

How To: Word Style Sheet Basics

PC WORLD

October 1987 \$2.95

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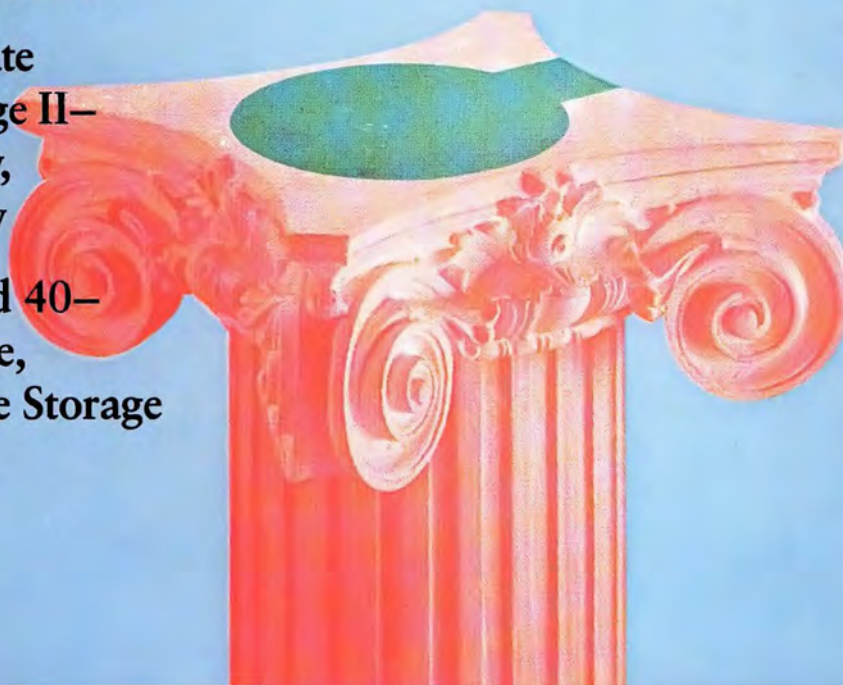


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**Crosstalk Mk.4—
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Turbo C: **NEW!** Powerful optimizing compiler ever

Sieve benchmark

	Turbo C	Microsoft® C
Compile time	2.4	13.51
Compile and link time	4.1	18.13
Execution time	3.95	5.93
Object code size	239	249
Execution size	5748	7136
Price	\$99.95	\$450.00

Benchmark run on an IBM PS/2 Model 60 using Turbo C version 1.0 and the Turbo Linker version 1.0; Microsoft C version 4.0 and the MS overlay linker version 3.51.

Technical Specifications

- ✓ **Compiler:** One-pass optimizing compiler generating linkable object modules. Included is Borland's high-performance Turbo Linker.™ The object module is compatible with the PC-DOS linker. Supports tiny, small, compact, medium, large, and huge memory model libraries. Can mix models with near and far pointers. Includes floating point emulator (utilizes 8087/80287 if installed).
- ✓ **Interactive Editor:** The system includes a powerful, interactive full-screen text editor. If the compiler detects an error, the editor automatically positions the cursor appropriately in the source code.
- ✓ **Development Environment:** A powerful "Make" is included so that managing Turbo C program development is highly efficient. Also includes pull-down menus and windows.
- ✓ **Links with relocatable object modules** created using Borland's Turbo Prolog into a single program.
- ✓ **Inline assembly code.**
- ✓ **Loop optimizations.**
- ✓ **Register variables.**
- ✓ **ANSI C compatible.**
- ✓ **Start-up routine source code included.**
- ✓ **Both command line and integrated environment versions included.**
- ✓ **License to the source code for Run-time Library available.**

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Minimum system requirements: All products run on IBM PC, XT, AT, PS/2, portable and true compatibles. PC-DOS (MS-DOS) 2.0 or later. 384K RAM minimum. Basic Telecom and Editor Toolboxes require 640K.

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4585 Scotts Valley Drive, Scotts Valley, CA 95066
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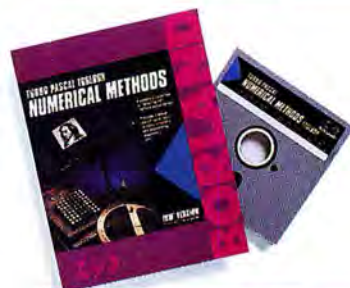
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Stephen Randy Davis, PC Magazine

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PC Magazine ”



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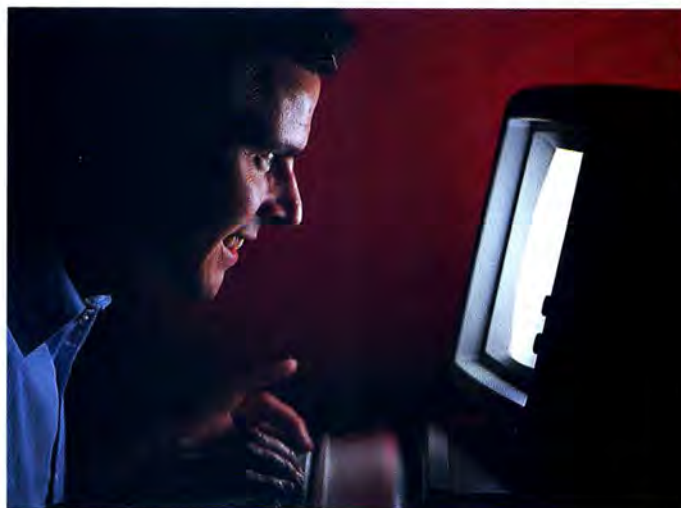
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Garry Ray, PC Week ”

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- ✓ Contains 40 example programs
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Michael Abrash,
Programmer's Journal ”

Turbo Basic introduces its powerful new Telecom, Editor and Database Toolboxes

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A technical look at Turbo Basic

- ✓ Full recursion supported
- ✓ Standard IEEE floating-point format
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- ✓ VGA, CGA, and EGA support
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- ✓ New long integer (32-bit) data type
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Ethan Winer, PC Magazine



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October 1987



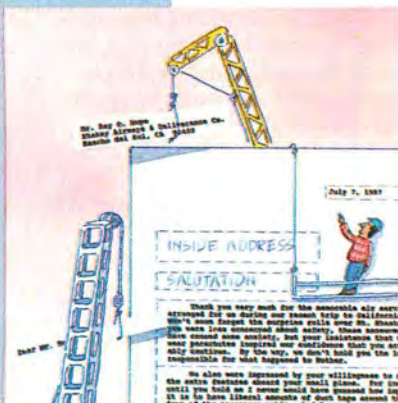
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Crosstalk Mk.4 is here at last! But despite a powerful script language and support for up to 15 simultaneous sessions, a host of flaws makes *Mk.4* a program for only the most audacious communications gurus.



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- Norton SI with 256-12 DRAM: 10.3
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16 MHZ 0 WAIT STATE

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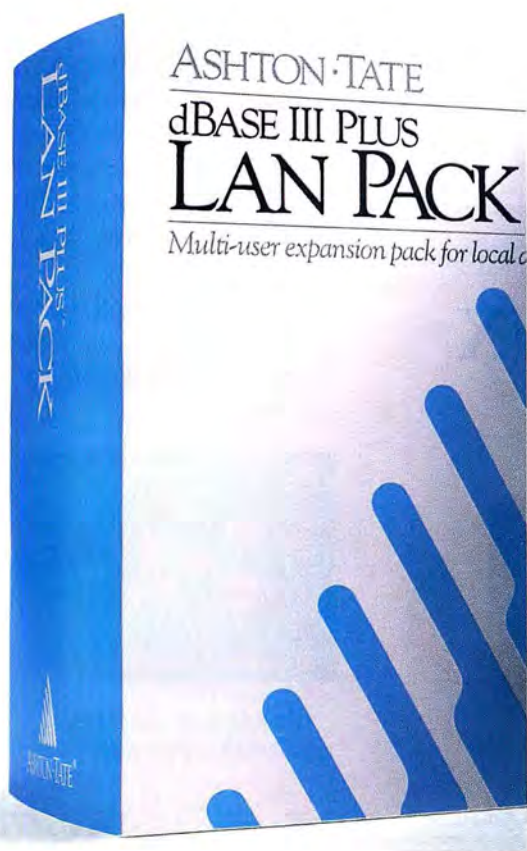
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David Bunnell

Error messages are beginning to flash in the conscience of the computer publishing industry. It's time we woke up and took a good hard look at some of the shenanigans going on in the name of greed and self-interest.

Benchmarking PC Ethics

Lately it seems I've been hearing more and more horror stories about the questionable ethics of some people in the computer publishing world.

Here are some notable lapses from grace that have come to my attention recently.

A software reviewer for a major computer magazine also happens to be a product manager for a leading software firm.

A computer magazine reporter willingly sells his inside source down the river in order to get an even bigger story from the source's own computer company. "We're trying to stop leaks," says the marketing executive at the company in question. "I'll give you even more information if you'll tell me which engineer spilled the beans."

The reporter downloads the name of his source and the dirty deal is done.

Six months after a magazine has reviewed a computer system, the columnist who reviewed it has not returned the evaluation equipment. The system is stacked with various boards, a hard disk drive, and a modem. When the system is

finally (and grudgingly) returned, the manufacturer checks inside the computer and discovers that the machine has been stripped of many of its boards.

"Often, we're billed for missing equipment," admits the editor of the magazine when asked to provide an explanation for his writer's behavior. "But otherwise, companies hesitate to do anything for fear the columnist will strike out against them in the future."

A software marketer has become wary of calls from magazine advertising salespeople who represent themselves as members of the editorial department. "We have your press release, we're interested in your product, we think it meets our readers' needs," the sales rep declares, before popping the loaded question at the end of the conversation: "By the way, have you ever considered advertising in our magazine?"

"Then I get mad," the software marketer says. "If they're in ad sales, I don't need to waste my time giving them a long technical

(continues)

talk about my product. Now I just ask them in the beginning, 'Are you in sales or editorial?'"

In another case, an advertising rep screams abuse over the phone at a company that hasn't bought advertising space in her magazine in some time. "I just want to let

with the advent of the personal computer in the early eighties did we witness the emergence of computer publications for the consumer. Consequently, many computer magazines and newspapers are advertising-driven. Their purpose is to create an environment for ads.

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you and your boss know that the way you advertise in those other magazines and not in ours is really beginning to irk me!"

Sighs the software firm's marketing executive, "Our company is private and not as big as Microsoft or Lotus or Ashton-Tate. So we have to be very particular about our advertising. We do advertise in that magazine, but not in every issue. They have no excuse for their rudeness and arm-twisting."

The truth is that computer publications are no different from any other medium when it comes to having ethical systems crash. The insider trading case against a reporter from the *Wall Street Journal's* "Heard on the Street" column comes to mind. In television journalism too, some major networks are known to have faked battle scenes during their news coverage.

One of the problems specific to computer journalism is that many of the older journals have always been trade publications. Only

For example, one major trade publisher, Cahners Publishing, clearly states in its corporate philosophy that its publications are primarily advertising vehicles. Naturally, you can't expect a great deal of critical reporting to come from journals of this persuasion.

Consumer-oriented computer publications are a different breed altogether. Or at least they should be. I don't think such journals can ever hope to remain successful if they're not editorially driven. For one thing, they wouldn't be able to sell enough subscriptions to be truly viable.

At some publishing companies, however, it's not uncommon for the editor of a magazine to report to the publisher, who not only has advertising as a main interest, but also runs the sales staff. These publishers frequently put pressure on editors to avoid negative stories. They pressure editors to cover products from potential advertisers. And they pressure editors to review a lot of products so that they can go to the advertisers and say, "We give you editorial coverage, so you should advertise with us."

Such publications include reader-service numbers in their reviews. Readers may think it's a reader service—but take it from me, this is nothing more than a ruse to sell ads. What happens is that after a product is reviewed or announced, the advertiser receives a couple of hundred reader-service inquiries. This provides a great entrée for the advertising sales rep to call the company. "Look at all the response you're getting just from this little review," goes the common pitch. "Just think of what will happen when you place an ad with us!"

A reader-service number at the end of a review is a dead giveaway that you're reading an advertising-driven magazine.

One major computer magazine features an "editor's day." This is a traveling road show designed to put potential advertisers in touch with editors and columnists. The idea is for the manufacturers to parade their products to a captive audience of the magazine's editors, who are required to make the trip. It's torture, but they have little choice except to be there.

Then the advertising squeeze is put on the companies to advertise in the magazine.

To my mind, and throughout the history of journalism, really good editors are reader-oriented, not advertising-oriented. Good editors and computer journalists have to put themselves into the shoes of their readers. They have to know the problems and challenges of implementing and using technology.

(continues)

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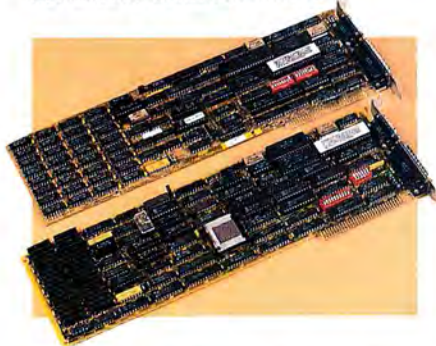


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PC World is dedicated to providing "power to the reader." In

fact, this is what sets us apart from other publications. We do not want to view technology as being good in and of itself, or to look favorably on new products just because they represent new technology.

At *PC World*, we like to raise questions that aren't usually asked. We want to know about the product's long-term benefit to the customer. How is that technology going to make our readers' workplaces more productive? How will it qualitatively improve the work process? Is the product better than another similar prod-

uct? Or would it perhaps be better not to buy any such product at all?

We believe that whether you're a multiple-unit buyer or a single-unit buyer—whether you're consuming one or a thousand—you have a basic right to a certain level of quality and performance.

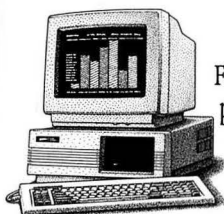
We feel it is our journalistic responsibility to delve into issues like after-sales support, warranties, dealer service, and the capability to expand and upgrade. Our regular *Upgrade Path* column shows you, for example, how to turn an XT into an AT. We also recently put together a new regular section called "How To,"

(continues)

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which incorporates the old-faithful "Getting Started" and "Hands On" sections. Our goal is to help you develop your skills at using various key products.

One of the major issues that is so crucial to our readers—and one that concerns advertisers and computer journalists alike—is the question of how we review products. How do we choose the products we review? What is our methodology? What standards do we set for accuracy and subjectivity? How reliable is the critique?

Over the past few years, our reviewing process has become more and more sophisticated.

In the early days of personal computer publishing, most re-

views were written by somebody who would take a package from a shelf, open it up, run it on a machine for about an hour, glance at the manual, then write the review based on his or her impressions.

Today's sophisticated readers need to have products reviewed in context. Jack Dongarra, one of the most famous benchmark creators in the field of electrical and electronics engineering, perhaps put it most succinctly in a recent issue of *IEEE Spectrum* when he stated that the best benchmark is a benchmark of real-world applications.

That means when an accounting package is evaluated, you need

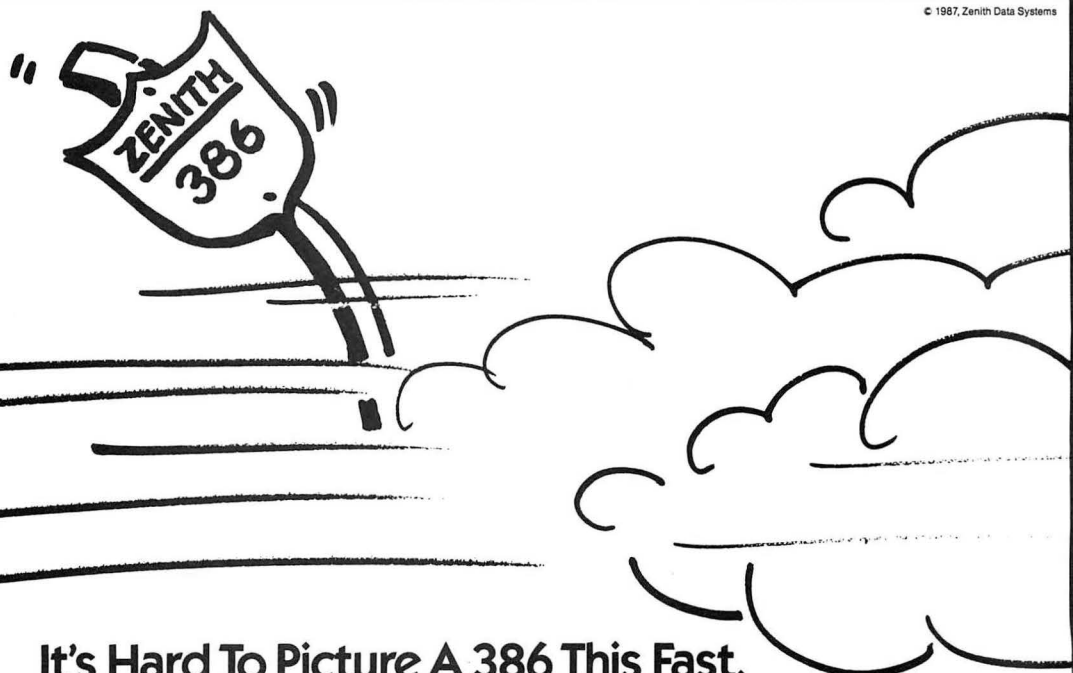
to know what it's like to use it. You want to know how it behaves when you're planning your budget. How it works inside your business—not how it performs in a lab or on an editor's desk.

Performance testing of speed—the current popular benchmarking criterion—tells only part of a product's story. Even so, various pseudoscientific measurements of speed are currently accepted as performance gospel.

For example, one major computer publication, which has its own test lab, tests the average access speed of a hard disk by measuring the speed of the microprocessor performing NOP functions (no operations performed).

(continues)


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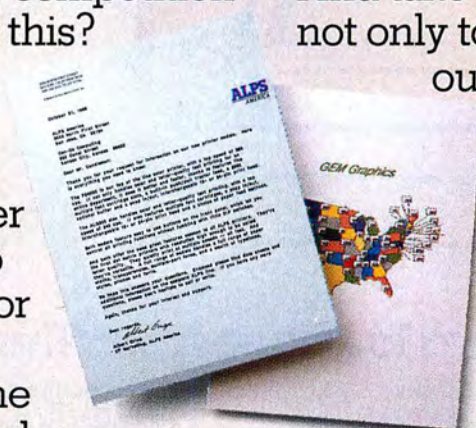
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In other words, it will measure just how fast the microprocessor is if you're not doing anything with it.

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In our determined effort to push the science of product reviews to the limit, *PC World* has recently entered into an unprecedented arrangement to have our review process conducted by National Software Testing Laboratories, one of the country's most widely respected independent test labs.

NSTL, based in Philadelphia, has the reputation for undertaking

the most comprehensive performance and versatility tests of hardware and software products in our industry. They're the ones who recently benchmarked the performance of the PS/2 line of computers for IBM.

They're context-minded to a tee. For example, before they examine an accounting package, they find out what should be expected of an accounting program. Never mind this package, or that package, or any specific package. They determine the real needs of people using such an accounting program in a genuine accounting environment.

We feel that an independent test lab like NSTL will benefit our readers tremendously because the

lab's testing methods won't be biased by any potential editorial tendency to favor one product over another. They're going to tell it like it is—not sell it like it is.

As *PC World* has matured over the years, we've learned not to be deterred by flak about our reviews. We are accused of all kinds of things by advertisers. We might be accused of having a regional bias by an advertiser in Texas who feels we cover too many California products simply because our offices are here. Small companies say we cover too many products from big companies, and big companies complain that we cover too

(continues)

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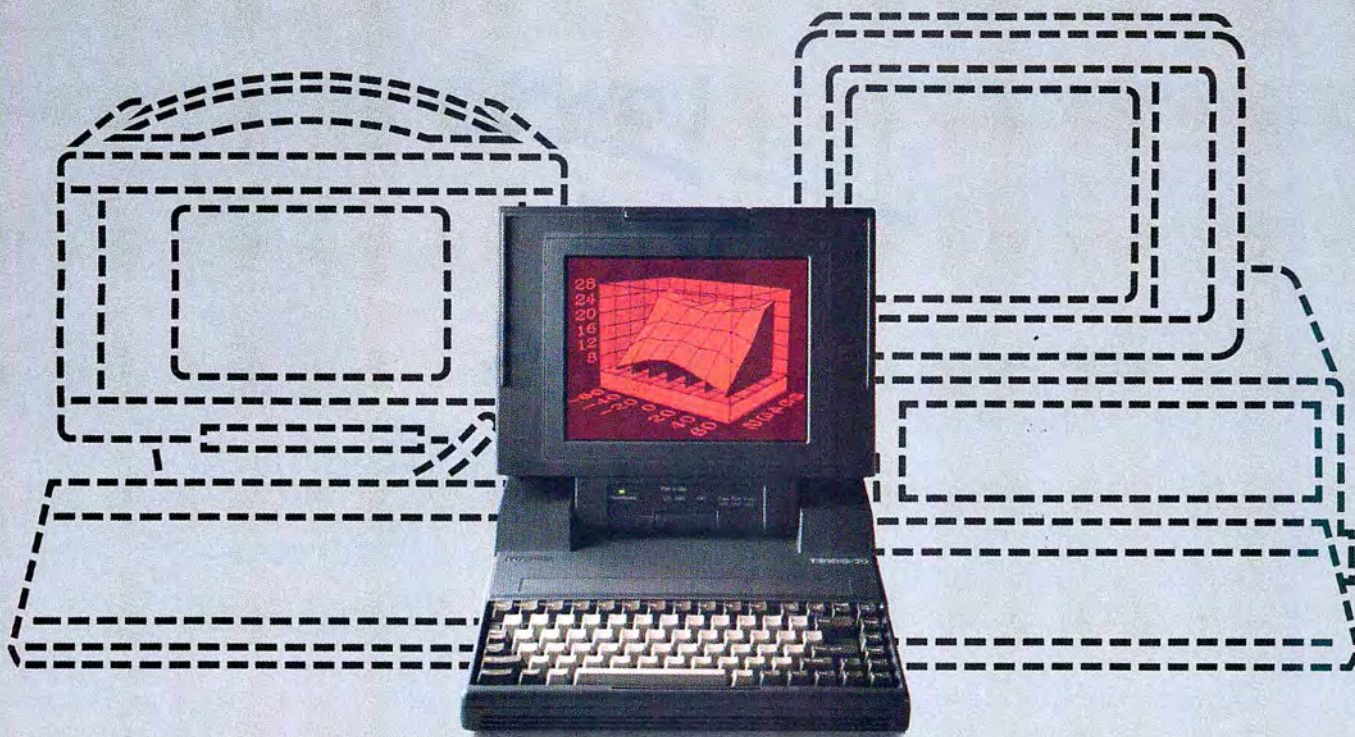
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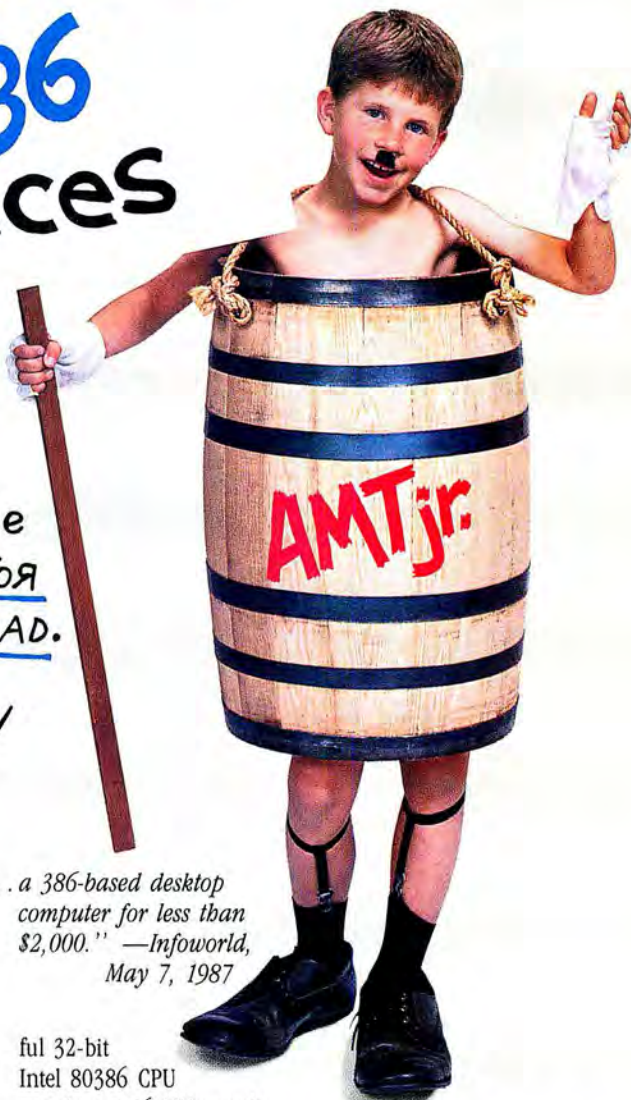
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many insignificant products from small companies.

Obviously, no one welcomes a bad review. But when we do print a negative report on a product, we sometimes get an incredible response from the manufacturer. Interestingly, the most vociferous objections come from smaller companies who chose to use what resources they had for promoting the new product instead of fine-tuning it. They will write letters to the publisher, to the president, to the chairman, and to the editor. They'll also write letters to other advertisers about how they believe they've been injured and wounded. They'll insist that the reviewer wasn't expert enough in the field, or that the reviewer had a bias.

They'll even claim that the reviewer was in cahoots with one of their competitors.

None of these claims are true, of course. But we do have to deal with these accusations. We have to stand firm with advertisers and at the same time be conscious of the economic reality of their situation.

The fact is that a review in *PC World* carries a great deal of weight. It can stimulate sales in the case of a positive review, or it can suppress sales in the case of a negative review. Sometimes when a product is given a negative critique, the manufacturer may lose

some business. Distributors may not want to carry as many of its products. Or the company may lose an important OEM sale.

We are extremely sensitive to the fact that a negative review can be damaging to a company. That's why we put such a high priority on accuracy and fairness. And that's why we've contracted with NSTL to be our inviolate test lab.

In a sense, *PC World's* reputation itself gives us a great deal of freedom. Ultimately, advertisers realize they're less interested in the editorial opinions of our writers than in knowing our readers. They want to reach those 1.6 million people, each of whom influ-

(continues)



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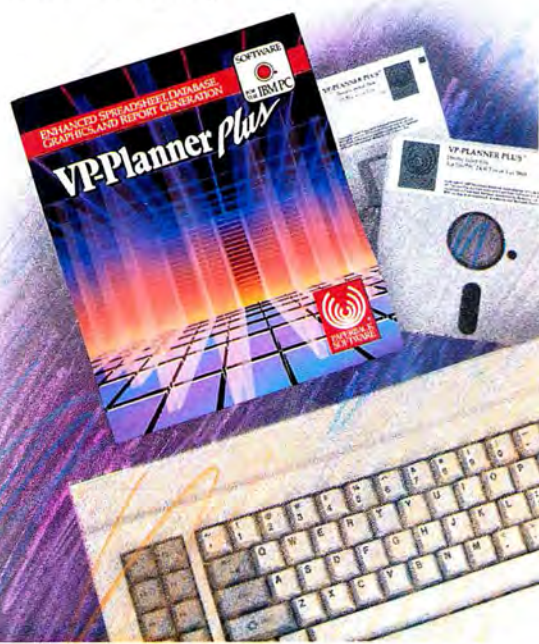
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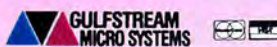
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For example, at present our editors are working with a number of 386 machines. We're experimenting with several PC local area networks. And we've put *PC World* on CD ROM.

In fact, it would be fair to say that the journalism we practice at *PC World* is advocacy journalism. We are user advocates. Among other things, we advocate better products, innovation, better pricing, more customer support, and honesty in the marketplace.

Finally, we advocate a strict code of ethics and proper comportment in the field of computer journalism.

Ethics are ethics are ethics. I believe that journalistic ethics are universal. I also believe that most reporters and writers want to apply the accepted notion of what journalism and ethics are to their own work.

After all, there are no rival systems as far as the truth is concerned. There is no MS-DOS of righteousness, no OS/2 of honesty, and no UNIX of virtue. Basic values do not have *Windows*.

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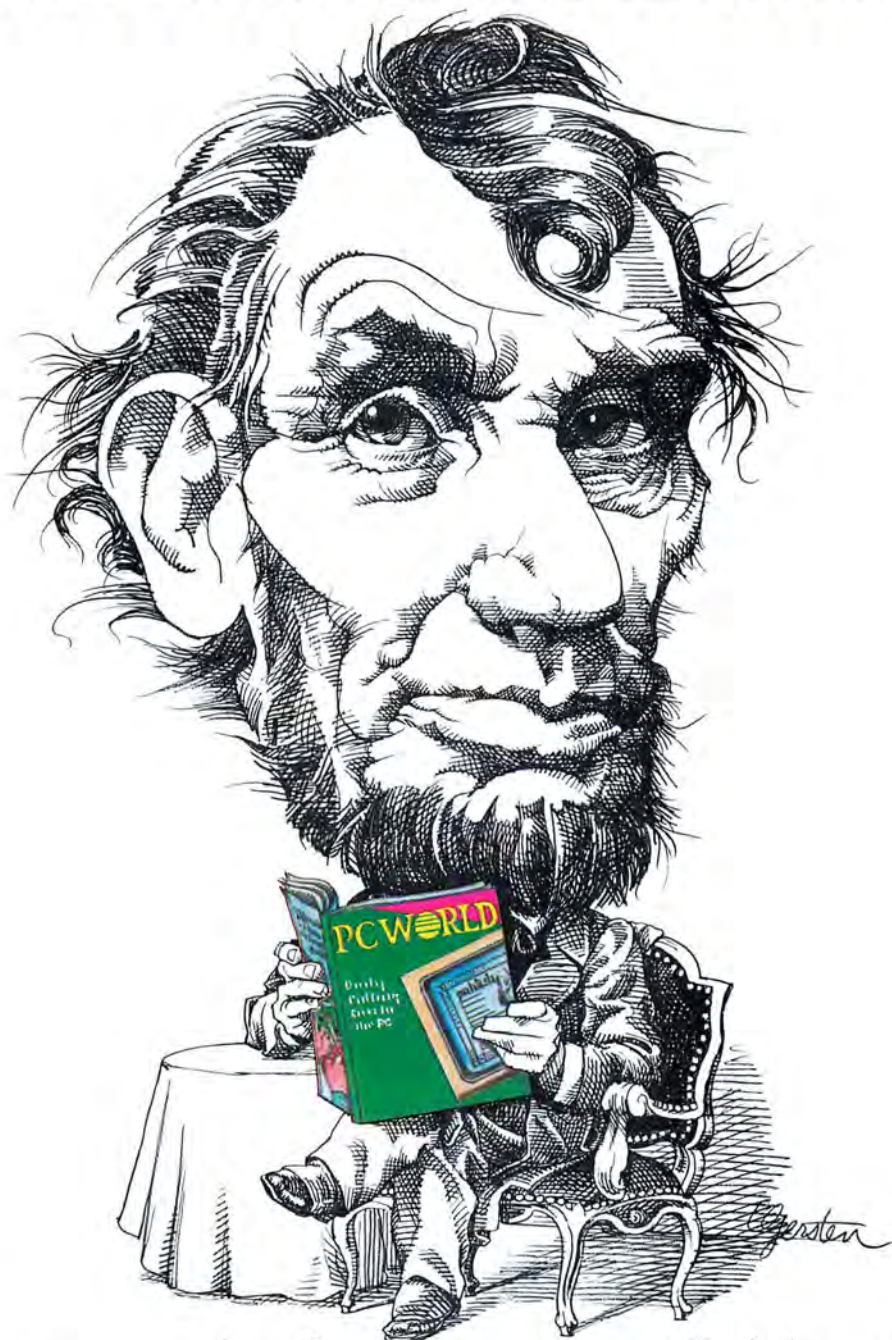


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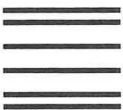
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Letters

Reactions and responses from the PC World community



Sink Toshiba

Without a doubt, Toshiba laptop computers and printers are at the top of the market, but let's send them to the bottom. Toshiba sold sophisticated computer-controlled machine tools to the Russians to help make submarine propellers quieter and harder for U.S. warships to detect.

We should send Toshiba a message by refusing to purchase any of their products and urge Congress to ban imports from Toshiba or their subsidiaries. I see no reason to reward a company that's stabbing us in the back. Our own State Department does that well enough without outside help.

*Fred Marklund
Vancouver, Washington*

Toshiba in Hot Water

Over the past few years the computer press has expressed righteous indignation over a multitude of problems. The great silence on Toshiba's sale of important military technology to the Soviet Union is frightening. Whether or not a program is copy protected may have immediate impact on PC users, but the Navy's inability to detect unfriendly submarines could be a tad more important in the long run.

I suggest that users boycott Toshiba products and that the magazines we support refuse to carry their advertisements. If our rich Uncle can't (or won't) do anything to make an example of a company that betrays the free world, maybe an informed user community can convey a strong message.

*M. Frederick Stewart
Culpeper, Virginia*

As we noted in September's Top of the News, Congress is considering trade sanctions against both the Toshiba Corporation and Kongsberg Vaapenfabrikk, the Norwegian firm also involved in the sale of sophisticated milling equipment to the Soviet Union. Furthermore, the Japanese government has banned Toshiba Machine, the subsidiary that actually conducted the sales, from selling products to Eastern Bloc nations. Two Toshiba Machine officials were arrested, and the top executives of Toshiba Machine and Toshiba Corporation have resigned over the incident. —Ed.

PC-Talk Talks Back

"Talk Isn't Free (Any More)" by Judy Getts [PCW, July 1987] seems to be more an editorial than a review. The article is more subjective than objective and challenges *PC-Talk4*'s right to be considered a serious communications program. I find that strange since *PC-Talk* is the de facto communications standard in several Fortune 500 companies. The article also contains much inaccurate and irrelevant information.

Ms. Getts fails to mention that in addition to the XMODEM and XMODEM/CRC protocols, we offer YMODEM, ZMODEM, and Kermit. These are available at no charge via our BBS, and information about the additional protocols is included on every disk distributed by Headlands.

The problem Ms. Getts encountered with the DOS shell is not attributable to *PC-Talk4*, but a

(continues)

function of DOS. Ms. Getts also refers to PC-Talk4's script language, but we don't have a script language. We have a macro command set that works very well. I'm at a loss to understand why PC World would sanction a review that contains errors in fact and whose overall tone is clearly slanted against a program that has earned the respect and admiration of thousands of users.

*Jim Sayers
Director of Operations
Headlands Communications
Tiburon, California*

Nowhere does PC-Talk4's documentation mention that the program supports YMODEM,

ZMODEM, and Kermit or that these protocols can be downloaded from the Headlands' BBS. Nor was there a READ.ME file on the disk I received. Furthermore, while writing the review, I spent several hours on the phone with Mr. Sayers, and he never mentioned that the program supported any of these protocols.

A DOS shell may be a scion of DOS, but its operation depends on careful implementation. Headlands Communications was not careful in implementing the DOS shell in PC-Talk4—as evidenced by the fact that it encroaches on DOS's COMMAND.COM checksum.

Mr. Sayers calls PC-Talk4's scripting feature a "macro com-

mand set." I call it a "script language." Whatever you want to call it, it could be better. —Judy Getts

MathPlan's PlanPerfect

I've discovered that *PlanPerfect*, reviewed in "Perfection According to Plan?" [PCW, July 1987], is actually the program formerly called *MathPlan*. But I disagree with your review. *MathPlan* macros can be edited from within a worksheet. Also, the manual contains full explanations and examples of all functions both in the appendices and in a compendious reference section.

(continues)

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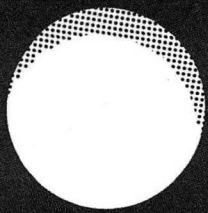


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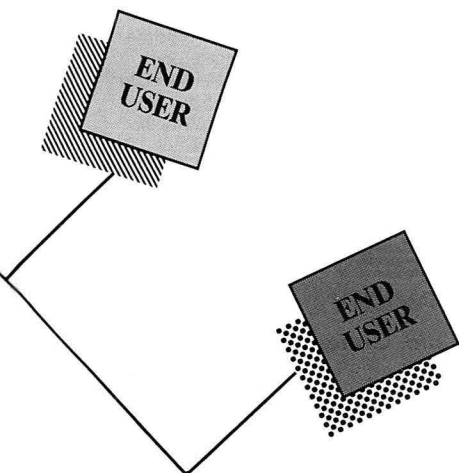
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True, *MathPlan* recalculates too slowly for "industrial-strength number-crunching"; but for most applications, there's no match for its bells, whistles, elegance, and sheer ease of use. My *MathPlan* worksheets incorporate data-extraction forms, record-scrolling windows, mailing labels, charts, and links to other worksheets without the expensive memory-gobbling add-ins that other spreadsheet programs require. After trying several 1-2-3 clones, I was delighted to escape from the menu jungle into *MathPlan*.

Dr. Phoebe S. Spinrad
Columbus, Ohio

WordPerfect Corporation's MathPlan was repackaged as

PlanPerfect in June 1987. PlanPerfect matches its older sibling feature for feature, except for a substantial increase in speed and much easier export of data to WordPerfect version 4.1. —Ed.

Nobody's Perfect

"Almost Perfect" [PCW, July 1987] points out a "new" *WordPerfect* feature "strangely lacking from previous versions"—the ability to print selected pages from a document. Although this feature might be simpler to use in *WordPerfect* version 4.2, it certainly exists in version 4.1.

To print selected pages, you call up the printer control menu and select P to print a document. *WordPerfect* asks for the docu-

ment name and then, consistent with the Margin Set feature, it requests the range of pages to print. You can print selected pages even when the file is closed.

Debra Jeffer Gips
Baltimore, Maryland

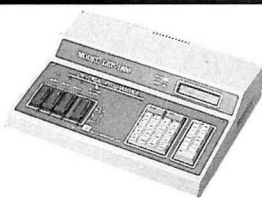
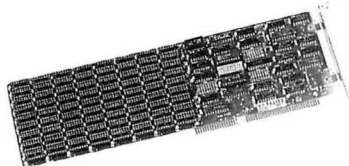
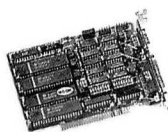
Friendliness to the Macs

I can't help but laugh about the look-and-feel controversy racking the IBM PC and clone worlds as discussed in David Bunnell's column "The Software Inquisition" [PCW, May 1987]. Virtually all Mac programs look and feel alike, so it's very easy to move from one program to another.

(continues)

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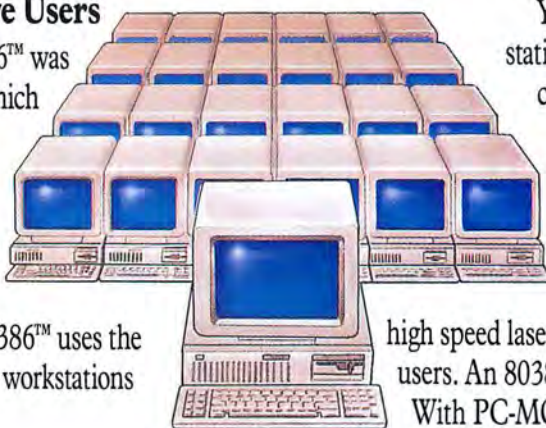


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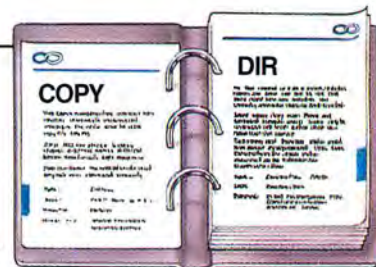
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While it's true you could look elsewhere for multi-tasking, why would you want to? The *other* multi-tasking operating system is not now, nor is it planned to be, multi-user. It won't even run multiple DOS applications in multi-tasking mode.

Now consider PC-MOS/386.™ At the touch of a key, you can switch between up to 25 different tasks. And if you have workstations connected to a host, they get multi-tasking, too. Finally...a system that won't hold you back.



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10. The Price...As you evaluate operating systems, ask yourself if it's reasons you're considering...or rhyme. Ask if you're getting a system for tomorrow, or one that was made for yesterday. See if you're being forced to buy new hardware because of *their* software.

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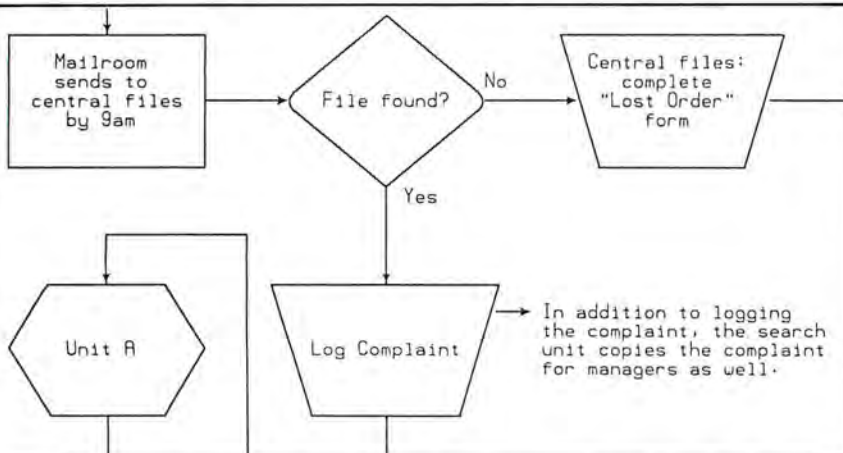
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* March 10, 1987 issue, page 278

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That's the reason I've switched to the Macintosh. Once people are able to work with one program, the others are relatively easy. The time saved just in training new staff on various programs pays for the machines.

There's a lot of talk about user-friendly programs, but there's nothing as friendly as having all programs look and feel the same.

Steve Fisher

Saipan, Mariana Islands

Misplaced Trust

A recently purchased software program contained a brochure published by ADAPSO (Association of Data Processing and Service Organizations) entitled *Thou Shalt Not Dupe* that warns the public of the evils of unauthorized software duplication.

The brochure posits the following premise:

"The relationship between customer and developer in a software transaction is one of mutual trust. The customer trusts that the developer has produced a product that will deliver the desired result. The developer trusts that the customer will make use only of those copies for which he has purchased a license."

I don't mean to defend software piracy, but what's all this about "mutual trust"? Virtually every program I've ever purchased contains a disclaimer specifically stating that it's sold "as is" and that its quality and performance aren't under warranty.

Mitchell Ostrom

Los Angeles, California

(continues)

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PC MAGAZINE

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PC MAGAZINE


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Who's Covering the Cover

"Software Hits"—safe; cover art—errors [PCW, July 1987]. First of all, who ever heard of a left-handed shortstop? As any coach or player will tell you, it's difficult for a lefty to turn a double play at second base.

Also, with the bases loaded, the infielders should be playing in to cut off the run at home plate unless there are two outs. But if there are two outs, why is the runner at third waiting to tag up on the fly ball?

The infielders don't seem to know where the ball is, although the positions of the outfielders and the batter indicate it's headed toward the right-center alley. It might be a good idea to get the infield into the game.

The contents of the issue were just fine.

Paul Lohmeyer
Bronxville, New York

Cover artist Robert Crawford is left-handed and played shortstop for four seasons with the semipro Newfoundland Newfs before injuring a rotator cuff. He batted .320 lifetime and still holds a team record of 245 consecutive errorless innings.

As for the runner tagging up on two outs, well, that's what happens when you don't have a third base coach. Finally, if you think this infield is inept, you obviously didn't see the Dodgers or the White Sox play this year. Scrutinize the cover a little closer, and you'll see Steve Wozniak eating a hot dog in the center field bleachers. —Ed.

