use command files to perform a number of jobs. In this article a typical business application—an invoicing program—will be created with three short command files. The resulting application will take a customer file, calculate the amount owed by the customer, and print a one-page invoice. In keeping with standard business practice, the program will print an invoice only if the ordered item is in stock. If the invoice is printed, this fact is noted in the “printed” field of each customer record.

More than time and typing are saved with this approach. Because each invoice is completed before the next is processed, you always know how far the program progressed if, for some reason, *dBASE II* crashes or the PC loses power. If one operation at a time were performed on the whole file, an inadvertently pulled plug could leave all the invoices incomplete. The invoice-by-invoice method provides an extra measure of safety.

Using Command Files

To illustrate how a command file can save time, load *dBASE II* (type `dbase` <Enter>) and create the invoice data file (CUSTOMER.DBF) shown in Figure 1. (This file will also be used for the invoice program.) Normally, to view a file's contents you would type in the commands `Use CUSTOMER` and `List`. This process is eliminated by creating the command file, `VIEW.PRG`, in Listing 1. With `VIEW.PRG`, viewing the file is a matter of typing `DO A:VIEW` at the *dBASE II* prompt. The `DO` command tells *dBASE II* to find the specified command file and execute its commands. Though only



● Hands On

two lines of typing are eliminated in this example, the technique can be extended indefinitely to handle any application that involves numerous files and commands.

Command File Rules

As you might have noticed in Listing 1, a command file is opened not with Create but with the Modify Command function, *dBASE II*'s single-line text editor. A command file can also be written with a word processor, but remember that each package has its own do's and don'ts. With *WordStar*, for example, you must use the nondocument mode; with other word processors, 512 spaces must be placed at the end of the command file. For simplicity's sake, the Modify Command function will be used throughout this article.

There's no limit to the number of lines a command file can hold, though a single line is limited to 78 characters with the Modify Command function and 254 characters with a word processor. Keep in mind that each command must be confined to a single line; you cannot wrap a command around to the next line in a command file. <Ctrl>-W saves a command file to disk.

Unlike most programming languages, *dBASE II* is not particularly fussy about spacing and requires only that commands be separated by one or more spaces. Comments, which can be used to impart information about a file's structure and function, are prefaced with an asterisk.

Inside the Invoice Program

Instead of writing one large command file, it's preferable to use three separate command files with each one handling a separate task. This modular approach, commonly used by programmers, makes each file shorter and thus easier to structure.

```
. Create CUSTOMER.DBF
ENTER RECORD STRUCTURE AS FOLLOWS:
FIELD NAME,TYPE,WIDTH,DECIMAL PLACES
001 name,c,20
002 address,c,20
003 city,c,20
004 state,c,2
005 zip,c,5
006 phone,c,14
007 item,c,20
008 instock,c,1
009 quantity,n,3
010 rate,n,3
011 amount,n,7,2
012 printed,c,1
013

INPUT DATA NOW? Y

00001 Robert Heinziger 1234 Elm St. Berkeley, CA 94937
415/464-5646 Skyhooks Y 20 3 <Enter> <Enter>

00002 Lee Kent 33 Alviso Ave. Yakima, WA 98902
509/935-3167 Snipe traps Y 3 6 <Enter> <Enter>

00003 Richard Ataboi 515 Taloosa Holyoke, MA 06743
617/434-9980 Warbs N 9 15 <Enter> <Enter>
```

Figure 1: CUSTOMER.DBF, the customer data file. The last two fields in each record, 'amount' and 'printed', are filled in by *dBASE II*. The amount is calculated by multiplying the quantity times the rate; the printed field is filled with a D, for done, if an invoice is printed. Pressing <Enter> moves you past these fields.

```
. Modify Command VIEW.PRG
use CUSTOMER.DBF
List name, phone, amount
```

Listing 1: VIEW.PRG, a simple command file for automating the listing of the CUSTOMER.DBF data file. Only the three fields specified after the List command will be displayed.

All three command files—INVOICE.PRG, ONEINV.PRG, and PRINTINV.PRG—are linked by internal references to one another. At the appropriate point in INVOICE.PRG, execution is passed to ONEINV.PRG with the 'Do ONEINV' statement; in the same manner execution is passed by ONEINV.PRG to PRINTINV.PRG and then back to the first command file, INVOICE.PRG.

INVOICE.PRG (Listing 2) is essentially a master file that opens the customer file, CUSTOMER.DBF, and directs the overall processing and printing of the invoices. As it sweeps through the customer file, it examines each record, decides if an invoice should be processed (is the invoiced item in stock?), and if the answer is yes, passes control to ONEINV.PRG.

```

. Modify Command INVOICE.PRG

* Any line of comments in a dBASE command file must be prefaced by an
* asterisk. At any point in a command file, you can insert comments to
* clarify the function and structure of a program. Comments are
* "invisible" to dBASE and do not affect the execution of the file.

Accept "Enter today's date" to today

Use CUSTOMER

Do While .not. eof
  If instock<>"N"
    Do ONEINV
  Endif
  Skip

Enddo

Erase
@ 10,10 Say "END OF PROCESSING"
Return

```

Listing 2: INVOICE.PRG, the master command file that directs the operation of the invoicing program. Indenting commands is not required, but it makes the file easier to read.

The INVOICE.PRG line 'Accept "Enter today's date" to today' produces an on-screen message asking for the date, which will be used later when an invoice is printed out. The 'Do While .not. eof' statement tells *dBASE II* to pass through the customer file until all the records have been processed; 'eof' (end of file) signals *dBASE II* that the last record has been processed. 'If instock <>"N"' is a conditional statement; it means that if an *N* (no) is present in the instock field of a customer record, the invoiced item is not in stock. In such a case the invoice is not processed. If a *Y* (yes) is present, the 'Do ONEINV' statement is executed and the invoice is eventually printed. 'Skip' tells *dBASE II* to move on to the next record in the customer file; '@ 10,10 Say' displays whatever message follows it, in this case 'End of processing'; 'Return' passes control back to *dBASE II*.

```

. Modify Command ONEINV.PRG

Replace amount with quantity * rate
Do PRINTINV
Replace printed with "D"
Return

```

Listing 3: ONEINV.PRG, the command file that calculates the total amount due for each invoice and marks invoices with a D when they are printed

ONEINV.PRG (Listing 3) calculates the amount due by multiplying the item quantity by the item rate, inserts the value into the amount field, then executes 'Do PRINTINV', which prints the invoice. After an invoice is printed, ONEINV.PRG marks the 'printed' field in the appropriate customer record with a *D*, for done.

PRINTINV.PRG (Listing 4) eschews *dBASE II*'s standard forms and creates its own, using @ Say

statements. 'Set Format to Print' tells *dBASE II* to accept the @ Say commands and send them to the printer. The @ command, followed by row and column numbers, positions the printer at a specific location on the page. (*dBASE II* considers the top left of the page 0,0 and the bottom right 65,79; if you display the invoice on

● Hands On

```
. Modify Command PRINTINV.PRG

* This command file handles all printing commands. Don't forget to
* turn on the printer.
* If you're not using a printer, replace the 'set format to print'
  command with
* Erase

Set Format to Print

@ 2, 0 Say "                               INVOICE"
@ 4, 28 Say today
@ 6, 0 Say "To:"
@ 6, 4 Say name
@ 7, 4 Say address
@ 8, 4 Say city
@ 9, 4 Say state
@ 9, 7 Say zip
@ 12, 0 Say "From: The Various Item Company"
@ 13, 0 Say "      1234 Fifth Street"
@ 14, 0 Say "      Berkeley, CA 98765"
@ 17, 0 Say "For:"
@ 17, 5 Say item
@ 19, 0 Say quantity using "999"
@ 19, 3 Say " orders at"
@ 19, 14 Say rate using "999.99"
@ 19, 20 Say " per item"
@ 21, 0 Say "Total Now Due = $"
@ 21, 18 Say amount using "99999.99"

Eject

* If you are not using printer, omit the Eject command and
* insert Wait so that each invoice can be inspected in turn.
* Press <Enter> to continue

Set Format to Screen

Return
```

Listing 4: PRINTINV.PRG, the command file that creates a custom invoice

the screen, the bottom right coordinates are 23,79. You can sketch out a grid like the one in Figure 2 to determine the layout of an invoice or any other custom form.) Whatever follows 'Say' is printed; characters bracketed by quotes are printed as is; anything not in quotes is either a

value entered from the keyboard, such as the date, or the current value of a variable that comes from a record in the customer file, such as a customer name. Numbers that are used in calculations—in this case quantity, rate, and total amount due—are represented by nines. The number of nines, coupled with the Using command, indicates the possible number of places to the right

and left of the decimal point for that variable. 'Eject' advances the printer paper one page; 'Set Format to Screen' tells *dBASE II* to send data to the screen and not to the printer. (If you don't have a printer, each invoice can be displayed on the screen if you substitute 'Erase' for 'Set Format to Print' and 'Wait' for 'Eject'.)

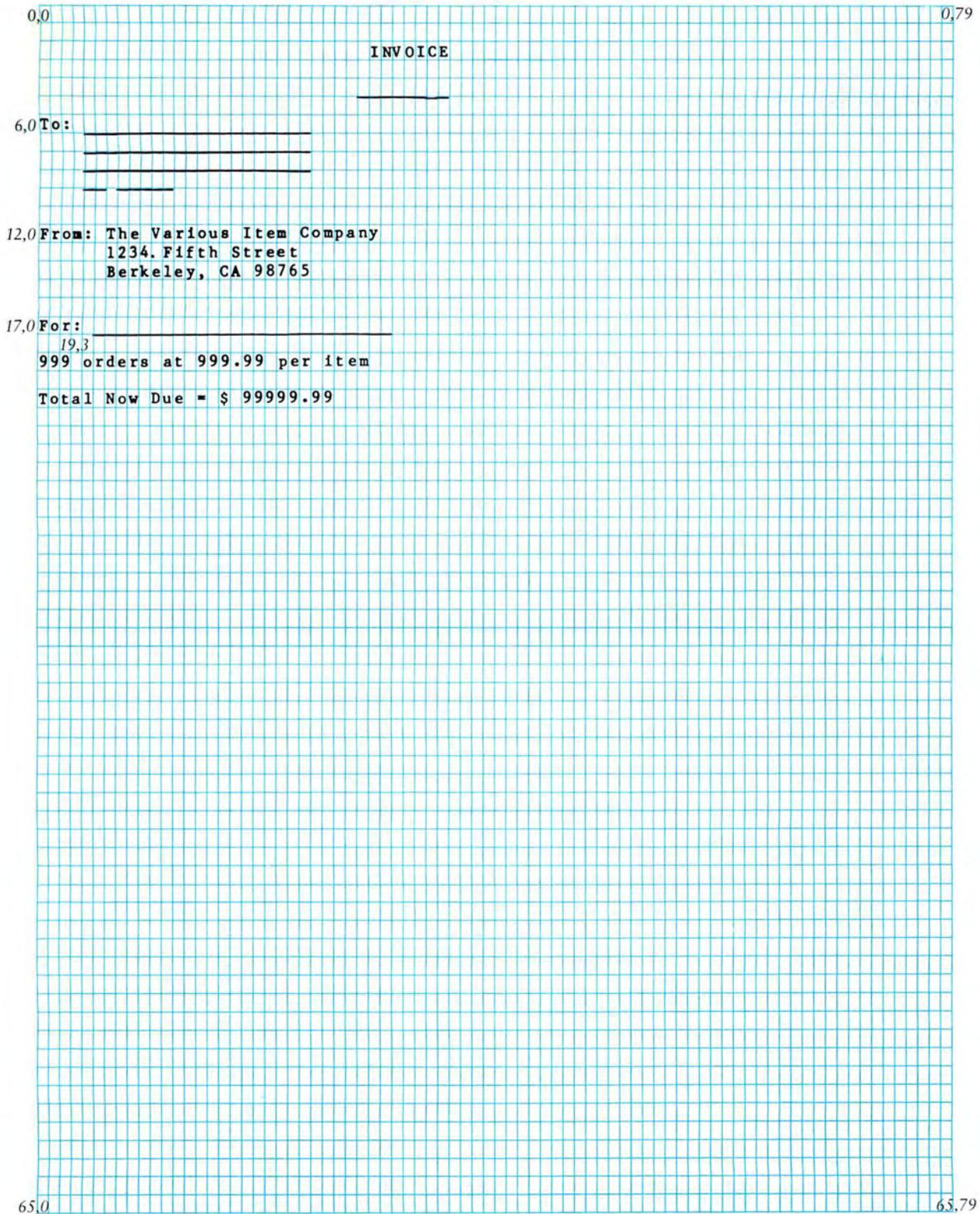


Figure 2: A sample grid used to plot out the format of the invoice. The first number indicates the row, the second number, the column. Note that the placement of the text in the invoice matches the @ Say statements in Listing 4. Blanks designate character fields that will be filled with data taken from the customer file or from the keyboard. Nines represent numbers that are used in calculations.

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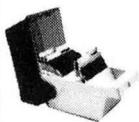
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Running the Program

Type in the three command files using the Modify Command function. If you come from the hunt-and-peck school and suspect the accuracy of your typing, use the three Set commands—Echo, Talk, and Step—to “walk” through the command files one instruction at a time (see “Stepping Through a Command File”). With all the files entered and in place, simply turn on the printer and type Do A:INVOICE. *dBASE II* will do the rest.

In a realistic invoicing program, the number of tasks—and the invoice itself—are usually more complex. An invoice often includes inventory control numbers, sales tax, back-ordered items, and so on. Customer information (name and address) might come from one file, line item information (item, quantity, and rate) from an-

other, and invoice information (customer number, total amount owed, and tax) from a third. But the methods used in this article for selecting and marking records, performing calculations, and creating an invoice form can be adapted and expanded for many other applications. ●

David Jenkins is the president of Midway Software, a consulting and programming company based in Berkeley, California, that specializes in dBASE II applications.

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Stepping Through a Command File

When a *dBASE II* application doesn't work properly, the problem isn't always easy to find. A command may be misspelled or a file reference missing. Fixing a command file—a process known as “debugging” in programming circles—is a matter of examining each line and looking for omissions or errors in syntax. One handy aid in this process lets you “step” through a command file as it performs each instruction. At the *dBASE II* prompt (a period), type in:

- . Set Echo On
- . Set Talk On
- . Set Step On

And then:

- . Do *command file name*

“Set Echo On” tells *dBASE II* to display each command as it is executed. Each time a value changes—in this case the record

number—“Set Talk On” displays it; “Set Step On” requires that the execution of the next command be confirmed at the keyboard. Before each command is executed, *dBASE II* displays “SINGLE STEP Y: = STEP, N: = KEYBOARD CMD, ESC: = CANCEL. Pressing Y tells *dBASE II* to continue, while N keeps your place in the command file and returns you to the *dBASE II* prompt. At that point you can inspect any values in the file with the ? command or use the List Structure command to display the structure of the current command file.

This debugging feature is turned off by entering the following commands at the *dBASE II* prompt:

- . Set Echo Off
- . Set Talk Off
- . Set Step Off

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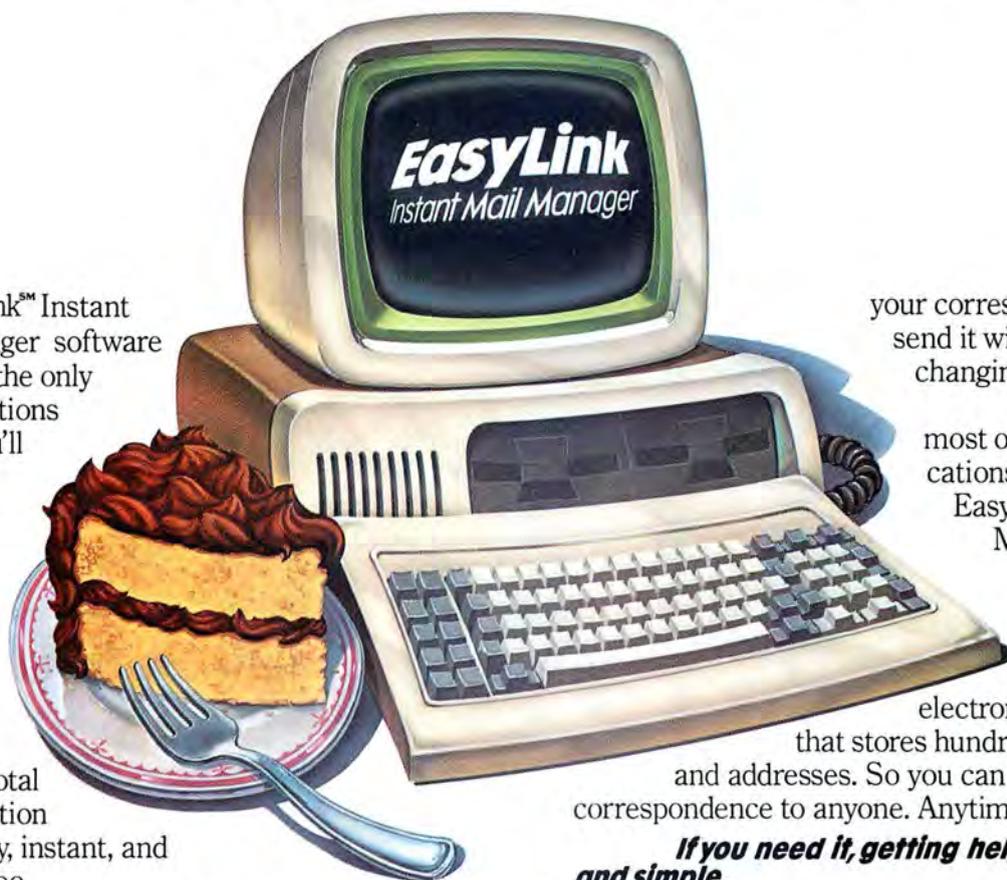
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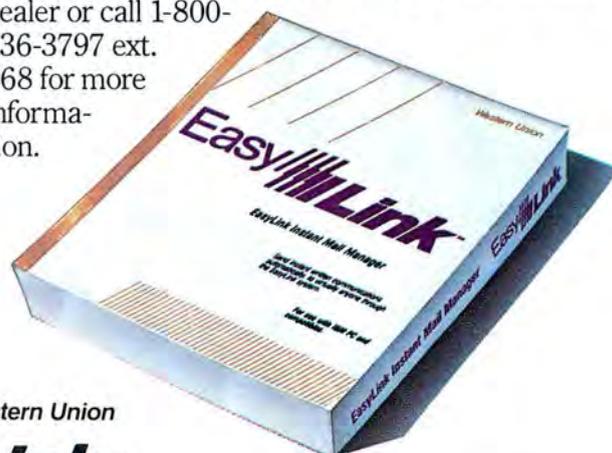
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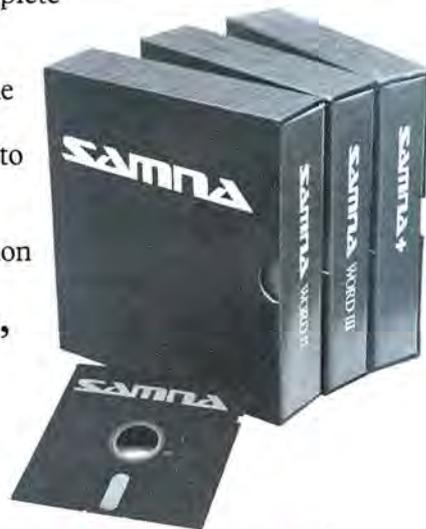
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The Single-Button Menu

Before DOS 2.00 there was no easy way to call both BASIC programs and application programs from one menu. Now you can set up a simple system to do that with a single keystroke.