(continues)

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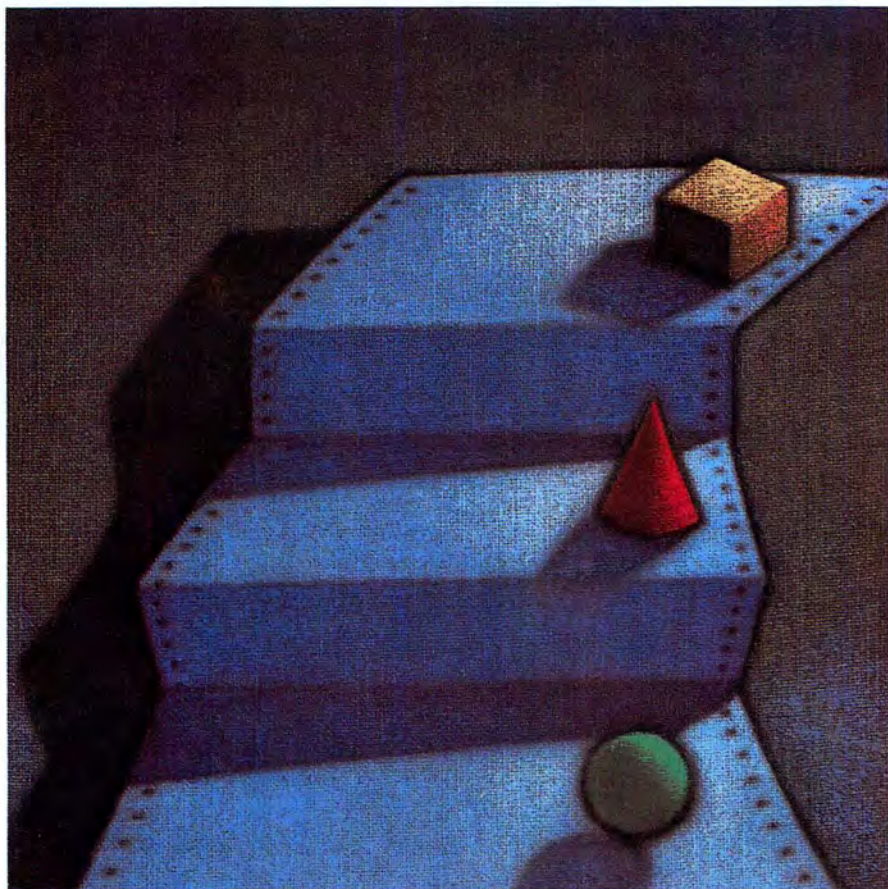
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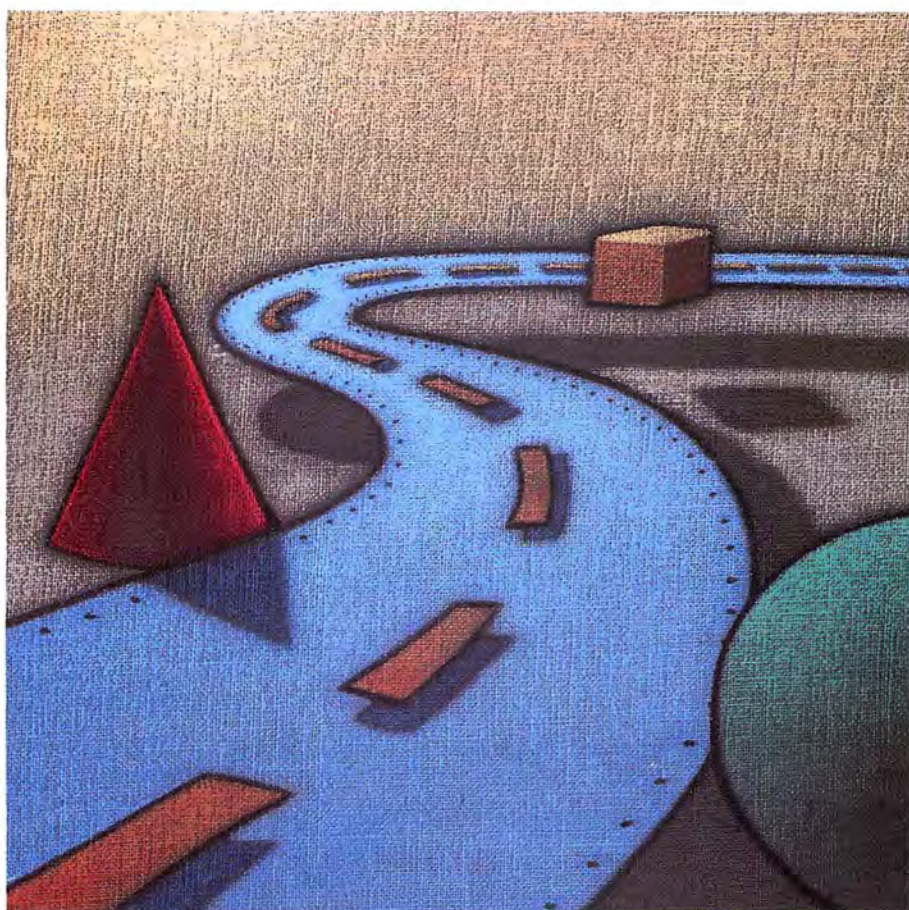
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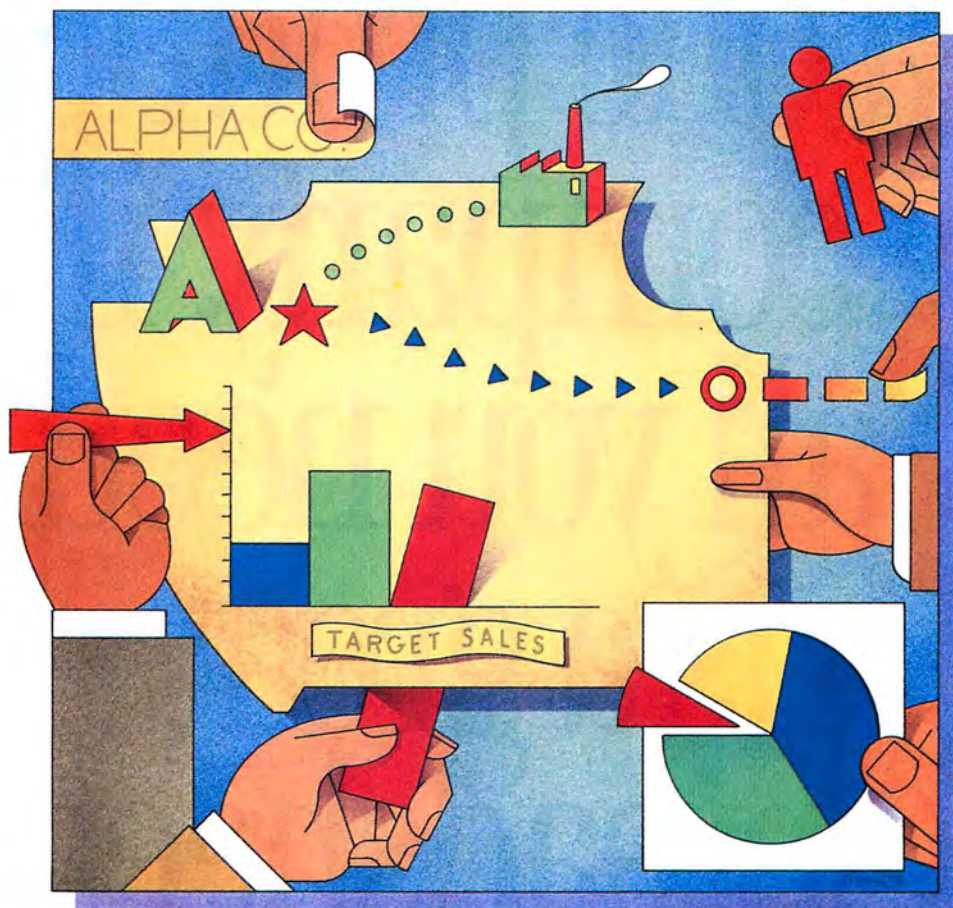
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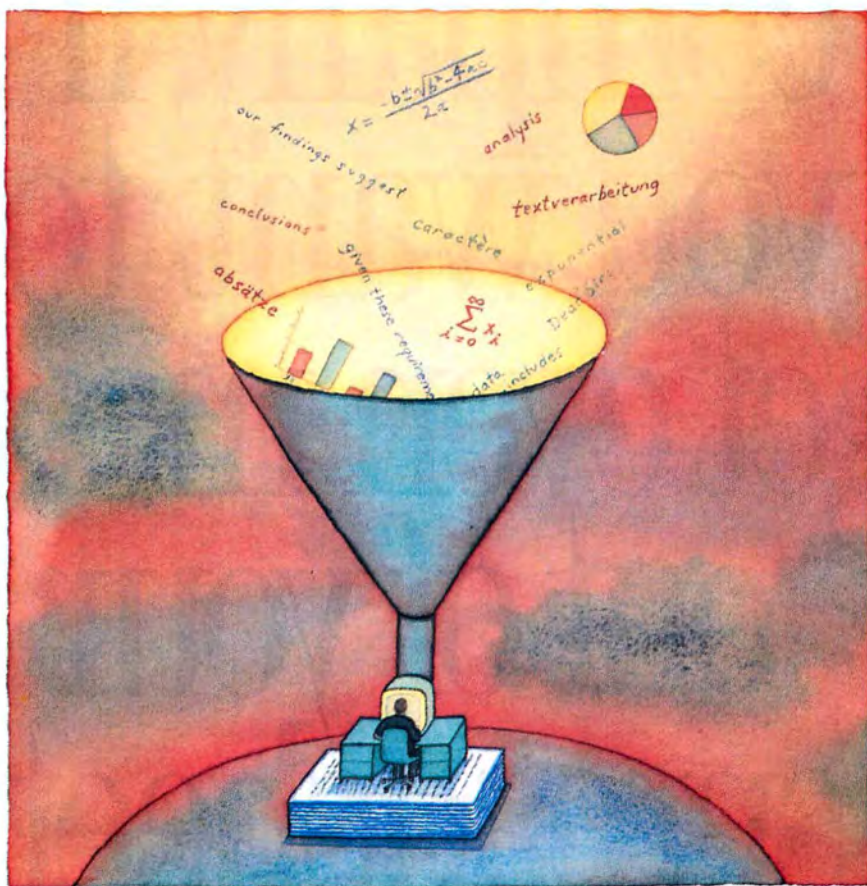
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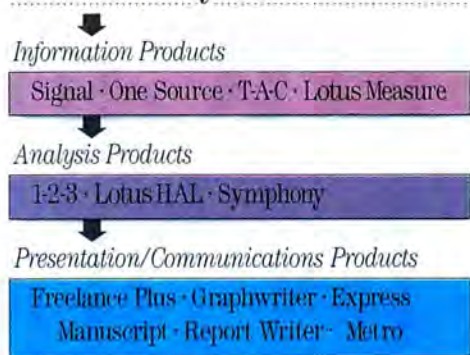
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User Group Alert

PC World plans to publish a user group list in its January issue. Send your group's address, phone number, E-mail information, SIGs, and total membership to the PC World Ultimate User Group List, c/o Letters.

Amplification

Readers planning to cull data from spreadsheets with XYZ: Spread from Intex Solutions (From the Software Shelf, PCW, August 1987) can consider selecting two XYZ programs instead of one. The 1000-worksheet versions of any two XYZ programs now cost \$395; any three cost \$495. The cost of a single 1000-worksheet XYZ program, however, remains \$395. The small versions that work with up to 12 worksheets continue to sell for \$145 each.

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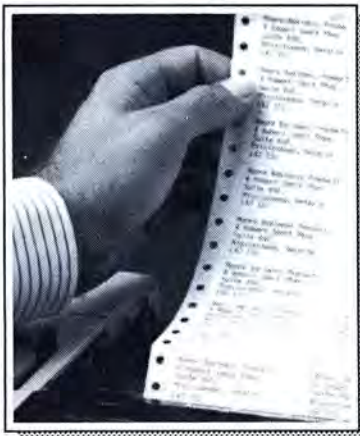
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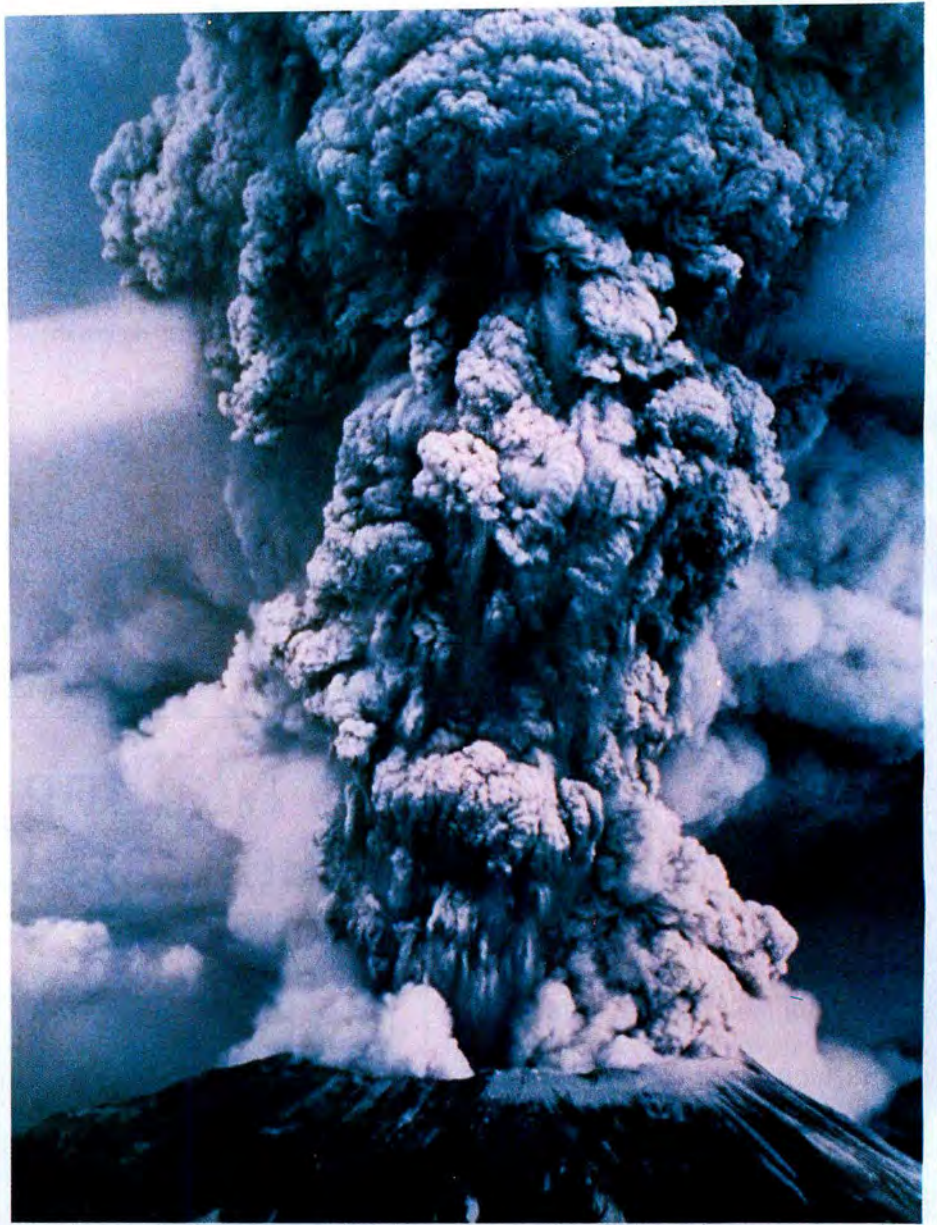
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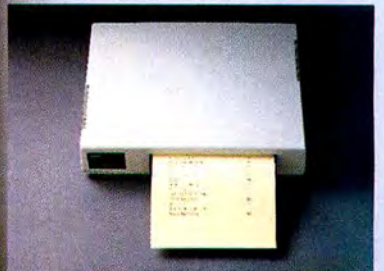
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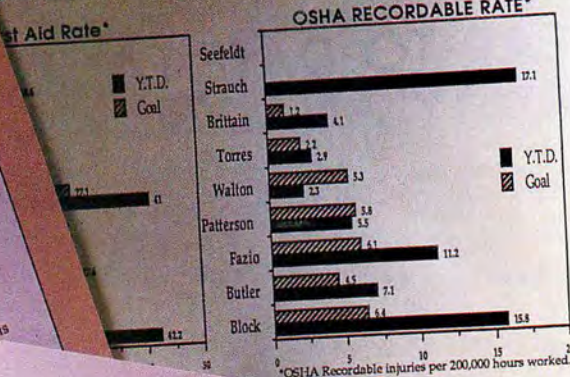
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Dr

The John Deere Dubuque Foundry was the last "fire-and-brimstone" operation of its kind in the entire John Deere organization. All other foundry operations are now larger-capacity electric melt facilities. The Dubuque Foundry cast all manner of parts for engines, transmissions, hydraulic control valve axles and housings, wheels, control levers and pedals, track components and a large variety of replacement parts for John Deere tractors long out of production. The Dubuque Works Foundry was a fascinating and often spectacular place.

Since its beginning in 1946, the Foundry came to represent some of the highest quality and productivity levels attainable in the Deere organization. It kept pace with changing technology and was considered the state of the art in the gray-iron casting process. But a changing economy and a company's need to consolidate foundry operations in its larger capacity facilities in Waterloo, Iowa, and Silvis, Illinois, necessitated the closing of the Dubuque Foundry. The Dubuque Foundry wasn't that old, and it wasn't antiquated. As it closed, Dubuque's facility was still one of the most productive and cost efficient operations in the chain. Unfortunately, it wasn't large enough, and increasing its capacity made no sense when the company was over capacity and under production.

Dubuque's was a 50,000 annual ton foundry, where Waterloo, for example, has a 175,000 annual ton capacity. The Dubuque Foundry closing represented the end of an era for Dubuque and for Deere & Company in the largest context.

Walking through the Dubuque Foundry, most visitors only saw the sights available at ground level. Few people, other than Foundry employees and maintenance personnel, saw the network of underground catacombs filled with a complex conveyor network for moving sand and scrap materials from work areas to reclaim points. Then there were the multi-storied cupola catwalks and the foundry sand delivery system. Each was accessible only by a series of narrow and steep stairways.

But the best view of overall Foundry operations had to be from the telpher cars, an overhead tramway traveled by operators driving electric cars on which ladles of molten iron were transported from the Ajax holding furnaces to the various production lines. It was really a monorail train system which required a high degree of operator skill. Many employees, who had the opportunity to learn how to operate the telpher cars during their careers,



A telpher car and pouring any iron into a 4-inch moving on a conveyor accurately while iron occurred in c... In this case, the telpour worker's lad... Rick Meyer was the Foundry back i... on the slinger-mold... On the days Rick ha... shakeout using a ho... castings on an overh... machine.

During the last days parts for old John De... "Come and watch m... enquiring photograph... the Egyptians did 4,000... these cores. The proces... principles are the same... Rick's partner on the... the same age as Rick and... according to Rick, Dave... job requiring great skill... to prove your skill; other... The slinger is a remote c... sand, packing it tightly i... operated manually, and the... control the movement of th... remote control levers to car... flasks, and he had to know... packed to maintain mold i... obsolete," says Rick, "havi... eliminated some of the 'artist... Just prior to the Foundry's clo... employees on the slinger line... busy. The pair were making... longer in production but still su...

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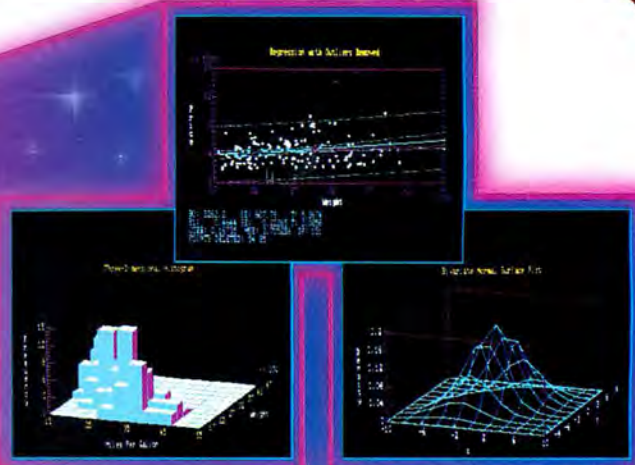
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Lotus 1-2-3 (2.0) and Symphony use RamFont to nearly double data display from 2,000 to about 3,400 characters by expanding the spreadsheet from 80 columns by 25 rows, to 90 columns by 38 rows—with no loss in scrolling speed.

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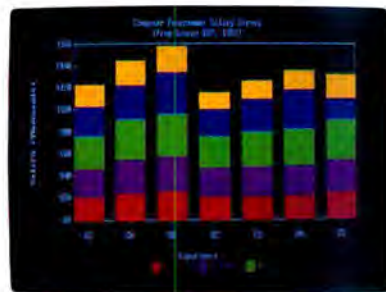
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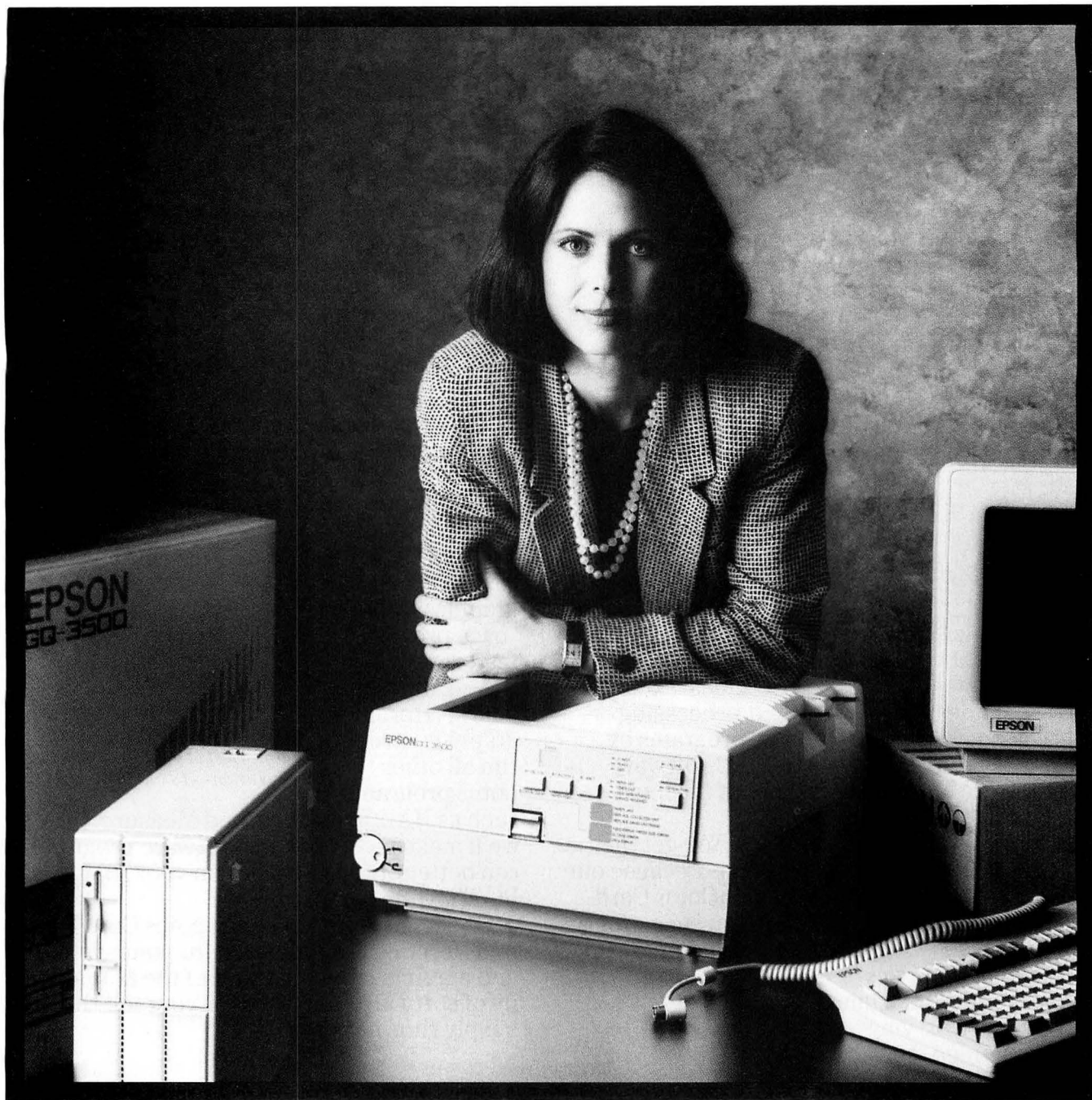
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Richard Landry

Who Wins With OS/2?

Microsoft and IBM have presented users with a new operating system—but nobody's eager to unwrap the gift.

For several months now a controversy has been stirring quietly among software developers about whether or not OS/2 will deliver all the long-term benefits promised to you. Many have been saying privately that OS/2 will create as many problems as it solves—it will slow down overall system performance, and it will stifle innovations that would make computers cheaper, more powerful, and easier to use in the long run. Now that the new operating system is on the verge of release, everyone's taking bets on what you will think of it.

A number of developers seem to be hoping that you will reject the operating system out of hand—in part for their own business reasons, but also because they think you will be better off in the future if you stage a revolt against OS/2 now. WordPerfect's vice president for marketing Dan Lunt and Borland's founder Philippe Kahn are two unlikely candidates to end up in this camp.

Lunt feels that OS/2, with its standardized user interface called the Presentation Manager, is a

blatant attempt by Microsoft to eat its principal competitor's lunch. Right now WordPerfect's word processor of the same name is fast and has a user interface that sets it off (for better or for worse) from its arch rival, *Microsoft Word*. With OS/2, Lunt feels, not only will *WordPerfect* lose its distinctive interface, but it also will lose the speed advantage it now enjoys over *Word*. "OS/2 seems horribly inefficient," Lunt recently complained to me. "Our developers have worked with it, and it's left a pretty bad taste in their mouths."

Kahn isn't worried about developing software that looks and feels like that of his competitors. "The issue is the same with the Macintosh," he reasons. "Although there's one standard user interface on the Mac, there are still good products and bad products." In fact, he promises that

(continues)

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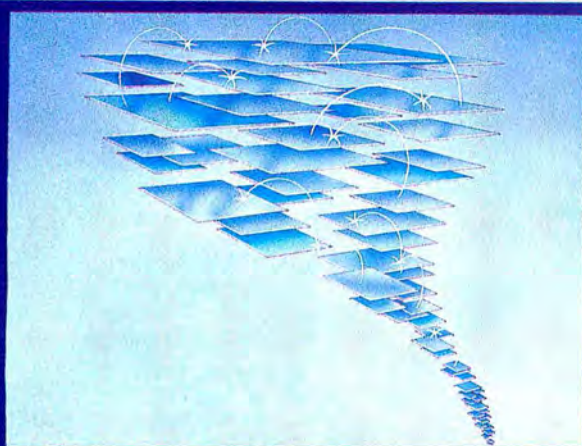
Borland will eventually convert all of its application software to OS/2 and the Presentation Manager, starting with its recently purchased data base, *Paradox*. OS/2's real problem, Kahn judges, is that it has arrived too late—three years after the release of the IBM AT, for which it was originally promised. And it's being delivered at a time when a new operating system—one designed for the Intel 80386 chip—ought to be released.

On the other side of the argument, Microsoft and IBM have bet their futures on the acceptance of OS/2, and both have spent much time and effort making sure that you will buy into it. In what must be the longest and most expensive PR campaign in personal computer history, Microsoft devoted the last few years to pushing its program *Windows*, the graphics operating environment that was supposed to bring multitasking to the PC. Due to sluggish performance that demands AT horsepower or better, and a host of problems running existing software, *Windows* never took off. Microsoft itself seems to have conceded that *Windows* will never make a good environment for machines that run at XT speeds. Nor does *Windows* seem very popular among owners of AT-power machines. But to Microsoft that's not important. All of the company's efforts in promoting a graphics operating environment were just a warm-up for the main event—OS/2.

(continues)

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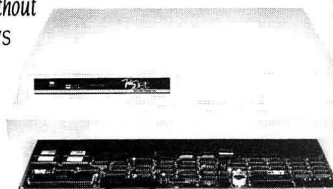


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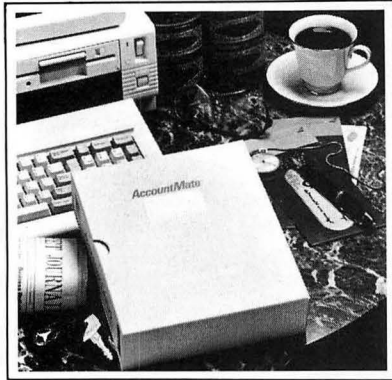
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OS/2 is supposed to do well what *Windows* has done poorly—provide a multitasking environment for any number of applications and make computing itself much easier. However, OS/2 also suffers from *Windows*' principal shortcoming: poor performance. A small diagram circulated by Microsoft at the time of the OS/2 announcement tells the whole story. Entitled the "1989 Desktop Workstation," it depicts a 4MB 386 machine with a 40MB hard drive and graphics monitor. If you expect to run OS/2 applications, the diagram implies, that's what you'd better save your money to buy.

But even such a powerful—and expensive—system may not cut the mustard for OS/2, says Kahn. Performing multitasking on a single-processor system like an IBM AT or Deskpro 386, he explains, divides the computer's power among the various tasks that are running at the same time. Run two tasks, and both function at about half the speed of one alone. Run three tasks, and each runs at a third its potential speed. Add the overhead of a multitasking operating system, and pretty soon your 16-MHz 386 is chugging along like the PC of old.

That's where IBM comes in. One little-discussed feature of the PS/2 line's Micro Channel architecture is its ability to perform

(continues)

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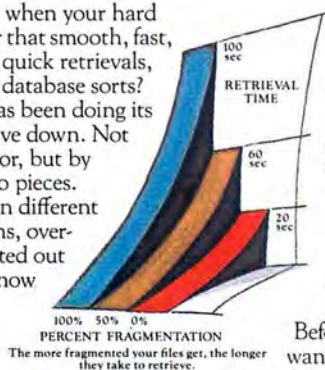
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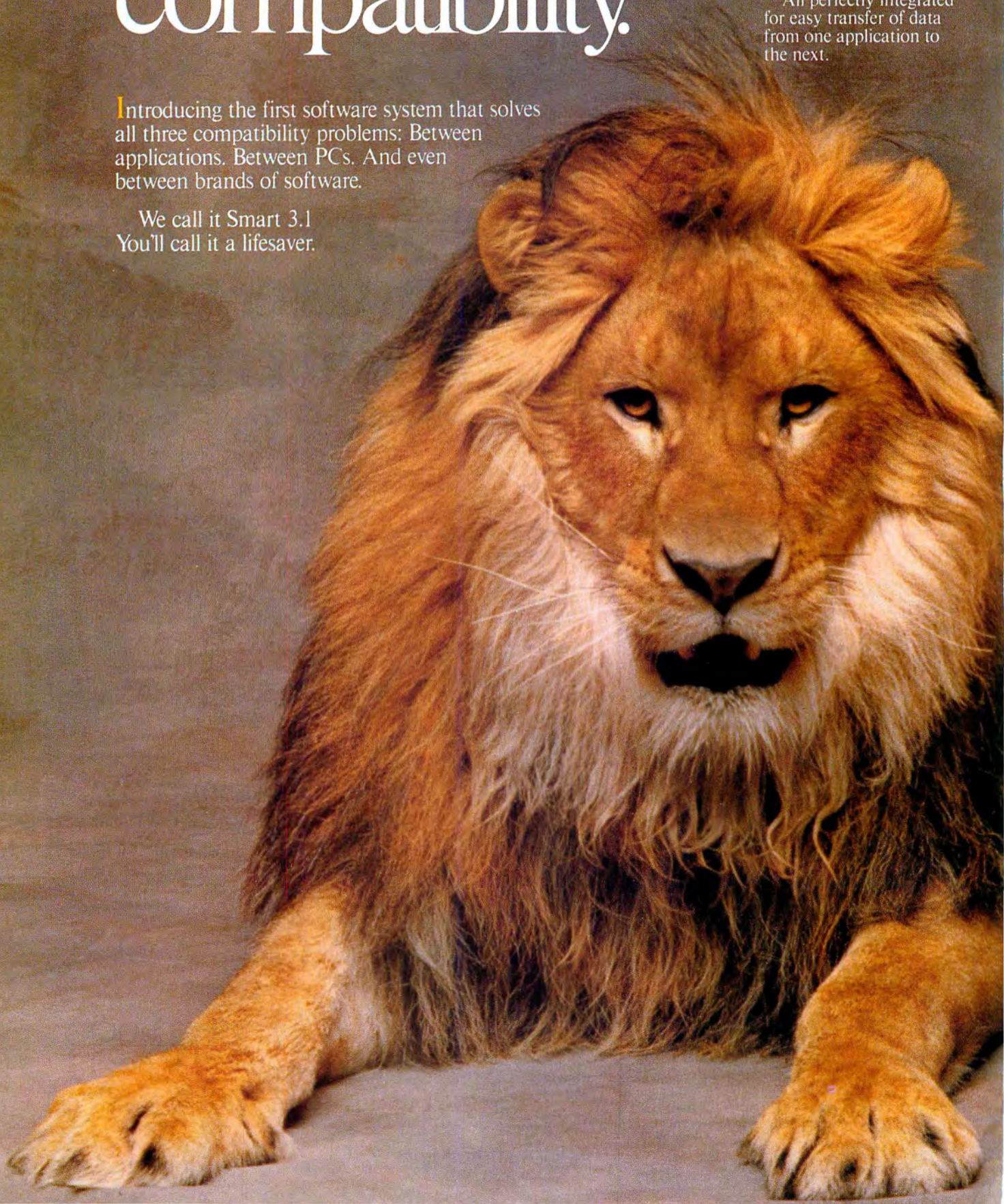
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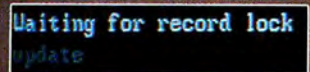
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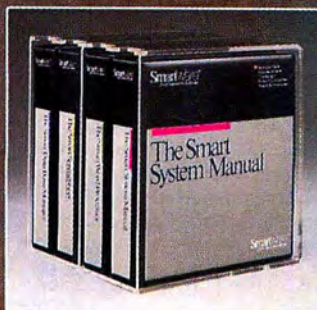
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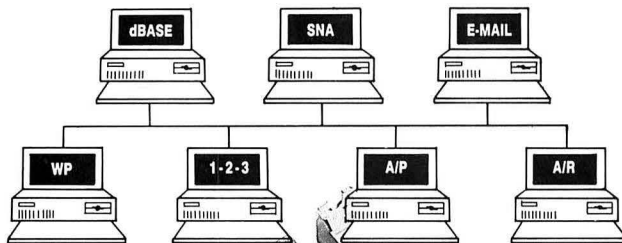
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multiprocessing—that is, to run more than one microprocessor at the same time. (Models 25 and 30 lack this capability, because they don't use the 286 chip or the Micro Channel bus.) With the right operating system and application software, you could devote a single microprocessor to each task, suffering no loss in speed. According to IBM's Chet Heath, the designer of the Micro Channel, it's not very difficult to make these boards—although you'll be out another \$1000 or so for every one you add to your system. And this new trick simply won't work on the old AT bus that all 286 and 386 clones now use.

So to be truly accurate, Microsoft's diagram should have shown a PS/2 stuffed to its gills with add-in processor boards. But here's the rub: OS/2 isn't designed to perform multiprocessing, and nobody knows if a later version will be able to do so, either.

What does this really mean? Without the Micro Channel architecture or some equivalent *plus* a multiprocessing operating system, 286 and even 386 machines remain nothing but fast XTs. Are the benefits of multitasking so great that you'll junk your old applications and use a new operating system that slows down your AT or 386 to XT levels or worse? Will you dump your hardware too, on the off chance that a future enhancement will make your system perform like it should have

(continues)

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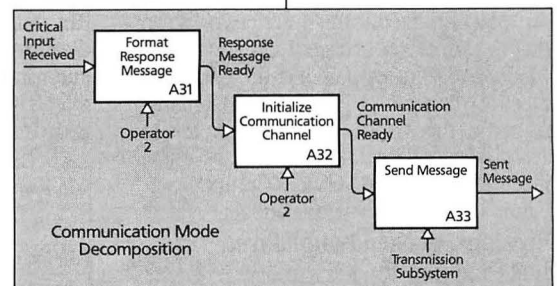
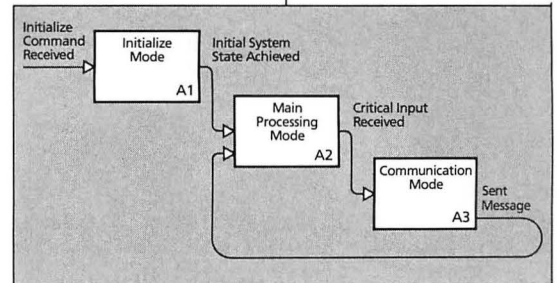
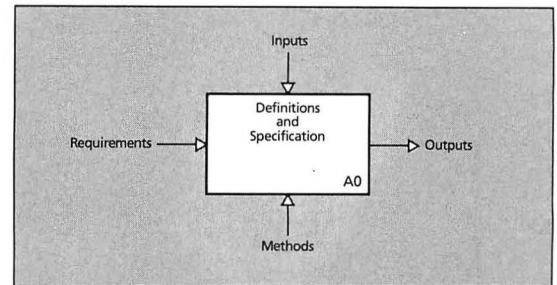
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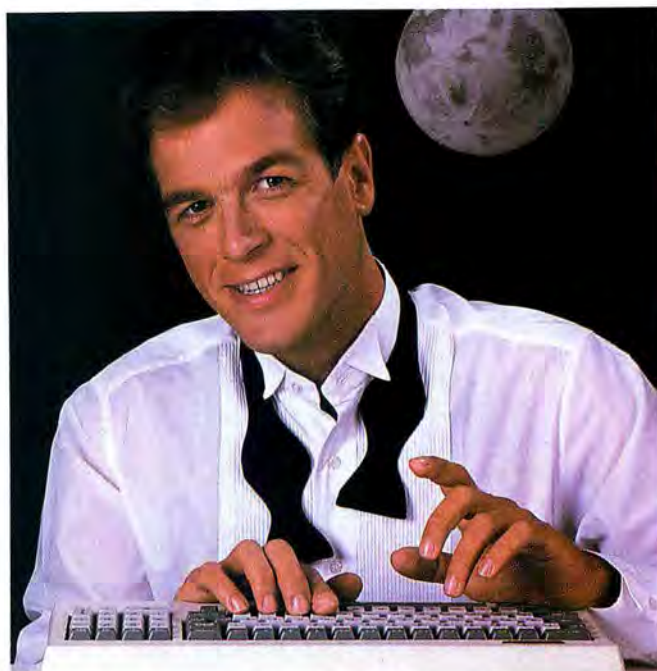
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from the start? Software developers like Lunt and Kahn say you won't go for it. I'd like to hear what you think.

Meanwhile, according to some reports, Microsoft has been saying privately that it will take a beating on OS/2, that sales may never offset the development costs that have gone into this Sgt. York tank of operating systems. These sources say that Microsoft is worried you'll stand pat with DOS until a 386 operating system arrives. Then you'll upgrade to 386 systems capable of full multitasking.

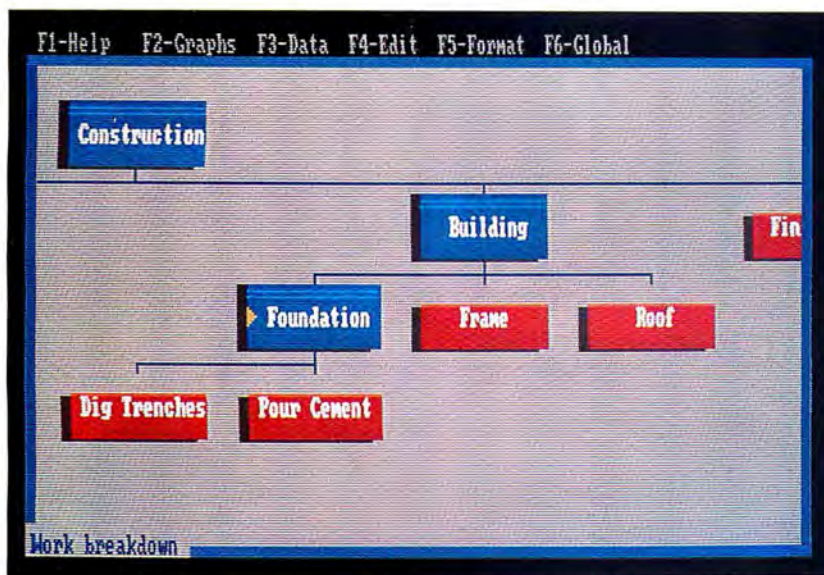
So who wins with OS/2? Right now, it seems as though only IBM comes out on top. But if you vote with your pocketbooks to remain in the DOS camp until a really substantial advancement comes along—like a multitasking, multi-processing operating system that takes advantage of the power of the 386 chip—then the giant itself may start singing the blues.

This issue of *PC World* brings a number of changes. First, it's my pleasure to introduce myself as the new Editor of *PC World*. I'm inheriting from Harry Miller the finest magazine in personal computing today and the most astute audience as well. Next, you'll notice that our short-review sections *From the Hardware Shelf* and *From the Software Shelf* have moved to the center of the magazine. "Getting Started" and

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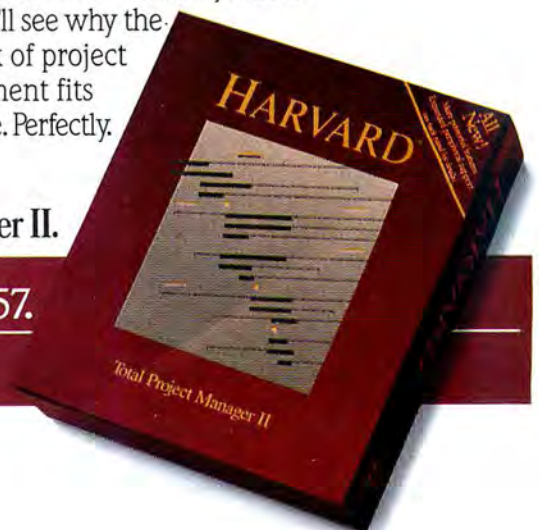
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Q. Is Peachtree Complete really the same product that used to sell for \$600 per module?

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With more than 150,000 users to its credit, Peachtree Complete has been the **PC World Class Winner** in its category for two of the last three years.

Q. What's the difference between Peachtree Complete and the \$69.95 systems?

A. Peachtree's system is called Complete because it contains the eight most needed accounting packages (including payroll) and all reference materials for one price. Remember, it was **designed as a \$4,800**

accounting software system.

The \$69.95 systems, on the other hand, are incomplete. They were designed to sell for \$69.95 and require the purchase of additional modules to be comparable—payroll, \$49.95 more; tutorials, \$19.95 each; etc. Everything is a la carte.

Q. How soon will I outgrow the system?

A. Peachtree Complete handles revenues up to \$21,000,000, so only the largest companies will outgrow the system. The ability to **process data for an unlimited number of companies** is one of the system's biggest selling points.

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to many popular spreadsheets and databases, as well as produce custom reports.

Q. What if I'm not satisfied with Peachtree Complete?

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"Hands On" have been consolidated into a new section called "How To," while *PC World View* has been replaced by *Industry Outlook*. We feel these changes create a format that is easier to read and more relevant to your needs.

You'll also notice that we've added a new voice to *PC World*. Beginning this month, Will Zachmann writes a regular column called *On IBM*. Vice president of the research firm International Data Corporation, Will brings a unique and somewhat contrarian perspective to the game of IBM-watching. At a time when IBM is reshaping the face of personal computing, it's Will's job to keep us all informed about Big Blue's latest stratagems. I don't expect to always agree with Will, but I do expect to be provoked by his candor and insight. I hope you will, too.

I'd like your feedback on these changes or on any aspects of *PC World* that you enjoy or think could be improved. Please drop me a note or send an MCI Mail message. My MCI number is 301-3685, and *PC World's* address is 501 Second St., San Francisco, CA 94107. ●

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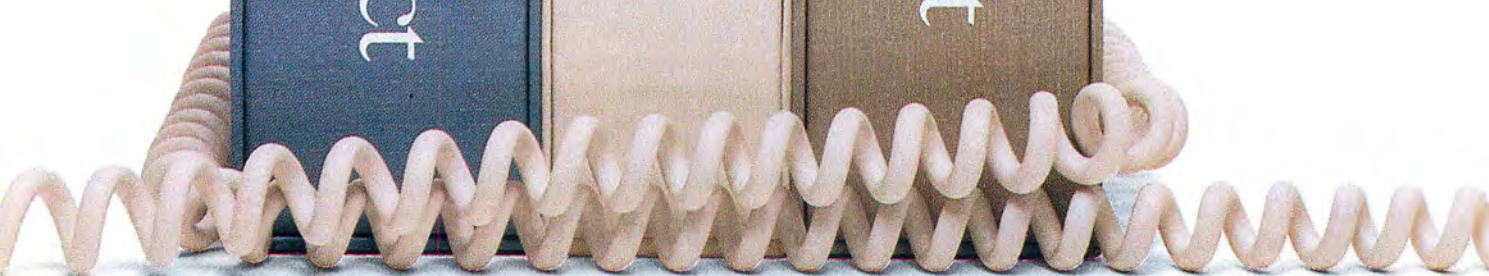
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Stewart Alsop

Programming for the Rest of Us

Complex languages make programming an enigma for most users, but user-programmable software may soon help resolve the mystery.

The personal computer industry really wants to turn you into a programmer. But you aren't being very cooperative.

The reason you're not falling in line is that most of you aren't too good at learning to speak new languages, a skill that's usually required to write a computer program. Still, the personal computer industry's idea of software perfection is to enable you to program your applications and your computer to work exactly the way you want them to. Despite your recalcitrance, there's evidence that the industry is getting close to achieving perfection.

One reason that personal computers have become such an amazing phenomenon is that they deliver enormous power into the hands of individuals at a reasonable price. With software such as *1-2-3*, *dBASE*, *WordPerfect*, and *SideKick*, an individual can produce an enormous amount of work, with minimal interference or help from others.

The very "personalness" of personal computing, however, brings with it a frustrating conundrum,

namely that the power of the machine can be tailored to your purposes only if you learn to speak its language. The difference between using a popular, off-the-shelf application program and writing your own is vast—separated by years of studying the syntax, construction, and logic of a particular programming language.

A remarkable number of you have at least learned to write simple programs in a language like BASIC or Pascal. Microsoft has sold millions of copies of BASIC by getting manufacturers to build it into their machines. And Borland International alone has sold more than 500,000 copies of its famous Turbo Pascal. Even Borland's recent introduction of Turbo C, a version of a language generally considered appropriate only for commercial software development, was one of the hottest new products in the industry's history. It's safe to say that at least a million people out there have learned how to write programs in a relatively low-level language.

(continues)



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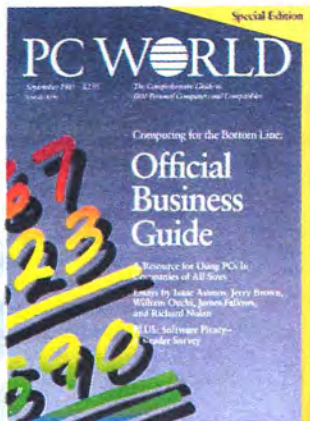
Still, it's a small percentage of users who can make that claim. To make "perfection" accessible to a wide audience, the industry's latest solution is to offer programming capabilities so you don't need to learn a language. In essence, the goal is to eliminate the gap between using software and creating it.

While this dream has flourished for years in research labs and think tanks, the first real commercial evidence of progress began to take shape in 1983 with the arrival of 1-2-3. 1-2-3 contained what came to be known as a macro language, a way of telling the computer how to automate repetitive and boring tasks. 1-2-3 macros also turned out to be a way for users to customize the program.

Unfortunately, macros (also called scripts or procedures) are fairly complex languages, requiring users to learn the correct syntax and logic to make them work. They're simpler to learn than a programming language, but they still require a certain amount of dedication and knowledge.