Raymond DeMers

A number of expensive software packages on the market will integrate all of the software you use into a tidy, coherent, menu-driven environment. Although you can't quite duplicate the sophistication of these packages with BASIC and DOS, you can create a menu that provides an environment that lets you access and use off-the-shelf software and BASIC programs from a single menu. All you need is DOS 2.00, BASICA, a RAM disk program, and a PC or compatible with 256K of memory.

Although creating this "Single-Button Menu" involves a little programming, no PEEKs, POKEs, or assembly language mnemonics are required. The Single-Button Menu exemplifies how DOS 2.00 facilitates the interaction of BASIC programs and batch files. The result combines the benefits of an easily programmable high-level language with the conditional processing of batch file DOS commands.

Before you set up the Single-Button Menu, it's important to understand how BASIC and DOS communicate and how the extended batch commands of DOS 2.00 can make life easier for you. When a PC loads DOS, it either displays the A>

prompt or executes the instructions in an AUTOEXEC.BAT file. The AUTOEXEC.BAT file is used to automate a number of processes, from designating a default drive to loading a frequently used application such as *WordStar*.

When you exit an application, you usually return to the DOS prompt. However, if the command in the AU-

TOEXEC.BAT file (or any batch file) that calls an application is followed by another command, exiting the application returns control not to DOS but to the next command in the AUTOEXEC.BAT file. The batch file could then call another application program, execute a DOS command, or invoke BASIC. The command may also be followed by optional arguments. For example, the command BASIC MYPROG loads BASIC, then runs the program called MYPROG.BAS. Exiting BASIC with the command SYSTEM returns control to DOS.

The extended batch commands of DOS 2.00 can make life easier for you.

TOEXEC.BAT file (or any batch file) that calls an application is followed by another command, exiting the application returns control not to DOS but to the next command in the AUTOEXEC.BAT file. The batch file could then call another application program, execute a DOS command, or invoke BASIC. The command may also be followed by optional arguments. For example, the command BASIC MYPROG loads BASIC, then runs the program called MYPROG.BAS. Exiting BASIC with the command SYSTEM returns control to DOS.

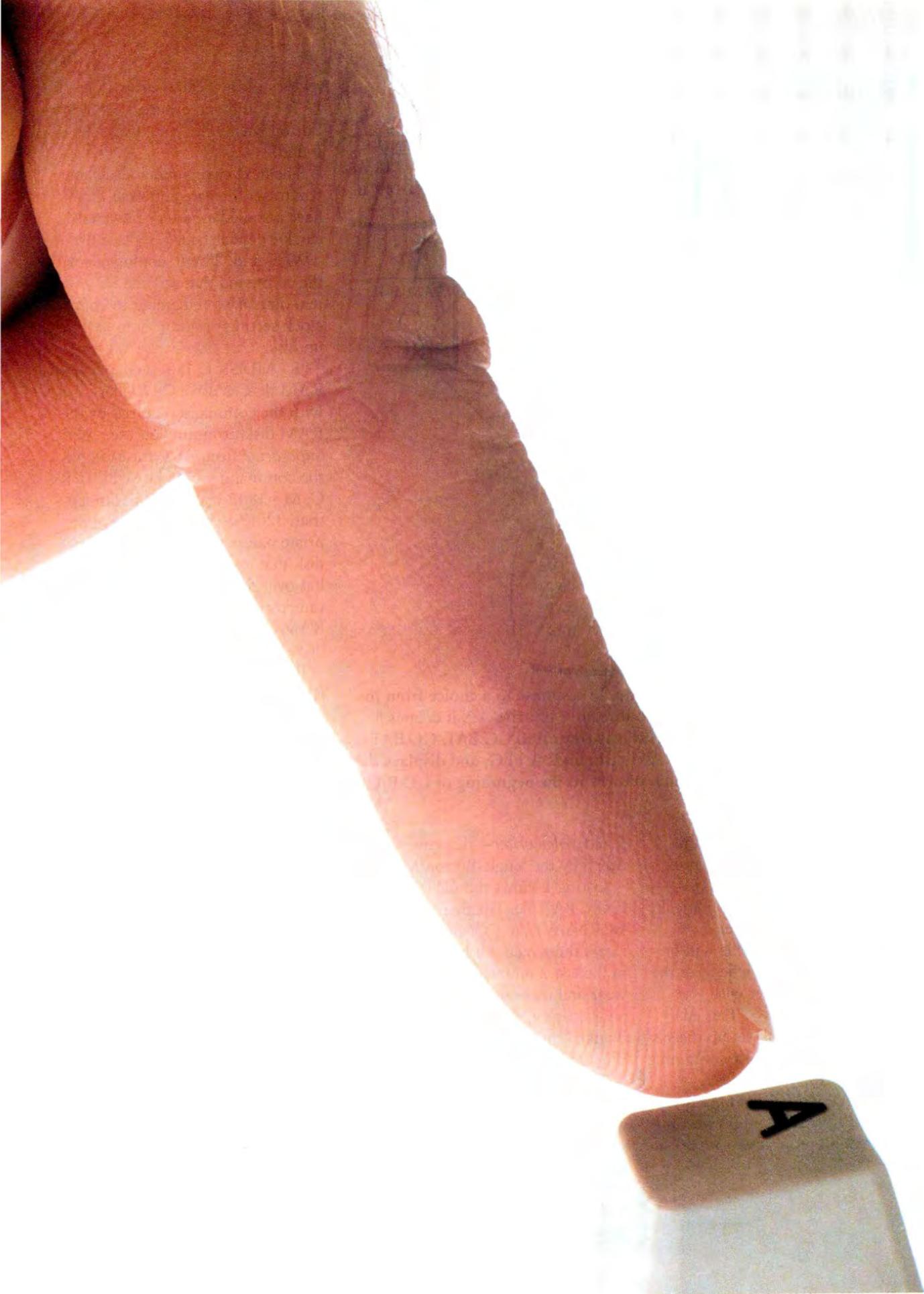
Making the Button Possible

Before DOS 2.00, returning to a batch file from an application or BASIC always caused the execution of the next command in the batch file. With DOS 2.00, however, batch file processing can be directed with the GOTO command to branch to any labeled line in the file. A labeled line begins with a colon and is followed by a label name; this name is not displayed when the batch file runs. DOS 2.00 also permits a command's execution to depend on a value set by a previous program, the equality of two character strings, or the existence of a specific file in the current directory of a specified drive.

This last condition is a vital factor in making the Single-Button Menu work, because the presence or absence of a particular file can control the execution of a batch file. The second important factor is BASIC's ability to create and delete files. Figure 1 shows the relationship between the batch file GO.BAT and the BASIC program MENU.BAS that control the Single-Button Menu.

Automatic Setup

To use the Single-Button Menu, you must prepare a start-up disk that holds the essential AUTOEXEC.BAT file, a RAM disk program, plus any



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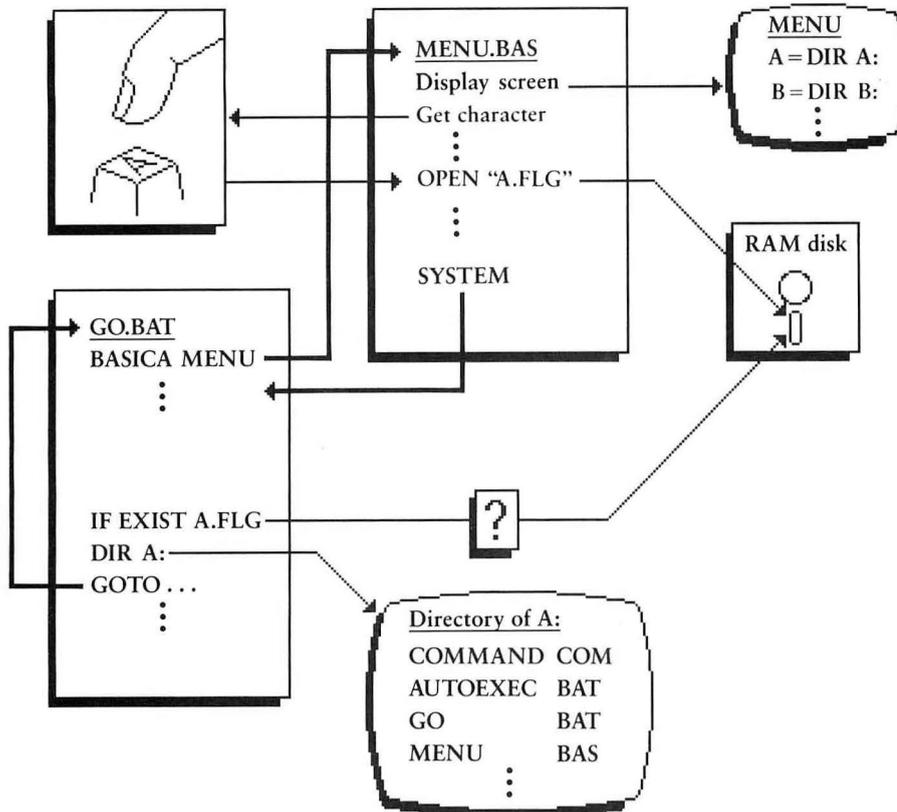


Figure 1: MENU.BAS displays the menu. In response to a choice from the keyboard (in this case A, requesting a directory of drive A:), it creates a file (A.FLG) on the RAM disk and returns control to GO.BAT. GO.BAT searches for the .FLG file on the RAM disk, finds A.FLG, and displays the requested directory. Processing then returns to the beginning of GO.BAT, and MENU.BAS is run again.

applications and BASIC programs you might want to use. These programs, as directed by the AUTOEXEC.BAT file, will be automatically copied into the RAM drive.

An AUTOEXEC.BAT file will be automatically executed whenever the PC is turned on or reset with <Ctrl>-<Alt>-. This AUTOEXEC.BAT file will set up the system, creating a RAM disk containing the Single-Button Menu files (MENU.BAS and GO.BAT), a BASIC program (FIND.BAS), plus two sample application programs—*SuperCalc*

3 and *Volkswriter*—that can be called by the Single-Button Menu.

Listing 1 shows the AUTOEXEC.BAT file. The first command is 'SCRNSAVE', a .COM program that clears the screen if it has not changed in the last 2 minutes. This reduces wear and tear on the screen's phosphor coating. (See "Building a Better Blanker" in *.* in this issue.) 'VERIFY ON' turns on the verification operation that directs DOS after each disk write operation to verify that the written data is readable. 'PATH C:\' tells DOS to look in the root directory of drive C: (the RAM drive) whenever it is unable to find a needed external DOS command file or an application program in the current di-

rectory of the default drive. Thus, the PATH command ensures that Single-Button Menu files can always be found.

The next two commands enable you to set the date and time. If you have installed a battery-powered clock/calendar board, replace the 'DATE' and 'TIME' commands with the command that sets the PC's system date. Also remember to copy the clock-setting program onto the start-up disk.

'RAMDISK C:180' sets up a 180K RAM disk as drive C:. Replace this with the command required by the RAM disk program you use. (With *Superdrive* from AST, for example, the command would be SUPERDRV C:/M=180.) If your PC has more than 320K of RAM, use the appropriate parameters to create a RAM disk that exceeds 180K. If your PC has over 500K of RAM, set the parameters for a 360K RAM disk; most RAM disk programs will not create a drive larger than 360K.

Like the clock-setting program, the RAM disk program must be copied onto the start-up disk. (If you don't have a RAM disk program, refer to the assembly language listing on pages 14 through 27 of IBM's DOS 2.00 manual. An assembler is required to convert this listing into a usable 180K RAM disk program.)

'COPY COMMAND.COM C:\' places a copy of the DOS command processor in the root directory of the RAM disk. 'SET COMSPEC=C:\COMMAND.COM' informs DOS that the command processor file can be found in drive C: and tells DOS its name. This allows DOS to find the proper command processor whenever it must be reloaded. Otherwise DOS will assume that the proper version of the command processor is in the drive from which it was first loaded—an annoying problem if you've replaced the disk with one

```

SCRNSAVE
VERIFY ON
PATH C:\
DATE
TIME
RAMDISK C-180
COPY COMMAND.COM C:\
SET COMSPEC=C:\COMMAND.COM
COPY VW.* C:\
COPY SC.* C:\
COPY BASICA.COM C:\
COPY GO.BAT C:\
COPY *.BAS C:\
C:
GO

```

Listing 1: AUTOEXEC.BAT

that lacks a command processor or has the wrong version.

Next comes a set of commands that copies the files needed by the Single-Button Menu into the RAM disk's root directory. The command 'COPY VW.* C:\' uses the global file name character to put *Volks-writer's* main program file and the support files it needs into drive C:. 'COPY SC.* C:\' performs the identical process for *SuperCalc 3*. Replace these with the appropriate commands to copy the essential files for the word processor, the spreadsheet, and other application programs you prefer. Last, the Advanced BASIC Interpreter, *BASICA.COM*, the Single-Button Menu batch file, *GO.BAT*, and several frequently used BASIC programs (including the BASIC program *MENU.BAS*) are copied to drive C:. After everything is copied, drive C: is set as the default drive and *GO.BAT* is called.

Calling Up GO.BAT

GO.BAT (Listing 2) is the batch file half of the BASIC/batch file team. This batch file calls the BASIC program *MENU* and all the DOS applications and commands available from the Single-Button Menu. For convenience' sake, the first command is 'ECHO OFF', which is used to inhibit the display of subsequent batch

```

ECHO OFF
CLS
C:
CD \

:BEGIN
BASICA MENU
CLS
IF EXIST DOS.FLG GOTO GETOUT
IF NOT EXIST DIRA.FLG GOTO DIRBFLG
DIR A:/P
PAUSE
GOTO BEGIN

:DIRBFLG
IF NOT EXIST DIRB.FLG GOTO DIRCFLG
DIR B:/P
PAUSE
GOTO BEGIN

:DIRCFLG
IF NOT EXIST DIRC.FLG GOTO VWFLG
DIR C:/P
PAUSE
GOTO BEGIN

:VWFLG
IF NOT EXIST VW.FLG GOTO SCFLG
VW
GOTO BEGIN

:SCFLG
IF NOT EXIST SC.FLG GOTO FINDFLG
SC
COPY *.PRN B:
COPY *.CAL B:
GOTO BEGIN

:FINDFLG
IF NOT EXIST FIND.FLG GOTO GETOUT
DIR B: > DIRFILE
BASICA FIND
GOTO BEGIN

:GETOUT

```

Listing 2: GO.BAT

file commands. (Echo is turned on whenever a batch file is called.) 'C:' ensures that the default drive is C:. 'BEGIN' is a label (preceded by a colon) and is not executed. Batch processing skips to the next executable command, which in this case loads *BASICA* and runs *MENU.BAS*. When a valid menu selection is made, *MENU* creates a file in drive C: and calls DOS with the command

'SYSTEM', which returns control to the next line of *GO.BAT*. This new file is given a name based on the menu choice and assigned the .FLG (flag) extension. The file's name and extension enable *GO.BAT* to make decisions based on the file's presence or absence.

If DOS is selected from the menu, *GO.BAT* must be exited. Getting to the DOS prompt from a batch file, however, cannot be done with a command. DOS can only be reached by going to the end of the batch file.

```

100 '          ***** The Single-Button Menu *****
110 '
120 OPEN "DUMMY.FLG" FOR OUTPUT AS 3:CLOSE ' * Open one .FLG file *
130 KILL "C:\*.FLG" ' * so all may be KILLED *
140 '
150 S=20 ' * S=Space from left to beginning of titles *
160 '
170 CLS ' * Clear screen, then print headings and titles *
180 '
190 PRINT:PRINT SPC(S) "***** M A I N M E N U *****"
200 PRINT:PRINT SPC(S) "(A) Directory A
210 PRINT:PRINT SPC(S) "(B) Directory B
220 PRINT:PRINT SPC(S) "(C) Directory C
230 PRINT:PRINT SPC(S) "(D)OS
240 PRINT:PRINT SPC(S) "(F)ind
250 PRINT:PRINT SPC(S) "(S)uperCalc
260 PRINT:PRINT SPC(S) "(T)elecom
270 PRINT:PRINT SPC(S) "(V)olkswriter
280 '
290 LOCATE ,,0 ' * Turn off the cursor *
300 '
310 MENUCHAR=INSTR("AaBbCcDdFfSsTtVv",INPUT$(1)) ' * Get a character *
320 '
330 CHOICE=(MENUCHAR+1)\2) '* Convert so "A" or "a" = 1, "S" or "s" = 6, etc. *
340 '
350 ' * If CHOICE = 1 TO 8, GOTO the appropriate line *
360 '          DIRA DIRB DIRC DOS FIND SCAL TCOM VOLK
370 ON CHOICE GOTO 1000,2000,3000,4000,5000,6000,7000,8000
380 '
390 ' * If CHOICE = 0, character entered is not acceptable *
400 GOTO 310 ' * Loop back and get another character *
410 '
1000 OPEN "DIRA.FLG" FOR OUTPUT AS 3:CLOSE
1010 SYSTEM
1020 '
2000 OPEN "DIRB.FLG" FOR OUTPUT AS 3:CLOSE
2010 SYSTEM
2020 '
3000 OPEN "DIRC.FLG" FOR OUTPUT AS 3:CLOSE
3010 SYSTEM
3020 '
4000 OPEN "DOS.FLG" FOR OUTPUT AS 3:CLOSE
4010 SYSTEM
4020 '
5000 OPEN "FIND.FLG" FOR OUTPUT AS 3:CLOSE
5010 SYSTEM
5020 '
6000 OPEN "SC.FLG" FOR OUTPUT AS 3:CLOSE
6010 SYSTEM
6020 '
7000 RUN "TELECOM"
7010 '
8000 OPEN "VW.FLG" FOR OUTPUT AS 3:CLOSE
8010 SYSTEM
8020 '
9000 END

```

Listing 3: MENU.BAS

Therefore, once control is returned to GO.BAT, the command 'IF EXIST DOS.FLG' asks the PC if the file DOS.FLG exists. If it does, batch processing is transferred to the command following the label ':GET-OUT'. Because no commands follow ':GETOUT', GO.BAT is exited and control returns to DOS. Typing GO <Enter> at the DOS prompt restarts the Single-Button Menu.

If the DOS.FLG file does not exist, GO.BAT checks drive C: to find out which .FLG file was created by looking for each in turn. When the .FLG file is found, control passes to the next line, which calls the application program or DOS command chosen via MENU.

Returning from an application or a DOS command passes control to the next command in GO.BAT. If the application or command has stored data in the RAM disk that you want copied to a permanent disk, the appropriate COPY commands should come immediately after the command that called the application. For example, the COPY commands that follow 'SC' in GO.BAT copy all *SuperCalc* spreadsheet and print files to drive B:. Note that each labeled section of GO.BAT (except GETOUT) finishes with a GOTO command that transfers control to the command following the ':BEGIN' label, which executes the command 'BASICA MENU'. The Single-Button Menu is now ready to accept your next selection.

Creating the BASIC Menu

MENU.BAS (see Listing 3) is a simple BASIC program. Its first task is to delete (KILL) all files in drive C: that have the .FLG extension. Since a KILL command issued in the absence of a target file results in a system error, the file DUMMY.FLG is opened

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```

100 '          ***** The BASIC program FIND *****
110 CLS:LOCATE 3,1,0
120 PRINT:PRINT "          ** The BASIC Program FIND **" :PRINT
130 PRINT:PRINT "          This program was called directly from GO.BAT and"
140 PRINT:PRINT "          will return to GO.BAT when you hit a key." :PRINT
150 PRINT:PRINT "          Although the BASIC program MENU could be RUN from"
160 PRINT:PRINT "          here, returning to GO.BAT keeps things in order."
170 PRINT:PRINT:PRINT
180 PRINT "NOTE: The command DIR B:>DIRFILE was issued from GO.BAT so"
190 PRINT "          the FIND program could READ each file name in drive B:"
200 A$=INPUT$(1)
210 CLS:SYSTEM

```

Listing 4: FIND.BAS

and closed before the KILL command is given so that at least one flag file exists.

After the menu is displayed by lines 150 through 270, line 310 accepts a single key input, compares it to the string of acceptable characters, and sets the value of MENUCHAR equal to the matching character's position in the string (or to zero if there is no match). Both uppercase and lowercase characters are acceptable. At line 370, CHOICE, derived from MENUCHAR, is used to go to the appropriate line, which then creates (OPENS) the correct .FLG file. If CHOICE equals zero—which signals an unacceptable input, such as R—the program drops to line 400 and is directed back to line 310 to get another character.

If the menu choice is a DOS application or command, a .FLG file is created, DOS is called, and control returns to GO.BAT. If a BASIC program that does not require preparatory DOS calls is chosen, a .FLG file is not created—the program is called directly by MENU with the command `RUN filename`. (An example of this is shown in line 7000.) Each such BASIC program must end with the command `RUN "MENU"` to return you to the Single-Button Menu.

A BASIC program is usually run from and returns to MENU without leaving BASIC. But some BASIC programs (such as FIND.BAS in Listing 4) require that certain DOS calls be made before they are run. There is no BASIC command that lets a program get at the directory of a disk (the BASIC command FILES allows viewing but not the use of the file names it

A RAM disk is desirable in any disk-intensive application program.

returns), so FIND requires the preparatory DOS command `DIR B:>DIRFILE`. Therefore FIND is not run directly from MENU. Instead, MENU creates the file FIND.FLG and returns control to GO.BAT. The existence of this flag file causes the batch file to write the directory of the disk in drive B: into the file DIRFILE, load BASICA, and run the BASIC program FIND.BAS. The last command in a BASIC program run from GO.BAT should be SYSTEM, which returns control to GO.BAT and then, via `:BEGIN`, to BASICA MENU.

Although remark lines are usually deleted in a program, line 360 should be retained. The labels positioned over the `ON . . . GOTO` line number list in line 370 are a valuable aid for developing and modifying the menu. Additional applications are easily added to the Single-Button Menu. Simply add the selection to the bottom of the main menu display (after line 270 of MENU.BAS), append both the uppercase and lowercase of the letter that will be used to select the application to the string of valid choices in line 310, append a new line number to the `ON . . . GOTO` line number list in line 370 (and add an identifying label to the remark line 360), and add a new line (using the new line number appended in line 370) containing an OPEN statement to create a unique .FLG file, followed by the statement CLOSE and the command SYSTEM.

GO.BAT must also be modified. Insert a new unique label before `:GETOUT`, followed by the `IF NOT EXIST new .FLG file GOTO GETOUT` conditional command, the command to call the application, and the command `GOTO BEGIN`. Also change `GOTO GETOUT` (in the pre-

vious selections' IF... GOTO command) to GOTO *new label*. Adding the application's necessary program files to the start-up disk and adding to the AUTOEXEC.BAT file the proper commands that will COPY these files to the RAM drive completes the modification of the Single-Button Menu.

The RAM Disk

Without a RAM disk, the Single-Button Menu would be prohibitively slow because of the repeated reads of disk directories and the repeated searches for labels, which always begin at the top of the batch file. Besides, a RAM disk is desirable in any disk-intensive application program.

Application programs can usually be trimmed to fit into a RAM disk. Some programs have tutorial and help files that may not be needed for everyday operation. Some have multiple printer tables, and chances are you'll need only one. Programs also often have separate utilities that duplicate DOS commands such as COPY, and these can likewise be omitted.

With such snipping I squeezed the necessary parts of *Volsurwriter*, *SuperCalc*, a telecommunications program, and some everyday utilities into a 180K RAM disk. With 320K of memory in the system, 140K is left for program use. With the Single-Button Menu, these programs are called by a single keystroke, and exiting a program returns control to the menu. It may not be the fanciest way to integrate software—there aren't any mice to play with, any windows to open and shut, or any icons to dump into miniature trash cans—but it works. And it's free. ☉

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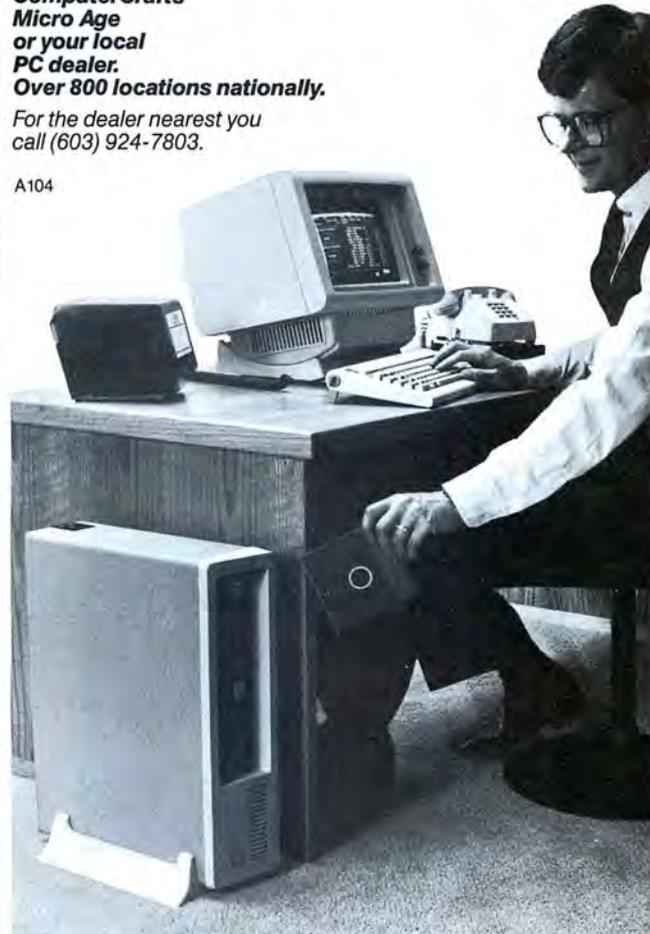
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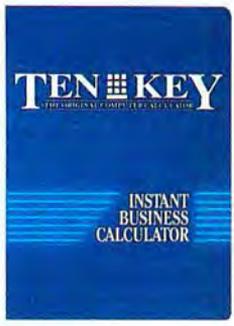
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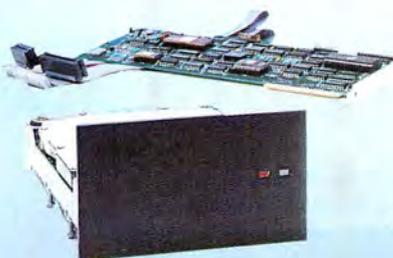
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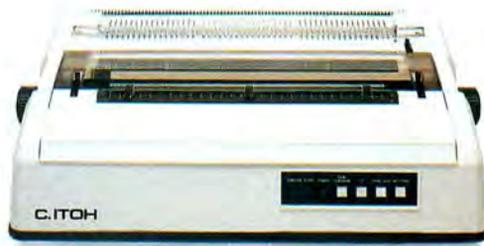
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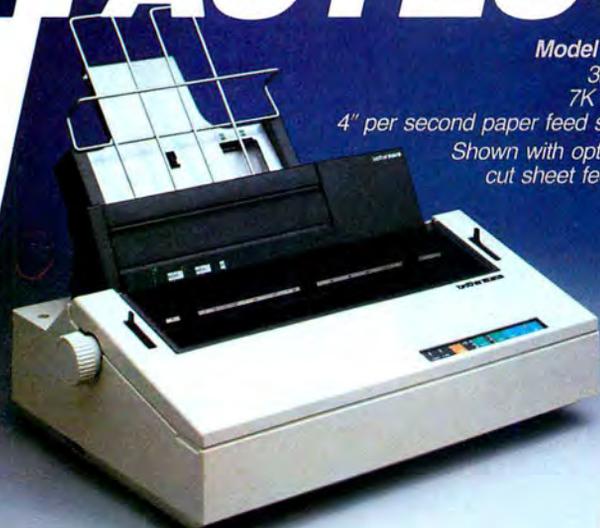
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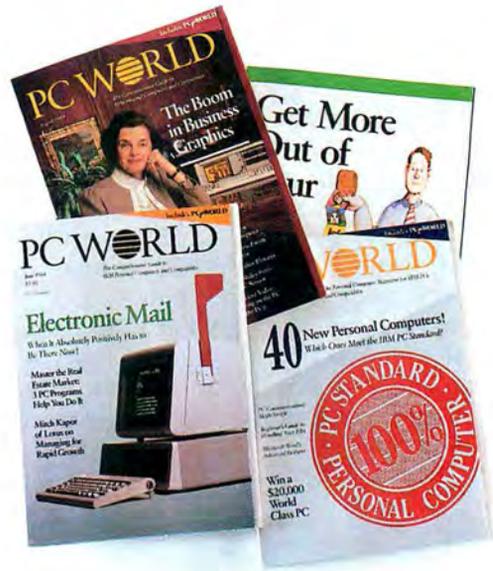
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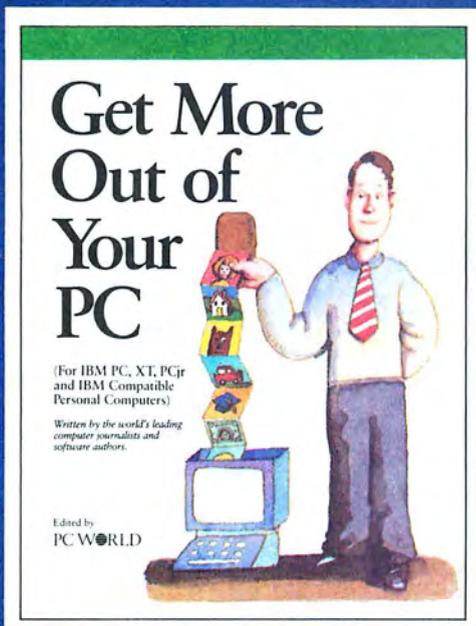


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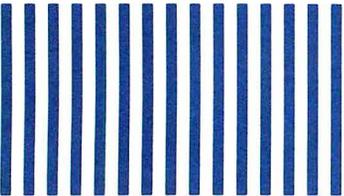


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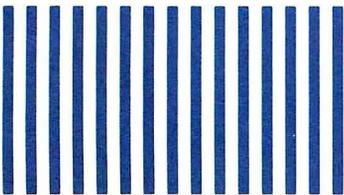


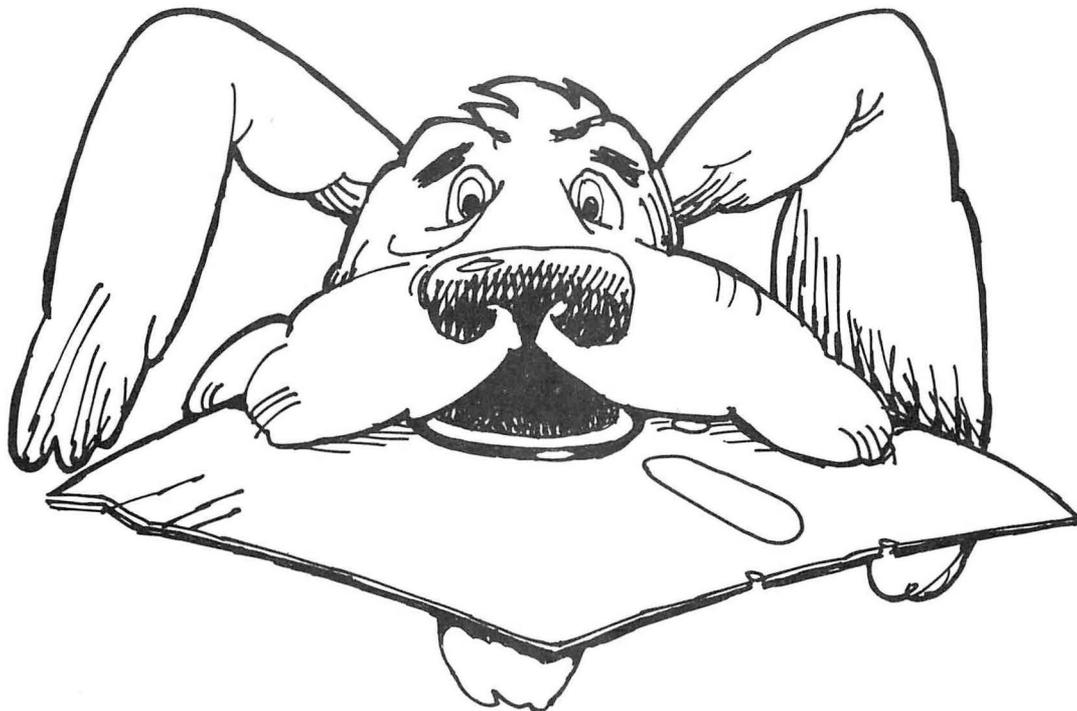
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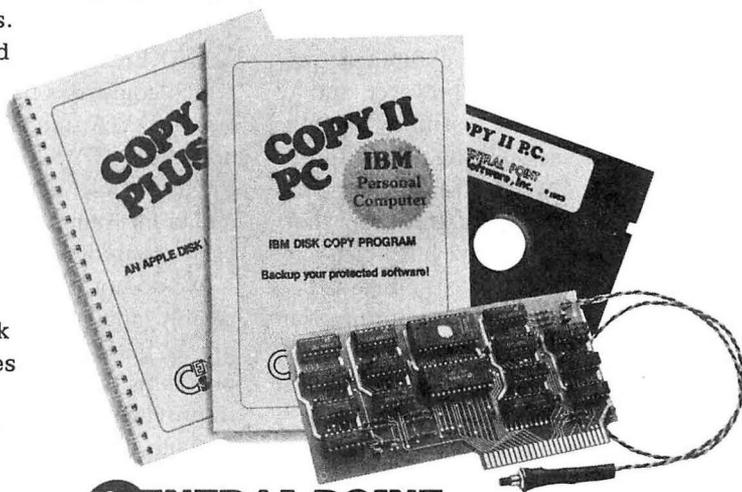
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A global exchange of personal computer discoveries

Edited by Steven Cook

This month we bring you a twice-improved version of the screen-blanking program published here earlier this year, a noisy variation of the PAUSE command, and a simple program to remove special codings from *WordStar* document files. We also have tips regarding a DOS command shortcut, 1-2-3, and rebooting the PC from within a BASIC program.

But first a few words regarding assembly language programs. In this space we share advice and programs submitted by readers so that everyone can reap the benefits of one person's discoveries. Many personal computer problems are best solved by assembly language programming, something that only a small percentage of our readers are able to do. It would be a shame if readers had to be able to program in assembly language to make use of the terrific programs that result; fortunately, that is not the case.

The result of an assembly language program is a binary file—a series of numbers that makes little sense to humans. Those numbers can be typed directly into a computer to recreate the program, however, and that is how many assembly language programs are published here. To prevent errors, we publish the numbers within a small BASIC program that verifies that they have been transcribed correctly. We use BASIC because it is the only programming language common to all IBM PCs.

In the past we have published various BASIC programs to recreate binary files; some readers provide the program with their submissions, and

sometimes we write them ourselves. Starting in this issue we will be using the program shown in XMAKER.BAS as the standard program for all such items. Once you have typed XMAKER.BAS and saved it on a disk, you will be able to use it to recreate the binary files published in this column. Because XMAKER.BAS incorporates a more sophisticated error-checking routine than we have used in the past, it will notice any typing error that you might

Pressing <F3> causes DOS to display a template of the last command typed.

make, and it will identify the line that contains the error to help you make corrections quickly.

The companion program for XMAKER.BAS is DATAMKR.BAS, which converts a binary file into a series of DATA statements that can be added to XMAKER.BAS to recreate the binary file. DATAMKR.BAS adds a data line number and checksum to each group of 16 bytes.

We do not usually publish the assembly language versions of programs, but occasionally we receive programs that are so useful we want to provide our assembly-fluent readers with all they need to make the most of the information. The screen-blanking program is an example of that situation. Hopefully, we will be seeing many similar items as a result.

Memorable Commands

In my work helping business users with the IBM PC, I have noticed that few have discovered how to use the <F3> key while in DOS to repeat the last command. It's a great time-saver that I frequently use myself. Pressing <F3> causes DOS to display a template of the last command typed. You can use the cursor keys to edit the template before pressing <Enter>.

Unfortunately, the command I usually want to repeat is not the last command but the command before that. For instance, problems often occur because I am logged on to the wrong disk drive or subdirectory when I issue a command. Switching to another drive or subdirectory requires a DOS command, and that command then becomes the one stored as the template.

I recently discovered how to retain the template of the first command for later use. Let's say that you have entered the command COPY AUTOEXEC.BAT B:, but it didn't work because you are logged on to drive B:. You must execute a command to change the logged disk drive and then reissue the failed COPY command. To do this, press the <Ins> key and type A:, then <Space>, and then <F3>. The text of the first command will appear on the same line as the A: command, with the two commands separated by a space. When you press <Enter>, the entire line will be passed to DOS, but only the first command will execute. DOS stops processing the line

```

10 DEFINT A-Z:CLS:KEY OFF:DEF FNHEX(X$)=VAL("&h"+X$)
20 LOCATE 3,1:PRINT "X-Maker":READ F$
30 LOCATE 5,1,1:PRINT "Now testing for data errors...please wait";
40 SUM=0:READ LN:IF LN<0 THEN 80
50 READ H$:IF VAL(H$)<0 THEN 70
60 SUM=(SUM+FNHEX(H$))*2:SUM=(SUM\256)+(SUM MOD 256):GOTO 50
70 READ CKSUM$:IF SUM=FNHEX(CKSUM$) THEN 40 ELSE GOTO 170
80 RESTORE:CLS:LOCATE 3,1:PRINT "X-Maker":READ F$
90 LOCATE 5,1,1:PRINT "Press any key to create ";F$;" ": ";
100 A$=INPUT$(1):PRINT:IF A$=CHR$(27) THEN END
110 LOCATE 6,1:PRINT "Working...";
120 OPEN F$ AS #1 LEN=1:FIELD #1,1 AS BYTE$
130 READ LN:IF LN<0 THEN 160
140 READ H$:IF VAL(H$)<0 THEN READ CKSUM$:GOTO 130
150 LSET BYTE$=CHR$(FNHEX(H$)):PUT #1:GOTO 140
160 CLOSE:PRINT:PRINT F$;" has now been created.":END
170 PRINT:PRINT "Error in DATA line";STR$(LN);". ";
180 PRINT "Check your work.":BEEP:END

```

XMAKER.BAS