Macros have increasingly been incorporated into other kinds of software, such as communications programs, utilities, and more recently, word processors. They've become a foundation of what is frequently referred to as *softer* software, commercially available applications that users can tune to their particular needs.

Further progress toward user-programmable applications is evident in radically easier-to-use data base languages. Mainframe data base languages have been around for years, using basic elements of information management rather



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than computer logic as their tools.

The first successful data base language for the PC was built into *dBASE*, but it's extremely difficult to learn. Later development work, primarily on the Apple Macintosh, focused on using icons and graphical objects to ease the learning process and enable users to manage data without resorting to complex languages. Ashton-Tate even sacrificed complete compatibility with PC *dBASE* to make the language in its *dBASE* Mac program more amenable to novice end users. But, even with an easy-to-use interface and graphics, data base management is a hard concept for people to master.

A hot new topic in the world of user-programmable software is something called hypertext. While much of what's being said about it is strictly hype, some underlying hypertext concepts will ultimately make the dream of user-programmable software a reality.

Hypertext treats text as data and provides a construct for building pathways, or links, according to user-defined rules so that a user can quickly explore and assimilate a massive body of knowledge.

The first commercial hypertext program is Owl International's *Guide* (released first for the Macintosh and more recently for Windows), which lets a user build a hypertext publication. *Guide* is

great for building such documents if you know exactly how you want the links between text to work. If you don't, it's very easy to get lost, even in a publication you've created.

The most recent and most promising effort to create a user-programmable environment took form in August 1986. Developed by Apple and included with every new Macintosh, *Hypercard* is an integrated amalgam of macros, data base languages, hypertext concepts, and the Macintosh user interface. Notecards, which contain all of the information you

(continues)

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might want to keep, are its central metaphor. You can design cards to look like anything you're capable of drawing (including Rolodex cards, calendar pages, atlases, book pages, and so forth), and you can relate "stacks" of cards to each other so that they work together.

On each card are "portable" buttons, which are predefined (or user-definable) areas that you click to make the program do something. Buttons can be cut and pasted from one card to another just like text or pictures, providing building blocks for a new application.

With *Hypercard*, Bill Atkinson (creator of both *Hypercard* and *MacPaint*) synthesizes all previous attempts to create user-programmable software: macros, languages, graphics interfaces, and hypertext. By integrating the best elements of each method, Atkinson enables a novice to program a computer by just cutting and pasting buttons, painting cards, and using dialogue boxes to connect groups of information. By building a language into *Hypercard*, which accesses the Macintosh's internal resources, Atkinson gives the novice an opportunity to grow into an accomplished program developer who can create fully functional applications.

Unfortunately, you won't be able to use *Hypercard* on a PC, since it's developed and published by Apple, which isn't likely to turn it into a PC program any time soon. But maybe, just maybe, Atkinson has finally found a way to do what the industry hasn't been able to do so far: persuade us that we might want to write programs, even if we won't think of it as programming. That's an idea compelling enough to eventually show up on the PC. ●

Stewart Alsop is editor and publisher of P.C. Letter and a Contributing Editor for PC World.

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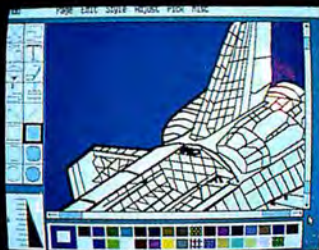
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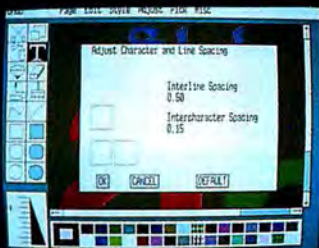


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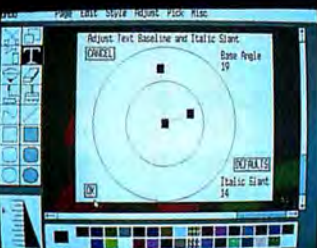


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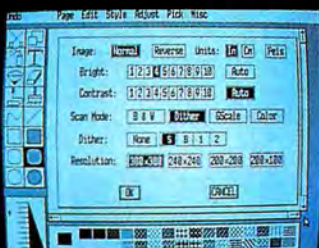


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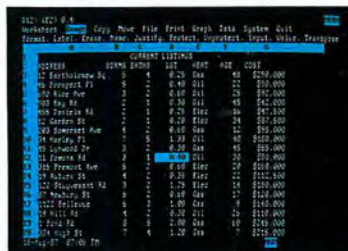
30 seconds let your software run with mouse —

The Genius Menu Maker comes with its own package that permit you creat a pop-up menu for any application software. For example, LOTUS 1-2-3, WORDSTAR... and many others, including your own.



Creat a Pop-up Menu

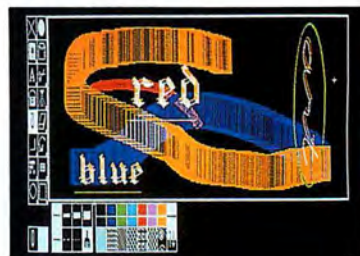
Most of the other pop-up menu is too hard to creat a pop-up menu your own software. But Genius Menu Maker let you make easily to creat yours in few minutes. Just only follow the instruction.



Run a Mouse through Lotus 1-2-3

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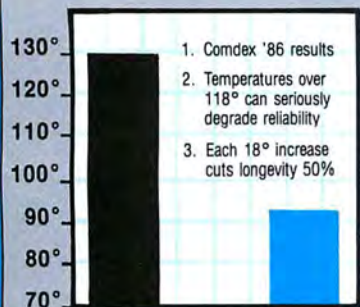


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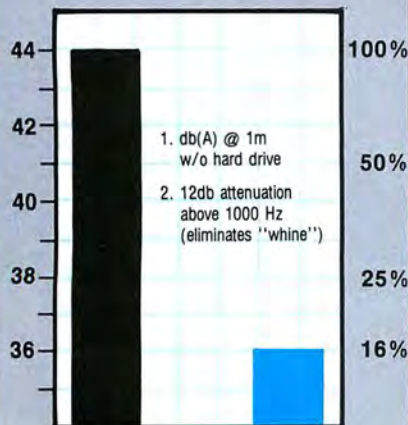
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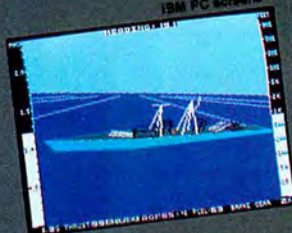
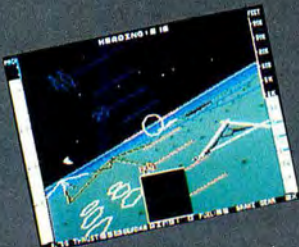
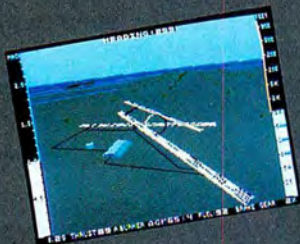
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William F. Zachmann

On IBM: What Personal Computers Mean to Big Blue

IBM made PCs a business necessity, but now personal computers threaten Big Blue's hold on the top spot in the marketplace.

It's only natural that we, as users, evaluate personal computers from our own perspective. We want to know what they can do for us and what they cost. But for a full understanding of IBM personal computers in general and the PS/2 line in particular, we need to understand another perspective—IBM's.

For IBM, the personal computer isn't just another product it happens to sell but a strategic product of critical importance to the company's future. There's more to this than the tremendous acceptance of IBM personal computers in business over the past decade. Personal computers, including IBM's own machines, pose a dire threat to IBM's position as the world's dominant computer company.

Personal computers aren't just the latest development in computer technology. They aren't just the latest stage in the ongoing development of information systems, which began when computers were first used in business in the early 1950s. Personal computers

are the earliest and most visible ripples in a wave of radical innovation that, over the next few years, will revolutionize information systems. As such, they pose a threat to the prosperity of all currently successful information system vendors. And no vendor has been more successful in the past, nor will any vendor be more deeply challenged over the next few years, than IBM.

For all the conventional talk about fourth- and fifth-generation computers, there has really been only one generation of information systems so far: the mainframes and minicomputers that have been IBM's dominion for years. First-generation information systems are characterized by proprietary system architectures, operating systems, and network environments. They are dominated by a computer-to-terminal paradigm and by traditional data communications.

(continues)

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On IBM

Personal computers are the shock troops leading a second generation of information systems. Second-generation information systems are characterized by microprocessor-based distributed resource systems. The key components are the personal computer desktop workstation linked by high-speed local area (and extended wide area) networks and supported by a multiplicity of increasingly powerful, sophisticated servers. Traditional multi-user mainframe and minicomputer systems will be replaced by specialized multifunction servers with multiple microprocessor architectures.

Mainframe and minicomputer systems are now basically in the position that the dinosaurs were in some 65 million years ago when a traumatic change in climate eventually caused their extinction. Personal computers are like the protomammals, which initially lived in the shadow of the dinosaurs but eventually evolved into the dominant life forms on the planet.

The economics of building computers for the new generation of information systems will also undergo evolutionary transformation. The economics of scale that characterize first-generation information systems will not apply to the emerging second generation. Standardized components, software, and interfaces combined with increasingly modular ways of building systems will lead to

(continues)

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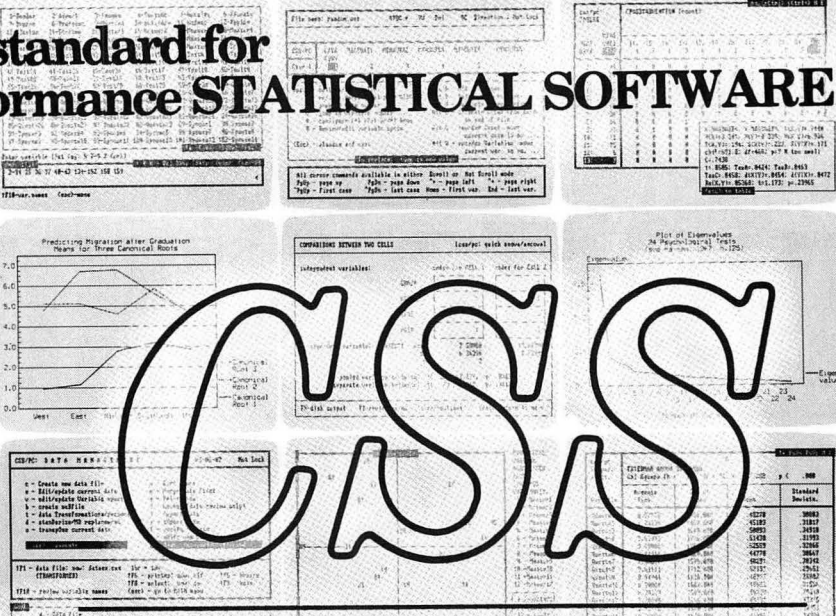
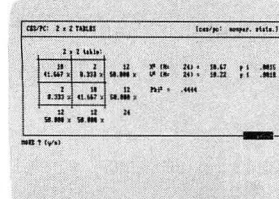
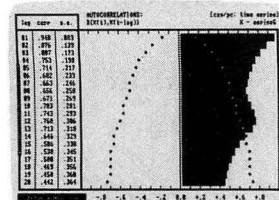
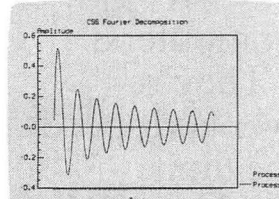
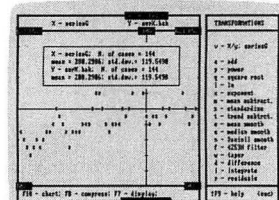
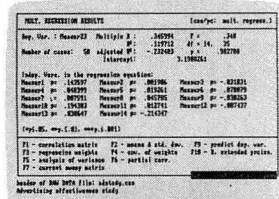
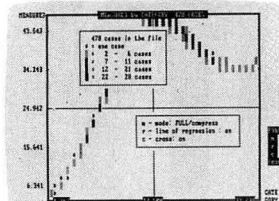
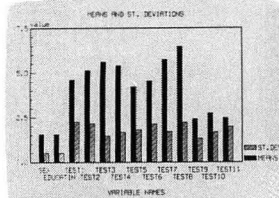
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Row	Col 1	Col 2	Row Total
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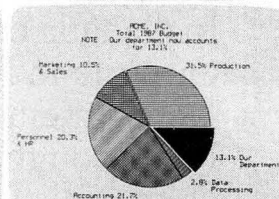
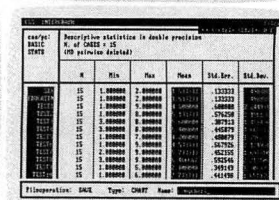
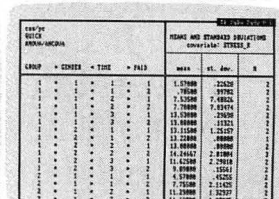
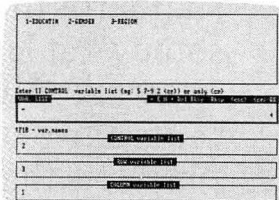
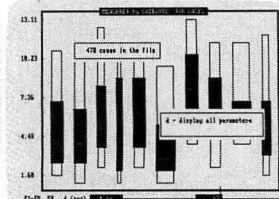
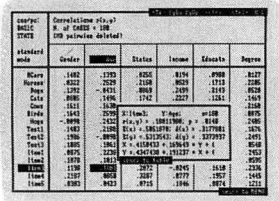
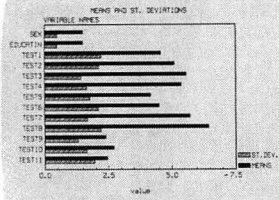
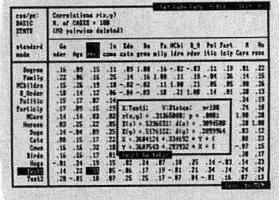
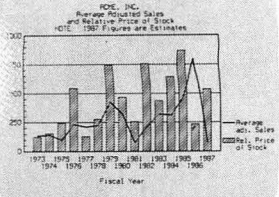


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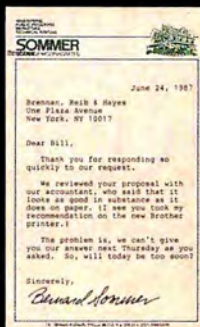


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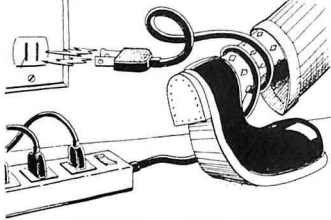
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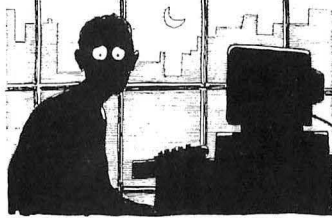
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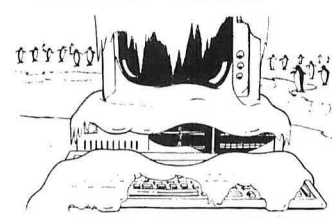
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"economies of assembly" rather than traditional, capital-intensive economies of manufacturing. That, in addition to the sales, marketing, administrative, and personnel expenses characteristic of large businesses, may actually put large vendors at a significant cost disadvantage.

IBM, for instance, will not be able to compete on price alone. Despite its ability to keep direct manufacturing costs low, "above the line" costs will prevent IBM from keeping total costs of sales as low as those of smaller, more mobile competitors. Moreover, because IBM has historically enjoyed high profit margins in markets with severely constrained competition, it's unlikely that the company will accept the lower profit levels engendered by competitive markets.

Only against this background does the rationale behind IBM's PS/2 personal computers emerge. Beneath all the hullabaloo about supposedly improved performance, new technology, and getting "closer to the customer" lies a critical imperative for IBM—to regain control of the computer industry.

Ironically, IBM's introduction of the PC in 1981 marked the beginning of the end for the main-frame era. Like Pandora's box, the PC let loose upon IBM's world a host of toils and troubles. Its stunning success in business unleashed

(continues)

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GRAND PRIZE LIVE LIKE ROYALTY AT A CARIBBEAN VILLA

8 days and 7 nights for four people at a Caribbean island villa, including round trip air fare.
(See 4 color cover of ad for details.)

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(3 winners) choose any one of three (3) vacation packages for two including airfare A) One week Caribbean cruise departing from San Juan; B) One week in Honolulu; C) One week in Acapulco.

But we said everybody's a winner!!

EVERYBODY WINS

a \$100 TravelDollars certificate*, redeemable on any vacation package, including air and ground accommodations, from a printed brochure. Just go to any travel agent and find a vacation package that most appeals to you, and bring the printed brochure home with you. Then call the telephone number on the back of your TravelDollars certificate, explain what you wish to do, and the reservations will be made. It's that simple!!

Oh!! One more thing —

EVERYBODY WINS

a \$10 Logisoft discount coupon, good towards your next Logisoft purchase. So now not only have you entered this stupendous sweepstakes, but you're getting an additional \$10 off Logisoft's already low prices on their entire inventory; and you still get their 30 day money-back guarantee!! Whatta deal!!
You receive both the TravelDollars certificate and the Logisoft coupon when you receive your order; the same order that entered you in the sweepstakes.

SO, C'MON, CALL LOGISOFT NOW, AND LIVE LIKE ROYALTY!!

TravelDollars certificates can be used with any vacation package of \$500 or more per person including air and ground accommodations from a printed brochure. Certificates cannot be combined for use on a single trip.

OFFICIAL SWEEPSTAKES RULES

1. No purchase necessary. For every product ordered by phone or mail during the period September 1 through December 31, 1987, you will automatically be entered in the sweepstakes (i.e., 3 products = 3 entries). Phone and mail orders must be received by December 31, 1987. You also may enter by hand printing your name, address, telephone number, and "Logisoft Live Like Royalty Sweepstakes" on a 3"x5" card and mailing it in an envelope, to: LOGISOFT SWEEPSTAKES, P.O. BOX 19-1764, MIAMI BEACH, FLA 33119, to be received by 12/31/87. Only one entry per envelope. Mechanical reproductions are not acceptable. Logisoft is not responsible for late, lost, or misdirected entries.

2. Winners will be selected in a random drawing by an independent judging organization about January 15, 1988. Winners will be notified by mail and may be required to sign an affidavit of eligibility and liability publicity release within 21 days of notification. Travel companions of winners will be required to sign releases. All taxes are the sole responsibility of winners. Odds of winning depend on number of entries. All prizes will be awarded. No transfers of prizes and no substitutions except by Logisoft due to prize unavailability.

3. PRIZES: One (1) Grand Prize of a one week (8 days, 7 nights) vacation for four people at a Caribbean island villa consisting of round trip air travel from any international airport

in the continental United States, \$1,260 cash allowance for meals and beverages, the services of a cook, maid, and gardener at the villa, use of a jeep and a cash allowance for fuel, and \$1,000 cash (approximate retail value \$15,000). Three (3) first Prizes: Choose from any of these vacation packages: a) One week Caribbean cruise departing from San Juan, b) one week in Honolulu, c) one week in Acapulco; all packages are for two persons and include round trip air from major gateways, 7 night accommodations, taxes, tips, and other extras as described in the tour operator's brochures. Cruise also includes food. (Approximate retail value of the first prizes are \$4,700.00). ONLY ONE PRIZE PER PERSON.

4. Sweepstakes open to legal residents of the U.S., age 21 or over, except employees and their families of Logisoft, Inc., its affiliates, subsidiaries, and advertising agency, and Lexington Promotions, Inc. Void in NY, FL and where prohibited or restricted by law. By participating you agree to these rules and the decisions of the judges.

5. For a list of major prize winners, send a self-addressed, stamped envelope to: LOGISOFT SWEEPSTAKES, P.O. BOX 19-1764, MIAMI BEACH, FLA. 33119 (by 2/15/88).

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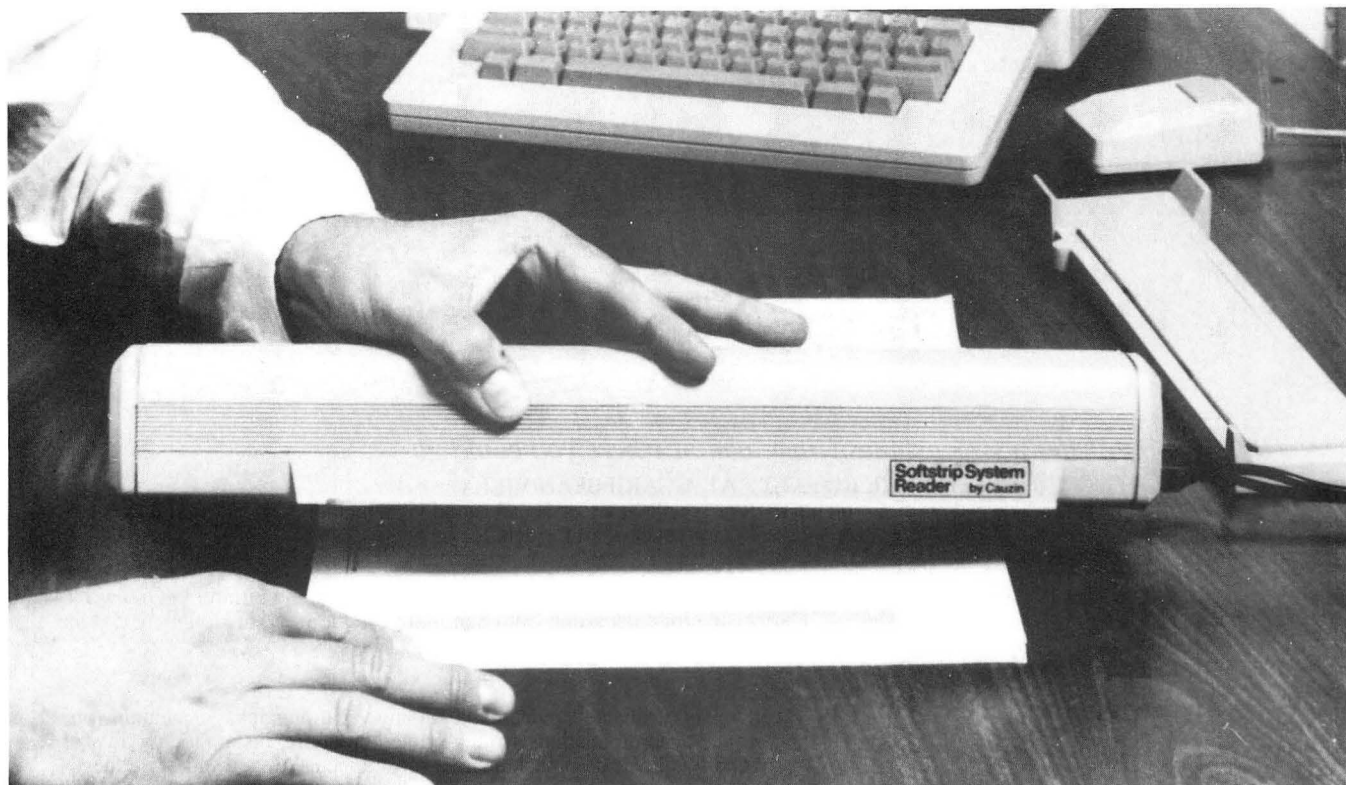
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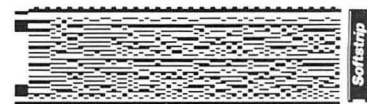
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LIVE LIKE ROYALTY

Sweepstakes

LOGICSOFT®

announces the "Yes, yes, yes, you too can live (at the taxpayer's expense) like royalty" sweepstakes. It's a week you'll talk about for the rest of your life!! A vacation money can't buy!!

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Yes, we do!! You'll live on the same tiny island as, uuhhh, right next door to, uh, er, let's just say oodles of famous people—rock stars, politicians, movie stars, more royalty—people you only read about in the National Enquirer!!

You'll enjoy all these sensuous pleasures in a secret place in the West Indies, at the villa of a royally famous individual. So royal and so famous that we can't even tell you who it is!! Due to protection of privacy, we had to sign a contract stating that we would not disclose the owner of the villa, nor the exact location of the island. So nobody knows, with the exception of the pilot (someone has to get you there!!), and of course you, the winner.

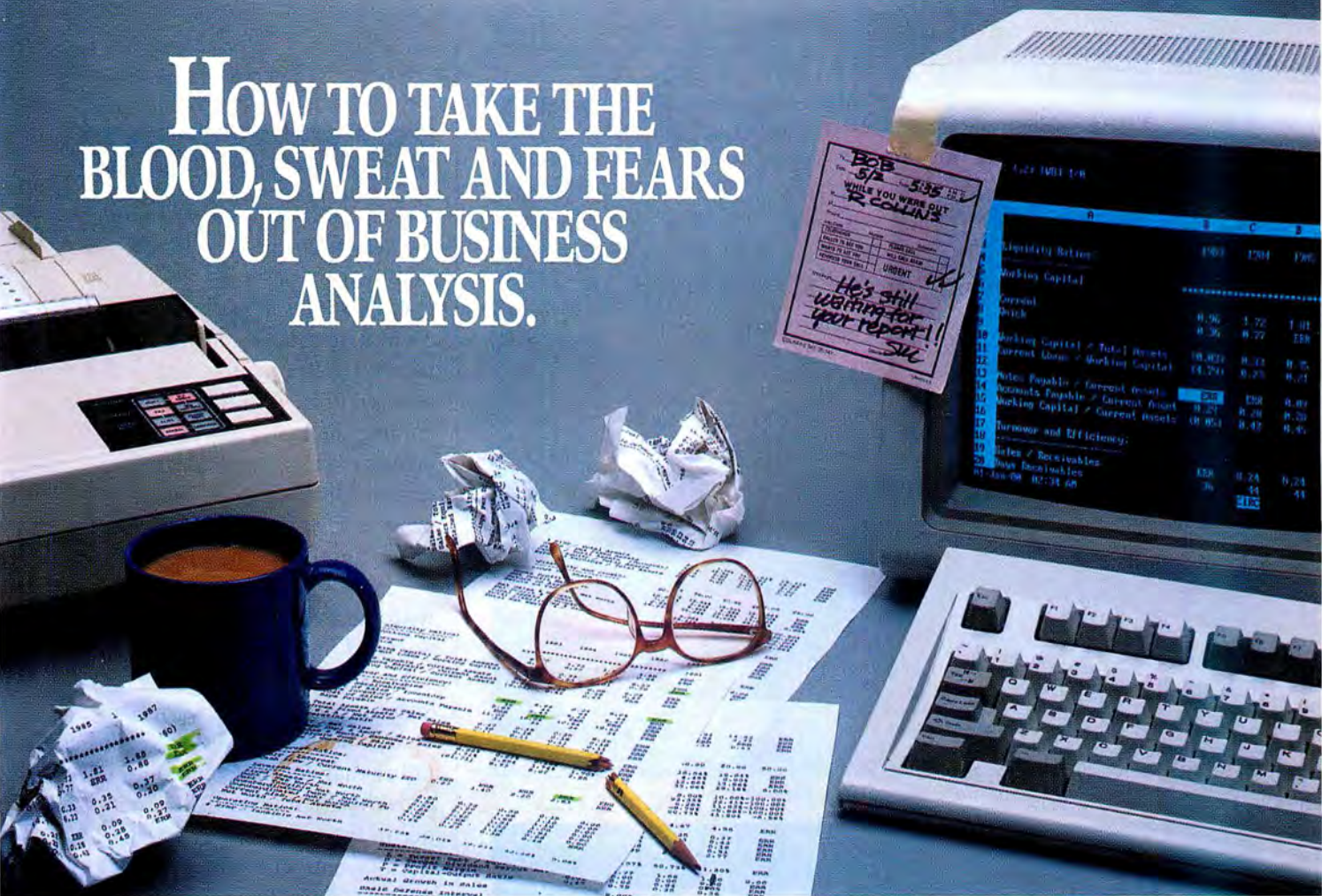
But who cares?? For 1 whole entire week it will be yours and only yours, to use but not abuse; to use the same "water closet" --- uses!! (Ha!! Thought we'd give the secret away??) In addition to a week of pure, unadulterated paradise, Logicsoft will give you \$1000 cash, to spend as you see fit. But, with everything included in this dream vacation, you may very well end up taking the money home with you.

EVERYONE'S A WINNER See inside for details.

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We've also opened up the architecture to accept modules for other specific business functions and applications, too. Several are free with Javelin PLUS, including "Multiple Regression Analysis." And others are already under development. So Javelin PLUS will grow with you in ways no spreadsheet can.

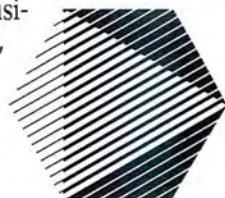
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forces that threaten to undermine the very foundation of IBM's dominance.

The PC was actually far more innovative than is generally believed. IBM broke into important new territory with the PC by becoming the first major vendor to deliver the expanded address space of Intel's 8088/86 microprocessor. Had IBM simply introduced another 8-bit, CPM-based system, it would not have met with the tremendous success that attended the PC.

Equally important, IBM's Entry Systems operation, which began as an independent business unit rather than an IBM division, radically departed from IBM's practice in the late 1970s by introducing a system with a completely open architecture. Not only were third-party hardware and software vendors brought in from the start, but minute details of the system were readily available. The original IBM PC Technical Reference Manual that I bought in 1982, for example, actually includes a complete, annotated assembly listing of the BIOS.

Naturally, this candor made it relatively easy for other vendors to clone IBM's PC and XT. Initially, compatible competition actually helped establish the IBM "standard" for personal computers.

Before long, however, IBM began losing market share to competitors that offered better features and performance, lower cost, or some combination of the

(continues)

two. By 1986, IBM's loss of market share had turned from a minor irritation into a major business problem. IBM needed to do something to stem the tide.

One option might have been aggressive pricing, innovative features, and improved performance, but that wouldn't have met IBM's need to regain control over the market. So at COMDEX Fall in November 1986, William Lowe, head of IBM's Entry Systems Division, made it clear that henceforth in IBM's lexicon, "open architecture" would simply mean that third parties could make compatible boards and peripherals.

In other words, IBM no longer believes that competitors have the right to build 100 percent compatible systems. After IBM's April PS/2 announcement, Lowe and others voiced IBM's intention to protect its "intellectual property rights" to the new machines.

Much of the complexity that keeps people scratching their heads over the PS/2 derives from organizational schizophrenia within IBM. Clearly as concerned with limiting competition as with delivering maximum value to its customers, IBM sought to preserve the image of an open system while making it as proprietary as possible. The "real" PS/2 machines (Models 50, 60, and 80—the Model 30 is a PS/2 in name only) are riddled with patent and copyright snares for would-be clone makers.

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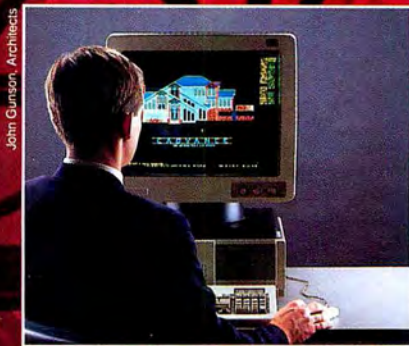
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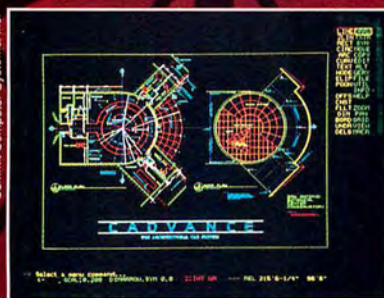
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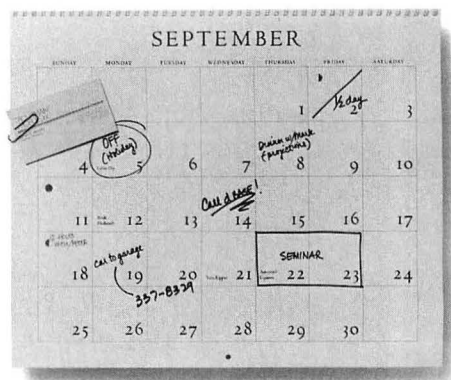
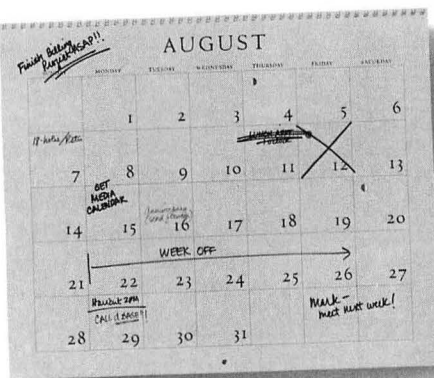
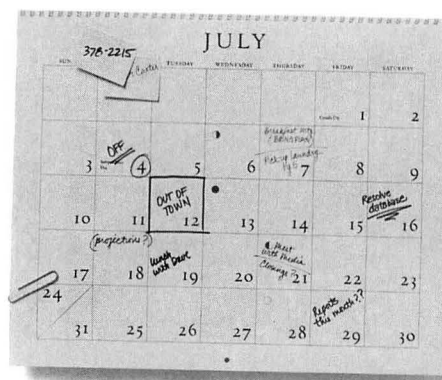
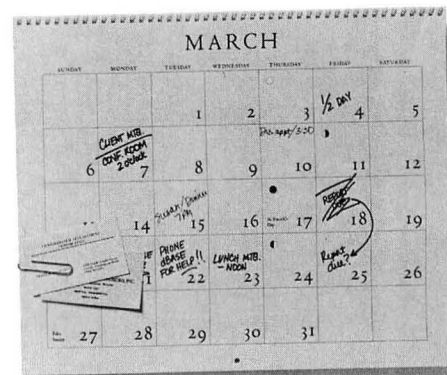
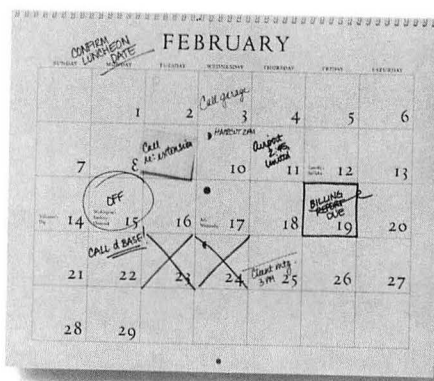
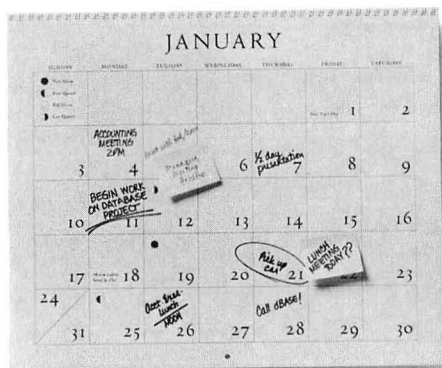
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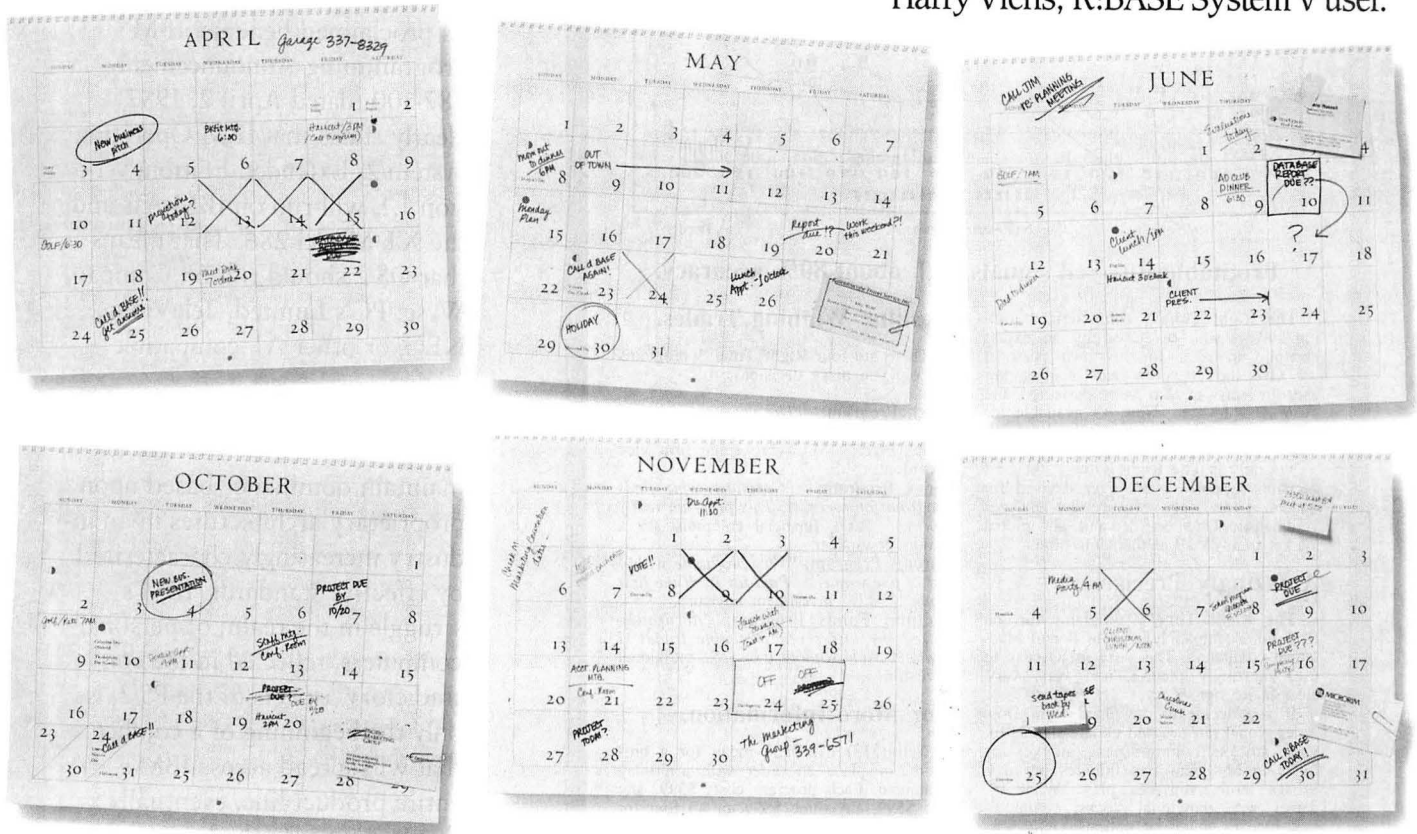
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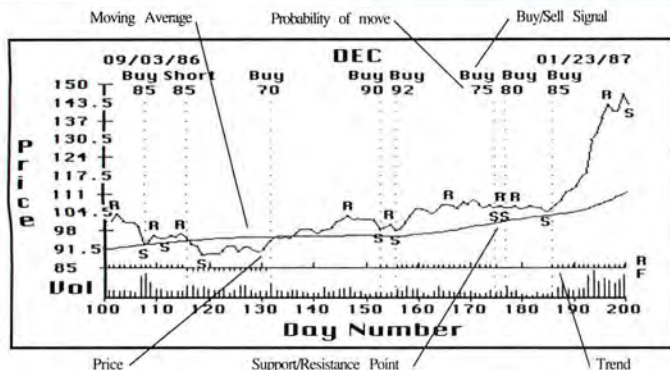


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Nevertheless, to IBM's credit—contrary to the impression that IBM's own spokespeople have created—users won't need to buy the Personal Systems/2 line to obtain its proclaimed benefits. IBM's Programming Announcement 287-100 (dated April 2, 1987) clearly states that IBM Operating System/2, Extended Edition, version 1.1, will run on IBM ATs and the XT Model 286. That means that OS/2 should run on Compaq, Wyse, PC's Limited, TeleVideo, NEC, or other AT-compatible systems.

Herein lies the essence of IBM's dilemma for the 1990s: how to maintain dominance based upon proprietary architectures in an industry increasingly characterized by effective standards. IBM's struggle in the realm of personal computers, reflected in the contradictory aspects of the PS/2, is only the beginning of a conflict that will spread across IBM's entire product line, eventually threatening even the largest mainframes. ☉

William F. Zachmann is vice president of research at International Data Corporation.

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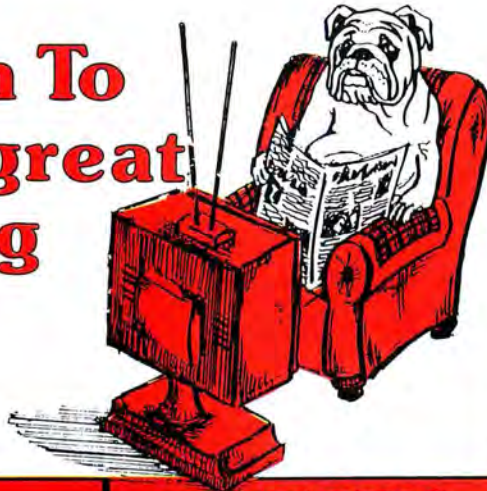
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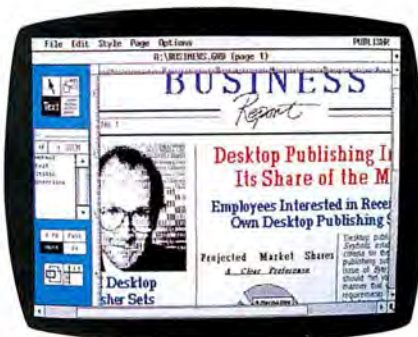
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Top of the News

Borland Debuts Power Spreadsheet

Borland International will unveil a fast, powerful spreadsheet sometime in the fourth quarter that includes fully integrated graphics and a soft interface that can be extensively customized by the user. Code-named *Silicon* during its three years of development, the product will be released as *Quattro*. Borland president Philippe Kahn calls it the next-generation spreadsheet, in part because *Quattro*'s soft interface lets multiple users each choose their own commands from a menu of the

most popular spreadsheet command sets. An extensive macro development environment allows further customization. *Quattro* runs 1-2-3 version 2.01 macros without modification, as well as .WKS and .WK1 files. Kahn claims that his program can calculate 1-2-3 files 30 percent faster than the Lotus spreadsheet, in part because of *incremental recalculation*, in which *Quattro* recalculates only cells affected by changes since the last recalc. It also reads and writes files from other popular spreadsheets. *Quattro*, whose main application core fits

on a 360K floppy, includes a complete presentation graphics package that provides control of fonts, colors, and graph types. Unlike 1-2-3, it can print graphs from within the spreadsheet module. Graphics can be saved as PostScript files for inclusion in other documents. The 256-column-by-8192-row spreadsheet uses a "sparse-matrix" technique that saves memory by storing only those worksheet cells that include data. No price has been set.

IBM Extends PS/2 Line

IBM has bracketed its six-month-old PS/2 line with a low-end computer for schools, homes, and small business and a 20-MHz, 80386-based system for businesses with large fixed-disk requirements. The Model 25 looks like an oversize Apple Macintosh. Its 8086, 8-MHz/no-wait-state CPU and single 3 1/2-inch, 720K disk drive are encased in the base of its 12-inch monitor for an overall footprint of 16 by 7 1/2 inches. A second floppy drive is optional, but no hard disk is available. The Model 25 comes with a shortened version of the AT enhanced keyboard and two IBM XT expansion slots. Its main selling points, say IBM staffers, are its com-

pact size, low price, and ability to connect to other IBM systems. But at \$1695 for the color version and \$1350 for monochrome, the computer is up to 35 percent more expensive than its competitors. State-negotiated volume purchases are likely to bring 30 to 40 percent discounts, predicts IBM education adviser John Hodges (the PS/2 Model 30 has been discounted as much as 45 percent); but other computer manufacturers are offering similar education discounts. The Model 25 has little education software currently available beyond IBM's popular *Writing to Read*. It will, however, allow teachers to distribute preplanned lessons from a file server and connect all school district computers together, points out Proctor Houston,

director of educational systems for IBM's Southwest Marketing division. At the other end of the line, the floor-standing Model 80-311 takes its place above the Model 80-111 as the most upgradable PS/2 machine. It will ship in early 1988 with a 20-MHz processor, the same system board memory of the 80-111 (2MB expandable to 4MB), and the same seven expansion slots. The standard configuration includes a single 3 1/2-inch 1.44MB disk and a 314MB fixed-disk drive—twice the hard disk capacity of the Model 80-111. The list price is \$13,995, with another 314MB fixed disk drive available for \$6495.

Tandy Recasts Its Computers

Tandy Corporation recently celebrated its tenth year selling PCs with a new product rollout that revamps the company's entire computer line but leaves Radio Shack stores still planted firmly in the market for inexpensive home, education, and small-business computers. Tandy, which is expected to ship more IBM compatibles this year than anyone, will carry its aggressive prices to the high end with its 80386-based Model 4000. This machine runs at 16 MHz and comes standard with 1MB of RAM expandable to 8MB on the system board, one 1.44MB 3 $\frac{1}{2}$ -

inch floppy drive, and nine expansion slots. All Tandy desktop computers will change over to 3 $\frac{1}{2}$ -inch disk drives and the enhanced IBM AT-style keyboard. At \$4299, the 40MB hard drive Model 4000 without monitor or graphics adapter is priced \$2000 cheaper than similarly configured systems from IBM and Compaq Computer. Tandy also showed its first MS-DOS laptop, the 13-pound 1400 LT. Styled like the IBM PC Convertible Model 3 with a backlit, Supertwist LCD, the \$1599 LT is based on an Intel 8088-equivalent processor. The standard configuration includes 768K of RAM, two 720K flop-

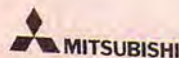
pies, a 76-key keyboard, and a battery pack good for 4 hours between recharges. Perhaps Tandy's most noteworthy offering is the \$699 1000 HX, which stores MS-DOS 2.11 and the core of Tandy's *DeskMate 2* productivity/utility software in ROM. The machine starts up on an application chosen by the user in about the time it takes the monitor to warm up. The 1000 HX comes with a dual-speed Intel 8088-2 processor, 256K of RAM expandable to 640K, and a single disk drive. Tandy also introduced three new versions of its AT compatibles and a \$2199, 6-ppm laser printer.