```

10 DEFINT A-Z:CLS:KEY OFF:LOCATE 5,1:PRINT "Data Maker"
20 DEF FNH$(X)=RIGHT$("0"+HEX$(X),2):CM$=CHR$(44)
30 '
40 PRINT:INPUT "Input filename--",N$:IF N$="" THEN END
50 OPEN N$ FOR INPUT AS #1
60 INPUT "Output filename--",F$
70 OPEN F$ FOR OUTPUT AS #2
80 '
90 LN=0:INPUT "Beginning DATA line number";BL 'start a new line
100 PRINT #2,STR$(BL);" DATA ";;WRITE #2,N$
110 SUM=0:LN=LN+1:LX=0
120 PRINT #2,BL+(LN*10);"DATA";:PRINT #2,STR$(LN);CM$;
130 '
140 IF EOF(1) THEN 210
150 X=ASC(INPUT$(1,1)):SUM=(SUM+X)*2:SUM=(SUM\256)+(SUM MOD 256) 'checksum
160 '
170 IF LX>0 THEN PRINT #2,CM$; 'commas between items
180 PRINT #2,FNH$(X);:LX=LX+1:IF LX<16 THEN 140 'count bytes per line
190 PRINT #2,CM$;"-1";CM$;FNH$(SUM):SUM=0:GOTO 110 'terminate after 16
200 '
210 IF LX>1 THEN PRINT #2,CM$;"-1";CM$;FNH$(SUM); 'partial checksum
220 PRINT #2,CM$;"-1":PRINT "Complete.":CLOSE:GOTO 40

```

DATAMKR.BAS



as soon as it comes across the space. The entire line, however, is saved as the new template.

To retrieve the initial command, press the key three times to remove the A, the colon, and the space from the template, and then press the <F3> key to display the rest of the line.

In general, to save a command template, begin the second command by pressing <Ins> and finish it by pressing <Space> and <F3>. Remember to use the key to remove the second command from the template.

*Kendall Callas
San Francisco, California*

Editor's note: This tip may seem to require you to use many keystrokes to keep from having to retype a single command, but anyone who makes use of DOS 2.00 paths will find it a welcome relief.

Call Me When It's Over

I have written a program called SIGNAL for use as a substitute for the PAUSE command in a batch file. SIGNAL works exactly like PAUSE, except that it beeps the speaker until you press any key to continue. It is very handy because it enables you to do other tasks instead of watching the screen while you wait for a lengthy job to be processed.

The data shown in SIGNAL.DAT will create a file called SIGNAL.COM, which is the actual program. You can create a version of SIGNAL.COM that beeps only once by

changing the fourth and fifth bytes in line 1030 from 'EB,EB' to '90,90' and the last byte on line 1030 from 'FC' to 'DB'. If you want both versions, you can run the program once, rename the SIGNAL.COM file it creates, and then change the three byte values and run it again.

*Martin Kelinsky
Falls Church, Virginia*

Editor's note: Add the DATA lines in SIGNAL.DAT to the end of XMAKER.BAS to create SIGNAL.COM.

Regarding REBOOT

Mark Anaker's program REBOOT.BAS (*.*; PCW, Vol. 1, No. 7) is only one line long, but it contains a subtle bug. The program is supposed to make the PC perform a cold boot, just as if the power had been turned off and then on. A little experimentation revealed that what the program actually does is repeat the last boot that has occurred, either warm or cold. That is, if you have pressed <Ctrl>-<Alt>- after turning the PC on, REBOOT.BAS will cause a warm boot to occur.

That bug occurs because when the PC performs a warm boot, it first places the value 1234H at address 0040:0072. Once the initial steps of booting are complete, the PC checks the value at that location; if it's 1234H, the PC skips the time-consuming memory test. To ensure a cold boot, you must place some value other than 1234H into that location and then jump to the boot address. The program line DEF SEG = &H40:POKE &H72,0:DEF SEG = &HFFFF:RB = 0:CALL RB does exactly that.

*Richard Hutchinson
Stanford, California*

Leapin' Lotus

As the *American Heritage Dictionary* states and as all calendar trivia enthusiasts know, "Every year whose number is [evenly] divisible by 4 is a leap year, with the exception of centennial [evenly divisible by 100] numbers, which are leap years only when [evenly] divisible by 400."

This means that the year 1900 was not a leap year, but the year 2000 will be one. Lotus 1-2-3, version 1A, has the leap year status of these two centennial years reversed. That is, the program calculates the year 1900 as a leap year and the year 2000 as not.

If all the dates you deal with are between March 1, 1900, and February 28, 2000, you will not have any difficulty, although the serial numbers for dates within that range will all be one higher than they should be. Beware, though, if you use subtraction to determine the number of days between two dates, one within that range and the other outside it.

*Rex Swain
New York, New York*

Build a Better Blanker

Concerning the program BLANK.COM (*.*; PCW, Vol. 2, No. 4), it might interest you to know that some of the information provided by the author was, to say the least, incorrect.

The author said the program was incompatible with BASIC, and indeed it was, but that was not BASIC's fault. He also implies that the screen would switch to page 7 after 5 minutes of elapsed time. Well, the counter was set to 01F4H, which equals 500 decimal and corresponds to 27½ seconds.

```

1000 DATA "signal.com"
1010 DATA 1,1E,2B,C0,50,8C,C8,8E,D8,8D,16,2A,01,B4,09,CD,21,-1,39
1020 DATA 2,B4,0B,CD,21,3C,FF,74,0D,E8,30,00,E8,2D,00,2B,C9,-1,B2
1030 DATA 3,90,E2,FD,EB,EB,B4,07,CD,21,CB,50,52,45,53,53,20,-1,FC
1040 DATA 4,41,20,43,48,41,52,41,43,54,45,52,20,54,4F,20,43,-1,B3
1050 DATA 5,4F,4E,54,49,4E,55,45,2E,2E,2E,24,B0,B6,E6,43,B8,-1,3B
1060 DATA 6,A0,06,E6,42,8A,C4,E6,42,E4,61,8A,E0,0C,03,E6,61,-1,20
1070 DATA 7,2B,C9,E2,FE,8A,C4,E6,61,C3,-1,33,-1

```

SIGNAL.DAT

The most important problem is that the interrupt routine does not restore the DS register. Therefore, at times the DS register is set to a value that causes the system's memory to be modified randomly. Correcting the program to preserve the DS register will cause it to work as it should, and under BASIC, too. However, an even more subtle problem stands out when the delay to blank the screen has been reduced to 27½ seconds.

Assume that you have a long job to run, one that takes more time than the delay time before the screen goes blank. The screen switches to page 7 (actually page 3 in 80-character mode) and sits there waiting for you to return from your coffee break and press a key. If the job has a few errors, however, they are displayed on the screen because page 7 is active. You come back, see the errors, and decide to fix them. As soon as you touch the keyboard (even the key to print the screen), page 7 goes away and the errors remain a mystery until the screen goes blank again. (It won't actually be blank, since the errors will be displayed.)

Therefore, the program should check to see not only if you type on the keyboard but also if a character is

sent to the screen. Before a character is sent to the screen, the program should switch back to the original screen page.

Finally, one last problem. Sometimes when I type a character, say the first character of the command DIR, the screen shows nothing. Why? Because the keyboard is checked only 18.2 times per second. If a key is pressed at the beginning of that cycle, the keyboard routine sets a flag until the routine is over. In the meantime, the system has processed the *D* and sent it to screen page 7, but you won't see it because the screen page will be changed too quickly. The system still recognizes that *D* as part of your command, and although the line will read 'A>IR', the command will work. If you notice the missing *D* and backspace to correct the line, the internal command will be DDIR, which will not work. I fixed that problem by forcing an interrupt to restore the screen.

The result of my work is the program BLANK2.ASM. I used the standard DOS function calls to get and set interrupt vectors, and I used

the series 60H vectors because the manual states that they are "reserved for user software interrupts," and I'm a user. I have a lot of memory in my PC, so I did not bother to optimize the memory requirements of my program. And since nobody is perfect, there may be errors in this program, too.

In conclusion, let me give ample credit to Christopher Wiley for his program, for I often thought about the wear on the screen, but the idea of his program did not occur to me. Leonardo da Vinci and the Wright brothers all deserve credit for their work on flying machines. My advice is, come up with great ideas, and someone else will improve on them.

*Gerard Perreault
Quebec, Canada*

Editor's note: Indeed, Mr. Perreault's program has already been improved. As originally supplied, the program switched the display to screen page 7 after 2 minutes of inactivity. Unfortunately, only the color graphics board supports that screen page. Therefore, as published here, BLANK2.ASM has been modified to

(continues on page 270)



```
; -----  
; Program BLANK2.COM to blank the screen after two minutes of  
; inactivity. This program by Gerard Perreault is based on  
; the program BLANK.COM submitted by Christopher Wiley in  
; PC World Volume 2, Number 4. Modified by Steve Cook 1-JUN-84.  
; -----  
  
; Define the code segment, and set things up for a .COM program  
  
CSEG      segment para public 'CODE'  
          assume cs:CSEG,ds:CSEG  
  
; Programs which are to be put through EXE2BIN must start at address  
; 100H, so...  
  
          org      100H  
  
START:    jmp      GO          ; jump around the data area  
  
SWFLAG   db      0          ; video not switched off (1 if we did)  
KEYFLAG  db      0          ; no key input nor display since video off  
COUNT   dw      0          ; timer count  
  
addr_6845 equ     63H       ; CRT control port base address  
crt_mode_set equ   65H       ; current state of CRT mode register  
  
GO:  
    mov     ah,35H          ; get address at 1C vector (timer 18.2  
    mov     al,1CH          ; times per second frequency)  
    int     21H  
    push    es              ; move ES:BX to DS:DX  
    push    bx  
    pop     dx  
    pop     ds  
    mov     ah,25H          ; set into interrupt 60H as replacement  
    mov     al,60H  
    int     21H  
  
    mov     ah,35H          ; Do same for keyboard interrupt  
    mov     al,09H  
    int     21H  
    push    es  
    push    bx  
    pop     dx  
    pop     ds  
    mov     ah,25H  
    mov     al,61H  
    int     21H  
  
    mov     ah,35H          ; Do same for video interrupt  
    mov     al,10H  
    int     21H  
    push    es
```

```

push    bx
pop     dx
pop     ds
mov     ah,25H
mov     al,62H
int     21H

push    cs                ; now set new values in the vectors
pop     ds                ; 1CH, 09H, and 10H
mov     dx,offset TICKER
mov     ah,25H
mov     al,1CH            ; ... as TICKER
int     21H

push    cs
pop     ds
mov     dx,offset KEY_IN
mov     ah,25H
mov     al,09H           ; ... as KEY_IN
int     21H

push    cs
pop     ds
mov     dx,offset VIDEO_OUT
mov     ah,25H
mov     al,10H           ; ... as VIDEO_OUT
int     21H

mov     dx,(offset END_PR)+100H ; Finished, leave resident and
int     27H              ; add more room than needed to avoid INT 27H bug

```

; Process the 1CH interrupt which occurs 18.2 times per second
TICKER:

```

sti                ; restore interrupts
push    ax         ; save some registers
push    ds
push    cs         ; set the DS register the same as CS
pop     ds
cmp     swflag,0   ; have we switched the video off?
jne     t01        ; yes.
inc     count      ; no, keep counting the clock pulses
cmp     count,0888H ; until we get to 2 minutes
jnae   t02        ; by the way, did we hit the limit?
mov     count,0    ; yes, reset the count and
push    dx         ; save these registers, too
push    es         ; Now to switch the video off...
mov     ax,0040H   ; (base address of ROM data area)
mov     es,ax
mov     dx,es:addr_6845 ; Get base address of the video controller
add     dx,4       ; point to controller's mode register
mov     al,es:crt_mode_set ; Get current mode settings

```

(continues)



```

    and    al,11110111B    ; Clear the video enable bit to
    out    dx,al           ; turn off the video.
    pop    es
    pop    dx
    mov    swflag,1        ; flag that we have switched off
    jmp    short t02       ; standard exit.

t01:
    cmp    keyflag,0       ; We have switched off. Has a key been
                           ; pressed or attempt been made to display a
    je     t02             ; character since then? No.
    push   dx              ; Yes. Restore the video signal
    push   es
    mov    ax,0040H        ; First, point to the ROM data area
    mov    es,ax
    mov    dx,es:addr_6845 ; Get base address of video controller
    add    dx,4            ; and point to controller mode register
    mov    al,es:crt_mode_set ; Get the old mode settings and
    out    dx,al          ; restore them.
    pop    es
    pop    dx
    mov    keyflag,0       ; Reset the flags as: No key in/video
    mov    swflag,0       ; not switched
    mov    count,0        ; reset (again) count to 0

t02:
    pop    ds              ; standard exit. Restore used registers
    pop    ax              ; and process whatever was
    int    60H            ; at int 1CH before this
    iret                  ; program came into action.

; The user has pressed a key...
KEY_IN:
    sti                    ; restore interrupts
    push   ax              ; save the registers which we will use
    push   ds
    push   cs              ; set DS to the same as CS
    pop    ds
    cmp    swflag,0       ; Are we already switched off?
    je     k01            ; No.
    mov    keyflag,1      ; Yes. Set the flag that we got a key
    int    1CH

k01:
    mov    count,0        ; reset count to 0
    pop    ds              ; restore the saved register and inform
    pop    ax              ; the system by causing the equivalent
    int    61H            ; of an int 09H in this program.
    iret

```

(continues)

BLANK2.ASM (continued)

```

; The system wants to output to the screen...
VIDEO_OUT:
    sti                ; restore interrupts
    push    ax         ; save registers
    push    ds
    push    cs         ; make DS the same as CS
    pop     ds
    cmp     swflag,0   ; Have we switched the video off?
    je     v01         ; No.
    mov     keyflag,1  ; Yes. Flag that we want video on
    int    lCH
v01:    mov     count,0 ; reset the count to 0
    pop     ds         ; restore registers
    pop     ax
    int    62H        ; process the video request
    iret

END_PR:                ; used to determine length of program

CSEG    ends
end     start

```

BLANK2.ASM (continued)

```

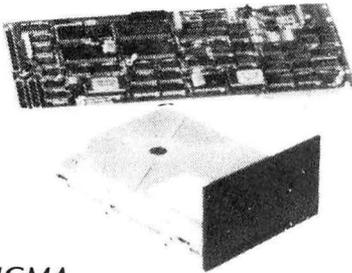
1000 DATA "blank.com"
1010 DATA 1,EB,05,90,00,00,00,00,B4,35,B0,1C,CD,21,06,53,5A,-1,8E
1020 DATA 2,1F,B4,25,B0,60,CD,21,B4,35,B0,09,CD,21,06,53,5A,-1,09
1030 DATA 3,1F,B4,25,B0,61,CD,21,B4,35,B0,10,CD,21,06,53,5A,-1,DA
1040 DATA 4,1F,B4,25,B0,62,CD,21,0E,1F,BA,5D,01,B4,25,B0,1C,-1,71
1050 DATA 5,CD,21,0E,1F,BA,CC,01,B4,25,B0,09,CD,21,0E,1F,BA,-1,33
1060 DATA 6,EA,01,B4,25,B0,10,CD,21,BA,08,03,CD,27,FB,50,1E,-1,4B
1070 DATA 7,0E,1F,80,3E,03,01,00,75,31,FF,06,05,01,81,3E,05,-1,1B
1080 DATA 8,01,88,08,72,52,C7,06,05,01,00,00,52,06,B8,40,00,-1,8D
1090 DATA 9,8E,C0,26,8B,16,63,00,83,C2,04,26,A0,65,00,24,F7,-1,A6
1100 DATA 10,EE,07,5A,C6,06,03,01,01,EB,2D,80,3E,04,01,00,74,-1,FB
1110 DATA 11,26,52,06,B8,40,00,8E,C0,26,8B,16,63,00,83,C2,04,-1,B4
1120 DATA 12,26,A0,65,00,EE,07,5A,C6,06,04,01,00,C6,06,03,01,-1,E0
1130 DATA 13,00,C7,06,05,01,00,00,1F,58,CD,60,CF,FB,50,1E,0E,-1,7C
1140 DATA 14,1F,80,3E,03,01,00,74,07,C6,06,04,01,01,CD,1C,C7,-1,A8
1150 DATA 15,06,05,01,00,00,1F,58,CD,61,CF,FB,50,1E,0E,1F,80,-1,E0
1160 DATA 16,3E,03,01,00,74,07,C6,06,04,01,01,CD,1C,C7,06,05,-1,47
1170 DATA 17,01,00,00,1F,58,CD,62,CF,-1,02,-1

```

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```
A>DEBUG <Enter>
-A100 <Enter>
xxxx:0100 MOV AH,07 <Enter>
xxxx:0102 INT 21 <Enter>
xxxx:0104 AND AL,7F <Enter>
xxxx:0106 MOV DL,AL <Enter>
xxxx:0108 MOV AH,06 <Enter>
xxxx:010A INT 21 <Enter>
xxxx:010C CMP AL,1A <Enter>
xxxx:010E JNZ 100 <Enter>
xxxx:0110 INT 20 <Enter>
xxxx:0112 <Enter>
-RCX <Enter>
CX 0000
:12 <Enter>
-NSTRIPHI.COM <Enter>
-W <Enter>
Writing 0012 bytes
-Q <Enter>
A>
```

STRIPHI

turn off the video enable bit of the CRT controller chip, a technique that works with either type of display. Pressing the <Shift>, <Alt>, or <Ctrl> key will restore the screen without sending a character to the computer.

The data lines in BLANK2.DAT can be MERGED with XMAKER .BAS to create this new and improved version of BLANK.COM. Beware that BLANK.COM should be run only once each time the PC has been turned on or rebooted. If you attempt to run the program a second time, the system will lock up and require that you turn the PC off and then on again. Also, this version of BLANK.COM does not work with Compiled BASIC programs.

Strip Ease

Some word processing programs (notably WordStar) create text files with the high-order bit of some characters set, thus adding 128 to the character's value. Such modified characters are not part of the standard character set and cause problems for some peripherals and programs.

The CP/M operating system provides a method to "strip" the high bit (set it to zero), but DOS provides no such utility. DOS does allow redirection of standard input and output and thus makes it possible to create a "filter" to strip high-order bits.

A filter is a program that reads from an input file, performs some operation on the data, and writes the result to an output file. IBM includes two filters on the DOS disk, SORT and MORE, and it is easy to create your own. All you have to do is write

a program that reads input data from the keyboard and writes output data to the display. The redirection feature of DOS will take care of all the complex disk accessing functions.