HP Introduces New PC Line

Hewlett-Packard is cautiously sticking its toe in the PC waters again but is keeping its arms wrapped securely around its minicomputer business. HP will soon announce an entire line of IBM compatibles, including an 80386 machine and a desktop/portable crossover. The Palo Alto, California-based company currently has a single MS-DOS-compatible offering, the Vectra. Although technically acclaimed, the Vectra has an installed base of only 90,000. That machine will be replaced by HP's new series of Vectra ES 80286-based computers in 20MB and 40MB hard disk configurations. Prices had not been set at press time, but PC product manager Jim Carlson indicated that the

machine would cost about the same as the current Vectra. For example, a Vectra ES with a single floppy drive, a 20MB hard disk, and 640K of RAM would sell for around \$3195 without monitor. HP is also introducing its new Vectra CS line, based on an Intel 8086-compatible NEC V20 CPU. HP's most interesting product in that series is its battery-powered, dual 3 $\frac{1}{2}$ -inch floppy Portable Vectra CS, which can operate for up to 10 hours on a single charge. Equipped with three available slots for HP-produced expansion boards, the \$2495 portable's Supertwist LCD can be removed and a full-size monochrome or color monitor added so that

it can function as a desktop system. Looking ahead, HP will ship in early 1988 its 80386-based Vectra RS series offering either a 16-MHz or 20-MHz CPU and 40MB, 100MB, 150MB, or 300MB hard disks. While the introduction of such a lineup would be a signal event for most companies, this one seems designed mainly to guard HP's minicomputer workstation customer base from incursions by other PC makers. There will be no significant increase in retail marketing expenses or efforts to increase the roughly 300 dealers now selling HP computers, reports Carlson. Nor does HP plan to challenge current PC market leaders, he says.



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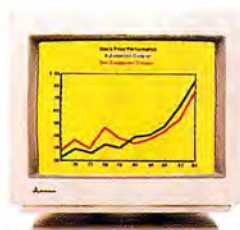
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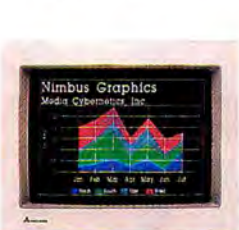
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Novice Users Get New Integrated Software

Microsoft is announcing in September an integrated software package for new and/or occasional PC users whose software needs are broad rather than deep in any one application. Microsoft's *Works* combines the four popular core applications—word processing, data base, spreadsheet, communications—with reporting and charting modules under the character-oriented graphic user interface of Microsoft's new *Menu Manager* DOS shell. *Works* is being released several years after wide acceptance of similar Microsoft prod-

ucts in the Apple II and Macintosh environments. But it is *pfs: first choice* from Software Publishing that has established this market for PCs during the past year with sales of 100,000 units. *Works* is for first-time users, executives, and nonpower users who don't want to dive too far below the surface of an application. Microsoft group product manager Mike Slade estimates that this group encompasses 40 to 50 percent of all users. Microsoft expects to gain significant sales from buyers of the new batch of 8088-based entry-level machines like the Zenith Eazy PC, which comes bundled with both the

Menu Manager and *Works*. *Works'* word processor is similar to *Microsoft Word* 2.0, employing the same printer drivers and spelling checker. *Works'* 256-column-by-4096-row spreadsheet has the functional capability of 1-2-3 release 1A except for tables and statistical functions and can import Lotus .WKS and .WK1 files. *Works* also includes a flat-file data base manager that resides in memory along with its record-and-playback macro utility. Its suggested retail price is \$195.

Leading Edge Ships Low-Priced AT Compatible

Leading Edge is scheduled to begin shipping in September a low-priced 80286-based computer to complement its popular 8088-2-based Model D. Like its predecessor, the Model D2 is manufactured by Korean giant Daewoo Corporation and comes completely configured for immediate use. The D2 is equipped with an 80286 microprocessor, which users can run at 6, 8, or 10 MHz; 640K of RAM expandable to 1MB on the motherboard; and a 5 $\frac{1}{4}$ -inch, 1.2MB floppy drive. The floppy disk controller is

built onto the motherboard and supports both 5 $\frac{1}{4}$ -inch and 3 $\frac{1}{2}$ -inch formats. The D2 comes with four 8/16-bit and two 8-bit expansion slots, an 80287 coprocessor socket, a 200-watt power supply, a Centronics parallel printer port, and an RS-232 serial port. An EGA board comes standard with automatic mode selection supporting MDA, CGA, EGA, and Hercules graphics standards. Also included in the \$1495 price is a 12-inch Hercules-compatible monochrome monitor, a 101-key IBM AT-style keyboard, MS-DOS 3.20, and GW BASIC 3.2. The price of the Model D, which has sold

more than 300,000 units since its introduction in June 1985, was recently lowered to \$1095. The D2's footprint is slightly larger than the Model D but 30 percent smaller than most AT systems, claims vice president of marketing John Sullivan. A second version of D2 will include a 1.2MB floppy drive and a 30MB hard disk with a 60ms access time for \$1995. There is room for still another vertical half-height storage device in the system. ●



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The action is so fast, even experienced pilots can "auger in." Which is why Yeager insisted on windscreens cursors that teach you in mid-flight: from flawless take-offs and flare landings to aileron rolls, Cuban 8's, even Hammerhead stalls.



Program Designer: Ned Lerner.
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Dig a hole and you'll face the wrath of the ultimate survivor himself.

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Industry Outlook

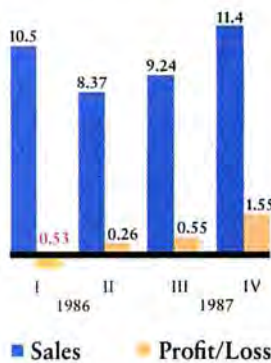
Edited by Eric Bender

A Star Reborn

"Thank you for calling the new MicroPro," says the friendly voice-mail recording. It's an indication that the one-time word-processing leader is out to reclaim some of its former glory. Armed with a new product lineup and a hefty promotional budget, MicroPro International plans to make a big splash in the months ahead.

Release 3.0 of *WordStar 2000 Plus*, the company's desktop publishing-oriented word processor, will hit retail stores in early fall. A high-end desktop publishing package code-named *Prism* is scheduled for introduction at a Fall COMDEX blowout that will also celebrate the sale of the 3 mil-

MicroPro Quarterly Financial Results
(in millions of dollars)



lionth copy of *WordStar*. To cap the festivities, MicroPro will give away \$50,000 in prizes to winners of a drawing from the names of all registered *WordStar* users. MicroPro's Christmas present to registered users will

be free upgrades to *WordStar Professional* release 5, which will be introduced a mere 10 months after *WordStar Professional* release 4. President Leon Williams attributes last quarter's earnings of 11 cents a share (the best performance in the past 13 quarters) to the success of *WordStar Professional* 4.0, which shipped 100,000 units in its first 100 days. Moreover, with a per-share stock price (\$6) triple what it was a year ago, \$25 million in the bank, and no debts, MicroPro is definitely on the acquisition trail. Outline processors, desktop presentation software, and paint and draw software are among the possibilities, says Williams. —Mike Hogan

The PC Network Crash



You read your credit card number to an anonymous operator a thousand miles away. You marvel at mail order's incredible prices. Then a nightmarish thought occurs to you: What if this really is too good to be true?

For 15,718 customers and suppliers of PC Network, that nightmare became reality on May 18. The Chicago

firm, which once claimed to be the world's largest PC mail-order house, filed for reorganization under Chapter 11 of the federal bankruptcy law.

Complaints had mounted during the preceding months as PC Network failed to ship products that were allegedly on "back order." Other consumers reported receiving substitute or defective goods. Repairs and refunds promised to irate purchasers never materialized.

One such customer, West Virginian Donnie Fox, says that he placed more than 30 calls to PC Network between last November and May. A game package and a printer accessory eventually

arrived. But he never received the color printer that he'd ordered or the company catalog—one of the benefits of the mandatory \$8 annual membership fee. Service problems were not new to PC Network, which in its prime boasted 170 employees. A torrent of consumer complaints spurred the Federal Trade Commission to fine the company \$61,000 in March for violation of U.S. mail-order regulations. But most observers say that PC Network had finally resolved those problems and that service had begun to improve.

(continues)

The PC Network Crash

(continued)

Fierce price competition during 1985 and 1986 finally knocked PC Network over the edge, says president and majority owner Stephen Dukker. "The industry itself was just nuts," he explains, pointing to many other discounters and retailers that went belly-up. Especially damaging was the mid-1986 collapse of First Software, one of PC Network's chief software suppliers. That firm's failure cost PC Network nearly \$500,000. Such news may be cold comfort to you if you're in danger of losing money as a result of PC Network's Chapter 11 filing. But all is not yet lost, because the company still has a chance to bounce back. You should receive a notice from the bankruptcy court informing you of your status as a creditor. (If you haven't, call the court at 312/435-6868 to obtain a "Proof of Claim" form to fill out, referring to case 87B-7306.)

If you paid for an item with a credit card, you may be able to get a full refund. Notify your credit card company of the situation by phone, then follow up immediately in writing and ask for a "charge back."

Federal law guarantees you a refund if you request reimbursement for unreceived goods within 60 days from the date the item appears on your credit statement. However, some credit card companies' internal guidelines are more flexible, and many banks have been known to honor cardholder requests made as much as a year later.

Most of PC Network's 15,000-plus customers, though, stand the best chance of getting at least some money back if PC Network stays in business. Companies in reorganization must fully reimburse consumers up to a maximum of \$900, reports Ronald Knell, a Los Angeles attorney who specializes in bankruptcies.

That's why PC Network's ads still run in computer magazines, although that may surprise many users. As Dukker is quick to point out, "It may be a shotgun wedding, but we are business partners with the people we owe money to right now."

At present, the assets of Dukker's firm and its two subsidiaries—Access Micro-Centers and T.H.E.—are under the control of the court and a panel of creditor representatives. "The irony is that a consumer is probably safer when placing an order with us than with seven out of ten other advertisers," Dukker insists. He also claims that PC Network no longer bills credit card customers until an order actually ships.

Consumer safety, of course, ultimately depends on PC Network's coming back.

Otherwise, reorganization will turn into liquidation.

—Harvey Rosenfield

Share and Like



Shareware paid off for Buttonware founder Jim Button.

Jim Button claims that his *PC-File* is the world's most popular data base manager, and it's hard to prove him wrong. Of course, it's hard to prove him right, because

he doesn't bother to slap serial numbers on all the copies going out the door. Such is the casual world of shareware.

Since Button wrote his first version in 1981 to print mailing labels for a local church, *PC-File* has reached something like a million users. While you can buy the latest release, *PC-File +*, for \$70 from a dealer, the software remains shareware—software that can be copied freely and that users

pay for on the honor system if they keep using it.

Buttonware, in Bellevue, Washington, also offers a word processor, spreadsheet, communications package, and other products. "Despite all the fads, I place my money on people wanting easy-to-use software," Button says. "We're doing several million dollars a year, and we've never borrowed a penny."

The minimal overhead required by shareware distribution has been the key.

(continues)



No Other Portable PC Can Make This Statement.

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Share and Like

(continued)

Button regularly gets letters asking how to get started in shareware, so earlier this year he joined *PC-Write* author Bob Wallace and others to form the Association of Shareware Professionals. Its goals? To help newcomers and "to set some minimum standards for shareware, so people will associate with shareware the respectability that it deserves."

Marshall Magee, another shareware enthusiast, had no grand commercial scheme in mind when he wrote the *Automenu* DOS shell a few years back. Showing it to a user group, he was flabbergasted when "some guy came up to me

and slipped me \$20. I asked him to send me a check at home, so my dad would believe that I could make money writing software." This year, Magee Enterprises in Norcross, Georgia, expects to make about \$800,000, mostly from sales to the Fortune 1000.

Many commercial developers have taken cues from shareware by dropping copy protection and soliciting comments from user groups, Button points out. One has become a shareware convert—Brown Bag Software, which recently cut a deal with Paperback Software that could put as many as 10,000 copies a

month of its *GoalSeeker* spreadsheet add-on into customers' hands.

High marketing and distribution costs drove Brown Bag out of traditional retail channels after eight years in business, reports Brown Bag's chairman Sandy Schupper. Shareware is a better idea, he insists, predicting that his company will double its sales this year to \$4 million.

Sharing the wealth a little further, registered users who turn others on to any of Brown Bag's programs get a 10 percent commission when the new user registers. With two huge site licenses, one user collected \$5000.

—E. B. and Mike Hogan

Network Visions

While OS/2 promises to fix many local area network shortcomings, users may have a long wait for network applications unless major network vendors settle their differences over the OS/2 LAN Manager.

Software developers have always faced daunting technical barriers to building packages that truly exploit PC networks (see "The Work-Group Ethic" in this issue). Microsoft's OS/2 operating system, with its support of multitasking and boosted memory addressing, promises to knock down many of the barriers. For the past three years, developers of network software have written to DOS 3.10 and IBM's NETBIOS interfaces. While these constitute a single development environment, it's a clumsy setup that might best be described as "lowest common



denominator," notes Rob Glaser, director of marketing for Microsoft's network business unit. "There's no way to handle intelligent processing over a net." Microsoft expects OS/2 and its accompanying LAN Manager network system software to overcome this hurdle and quickly dominate network server applications. But some of the developers now getting their

hands on OS/2 tools note that neither IBM nor network powerhouse Novell have endorsed the LAN Manager. The developers' greatest worry, they say, is that OS/2-based networks from different vendors may require separate software versions.

"We're about to take this horrible step backward," says Edward Belove, Lotus's vice president of corporate R&D. "What we can't deal with is different network software, and yet the one place where Microsoft and IBM are heading in different directions seems to be the network software. IBM's doing its Extended Edition, Microsoft announced its LAN Manager, and there are two competing directions from the two firms that own the standard in system software."

(continues)

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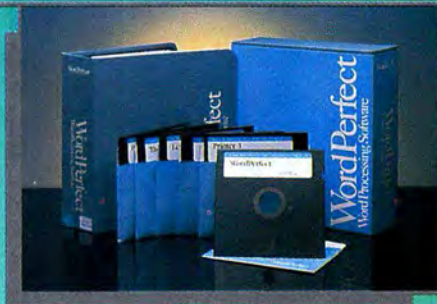
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Network Visions

(continued)

However, Novell vice president Craig Burton points out that most standard workstation-based applications, including his firm's Netware products, will run across an OS/2 net just as well as LAN Manager-based products. Potential difficulties do arise with ap-

plications tailored to run on the network server or on both server and workstation; here vendors (like Lotus, with its upcoming data base managers) can choose among several competing network system software platforms, Burton notes. Glaser agrees that workstation-based applications will

dodge the incompatibility bullet. "There aren't new programming interfaces—at the programmer's level, you just extend OS/2 across the network." And Microsoft expects to offer developers special run-time software tailored for server-based and distributed applications. —E. B.

Going On Line, On Time

As electronic publishing revenues climb past the \$5-billion-a-year mark, the market becomes an ever-more tempting target for large and aggressive software firms. Among them is



Ken Winkler

Don McLagan leads Lotus's CD ROM publishing efforts.

Lotus Development Corporation, whose initial focus is to bring new value to the one-fifth of 1-2-3 users who are in the financial services industry.

Lotus's first foray was with Signal, which shoots market quotes out to a FM radio receiver and then into 1-2-3 worksheets. After two years of lukewarm sales, Lotus has now carefully retargeted Signal toward sophisticated individual investors who make a lot of trades.

The spreadsheet king next acquired ISYS Corporation and its Microscan financial data base system. Micro-

scan was reborn as One Source, a collection of services that Lotus began delivering weekly on CD ROM last winter. "That's as much as 1 gigabyte of data we're working with each week," points out Don McLagan, vice president of Lotus's Information Services division. McLagan, who came to Lotus after helping to build Data Resources, a large economic-data supplier, comments that Lotus aimed to make the connection between data and analysis software as tight as it is in time-sharing.

In June, Lotus announced an agreement with Telerate under which the two will jointly develop and market offerings that feed Telerate's real-time international credit-market data into 1-2-3. Lotus-developed custom software will help traders, analysts, money managers, and other investment professionals find those big payoffs.

With the Telerate move, Lotus takes on a new role in sharing the complete chain of tasks that electronic publishing requires, says McLagan. "With Signal and

One Source, we're really going end to end.... Even for Lotus, that requires a lot of time and cost." Instead, Lotus would rather leverage its strengths with suitable partners—"the people who are doing most of that \$5 billion business."

The software giant will offer potential partners strengths not only in creating application software but in preparing and distributing data on CD ROM. "Nobody else is doing it weekly, nobody else is doing electronic updates, and nobody else has data fed directly into 1-2-3," McLagan declares.

Lotus also will snap up related services and technology, as it demonstrated in July. The company detailed its plans to buy Datest, which offers historical corporate data on CD ROM, and completed the acquisition of Computer Access's *Bluefish* full-text search-and-retrieval software.

"Our starting point is financial services, but we didn't buy full-text search-and-retrieval technology to sit on it," McLagan proclaims. "We are going to be the market leader in CD ROM publishing for business purposes." — E. B.

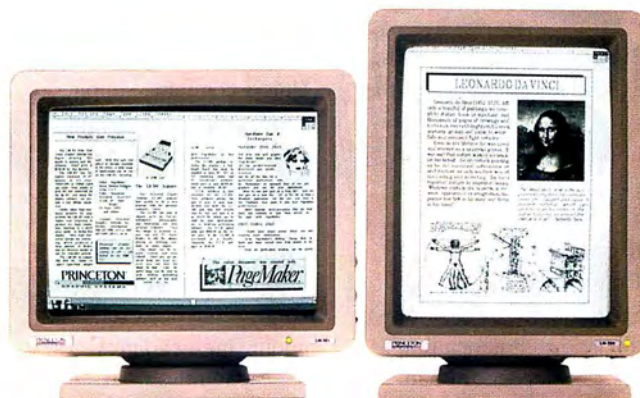
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Humming Along

Three years ago the commercial custodians of the artificial intelligence flame typically dismissed PCs as unworthy to run AI applications. A year ago, they began to grudgingly admit that PCs built around the Intel 80386 chip might prove interesting. This year, they all seem to be shipping PC products.

At this summer's American Association for Artificial Intelligence conference in Seattle, established AI software houses like Intellicorp were busily trumpeting the virtues of expert systems delivered on PCs. (A neigh-

boring exhibitor, Gold Hill Computers, has grown from 12 to more than 80 employees in two years by offering LISP language products for PCs.)

Even more striking, Symbolics, which dominates the market for specialized LISP machines, led the 386 parade. Symbolics unveiled software that lets users move packages developed on its pricey, powerful 3600 series computers down to a 386, along with a 386 coprocessor for 3600s. Competitor Texas Instruments, which is betting

heavily on AI technology, hinted strongly at a reverse approach that would allow its new LISP-machine-on-a-chip to attach to PCs. Meanwhile, A.I. Architects president Tom Spalding estimated that his firm's 386-based Hummingboard, which it comarkets with Gold Hill, may account for half the LISP machines now shipping. This awesome add-on, built around a 20-MHz 386 chip and shoe-horning up to 24MB of memory onto a single board, outperforms even Symbolics hardware in some tasks, says Spalding. —E. B.

End of the Line

Reports of the PC XT's death don't seem to be exaggerated. Early this summer, IBM confirmed plans to shut down production of remaining XTs and all but one AT model by fall. That leaves the AT model 339 as the final Personal Computer. Even as it launched the Personal System/2 line this spring, IBM ramped up production of

the 339. At press time, Big Blue had not set any final date for the machine's demise. Most observers expect the AT to remain in good supply throughout the year—unlike the XT, which became difficult to order months ago.

IBM told analysts in June that it had shipped 250,000 Personal System/2 models, had back orders for 500,000, and expected a

record year in personal computer sales. However, some have suggested that Big Blue was simply pumping the product into distribution channels. Substantial retail price discounts and quota pressure on direct sales personnel seem to back up that theory. The jury is still out on the scale of the PS/2's success. —E. B.

Desperately Seeking...Suitor

3Com Corporation, whose executives often suggest that good things come in threes, hopes for luck the fourth time around with the acquisition of fellow network supplier Bridge Communications. Seeking both to grow rapidly and to broaden into a system supplier, the Santa Clara, California, firm has had the urge to merge with

network developer Sytek, Unisys computer supplier Convergent Technologies, and Centram Systems West, a network software developer.

Most observers expect 3Com to build the Bridge connection, however, thus adding high-end networking capabilities to 3Com's PC and UNIX-based products. Unlike the parties in many mergers, both companies are profitable and growing fast. 3Com posted

earnings of \$3.2 million on sales of \$31.6 million during the quarter ended May 31. —E. B.

Mike Hogan is PC World's News Editor, and Harvey Rosenfield is a consumer lawyer in Los Angeles.

Princeton LS-300 SCANNER

Critically Acclaimed...

"The PGS LS-300 is a competent image scanner that is compact, reasonably priced and extremely fast and easy to set-up and operate...The LS-300 will stand out as an excellent value."

Personal Computing, April 1987

"The ability to alter the image in detail using the zoom feature gives this product a big advantage over many other scanners that rely on screen grabbers or their own graphics editors...The LS-300 is a good candidate for users who want a general purpose scanner for desktop publishing."

PC Magazine, April 1987

Imagine being able to scan photos, graphics, and illustrations into your personal computer and being able to precisely position them in reports and proposals. Preview the graphic impact of charts and tables, modifying at will, before they appear in print on your laser printer.

The Princeton LS-300 allows you to scan a full page of text and images into your IBM PC/XT/AT or compatible at a laser-perfect 300 dots per inch in as fast as 12 seconds per page.

The LS-300 can be used with PC systems that utilize CGA, EGA or monochrome displays. Or team it up with the Princeton LM-300 Monitor, to allow you to view full page visual effects before printing. An optional trainable OCR software package enables your PC to read and store typewritten pages.

PC Paintbrush Plus Included!

A \$149 retail value, the amazing PC Paintbrush Plus is included with the purchase of the LS-300 Scanner. The Paintbrush Plus lets you create image files, compatible with Ventura Publisher, Page Maker, etc. for professional-quality drawings, diagrams, charts, graphics, and headlines, with your mouse, joystick or digitizer. Manipulate images to create precisely the effect you want. Incorporate company logos, too!

Put a spark into your reports with the quick creative and productive LS-300. It's available with adapter board, PC Paintbrush Plus, and all cables, for a suggested retail price that's remarkably affordable, \$1,095.



Also available is an "SCSI" interface Mac Scan* for the Apple Macintosh. You can scan, edit and store a variety of Mac desktop publishing applications — MacPaint, MacWrite, PageMaker, ReadySetGo!, Ragtime and Just Text — and print on your Apple Laser-Writer.

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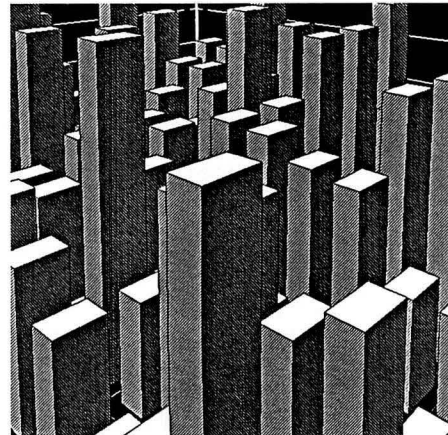
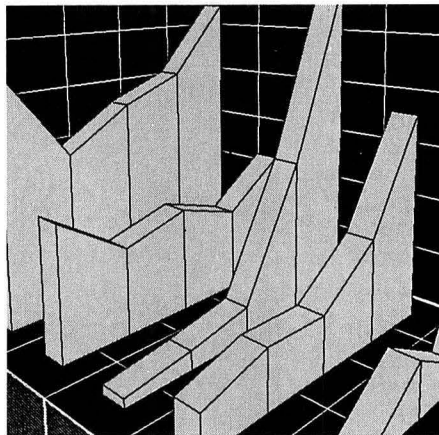
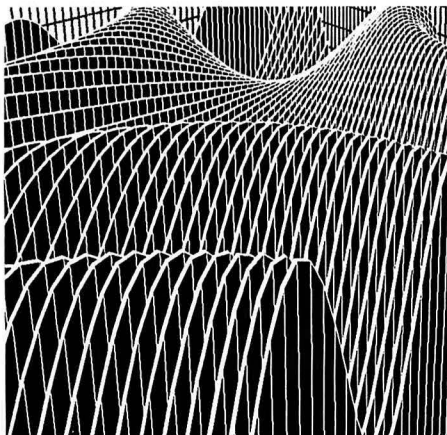
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ENABLE

Every now and then in the software industry something momentous comes along and changes attitudes overnight. The introduction of Enable 2.0 (with a LAN version, and now available on 3½" disks) promises to be one of those events.



Enable with Perspective.™ Talk about something to get excited about!

Perspective. *The graphics package.* As *Personal Computing* just wrote, "other products cannot even come close!"

Now, Perspective is fully bundled in Enable 2.0. Which means you can now have an integrated system beyond all others. Word processing, spreadsheet, DBMS, communications and mind-boggling graphics all in one. All offering the power business users need (for confirmation, just read our "Raves" column to your right).

And what Perspective offers is truly awesome:

- 15 2-D and 32 3-D graphs from Enable's spreadsheet or database
- Menu exhibiting all graph types for selection
- Graphs can be resized, and rotated 360 degrees or on any axis for best viewing angle
- 180 choices of shades and patterns for various graph elements
- Automatically converts data from one 2-D chart to another, or from 2-D to 3-D; all graph types compatible.

Note: the six remarkable 3-D graphs you see on these two pages were drawn using Perspective. Which should give you greater perspective on Enable 2.0's vast potential.

100+ new features and enhancements to enhance your productivity.

Not bells and whistles, but meaningful improvements! Across all modules. Brought about by listening to our special User Advisory Board, calls and letters to our Customer Support staff and continuing dialogue with such demanding Enable users as the U.S. Air Force, AT&T and Hughes Aircraft.

Here are some 2.0 enhancement highlights:

- A High-Level Language Interface [Basic, C, Pascal]
- Expanded macro facility
- Enhanced report language
- Enhanced menu generator
- Simplified installation/getting started procedure.
- 80,000 word Proximity/Merriam-Webster Linguibase™ spelling checker
- Row/column sorting on spreadsheets
- Simultaneous display and updating of spreadsheet and graph
- Enlarged Import/Export file compatibility with a wide range of popular software*

And remember, these are improvements to what is already recognized as the most fully featured, most powerful, most customizable, tightly integrated software system in existence.

More and more users are using more and more of Enable.

In the tough, spec-filled world of the Federal Government, Enable is by far the number one selling integrated software.

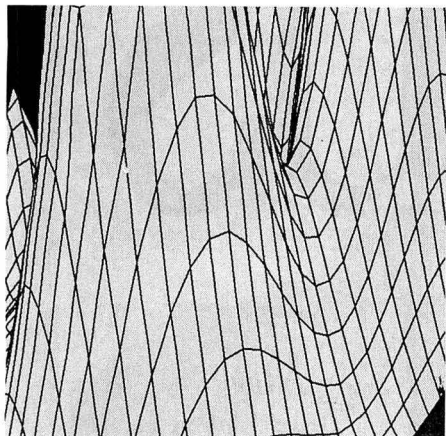
In the corporate world, after thorough testing and trial usage, dozens upon dozens of Fortune 1000 companies have specified Enable.

And thousands of smaller companies have come to the same conclusion: Enable has an incredible ability to handle a nearly unlimited range of jobs.

- From the Dow Corning Economic Evaluator, "It's not really a matter of finding ways to use Enable. I haven't found a way *not* to use Enable"
- From a DP Manager for Postal Service HQ, "When people come in for a spreadsheet, we give 'em Enable. Database... we give 'em Enable. Word processing... we give 'em Enable. I simply can't see us out-growing Enable"
- From Xerox, after benchmarking the three leading integrated systems, "[Enable had] the user-friendliness and methodology of integration we were looking for"

As a complete off the shelf product or as a base product on which to build special applications, there just isn't a package on the market that can touch Enable. Especially now that 2.0 is here.

IN A NEW PERSPECTIVE



One after another, the raves keep flowing in.

Raves! Raves! Raves! Reviewers were lauding Enable even before 2.0.

"A masterpiece of engineering... Enable clearly outdistances its competitors. It is, without a doubt, the first of a new generation of integrated software products."

(PC Products)

"The great thing about Enable is that it gives you all the benefits of a collection of top-notch stand-alone packages—plus integration to boot. It's what Symphony was supposed to be."

(Software News)

"If you are looking for one program to do it all, this is the one!"

(PC Magazine)

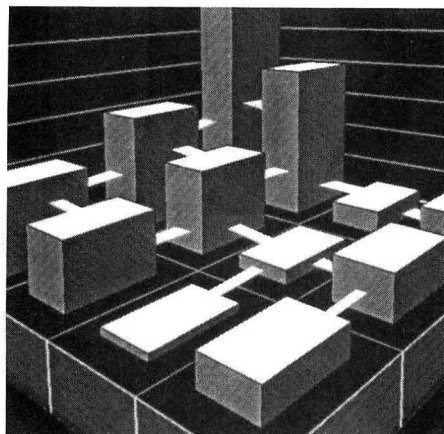
"Enable... may be the first program to make you give up your dog-eared WordStar, dBASE, Smartcom and Lotus 1-2-3 disks."

(Business Software)

"Each of the five modules... has a depth of features and functionality rare in an integrated package..."

(InfoWorld)

Enable 2.0 is bound to generate a whole new file of raves! Including your own.



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Consider, a system with all the benefits of Enable 2.0 itself:

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- Smooth, simple, fast integration between applications.

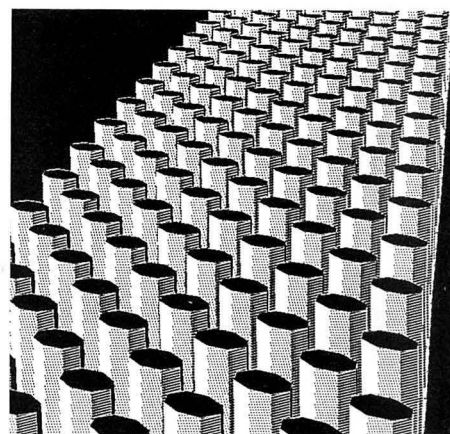
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(Available 2nd quarter, 1987)



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Mike Hogan

Q&A—Write Away

Like a popular second banana who earns his own TV series, Q&A's muscular word processor has spun off into what developer Symantec hopes will be a long-running saga in shrink-wrap.

Q&A Write is tuned to spreadsheet and data base devotees for whom word processing is a secondary—but still critical—application. Designed for tight integration with 1-2-3 and dBASE, Q&A Write makes it easy for worksheets and graphs to slide into text files.

From within a Q&A Write document, you can edit 1-2-3 worksheet ranges and even perform basic row-and-column math. You can also print files complete with columnar formats and imported 1-2-3 graphs. And integration is a two-way street: You can run 1-2-3 or dBASE directly from Q&A Write's main menu.

More than just another pretty add-on, Q&A Write is blessed with features usually found only in top-of-the-line word processors. Producing typeset quality documents is a cinch, since the Q&A Write menu offers nine popular fonts; the program also supports the HP LaserJet printer series and PostScript laser printers.

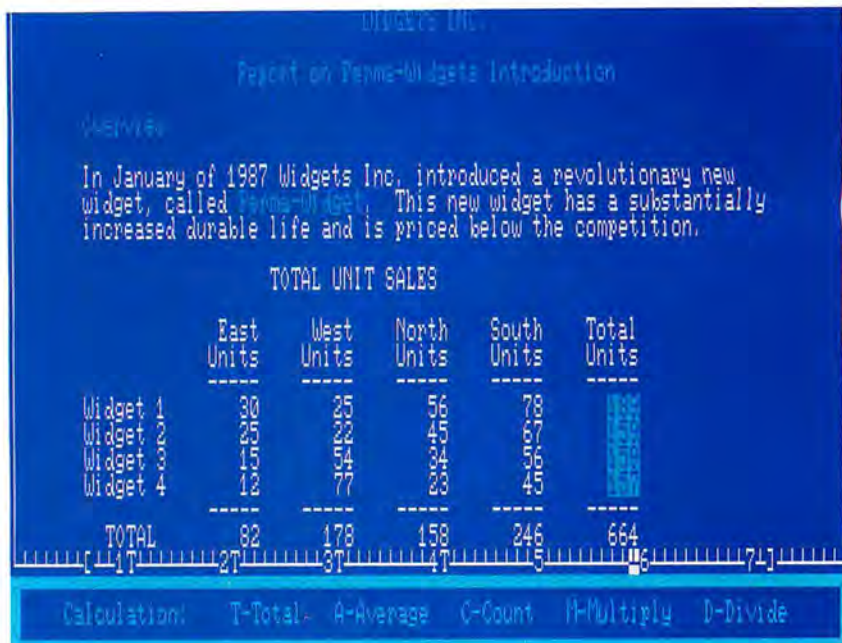
Other amenities include mail merge capabilities with *Q&A* data as well as data from 1-2-3, *dBASE*, and a number of other data managers. You can import data to create a handy 1000-record card file of frequently accessed names, addresses, and phone numbers. *Q&A Write* requires 384K of RAM and lists for \$199; you can upgrade to *Q&A* for \$150. Symantec Corp., 10201 Torre Ave., Cupertino, CA 95014; 408/253-9600.

New Lease on Computing

One of the ironies of computing is that the technology ages much faster than the hardware. Clock speed is passing by those millions of PC and XT compatibles that only recently entered the American desk force.

But thanks to a pair of 80386-based motherboard replacements, you don't have to send that trusty desktop servant into early retirement or settle for trailing-edge technology. Hauppauge Computer Works has introduced a \$1495 solution to bring your vintage IBM PC or XT up to snuff. Running at 16 MHz and equipped with 1MB of 32-bit system memory (expandable to 12MB), Hauppauge's 386 MotherBoard/PC and 386 MotherBoard/XT can hold their own with the newest systems on the block.

More than garden-variety accelerator boards, the Hauppauge duet is designed with an AT-compatible BIOS that promises a graceful segue to OS/2. Each



Symantec's *Q&A Write* will accept Lotus 1-2-3 spreadsheet ranges into a word processing document and let you perform simple row-and-column math.

board has a single 16-bit expansion slot; the 386 MotherBoard/XT offers seven 8-bit slots, while the 386 MotherBoard/PC has five. The motherboards fit only those machines that replicate the XT's form factor and connectors, and the firm claims that the replacement process doesn't amount to major surgery. Just pop the top, remove any existing expansion boards, unscrew the motherboard—and you've beaten back the ravages of time. Hauppauge Computer Works, 358 Veterans Memorial Hwy., Commack, NY 11725; 516/360-3827.

Worksheet Liberty

Long-suffering spreadsheet users are now in a position to acquire one of the data base maven's most cherished rights—the freedom to create run-time programs. Data

management compilers have brought significant cost savings, ease of use, and enhanced data security to work groups that share data bases.

Now several new compilers—including *@Liberty*, *Baler*, and *LTS_2_C*—enable you to create equally unique spreadsheet applications that can be legally shared by work group members who don't own copies of the original. As its name suggests, *LTS_2_C* translates 1-2-3 worksheets into compiled C code. *Baler* also works on 1-2-3 clone *VP-Planner*, converting 1-2-3 and *VP-Planner* worksheets into BASIC code. These programs can be run as is or compiled into worksheets with standard compilers. *@Liberty*, on the other hand, has a built-in

This is a scanning electron micrograph of common dust, magnification X80.

Is your computer developing a life of its own?

It's there. Underneath the keys, clinging to your CRT's.

Sitting right on top of your "Help" button.

Dust. Grime. Even ordinary oxide buildup on disc drive heads.

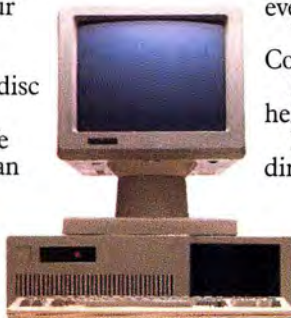
Without regular cleaning, it can shorten the life of your hardware. Cost money in repair bills. It can

even cause a loss of data.

That's why we recommend the new, Liquid Paper Computer Care Product line.

Products that not only wipe away the nasties, but also help control sticky static.

New Liquid Paper Computer Care Products. Get the dirt on your computer. Before it gets you.



LIQUID PAPERTM COMPUTER CARE LINE.

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compiler that immediately turns *1-2-3*, *Symphony*, *Multiplan*, and *SuperCalc 4* code back into familiar and ready-to-use worksheets.

Your department will no longer have to buy a separate copy of *1-2-3* for everyone who contributes to the budget or departmental sales forecast. Data can be entered or modified in unprotected cells, but critical formulas as well as macros, column/row formats, and labels remain off-limits in all but the developer's original worksheet. After everyone has added his or her two cents to a budget forecast, you can assemble the results in that original without fear of unseen reformulations.

An @Liberty license to develop 10 separate compiled worksheets costs \$99.95. SoftLogic Solutions, One Perimeter Rd., Manchester, NH 03103; 617/437-1600. *LTS_2_C* is \$150 for 25 uses from Resource Analysis Int'l, 12581 Venice Blvd. #204, Los Angeles, CA 90066; 213/390-7661. It works with a variety of compilers. *Baler* is \$495 for unlimited worksheets. It requires Microsoft's QuickBASIC III (\$99) for compiling. Brubaker Software, 8825 N. County Line Rd. E, Lafayette, IN 47905; 317/564-2584.

Color Meets NLQ

No, not another Japanese sci-fi flick, but rather, one more sibling in the growing Hewlett-Packard printer family. The **HP PaintJet** color graphics printer represents a refinement in HP's patented thermal ink jet technology; it's designed for the knowledge worker whose job demands presentation-quality graphs and reports.



The Hewlett-Packard **PaintJet** prints graphics at a resolution of 180 dots per inch and near letter quality text at 167 characters per second.

PaintJet graphics images come across with a big, bold resolution of 180 dots per inch after a single pass of the printhead, while NLQ text can spin off the platen at a brisk 167 characters per second. A full page of text prints in 40 seconds, a full page of color graphics in about 4 minutes. Ink, nozzles, and printing element are contained in two easily replaceable cartridges whose million-character duty cycle is sufficient for 1100 pages of black-and-white text or 180 pages of color graphics. PaintJet, whose footprint is the size of an 11-by-14-inch piece of paper, weighs in at a mere 11 pounds and never speaks above 50 decibels. Vendors of many popular software packages—including *1-2-3*, *Framework II*, and *AutoCAD*—are already committed to supporting the unit. The printer retails for \$1395, while each disposable cartridge sells for \$27.95. Hewlett-Packard, 3000 Hanover St., Palo Alto, CA 94304; 800/367-4772.

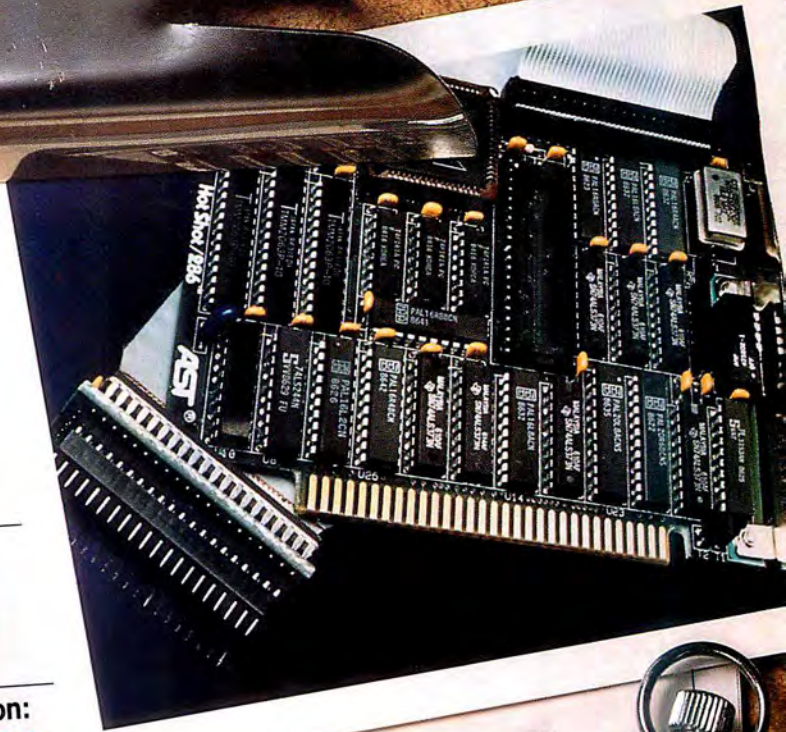
Faster Raster

It's great getting what you see, thanks to desktop publishing software, but are you getting it fast enough? Rotating a font or cropping a scanned image can throw a wet blanket over your once-blazing laser. Don't blame the printer; the bottleneck may be as near as the printer controller.

Conographic can turn those long minutes per page back into pages per minute. The **ConoDesk 6000** laser printer controller makes it possible to print output from page composition software at the rated speed of the print engine, in some cases as fast as 25 ppm.

Claiming a single slot, the ConoDesk 6000 speeds up a host of desktop publishing functions, including scanner image capture, the rendering of type outlines to bit maps, and support for dot matrix printers. PostScript and other page description language commands are transformed into raster images more than 30 times faster than with most boards.

*Why Do You
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It Hot Shot?*



IBM® PC/XT Accelerator Board Evaluation:

AST Hot Shot/286™

<input checked="" type="checkbox"/>	80286 Processor	
<input checked="" type="checkbox"/>	Speed	10 MHz
<input checked="" type="checkbox"/>	Half-Card Size	Fits XT short slot... beautifully!
<input checked="" type="checkbox"/>	80287 Math Co-processor Socket	
<input checked="" type="checkbox"/>	EEMS Compatible	Works with our AST expanded memory boards--Rampage® and SixPak Premium.™
<input checked="" type="checkbox"/>	EMS Compatible	Speeds EMS software like Lotus® 1-2-3®
<input checked="" type="checkbox"/>	Retains 8088 Processor	Hot-Key for toggling between speeds!
<input checked="" type="checkbox"/>	Cache Memory Speed	16 Kb maximizes speed.
<input checked="" type="checkbox"/>	Warranty	2 years
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The board also delivers up to 2MB of expanded memory and additional selectable print resolutions of 300-by-300, 600-by-300, and 400-by-400 dpi. Priced at \$1995, the ConoDesk 6000 can drive all popular laser printer engines—including those in the HP LaserJet Plus and Series II—and supports Microtek, Canon, Ricoh, and HP scanners. Conographic Corp., 16802 Aston St., Irvine, CA 92714; 714/474-1188.

More, Faster

Peripherals manufacturers that want to play in the laser printer market will have to dig deeper for the ante. Panasonic has upped the stakes in the laser price/performance game by introducing a unit with higher throughput and a lower tariff. For \$1999, Panasonic's **Laser Partner** will print a sizzling 11 pages per minute—almost twice the rated speed of its budget rivals. The Laser Partner offers the standard 300-dot-per-inch resolution and five built-in emulations, including the HP LaserJet Plus, the Epson FX-85, and the IBM Proprinter. Both serial and parallel ports are standard, as is 512K of RAM, expandable up to 1.5MB for full-page graphics.

The Laser Partner comes with two 250-sheet letter-size-paper cassettes, upgradable to legal size, and offers an envelope cassette option that eliminates single-envelope feeding. The Laser Partner is built around Panasonic's own engine with a 5000-sheet-per-month duty cycle over a five-year life



The new Panasonic Laser Partner offers a new price/performance standard, printing 11 pages per minute for a suggested retail price of \$1999.

span. By comparison, the HP LaserJet Series II has a 4000-page duty cycle. You can individually replace all consumable items—drum unit, toner, and developer—for the most cost-efficient use. Panasonic Industrial Co., Two Panasonic Way, Secaucus, NJ 07094; 201/348-7000.

Power Mail

You've mastered power lunches, power ties, and power spreadsheet and data management applications, and still you hunger for new worlds to conquer. Arc Tangent has your next challenge: power mail. Its *ArcList* mail manager is de rigueur for those who want to get serious about addressing envelopes.

No mere word processing add-on, *ArcList* bills itself as a professional list manager and has a professional price tag to prove it—\$595. But it's worth every dollar, claims the publisher, because *ArcList* provides functionality matched only by a mailing house

running a \$25,000 mail manager on a \$100,000 minicomputer. *ArcList* can manage lists of up to 20 million names, making it especially useful for direct-mail companies, political organizations, trade unions, magazine publishers, and anyone whose little black book packs the girth of the yellow pages.

ArcList will save you money and endear you to your letter carrier by presorting your correspondence according to U.S. Postal Service carrier-route and 5-digit ZIP code requirements. *ArcList* can merge-purge up to five lists at once and generate five different types of Postal Service-required reports. *ArcList* catches near-duplicate records, invalid ZIP codes, and errant state abbreviations. It generates list analysis reports and charts, nth samplings, and all types of labels. Registered users receive unlimited free support. Arc Tangent, 923 Olive St., P.O. Box 2009, Santa Barbara, CA 93120; 805/965-7277. ●

A Convincing Display for Desktop Publishing.

Don't sell yourself short! If you're doing desktop publishing on an IBM® PC/XT/AT®, or compatible, you need to see the whole picture. You need the AST TurboVision™ large-screen display.

Improve Your Vision. A standard display monitor shows a picture that's only 7" by 9". The standard printed page is 8½" by 11". If you think these two numbers are incompatible, you're absolutely right.

The AST TurboVision offers a full 15" diagonal display. That means you'll see your entire work, a whole page at a time, without scrolling, or shrinking, or trying to guess what your page will look like when it's printed.

What You See Is What You Print. Besides offering a full-page display, the AST TurboVision is a time and paper saver. You see, when the page on your screen matches the page coming off your printer, you can say "good

bye" to endless trial-and-error printing.

The AST TurboVision makes this possible through features like high-resolution output (1024 pixels by 1280 lines), "paper white" phosphor, a wide selection of on-screen fonts and support for all of your computer-generated graphic masterpieces.

A Display of Speed and Versatility. What's the next best thing to seeing the whole picture? Not having to wait to see it. That's why the AST TurboVision uses a state-of-the-art graphics chip to increase the speed in which images appear on your display. Make a change, then see it—almost instantaneously.

Spreadsheet artists can also see the benefits of the AST TurboVision. By showing four

Your changes show up on the screen faster than you can say "WYSIWYG."



Sometimes the best things come in big packages. The AST TurboVision shows the whole picture.

times as much data as a standard display, critical information can be viewed without the hassle of scrolling and paging from screen to screen. What an aid to spreadsheet productivity!

A Convincing Combination.

The AST TurboVision display monitor is packaged with its own graphics adapter. Hercules™ compatible, it works with just about anything you

want to run on your system, including popular publishing and business application software. Some examples include PC Pagemaker™, Ventura Publisher™ and Lotus® 1-2-3®.

Of course, AST TurboVision works with more than just IBMs and compatibles. It is also perfectly compatible with the AST Premium/286™ and the AST Premium Publisher™ to provide complete desktop publishing solutions.

Think about it. A computer publishing system is an investment in personal productivity. To get the biggest return on that investment, you need AST TurboVision.

For more information on the AST TurboVision full-page display, call **(714) 863-1480**. Or, send the coupon to AST Research, Inc. 2121 Alton Avenue, Irvine, CA 92714-4992, Attn: M.C.

Side-by-side, the difference between the display and the printed page isn't enough to chart.



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Mfg/Model	Pin/Type	Speed (cps)	Print Quality	Buffer (KB)	Column Width	Interface
OKIDATA M192 Plus M193 Plus 2410	9 Dot Matrix	200/40 175/87.5 350	Draft/ NLQ	8 4	80 136	Centronics or RS-232C or IBM Version
HEWLETT PACKARD Laser Jet Series II	Laser	8 pgs/min	LQ	512	Letter & Legal	Parallel & RS-232C/422
EPSON Fx-86e Fx-286e	9/Dot Matrix	240/ 48	Draft/ NLQ	8	80 136	Standard Parallel with "Dual Identity" Dip Switch
LQ-800 LQ-1000	24/Dot Matrix	180/ 60	Draft/ LQ	7K/ 1K	80 136	Parallel (Centronics Compatible) or Optional Serial (RS-232C)
NEC P660 P760	24/Dot Matrix	216/ 65	Draft/ LQ	8	80 136	Parallel (Serial Models are available)
DICONIX 150-P	12 Thermal Ink Jets	150/50	Draft/ LQ	1	7 1/2" Print Line	Centronics (Optional RS-232C)
TOSHIBA P321SL P341SL P351SL	24/Dot Matrix	216/ 72 300/100	Draft/ LQ	32 4	80 136	Parallel/Serial Standard Centronics Parallel w/RS-232C Serial

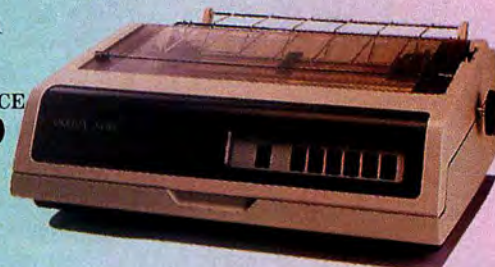
OKIDATA
M-193 Plus
List Price
\$649
OUR PRICE
\$489



The desktop user's choice due to the Microlines' sleek, spacesaving profile. Okidata has combined speed, paper handling, and compatibility with the latest in technology, making these printers among the finest in their class. Proprinter & 5152 graphics printer compatibility with IBM versions. Complete with semi-automatic sheet feed (friction and tractor).

M-192 Plus (not shown) List Price \$449 **Our Price \$339**

OKIDATA
2410
List Price
\$2395
OUR PRICE
\$1759



When you need versatility, this one's for you!! This printer has 3 speeds for 3 applications—like having 3 printers in one!! It can produce up to 350 cps, handle 4-part carbons, print full graphics; even variable paper widths are a breeze for this professional printer. A factory configured IBM compatible model available with Centronics & RS232C. Friction and tractor feeds for smooth sailing.

HEWLETT
PACKARD
Laser Jet
List Price
\$2595
OUR PRICE
\$1849



The industry standard!! This second generation of Laser Jet printers from HP is compatible with the original Laser Jet and Laser Jet Plus printers, but it is 36% lighter, more reliable, does more, and costs less!! This whisper-quiet printer now comes with 6 internal fonts, so you can customize the printing environment. Contains input and output trays as well as friction feed.

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FX-86e
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150-P
List Price
\$479
OUR PRICE
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The printer to take when you've got places to go. So small and light, it runs on rechargeable batteries or electricity; specially designed to be portable, so you won't be weighed down. Even prints on transparencies. Reliable tractor feed helps get the job done. Great for laptops and desktop use between office, home, or client.

EPSON
LQ-1000
List Price
\$999
OUR PRICE
\$569



From Epson, the price performance leader, comes another advanced, high-tech answer to your business printing. Capable of outstanding graphics, the new 24 pin line gives you a higher resolution for sharper letters. Choose between Extended Epson Graphics, IBM Graphics, or Diablo 630 codes with Identity Modules. Paper is friction fed. Use the 1000 if your needs include spreadsheet and financial report printing.

LQ-800 (not shown) List Price \$699 **Our Price \$479**

TOSHIBA
351
List Price
\$1399
OUR PRICE
\$939



Another 3-in-one printer, we feel this has the highest quality "Letter Quality" dot matrix printing available; it even prints on 6-part forms!! Accepts type font cartridges and down-loadable type font disks. Emulates IBM Graphics Printer and the Qume Sprint 11. Complete with auto paper loading and friction feed.

NEC
P760
List Price
\$995
OUR PRICE
\$649



With 24 resident fonts, this is a typesetting dream!! High resolution, plus 4 paper handling options puts this printer a step above the rest. Epson LQ series software compatible; color kit upgrade and added memory available. Uses a standard friction feed. The P760 adds multi-column word processing and full-size spreadsheet capability.

P660 (not shown) List Price \$699 **Our Price \$459**

TOSHIBA
P321SL
List Price
\$749
OUR PRICE
\$549



One of the easiest printers to use, due to a new front panel which lets you choose type fonts, pitch, emulation, quiet mode, lines per inch, page length, and more, all at a touch of a button. Fanfold by-pass eliminates the need to unload the continuous form paper when using single sheets. High resolution and a built-in tear bar; standard emulations include IBM Proprinter and Toshiba/Qume. Paper is fed through tractor feed for continuous forms; also features auto loading, single sheet guide, and friction feed.

P341SL (not shown) List Price \$999 **Our Price \$779**

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Briefly Noted

Boston Doc

Just can't seem to recall that seldom-used 1-2-3 formula? You can let your fingers do the trudging through a 3-pound operations manual, or you can travel a unique path to the answer with **Boston Doc**, a disk-based reference guide from Boston Documentation Design. RAM-resident *Boston Doc* uses a hypertext information-storage method for speed and accuracy. Every 1-2-3 command and function in versions 1A and 2.xx is extensively cross-referenced in 2500 connected but nonsequential packets, so you can arrive quickly at the answer you seek from any point on the compass. This \$34.95 helpmate doubles as a self-guided 1-2-3 tutorial.

The package includes a table of contents, an alphabetical index, and 360 screens, each devoted to a particular 1-2-3 command or function. Boston Documentation Design offers the same convenience in a DOS manual that details the operating system on 250 screens with more than 1600

cross-references. Each *Boston Doc* product requires 98K of RAM. Documentation Design, 125 Adams St. #301, Newton, MA, 02158; 617/965-5300.

VGA Extra

Owners of PCs, XTs, and AT compatibles needn't feel left out of the latest in graphics technology. STB Systems' **VGA Extra** graphics board brings classic PCs the Video Graphics Array (VGA) capability of IBM's new PS/2 line. When partnered with a multiscan monitor, the VGA Extra offers a full range of VGA color and monochrome graphics resolutions, including 320 by 200 pixels with 256 simultaneous colors and 640 by 480 with 2 or 16 colors. Nor do users have to give up software capability built on previous graphics standards. The VGA Extra is fully compatible with MDA, CGA, EGA, and Hercules monochrome graphics and provides 132-column display for spreadsheet and terminal emulation applications. Backed by a two-year warranty, the VGA Extra lists at \$495 and includes 15-pin (analog) and 9-pin (digital) connectors. STB Systems, 1651 N. Glenville #210, Richardson, TX 75081; 214/234-8750.

Mayday

Go ahead, kick out the cord and make my day. Power failures and keyboard lockups hold no terror for someone equipped with **Mayday**, a keystroke logger from Daybreak Technologies. The \$99.95 RAM-resident utility, first seen as a transcript utility in Daybreak's *Silk* spreadsheet, consumes just 10K and stores every keystroke on a hard disk, permitting the complete re-creation of a file or programming session up to the moment the lights went out. Because *Mayday* logs commands as well as text, you can also use it as a handy macro processor, to debug a program, and to show another user how to build a program or a spreadsheet template. Daybreak Technologies, 2271 205th St., Torrance, CA 90501; 213/781-2203. ●



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6.6 MB OF ADDED STORAGE FROM KODAK

The new vision of Kodak



Microsoft Word 4.0

If you fancy the power of *Microsoft Word*, but feel constrained by some of its command conventions, you'll appreciate the new simplified **Word 4.0**. Microsoft has streamlined its interface, accelerated cursor movement and file loading, and made some of the program's most powerful features more accessible. The text editing screen has lost its borders but gained cursor coordinates and dotted-line page breaks. And if you've never really felt at home in the *Word* Gallery, you may appreciate the new format-by-example method of creating style sheets. Just take a snapshot with the new Format Stylesheet Record command. After that, a touch of that Format's key code will let you set the style for any portion of a document right down to paragraph level. Speed typists will appreciate *Word 4.0*'s new macro capability, and you can even redefine the program's cursor movement keys. That's just for openers. Other new

features include character-string searches, text redlining, and worksheet importing. *Word 4.0* lists for \$450; current users can upgrade for \$75. Microsoft Corp., 16011 N.E. 36th Way, Redmond, WA 98073-9717; 206/882-8080.

Perfect Plan

When WordPerfect Corporation dropped the *MathPlan* moniker in favor of **PlanPerfect**, it gave its \$395 spreadsheet a make-over. The result is a program the company claims is significantly quicker and freer from bugs than the retired *MathPlan* (see "Perfection According to Plan?" PCW, July 1987). WordPerfect has reportedly cranked up the program's calculation speed for financial and statistical functions by a factor of 10. Floating-point speed and accuracy likewise have been boosted, as have screen refresh and scrolling. WordPerfect has also eliminated bugs in the program's macro, help, printer setup, range copying, data extract, and graphing elements. Also new in *PlanPerfect 3.0* is support for *WordPerfect 4.1* files. *MathPlan* owners can get current for \$15. WordPerfect Corp., 288 W. Center St., Orem, UT 84057; 801/227-4000.

XyWrite III Plus

XyQuest advances the cause of cooperative document creation with **XyWrite III Plus**, its latest incarnation of the potent word processor. Augmenting existing support for such desktop publishing features as variable spacing between words and lines is the ability to include in a *XyWrite* document any graphic element, spreadsheet, or photo that can be stored on a disk in ready-to-print form. Other handy new capabilities include counting the words in an open file, hiding remarks that only a hot key will reveal, and embedding printer codes in a document. A new text redlining feature highlights additions and deletions to multiuser documents without corrupting the original. Also new are a 100,000-word spelling checker, a typographical-error checker, and Microlytics' 220,000-synonym thesaurus. *XyWrite III Plus* lists for \$445, but current users can upgrade for the difference in price between *XyWrite III Plus* and their version. XyQuest, 3 Loomis St., Bedford, MA 01730; 617/275-4439. ●

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Making MultiSync Plus perfect for everything from business graphics to desktop publishing and CAD/CAM. For literature or a

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dealer call 1-800-447-4700. For technical details call NEC Home

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The most advanced automatic testing to ensure total reliability.

standard PC/AT, the ACER 900 was dubbed "the AT standard to beat" by Computer Currents, a U.S. publication.



The 1100 makes a powerful yet economical graphics workstation.

BREEDS SUCCESS

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Advantage, MultiMate?

After months of quietude, Ashton-Tate has spruced up MultiMate Advantage its word processing mainstay. Although unlikely to recapture its old glory, the refurbished product has fully entered the modern era.

Ruth Halpern



MultiMate Advantage II, Ashton-Tate's flagship word processor, may well be the QE2 of its class: luxurious, worldly, and spacious enough to accommodate passengers of every taste. Like that great oceangoing vessel, however, *Advantage II* has its limitations; it won't get you there in a hurry, and it isn't amenable to graceful midcourse corrections.

Promotional fanfare notwithstanding, the program is still dogged by page orientation. And given its leisurely performance, an inability to handle multiple documents, and a few conspicuous omissions, *Advantage II* won't be outrunning sloops like *XyWrite*, or outgunning frigates like *WordPerfect* and *Microsoft Word*. Still, just as MicroPro breathed new life

into *WordStar*, so Ashton-Tate's makeover of *MultiMate Advantage 3.60* may well succeed in attracting a new class of users.

Advantage II is the first upgrade of this formidable word processor since the company acquired Multimate International in mid-1985 (see "On a Wang and a Prayer," *PCW*, September 1986). The overhaul is overdue, if only because the importance of *MultiMate's* Wang ancestry has waned along with dedicated word processing itself. To survive, the product has to cultivate a new audience of managers and professionals beyond its clerical core.

Here, happily, the program's degree of difficulty isn't proportionate to its power. Pulldown menus and built-in shortcuts should prove alluring to those who need to learn to use a word processor without first taking a crash course in cryptography. *Advantage II*'s pulldown menus lead the way to a limited number of advanced functions, like preview and library creation, as well as to more basic operations, like move and copy. Not surprisingly, menus evoke *dBASE* and *Framework* and attest to Ashton-Tate's bid to create a consistent look throughout its product line.

Advantage II isn't a program as much as it is an experience. Everything about the \$565 product suggests bigness—from the 9-volume documentation to the 11 floppy disks to the layers of full-screen menus. Augmenting the word processor are a 110,000-word dictionary; a 40,000-word thesaurus with 470,000 synonyms; two disks' worth of utilities; a disk containing 400 printer action tables (PATs) and 18 LaserJet Plus soft fonts; and On-File, a file manager designed for mail merge

operations. For an additional \$30, you can obtain the entire assemblage on 3½-inch disks for laptops and IBM's PS/2 machines. The package also includes a hefty plastic template, stick-on key-top labels, and a quick-reference card. Although the program includes written and disk tutorials, Ashton-Tate doesn't provide toll-free telephone support.

Hot Stuff

Beyond helping to flatten the learning curve, *Advantage II*'s selections fall into seven categories: Layout, Typestyle, Cut & Paste, Library, Special, Print, and Exit. These pulldown menus extend just one level deep; you can move among them via the cursor keys or with <Ctrl> and the menu's first letter, and activate a selection from the cursor keypad or with an option's first initial. Unfortunately, *Advantage II* violates a cardinal rule of menu design: Several items begin with the same letter, so you'll definitely need to choose some of them with the cursor keys.

Users old and new will like the program's Hot Start/Hot Print options. If you don't plan to probe every last *Advantage II* feature—or if you'd simply prefer to never again see the document summary screen's keystroke counter—you can invoke Hot Start from the DOS command line, loading the program along with a new or existing document.

Hot Print helps dispatch short works to the printer. This two-keystroke menu-bypass option applies only to the current page and is ideal for brief letters or memos. Hot-Printed documents can contain page numbers, headers, and footers but, strangely, no footnotes. The downside to Hot Print is that once the process has begun, you can't do anything else—and that includes editing a document or canceling the Hot Print command itself. Other than with Hot Start/Hot Print, you can back out of a document by means of Alternate Routes—any of several keystroke combinations that save the current file and promptly serve up the main menu selection of your choosing.

If all this hot action leaves you sweating, you can regain your

composure with *MultiMate*'s voluminous documentation. Each of the nine volumes of the *Advantage II* manual illuminates a different facet of the program. Each is clearly written and easy to follow; each is indexed, and the larger booklets cross-reference the others. Of special moment for first-timers is the concise *MultiMate in Minutes* pamphlet, which helps you kick the program into high gear without having to muck about in technical minutiae.

Executive Summary

MultiMate Advantage II

Word processing software

MultiMate Advantage II—Ashton-Tate's bid for the hearts and minds of the managerial class—is a marked improvement on release 3.60. It creates merge documents directly with *dBASE* files, provides extensive printer support (including HP soft fonts) and an attractive pulldown menu interface, and adds such appealing new features as continuous undelete and a quick-start option. But the program's sluggish performance, fundamental page orientation, and significant omissions consign it to runner-up status in the word processing sweepstakes.

Block mark, move, and delete	Good
Search and replace	Fair
Spelling checker	Fair
Printer control	Excellent
File management	Excellent
Overall value	Good

In addition to broadening the program's appeal beyond the secretarial pool, Ashton-Tate has made it easy for veteran *MultiMate* users to step up from earlier versions. You needn't learn a slew of new commands; on the surface at least, the familiar *MultiMate* look and feel remains. The largest difference lies under <F10>, the key that now executes more than 300 operations. If you've invested in a custom *MultiMate* keyboard, you'll be able to stick with it. But Ashton-Tate no longer sells the 116-key unit.

Many of the powerful text manipulation features that made *MultiMate* a hit among office workers are spiffier than ever. You can create macros (called Key Procedures) to store repetitive keystrokes, and you can now view a directory of macros from within a document. You can also build libraries of boilerplate text and attach them to a specific document, either through pulldown menus or via a function key. And you can draft and edit tabbed, bound (variable width), or snaking (wraparound) columns on screen simply by designating them in the format line and marking the end of each column. The program's column mode now supports eight columns of text on screen.

Your Page or Mine?

Although *Advantage II* presents a flexible interface that appears ready to accommodate any and all demands, the program's rocky foundation remains.

That foundation is page orientation—a significant departure from the document orientation of most contemporary word processors. Page-oriented programs automatically save everything but the current page to disk, so you can never lose more than a sin-

gle page; however, formatting changes made to one page affect only that page. Document-oriented programs, on the other hand, automatically flow formatting changes—such as revised margins, new tabs, or reorganized footnotes—through the entire file and enable you to view more than one page at a time.

Despite Ashton-Tate's claim that *Advantage II* has resolved this computer-age-old conflict by offering *both* orientations—with the document approach as the default—the claim doesn't hold up under scrutiny. The new *MultiMate* supports document mode, not document orientation. Although the program automatically supplies page breaks as you create a document, document mode reflects only the look of the screen, not the underlying method of document handling.

If any suspicions exist that *MultiMate* has been rebuilt rather than renovated, its treatment of pages should lay those doubts to rest. Consider that a format-line change to one page doesn't affect subsequent pages; you can make documentwide format changes only through a global search and replace. If the document contains several formats, you'll need to perform a series of discretionary replaces—a complex procedure in a lengthy document. On the plus side, *Advantage II* is now dexterous enough to perform backward search-and-replace operations, although wild-card searches aren't in the deck.

The document reorganization option provides further evidence that *Advantage II* hasn't resolved

the document-orientation conundrum. You must invoke that menu option to perform either manual or automatic hyphenation, to repaginate, and to display properly ordered footnotes and endnotes on the appropriate pages.

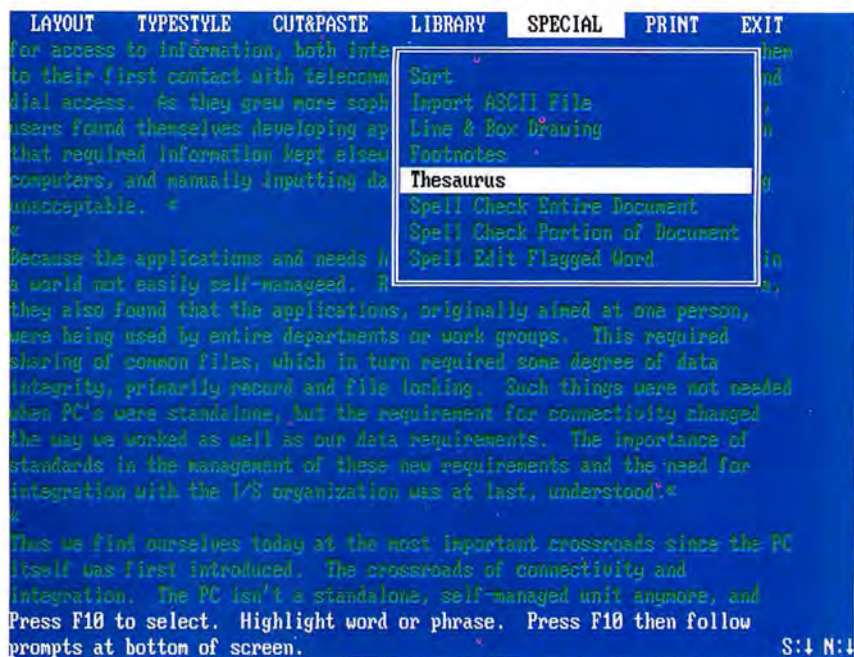
Neither has *MultiMate* broken free of its traditional page-dimension strictures. The program can handle a page 150 lines long and 156 characters wide. If a page exceeds the length you assigned when creating the document, the line-number indicator on the status line will flash. Ignore this warning at your peril; if you print the document without first using document reorganization, printed text will dribble off the bottom of the page.

On the Sun Deck

This latest version of *MultiMate* finally delivers a few niceties that somehow never made it into previous releases. New for 1987 are a flexible insert mode, continuous undelete, footnotes and endnotes, a comment facility, and a preview option.

The program's insert mode has been improved dramatically, if somewhat predictably. Pressing <Ins> activates a new "push" mode, which enables you to drop any amount of text anywhere in a document—including in the middle of another insertion. As long as the insert mode is active, you can also delete material anywhere in the document. You can essentially make insert mode the default, although you must turn it on manually each time you enter a document.

If you're more comfortable with the traditional drop-down insert mode—in which the text splits apart at the cursor position to



New *MultiMate* users needn't forage among the function keys. From the program's pulldown menus—activated with <Alt>-L—you can trigger features esoteric and routine.



System defaults are abundant in *Advantage II*, and you can tinker with just about all of them. Note the page-mode/document-mode option.

make room for one highlighted insertion at a time—you can change the system default accordingly. Ashton-Tate bills this as yet another example of the program's flexibility, but given that pulldown menus don't work with drop-down mode, this option doesn't

have a great deal to recommend it.

Word processors commonly recover text inadvertently zapped, but no undo feature is as thorough as *Advantage II*'s. The program's undelete option enables you to retrieve virtually anything you've erased from the current








































file during an editing session—characters, sentences, return symbols, spaces—one deletion at a time. When the 20K delete buffer is full, excised material is written to disk. You can also use undelete for quick moves without resorting to the formal block move process. Once you've restored a deletion or repaginated a document, deleted material is wiped out of the buffer, however, so undelete isn't fit for impromptu copying.

Also new this go-round is a preview option that lets you view a document in most of its splendor before it's printed. Because you can't edit in preview mode, however, and because formatting codes can't be temporarily hidden in this character-based program, *Advantage II* still doesn't provide the kind of practical, realistic display that *Microsoft Word* supplies as a matter of course.

Although footnotes and endnotes were a long time coming, *Advantage II* does them justice. Footnote creation and editing is a straightforward procedure; each footnote is indicated by a small eighth note embedded in text, an improvement on some of the program's other more intrusive formatting codes. This eighth note is all you see while editing; you can view actual footnote numbers and text only in preview mode. All of a document's footnotes reside in a separate, linked file.

Elsewhere, the program's new comment feature enables you to annotate drafts and print (or hide) remarks as you please. Two-function math has grown to six functions, with the addition of vertical or horizontal multiplication, divi-

Making the MultiMate Upgrade

	Advantage II	Advantage 3.60
Section numbering		
Table of contents		
Backward search and replace		
Continuous undelete		
Pulldown menus		
Flexible insert mode		
Automatic document backup		
Comment facility		
Document name stamping		
Double-space draft print		
Endnotes/footnotes		
Multiple headers/footers		
Preview mode		
Line/box drawing		
Sort within document		
Automatic hyphenation		
Multiple-column support		
Downloadable laser printer fonts		
Built-in font support		
Hot Start/Hot Print		
Proportional spacing support		
Import ASCII files directly		
Import DCA.RFT/DCA.FFT		
Import WST (WordStar)		
Import graphics		
Full DOS path support		
DOS access		
Direct dBASE merge		
On-File merge		
Select records by logical operator		
Size of dictionary (words)	110,000	110,000
Maximum file size	128K	128K
Math functions supported	6	2
File handling mode	page/document	page

Curiously, *Advantage II* continues to neglect the obvious. Absent are such word processing amenities as an outline processor, an index generator, and a multiple-document capability. Although you can insert section numbers at the beginning of new groups of ideas and thereby generate a table of contents, this isn't a bona fide outline generator that can expand and contract headings and text to show hierarchies. Indeed, section numbering is a feeble substitute for outline processing because section numbers aren't updated automatically.

In a similar vein, *Advantage II* is simply unable to work fluidly with more than one document at a time. As in the program's previous incarnations, you can copy material from the current file to another file only by storing it as library text. Conversely, plucking text from elsewhere still requires that you resort to the External Copy command.

MultiMate's ability to com-

municate with the world beyond its margins—always impressive—has become even more versatile. You can now import ASCII files directly into *Advantage II* and move files to and from a host of other formats; *WordStar* and IBM's DCA have joined .WKS, .WK1, DIF, and Wang, among others. But imports are not duty-free: when *Advantage II* reads an

Because the applications and needs had matured, users found themselves in a world not easily self-managed. Recognizing their need to access data, they also found that the applications, originally aimed at one person, were being used by entire departments or work groups. This required sharing of common files, which in turn required some degree of data integrity, primarily record and file locking. Such things were not needed when PC's were standalone, but the requirement for connectivity changed the way we worked as well as our data requirements. The importance of standards in the management of these new requirements and the need for integration with the I/S organization was at last, understood."

ALT-1	Case:	Not Significant	Significant
ALT-2	Direction:	Forward	Backward

```
|1.,»...»...».....|*  
Single line spacing      right margin 75
```

S:↓ N:↓

The process of changing the format line in the middle of a document is less than elegant. With Advantage II, you need to organize a search-and-replace party.

Path C:

Conversion Path C:

```
Source Directory: _____ Destination Directory: _____
```

123.001	ASCII.001	ASCII.002	123.001	ASCII.001	ASCII.002
BARR.TXT	BIOGRAPHY.DOC	CLAMCONV.EXE	BARR.TXT	BIOGRAPHY.DOC	CLAMCONV.EXE
CLANFL.UH	COMM.001	COMM.002	CLANFL.UH	COMM.001	COMM.002
CONFIG.SYS	CONSTSYS.SYS	DCA.001	CONFIG.SYS	CONSTSYS.SYS	DCA.001
DCA.002	DEMO.CRD	DEMO.IDX	DCA.002	DEMO.CRD	DEMO.IDX
DEMO.TEN	DIF.001	FFT.001	DEMO.TEN	DIF.001	FFT.001
FFT.002	GSA.001	GSA.002	FFT.002	GSA.001	GSA.002
HOM.001	HOM.002	JW.001	HOM.001	HOM.002	JW.001

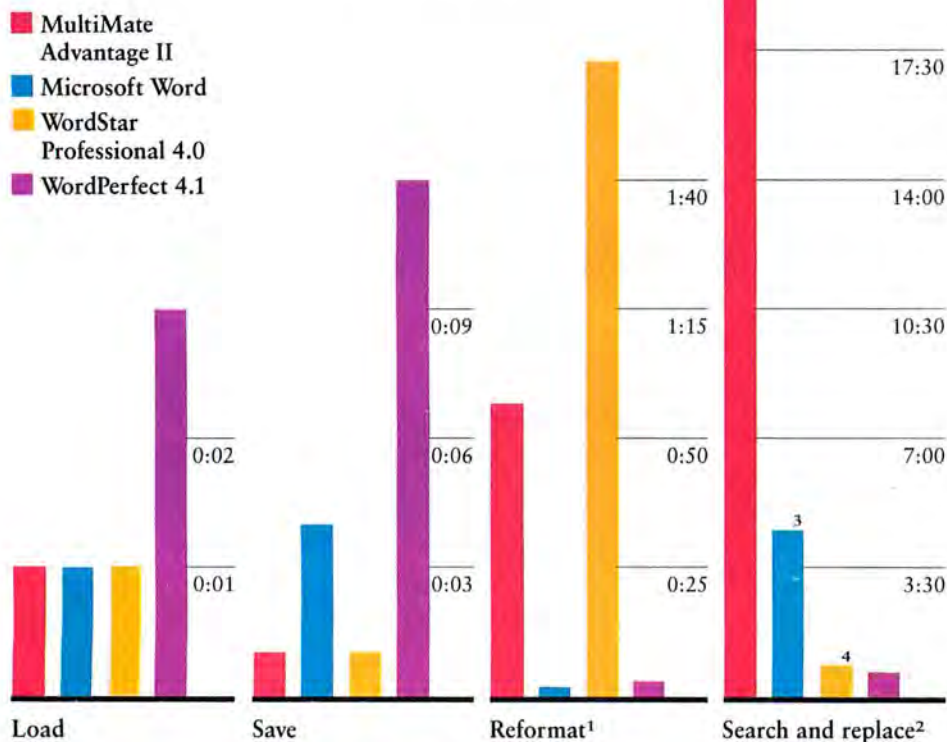
Conversion Types:					
123	ASCII	COMM	NCA	DIF	FRT
CSA	HON	JW	RM	VCDIF	WPC

Press F10 to start conversion, ESC to exit

Press CTRL-PGUP or CTRL-PGDN to scroll directory, PGDN to select directory

The program's document conversion facility offers a generous helping of final resting places for Advantage II documents, and vice versa.

The Disadvantage of Page Processing



Performance tests show MultiMate Advantage II has its ups and downs. Tests were done on an 8-MHz IBM AT with 512K and a 40MB hard disk. Times shown are in minutes:seconds.

¹ Test reformats 100K file from 74 columns to 40 columns

² Test replaces "a" with "apple" in a 100K file

³ File had to be saved six times during test; time to save is not shown

⁴ Test conducted with screen update turned off by pressing <CursorDown>

ASCII file, it may add as much as 14K worth of codes to every 50K of text.

If you work with *dBASE* files extensively, *Advantage II* may well be the ultimate word processor. The program now easily and directly performs merges using *dBASE* files. When combining text and *.DBF* files, you simply need to ensure that the merge document and the *dBASE* file contain identical field labels. The merge option is adept at performing selective merges without requiring a great deal of preliminary sorting. *Advantage II* can handle up to 90 lines of print criteria linked by such logical operators as AND and OR.

Advantage II's enhanced On-File program offers yet another merge alternative. On-File, once \$149, is now bundled with the program; it enables you to record data on the equivalent of 3-by-5 cards and can now send that data directly to an *Advantage II* document. Fastidious housekeepers will also like On-File's document cataloging function, which converts document summary screens into "cards."

■ A Speed Advantage?

Ashton-Tate is touting the refurbished *MultiMate* as quicker than its predecessors, which it certainly is. That, however, is damning with faint praise. Regardless of how it stacks up against version 3.60, *Advantage II* barely competes against this era's dominant word processors.

The program's sluggishness is immediately apparent when you scroll through a document. *Advantage II*'s document mode requires that the program hold 6K of text in a buffer at all times. With that file fragment loaded, you can view two pages on screen simultaneously and scroll between them relatively quickly. When the program retreats to disk, however, it lags perceptibly. The spelling checker also writes to disk on a page-by-page basis. Although you can regulate the speed at which *Advantage II* scrolls across page breaks, that adjustment is essentially cosmetic.

The abbreviated buffer also means that *Advantage II* can't handle a file larger than 128K—a

serious inconvenience if you're working on long documents or manuscripts. The program's performance when handling a 100K file exposes the primitive tugboat hiding beneath *Advantage II*'s sleek Cunard exterior.

The *Advantage II* spelling checker is likewise unwieldy and slow. Proofing, whether initiated from the main menu or within a document, requires two passes: a spelling check to mark all the errant words, followed by a spelling edit, so you can find the marked words and decide whether to ignore them, correct them, or add them to the dictionary. If the spelling checker were perfectly reliable, its performance might be less troublesome. The checker, however, is unpredictable: It balked at compound words; and although it caught a footnote error, it inexplicably treated a font code as part of a misspelled word. Search and replace isn't as tedious, but the process is excruciatingly slow: 21 minutes, 50 seconds on a 100K file (5 to 30 times longer than the competition). In short, don't expect a sizzling outcome on disk-intensive operations.


Gentlemen, Start Your Drivers

Advantage II never met a printer it didn't like. The program includes support for more than 400 output devices and nicely saves print specifications in a table in either ASCII or hexadecimal format. The program's relationship with the LaserJet Plus is first-rate; in addition to supporting that printer's cartridge fonts, Ashton-Tate worked directly with Hewlett-

Packard to develop 18 downloadable fonts that can be sent to the printer on the fly (the program supports 26 fonts all told). LaserJet Plus users needn't remember to load fonts before loading *Advantage II*—they need only remember the letter of the font desired. A

workings of yet another package, *Advantage II* provides an accessible interface, superb dBASE and laser printer support, and word processing features aplenty.

But if you need to harness a word processor to perform complex tasks on a daily basis, you

 *The program's undelete option enables you to retrieve virtually anything you've erased from the current file during an editing session.*

single command calls up the relevant font list from within a document.

The printing story isn't entirely rosy, however. If you're using any letter quality or laser printer, for instance, you'll need to change the default for the enhanced/draft option on the print options screen or insert a draft print code at the beginning of each document. Otherwise the printer will type every line twice, mimicking a dot matrix printer creating near letter quality output. Also confusing is the print options menu listing of a Diablo 630 print specifications table for the Brother HR-15XL; you'd have to comb the printer manual to discover that the Brother is automatically assigned to the Diablo's PAT. And interrupting a print job in midstream is still a challenge; you can try <Ctrl>-<Break>, but odds are your printer won't respond.

For entrenched *MultiMate* users who'd like more power, speed, and versatility but want to stay in the fold, *Advantage II* is clearly the logical next step (with the upgrade priced at \$100). And for harried professionals who don't feel compelled to master the inner

might want to look elsewhere. *Advantage II*'s page orientation and lethargic performance frequently mute its more sophisticated capabilities. And the program still lacks a number of critical tools for quickly arranging ideas on paper.

Overall, the ship's definitely still afloat, and it's arguably on course, but this cruise simply isn't an adventure. ●

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MultiMate Advantage II
Ashton-Tate
20101 Hamilton Ave.
Torrance, CA 90502-1319
213/329-8000

List price: 5¹/₄-inch version \$565, 3¹/₂-inch version \$595
Requirements: 384K, two disk drives (hard disk recommended), DOS 2.00 or later version
Not copy protected

Crosstalk Misses the Mark



With its powerful script language and X.PC support, Crosstalk Mk.4 is a communications programmer's

playground. But until you modify it with complex scripts, the program leaves much to be desired.

Eric Brown

■■■■■ Nessie, the Loch Ness monster, is still at large, but the long-awaited heir to *Crosstalk XVI* has surfaced at long last. Two years after its announcement, *Crosstalk Mk.4* is on dealer shelves. Ironically, the program was delayed primarily to compete with the now-defunct *Microsoft Access*. With *Access* discontinued, *Mk.4* shares with *Relay Gold* and *Smartcom III* the distinction of being a communications package that incorporates a high-end programming language.

Mk.4's most important feature, CASL (Crosstalk Applications Structure Language), supplies the programming tools for complex unattended sessions and elaborate custom interfaces (see the sidebar "CASL Keep"). Less momentous, but still significant, are *Mk.4*'s macro features, text editor, and three new error-checking protocols. An optional menu interface has also been added, along with 24 <Alt>-key commands and the ability to conduct up to 15 simultaneous sessions.

Despite the improvements, *Mk.4* is surprisingly shy of advanced features. It lacks file encryption and conversion routines, and it offers no mailbox features, file retrieval scripts, or special talents for transmitting graphics. Programs written in CASL can compensate for many of these deficiencies, but most users would be better served by a communications program with ready-made solutions.

■■■■■ Off on the Wrong Foot

Even experienced *Crosstalk* users will find *Mk.4* a challenge. The *Mk.4* manual is minimalist to the point of absurdity, doling out a few cryptic pages for each feature and tacking on a meager collection of screenshots. The paucity of examples forces you to plow through the command descriptions in the back of the manual. There's no on-screen tutorial or toll-free help number, and the help screens are far from context-sensitive. For some features there's no help at all.

Although *Mk.4* is not copy protected, the installation script is tedious and lacks menus. To change one parameter, you have to wade

through them all. The program supports a healthy set of modems, but as with *Crosstalk XVI*, you may have to flip some DIP switches to get up and running. No 9600-bps modems appear on the list, but *Mk.4* generically supports high-speed links.

■■■■■ Between a Menu and a Command Place

Like *Crosstalk XVI*, *Mk.4* has a modular structure. Though larger and more complex than its predecessor, the program shuttles components such as script files and command files in and out of memory, retaining *Crosstalk*'s speedy performance. Unfortunately, many of the additions to *Mk.4* hinder rather than help.

When you start *Mk.4*, you'll soon find yourself lost in a poorly organized and sporadically buggy menu system. For example, five menus separate calling and setup functions, and *Mk.4* occasionally

forgets the parameters that you assigned during installation, reverting to the useless default of Com:0. Worse, you have to disconnect the menus and enter command mode to access many features.

Mk.4 offers a rich, 147-command vocabulary, but the learning curve is steep, even for *Crosstalk* users. Of the original 74 *Crosstalk* commands, 32 have been discarded, renamed, or altered. Gone are the tongue twisters of old; most commands are in plain English, yet many commands now require more than two letters. If you make a mistake, *Mk.4*'s typing checker pops up a selection of possible alternatives.

Gone too is the trademark status screen that *Crosstalk* Communications battled over in court. The old screen never won any beauty contests, but at least it yielded ample information. With *Mk.4*, all gauges are hidden. To check speed and other parameters you must enter a series of <Alt>-key combinations that display eight setup boxes, one at a time.

For example, *Mk.4* has an extensive error-trapping system, but it's full of bugs. Among the many mismatches, when your phone jack is unplugged, *Mk.4* delivers a 'No answer' message.

Like *Crosstalk XVI*, *Mk.4* lets you program the function keys, along with <Alt>-, <Shift>-, and <Ctrl>-key combinations, and assign keyboard sets to different on-line services. *Mk.4* also lets you program the numeric keypad and introduces a macro feature for constructing new commands.

The macros can recognize variables and nest other macros. Unfortunately, you can't save or load macros along with the function key sets but must add them to script files.

Mk.4 Calling

Whether you work via menus or commands, you prepare dialing entries and make calls with *Mk.4*'s card-file-like phone book. However, you can view only one entry at a time or a list of entry names—not a complete dialing directory. You can set up global defaults for new cards, but you can't override the settings of existing cards.

Each card can be modified via various setup boxes. As you tab through the settings, a one-line description appears, but no additional help is available. Pressing the <Space> bar toggles dual options, but other options demand a typed response. Many settings are oddly grouped: Important functions such as call or answer mode

sit next to trifles such as keyboard click. *Mk.4* would be much easier to use if you could see the major settings at all times.

Visible or not, the wealth of options provided by *Mk.4*'s setup boxes far surpasses the features offered by *Crosstalk XVI* and most other programs. In addition to storing such basic settings as speed, echo, answerback, and time between redials, setup boxes can even instruct *Mk.4* to keep a log of file transfers. Other boxes offer extensive variables for uploading, capturing, filtering, file transfer, and terminal emulation. *Mk.4* supports twice as many terminals as *Crosstalk XVI*.

File Management and Editing

Mk.4's file management talents are greatly improved. Whereas *Crosstalk XVI* offers some basic DOS commands, *Mk.4* can create and remove directories and re-

Crosstalk Mk.4 Status Screen Session #1 You are: entering a command

Name: MCI		Description: MCI Mail	
MetID:	Number: 543-1568		
UserID: pcworld	Password: [SECRET]		
Script: MCI	Device: MODEM	Terminal: DEC	
Keys: XVI	Filter:	Protocol: XMODEM	

Modem device driver setup for session MCI				
Port: 1	Speed: 1200 bps	DataBits: 8	Parity: none	StopBits: 1
Local: off	Flow: xon/xoff	Breaklength: 200 ms		
DialPrefix: ATDT	DialSuffix: !			
AnswerSetup: ATX4S0=1!	ModemInit: !ATV1E0X4!			
break signal duration in milliseconds				

Unlike *Crosstalk*, the *Mk.4* status screen hides all its gauges, so you must call up one of eight setup boxes to check system parameters.

name and copy files. You can now sort files by name, extension, date, and size. The directory menu also lets you view files in other directories, but to delete or copy files you must return to the command line, where the directory is invisible. Oddly, *Mk.4* relegates *Crosstalk*'s most valuable file feature, a command that estimates file transmission time, to a separate utility called XDIR.EXE.

One useful new feature is the ability to group files into a list. File lists facilitate deleting or copying files but can't be used to upload files. Fortunately, all the protocols except XMODEM offer their own schemes for multiple uploads.

Mk.4's text editor is designed to write CASL scripts, yet it also serves as a passable word processor. The editor offers case-sensitive search and replace, and you can move the cursor or delete text by word, by line, or by file. You can copy, move, and delete blocks, read and write files to disk, and upload a block of text or a file. The editor handles word wrap but no reformatting, so it's hard to re-align margins. Sadly, you can't print files. Although there's room for improvement in *Mk.4*'s editor, most communications programs offer no editing features whatsoever.

Stick to the Scripts

How many *Crosstalk* programmers does it take to screw in a light bulb? None. They use a script file. The same goes for logging on with *Mk.4*. In addition to

manual log-on, you can use three types of scripts to storm the phone lines: preprogrammed, Learn, and custom scripts.

Mk.4 duplicates *Crosstalk XVI*'s log-on scripts for ten on-line services. The list is better than most, and the scripts work well. Unlike Lotus's *Express* and Softechnics Systems' *Telewriter II*, however, *Mk.4* has no scripts for automatic file transfers with E-mail services.

Mk.4 tries to make amends with a Learn mode that records log-on sessions and translates the prompts, replies, and wait periods into a script. Learn excels at log-ons but falters when it encounters conditional situations. For instance, Learn can download an MCI Mail file and log off, but it crashes if the number of messages in your in-box differs from the number you specified. Furthermore, you can't use a Learn script for delayed, unattended file transfer unless you modify it with CASL. Beyond log-on, it's best to learn CASL and write custom scripts yourself.

Blind On Line

Once on line, you can summon *Mk.4*'s terminal mode by entering the on-line menu or flipping to the command line. Unlike its off-line counterpart, the on-line menu is well organized and offers more features. Besides controlling capture and printing toggles, for example, you can change terminal types and protocols.

Even the simplest communications programs offer an on-line status line. Not so *Mk.4*. You must press <Alt>-L to display the date, time of day, elapsed time, and session description. Worse yet, unless you reprogram all your

Executive Summary

Crosstalk Mk.4

Communications program

Aimed at the high end of the communications marketplace, *Mk.4* offers abundant features, such as text editing and macros, and ices the cake with multiple concurrent communications and a powerful programming language. Yet for users without advanced programming skills, much of the program's power lies dormant. In addition, dismal documentation, poor help and error handling, and a buggy and confusing user interface make the current version of *Mk.4* a risky buy.

Ease of setup	Fair
Session automation	Excellent
Terminal support	Excellent
Protocol support	Good
Error handling	Poor
Ease of use	Poor
Overall value	Fair

scripts with CASL, the status line doesn't display capture status. But once the status line appears, capturing and printing data is easy, and the buffer action is smooth.

If you find life in the on line a little too fast, you can slow things down with *Mk.4*'s excellent review buffer, which lets you stop the action and browse through up to 65K of text. Better yet, you can search for text, mark blocks, or write blocks to disk. The smooth interaction between terminal and on-line modes deserves high

marks. While you're on line, you can edit files, run scripts, adjust parameters, and more without being kicked off for time-out indiscretions.

Dart Hits the Bull's-Eye

In an imperfect world flooded with conflicting protocols, *Mk.4* makes sure you won't be left high and dry. It supports five popular error-checking protocols (Crosstalk, CompuServe-B, Kermit, XMODEM, and YMODEM) and tosses in a newcomer called Dart.

Dart debuts with an impressive repertoire. If a session crashes, the next time you attempt a file transfer, Dart will pick up where it left off and append the new blocks to those already received. In *PC World* tests Dart performed slightly faster than the other protocols. Unlike most protocols, which wait for confirmation each time they send a packet, Dart allows up to 16 packets to pass before it requests a response. Finally, Dart remedies a *Mk.4* deficiency by ensuring that files aren't overwritten.

Implementing a protocol produces a window with an abundance of monitoring data. A sliding bar graph shows the progress of a transfer session; other indicators display remaining time, approximate throughput, error counts, and so on. Unfortunately, you cannot chat on line during transfers.