The steps shown in STRIPHI allow you to use DEBUG to create a DOS filter that strips the high-order bits from input data. The program uses DOS function calls to read and write characters and stops processing when it reads a Control-Z (the end-of-file mark). DOS function number 7 is used to read characters because it does not echo them to the screen, and function 6 is used to output characters without tab expansion or other interpretation. Note that a simple filter to expand tabs can be made by reading characters with function 7 and writing them with function 2.

To use STRIPHI, enter a command such as A>STRIPHI>IN>OUT, where IN and OUT are the names of the input and output files, respectively. If you omit either file name (and its redirection prefix), STRIPHI will default to the keyboard or the screen.

*Robert Showalter
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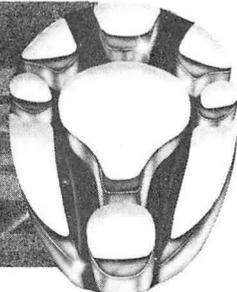
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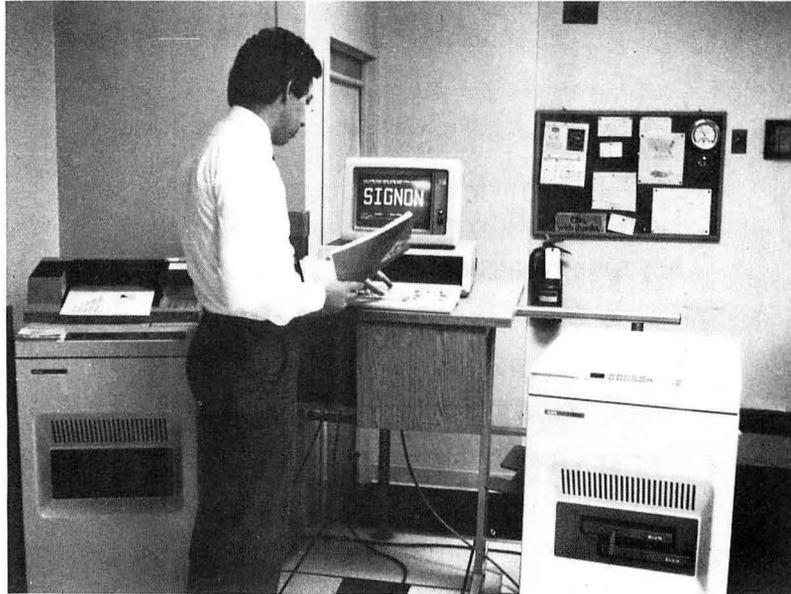
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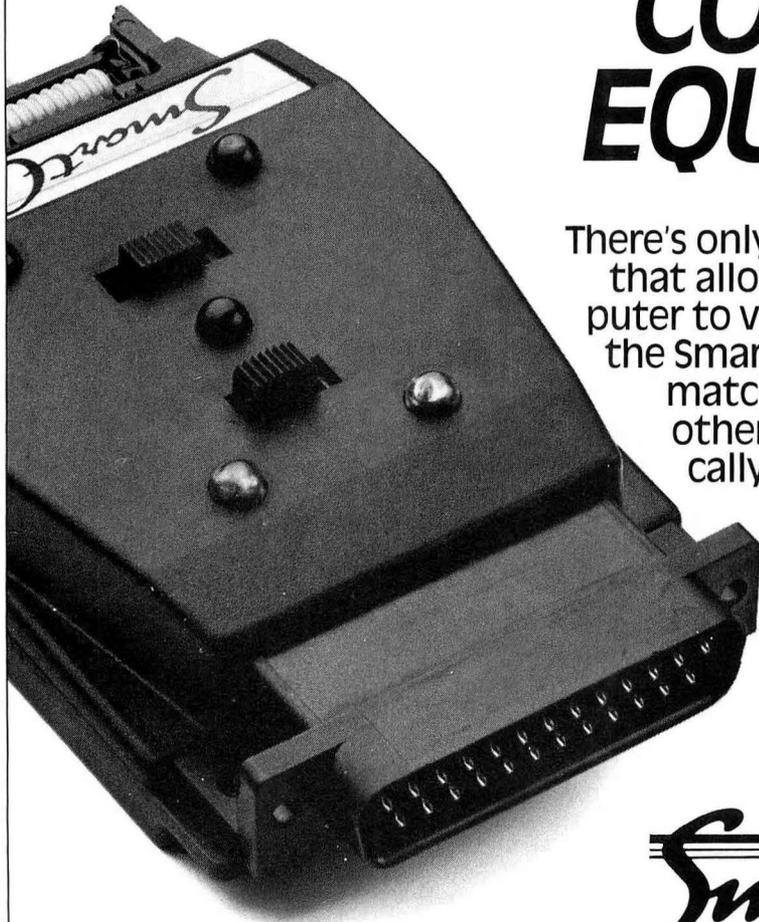
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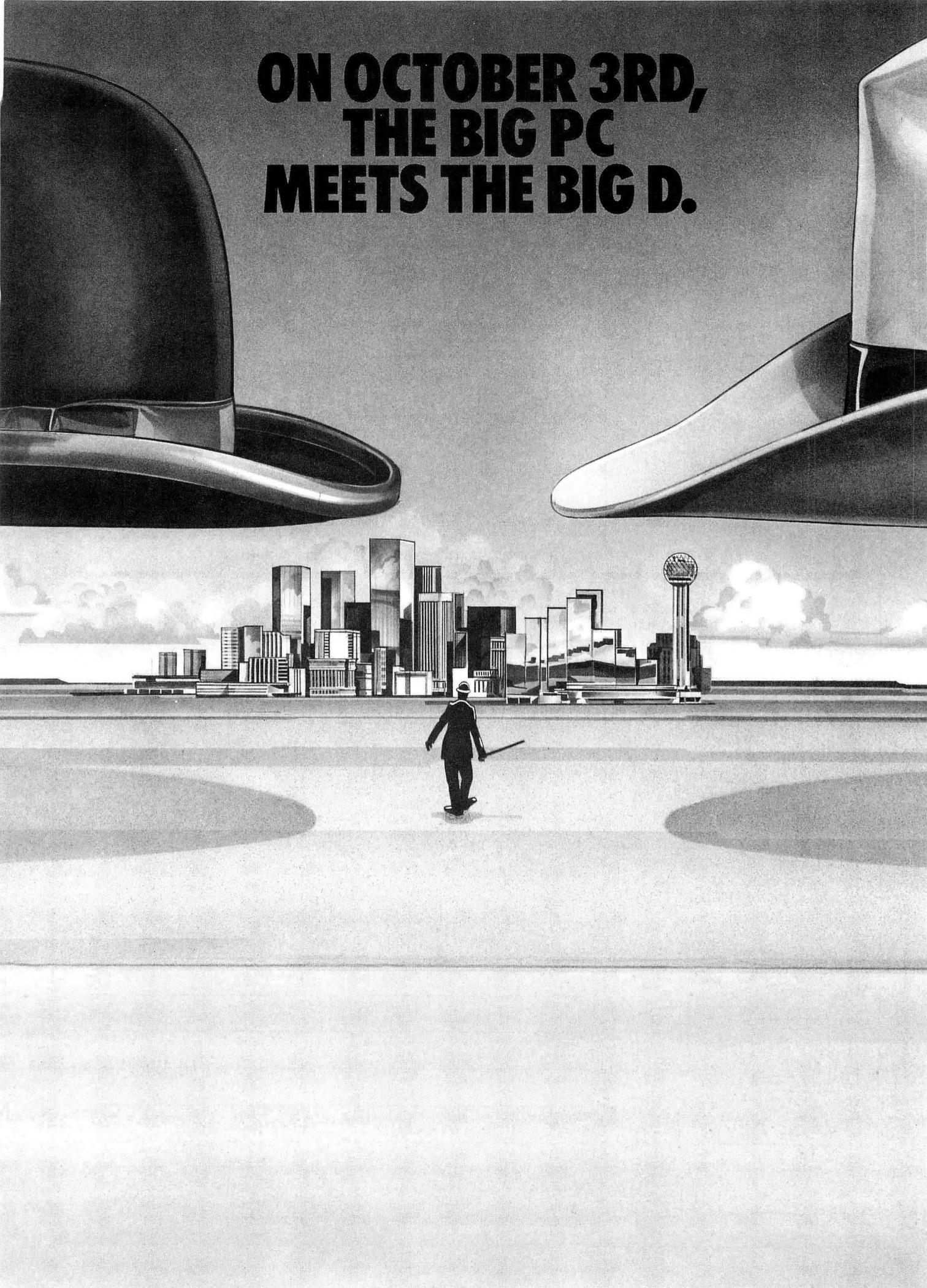
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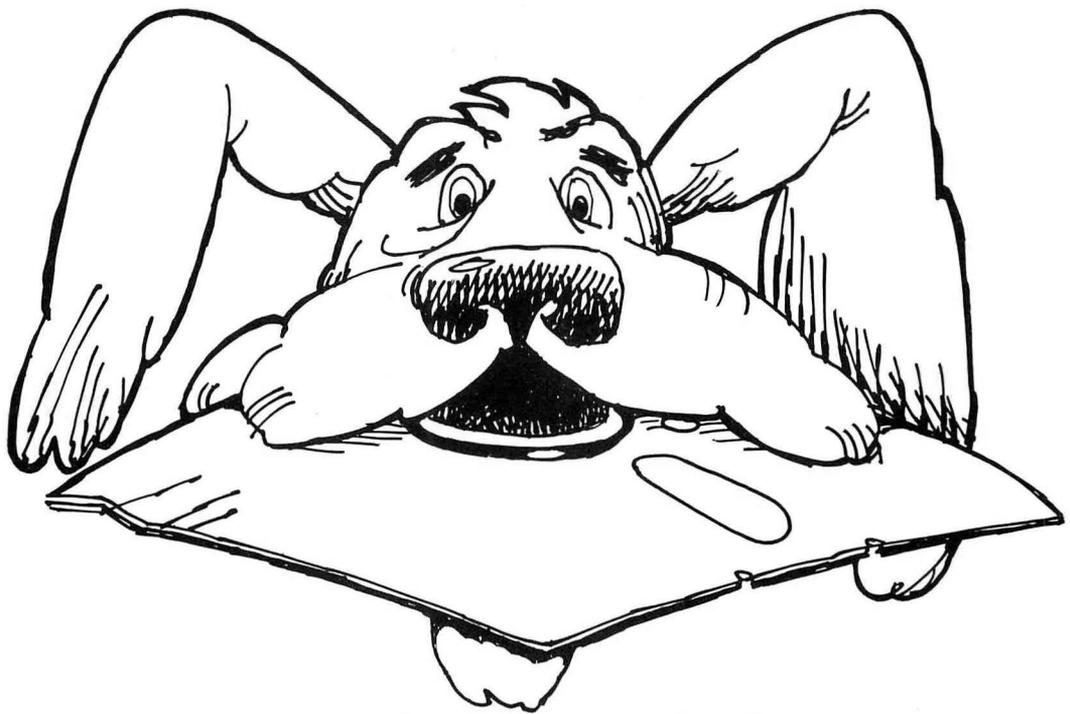
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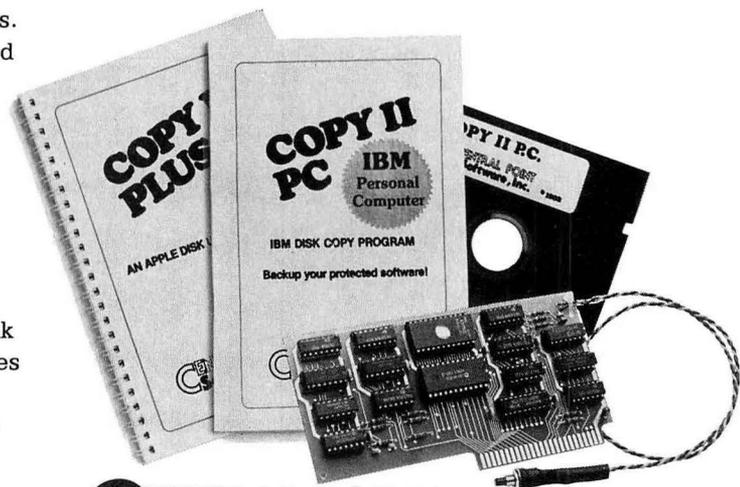
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Which program plays the best game of chess on the IBM PC? Who plays a better game of chess, people or computers? To find out, international chess master Julio Kaplan and three highly ranked junior players came to the offices of PC World and battled three chess programs that run on the PC: Bluebush Chess, Sargon III, and SPOC.

“If one could devise a successful chess machine, one would seem to have penetrated the core of human intellectual endeavor.”—Newell, Shaw, and Simon, IBM Journal of Research and Development, 1958.

The idea for a computer chess tournament surfaced at the first IBM PC Faire in San Francisco when Rob Glazer of Microsoft and I were standing in front of the *Bluebush Chess* booth. Glazer, who had studied artificial intelligence at Yale, reflected that it wouldn't be long before a program could take on and defeat the best players in the world. He told me about a recent tournament involving chess programs running on lightning-fast mainframes from Cray Research and Bell Laboratories. For the first time in the history of computer chess, the programs were approaching master-level play.

Joan Irvine of *Bluebush Chess*, who had been silently tracking the discussion, wondered how we could establish which chess-playing program is champion in our own 16-bit league. We tossed a few ideas back and forth and on the spot decided to organize a championship tournament of the chess programs written for the 8088 chip.

The Stage Is Set

After a bit of shuttle diplomacy between Bluebush and Cypress Software, the maker of *SPOC*, the preliminary terms of the confrontation were agreed upon. To make the play more interesting, it was decided that *PC World* would try to find a highly ranked player to compete against the programs after they had battled each other.

Over the next several months Glazer and I evaluated all the programs written for the IBM PC and established the field for the championship. We selected *Bluebush Chess*, *SPOC*, and *Sargon III*. The latter was well known on the Apple, but Hayden Software had only recently introduced an advanced version for the PC. Parker Brothers was scheduled to release a chess game that was reputedly of high caliber, but their beta-test version did not meet our stipulation that only off-the-shelf, commercially available programs could compete in the tournament.

Meanwhile, our search for a human player succeeded beyond our dreams when international master Julio Kaplan agreed to battle the computers. Kaplan is not only a top-ranked tournament player but also an accomplished programmer with an advanced degree in computer science. Recently Kaplan abandoned the chess circuit to program dedicated chess computers for Heuristic Software.

We knew that the three participating programs would defeat novice and low-intermediate chess players without much difficulty. To make an equitable match, we also invited three junior tournament contenders to play the programs. The three juniors ranged in established rated play from an intermediate level of around 1200 to a high expert rating of over 1900. The greatest players in the world play at a rating of over 2000, while novices play at a level under 1000.



International master
Julio Kaplan prepares to
challenge (left to right)
SPOC, Bluebush Chess,
and Sargon III.

● Community

How Chess Programs Think

Chess programs on the IBM PC show the player a screen that displays the familiar chessboard. Depending on the package, you move the pieces either with the cursor keys or by typing in the grid coordinates. Several chess programs offer a Teach mode, in which games can be replayed instantly or alternate moves can be suggested by the computer. Other features provided by some packages include the ability to save a game to disk for later play and the option of taking back a move (see “Chess Game Features”).

Each program follows the standard rules for playing the game of chess and never makes an illegal move. However, each has its own algorithm—the internal structure that guides it. All the programs incorporate general chess principles within their algorithms to systematically consider alternate paths and determine the best possible move. They do not, at this stage of development, think with the same focus as the human mind, but some subtle chess ideas can be built in. Since they rely on a systematic search for alternatives, the more time they have, the better they play.

Playing at their midlevel settings, about 40 moves per hour, any of the three selected programs should be able to beat an average chess player consistently. When



SPOC and Sargon III, in mortal combat to settle the championship of the 8088 chip

the time per move is increased and the programs are making only 20 moves per hour, they can defeat about 95 percent of the players who oppose them (a rated level of 1600 to 1800).

First we wanted to determine the most competitive program by letting the programs play against one another. The competition was to be a full round-robin; each program would play both white and black against all contenders. Two points would be awarded for a win and one point for a draw.

The machines were standard IBM PCs. At first we thought it would be necessary to provide machines that had identical amounts of usable RAM (random access memory) to assure an absolute parity among competitors. However, we learned from the developers that none of the programs could take advantage of RAM over their minimum requirements (64K for *Bluebush Chess* and *Sargon III* and 128K for *SPOC*). The determining factors are the speed of the processor, the algorithm, and the amount of time the computer is given to compute each move, not the amount of available RAM.

In the round-robin the programs would play at a midlevel time allowance, using 1 hour to complete 40 moves. This timing level qualifies for rated play under U.S. Chess Federation guidelines but does not meet the usual international standards. If we had chosen 20 moves per hour, the games would have lasted approximately 8 hours apiece, with the possibility of an adjournment to the next day. Although the computers would not have felt the fatigue, the human players elected to avoid a drawn-out affair.

Computer Versus Computer

The tournament was held at the *PC World* offices in San Francisco on April 28, 1984. Rob Glazer flew in from Microsoft's Bellevue, Washington, headquarters to assist in adjudicating the match. Each contending program had at least two representatives to enter the moves and assure that the program was performing at its best.

Among these "seconds" were the programmers responsible for the original development of the software. At the outset each programmer seemed convinced that his program would defeat all challengers. At the same time each reminded us that a commercial chess program is much more than its algorithm, and that the best design combines a variety of specialized features with a high level of play. The program that won this tournament would be crowned the champion, but this did not make it the best overall program for any individual to use recreationally or to improve his or her game.

Six computers were set up, and play was divided into two rounds. Before an hour of play had elapsed in the first round, a trend had been established in which

(continues on page 285)

Chess Game Features

Listed here are features to look for in a microcomputer chess program.

1. Plays a good game of chess.
 - a. Has multiple levels of play.
 - b. Has one level that plays close to tournament times.
 - c. Tournament level plays at about the 1600 level or above.
 - d. Knows and obeys all chess rules.
 - e. Is able to recognize and take advantage of special moves (castling, *en passant* captures).
 - f. Does not require more than 5 minutes per move.

2. Is rich in features.

Minimum list:

- a. Saves game.
- b. Restores game.
- c. Echoes moves to a printer.
- d. Supplies option of graphics board display or monochrome game without graphics.
- e. Has multiple levels of play.

Other features:

- a. Prints complete move list.
- b. Allows player to take back a move.
- c. Allows player to take back multiple moves.
- d. Displays the move list on the screen.
- e. Scrolls forward and backward through the various screens of the game.
- f. Prints out the chessboard as it appears on the screen.
- g. Allows the board to be reset at any time during a game.
- h. Allows changing levels at any time during a game.
- i. Has timing clocks.
- j. Allows piece movement by cursor.
- k. Allows piece movement by mouse or light pen.
- l. Allows player to trade sides during a game.
- m. Suggests moves.
- n. Displays the search in progress.
- o. Has on-line help screens.
- p. Displays captured pieces.
- q. Evaluates game status.