In *PC World* tests the error-checking protocols generally worked fine; occasionally, how-

```

/*
  Crosstalk Mk.4 AUTOEXEC startup script
  Version 1.0 4-15-87 STH
  Copyright (c) 1987, Digital Communications Associates, Inc.
  All rights reserved

*/
assume device  "MODEM"
assume terminal "DEC"

device  "MODEM"
terminal "DEC"

fkey 40, "@do menu"

if exists("MENU.XTS") or exists("MENU.XTC") then ...
  chain "MENU"

end

```

Edit action: save cancel goto find replace block include upload wrap

Mk.4's text editor is designed to create CASL scripts. It offers word processing features but no printing or reformatting.

```

Port: 6.
Please enter your user name: pcworld
Password: _

Script output to MCI.XTS
Trace "t 32 ticks"
wait 32 ticks
Wait quiet 5 ticks
reply
Trace "user name:"
wait for "nter your user name:"
Wait quiet 5 ticks
reply UserID

Crosstalk Mk.4 LEARN mode
F1 - Do another script
F2 - Send NETID
F3 - Send USERID
F4 - Send PASSWORD
F5 - Send a string
F6 - Send an ENTER
F7 - Perform Crosstalk command
F10 - End LEARN

= VT102 Cursor

```

In Learn mode, *Mk.4* copies your log-on session for later use as a script and displays the CASL translation in another on-screen box.

```

MCI Mail Version 3.3
Crosstalk Mk.4 ONLINE Menu

There are no
** You have a DR
creating a new o
start another me

Press <RETURN> t

You may enter:

SCAN      for
READ      to R
PRINT     to d
CREATE    to w
CREATE LIST to m
DOWJONES to D
ACCOUNT   to a
HELP      for assistance

Capture control (Capturing to C:\X\MCI.616)
Printer control
Protocol File Transfer control
Text File Upload control
Terminal Settings
Disconnect from MCI Mail
Check on other sessions
Do another script
Return to terminal mode
Quit
Select with ↑ ↓, press ←

Command (or MENU or EXIT): _

= VT102 Cursor

```

You can access the on-line menu at any time during an on-line session.

CASL Keep

Crosstalk users who thought they had conquered their programming fears by writing scripts may be in for a lesson in humility when they grapple with *Mk.4*'s CASL. Unlike the old script language, CASL offers a bewildering array of procedures, statements, variables, and expressions. Thanks to *Mk.4*'s poor manual, the learning process takes time. There's a utility that translates *Crosstalk* scripts into CASL, but most scripts will require some tinkering. One of the chief differences between *Mk.4* and *Crosstalk XVI* is the new compiler, which adds speed and security.

CASL borrows heavily from BASIC and slightly from Pascal. In fact, you can choose to use either line numbers or labels. To streamline program structure, you can define procedures and use the sample procedures furnished by *Crosstalk Communications*. You can also pass data between scripts and chain scripts. BASIC programmers will feel at home

with functions such as GOTO, LABEL, and PEEKs and POKEs. Even the string functions are similar.

Much of CASL's power is devoted to controlling *Mk.4*'s windowing feature, with commands that create windows, boxes, and lines of any size, type, and color and place them anywhere on the screen. These features ease the creation of custom interfaces and greatly enhance *Mk.4*'s multiple communications talents.

In the right hands, CASL could make up for many of *Mk.4*'s deficiencies. Among other applications, you could write mailbox- and file-encryption programs, scripts that poll a number of services in succession, improved help systems, and even a passable BBS. *Access*'s MASC language never had a chance to live up to its potential. It remains to be seen whether CASL will. —E. B.

ever, files appeared to be transmitting but didn't write to disk. This situation elicited incorrect error messages such as 'Host disk full'. Since the problems surfaced in several protocols, it's likely that serious bugs lurk in *Mk.4*'s main code.

Answering: A Pinch of Remote

When *Mk.4* answers calls, its motto is My House is Your House. Unless you implement the program's security features, *Mk.4* allows callers to traipse all over your PC. As with *Crosstalk XVI*, you can assign a password to the answer session and set four levels of system access.

Mk.4 adds a script feature called Permission, which restricts access to specific command groups. Even set to the widest tolerance, access is limited. You can't use the text editor, and you can run only DOS utilities. Although you can copy and transfer files, you can't create or delete them. Clearly, *Mk.4* isn't a true remote program that enables two users to work on an application together. Yet, wedded to a sophisticated answer script, it could prove valuable.

How Can You Be in 15 Places at Once...

Mk.4 joins *BackComm* from LaSalle Micro and Applied Communications Systems' *TymComm* as one of three PC programs that support simultaneous multiple communications. *Mk.4* enhances its multisession talents with a flexible windowing system that can be

Mk.4 device support crosses swords with Crosstalk XVI and Relay Gold.

	Crosstalk Mk.4	Crosstalk XVI 3.6	Relay Gold 2.0
Terminals supported	ANSI Standard AT&T Model 513 Data General Dasher D210, D211 DEC VT 52, VT 100, VT 102, VT 220 Datapoint Datastation 3601 Hazeltine Esprit II IBM 3101 Models 10, 20 TTY TeleVideo 912, 920, 925, 950 Adds Viewpoint	Adds Viewpoint DEC VT 100, VT 52 IBM 3101 ASCII TeleVideo 910, 920 Texas Instruments 940	Relay/3270, Relay/TSO, Relay/VM TTY DEC VT 52, VT 100, VT PCI
Modems supported	AT&T Autocall 2224B AT&T System 75/85 DTDM, PDM 7404, or 7407 Bizcomp PC-Intellimodem Bytcom 212AD Concord Data Systems 224 DCA 911 GridCase internal Hayes Smartmodems IBM modems Multi-Tech 224AD, 224AB Novation Popcom Racal-Vadic Rixon U.S. Robotics Ven-Tel	AT&T Dataphone II 2212C, 2224A, 2224B AT&T System 75/85 DTDM, PDM 7404, or 7407 Bizcomp PC-Intellimodem Bytcom 212A Concord Data Systems Autodial 224 DCA 911 General DataComm 212 Intelligent Modem Hayes Smartmodems IBM PC modems IBM PC Voice Communications Adapter Ven-Tel Lockheed GETEX Multi-Tech Novation GridCase internal Popcom C100, X100 Racal-Vadic 3451 or Auto-dial VA212 Rixon PC-212a, Executive 212	Alpha Concord AT&T Autocall 2224, 2212C, 4000, 4112 Codex 2233 Concord Data Systems 224 Datagram DCA Fastlink EVI Fastcom Hayes Smartmodem IBM 5841 Opticom OSI 8224 OmniTel Encore Penril Auto Data 300/1200, Cadet 1200, Cadet 2400, Pacer 2400 Popcom X100, C100 Quadram Quadmodem Qubie Racal-Vadic Maxwell, 2400 PA, VA 212 Rixon PC212A, R212 Telenetics Expressdata U.S. Robotics Courier Ven-Tel PC Modem Microcom
High-resolution displays supported	DCA IRMAVision IBM EGA STB Chauffeur HT STB Multi Res II Tseng EVA Video Seven Vega Paradise AutoSwitch EGA 480	IBM EGA IBM PGA	IBM EGA
Error-checking protocols	Crosstalk CompuServe-B Dart XMODEM YMODEM	Crosstalk Kermit XMODEM	Kermit Relay XMODEM

Feature for feature, Mk.4 outshines Crosstalk XVI 3.6 and holds its own against Relay Gold.

	Crosstalk Mk.4	Crosstalk XVI 3.6	Relay Gold 2.0
Text editor	■		■
Chat window			■
Unattended call and answer	■	■	■
Learn mode	■		■
Background operation	■		■
Preprogrammed log-on scripts	10	10	20
Script language	■	■	■
Programming language	■		■
X PC support	■		

modified by <Alt>-key combinations or a script.

The program establishes multiple links in several ways. First, it supports multiple physical connections. Given enough ports and phone lines, you can orchestrate a simultaneous symphony of emulation boards, modems, and cable connections. Second, it supports the X.PC protocol. If you're a Tymnet user, you can log on and take advantage of X.PC's ability to handle links with up to 15 different services.

Mk.4 provides a script for the X.PC process, but because it responds to the ID and password prompts in the wrong order, it doesn't work. However, by following instructions in the manual, you can harness X.PC without a script. You can switch easily between sessions or choose from three windowing schemes: top, bottom; left, right; or a quartered

screen. With several services running at once, including a terminal session, I was able to download and capture files simultaneously without any noticeable delays.

Finally, even if you lack X.PC or multiple devices, you can perform background processing. For example, during file transfers, you can work with another application by opening up a new session and using the Run command. Although the software must fit in memory with Mk.4, this could prove the most valuable of all Mk.4's multisession capabilities.

■ ...When You're Not Anywhere at All

After the years of waiting, perhaps nothing could live up to our expectations of Mk.4. Yet despite its multisession talents and potent script language, Mk.4 is a disappointment. Not only is it difficult to use, but its power is accessible only to experienced programmers. Worse still, bugs and a confusing interface pester the user. The po-

tential for a good program is there, but it will take time and programming, from both the company and users.

Crosstalk Communications has no plans to discontinue *Crosstalk XVI*, and it's likely that further updates are on the way. The company is hedging its bets here, and for good reason. Full-time *Crosstalk* programmers who have found the old command set restrictive will undoubtedly jump to Mk.4 despite its flaws. But most *Crosstalk* users should think twice about making the switch.

Like Microsoft, Crosstalk may have overestimated the numbers and influence of sophisticated communications programmers. Certainly, Mk.4 fills a need for office gurus (and the people they serve), but the majority of users have no guru to turn to. While not averse to a little programming, most users want smooth functioning the moment the program's installed. For these people, Mk.4 clearly misses the mark. ●

Eric Brown is a Contributing Editor for PC World.

Crosstalk Mk.4
Crosstalk Communications
1000 Holcomb Woods Pkwy.
Roswell, GA 30076
404/998-3998
List price: \$245, updates for
Crosstalk XVI \$50 plus
shipping and handling
Requirements: 384K, modem

Hardcard Turns 40



Sam Muelick

Plus Development's Hardcard 40 doubles its predecessor's

storage capacity, but it still fits comfortably into a single expansion slot.

Reed McManus

||||| PC users looking to increase hard disk storage have several choices. They can buy a standard internal drive, which may force them to move or dispose of existing drives. They can add an external system. Or they can buy a hard disk card, boosting storage capacity without having to remove installed hard or floppy disk drives or tamper with existing hard disk program and data files.

While many hard disk card manufacturers simply strap off-the-shelf hard disk components to an expansion board, Plus Development planned the disk/controller assembly from the ground up. Like earlier models, the new Hardcard 40 uses compact and efficient surface-mount technology and VLSI (very large scale integration) chips. To fit twice the storage capacity of its Hardcard 20 in the same amount of space, Plus turned to thin film media, composite heads, and a more efficient method of defining hard disk sectors.

Unlike copycat manufacturers, Plus squeezed both the disk and the controller onto a 1-inch-thick board that fits in a single expansion slot. Today, a 40MB card is not unique, but Plus is the only company to pack that much storage capacity onto such a thin frame.

Rapid and Rugged

A 3-to-1 interleave factor and voice-coil actuator read/write heads contribute to the Hardcard 40's fast access times. Because it has fewer and more compact electronic components than most hard disks, it draws less power (8 watts average, 17 watts when starting up) and runs cooler than many disks offering lower capacity. Such efficient design allows the Hardcard 40 to reside happily in computers already packed with expansion boards and another hard disk. If you have another hard drive, only 63.5-watt power supplies need upgrading.

Sheathed in a protective metal cabinet, the Hardcard 40 is well

equipped to survive the perils of modern living. The drive's automatic parking mechanism moves the read/write heads to a non-vulnerable "landing zone" when the computer is turned off. The drive can withstand a 10g shock while operating and a 100g shock when turned off—exceptional protection that should frustrate the most ham-fisted airline baggage handler. Plus claims a MTBF (mean time between failure) rating of 40,000 hours—two to four times the industry norm.

To install the Hardcard 40, simply seat the board in an available slot (change jumper positions first if the Hardcard will be the computer's second hard disk) and follow the manual's instructions to partition and format the drive using DOS FDISK and FORMAT commands.

Installation is not a simple matter of typing C:INSTALL C:, as it is with the Hardcard 20. This is because you have the option of formatting the disk in several ways, though most people will probably opt for two 20MB volumes, the drive's default selection. The installation program also offers defaults for three- and four-volume partitions, but you can override these suggestions to create two to four volumes of virtually any size.

If the Hardcard 40 is your only fixed disk, the installation procedure designates its volumes as

drives C: through F:, depending on how many volumes you've selected. If you add the Hardcard 40 to a computer with a resident hard drive, the Hardcard designates its volumes D: through G:. Using third-party software that overcomes DOS's 33.5MB limit (such as *SpeedStor* from Storage Dimensions or *Vfeature* from Golden Bow Systems) permits you to configure the Hardcard 40 as one 42.6MB volume.

Plus's documentation tries to clarify the intricate installation procedure. To set up the Hardcard as a second hard disk or in any configuration other than two 20MB volumes, you must run a Plus program called DIVIDE in addition to running FDISK and FORMAT. DIVIDE temporarily convinces DOS that the volume DOS is formatting is drive C:, re-

unless the existing drive is also a Plus Hardcard. In the latter case, of course, you can't boot from the Hardcard 40. To make the fast, high-capacity Hardcard 40 your primary hard disk, you must edit the AUTOEXEC.BAT file in drive C: so it will switch to the Hardcard 40 immediately after start-up.

Happy Family

The Hardcard 40 is compatible with a slim 14 computers and with the factory hard disks they contain. However, Plus is continually testing new configurations and updating its compatibility list. If your computer or existing hard disk is not listed, ask Plus whether the equipment in question has been tested with the Hardcard and get a commitment for support before you buy.

Executive Summary

The Hardcard 40

Hard disk on an expansion card

Plus Development, which holds a patent on its hard disk card design, has doubled the capacity of its latest product while maintaining the same 1-inch-wide, one-slot form factor. This assembly is pricey, but it offers an AT-class hard disk without requiring a change in a PC's existing drive configuration.

Speed	Excellent
Durability	Excellent
Hardware compatibility	Good
Ease of installation	Good
Overall value	Good

To fit twice the storage capacity of its Hardcard 20 in the same amount of space, Plus turned to thin film media, composite heads, and a more efficient method of defining hard disk sectors.

gardless of the volume's actual designation. (This sleight of hand is necessary because DOS can partition only two hard disk volumes.) Although the manual clearly states that DIVIDE protects your precious C: drive files and tells you to ignore DOS's warnings that it is about to format the C: drive, the messages can be unnerving.

In a computer with an existing hard disk, the Hardcard 40 must be set up as the second hard drive

Plus cautiously affirms that Hardcards can be ported between PCs but recommends that you try this only between computers from the same manufacturer that are running identical versions of DOS. Furthermore, Plus warns that repeated installations and removals can damage the contacts on both the computer and the card.

The Plus Hardcard 40 promises a speed of 35 milliseconds and can withstand a 100g shock.

Hardware supported

AT&T PC 6300
Compaq Deskpro
Compaq Deskpro 286
Compaq Portable
Compaq Portable II
IBM PC
IBM 3270 PC
IBM PC AT
IBM PC XT
IBM PC XT 286
IBM PS/2 Model 30
Wyse PC 286

Operations

Formatted capacity: 42.24MB
Average access time
 two 20MB volumes: 35ms
 one 40MB volume: 40ms
Interleave value: 3 to 1
Changeable interleave
Power required (watts)
 maximum/start-up: 17
 average: 8

Durability

Shock resistance
 operating: 10g
 nonoperating: 100g
Automatic head parking
Landing zone
Mean time between failures:
 40,000 hours

General

Software included
User manual: excellent
Warranty: one year
Toll-free technical support
Price: \$1195

Once installed, the drive recognizes and adapts itself to BIOS ROM variances. For example, the Hardcard 40 can be installed in an AT and then moved to a PS/2 Model 30—one way to avoid transferring the Hardcard 40's installation software to a 3½-inch disk. *PC World* had no trouble porting the Hardcard between two PCs. The drive performed flawlessly in *PC World*'s hard disk benchmark test, sequentially reading and writing 100K and 1MB files and then performing a series of random searches.

The Hardcard 40 gives the PS/2 Model 30 the flexibility that IBM omitted. The only factory hard disk option for the Model 30 is a 20MB disk running at 80 milliseconds—too small and too slow for many users. Smart shoppers can use the Hardcard 40 to double both capacity and speed for about the same price. PS/2 Model 30 users should also keep in mind that the Hardcard 40's installation software arrives on a 5¼-inch disk; either the dealer or Plus will convert the files to the 3½-inch format for you.

To fit the Hardcard 40 into a single slot in the Compaq Portable II, you must move the video cards to free up a coveted 8-bit slot. Owners of a 6-MHz AT running DOS 3.10 or 3.20 must run a patch program called ATPLUS before installing the Hardcard 40.

■ Plus and Minus

The Hardcard 40's advantages don't come cheap. While a mail-order internal 40MB hard disk with controller card may set you back as little as \$700, the Hardcard 40 won't pull its teeth

out of your credit card until you've signed over as much as \$1195. (Most retailers offer the system for about \$1000.) For many, paying a dealer to install a traditional internal hard disk (or fiddling with a screwdriver and a few cables themselves) is a small price to pay. However, the Hardcard 40's hefty premium provides an easy-to-install hard disk backed by a respected company—a benefit corporate buyers don't take lightly.

Many users looking to upgrade their storage capacity will be satisfied with less expensive, less elaborate products. But for those who value speed, space, and convenience, the extra tariff on the Plus Hardcard 40 is a worthy investment. ●

Reed McManus is an Associate Editor for Sierra magazine and a former Associate Editor for PC World.

*Hardcard 40
Plus Development Corp.
1778 McCarthy Blvd.
Milpitas, CA 95035-7421
800/826-8022, 408/946-3700
List price: \$1195
Requirements: DOS 3.00 or
later version; older systems
with 64K motherboards may
require a BIOS ROM upgrade*

Corporate Consolidation

Corporate Class Software's FASTAR, a potent companion application to 1-2-3, endows financial analysts with uncanny new powers.

Ralph Soucie

Although 1-2-3 is as versatile as a program can be, it simply can't do everything short of tying your power tie. Just ask any financial analyst who's had to grapple with a mammoth, macro-driven 1-2-3 apparatus that no one fully fathoms. You'll hear—in excruciating detail—just how frustrating and unreliable 1-2-3-based consolidations really are.

While the world awaits 1-2-3/M, antidotes to overstretched spreadsheets have varied from multidimensional programs to solutions like Control Software's *Control/PC* (see "Dimensional Fortitude," *PCW*, September 1987, and "The Controller's Controller," *PCW*, May 1987). Other users have shown a predilection for mainframe-based fourth-generation applications and accounting packages. Each approach involves compromises; the larger the job, the more troublesome the trade-offs.

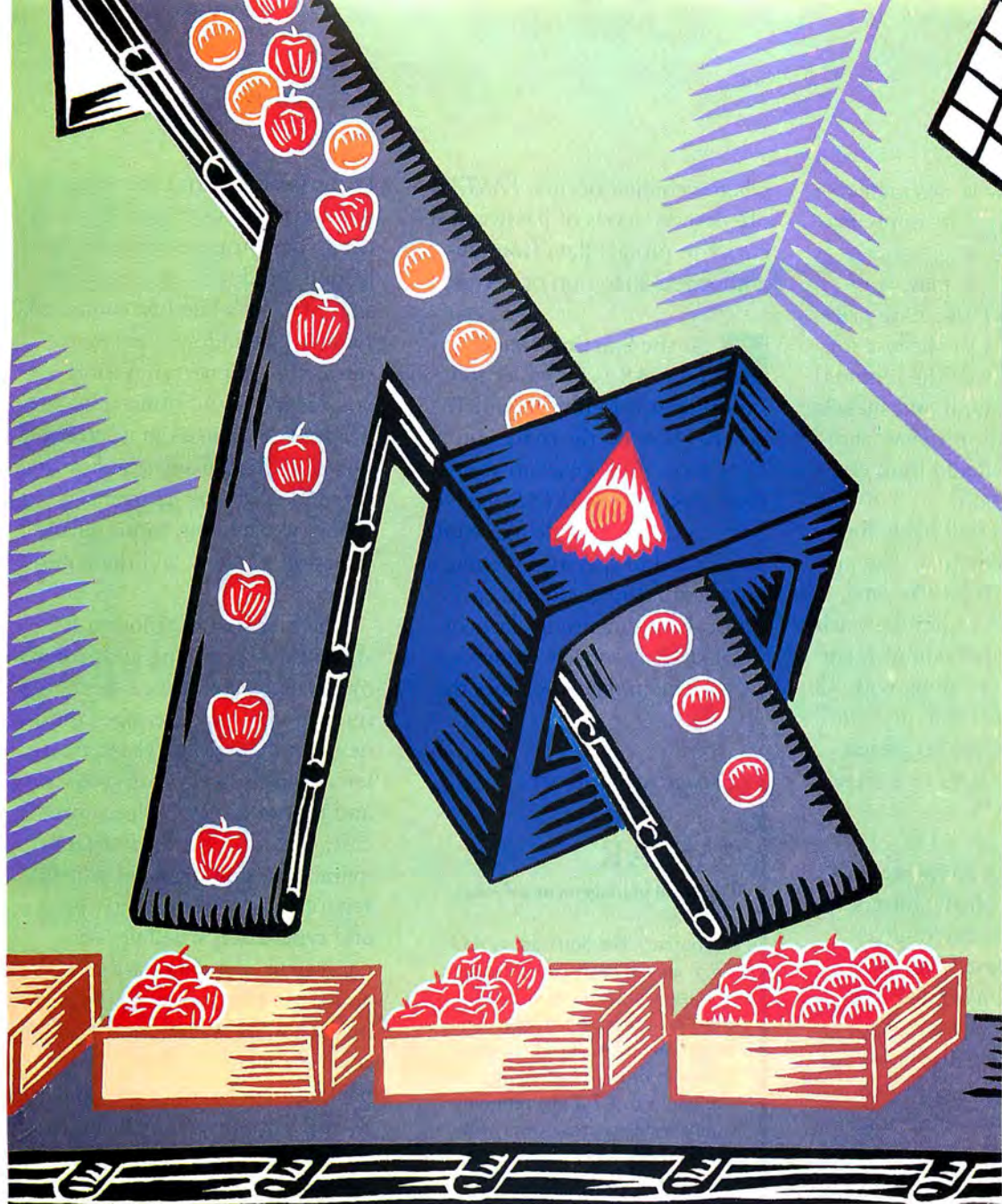
The latest and most ambitious salvo in the ongoing battle to domesticate corporate data is FASTAR (*Financial Application Solution to Analysis and Reporting*), from Corporate Class Soft-

ware (CCS), a subsidiary of chemical giant Celanese Corporation.

FASTAR may be the most sharply focused of the post-spreadsheet lot. The program is not a generic application development tool but a dedicated, production-oriented application. It essentially does only two things—consolidate financial statements and manage related data—but it does them with an unprecedented thoroughness. If your company's two dozen business units are using two dozen distinct accounting systems, FASTAR provides the structured solution that ordinary (or even multidimensional) spreadsheets can't.

In designing the product, CCS anticipated the challenges of aggregating data from numerous far-flung divisions and subsidiaries (including units newly acquired or shed, or those reporting in foreign currency). FASTAR is aimed at users charged with performing consolidations—often senior financial analysts a level or two below the chief financial officer.

FASTAR enjoys a special relationship with 1-2-3. It assumes 1-2-3 is both a source of and an eventual destination for consolidated data. While it reads and writes .WKS and .WK1 files, that's



merely the beginning. Forging links between the two programs can be tough stuff, but once in place, those bonds help you cope with organizational permutations in an impressive fashion. *FASTAR* can read data exported from mainframe systems in ASCII format, although the translation is cumbersome. The program also takes a perfunctory stab at modeling by allowing you to play “what if” with historical data.

In Spreadsheet's Clothing Although spreadsheet mavens are its natural audience, *FASTAR* isn't a spreadsheet. Under its hood is a full-fledged relational data manager. Micro Data Base Systems built the engine that runs *FASTAR*—the same basic power plant found in MDBS products *Knowledge Man* and *Guru*.

FASTAR's styling, however, is all its own. The program's organization mirrors the fundamental way in which large companies structure their data—by schedule, entity, period, and type (often ab-

breviated as SEPT). While this schema makes organizational sense, it breaks with spreadsheet thinking. Coupled with the design of the “bridge” to 1-2-3, this regimen makes *FASTAR* a formidable peak to climb—and explains why CCS mandates on-site training and application development. Once you've made the ascent,

however, the view is spectacular—consolidations are not simply feasible, they're easy.

But if you want to play, you have to pay: *FASTAR*'s base price of \$25,000 buys a site license for up to 15 users. Given the required commitment in sweat and shekels, organizations with revenues short of \$100 million should look elsewhere for a solution.

1-2-3 stalwarts will likely find *FASTAR* hospitable turf. The program provides a *1-2-3*-like environment in which to build models, and it includes a full complement of logical operators along with 42 mathematical, financial, and statistical functions. It also allows certain data managers to coexist with *1-2-3* in RAM.

FASTAR requires 640K of RAM and at least 5MB of free hard disk space. Heavy hitters won't get by with anything less than an 80286-based system housing a 40MB hard disk. The program has a nose for a math coprocessor—especially handy for currency conversions and handling partially owned subsidiaries. *FASTAR* doesn't support expanded memory, relying instead on virtual memory to manage files exceeding the DOS 640K limit. Users have reportedly built data bases as large as 12MB, but *FASTAR*'s frequent disk accesses tend to take their toll in performance.

FASTAR was built from the ground up as a multiuser product and will run on any NETBIOS-compatible local area network. The program supports record locking and issues an advisory

when a conflict occurs. *FASTAR* offers seven levels of password security to protect data from unauthorized alteration or access.

At the Starting Gate

FASTAR is far easier to install than it is to implement. To get the show on the road, you copy some 20 floppies to your hard disk. Each *FASTAR* data base resides in a single file; while you'll need to specify a file size at installation time, you can easily boost those dimensions later on.

FASTAR is entirely menu-driven. The main menu assumes the

Lotus position, and the staggered pulldown menus extend five levels deep. The program provides "selection windows"—a niftier version of *1-2-3*'s File List command. *FASTAR*'s windows are context-sensitive; the program prompts you for input and offers a list of pertinent responses in a scrollable box. *FASTAR* nicely supplies context by collapsing its menus accordion-style, making room for the selection window and the input area.

The first step in tailoring *FASTAR* entails specifying your company's schedules (balance sheet, income statement), entities (business units), periods (years, quarters, months, weeks, or even days), and types (actual, budget, forecast, or user defined). *FASTAR* maintains each financial schedule separately for every entity, period, and type. Each schedule is the equivalent of a data base record, and within each record, the various accounts (sales, cost of goods sold) make up the fields. The package can handle any number of SEPT attributes. Figure 1 lists the breakdown for Nonex Corporation, a holding company with four subsidiaries.

Building a *FASTAR* application also involves creating a roster, or dictionary, for each attribute. The entity dictionary, for example, contains the names of the various business units, along with vital statistics (name, currency type, ownership percentage, and so on). In all, the program supports six dictionary types: period, type, currency rate type, currency rate code, entity, and account description.

Executive Summary

FASTAR

Financial management software

Corporate Class Software's *FASTAR* is an extensive, expensive data management application for analysts who need to put their consolidation and financial reporting houses in order. Boasting impressive hooks to *1-2-3*, the program combines big-system power with the flexibility and snappy interface PC users have come to expect.

FASTAR is marred by a steep learning curve, limited modeling and query capabilities, and an entrance fee only Fortune 1000 firms can pay.

Consolidation capabilities	Excellent
1-2-3 support	Excellent
Data analysis	Good
Report writing	Good
Accounting controls	Excellent
Data security	Excellent
Overall value	Good

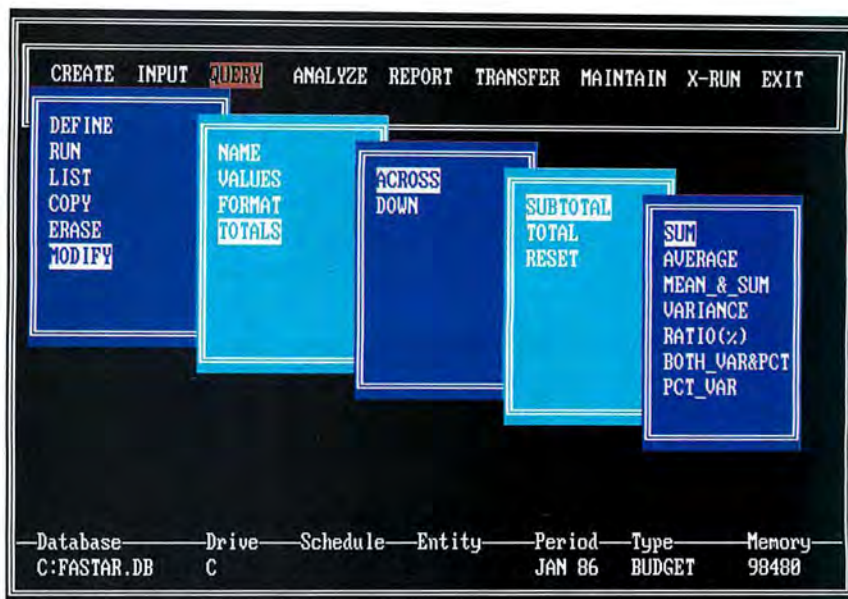
Once the dictionaries have been created, you can establish a pecking order among the entities with the program's Create Hierarchy command. *FASTAR* dictionaries apply to only one period at a time; if the status quo holds, you can simply copy the October 1987 dictionary to November 1987, for example. Far from being bothersome, this is actually a testament to *FASTAR*'s almost maternal regard for data integrity, since it precludes entering a currency rate (or anything else) idly. Still, *FASTAR* is nimble enough to let you create a new hierarchy for a different period—an essential capability in a business climate where mergers and acquisitions are endemic.

Feeding *FASTAR*

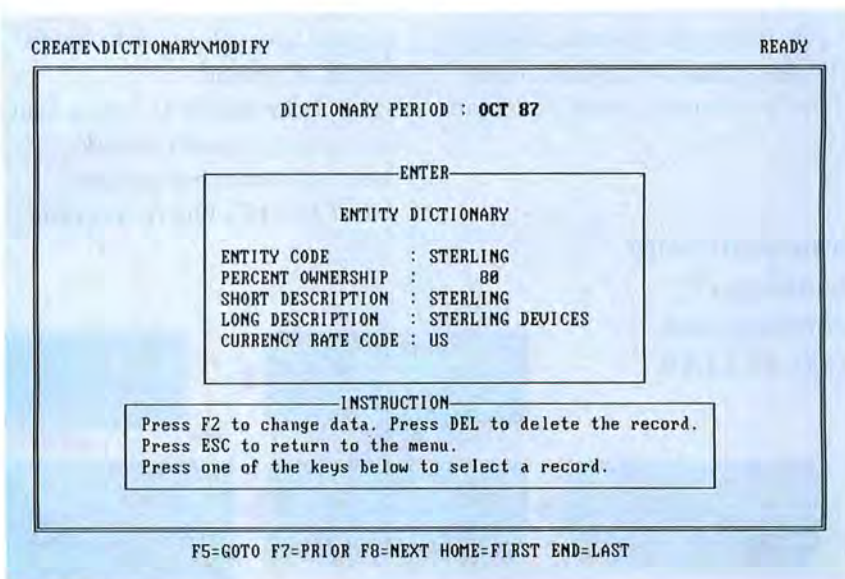
In most corporations, subsidiaries generate financials from independent mainframe general ledger accounting programs. Business units typically then ship figures to 1-2-3 and massage that data into the format that headquarters decrees.

FASTAR cannot import data directly from accounting programs, but it expedites data entry via a worksheet entry mode—the program's means of lifting data from 1-2-3 files. These files serve as way stations for financial schedules that originate in the subsidiaries' general ledger systems.

Note that *FASTAR* reads and writes only 1-2-3 cell values, not the formulas from which those values are derived. Once data has been pulled in, *FASTAR* can perform computations to test cell values for accuracy according to integrity rules, which are formulas you devise.



FASTAR provides a novel "sliding windows" interface that enables you to keep your bearings as you move deeper into the program. The extended menus can slide accordion-style to the left to make room for a selection window and an input area.



FASTAR dictionaries permit you to specify ownership percentage. This example notes Nonex's 80 percent stake in its Sterling Devices subsidiary.

Prepping *FASTAR* to receive subsidiary data is time-consuming and a bit tricky. Through *FASTAR* menu options, you prepare an *input template*—a bridge to your 1-2-3 files—by describing worksheet design, foreign currency specifications, and the monetary denomination of cell entries. *FASTAR* extracts range names from 1-2-3 worksheets and places them in the data base; the program will also generate range names based on every schedule in the data base.

With an input template set up and the pertinent worksheets copied to your hard disk, inputting data becomes a snap. By designating from a selection window those worksheets that need updating, *FASTAR* automatically populates the data base with the appropriate cell values. It also alerts you to anything untoward in the worksheets—a cell with an improper range name, for example. *FASTAR* keeps track of updates from 1-2-3 in a transaction file and can

display or print a chronology of updates for any entity—a must in companies where business units abound.

If an entity itself has subsidiary entities, it can submit all results on one multicolumn worksheet—a column for each entity, along with consolidated results. If one of your entities also uses *FASTAR*, the program's Transfer command will feed subsidiary data directly into the parent company's data base, bypassing 1-2-3 altogether.

■ Digging for Data

As *FASTAR* asserts more control over consolidated financial data, it also renders it less accessible. You cannot examine *FASTAR* data directly as you can a 1-2-3 or *Boeing Calc* worksheet. Instead, you perform ad hoc inquiries by defining queries: The program prompts you to select the relevant data from the data base and to determine how values are to be displayed or printed.

1-2-3 devotees with a penchant for scrolling around a worksheet may never feel at home with *FASTAR*'s Query function.

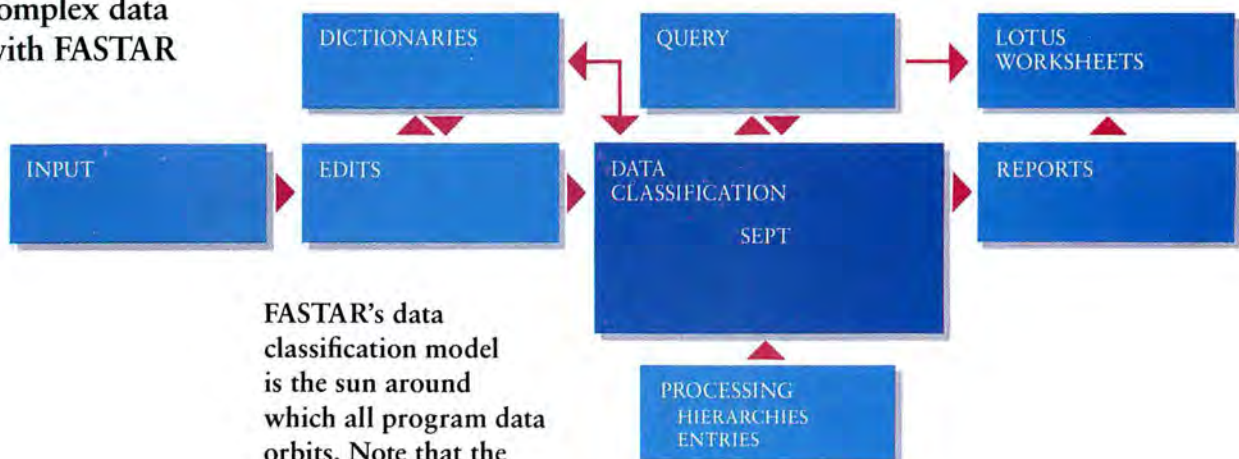
Though intended as an on-the-fly inquiry device, it feels more like a menu-driven report writer—without possessing the patina of a presentation tool.

Query specifications and results can be saved as ASCII files. Each query pertains to a specific time period, and although you can copy a query to subsequent periods, the procedure is awkward; *FASTAR* forces you to repeat the entire query-definition process. With the program's Analyze option, queries can be modified for quick viewing, but they can't be saved.

Like *VP-Planner*, *Boeing Calc*, and *MVP*, *FASTAR* is multidimensional, but its interface shelters you from dealing with dimensional issues explicitly. Query definition is an exception to that insulation, since you must specify which attributes are associated with columns, and which with rows.

FASTAR treats fields as cells, but lest you mistake it for a spreadsheet, the program does not offer automatic recalculation.

Straightforward handling of complex data with *FASTAR*



FASTAR's data classification model is the sun around which all program data orbits. Note that the package fosters a genuine dialogue with 1-2-3.

CCS made modeling a low priority within FASTAR, and it shows. An offshoot of the Query command, model definition exhibits some of the latter's churlish qualities. To determine the effect on Nonex of a change to the U.S.-Canadian exchange rate, for example, you must update the Hoseman dictionary for the new rate, re-input the data from Hoseman's worksheet file, perform a "hierarchy roll-up" to flow the change through the entire consolidated group, and then execute the query to display the results. That's a rugged gauntlet to run to answer a fairly simple "what if" question.

On the plus side, however, FASTAR performs a credible imitation of an accounting program. Alone among multidimensional packages, it can accept changes to data base entries in journal-entry format—the preferred method for eliminating intercompany activity from consolidated financial statements. You can prime FASTAR's validity-checking facility to perform certain accounting tests—for example, ascertaining that the books balance, or that summary totals agree with supporting schedules, for each entity.

The system administrator—the highest-level user in the FASTAR universe—can authorize colleagues to "undo" journal entries. Fortunately, FASTAR will refuse to delete a dictionary item for which live data is currently on file.

Reporting for Duty
Whipping FASTAR data into shape for the top brass may sound arduous, but it proves fairly slick in practice. The process requires that you create a template (or reference file) in 1-2-3. This file

CREATE\INPUT_TEMPLATE\MODIFY

WAIT

ENTER

DESCRIPTION : BALANCE SHEET-----

OF ROW : 80

OF COLUMN : 27

CURRENCY : PARENT LOCAL

RATE TYPE :

DENOMINATION : \$

ARE THERE ANY FORMAT EXCEPTIONS ? ☐ Y

IS THIS A WORKSHEET TEMPLATE ? ☐ N ☒ Y

PERIOD : JAN 86

TEMPLATE CODE : BAL SHT

SELECTION

Press F3 key to make a selection from select window.

Modify an input template definition.

FASTAR's relationship with 1-2-3 depends in part on defining an input template. Modifying that template is a fill-in-the-blanks exercise.

86/10/87











































M2

CAP Pg. 1

NONEX CORPORATION		CARVER	STERLING	MIRAGE	HOSEMAN	NONEX
SUMMARIZED NET INCOME						
BY ENTITY—U.S. DOLLARS						
OCT 87	ACTUAL	A	B	C	D	E
1	SALES	388	588	481	389	1498
2	TOT OP EXP	294	471	388	184	1155
3	BEFORE TAX	183	56	117	125	398
4	NET INC	188	-32	64	96	234

FASTAR generates query results as a matrix. Here, Nonex subsidiary figures are displayed side-by-side with consolidated totals. Hoseman totals have been converted from Canadian to U.S. dollars, and the Nonex figures reflect an adjustment for the firm's 80 percent ownership of Sterling.

FASTAR and Control/PC head to head

	FASTAR	Control/PC
Features		
Contains data base in one file		
Accepts manual input		
Imports/exports .WKS and .WK1 files		
Imports/exports ASCII files		
Imports/exports DIF files		
Batch import/export		
Checks input data validity		
Converts foreign currency		
Handles partially owned subsidiaries		
Defines simplified hierarchy		
Matrix-type hierarchies		
Multidimensional structure		
Changes automatically flowed through consolidated group		
Scrolls through data base		
Query function		
Status-update reports		
Keyboard macro capability		
Memory-resident utility		
Accepts journal entries		
Predefined reports		
Flexible report writer		
Year-to-date code for reports		
Supports modeling		
Suitable for tasks other than consolidations		
Password security		
Handles periods other than months		Limited
Supports graphics		
Provides on-site consulting		
Context-sensitive on-line help		
Indexes error messages		
Network support		
Ethernet		n/a
3Com 3+		n/a
IBM Token-Ring		n/a
Mainframe links		
Size		
Periods	Unlimited	60
Data types	n/a	25
Organizational levels	255	2621
Financial functions	42	79
Data base size	100MB	n/a
Records/file	Unlimited	n/a

acts as the master key that unlocks FASTAR data for 1-2-3, actually creating 1-2-3 files in the process. One reference file can generate hundreds of 1-2-3 files containing FASTAR data in your preferred format.

Helping this process along is a memory-resident utility called Pop-up. Pop-up loads automatically with FASTAR and can stick around once you've switched to 1-2-3. Pop-up permits neophyte FASTAR users to peek into and pull data out of FASTAR for analysis, all the while staying within the friendly confines of 1-2-3.

Although using 1-2-3 as a report writer doesn't sound terribly appealing, it works surprisingly well here. FASTAR coexists with such 1-2-3 enhancements as 1-2-3 Report Writer and 4Word, although it doesn't really take advantage of them.

With Pop-up you can do more than prep data for 1-2-3 reports. You can scroll through any FASTAR dictionary, examine cell values via range names or cell references, and view status reports for any schedule for any entity. Pop-up also offers easy access to basic DOS services, from running an external program to backing up files.

FASTAR can also download data from the Dow Jones Disclosure data base of 10K information, and the program's learn mode enables you to create macros as you go. While FASTAR's complexity isn't conducive to macro-driven templates, macros can be a handy means of automating the routine retrieval of 1-2-3 data.

The FASTAR Method

Schedule	Entity	Period	Type
Income statement	Nonex	October 1987	Actual
Balance sheet	Carver Tool	November 1987	Budget
	Sterling Devices		
	Mirage Cosmetics		
	Hoseman Transport		

Figure 1: FASTAR's SEPT scheme makes short work of handling numerous units—in this case, a simple organizational structure during a brief period.

■ Ferreting Out Foibles

Putting aside issues of price and difficulty, *FASTAR* behaves well—with a few notable exceptions. The program saves changes to data when a logical operation, like a query, has been fully defined, but, curiously, it lacks a File Save command. The data base can thus be corrupted by an inadvertent program exit. Of course, in this era of clones and turbo boards of dubious compatibility, resets are unavoidable. Thankfully, *FASTAR* includes a utility to validate and repair the data base.

If you prefer to dress up reports graphically, *FASTAR* won't be of much help. To generate graphs, you'll first need to move data to *1-2-3*. Outside the realm of graphics, error messages aren't sufficiently informative to get you back in the saddle quickly, and they're occasionally spurious.

As with *1-2-3*, *FASTAR* commands can be executed either with cursor keys or with first letters. The only quirk in that system is an annoying requirement that certain options be confirmed with a Y—bad medicine for quick-fingered users who type ahead blithely.

FASTAR documentation runs to three volumes and two wallet-size quick reference guides. CCS provides a fine hands-on tutorial, and context-sensitive on-line help is always available. Help screens for

all menus and submenus are ingeniously cross-referenced.

FASTAR's base price includes presale consultation, two days of installation consulting—typically spent setting up dictionaries and a few reports—and two days of user training. If your department is chafing under a deadline and needs a complete turnkey installation, expect to pay an extra \$15,000. Additional consulting is available for a fee.

Don't put away the department's checkbook just yet; telephone support is available if you purchase a maintenance contract. At an annual fee equal to 15 percent of the current *FASTAR* price, maintenance is hardly a trifling item. At least you have the satisfaction of knowing that a CCS consultant has been assigned to your account.

■ Wishing Upon a Star

FASTAR is a rarefied, highly specialized package that relies on *1-2-3* to communicate with the rest of the world. The program's query and "what if" capabilities are limited, and it feels very much like the data management application it is. So why spend \$25,000 up front, plus \$3500-plus annually for maintenance, for a program that leaves you with spreadsheet work to do?

Primarily because managing consolidated financial data with a spreadsheet alone is a time-consuming, risky business—and the peril increases exponentially as the number of business units rises. *FASTAR* is a bargain if it proves to be the lifeline capable of pulling you out of the quicksand.

As a dividend, *FASTAR* imposes discipline on the corporate consolidation and reporting process. Think of the program as the financial equivalent to a math coprocessor. It doesn't do *1-2-3*'s work; it shoulders the data management chores that *1-2-3* can't perform and masterfully handles whatever organizational complexity you dish out. And once you've set up your application, the amount of work *FASTAR* does with just a few keystrokes is nothing less than stunning. ●

Ralph Soucie is a CPA with McCallister & Company, P.C., in Portland, Oregon.

FASTAR

Corporate Class Software
1211 Avenue of the Americas
New York, NY 10036
212/719-8209

List price: 15-user site license
\$25,000

Requirements: 640K, hard disk,
DOS 2.10 or later version;
available on 3 1/2-inch disks

Risky Business

Sometimes your best guess just isn't good enough. Simulation software like *Predict* lets statistically savvy users build comprehensive models—before making a risky decision.

Michael Orkin
and Richard Drogin

 Suppose you're a property developer deciding whether to buy a building, remodel it, and rent it out as office space. The price seems right, but there are many uncertainties: how long the remodeling will take and how much it will cost, what the vacancy rate will be, and how much the offices will rent for. Future maintenance and insurance costs are also up in the air.

If you create a model of this problem with a spreadsheet, you can plug in different values and


view the problem under various conditions. Assuming a vacancy rate of 30 percent, a rental rate of \$10 per square foot, and maintenance costs of \$700 per month, you'll reach one conclusion. Change the assumptions and you'll get different results.

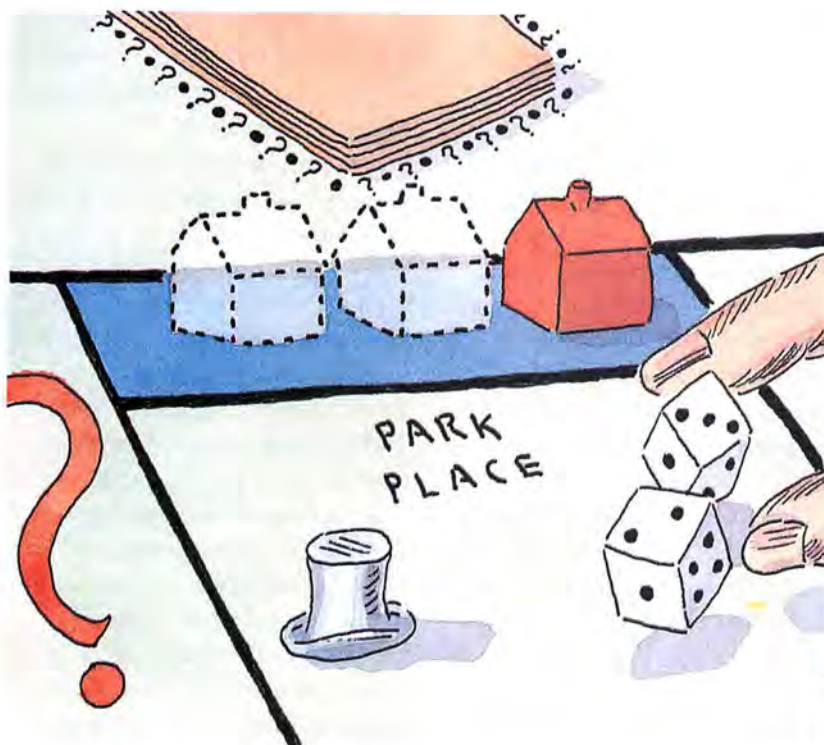
Although useful, substituting values in a spreadsheet is a time-consuming, haphazard, and ultimately limiting approach. A model with seven uncertain factors, each factor having one of five possible values, yields over 78,000 combinations—far too many for the casual “what if” style of analysis.

That's where a dedicated simulation program like *Predict* can help. *Predict* uses the familiar spreadsheet format and traditional Monte Carlo simulation techniques as a basis for building and analyzing models. When you simulate a problem, such as how to invest funds for maximum return, *Predict* randomly selects values according to a given distribution for each uncertain factor, runs them through your assumptions, and generates a statistical summary. With such information in hand, you can determine how well a proposed investment might fare—and gauge the likelihood that profits will exceed or fall below a given level.

Unlike programs such as *SPSS PC+* and *SAS*, which perform a wide range of statistical analyses, *Predict*'s only statistical capability is doing simulations. (For more on *SPSS PC+*, see “The New Statistics” in this issue.) But if you're considering capital investments, pricing products, or eyeing natural resource exploration—risky ventures with plenty of unknowns—*Predict* can be the right tool.

Unison Technology deserves a pat on the back for bringing this mainframe discipline to the PC. *Predict* is an innovative first shot, but its limitations are substantial. Its method of generating binomial distributions is suspect, calculation speed is incredibly sluggish, and the program's interface occasionally lacks grace.

 **A Familiar Metaphor**
Spreadsheet users will find setting up a *Predict* model rather familiar. You enter labels, constants, formulas, and the like into a blank worksheet and access the program's data manipulation and statistical functions from a pull-down menu. But that's where the similarity ends. To create a meaningful model, you must specify



probability distributions for cells containing uncertain values. As *Predict* performs a simulation, each of these cells accumulates a list of random values to be used in later analysis. You must also specify how many values the program should generate (how many iterations).

After running the simulation, *Predict* provides a number of angles on the generated values. For example, you can obtain the mean, the standard deviation, and the "chance of" the value falling within a certain range, and then graph the results.

If you had a thorough statistics course in college, you can probably grasp the essentials of a *Predict* simulation. But setting up a simulation and properly interpreting the results is a job for a statistician. In addition to knowing

about probability and sample statistics, *Predict* users must be able to judge how many iterations are necessary to produce an accurate rendition of a given model.

Getting Started

Predict's designers have worked hard to make the program manageable. Installing the four-disk package is a follow-the-menu process; an installation booklet, tutorial, user guide, and user manual provide ample instructions for getting to know the program. The tutorial is especially helpful because it leads you through a simulation from start to finish. A separate demo program actually runs a simulation while you watch. But don't expect much

from *Predict*'s in-context on-line help facility—messages are inconsistent or unavailable for many functions, and few tell you how to use the program in a particular situation.

Predict provides six pulldown menus: Style (for formatting cells), Instruct (for manipulating data), File (for basic operations such as retrieving and saving files), Graph (for graphing the results of the simulation), Perform (for carrying out a simulation), and Cell (for embedding statistical functions). These menus are easy enough to use—just remember that performing some tasks means digging through any number of overlapping submenus. As a result, you'll find yourself continually closing (and reopening) menus because they usually obscure the *Predict* worksheet.

Command sequences are generally straightforward, but there are exceptions. A case in point: When you issue the exit command, *Predict* reminds you to save the file or you'll lose the data—but to save the file you must cancel the exit command and dig through another menu.

Spreadsheet users may find *Predict*'s data manipulation tools somewhat crude—niceties such as the ability to name ranges aren't

available. But selecting a probability distribution is a breeze. With the cursor in the appropriate worksheet cell, press C to open the Cell menu and choose D for distribution; *Predict* asks you to select a distribution and to specify the range of values. The program then pops one of these values in the cell as a placeholder.

Key Functions

Predict's library of 58 functions can add immeasurably to a model's sophistication. Probability distributions, for example, include normal, triangular, uniform, exponential, binomial, Poisson, geometric, and hypergeometric. Users can also define their own distributions.

In addition to standard statistical functions such as mean and percentile, *Predict* offers financial functions (internal rate of return,

future value of an annuity); trigonometric functions (sine, tangent); mathematical functions (absolute value, exponential value); and logical functions such as IFVAL, which allow you to make one cell's value contingent on another's.

Still, a few more predefined statistical functions would be helpful. As it stands, *Predict* doesn't automatically perform statistical inference. For example, if you take a random poll of 100 people, you'll want to know how accurately the results of that poll can be applied to the population at large. To obtain a 95 percent "confidence range" about the results, you'd have to enter a formula using *Predict*'s predefined functions STDDEV (standard deviation) and SQRT (square root). The process is cumbersome; a predefined function could handle this more easily.

In the Slow Lane

Unison claims *Predict* is written in Microsoft C, automatically uses a math coprocessor if present, and dynamically uses all available memory (even beyond 640K). Thus, we expected *Predict* to be fast. It wasn't.

Generating 1000 uniform random numbers in the simplest possible model—one cell, no computations, and no options—took 5½ minutes on our test system—a hard-disk-equipped PC with 512K of RAM and an 8087 coprocessor. A similar program written in Turbo Pascal executes the same task in less than ¼ second.

Screen updating is unbearably sluggish. It takes 1¼ seconds to close a pulldown menu and more than a second to shift the cell pointer up or down one row. After you've used lightning-quick programs like 1-2-3, a session with *Predict* may inspire you to toss your computer out a window.

To Buy or Not To Buy

We put *Predict* through its paces using a property development model like the one described earlier, with suggestions from Abrams, Millikan, and Kent, a Northern California property development firm. The model's purpose? To determine whether such an investment would turn a handsome profit.

In the model, the proposed property, 1001 Park Place, is on the market for \$1 million. To generate income, the developer must remodel the building and then rent it out as office space. In the remodeling phase, direct remodeling costs and "soft costs" such as architects' fees, engineering fees, and holding costs (based on the time needed for remodeling) will be incurred. Once offices are rent-

STYLE Instruct File Graph Perform Cell 84K					
1	FORMAT CELLS				
2	Width				
3	Print S				
4	FORMAT SELECTION				
5	DOLLAR FORMAT				
6	% Percentage				
7	Exponential Format				
8	Normal F				
9	Comma Fo				
10	Hide				
11	Show				
12	Reset				
13	FORMAT RANGE				
14	Cells [C5]:				
15	C5~C7.....				
16					
17					
18	Sales Revenue:			Year 3	Total
19	Unit sales	1,447	2,220	3,604	
20	Unit price	\$399	\$349	\$309	
21	Sales revenue	\$577,436	\$774,810	\$1,113,528	\$2,465,774
22	Cost of Sales:				
23					
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Predict's pulldown menus are big and clear, but they sometimes obscure cells.

ed, tax, insurance, maintenance, management, and mortgage costs must be paid. Income, derived solely from rental fees, will depend on the rental rate and vacancy rate.

To set up the model, we entered labels, plugged in constant values such as purchase price and square footage, and then typed in formulas. For example, total remodeling costs (cell C10) were calculated by multiplying the square footage (cell C8) by the cost per square foot (cell C9).

Next, we assigned probability distributions to uncertain values, given the development firm's best assessment of the situation. In Phase I (Development), engineering fees, miscellaneous fees, and holding time are uncertain quantities (cells C14, C15, and C16); in Phase II (Rental), rate per square foot, vacancy rate, insurance costs, maintenance costs, and interest rate are likewise uncertain (cells C24, C26, C31, C32, and C39).

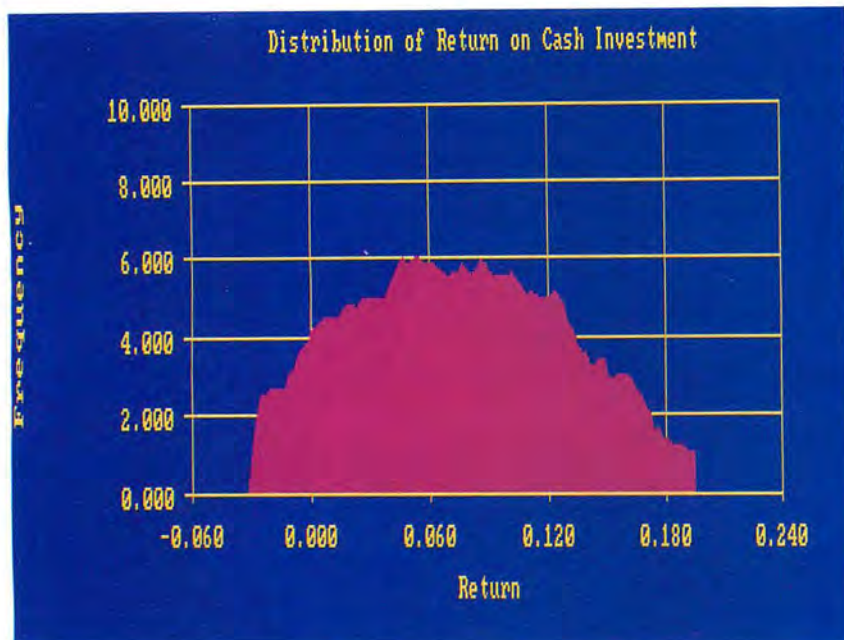
As Figure 1 illustrates, all cells holding uncertain values are tagged with *Predict*'s distribution functions. Engineering fees (cell C14), for example, were given a uniform distribution (all values equally likely) between \$500 and \$2000. Holding time (cell C16) was given a triangular distribution—a minimum of four months, a maximum of eight months, with six months being the best guess. Insurance costs, maintenance costs, and interest rate received a normal distribution (the familiar bell-shaped curve).

To determine likely profit, the functions MEAN and CHANCEOF are applied to cells C48

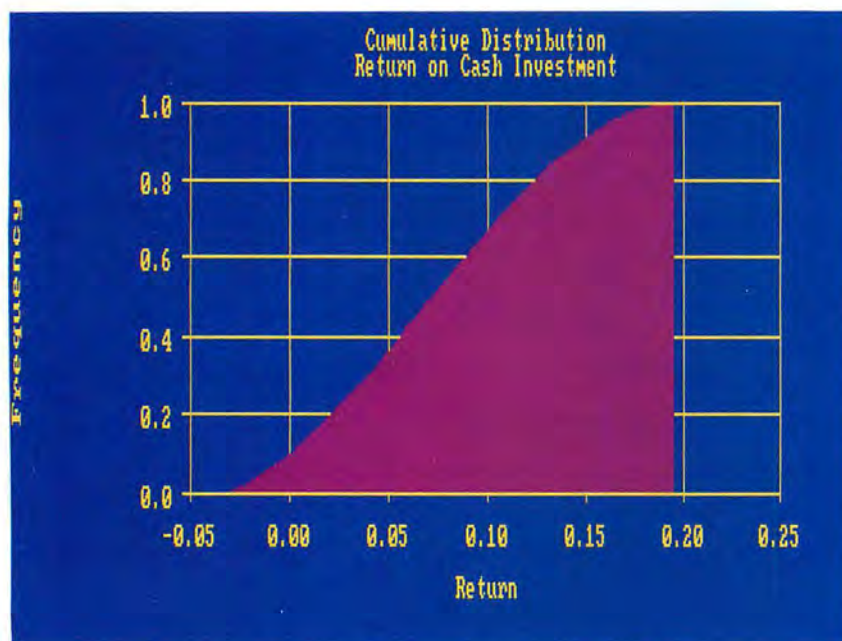
Running the Numbers Through Predict

A	B	C	
1	Profitability Analysis for 1001 Park Place		Formulas/Distributions
2			
3	Phase I: Development		
4			
5	Purchase price	\$1,000,000.00	
6			
7	Remodeling costs		
8	Square feet	5,000	
9	Cost per square foot.	\$23.90	Triangular Distribution
10	Total	\$119,479.04	C8*C9
11			
12	Soft costs		
13	Architects' fees	\$5,973.95	.05*C10
14	Engineering fees	\$1,556.17	Uniform Distribution
15	Miscellaneous fees	\$1,980.87	Uniform Distribution
16	Holding time	0.46	Triangular Distribution
17	Holding costs	\$1,919.20	1000+2000*C16
18	Total	\$11,430.18	C13+C14+C15+C17
19			
20	Total development cost	\$1,130,909.22	C5+C10+C18
21			
22	Phase II: Rental		
23	Square feet	4,000	.8*C8
24	Rent/Square foot per month	2.55	Triangular Distribution
25	Rent/Square foot per year	30.66	12*C24
26	Vacancy factor	0.06	Triangular Distribution
27	Total	\$115,872.52	C23*C25*(1-C26)
28			
29	Management costs		
30	Taxes	\$11,309.09	.01*C20
31	Insurance	\$1,560.44	Normal Distribution
32	Maintenance	\$1,253.21	Normal Distribution
33	Management	\$9,269.80	.08*C27
34	Total	\$23,392.54	C30+C31+C32+C33
35			
36	Net income	\$92,479.97	C27-C34
37			
38	Mortgage costs		
39	Interest rate	0.11	Normal Distribution
40	Amortization in years	20	
41	Loan amount	\$850,000.00	.85*C5
42	Yearly loan payment	\$46,845.33	(.5*80000*C39*C40+C41)/20
43			
44	Cash investment	\$280,909.22	C20-C41
45			
46	Bottom line: Return on cash investment	0.16	(C36-C42)/C44
47			
48	Mean return	0.07	MEAN(C46\$)
49	Over 5% return	0.61	CHANCEOF(.05,99,C46\$)
50	Over 10% return	0.32	CHANCEOF(.10,99,C46\$)
51	Over 15% return	0.09	CHANCEOF(.15,99,C46\$)

Figure 1: Predict allows you to build a model using a spreadsheet foundation. The shaded area in this property development model shows formulas and distributions that are actually "hidden" in column C. After Predict runs the simulation, cell C48 illustrates the results: a 7 percent return on cash invested. Note that the figures shown in the model are rounded to two decimal places; Predict performed the calculations with more exact figures.



Predict's customizable graphics function helps simplify complicated data. Here, a distribution graph of the return on investment for 1001 Park Place shows a mean return of 7 percent.



Using this cumulative distribution graph, you can easily determine percentiles—in this case, the chance of getting a mean return on investment less than or equal to a given percentage.

through C51. In cell C48, the formula `MEAN(C46$)` instructs the program to compute the mean for cell C46, namely, the return on cash invested.

Next, to determine the chance of the return on investment being greater than 5 percent, the formula `CHANCEOF(.05,99,C46$)` in cell C49 instructs *Predict* to calculate the percentage of values in the interval .05 to 99. `CHANCEOF` cells are also defined for 10 percent and 15 percent in cells C50 and C51, respectively.

The Big Picture

Running the simulation is a matter of pressing a few keys. A time bar appears at the bottom of the screen, indicating the progress of the calculations.

And then you wait. This example, with 200 iterations, took 15 minutes on our test system. But the simulation generated the results we were looking for. Based on the assumptions, the developer can expect a mean annual return (cell C48) of 7 percent. The `CHANCEOF` functions in cells C49, C50, and C51 indicate a 61 percent chance of a return greater than 5 percent, a 32 percent chance of a return greater than 10 percent, and a 9 percent chance of a return greater than 15 percent, respectively. Given these figures, the hypothetical developer in this scenario decides to look for a sweeter deal. *Predict* has done its job for this model—but in certain situations, it simply won't produce an accurate result.

A Flaky Distribution

Flip a coin 100 times, and according to the laws of statistics, there's a 95 percent chance it will come up heads between 40 and 60 times. *Predict*'s binomial distribution function is supposed to

simulate just that probability—but it doesn't. (A binomial distribution would let you model, for example, the number of offices between 0 and 20 that will be rented.)

To test the binomial distribution function, we performed a chi-square goodness-of-fit test on *Predict's* simulation of the binomial distribution, with $n = 10$ and $p = .5$ (this is equivalent to tossing a coin ten times). We did seven simulations of 100 iterations each, reseeding the random number generator before each simulation. The results were grim.

In five of the seven simulations, the significance probability for the goodness-of-fit test was less than .01. Simply put, the results of the

simulation would be extremely unlikely for a binomial distribution. In each case, there were significantly more low observations than one would expect, leading to the inevitable conclusion: *Predict's* method of generating binomial observations is flawed.

Rick Roth, president of Unison Technology, admits to a problem with the reseeding process (which may be responsible for the inaccuracy) and says the binomial distribution function has been rewritten and retested for the next release of *Predict* (version 1.3, release 2), due out by the time this article is published. Roth also says the new version will be about 20 percent faster.

Getting the Message Across

When the time comes to report a simulation's results, most users will appreciate *Predict's* graphs, which include line, scatter, bar, layered bar, continuous distribution, and raw distribution. Creating a graph can be as simple as selecting the graph type, naming the graph, and specifying the data range. If you want legends and titles, however, you must turn to the Graph menu to dress things up. For example, to create the distribution and cumulative distribution graphs illustrating the mean return on investment (cell C48), you would first type in the main title and the x- and y-axis titles; select colors from a supplied list; save these entries in a graph file; and finally, after flipping through several menus, direct *Predict* to graph the data.

Modifying a graph file is even more ponderous. You must open the Graph menu and select Create Graph, and from the File Restore submenu specify the name of the graph to modify. After you make the changes, you must save the file

once more. To view the changes, return to the Graph menu, select Draw Graph, pick the graph file from a list, specify the data ranges, select the output device (the screen or a printer), and wait for the graph to appear.

As with a spreadsheet, *Predict's* report generation is limited to printing all or part of the worksheet (like Figure 1) and whatever graphs you create. If you need to create fancier reports, you can export *Predict's* files in ASCII format and tinker with them in a more flexible program.

Predictable Conclusions

Predict is a bold attempt to bring sophisticated simulation techniques to the PC, but its rough edges stand out. Once the binomial distribution function is fixed and calculation speed improves, running the numbers through *Predict* may help statistics pros clarify business situations where uncertainty is key. ●

Michael Orkin is chairman of the statistics department at California State University at Hayward; Richard Drogin is a professor of statistics there.

Predict

Unison Technology, Inc.
410 Rouser Rd.

Coraopolis, PA 15108
412/773-3428

List price: \$795, trial pack \$25
Requirements: 512K (640K recommended), two floppy disk drives or a hard disk drive,
DOS 2.10 or later version
Not copy protected

Executive Summary

Predict

Simulation software

Predict version 1.3, release 1, is a dedicated simulation program useful for analyzing situations where some values (such as market share) are uncertain. If you can specify probability distributions for those values, you can run a simulation and generate a statistical analysis of the results. But *Predict's* method of generating a binomial distribution is flawed, and it crawls through calculations.

Data entry/ manipulation	Excellent
Calculation speed	Poor
Graphing/reporting	Good
Documentation	Good
Overall value	Good

The agony of delete.


HD FILES

- ~~1. Alfa Repairs~~
- ~~2. Alfa Repairs II~~
- ~~3. Alfa Repairs, son of!~~
- ~~4. ANR 2045~~
- ~~5. ANR 2046~~ *?*
- Resume P. 4* → ~~6. BTP 6060~~
- ~~7. Bus. Klenel.~~
- ~~8. Critical file~~
- stet* → ~~9. CDE 6011~~
- ~~10. CDE 6012~~
- ~~11. Klonations~~ *delete PTL Club!*
- ~~12. Also not destroy~~
- ~~13. DRU 300 KNT~~
- ~~14. Ent/Rec.~~ *save "Flight Simulator"*
- '86 Football Pool - DJ owes \$40* → ~~15. FBPL86~~
- ~~16. FDT 9011~~
- ~~17. Foreign affairs~~ *delete Helga + Pia*
- Projected '88 Taxes* → ~~18. Future shock~~
- ~~19. Hart Campaign~~
- ~~20. HDN 0031~~



Disk full

9:34 Tuesday night. You're working on a report that's going to top 80 pages. It's got charts, graphs, database files from the company mainframe, it's a monster.



About halfway through, you decide to make a backup file so you can tweak the original without losing it. And up comes a familiar message.

Your hard disk has 75K left. And you need at least 220K.

At this point, the next hour gets very predictable. You pull up the directories, looking for files to delete. Which isn't all that simple. Did ANR 2046 replace ANR 2045, or do you still need both of them? And then there's your resume. Did you put it at the back of BTP 6060 or somewhere else?

The only way is to browse those files one at a time, and delete the ones you can. Which can definitely affect the mood of the evening.

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in a single slot. So you won't have to throw out your old drive to make room.

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Since Hardcard is engineered so lean and tight, it uses less power than ordinary hard disk drives. And lasts two to four times longer. It even leaves the rest of your PC open for turbo-boards, graphics cards, or whatever.

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And get ready for the thrill of victory. Which sure beats the agony of delete.

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Q.

HOW MANY LAPTOP COMPUTER COMPANIES DOES IT TAKE

to give you the largest laptop selection, expert, non-biased laptop information, all the laptop peripherals you need to be "up" immediately, authorized laptop service, free delivery, and a full laptop 'No-Lemon' replacement guarantee above and beyond that of the manufacturer?

A.

ONE*

	Bondwell Model 8	Spark by Datavue	Snap 1 + 1 by Datavue	NEC Multi Speed	Toshiba T3100	Toshiba T1100 Plus	Wang Laptop	Zenith Z-183	Zenith Z-181
Micro processor	80C88	NEC V20	80C88	NEC V30	80286	80C86	NEC V30	80C88	80C86
Screen Type	superwist LCD	superwist LCD	superwist LCD	superwist LCD	Gas Plasma	superwist LCD	LCD	backlit superwist LCD	backlit superwist LCD
Hard Drives	—	—	120M-byte	—	110M-byte	—	110M-byte	110M-byte	—
Internal Memory	512K	384K	640K	640K	640K	640K	512K	640K	640K
Battery Duration Time	6 to 8 hours	8 hours	8 hours	4 to 6 hours	Call for Avail	8 hours	4 hours	2 hours	3 hours
Clock Time (MHz)	4.77	4.77 or 9.54	4.77	4.77 or 9.54	4 or 8	4.77 or 7.16	8	4.77 or 8	4.77 or 8
Number of Floppy Discs	1	1	1	2	1	2	1	1	2



BONDWELL Model 8

This is one of the most complete IBM-compatible computer systems in a lap-size package. With 512K RAM and a high contrast backlit LCD screen, the Model 8 runs all popular IBM programs, weighs just about 10 lbs., and even fits in a briefcase!!

LIST PRICE

\$1295

OUR PRICE
\$1095

ZENITH Z-181

Perhaps the best laptop value available today, this is the laptop the competition would like to forget!! A switchable clock speed, a large, adjustable screen for super sharp images, full 640K memory, and dual 3.5" pop-up drives are packed into a fully portable unit that weighs less than 12 pounds. Compatible with the IBM PC & XT, the Z-181 puts the weight of your work on its shoulders, instead of in your lap.

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NEC MULTISPEED

With its unique detachable Super Twist LCD screen, this laptop is a breakthrough of truly small proportions. The Multispeed has more power, more memory, and twice the speed of the IBM convertible. With a weight of just over 11 pounds, folks all over town will know you're really going places.

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ZENITH Z-183

Easily upgradable, this is the laptop that gives serious users all they need. An internal 10 MB hard disk, dual speed processing, and 640K RAM plus EMS expansion capability to 1.6 MB gives the Z-183 the edge over the competition. Add these to an adjustable backlit Super Twist LCD screen and a long-life rechargeable battery, and suddenly the Z-183 doesn't really have any competition...

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\$3499

OUR PRICE
\$2359

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LIST PRICE
\$1325

OUR PRICE
\$1209

SNAP 1+ 1 (Not shown)
LIST PRICE
\$3495

OUR PRICE
\$2999



WANG LAPTOP

With the built-in printer, no other portable has ever been carried this far—a built-in 10MB Winchester H.D., built-in MX80 compatible Near Letter Quality printer, IBM compatibility, and a fast 8 MHz clock. Even with the battery pack, Wang weighs less than 14 lbs, and is small enough to fit on an airline tray. That's portability!!

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THE HARDWARE SHELF

Edited by Charles Bermant

This Month

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Saba Handscan

Hand-held optical character recognition system

Pros: Fast, accurate, inexpensive

Cons: Won't recognize proportionally spaced fonts

Saba Technologies

9300 S.W. Gemini Dr.

Beaverton, OR 97005

800/654-5274

List price: \$649.95

Requirements: 512K, DOS 2.10 or later version, hard disk recommended

Most optical character recognition (OCR) systems are for big jobs. You load a multipage document into the scanner's sheet feeder, find something else to do, and return later to correct the recognition errors in the massive file you've created. Starting at \$3000, OCR page scanners are clearly overkill if all you want to do is turn the occasional hard-copy report into ASCII text.

Saba Technologies' Handscan offers a new OCR option—and at \$650, one that won't bust your budget. The Handscan is a hand-held, mouselike device that you roll across the page from left to right, line by line. If the font you

scan is supported by the Handscan's OCR software, text appears on the screen almost as fast as you can swing the device across the page. Even more impressive, if you move the Handscan slightly off the center of a line—or skew the angle of a character by as much as 30 degrees—the scanner will still produce remarkably accurate results.

In concert with its full-length interface board and memory-resident OCR software, the Handscan operates with virtually any application program. Essentially, the OCR software fools the foreground application into assuming that the Handscan's input is coming from the keyboard—though the keyboard itself remains active. Thus, if you're working with a word processor, you can type a line of text, press the Handscan's read button, scan any number of lines or pages, and resume typing.

Four cursor keys on the Handscan's shell enable you to pinpoint where scanned scraps of text will appear on screen. When building a large spreadsheet, for example, you can scan numbers into the appropriate cells without resorting to the keyboard's cursor keys. Moreover, a macro function enables you to program the Handscan's cursor keys with strings up to 255 characters long. A shift



Mark Johnson

Saba's Handscan adds a new wrinkle to scanner technology: a remarkably fast and accurate handheld scanning unit that reads text line by line. Eleven typewriter styles, six NLQ fonts, and seven mainframe laser printer fonts are supported.

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Hauppauge!

Trademarks: IBM PC/AT and Personal Computer; OS/2; Compaq Computers

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button puts you in macro mode; you can even disable the cursor function for a total of nine possible macro sequences (including one for the read button).

scan documents that violate these rules, you can disable the feature. Other options enable the Handscan to limit the pattern search to numbers and symbols, sense light

ning that kind of document never fails to produce garbage on the screen. So if you're itching to scan the latest *Business Week*, forget it.

Saba believes that in a world where micro-to-mainframe links are more promise than substance, the primary use for the Handscan will be scanning mainframe hard-copy reports, instead of having PC personnel key them in. Of course, the potential of this new class of peripheral is far greater, particularly because of the device's low price and nearly error-free performance. Once it can recognize proportionally spaced fonts (a goal that Saba expects to attain in two years or so), the Handscan may become as common as the mouse.

—TJ Byers

The Handscan's cleverest feature is an automatic 'font finder' that identifies the font you want to scan. You scan a line of text and wait a few seconds until the software comes up with a best guess.

Unlike conventional OCR systems that use algorithms to decipher characters, the Handscan uses a pattern recognition method. When the Handscan detects a printed character, it analyzes the input and compares it to previously stored patterns for the font. The stored pattern with the closest match is the character that the OCR software sends to the main application.

It's hard to move too fast for the Handscan. If you manage to do so, a high-pitched beep urges you to slow down; a low-pitched beep warns you when the keyboard buffer is almost full. Both signals go off before you lose any characters.

A context-assistance function reduces errors by ruling out certain character sequences. The software assumes, for instance, that numbers or uppercase letters don't appear in the middle of lowercase words. When you need to

or dark paper automatically, and substitute or eliminate characters (a blank space for a dollar sign, for example).

The Handscan's cleverest feature is an automatic "font finder" that identifies the font you want to scan. You simply turn on the font finder, scan a line of text, and wait a few seconds until the software comes up with a best guess—which saves you from having to know the difference between Pica 10 and Courier 12. Consisting of 11 typewriter styles, 6 near-letter-quality fonts, and 7 mainframe laser printer fonts, the font library is extensive when compared to those of most other low-end scanning systems.

Nonetheless, even if the font is not officially supported, the Handscan often does a creditable job. No input goes ignored; the Handscan will always attempt to match the character on the page with one of the patterns held in software. However, because the Handscan isn't designed to handle proportionally spaced text, scan-

GV-286

AT compatible

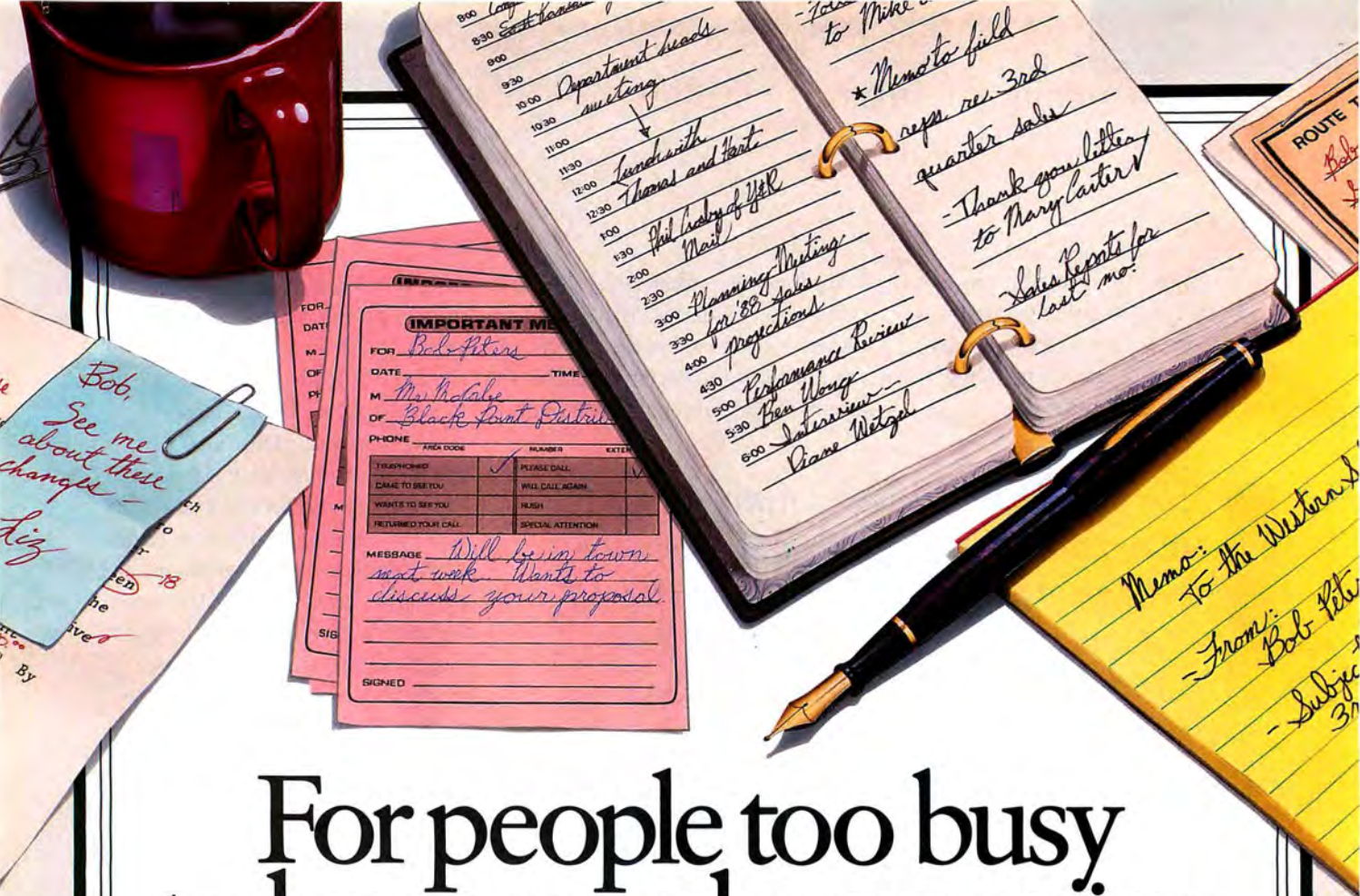
Pros: 12-MHz processing speed, no-wait-state performance, money-back guarantee

Cons: High price

PC Designs

2500 N. Hemlock Circle
Broken Arrow, OK 74012
918/251-5550

List price: with one floppy drive and 30MB Seagate or 25MB Priam hard disk \$2920, with 40MB Seagate \$3034, with 40MB Priam \$3174, with 60MB Priam \$3284, with 80MB Seagate \$3420; 3 1/2-inch floppy



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drive \$165; 60MB Everex tape backup \$605; Hercules Monochrome Graphics board and Princeton Max12 Amber Monochrome Monitor \$274; Hercules Color Video Adapter and Princeton HX12 RGB Color Monitor \$610; Enhanced Graphics Adapter and Princeton HX-12E EGA Monitor \$764; EGA and NEC MultiSync Monitor \$825

When I recently reviewed IBM's PS/2 Model 50, I put the rest of my life on hold. The PC Designs GV-286 I had also been assigned to review was shunted to the other side of the office as I ogled the elegant design and innovative technology of Big Blue's new baby. By comparison, the GV-286 seemed an elephantine throwback.

I kept the GV-286 up and running, if only to use software on 5¼-inch disks. The machine slowly gained my respect. Many modern PCs are undistinguished, but this clone from Broken Arrow, Oklahoma, zips down the track like its namesake, the *Très Grande Vitesse* (TGV): the fastest train in the world.

When I ran the *PC World* performance tests, respect turned to admiration. Not only did the GV-286 outclass the PS/2 Model 50 and the PC's Limited 12-MHz 286, but in one test it surpassed the Compaq 386. No-wait-state, 100-nanosecond RAM and a special static RAM cache that accelerates memory access help account for the breakneck speed.

The GV-286's 21.3-by-17.3-by-6.8-inch box is as durable and heavy as it looks (42 pounds), and the switchable 200-watt power supply is sufficient to handle almost any expansion option. The basic system includes either a 360K or 1.2MB 5¼-inch floppy drive (a 3½-inch drive costs \$165 more) and your choice of a 30MB Seagate or 25MB Priam hard drive. Also standard are two serial ports, a parallel port, and a battery-powered clock/calendar. Top this off with a free copy of *Desqview 1.3* multitasking software, and the \$2920 base price looks more reasonable.

How fast is 12 MHz? With the speedy PC Designs GV-286, fast enough to beat out IBM's PS/2 Model 50 on most tests.



Mark Johnson

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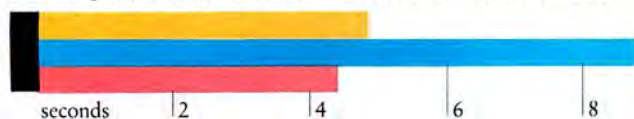
PWD

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A No-Name AT Outmuscles the Big Guys

- 12-MHz GV286
- PS/2 Model 50
- Deskpro 386

Find all prime numbers less than 1000 in interpreted BASIC



Find all prime numbers less than 10,000 in compiled BASIC



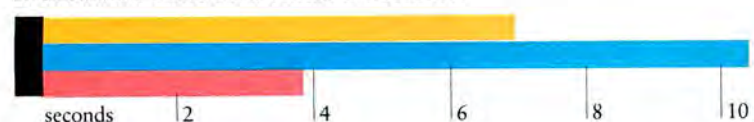
Reformat a 150K WordStar document



Retrieve a 243K 1-2-3 release 2 worksheet



Recalculate a 243K 1-2-3 release 2 worksheet



Save a 243K 1-2-3 release 2 worksheet



Sort a 76K 712-record dBASE III Plus file



PC Designs' GV286 easily bests IBM's 10-MHz PS/2 Model 50 and even gets the better of Compaq's Deskpro 386 on one test.

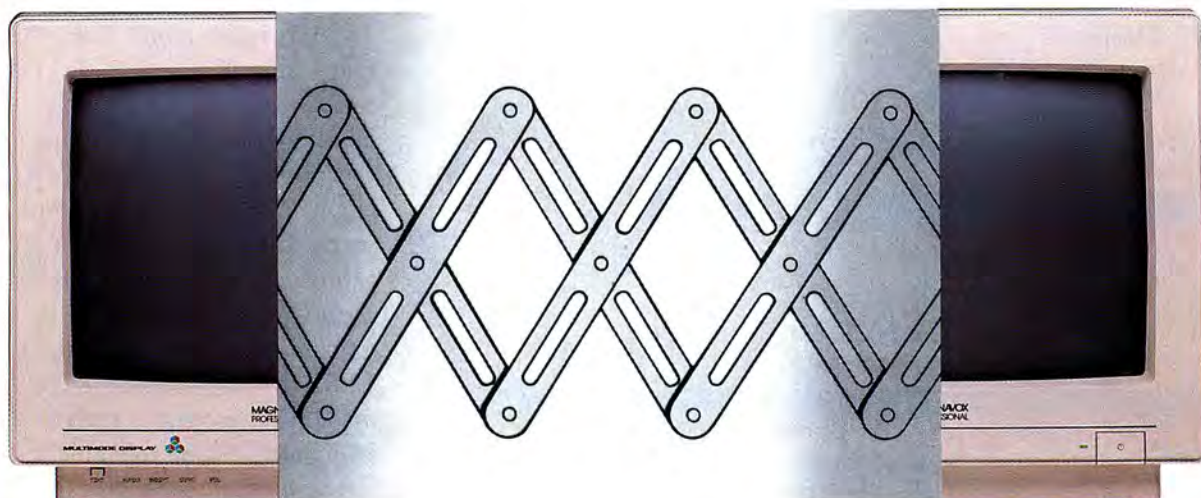
Along with the usual indicators, the front panel offers a keylock, a reset button, and an LED showing 12-MHz turbo mode. Everything else is pure AT mimicry. PC Designs wrote its own BIOS, attempting to match the timing and specifications of the 8-MHz AT as closely as possible. The computer successfully ran a variety of applications, including *1-2-3*, *Manuscript*, *dBASE III Plus*, *Word*, *Crosstalk Mk.4*, and *Starflight*. In 12-MHz turbo mode, the GV-286 made poky programs such as *WordStar 3.1* look tolerable.

The motherboard, also designed in-house, includes a socket for an 80287 math chip, six 16-bit slots, and two 8-bit slots. One of the 16-bit slots is taken up by the floppy/hard disk controller, and the 8-bit slots hold the I/O board and the optional video adapter, leaving five full-length slots. In addition to the parallel port, the I/O board contains both 9-pin and 25-pin serial ports. The video adapter offers a second parallel port. Four punch-outs let you install additional ports.

The GV-286 provides bays for five half-height devices or two full- and one half-height device. All the drives except the 60MB and 80MB models are available in half-height versions, including the 60MB streaming-tape backup system.

PC Designs offers four display options: monochrome graphics, CGA color, or standard EGA setups, plus an EGA board teamed up with a NEC MultiSync monitor. All systems are shipped with

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some people charge for the graphics card alone. Plus you get complete backwards compatibility with virtually all software written for the PC/XT and AT.

It's a dynamite combination.



the popular 101-key Maxi-Switch keyboard. Two DIP switches on the back of the keyboard let you switch between AT and XT formats and exchange the <Ctrl> and <CapsLock> functions.

For sensitive software, you can downshift the GV-286's clock

There's no justice in the computing world. While IBM and Compaq get the cover stories, clones from Broken Arrow and Seoul, even if they offer a better deal, struggle for recognition. Since *PC World's* review of the ET 286i (see "An AT by Any Other

Because normal GammaFax transmissions omit the scanning process, converted ASCII files received from the board are generally far more legible than those received from a fax.

speed to 6 MHz with a keyboard command. You can even switch your bus speed from 6 MHz to 12 MHz by changing a DIP switch, but only a few high-speed boards support the latter setting. In addition, when adding storage or boosting memory (up to 16MB), you use the unit's ROM-based setup program—it's far more convenient than a setup disk.

As for support, PC Designs seems to be going out of its way to make friends. The GV-286's documentation is thorough and informative and offers an excellent tutorial for beginners. You can turn to a toll-free number for technical assistance, and a conditional 30-day money-back guarantee and one-year repair guarantee are standard.

Name," *PCW*, December 1986), PC Designs has not only gotten into the business of designing its own motherboards, it has also cleaned up its documentation and support act considerably. The GV-286 is a bit pricey when compared to other AT clones (\$3194 for a basic system plus monochrome graphics), but the blistering speed, expansion opportunities, and full customer support make it a worthwhile purchase.

—Eric Brown

GammaFax

Facsimile communications system

Pros: Low cost, ability to convert ASCII to fax files

Cons: Poor character recognition software

GammaLink
2452 Embarcadero Way
Palo Alto, CA 94303
415/856-7421

List price: \$995; *GammaFax Plus* (with 1200-bps modem) \$1195; *Font Character Recognition* (FCR) software \$595
Requirements: 256K (512K with FCR software)

If having a facsimile machine on your desk intrigues you but the price doesn't, then you should know about GammaFax. For about half the cost of a stand-alone fax machine, this 10-inch-long, 8-bit expansion board can turn your PC into a powerful fax system.

Of course, you can't shove an 8½-by-11-inch sheet into an expansion board, so GammaFax isn't *exactly* like a fax machine. The board is actually designed for two purposes. First, it receives binary fax files—which arrive in their own bit-mapped graphics file format—and either displays them on a graphics monitor or sends them to a graphics printer. Second, GammaFax converts ASCII-based files (up to 999 characters long) from your PC into fax file format and transmits them to remote fax machines.

Because normal GammaFax transmissions omit the scanning process, converted ASCII files received from the board are generally far more legible than those received from a fax. However, GammaFax also drives the Canon IX-12 scanner, so—just like with a stand-alone fax system—you can send remote fax machines bit-mapped renderings of hard copy.

Based on the popular Rockwell 9600-bps chip set, the GammaFax

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*Source: International Data Corp.



system includes all the features necessary for normal Group 3 fax communications (see "A Reasonable Facsimile," *PCW*, June 1987). The board's talents include auto-dial and auto-answer, unattended file transfer, broadcasting (for calling multiple fax machines and sending them documents), and polling (for calling multiple fax machines and receiving documents). GammaFax also offers turnaround (the ability to receive and forward fax transmissions), a feature usually found only in fax machines that cost \$5000 or more.

As a bonus, you can hook up two GammaFax-equipped local computers with a telephone wire and use the 9600-bps modem to transfer files. (While 80286 and 80386 computers can exchange files at a full 9600 bps, 8088- or 8086-based machines can only use this local link at 4800 bps.) For remote communications, GammaLink offers a 1200-bps, Hayes-compatible modem option for an additional \$200.

The GammaFax software package consists of four program modules: one for fax communications, one for converting ASCII files to the fax file format, one to print fax files, and one to display fax files on screen. The menu structure is clunky, however, requiring you to go through many options to get to the function you need.

Fortunately, you can use GammaLink's powerful script language to automatically execute functions among all four program modules. Like most telecommunications programs, GammaFax enables you to set a timer for

sending files (up to 25 per unattended session) at off-peak hours. You can also instruct the software to maintain a log for each session. In addition, GammaLink provides a rudimentary cut-and-paste function, but because it's not interactive (you actually issue the cut-

and pan functions to give you a closer look at bit-mapped images.

The weakest link in the GammaFax connection is the optional font character recognition (FCR) software. This \$595 package is supposed to convert fax files—or IX-12 scanner input—into ordi-

Though the menu structure is clunky, you can use GammaLink's powerful script language to automatically execute functions among all four program modules.

and-paste commands from DOS), the procedure is too clumsy to be useful.

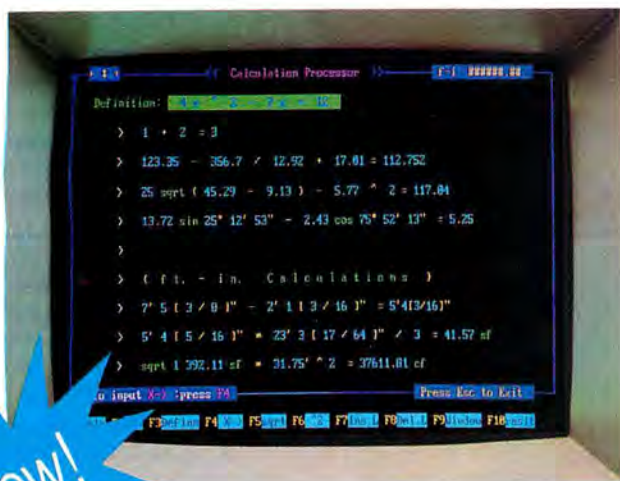
You can print incoming fax files on a variety of graphics printers, including the Epson MX-80, the IBM Graphics Printer, the NEC P6, the HP LaserJet Plus, and the Canon LBP-A200 laser printer. For on-screen display, GammaFax supports the IBM Color/Graphics Adapter (CGA), the Enhanced Graphics Adapter, and the Hercules Graphics Card. The board also drives the high-resolution Genius VHR and Wyse WY-700 full-page monitors.

Sadly, the default video mode is CGA, and you have to enter cryptic display codes to change video boards. If the hard copy scanned by a remote fax machine is less than perfect, you may find CGA resolution too low for distinguishing flawed characters. For this reason, the software provides zoom

nary ASCII files. The program is persnickety, however, and unless the text is in exactly the font and pitch the FCR prefers (Courier 10), the conversion is riddled with errors. If you have a laser printer, you'd probably do better printing out a fax file and scanning it with the Handscan.

The basic GammaFax software has its own share of annoying quirks. Because of the sensitive nature of fax transmissions, the program completely takes over the system until terminated. To prevent a machine interrupt that could corrupt a file, GammaFax even turns off the PC clock during fax file transfer, resulting in a clock that's never on time and files that are incorrectly date-stamped.