Kaplan's Play-by-Play

International master Julio Kaplan played all three chess programs simultaneously. As he moved from board to board, he commented on his match with *Sargon III*. (See Figure 1 for a move list of Kaplan's game with *Sargon III*, in descriptive chess notation.) After the tenth move the board looked like Figure 2.

Move	White	Black
1	P-K4	P-QB4
2	Kn-KB3	Kn-QB3
3	P-Q4	PxP
4	KnxP	P-K3
5	B-K2	Kn-KB3
6	B-Kn5	Q-R4
7	B-Q2	Q-Kn3
8	Kn-Kn3	KnxP
9	B-K3	Q-B2
10	00	P-Q4
11	P-KB3	Kn-B3
12	B-QKn2	B-Q3
13	BxKn+	PxB
14	P-KB4	P-QB4
15	Kn-B3	R-QKn1
16	Kn-R4	P-Q5
17	B-B2	B-Kn2
18	P-Kn4	Q-B6
19	Q-B3	QxQ
20	KnxQBP	Q-Kn7++

Figure 1: Move list of Sargon III (white) vs. Julio Kaplan (black)

Kaplan: Notice that I have won a pawn by falling a little behind in development. The next few moves will be critical to see if Sargon III tries to get some compensation for it. If it doesn't play very vigorously right now, it will be a pawn down with nothing to show for it.

After the 16th move the board looked like Figure 3.

Kaplan: I'm clearly a pawn ahead, and now I'm also developing an initiative, so with careful play I should win. In the last few moves the computer made a strategic mistake, which increased its problems very rapidly. This has given me a very strong mass of pawns in the center. Sargon's 16th move is an attempt to slow down my initiative and defend some of the things that I'm attacking. However, it leaves Sargon with a knight totally stranded on the edge of the board. That's something else a computer is prone to do. If the capture of the knight is not within its horizon, it will continue to consider the knight important. However, if you look at the position, as a human pattern recognizer you will see that the knight has no retreat, nowhere to go, and there is no easy way to defend it. Therefore, no more time should be spent on its defense.

For Kaplan's checkmate, see Figure 4.

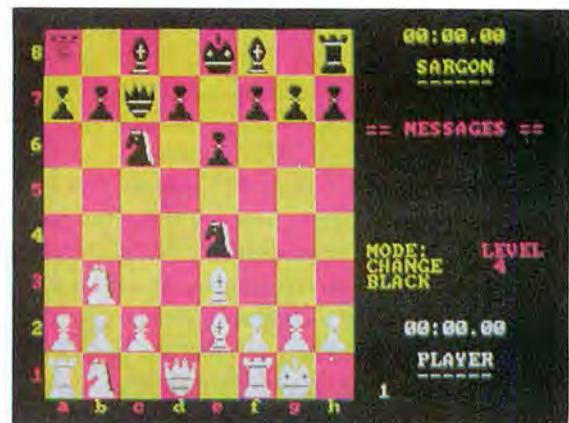
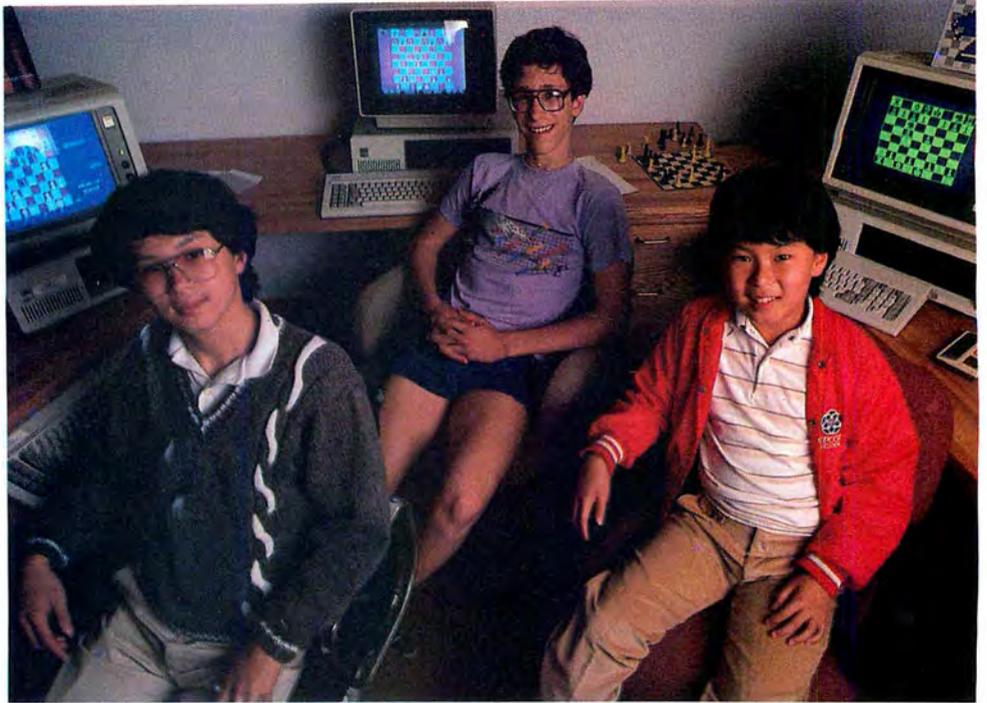


Figure 2: Sargon III versus Kaplan—move 10

Community

From right: Matthew Ng, Thomas Oscherwitz, and Michael Ng posing with their PC opponents



Michael Ng looks on as Julio Kaplan takes on Sargon III.





Michael Ng prefers to ponder the board rather than the color monitor.

(continued from page 181)

one program dominated and the other two battled each other in a close, drawn-out match. *Sargon III* proved its superiority by making decisive moves and handily defeating both *Bluebush Chess* and *SPOC*. *Sargon III* didn't seem to mind whether it played white or black; it quickly took command of all the games.

In the match between *SPOC* and *Bluebush Chess*, *SPOC*, playing white, found the stroke that gave it a narrow margin of victory after 80 moves. When interviewed after the first game, the originator of *SPOC* acknowledged that his program had had a tough time against *Sargon III*, and even though *SPOC* had beat *Bluebush Chess*, he admitted that the two runner-ups had played at about an equal level.

In the second round of play, *Sargon III* once again rapidly finished off its opponent. This time *Bluebush Chess* played white and narrowly defeated *SPOC*. By winning all its games, *Sargon III* had a score of eight points, giving it a clear victory. Both *Bluebush Chess* and *SPOC* had garnered two points to share the runner-up position.

"Blitz" chess is played at 15 seconds a move, and a match played at world-class time standards averages 40 moves in 2 hours. Can we assume that victories at our arbitrary midrange playing level of 40 moves in 1 hour would hold up at other time limits? Kathy Donovan of Hayden Software reports that in repeated trial games at other set times, *Sargon III* consistently defeated both *Bluebush Chess* and *SPOC*.

One possible explanation for the superiority of *Sargon III* is that while its opponent is considering which move to make, *Sargon III* is also computing possibilities. This is somewhat analogous to the way a human would approach a game. *Sargon III* can think on the opponent's time, while *Bluebush Chess* or *SPOC* considers possibilities only after the opponent has made a move.

Man Versus Machine

Tension mounted when Julio Kaplan, ranked among the top 100 players in the world, stood up to face all three programs at once. Kaplan is experienced in simultaneous play, having opposed as many as 50 humans at the same time. In one competition he opposed five players simultaneously while blindfolded. In such exhibitions the master is usually given a slight edge by playing white against all opponents. For the *PC World* Championship, Kaplan played white against the two runner-up programs and black against the champion, *Sargon III*.

Kaplan confided that he had lost the first game he had ever played against a computer, a blitz game with a powerful program written for a mainframe. In that game he made an unfortunate blunder, but he has been more careful ever since and has never again lost to a computer.

● Community

This time the room was set up with three adjacent tables, each equipped with an IBM PC and a chessboard. The games began. Kaplan walked around the room quickly, making a move on each board, while one of the seconds entered the move into the computer and waited for it to respond. The seconds would then show the computer's move on the chessboard. In the earlier days of computers, when human-against-machine play was a novelty, games were lost by some players who experienced intense pressure as crowds gathered around to watch a match against a computer that experienced no emotions. However, Kaplan appeared unruffled, as oblivious to the onlookers as were his digital opponents.

Because the computer programs had no ears to overhear us, we had a chance to talk with Kaplan about how one goes about defeating a computer. He said that if you are going to engage in any kind of tactical exchange (an exchange of pieces) with the computer, you had better be on solid ground and know exactly what you are doing. Games with a strategic bent tend to reveal a computer's Achilles' heel. People can plan further ahead than a computer and can create a long-range strategy. Kaplan advised, "Just make sure you don't give anything away while you gradually carry out your plan. Don't get involved in any tactical exchanges, but don't play too timidly."

He also suggested that a player never assume that the machine is making a tactical error or a foolish blunder. "Double-check anything that looks like a mistake by the computer. Ninety percent of the time you are going to be wrong and it's going to be right."

Kaplan established the initiative in each of the three games in only a few moves. Against *Sargon III*, Kaplan quickly established a pawn advantage and on the twentieth move achieved checkmate. The other two programs played without obvious error, but on both boards Kaplan claimed victory in fewer than 30 moves. (See "Kaplan's Play-by-Play" for the master's commentary on his victory over *Sargon III*.)

The Juniors Take the Field

After Kaplan had demonstrated his superiority, the chessmen were once again set up on the board, the computers were rebooted, and three fresh players sat down to face the machines. Matthew Ng, the top-ranked player of San Francisco University High School's championship chess team (which finished third in national competition this year), played *Sargon III*. Thomas Oscherwitz, also of the University High team, played *SPOC*.

(continues on page 288)

The Champ Speaks

After his victory over *Sargon III*, we spoke with chess master and programmer Julio Kaplan.

PCW: How old were you when you got involved with chess?

Kaplan: I learned the moves when I was six years old. I was born and raised in Argentina. It's a much more popular game there than it is here, so kids learn early.

PCW: Is there any relationship between one's abilities in computer science and chess?

Kaplan: There's always talk about a relationship between the chess mind and the mathematical mind. I don't think it exists. I have known brilliant mathematicians who just can't play the game at all. There is supposed to be a strong relationship between the programming mind and the mathematical mind, but I'm not sure that that exists either. I'm not a psychologist, but I think there is a strong relationship between programming and chess aptitude. In programming you break down the problem into manageable components, apply knowledge to each component, and then put the whole thing together. Thinking ahead in chess is the same kind of thing as thinking ahead when writing a program. It's a matter of keeping a lot of information organized and manageable.

PCW: When did computers first enter the chess scene?

Kaplan: The seminal paper on computer chess was written in the 1950s. The artificial intelligence community was interested in chess for a long time. They lost interest to some extent when the hardware improved and all advances centered upon hardware. People began to write really fast but dumb programs.

PCW: What are the best chess programs around?

Kaplan: The highest-rated right now is a dedicated chess computer built at Bell Labs. It's approaching master rating and is probably more than a match for most masters. It can avoid all the most obvious blunders. Give one of these machines only 2 seconds a move, and if it makes a mistake it will be a subtle mistake. The program sees all the possible moves to a certain depth.

Programmers are trying to apply some general chess knowledge as criteria for the computer to consult for decisions. For example, one rule applies to where pieces are centralized. A position where you have more pieces is better than one where you have less. Programming chess games is a heuristic, not a deterministic, process. With an accounting program you know exactly what it's going to do, but with a chess program you give it some general rules and say, okay, do the best you can.

PCW: How many moves can a computer look ahead?

Kaplan: In the opening moves the most powerful chess computers around can look about 4 moves ahead and see all possible ramifications. As the number of pieces diminishes and the number of ramifications is smaller, they can look maybe 15 moves ahead. Most strong programs use what's called a "full width search," which means they look at every possible ramification, but only 1 move ahead. There are some programs around that do a "selective search," which is essentially what people do. You look at some consequences and ignore the others. Using a selective search, you can make the computer play faster by focusing on fewer things.

Also, there are simple positions that are susceptible to a complete computer solution by simply enumerating all the possibilities. For example, computer programs are getting much more proficient in

the endgame, and the endgame is the weakest phase for most human players. So just getting to the endgame is no guarantee that you're going to beat the program. Bell analyzes end games by looking at every possible position and then working its way backwards.

PCW: Do chess masters use computers for analysis?

Kaplan: No. Computers are not at the stage yet where they can do exacting analysis, but pretty soon we're going to see players using a very large chess data base, especially in the analysis of endgames. In the typical tournament you play for 5 hours, then adjourn for a couple of hours or until the next day. In fact, you're allowed to consult other players, although that's kind of a gray area. A computer could help if it had an appropriate data base.

PCW: What else needs to be done to make a champion computer chess game?

Kaplan: There is a lot of work to be done in software. This view is not shared by all the people working in the field. Some say most of what can be done to the software is already done and we need better hardware. Until then only small increments of change are possible. But I don't think we have really intelligent programs. It's not that the programmers are dumb; I don't mean that at all, especially since I'm one of them. What I mean is we've concentrated so far on making the most of the hardware, and nobody yet knows how to write a program that understands chess concepts, which is the interesting artificial intelligence research area of chess.

● Community

(continued from page 286)

Finally, Matthew's younger brother Michael sat down to oppose *Bluebush Chess*. Although not yet in high school, Michael has been playing chess for over seven years. All the juniors were given the slight advantage of playing white against their computer opponents.

Matthew Ng quickly established a superior position and took only a few moves more than Kaplan to claim victory against *Sargon III*. Thomas Oscherwitz struggled harder against *SPOC*, but the result was the same.

Michael Ng defeated *Bluebush Chess* with little apparent difficulty. One of the spectators confided that he had had mixed emotions as he watched the games unfold. Although he had wanted to see the boys do well, he had begun to root for the computer programs, not wanting to see a clean sweep for the humans.

There is a general misconception that computers perform all of their functions almost instantaneously. In the case of this chess confrontation, the chess programs undoubtedly would have performed better if they had had more time to evaluate alternatives and use all the capabilities built into their algorithms.

A Perspective on the Future

After all the games were over, Julio Kaplan reminded us that the 8088 is a relatively slow microprocessor and asserted that advances in the level of computer play will occur only when faster microprocessors are incorporated in personal computers. He also stressed the need for improvement in software, which should distill the thousands of years of human chess-playing experience more adequately.

When asked whether in his lifetime a computer program will ever be able to consistently defeat him, Kaplan looked away thoughtfully. Finally he replied, "A program that could regularly beat me is a possibility. When it happens I guess it will think a bit like me. After all, it might even be a program that I have written myself." ●

Contributing Editor Stuart R. Schwartz is a clinical professor of psychiatry at the University of California, San Francisco, School of Medicine and president of Senior Software, Inc.

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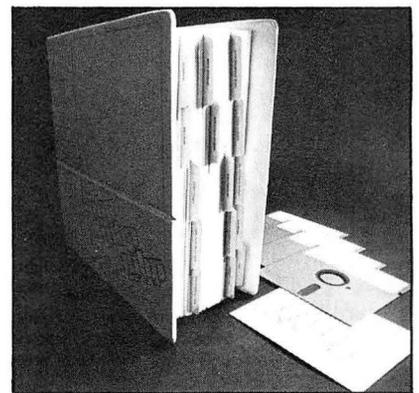
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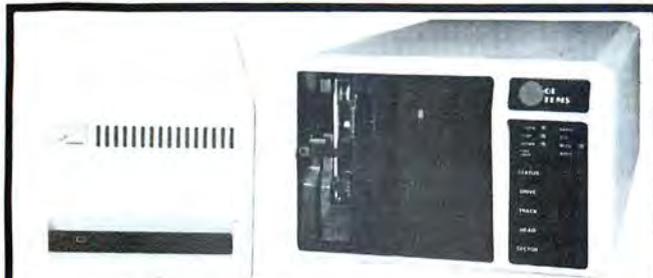
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Easy to use, powerful full-screen editor for beginning/advanced users. FAST. Edits 2 files concurrently (size is media bound). Cut/paste within & between files. Search (forward/backward), replace, hex conversion, directory, macros, & more. For IBM PCjr/PC/XT. Minimum 64K RAM, 1 disk. \$89. *Progress Management Group, 10791 Tierrasanta Blvd. #104, San Diego, CA 92124, 619/268-4210*

Pascal/Fortran/C Util.

Written in assembly language, Pascal/FORTRAN/C Utilities control screen, keyboard, graphics, music, lightpen, mouse, joystick, printer, RS-232, & I/O ports. Line/circle/ellipse/pie drawing, clipping, windowing & animation. Terminal emulator, random number, BIOS/DOS calls. 150 page manual, demos. Specify compiler. \$119. Chk/Visa/MC. *Software Labs, 1221 Matisse St., Sunnyvale, CA 94087, 408/730-8108*

DOSshell

A complete menu & directory system for organizing a hard disk. Superior to other organizers because it is written with DOS files & batch files so that the user is always in DOS. DOSshell may be altered to match any user needs. Utilities included. Disk & manual, \$70. *Handcrafted Software, P.O. Box 902, Santa Barbara, CA 93102, 805/967-7837*

Screen I/O Utility

SCRIO creates complex displays, menus & input screens under PC-DOS 2.00 using Lattice C (Lifeboat Assoc.). Separates the screen I/O parameters from the compiled program. Recompile is not necessary to make changes. Immediate type checking, input limit checking & more. List, \$159.95. Includes shipping & COD. *Delta-Pro Management Consultants Inc., 350 Sagamore Pkwy. #6, P.O. Box 2638, W. Lafayette, IN 47906, 317/463-1936*

Deluxe File Manager

At last! Display disk directories sorted ANY WAY you want. List hidden/system files. Perform file operations (type, delete, etc.) using SINGLE KEY commands after selecting file with cursor. Great timesaver! Many features put you in control of your files. Executable from BASIC. \$39.95. Free brochure. *World Class Software, Box 2146, Toledo, OH 43603, 419/698-8086*

RamDisk II

RamDisk II is a 180K RAMDISK & comes with a PRINT SPOOLER. Runs on IBM PC compatible systems, & WORKS EXACTLY LIKE ANOTHER DRIVE. Instantaneous loading of programs. NO hardware, NO commands, 100% software! Self-initializes at bootup. Searches ALL boards for memory. ONLY \$59.95 for the ramdisk & our print spooler. *Rensin Communications, P.O. Box 414, College Park, MD 20740, 301/728-7955*

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Developed in collaboration with small & large animal Veterinarians. A/R, billing, Report Generator, word processing, inventory, practice analysis, deposit slips, owner or animal labels. Transfer/restore patient to/from floppy disks. XT. \$3600. Training included. Dealer inquiries invited. *Data Strategies, Inc., 332 S. Juniper St. #210, Escondido, CA 92025, 619/489-9218*

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TEXT ENGINEER and LINGUIST are word processors with special symbols & character fonts. You can design characters, even whole alphabets. Italics, European characters, super/subscripts, math, chemistry & more. Text is displayed EXACTLY as printed. Instant, simple editing operations. \$150 to \$400. *Pelada Informatica Inc., 562 Johnson St., Kingston, Ontario K7L 2A1 Canada, 613/549-1747, Source STP892*

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cheapware™

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PC World Directory is a comprehensive listing, by category, of products and services for the IBM PC, look-alikes, and compatibles. It provides rapid access to the burgeoning PC marketplace for both readers and advertisers.

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Taxan RGB Vision III **435.00**
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PGS HX12 **479.00**

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(Internal 10MB) **1,049.00**

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Just Announced

The wide world of PC products

Edited by J. Schaffner

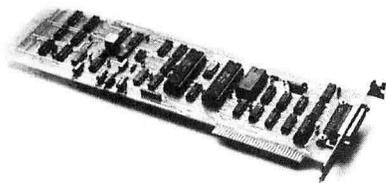
In the dynamic personal computer marketplace *Just Announced* keeps you apprised of the latest developments in IBM PC and compatible technology. Information for this department is provided by manufacturers; these write-ups are not reviews. *Just Announced* does not evaluate products or corroborate manufacturers' claims. Many of these descriptions will be followed up by reviews in future issues.

Hardware

Boards

IRMAcom

You can connect a PC or compatible to networks that use synchronous protocols over leased or switched lines with the IRMAcom expansion board. The board has a serial port that connects to the transmission line through an external modem or a modem eliminator. IRMAcom operates at speeds of up to 19.2 kilobits per second, has two independent communications channels, and performs direct memory access (DMA) data transfers.



IRMAcom, Digital Communications Associates

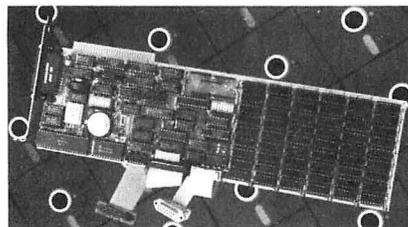
IRMAcom is available with one of five communications software packages. *IRMAcom/3270* and *IRMAcom/3270B* work with the board to emulate, respectively, SNA/SDLC and BSC 3270 controllers. With the *IRMAcom/RJE* program you can communicate in a binary-synchronous network by emulating a 2780/3780 Remote Job Entry work station. *IRMAcom/3770* and *IRMAcom/3770B* emulate 3770 Remote Job Entry stations in SNA/SDLC or BSC environments. List price: board and one package \$895, each additional package \$495. Requirements: 128K (96K for *IRMAcom/RJE*), one disk drive, synchronous modem or modem eliminator.

Digital Communications Associates, Inc.

303 Technology Park
Norcross, GA 30092
404/448-1400

RAM + 6

Five common expansion functions come on the RAM + 6 multifunction board. You can select up to 384K of RAM to accompany the serial port, parallel port, game port, and clock/calendar. RAM + 6 comes with Flash Disk and Flash Print software that let you designate a portion of memory to be used as a disk emulator or print buffer. List price: 64K \$395, 128K \$475, 192K \$545, 256K \$625, 320K \$695, 384K \$765.



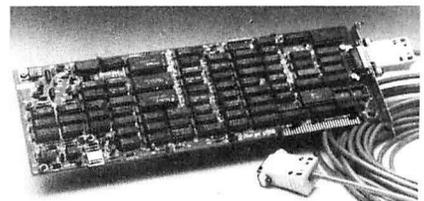
RAM + 6, Seattle Computer

Seattle Computer
1114 Industry Dr.
Seattle, WA 98188
800/426-8936, 206/575-1830

Network Devices

Quadnet

A family of local area networks for the PC, Quadnet operates from a file server and uses an operating system that works with any member of the



Quadnet VI, Quadram

family. Quadnet II uses twisted pair cables on a bus configuration to connect up to 32 PCs. The mid-range network, Quadnet VI, uses baseband coaxial cable to transfer data at up to 2 megabytes per second. The CSMA/CD protocol (carrier sense multiple access/collision detection) ensures correct data transfers. Quadnet IX allows up to 255 PCs to share data using a "token passing" protocol; data can be transmitted on the network at up to 10 megabytes per second. For the file server, each network has a master kit that includes a board, network software, and a key card to prevent unauthorized access. The user kit is a board for the PC. List price: Quadnet II master kit \$995, Quadnet II user kit \$395,

Just Announced

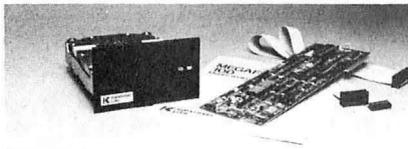
Quadnet VI master kit \$1995, Quadnet VI user kit \$595, Quadnet IX master kit \$2295, Quadnet IX user kit \$795.

Quadram Corporation
4355 International Blvd.
Norcross, GA 30093
404/923-6666

Storage Devices

Megaflight 100

You can store over 30,000 typed pages with the Megaflight 100 hard disk drive. The system includes a 10MB internal disk drive, a controller board, plugs, and cables. Megaflight



Megaflight 100, Kamerman Labs

100 runs on the computer's own power supply. List price: \$895. Requirements: DOS 2.00 or 2.10.

Kamerman Labs
7787 S.W. Cirrus Dr.
Beaverton, OR 97005
800/522-2237 except Alaska and Hawaii; 503/626-6877 Oregon

System Software

Languages

DeltaBASIC

Providing both file and record locking, DeltaBASIC is a business language for single- and multiple-user systems. The program features keyed data files, decimal arithmetic, and

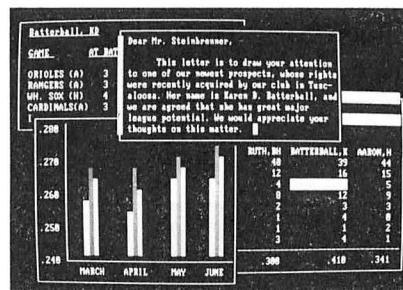
formatted data entry screens. A substring function permits access to any part of a string and insertion or deletion of characters within strings. Binary-tree data management speeds program execution. DeltaBASIC supports program chaining, long variable names, function and arrow keys, and screen features such as blinking and inverse video. Included utilities let you design data entry screens, sort data files by predefined keys, generate help messages for your programs, and convert ASCII files to and from DeltaBASIC format. A runtime module and source code in 8088/8086 assembly language are available. List price: \$350. Requirements: 128K, one disk drive.

DeltaSoft, Inc.
7524 S. Broadway #119
P.O. Box 7082
Tyler, TX 75711
214/581-1425

Utilities

Core Executive

You can integrate your favorite programs with *Core Executive*. The utility can process up to eight applications concurrently. You can define



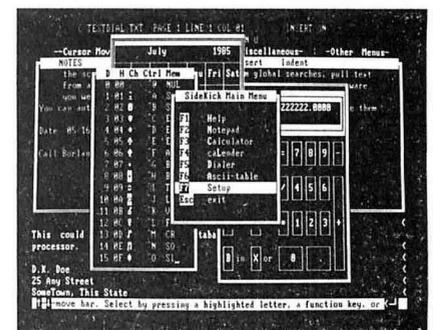
Core Executive, Application Executive

overlapping windows for applications, construct keyboard macros, and "cut and paste" data between programs. *Core Executive* works with 1-2-3, *WordStar*, *VisiCalc*, *SuperCalc*, *MultiMate*, *dBASE II*, and the *pfs* series. List price: \$195. Requirements: 48K.

Application Executive Corporation
600 Broadway #4C
New York, NY 10012
212/226-6347

Sidekick

While working with an application, you can call up *Sidekick* with one keystroke and use its notepad, calculator, appointment calendar, or au-



Sidekick, Borland International

tomatic dialer. The program is an integrated set of utilities, each in its own window, that can share data and can be used along with software such as 1-2-3, *WordStar*, and *dBASE II*. The notepad function has a word processor that saves notes to disk and returns to the original application with one keystroke. *Sidekick* includes a calculator with business and scientific functions and an automatic dialer that can use numbers from the notepad or from the program itself. ASCII data conversion charts contain decimal and hexadecimal characters,

control character representations, and mnemonics. List price: \$49.95. Requirements: 20K, one disk drive. Borland International
4113 Scotts Valley Dr.
Scotts Valley, CA 95066
408/438-8400

dB/Compiler

With dB/Compiler, consultants and office managers can translate *dBASE II* programs into code that won't require *dBASE II* to operate. Offered as an alternative to *RunTime*, the compiler can also speed execution (depending on the size of the files) and protect source code. When used with optional cross-compilers, programs can be used in different operating environments. dB/Compiler is available in MS-DOS, CP/M-80, CP/M-86, and UNIX versions. List price: \$750, cross-compilers \$350 each. Requirements: 54K, one disk drive. Wordtech Systems, Inc.
Box 1747
Orinda, CA 94563
415/254-0900

Applications Software

Accounting and Inventory

focus:ABC

Accountants, bookkeepers, and controllers can use *focus:ABC* when auditing accounts. Used with 1-2-3, the program creates its own menus and work papers within the 1-2-3 spreadsheet. You can record reclassifications

and tax adjustments, summarize and consolidate trial balances, and perform analytical reviews. With *focus:ABC* you can graph a five-year comparative ratio analysis. Data may be translated to and from other programs such as *MultiMate* and *dBASE II*. List price: \$950. Requirements: 256K, two disk drives, 1-2-3 (version 1A). Hemming Morse, Inc.
1700 S. El Camino Real #320
San Mateo, CA 94402
415/574-1900

Business Management

Netcon

Professional planners and schedulers can define, schedule, update, and report on projects with *Netcon*. Using the "critical path" method, you calculate early and late finish dates by providing the project start date and each activity's duration. *Netcon* accommodates up to 1000 activities per project, a calendar as long as 10 years, and workweeks from one to seven days. The program's logic checks for loops, multiple starts, invalid dates, and other errors. You may update the schedule with actual dates and remaining durations at any time; the project schedule is automatically recalculated using the current information. Other features include bar charts, working reports, cash flow summaries, and "what if" calculations. *Netcon* is available in two forms: *Netcon I*, which uses an arrow diagram method, and *Netcon II*, which uses a precedence diagram method. List price: \$595. Requirements: 128K, two disk drives, DOS 2.00.

Project Planning Management & Control Systems (PPMCS)
1309 E. 132nd St.
Burnsville, MN 55337
612/894-2415

Communications

Data Interface System 31 (DI031)

A PC or compatible can communicate with mainframes by telephone with the *Data Interface System 31*. Performing like 3270 software, the program uses a proprietary asynchronous protocol to link the microcomputer with mainframes from IBM, DEC, CDC, Univac, and Burroughs and with virtually any system that supports an asynchronous foreground driver and COBOL. With full-screen interaction you can request formatted reports in real time and capture them with a printer or on disk. You can "browse" through reports on disk with function-key commands. *DI031* uses data compression and reduction algorithms to minimize the volume of data transmitted. The mainframe package uses familiar COBOL facilities, including file handling, and includes application development tools. Applications may be transported between host systems. List price: mainframe software \$9750, for each PC \$475. Requirements: 128K, one disk drive, asynchronous modem. Data Interface Systems Corporation
827 Harris Ave.
Austin, TX 78705
512/346-5641

Just Announced

Construction and Engineering

TK!SolverPack for Building Design and Construction

Architects, building designers, and construction engineers can solve common problems when planning residential construction with *TK!SolverPack for Building Design and Construction*. Designed for use with *TK!Solver*, the program contains 15 models, with accompanying values and tables, for estimating costs, solar heating requirements, and stresses. *TK!SolverPack* includes models for solid column design, cantilever and overhanging beams, heat loss, floor framing, concrete foundation and roofing estimation, rafter and stair design, and mortgage or loan analysis. List price: \$100. Requirements: 128K, one disk drive, *TK!Solver*.

Software Arts Products Corp.
27 Mica Ln.
Wellesley, MA 02181
617/237-4000

Data Management

Please

Promoted as speedy and easy to use, *Please* is a menu-driven data base manager that offers optional templates with preset data structures for common data applications. The program uses simple English-like commands, and on-line help is always available. *Please* lets you manipulate 999 characters per field, 99 fields per record, 2000 characters per record, and several million records per data

base, depending on the system's capacity. Optional templates can be used for tracking appointments, contacts, mailing lists, memberships, home finances and documents, and applicants interviewing with your company. Data may be exchanged with other programs. List price: \$349, per template \$29.95. Requirements: 128K, two disk drives. Hayes Microcomputer Products, Inc. 5923 Peachtree Industrial Blvd. Norcross, GA 30092 404/449-8791

Educational

SEI History/Government Series

Students and curious nonstudents can review basic history with the *SEI History/Government Series*. The series includes ten disks that cover American history, European history, Asian/African history, ancient civilizations, United States government, foreign governments, and the United Nations. Each disk has a data base of approximately 300 multiple-choice questions with hints and in-depth analyses. You can expand or modify the data base with the *SEI Editor* that comes with each disk. The series covers the equivalent of a curriculum for high school or first-year college students. List price: per disk \$30, complete set of 10 disks \$255. Requirements: 64K, one disk drive.

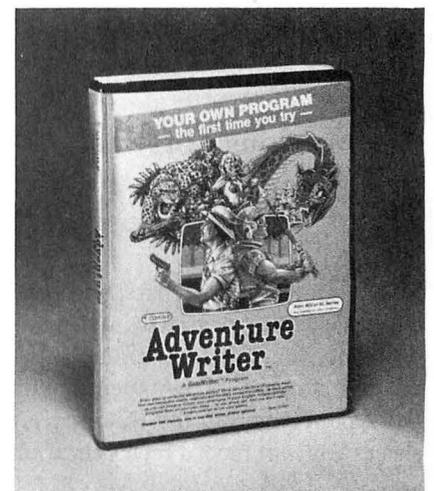
Sliwa Enterprises, Inc. (SEI)
2360 George Washington Hwy.,
Ste. J
Yorktown, VA 23692
804/898-8386

Entertainment

Adventure Writer

You can write your own fiction games with *Adventure Writer*. Using menus and submenus, you can invent up to 255 objects and situate them in up to 255 rooms or locations. Each room may have up to a full screen of text. Sound effects include shots and bells, and you can program your own sounds. Special effects include highlighting and changing color. List price: \$79. Requirements: 64K, one disk drive.

CodeWriter Corporation
7847 N. Caldwell Ave.
Niles, IL 60648
800/621-4109, 312/470-0700



Adventure Writer, CodeWriter

The Oracle

The *I Ching* may be consulted by computer with *The Oracle*. The traditional yarrow sticks or coins are approximated by the computer's random number generator. The generator is seeded: in the "contemplative" mode the generator is timed, and in the business mode you type in a topic or question, and the generator is seeded by the ASCII text. The lines pop up as the program "throws" the *I Ching*. The text that corresponds to each configuration is a new translation. List price: \$69.95. Requirements: 64K, one disk drive.

Kerson Huang
P.O. Box 1083
Marblehead, MA 01945
617/631-5985

Graphics

Overhead Express

You can make near-typeset-quality overhead transparencies and foils with a PC, a dot matrix printer, and the *Overhead Express*. The program includes 12 templates for a title page, a list separated by bullets, a comparison chart, a table, and a budget. You can modify the templates to suit your needs or you can start from scratch. ASCII files from word processors can be imported and manipulated with the program's editor. Symbols such as stars, arrows, and check marks are included. To preview the layout while editing, you use a single function key. *Overhead Express* offers four typefaces in five sizes with proportional spacing. The program supports several printers, including those from Epson, C. Itoh, and NEC. List price: \$195. Requirements: 192K, two disk drives.

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143 Binney St.

Cambridge, MA 02142

800/342-5277, 617/491-3377

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A package of integrated products for the PC, *SeriesOnePlus* includes programs for word processing, spreadsheets, data management, financial modeling, and report writing. Execu/BUS is the kernel of the *SeriesOnePlus* system, providing the same interfaces for all the programs. Execu/WRITER is a word processor that can include any portion of a data base or spreadsheet in the text. The spreadsheet program, Execu/MODEL, can recalculate with one keystroke or automatically recalculate whenever a number or an expression is changed. Data base management functions, such as entering, updating, searching, or displaying records, come in the Execu/FILE module. Reports can be structured and reused with the Execu/REPORTER program. Execu/PLOT provides business graphics, including pie and bar charts and line graphs. List price: \$1000. Requirements: 192K, two disk drives.

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Cincinnati, OH 45211

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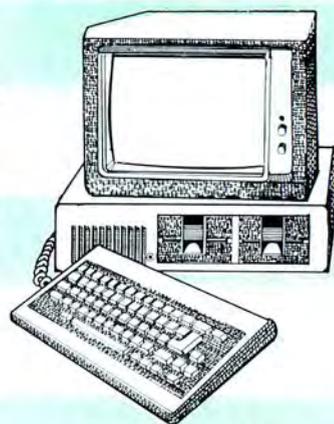
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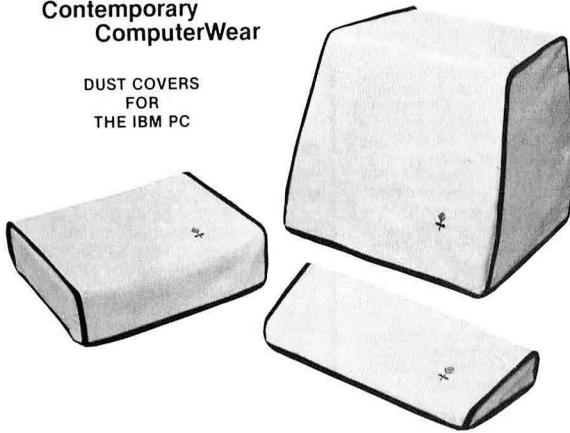
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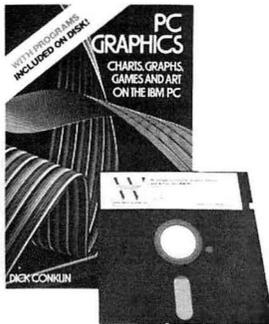
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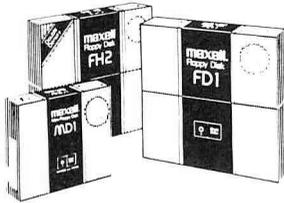
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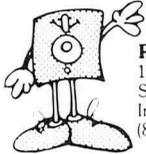
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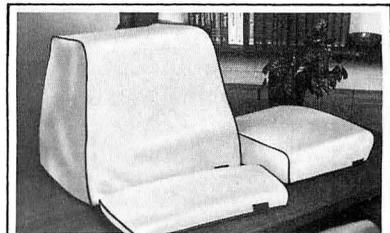


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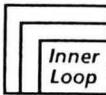
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Reader
Service
Number

Computers

- AT & T Information
Systems, 123-25
Hewlett-Packard, 81
798 IBM, 8-9
807 Intertec Data Systems Corp., 257

Hardware

Boards

- 18 AST Research, Inc., IFC, 1
782 Comway Electronics Corp., 69
699 Everex, 155
73 Heath Company, 162-63
77 Hercules Computer Technology,
28, 33
Paradise Systems, Inc., 208-09
468 Profit Systems, Inc., 47
605 Qubie' Distributing, 191, 207
254 STB Systems, Inc., IBC
190 Tecmar, Inc., 16-17
261 Univation, 292
193 Ven-Tel, Inc, 164

Storage Devices

- 315 Alloy Computer Products, 230
646 Control Data Corporation, 15
200 IDEAssociates, 36-37
537 Micro-Design, 276c
475 Micro Tech Exports, 322
802 Pacific Datanet, 177
605 Qubie Distributing, 255
Santa Clara Systems, Inc., 2^c4
169 Sigma Designs, Inc., 231
188 Tallgrass Technologies
Corporation, 31

Monitors

- 296 Princeton Graphic Systems, 109
75 Zenith Data Systems, 205

Printers, Plotters, and Typewriter Interfaces

- 808 Brother International Corp., 258
777 C. Itoh Digital Products, 256
15 Canon USA, Inc., 128, 213

Reader
Service
Number

- 685 DataSouth Computer
Corporation, 32
Hewlett-Packard, 183
627 Juki America, 68
319 Star Micronics, Inc., 139
Texas Instruments, 67

Communications

- 397 CXI, 22-23
221 Hayes Microcomputer Products,
Inc., 10-11
151 Qubie Distributing, 78-79
405 US Robotics, 87

Miscellaneous

- 791 Addmaster Corporation, 322
50 Cuesta Systems, Inc., 313
796 Curtis Manufacturing Company,
Inc., 240-41
Curtis Manufacturing Company,
Inc., 251
738 IQ Technologies, 276d

Systems Software

Utilities

- 491 Barr Systems, Inc., 276b
760 Borland International, 51
31 Central Point Software, Inc., 261, 276h
270 Computer Control Systems,
Inc., 334
11 Deeresoft, 185
199 Diversified Computer Systems, 320
203 Dymek, 186
74 Funk Software, 176
133 Orchid Technology, 80
142 Persoft, Inc., 127
575 Photon Software, 252
673 Quaid Software Limited, 313
162 RoseSoft, 52
163 RTCS Corporation, 290
174 Soft Right, 204

Languages

- 406 Computer Innovations, Inc., 249
92 Lifeboat Associates, 187
231 Mark Williams Company, 276a
100 MBP Software Systems
Technology, 289
790 Snow Crest Computer
Specialties, 226

Reader
Service
Number

Applications Software

General Business

- 772 Analex Computing, Inc., 206
303 Hauppauge Computer Works, 129
786 Michtron, 321
804 POLYTRON Corp., 154
281 SAMNA Corp., 242-43
Scitor Corporation, 88-89

Financial & Spreadsheets

- 747 Barron-Ross, 93
C.P. Aids, 111
532 Future's Group, 323
H & E Computronics, Inc., 35
657 Meca, 165
292 Microcomputer Tax Systems, 27
Microsoft Corporation, 2-3
321 Pacific Data Systems, Inc., 308
448 Via Computer, Inc., 21
704 Zylab, 253

Job and Industry Specific

- 111 Mitchell Management Systems,
Inc., 316
410 Softstyle, Inc., 330

Data Management

- 159 BMDP Statistical Software, 210
436 Cosmos, 126
776 Quest Research, Inc., 259
Walonick Associates, 290, 320

Word Processing/Text Editing

- 72 FriendlySoft, 49
93 Lifetree Software, Inc., 108
23 Mansfield Software Group, 271
533 Office Solutions, 53
281 SAMNA Corp., 242-43
165 Satellite Software International, 50

Communications

- Computational Systems, Inc., 336
624 Inner Loop Software, 323
682 Menlo Corp., 272-73

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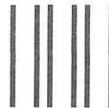
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26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125
126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150
151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200
201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225
226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250
251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275
276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300
301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320	321	322	323	324	325
326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350
351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375
376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400
401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425
426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450
451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475
476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500
501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518	519	520	521	522	523	524	525
526	527	528	529	530	531	532	533	534	535	536	537	538	539	540	541	542	543	544	545	546	547	548	549	550
551	552	553	554	555	556	557	558	559	560	561	562	563	564	565	566	567	568	569	570	571	572	573	574	575
576	577	578	579	580	581	582	583	584	585	586	587	588	589	590	591	592	593	594	595	596	597	598	599	600
601	602	603	604	605	606	607	608	609	610	611	612	613	614	615	616	617	618	619	620	621	622	623	624	625
626	627	628	629	630	631	632	633	634	635	636	637	638	639	640	641	642	643	644	645	646	647	648	649	650
651	652	653	654	655	656	657	658	659	660	661	662	663	664	665	666	667	668	669	670	671	672	673	674	675
676	677	678	679	680	681	682	683	684	685	686	687	688	689	690	691	692	693	694	695	696	697	698	699	700
701	702	703	704	705	706	707	708	709	710	711	712	713	714	715	716	717	718	719	720	721	722	723	724	725
726	727	728	729	730	731	732	733	734	735	736	737	738	739	740	741	742	743	744	745	746	747	748	749	750
751	752	753	754	755	756	757	758	759	760	761	762	763	764	765	766	767	768	769	770	771	772	773	774	775
776	777	778	779	780	781	782	783	784	785	786	787	788	789	790	791	792	793	794	795	796	797	798	799	800
801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821	822	823	824	825
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851	852	853	854	855	856	857	858	859	860	861	862	863	864	865	866	867	868	869	870	871	872	873	874	875
876	877	878	879	880	881	882	883	884	885	886	887	888	889	890	891	892	893	894	895	896	897	898	899	900
901	902	903	904	905	906	907	908	909	910	911	912	913	914	915	916	917	918	919	920	921	922	923	924	925
926	927	928	929	930	931	932	933	934	935	936	937	938	939	940	941	942	943	944	945	946	947	948	949	950
951	952	953	954	955	956	957	958	959	960	961	962	963	964	965	966	967	968	969	970	971	972	973	974	975
976	977	978	979	980	981	982	983	984	985	986	987	988	989	990	991	992	993	994	995	996	997	998	999	1000

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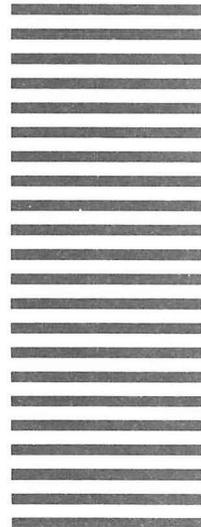
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Reader
Service
Number

- 275 Microstuf, 152
- 792 Softronics Software, Inc., 277
- 769 3Com Corporation, 142-43
- 801 Transend Corp., 190
- Western Union, 239

Graphics

- 596 Autodesk, Inc., 130-31
- 342 Decision Resources, 34
- 30 Digital Research, Inc., 54-55
- 62 Digital Research, Inc., 38-39
- 680 Hypergraphics, Inc., 151
- 332 MICROGRAFX, 24
- Microsoft Corporation, 2-3
- 241 Polaroid, 90-91

Integrated Systems

- 6 Alpha Software Corp., 12
- BelleSoft, BC
- 788 Innovative Software, 70-71
- 81 Martin Marietta/ITSoftware, 153
- 281 SAMNA Corp., 242-43
- Software Group, 80a & b
- Texas Instruments, 67
- 244 Unisource, 229
- 196 Warner Software, Inc., 96-97

Educational, Personal, Entertainment & Misc. Software

Educational

- 7 American Training International, 5
- 20 Creative Software, 82
- 657 Meca, 165
- 52 SoftHelp, Inc., 334

Personal

- 657 Meca, 165
- 25 Prentice-Hall/Lumen Systems,
Inc., 189

Entertainment

- 589 Spectrum Holobyte, Inc., 14
- 308 subLOGIC Corporation, 95

Reader
Service
Number

-
- Miscellaneous**
- 758 Connecticut Software, 20
 - CW Communications, 276f, g

General

Accessories

- Beck Manufacturing, Inc., 46
- 721 Borg Industries, 323
- 146 Computer Aid Covers, 322
- 276 Contemporary
ComputerWear, 320
- 634 Creative Computer Products, 94
- Curtis Manufacturing Company,
Inc., 240-41
- 787 Global Distribution, 204
- 42 Hudo, Inc., 332
- OCLI-CRT Division, 110
- 805 Omega Electronics, 119
- 576 Pacific Exchanges, 322
- 312 PCCase, Inc., 336
- 171 Sentinel Technologies, 226

Services

- 362 Compuserve, 227
- 781 IBM-ISG/Service-PC, 192

Books, Catalogs, and Periodicals

- 102 COBB Group, Inc., 211
- IB Magazine, 147
- Infoworld, 276e
- 65 John Wiley & Sons, Inc., 321
- 733 Lionheart Press, Inc., 322
- 799 Microsoft Press, 18
- 806 Prentice-Hall/General Book
Marketing Division, 198-99

Mail Order

- 2 Advanced Computer Products, 333
- 205 Applied Computer Products,
Inc., 156-57
- 134 Bits & Bytes of Electronics, 322
- 613 Comark, Inc., 323
- 90 Compuclassics, 340
- 803 Compumail, 328
- 754 Computer Discount Products, 276
- 420 Computer Mail Order, 318
- 554 Conroy La Pointe/Computer
Exchange, 166-67
- 110 Creative Microsales, Inc., 270
- 718 Data Base Company, 322

Reader
Service
Number

- 58 Diamond Software, 92
- 780 Disk World!, 238, 332, 336
- Diskette Connection, 320
- 214 800 Software, 314
- Economy Software, 327
- 768 47th Street Photo, 174-75
- 95 Logicsoft, Inc., 228
- 762 Mandingo Computers &
Cameras, 290
- 793 MC-P Applications, 331
- Micro Exchange, 122, 291
- 108 Micro Flash Computer
Systems, 184
- 112 Micro Mart, 338-39
- 116 Microshop, 337
- 118 MicroWay/MicroWare, 337
- 681 Oryx Systems, 274-75
- 136 PC Connection, 112-15
- 201 PC Connection, 140-41
- 800 PC Express, 319
- PC Link Corp., 335
- 460 PC Network, 212
- 626 PC Pipeline, 322
- 737 PC Warehouse, 307
- 274 Progressive Micro
Distributors, 317
- 380 Rogue River Software, 330
- 784 Wellway International, 322
- 731 Wildcat Computing, 323

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315 Alloy Computer Products, 230	758 Connecticut Software, 20	42 Hudo, Inc., 332
6 Alpha Software Corp., 12	554 Conroy La Pointe/Computer Exchange, 166-67	680 Hypergraphics, Inc., 151
7 American Training International, 5	276 Contemporary ComputerWear, 320	798 IBM, 8-9
772 Analex Computing, Inc., 206	646 Control Data Corporation, 15	781 IBM-ISG/Service-PC, 192
205 Applied Computer Products, Inc., 156-57	436 Cosmos, 126	IB Magazine, 147
18 AST Research, Inc., IFC, 1	— C.P. Aids, 111	200 IDEAssociates, 36-37
— AT & T Information Systems, 123-25	634 Creative Computer Products, 94	Infoworld, 276e
596 Autodesk, 130-31	110 Creative Microsales, Inc., 270	624 Inner Loop Software, 323
491 Barr Systems, Inc., 276b	20 Creative Software, 82	788 Innovative Software, 70-71
747 Barron-Ross, 93	50 Cuesta Systems, 313	751 International RED HOT Software, 329
— Beck Manufacturing, Inc., 46	Curtis Manufacturing Company, Inc., 240-41	807 Intertec Data Systems Corp., 257
— Bellesoft, BC	— Curtis Manufacturing Company, Inc., 251	738 IQ Technologies, 276d
134 Bits & Bytes of Electronics, 322	CW Communications, 276f, g	65 John Wiley & Sons, Inc., 321
159 BMDP Statistical Software, 210	397 CXI, 22-23	627 Juki America, 68
721 Borg Industries, 323	718 Data Base Company, 322	92 Lifeboat Associates, 187
760 Borland International, 51	685 DataSouth Computer Corporation, 32	93 Lifetree Software, Inc., 108
808 Brother International Corp., 258	342 Decision Resources, 34	733 Lionheart Press, Inc., 322
777 C. Itoh Digital Products, 256	11 Deeresoft, 185	95 Logicsoft, Inc., 228
15 Canon USA, Inc., 128, 213	58 Diamond Software, 92	762 Mandingo Computers & Cameras, 290
31 Central Point Software, Inc., 261, 276h	30 Digital Research, Inc., 54-55	23 Mansfield Software Group, 271
102 COBB Group, Inc., 211	62 Digital Research, Inc., 38-39	231 Mark Williams Company, 276a
613 Comark, Inc., 323	— Direct Net, 188	81 Martin Marietta/ITSoftware, 153
90 Compuclassics, 340	780 Disk World!, 238, 332, 336	100 MBP Software Systems Technology, 289
803 Compumail, 328	— Diskette Connection, 320	793 MC-P Applications, 331
362 Compuserve, 227	199 Diversified Computer Systems, 320	657 Meca, 165
— Computational Systems, Inc., 336	203 Dymek, 186	682 Menlo Corp., 272-73
146 Computer Aid Covers, 322	214 800 Software, 314	786 Michtron, 321
270 Computer Control Systems, Inc., 334	— Economy Software, 327	292 MicroComputer Tax Systems, 27
754 Computer Discount Products, 276	699 Everex, 155	537 Micro Design, 276c
406 Computer Innovations, 249	768 47th Street Photo, 174-75	761 Micro Design International, 316
	72 FriendlySoft, Inc., 49	— Micro Exchange, 122, 291
	74 Funk Software, 176	
	532 Future's Group, 323	
	787 Global Distribution, 204	
	303 Hauppauge Computer Works, 129	
	221 Hayes Microcomputer Products, Inc., 10-11	
	73 Heath Company, 162-63	
	— H & E Computronics, Inc., 35	

Reader
Service
Number

- 108 Micro Flash Computer Systems, 184
332 MICROGRAFX, 24
112 Micro Mart, 338-39
116 Microshop, 337
275 Microstuf, 152
— Microsoft Corporation, 2-3
799 Microsoft Press, 18
118 MicroWare/MicroWay, 337
475 Micro Tech Exports, 322
118 MicroWay/MicroWare, 337
111 Mitchell Management Systems, Inc., 316
— OCLI CRT Division, 110
533 Office Solutions, 53
805 Omega Electronics, 119
133 Orchid Technology, 80
681 Oryx Systems, 274-75
802 Pacific Datanet, 177
321 Pacific Data Systems, Inc., 308
576 Pacific Exchanges, 322
— Paradise Systems, Inc., 208-09
312 PCCase, Inc., 336
136 PC Connection, 112-115
201 PC Connection, 140-41
800 PC Express, 319
PC Link Corp., 335
460 PC Network, 212
626 PC Pipeline, 322
737 PC Warehouse, 307
485 PC World Exposition, 276b & c
142 Persoft, Inc., 127
575 Photon Software, 252
241 Polaroid, 90-91
804 POLYTRON Corp., 154
25 Prentice-Hall/Lumen Systems, Inc., 189
806 Prentice-Hall/General Book Marketing Division, 198-99
296 Princeton Graphic Systems, 109
468 Profit Systems, 47
274 Progressive Micro Distributors, 317
673 Quaid Software Limited, 313
151 Qubie' Distributing, 78-79
605 Qubie' Distributing, 191, 207, 255
776 Quest Research, Inc., 259

Reader
Service
Number

- 380 Rogue River Software, 330
162 RoseSoft, 52
163 RTCS Corporation, 290
— Safeware, 332
281 SAMNA Corp., 242-43
— Santa Clara Systems, Inc., 254
165 Satellite Software International, 50
— Scitor Corporation, 88-89
171 Sentinel Technologies, 226
169 Sigma Designs, Inc., 231
790 Snow Crest Computer Specialties, 226
52 SoftHelp, Inc., 334
174 Soft Right, 204
792 Softronics Software, Inc., 277
410 SoftStyle, Inc., 330
— Software Group, 80a & b
794 SolutionWare, 323
589 Spectrum Holobyte, Inc., 14
319 Star Micronics, Inc., 139
254 STB Systems, Inc., IBC
308 subLOGIC Corporation, 95
188 Tallgrass Technologies Corporation, 31
190 Tecmar, Inc., 16-17
— Texas Instruments, 67
769 3Com Corporation, 142-43
801 Transend Corp., 190
244 Unisource, 229
261 Univation, 292
405 US Robotics, 87
193 Ven-Tel, Inc., 164
448 Via Computer, Inc., 21
— Walonick Associates, 290, 320
196 Warner Software, Inc., 96-97
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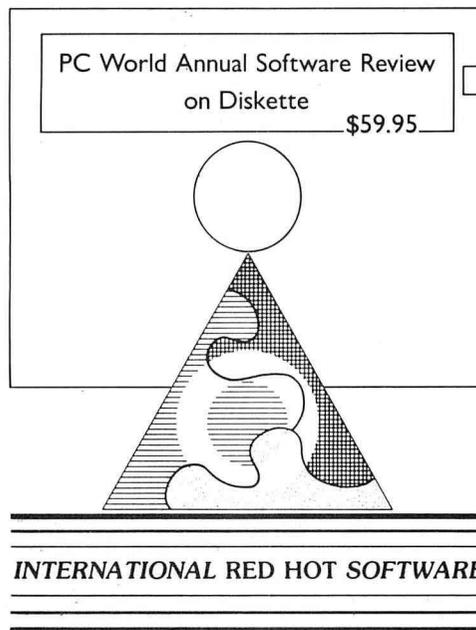
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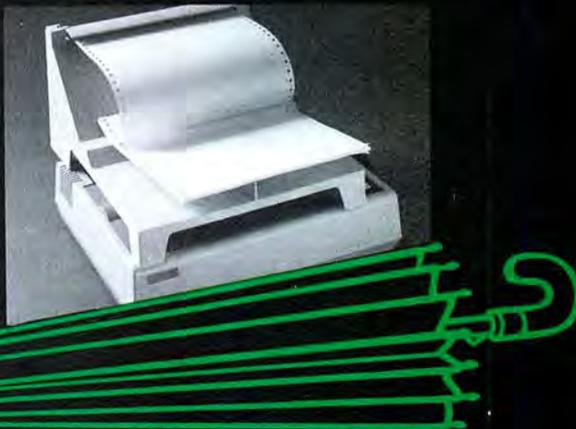
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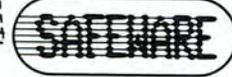
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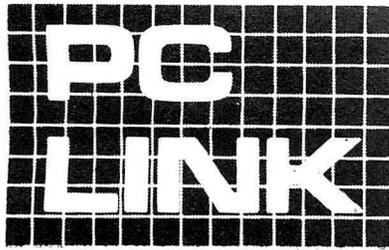
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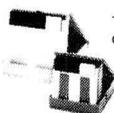
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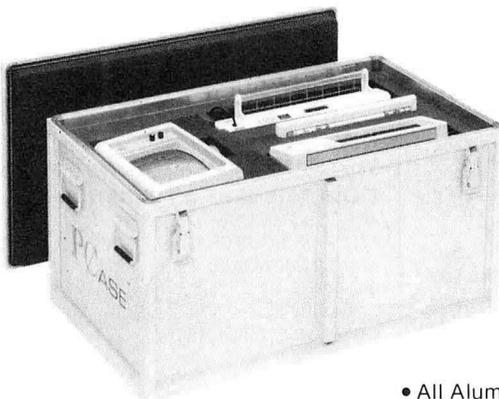
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