Even more irritating, GammaFax can't coexist with applications that modify the keyboard. The software is not smart enough to temporarily override a programmed function key, so when it encounters one, the system locks.



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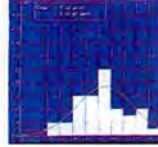
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2: 1.1 linear and quad	$20(10) = 16,000$	16,000.00
3: 1.2 min. payment	$5.00(10) = 50.00$	50.0000
4: 1.3 incl. taxes	$100(10) = 1,000.00$	1,000.0000
5: 1.4 ch. notes	$100(10) = 1,000.00$	1,000.0000
6: Subtotal		316,000.00
7: Chapter 2: Gen. Linear Work		
8: 2.1 filler material	$4.00(10) = 40.00$	40.0000
9: 2.2 setting	$1.00(10) = 10.00$	10.0000
10: Subtotal		50.0000
11: Chapter 3: Concrete work		
12: Chapter 4: House items	$11.00(10) = 110.00$	110.0000
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Obviously, GammaLink's programmers need to smooth some rough edges.

Nonetheless, when you consider that you're getting more features than you could dream of from a dedicated fax machine—for half the price—GammaFax's shortcomings

dealers and customers have been scrambling for ways to transfer existing programs and data to the new machines. With little PS/2-compatible communications software available on 3½-inch disks, the most convenient option is an external 5¼-inch floppy drive.

ble delivering both data and power runs from this connector to the external drive.

The Model 30 requires no setup or configuration changes, but the other models in the PS/2 line rely on a configuration file to describe the peripherals. This file is maintained by IBM's PS/2 Reference Diskette; you must run the configuration program and select the automatic-configure option. The program will correctly identify the equipment attached to drive B: as a 5¼-inch disk and make the necessary updates.

The external drive functions like any 360K 5¼-inch floppy disk drive. Although it must be installed as drive B:, you may use the DOS command ASSIGN B=A to make drive B: also function as drive A: regardless of any ASSIGN command. However, this will not always have the desired effect. Some programs—especially games that boot and run directly from drive A:—bypass the DOS functions and make direct calls to the disk drive. When this happens, the program reads the 3½-inch drive as A: regardless of any ASSIGN command.

A quirk in the DOS 3.30 FORMAT command causes the 40-track parameter (/T:40) to be ignored; thus you cannot format a 5¼-inch disk on the external drive when it's connected to the Model 30. Because the Models 50 and 60 use a configuration file, the 40-track parameter is not needed for those machines, and DOS 3.30 formats the 5¼-inch disk correctly.

As the PS/2 gains popularity, 5¼-inch external drives will become commonplace. By using

Nth External Floppy installs in less than 5 minutes, thanks to IBM's new snap-off cover design. You simply connect the signal cable for drive B: to the ribbon-cable assembly supplied by the Nth Group. The connectors are keyed, so you can't go wrong.

ings are easier to live with. Once you've gotten the hang of GammaFax's script files, you'll quickly find yourself telecommunicating with offices that have never seen a modem. —TJ Byers

Nth External Floppy *External 5¼-inch floppy disk drive*

Pros: Ease of installation, low price

Cons: None

The Nth Group
P.O. Box 1287
23046 Lull St.
West Hills, CA 91304
818/883-5506

List price: \$349

Ever since IBM's PS/2 line of computers trumpeted 3½ inches as the new floppy disk standard,

The Nth Group offers two 360K, 5¼-inch external floppy drives: one for the Model 30 and another for Models 50 and 60. The units are identical except for the plug that connects them to the controller board. Both measure about 6 inches wide by 2 inches high by 10 inches deep and draw about 4 watts from their respective controllers.

The unit installs in less than 5 minutes, thanks to IBM's new snap-off cover design. You simply connect the signal cable for the 3½-inch drive B: to the ribbon-cable assembly supplied by the Nth Group. The connectors are keyed, so you can't go wrong.

The other end of this ribbon cable is a female connector that fits neatly on the computer's expansion board knockout panel at the rear of the machine. A 4-foot ca-



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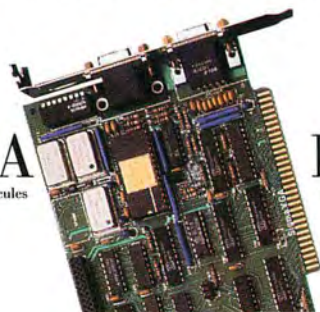


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IBM's controller, the Nth Group has set an acceptable standard for this indispensable peripheral.

—Donald B. Trivette

Courier HST

9600-bps modem

Pros: Good price/performance ratio

Cons: Nonstandard protocols

US Robotics, Inc.
8100 N. McCormick Blvd.
Skokie, IL 60076
800/DIALUSR

List price: \$995

The US Robotics Courier HST is part of a new generation of sizzling modems that break the 9600-bps barrier. At \$995 (just pennies per bit), this speed demon looks the part. With hard, sleek lines, a vented black housing (12½ inches deep by 8 inches wide by 1¾ inches high), and 12 red LED indicators, it looks like something out of *Blade Runner*.

Though the Courier HST's top speed is officially 9600 bps, US Robotics says it can use most of the line bandwidth to transfer data at a top throughput of 11,000 bps. It performs this feat by linking to the home computer at 19,200 bps and feeding data out over the phone as fast as the lines can take it. The Courier HST also runs at 2400, 1200, and 300 bps.

Speed considerations aside, buyers of this modem are taking a chance. At 9600 bps, the Courier HST recognizes only the USR-HST protocol, making it incompatible with the new Hayes V-series modems.

The Courier HST has its own extended command set in addition to basic AT commands—customiz-

lines. In comparison, US Robotics claims a 200-cps throughput for its Courier 2400 series modems. The Courier HST fell back from 9600 to 300 bps without a hitch, except that the MNP protocol, enabled at the factory, had to be turned off.

The Courier HST's biggest drawback has nothing to do with

US Robotics says the Courier HST can use most of the line bandwidth to transfer data at a top throughput of 11,000 bps. It performs this feat by linking to the home computer at 19,200 bps and feeding data out over the phone as fast as the lines can take it.

able features like being able to tell the modem to tone-dial a number first and then use pulse dialing if that fails. In addition, you can set an "inactivity timer" that automatically hangs up after a user-defined period of inaction on the phone line. The 4K nonvolatile RAM buffer holds user-defined features, including up to four frequently called phone numbers, after the modem has been turned off. To help you use the tricky extended commands, the firmware includes several help screens, and a command summary is pasted right on the bottom of the modem.

Using the YMODEM protocol at 9600 bps, the Courier HST transferred a binary file at an average 440 cps over public telephone

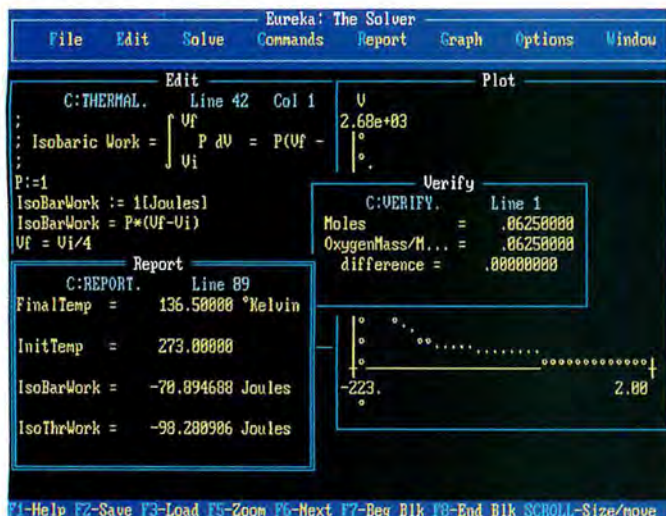
the hardware: There simply aren't enough software packages that take advantage of the device's lightning speed. So far, only new versions of *Hyperaccess* and *Qmodem* effectively exploit the Courier HST's capabilities. Think of it as a device that heavy telecommunicators can grow with.

—Christopher Johnston

Eric Brown and TJ Byers are Contributing Editors for PC World. Donald B. Trivette is a freelance writer and consultant in Wrightsville Beach, North Carolina. Christopher Johnston is a New York-based writer. ●

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Minimum system requirements: For the IBM PS/2* and the IBM* and Compaq* families of personal computers and all 100% compatibles. PC-DOS (MS-DOS*) 2.0 and later. 384K.

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THE SOFTWARE SHELF

Edited by William Rodarmor

GEM Desktop

Publisher

Page layout program

Pros: Works closely with other GEM applications; runs almost as fast as Ventura

Cons: Limited typographic functions; hard to learn; no on-line help; poor documentation

Version 1.0

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List price: \$395

Requirements: 512K, two disk drives (hard disk recommended), graphics adapter, DOS 2.00 or later version

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It ain't easy being easy.

A country and western singer first uttered that bit of down-home wisdom, but the folks at Digital Research are surely singing it now.

When Digital set out to create *GEM Desktop Publisher*, it had in mind a document-oriented program for newsletters and short reports that would be easier to use than high-end packages like Ven-



tura Publisher. Yet *GEM Desktop Publisher* (GEM DTP) is hard to learn, hard to use, and its printed output isn't significantly better than what you get from a high-end word processor like *Microsoft Word*.

Like *Ventura*, *GEM DTP* is built around *GEM*, Digital's Macintosh-like windowing environment. It runs almost as fast as *Ventura* on an XT-class machine and relies on its own bit-mapped fonts. *GEM DTP* also asks the user to describe a document's format via style sheets that encode paragraph-level details such as font, point size, spacing, and tab

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* Using the suite of 48 comprehensive benchmarks published in Data Based Advisor, March 1987.

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settings. But this long-document approach to formatting is ill-suited to *GEM DTP*'s stated purpose—generating newsletters, brochures, and other short documents. The clash between form and function will leave users' ears ringing.

Although *GEM DTP* borrows many of *Ventura*'s concepts, it often adds a new and unnecessary level of complexity. For instance, loading text and graphics files with *Ventura* is a matter of clicking on the file name listed in a single Item Selector dialog box. *GEM DTP* uses an Item Selector in some cases, but in others you must rely on the Mini-Selector, whose role varies according to the mode *GEM DTP* is in. (In the Select mode, for example, you use the Mini-Selector to import text or graphics into general-purpose containers called rectangles; in Paragraph mode you use it to create and apply style sheets.) Even if you can figure out what the Mini-Selector does, it's hard to understand why Digital Research bothered to create it.

Although *GEM DTP* handles documents of up to 100 pages, creating a global format is no simple task. Unlike *Ventura*, *GEM DTP* doesn't come with a sheaf of ready-made style sheets for newsletters, reports, and books, and the user manual gives scant instruction on adapting the six sample documents hidden away in the \GEMPAGES directory.

Creating styles with *GEM DTP* is a tedious process, although no more so than with *Ventura*. For

GEM Desktop Publisher can't compare with PageMaker 1.0 and Ventura 1.1 in typographic and document control features

Typographic features	GEM DTP	Page Maker	Ventura
Automatic hyphenation		◆	◆
Manual hyphenation	◆	◆	◆
Measured hyphenation and justification mode		◆	◆
User-expandable exception dictionary		◆	◆
Manual kerning	◆	◆	◆
Automatic kerning		◆	◆
Tracking control			◆
Spaceband controls	0	3	3
Letterspacing control		◆	◆
Multiple fonts	◆	◆	◆
Automatic horizontal rules			◆
Automatic vertical rules			◆
Automatic bullets			◆
Automatic drop caps			◆
Tabs per paragraph	16	20	16
Multiple tab alignment		◆	◆
Leader tab characters		◆	◆
Multiple measurement units		◆	◆
Quad commands			◆
Automatic first line indents	◆		◆
Automatic left and right indents	◆		◆
Hanging indents			◆
Fixed spaces		◆	◆
Reverse type		◆	◆
Document and page controls			
Automatic text flow across pages			◆
Automatic text flow around graphics	◆	◆	◆
Separate left- and right-page formats	◆	◆	◆
Automatic page numbering			◆
Automatic section numbering			◆
Automatic footnotes			◆
Adjustable widow and orphan control			◆
Captions anchored to graphics			◆
Labels and arrows anchored to graphics			◆
Automatic left, center, and right justification of headers and footers	◆		◆
Multiple automatic numbering styles			◆

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two 60s,
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example, to create a *GEM DTP* document, you open a rectangle on the first page and load a text file into it by selecting the file name from the Mini-Selector. You then highlight an element in the text, such as a headline, and select attributes from a series of menus. In one, you specify font, point size, and color; in another, indents, line spacing, and so on. Once you define this style, you can apply it to the text throughout the document. Alter a style—such as changing the subhead from 10-point Dutch to 14-point Swiss—and the change is instantly reflected in all tagged text. The formats you specify can be saved as a style sheet and applied to future documents.

You capture a graphics file the same way you snare text: Open a

ages created by popular packages ranging from 1-2-3 to *AutoCAD*.

GEM DTP accepts files from many leading word processors but won't translate character attributes such as boldface, underline, italics, and so on. Note, too, that *GEM DTP* incorporates imported documents into a master file and then creates yet another file at print time. Be prepared for a cluttered hard disk.

Still, it's *GEM DTP*'s lack of typographic and formatting niceties that is most keenly felt. The package doesn't offer automatic hyphenation or kerning (although manual kerning is supported), and essentials like rules, page numbers, headers, and footers must be created with *GEM Draw Plus* and then imported. As a result, this \$395 page layout package can't be

This is one more way in which the program fails to meet minimum standards for a professional page layout program.

If you already own the *GEM* family and your page layout needs are minimal, you might consider adopting *GEM DTP*. Anyone else will prefer *PageMaker* for producing short documents and *Ventura* for long ones. Beginners who buy *GEM Desktop Publisher* thinking it's a quick and easy route to professional-level documents will soon be singing the blues. —Jesse Berst

WordPerfect Executive

Integrated package for laptop computers

Pros: Versatile incorporation of mini versions of WordPerfect, PlanPerfect, and office utilities

Cons: No communications module

WordPerfect Corp.
288 W. Center St.
Orem, UT 84057
800/225-5000

List price: \$249
Requirements: 512K, two disk drives (or one 3½-inch 720K drive), DOS 2.00 or later version
Not copy protected

If silence were really golden, the makers of *WordPerfect Executive* would be counting ducats. Their versatile laptop package includes compact versions of WordPerfect's

The \$395 GEM DTP page layout package can't be used for serious business and academic applications without spending an additional \$299 for a drawing package.

rectangle, click the file's name, and the image pops into the box. Text automatically flows around the rectangle, but you must add invisible "phantom" rectangles to buffer the graphic with white space. You move, copy, or resize bit-mapped and object-oriented graphics by pointing and clicking. Unfortunately, *GEM DTP* accepts only images created by other *GEM*-compatible applications—a major limitation that excludes im-

used for serious business and academic applications without spending an additional \$299 for the drawing package.

You can roll *GEM DTP* documents out of a LaserWriter, a LaserJet Plus, a LaserJet Series II, and several dot matrix printers. Although a few third-party downloadable fonts are beginning to appear, *GEM DTP* users are generally limited to the program's paltry collection of Dutch and Swiss fonts, which lacks boldface and italics in some point sizes.

Bookends not included.



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spreadsheet and word processing programs and a battery of helpful office utilities, but inexplicably lacks any communications capability. *WordPerfect Executive* may help do roadwork, but people

WordPerfect Executive's ancestry is apparent from the first. The opening screen, calculator, and calendar display are borrowed from *WordPerfect Library*. The calculator works like an electronic

keeping macros, accessible with <Alt>-key combinations. Some help you move numbers, addresses, or note-card information between modules; others create routine memo, travel, letter, or itinerary forms within the word processor. These macros can't be customized, but they take some of the tedium out of standard tasks.

Personally, I think *WordPerfect* shot itself in the foot this time. Laptop users may well forsake *WordPerfect Executive* for integrated programs such as Software Publishing's *pfs:first choice*, which includes communications. Considering all the things *WordPerfect Executive* can do, it's a shame it literally leaves you speechless.

—Charles Bermant

WordPerfect Executive *may help do roadwork, but people aren't going to buy a product that can't walk and talk at the same time.*

aren't going to buy a product that can't walk and talk at the same time.

WordPerfect Executive's other talents are laudable. Users can switch among appointment calendar, phone directory, calculator, note card filer, spreadsheet, and word processor applications with a keystroke. The modules all follow the same command conventions, so if you're familiar with *WordPerfect* and the company's other products, you'll be up and running in no time.

Despite its impressive grab bag of capabilities, *WordPerfect Executive's* lack of a communications program is a glaring and perhaps fatal imperfection. After all, being able to send and receive files while traveling is the main reason many users get a laptop in the first place. According to a *WordPerfect* representative, including communications would have made *WordPerfect Executive* too big to fit on a single 3½-inch disk. The company says it has no current plans to add such a module.

adding machine, complete with tape, while the calendar stores dates, times, and short memos. Both the phone directory and the note-card file have spaces for name, title, salutation, address, two phone numbers, and notes. *WordPerfect Executive* won't let you create data fields, but then it isn't intended to be a data management tool. At a trade show, though, *WordPerfect Executive* would be the perfect haven for business-card data.

The word processor and spreadsheet at the heart of *WordPerfect Executive* are sophisticated, if abridged, versions of *WordPerfect* and *PlanPerfect* (formerly *MathPlan*) and closely resemble scaled-down versions marketed by *WordPerfect* under the PCjr rubric. The word processor makes do with a smaller dictionary and fewer text formatting features than *WordPerfect* 4.2, and no thesaurus. The 8192-line-by-230-column spreadsheet can display only a single graph and lacks macro facilities.

Spreadsheet macros may be beyond *WordPerfect Executive's* reach, but the package does come with nine preconfigured house-

DS Optimize

Disk optimizer and manager

Pros: Combines disk-optimizing and file management; good preview function; attractive menu system

Cons: File functions hard to find

Version 1.00a

Design Software

1275 W. Roosevelt Rd.

West Chicago, IL 60185

312/231-4540

List price: \$69.95

Requirements: 256K, hard disk, DOS 2.00 or later version

Not copy protected

Disk-optimizing programs are the mother hens of the hard disk world, picking up the bits and pieces of a file that DOS scatters

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across a hard disk and pulling them together into a neat bundle. It isn't so much sloppiness on DOS's part as expediency; DOS automatically packs files into the first available clusters on the disk, even if that means breaking the files up. Disk optimizers repack such fragmented files into contiguous clusters, noticeably speeding file access.

Thankfully, you don't need a Ph.D. in DOS to run one of these utilities. *DS Optimize*, a compact, menu-driven program from Design Software, even does competitors like *VOPT* and *Disk Optimizer* one better: It sticks around after optimizing the disk and helps you move files to where they will do the most good. Files that are read frequently (such as a word processor's overlays) can be

placed on the disk first, where they can be accessed and read most quickly. Files you write to often (such as documents) can be put at the end, where fragmentation will cause the fewest delays.

Easy to install and load, *DS Optimize* displays a visual garden of useful information. An *Xtree*-like directory tree sprouts in a window on the left, with files in the highlighted directory shown on the right. A third window gives program settings (such as backup status and excluded files) and the status of the disk drive (the number of subdirectories and files). When you highlight a command on the menu at the bottom of the screen, a brief description of the function appears; press <F1> for a longer explanation. The *DS Optimize* screen is so intelligently designed, you'll be

tempted to chuck the program's cramped mini-manual after reading it once.

One of the nice things about *DS Optimize* is that it lets you test the water without getting your feet wet. If you're not sure your hard disk needs to be optimized, the program's View command will generate a map showing file fragmentation. When the map starts to look like an aerial view of the Austro-Hungarian empire, the disk needs help.

If you're still feeling cautious, the Optimize Test feature notes the number of clusters to be moved during optimizing and the time it will take. For example, *DS Optimize* informed me that it would take 7 minutes and 45 seconds to clean up the messy 20MB hard disk on my Compaq 286. When I ran the program, its prediction was right on the money.

Most people are understandably nervous about turning *any* program loose on their hard disk, not to mention one whose stated aim is wholesale reorganization. But like flying, disk optimizing isn't inherently dangerous; it's just very unforgiving of mistakes. To make the process less nerve-wracking, there are a few precautions you can take.

Back up every file that you care about... just in case. *DS Optimize* isn't likely to destroy anything, but if the optimizing routine is interrupted—by a power outage, say—you can lose data. Exclude system and hidden files (often used by copy-protected software such



Portrait of a directory in distress. Files are scattered all over creation, which slows hard disk access. When *DS Optimize* shows cluster fragmentation like this, it's time to optimize.



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as 1-2-3, *Microsoft Word* prior to version 3.0, and programs that can be installed only a limited number of times) from the reorganization, since moving them may wreak havoc. Finally, if the computer is part of a multiuser network sharing the same disk, it should be isolated from the rest of the network before you run *DS Optimize*.

Like *Xtree*, *DS Optimize* can move and copy files, rename directories, and so on. It also includes three DOS-like utilities: Verify

(for detecting bad sectors on disks), *Chkdsk* (for checking disk usage and restoring lost clusters), and *Backup* (for backing up files). The first two work as advertised, but beware: only a demo of the *DS Backup* program comes on the *DS Optimize* disk. It can back up your files, but that's all; to restore them, you'll need to buy the complete program.

DS Optimize's only real drawback is that often-used functions like file management are buried in submenus, whereas the rarely used optimize commands are on top. Still, a program that optimizes a

hard disk and then tidies up the files is as much a prize as a babysitter who also cleans the house.

—Patrick Marshall

Dragnet

Text-retrieval and management tool

Pros: Can search hundreds of files for specified words or phrases; accepts wild cards; has three search modes; stores search parameters

Cons: Expensive; very slow on a standard PC; Windows and an 8-MHz or faster system recommended

Version 1.0

Access Softtek

3204 Adeline St.

Berkeley, CA 94703

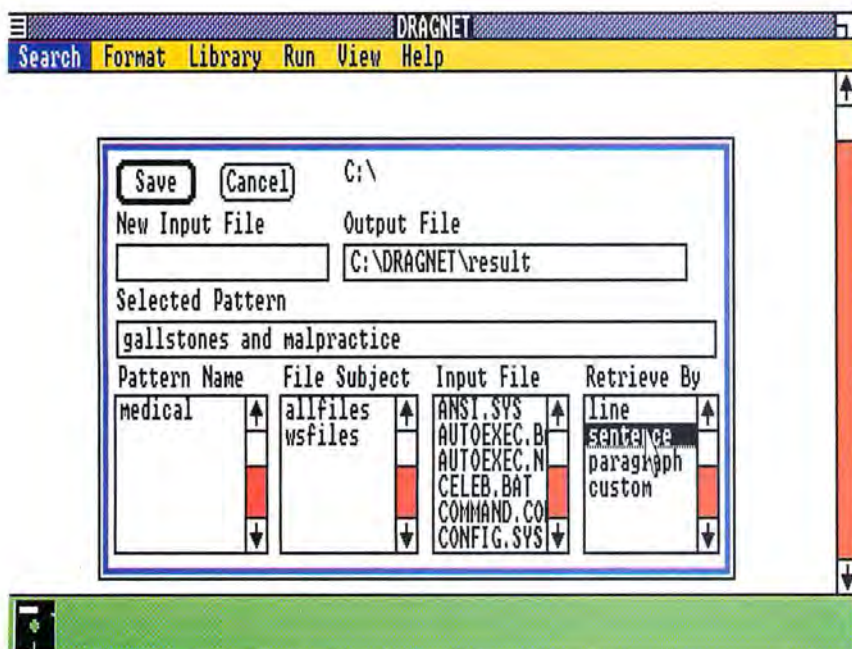
800/222-4020, 800/445-6466

California, 415/654-0116

List price: \$145

Requirements: 256K, two disk drives, DOS 2.00 or later version, graphics adapter; recommended: 8-MHz or faster system, 512K, hard disk, Microsoft Windows, mouse or other pointing device

Not copy protected



Specify a file or group of files to be searched, define the keywords or phrases you want, pick a retrieval method (by line, sentence, paragraph, or block), and Dragnet quickly produces an output file with all the references it finds. Using Boolean operators, a personal injury lawyer could narrow a search pattern to "medical malpractice AND gallstones."

If Sergeant Friday had used *Dragnet*, he wouldn't have spent so many hours poring over police files to track down the bad guys. Likewise, if you've got vital data hiding out on a crowded hard disk



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and too few leads to follow, you can benefit from *Dragnet's* sleuthing power. *Dragnet* is a menu-driven text-retrieval program, like Zylab Corp.'s *ZyIndex*, that puts out an all-points bulletin for keywords or phrases buried in text, spreadsheet, or data base files; it then lists both the files and references in a summary output file. The program (which comes with a run-time version of *Microsoft Windows*) is sluggish on a PC, but if you run it under the full-blown *Windows* on an AT, it will put you way ahead of most other computer gumshoes.

A medical researcher could use *Dragnet* to peruse a large downloaded file for references to interferon. A network user could search all files on the server to determine which contain references to earnings and production assembly techniques. And you can locate those memos you wrote last year about the company profit-sharing plan without having to laboriously open and close a slew of half-forgotten documents.

Dragnet's *Windows*-ordained interface is a snap to use. The five-disk program takes a while to install but loads quickly. Its basic program commands—Search, Format, Library, Run, View, and Help—appear at the top of the screen on the opening menu bar, waiting for you to point and click.

To initiate a search, click the Search command, then enter the

names of the directories or files to be searched in the Input File dialog box. Next, define a search pattern that locates the information you want. A search pattern can be a single word or phrase, or a complex combination of words or phrases strung together by the Boolean operators OR, AND, or NOT.

the output file with *Dragnet's* View option, but unfortunately it's limited to files smaller than 35K.

Flexibility is *Dragnet's* byword. Depending on which search format you choose, the program can retrieve and display text matches by line, sentence, or paragraph. And if you're searching docu-

Dragnet is a menu-driven text-retrieval program that puts out an all-points bulletin for keywords or phrases buried in text, spreadsheets, or data base files.

If you're unsure of the exact word or phrase you want, you can use wild-card characters. For instance, specifying *Computers*Music* will bring up all references to *Computers & Music* as well as *Computers and Music*. Searched files can be grouped together and named in the File Subject dialog box. *Dragnet* can store the grouping and search patterns for later use, which is handy if you have to comb through a large group of files. A civil engineer could create separate File and Pattern libraries for structural, hydraulic, and mechanical engineering files, for example.

Once *Dragnet* finds text that matches the search pattern, it copies the material into an ASCII-format output file, listing not only the text and its context but also the name and location of the file containing it. You can examine

ments with unusual structures, such as the transcript of an interview in question-and-answer form, you can design a custom search format. A special prosecutor searching a transcript of the Iran-Contra congressional committee hearings could specify occurrences of *Swiss bank accounts* in text following a *Q.* but preceding an *A.* *Dragnet* would retrieve all the questions in which Oliver North was asked where the money went—though not, of course, the money itself.

Dragnet performs searches in any of three modes: Continuous, Icon, or Interactive. In Continuous mode, *Dragnet* runs a non-stop search while keeping you

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posted on its status. On-screen dialog boxes show the search pattern and the files to be searched, the percentage of the search that has been completed, the page and line numbers of the file being searched, and the number of files remaining in the queue. In Inter-

running at 4.7 MHz, the same search took 16 minutes and 20 seconds. But if you've upgraded to an 80286 machine and are running *Windows*, you'll marvel at *Dragnet's* power and usefulness. Sergeant Friday never had it so good. —Ken Smith

In the charming *PreCursor* ads, charwomen can run color graphics programs. As with a lot of computer advertising, the message somewhat exceeds reality.

active mode *Dragnet* pauses at each match, displays the matched text on screen, and lets you decide whether to write the text to the output file or ignore it and go on. Icon mode, the speediest of the three, works only with *Windows*. *Dragnet* runs in the background, freeing the work area for other programs; a small icon at the bottom of the screen notes the percentage of the search completed.

Impressive as it is, *Dragnet* isn't perfect. Its slim manual offers only one example illustrating the product's potential use. The program is quite sluggish on a standard 8088 PC. On an IBM AT running at 8 MHz, *Dragnet* took 5 minutes and 50 seconds to locate 19 occurrences of *movie* OR *movies* while searching a single 150K *WordStar* file. On an 8088

holding a stack of printouts watches in amazement. Aside from what the drawing says about age, men, women, work, and computers, it's a terrific ad—and it makes its point: With *PreCursor*, even charwomen can run *Harvard Presentation Graphics*. As with a lot of computer advertising, the message somewhat exceeds reality.

PreCursor is part *Xtree*, part *Keyworks*. Like the former, it helps you manage files; like the latter, it enables you to create custom menus listing programs you frequently use. Instead of sifting through subdirectories and issuing terse commands like *WS*, you can run a program by simply picking 'WordStar' off a menu. Version 3.1 adds computer usage tracking and enables PC managers to password-protect sensitive programs and data. As you might guess, *PreCursor* is aimed at organizations supporting a large number of PCs, especially those staffed by beginning and intermediate users.

Building a menu with *PreCursor* is straightforward: You enter the menu descriptions and program names, then direct *PreCursor* to automatically locate the programs on the system's hard disk. Press <Esc> to preview the menu; if you like what you see, save it to a setup file. Your very

PreCursor

File manager and menu generator

Pros: Creates custom menus and help screens easily; uses only 16 bytes of RAM

Cons: DOS commander is difficult to use; setup screen is crowded and unclear

Version 3.1

The Aldridge Co.

2500 City West Blvd. #575

Houston, TX 77042

713/953-1940

List price: \$69.95

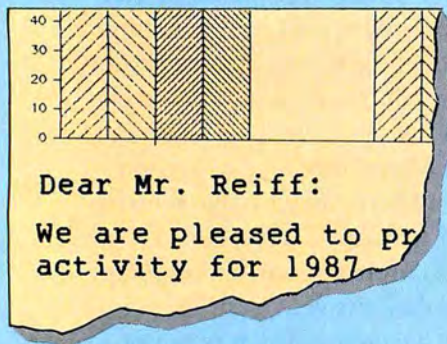
Requirements: 128K, hard disk, DOS 2.00 or later version

Not copy protected

The *PreCursor* ads are charming, at least at first glance. A drawing shows the spry gray-haired lady who cleans the office cheerfully running a color graphics program on a PC, while a male executive

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* Apple Imagewriter II version is a separate model.

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own custom menu then appears on the screen, ready to do your bidding.

Tapping *PreCursor*'s other options, however, can take on aspects of a treasure hunt, for almost all program operations center on the Maintenance screen. It is here, for example, that menu descriptions and program names are entered, passwords assigned, program options set, and menu screens moved around. It's also where you turn on screen-blanking or search for a file. In short, this screen is packed, and *Pre-*

Cursor's reliance on a mishmash of function, <Alt>, and <Ctrl> keys doesn't improve matters. The program's context-sensitive on-line help is occasionally useful—but sometimes further muddles the issue.

More to the point, however, is the ease with which you can create custom help screens as a menu entry. Aside from documenting programs used in-house, a *PreCursor* help screen can lead users to text screens containing salient office procedures or even a phone directory.

If you need to track program usage or the amount of time spent on a given project, *PreCursor* can

record computer usage according to user, project, and program, then print reports detailing who, what, and when, and how long it all took. If you like, you can make entry of user and project codes mandatory. Coupled with the passwords that can be attached to individual menu items or whole menu pages, that authority provides you with as much control over your PCs as you want.

PreCursor's DOS utilities menu is probably the weakest link in the program and does little to mask DOS's vagaries. Although you can move or copy a number of files at once, the function is limited and awkward to use.

PreCursor also has some unexpected compatibility problems. The View function, which displays the contents of a file in hexadecimal or ASCII format, locked up a MultiTech 900 AT clone. According to company president David Aldridge, the problem shows up only with AT clones using Hercules Graphics Card-compatible boards. A fix is promised by the end of the year.

PreCursor also works as a stand-alone program, which is useful if your machine is crammed with memory-resident programs battling for space. *PreCursor* needs about 96K when displaying a menu, but that drops to a measly 16 bytes when running other programs.

Menu Name	Main Program
1 Make a list	DBASE.EXE
2 Help with list	DBASE.HLP
3 Work on a spread	SS.BAT
4 Make a graph	WIN.COM
5 Edit a document	ED.EXE
6 Help with editing	PCWRITE.HLP
7 Call the main c	PROCOMM.EXE
8 Run Windows	WIN.COM
9 Show disk space	CHECK.BAT
10 Print computer	PRELOG.COM
11	

F1-Help F2-Page Title F4-Password F5-Parameter F6-Screen F7-AutoSearch F9-Search

In *PreCursor*, all roads lead to the Maintenance screen. This handy program creates and displays help screens, but it occasionally gets overloaded. Here, help menus, program listings, and Maintenance's own help screen jostle for the user's attention.

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If your organization has several (or several hundred) PCs whose users are grappling with DOS or *Microsoft Word*, *PreCursor* will help you simplify and standardize the way those PCs are used. But *PreCursor* isn't a dedicated file manager like *WindowDOS* or *Xtree*; if you need that kind of hand-holding, look elsewhere.

—Lee Richardson

Atlas-Graphics

Mapping program

Pros: Creates and imports data files easily; lets you edit and redraw map boundary lines

Cons: Demanding hardware requirements; expensive

Version 2.1

STSC Inc.

2115 E. Jefferson St.

Rockville, MD 20852

800/592-0050, 301/984-5000

List price: \$450

Requirements: 512K, two disk drives (hard disk recommended), DOS 2.00 or later version, graphics adapter

Not copy protected

If a picture is worth a thousand words, then a map based on business statistics must be worth ten thousand pictures. Decision-makers lulled to sleep by dreary statistics displayed in a spreadsheet's rows and columns snap

awake when the same information is shown in lively, colorful maps.

Atlas-Graphics is a powerful, multifeatured program for creating thematic maps that can display anything from traffic volume on the U.S. highway system to total restaurant sales in Wilmington, Delaware. These maps have noth-

monochrome monitor and a dot matrix printer, but you really need an EGA, a matching color monitor, and a pen plotter, laser printer, or Polaroid Palette.

Computer cartography is a marriage of map and spreadsheet. In *Atlas-Graphics*, the matchmaking happens at the 1-2-3-like menu

Thematic maps can display anything from traffic volume on the U.S. highway system to restaurant sales in Wilmington, Delaware.

ing to do with sextant and chronometer. Programs such as *Atlas-Graphics* let you summon geographical images from a library and superimpose plotted data. You can then manipulate the way the map looks and print it out.

Atlas-Graphics version 2.1 is a major upgrade of *Atlas AMP*, a top-rated program flawed by a complex command structure and the need for a number of separate utilities to help it do its job (see "Mapping Strategies," *PCW*, October 1986). *Atlas-Graphics* integrates the utilities into a flexible, almost intuitive package, and adds a significant new feature called *BoundaryEdit* that permits redrawing any map you can put on the screen.

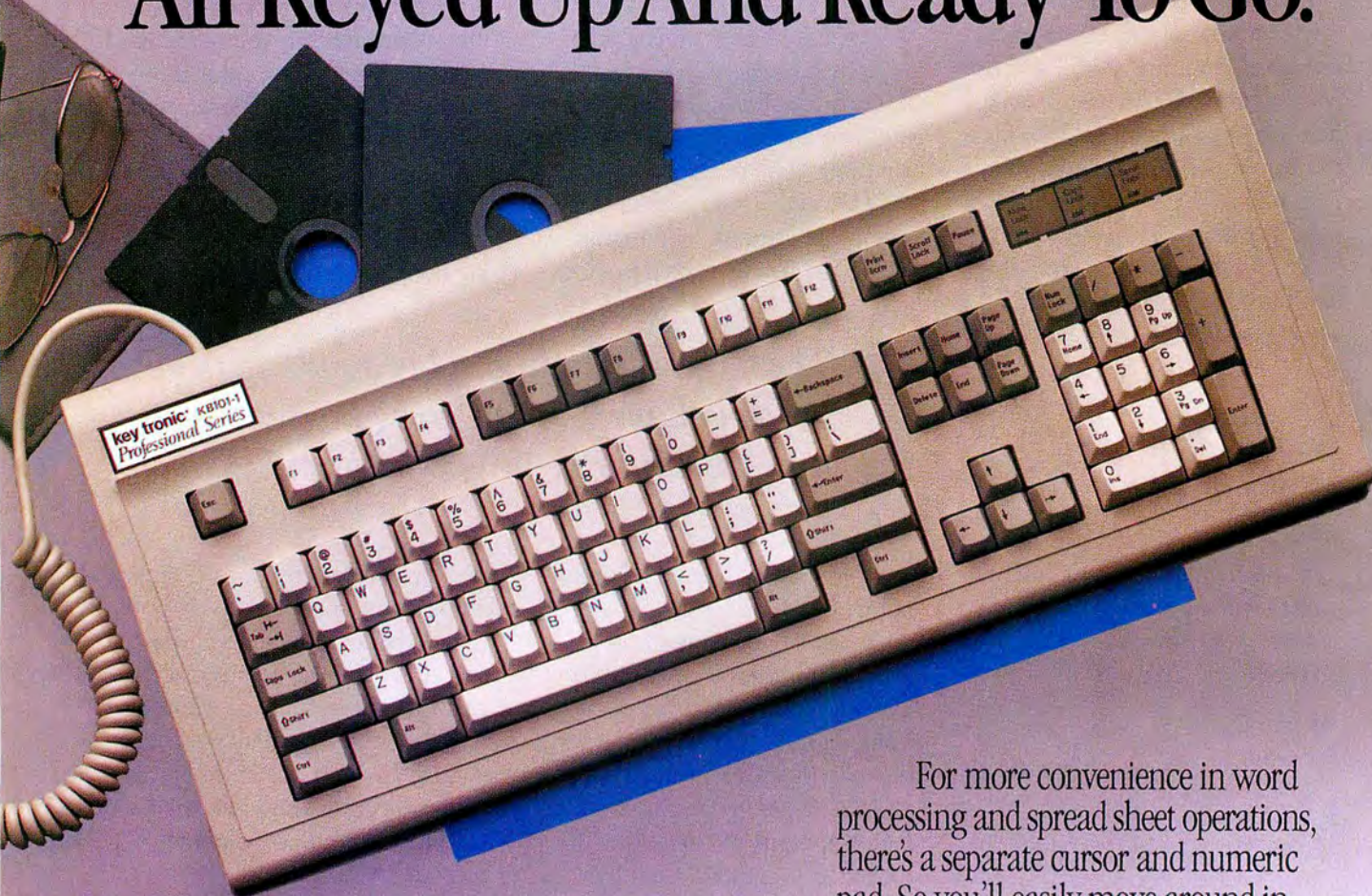
But be forewarned: While it's busy drawing maps, *Atlas-Graphics* can also redraw your hardware budget. It can run on a two-floppy system, but your hands will fall off from swapping disks. Likewise, you could get by with a

line. From the program's extensive library, you first choose a boundary file holding the map borders of a state, county, census tract, ZIP code, area code, or whatever. You then choose a data file containing the information to be plotted on the graph and join the two with the program's *Combine* command.

To differentiate and display the analyzed data, *Atlas-Graphics* offers a dizzying array of colors, cross-hatching, titles, legends, and text comments. For map titles, you can choose from 16 text sizes (*Atlas AMP* had 3) and 8 fonts, and place legends wherever you want in a picture.

To update a map, you turn to the *DataEdit* function, a worksheet in which the number of rows equals the number of geographic regions in the map and the columns contain the data variables.

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Not only can you create a new data file or edit an existing one, but you can also import data in ASCII, .DIF, dBASE, and 1-2-3 formats.

Similarly, BoundaryEdit lets you alter an existing map as easily as DataEdit lets you manipulate the underlying data. You can hide boundary lines, for example, when you want to merge a group of states into a sales region. You can rename regions, delete a boundary to reduce the total size of the file, or show the map and its information legends on the screen at the same time. Moreover, you can now isolate a state or other boundary element from

its neighbors to highlight its information—a trick that required a separate utility with AMP.

BoundaryEdit also dovetails nicely with MapFile, a new feature that stores all menu choices made when configuring a map. Finally, BoundaryEdit lets you import and export boundary files in ASCII and merge two or more boundary files, a fact that will surely fuel the growing map-selling aftermarket.

Producing a simple map with Atlas-Graphics takes no more skill than creating a graph with 1-2-3, but mastering the package isn't for a dilettante with a dual-floppy system. In the hands of an experienced user, however, Atlas-

Graphics will streamline analysis and visibly enhance your presentations. —Stephen A. Blumenthal

Make Your Own Murder Party

Party game

Pros: *Clever, personalized character sketches; believable murder motives*

Cons: *Lengthy printing of supporting materials required*

Version 1.0

Electronic Arts

1820 Gateway Dr.

San Mateo, CA 94404

415/571-7171

List price: \$39.99

Requirements: 64K, DOS 2.00 or later version, printer

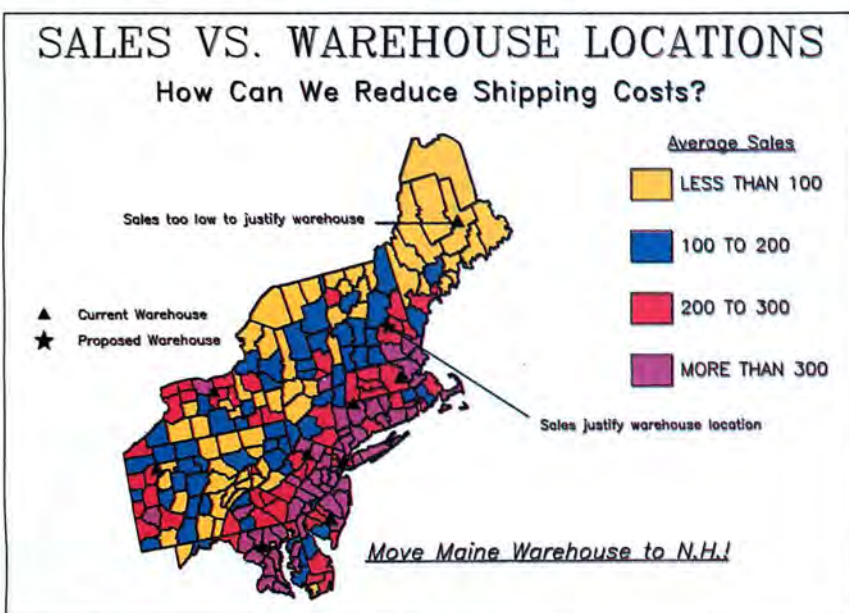
Copy protected

The group was wary as we gathered in my home that evening. We were there to relive Berkeley in the '60s and to remember Jeremy Summers, our good friend. As the Byrds played in the background, we learned the startling truth: Jeremy had been murdered—and one of us was the killer!

Some software packages may give you an urge to kill, but few actually aid and abet. *Make Your Own Murder Party* from Electronic Arts supplies a partner in crime and invites you to hack away... at your friends.

Riding the popularity of murder-mystery weekends and board games, *Murder Party* is a great excuse to invite as many as eight

Atlas-Graphics Minds the Store



Atlas-Graphics can turn up likely places to do business. Here, a look at a company's warehouse locations suggests that putting a new warehouse in New Hampshire—close to existing stores in three states—might be a good idea. The program also lets you zoom in for a closer look.

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SMARTMODEM 2400



HS

AA

CD

OH

RD

SD

TR

MR

people to participate in an evening of detective work. The program has two scenarios. In "The Big Kill," hippies-turned-yuppies get together over a nice murder. Advanced sleuths will want to try "Empire," a more complex tale of wealth and murder set in the spooky mansion of a pharmaceuticals magnate.

In *Murder Party*, you choose a scenario and assign roles to your guests, rounding out the program's character sketches by specifying hair color, favorite expression, and type of car. Once you establish the characters, the program secretly picks one of the party guests as the murderer and provides the printed material to support the evening's detective work.

Each guest gets a lengthy invitation, a clue booklet with his or her character's background information, and a "bitter truth," something that is not known to the others but could be a motive for murder. The program also prints special materials for the party's hosts, including instructions and props such as police reports.

Printing the materials is *Murder Party*'s only stretch of tedium. The 100 pages of "The Big Kill" took about an hour to print out on a 180-cps printer; even with a laser printer it would have taken 20 minutes. As the host, you must avoid the awful temptation of peeking at the materials. Your best bet is to print out the clue booklets and then seal them in an envelope until your guests arrive.

Murder Party's manual—which reads like a mystery itself—even offers suggestions about party locations, menus, costumes, and sound effects to generate the most realistic setting for a murder. But though it supplies the fixings, your computer isn't invited to the party. Once you print out the ma-

know the characters' bitter truths and hidden motives. In essence, you spend \$39.99 for software that can be used only twice. Seen in another light, *Make Your Own Murder Party* is a good entertainment buy. It provides two evenings of sleuthing for up to 16 people, which comes to only

Murder Party's manual reads like a mystery and offers suggestions about party locations, menus, costumes, and sound effects.

terials, you can pull its plug and start mixing drinks.

You and your guests unmask the murderer in four rounds of questioning that take 45 minutes each; the entire evening lasts about three hours. The clues in your booklets are of two kinds: Most you divulge when asked; others you admit only if cornered. The manual's final page reveals the murderer's motive, although the villain must still profess innocence. At that point, all players vote on the murderer, and for best costume and acting. It's the kind of evening that brings out the ham in all of us.

Once you've played "The Big Kill," you can move up to "Empire" for another evening of murder. The computer randomly selects a murderer each time you create a party, but you won't want to repeat a scenario once you

\$2.50 a head. Just be careful whom you invite. One of your friends is a killer. —Leslie Lauderdale

Jesse Berst is president of CompuTh!nk, a Los Angeles publishing company. Charles Bermant is an Associate Editor for PC World. Patrick Marshall edits the Commentary Page of the Oakland Tribune. Ken Smith is a technical support supervisor at a large software company in San Rafael, California. Lee Richardson does freelance programming and software testing out of Cupertino, California. Stephen A. Blumenthal is a Contributing Editor for PC World. Leslie Lauderdale is a freelance writer specializing in instructional design and the author of Home Accountant Plus: A Guide for IBM PC Users (Reston Publishing, Reston, Virginia, 1985). ●

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- Personics ... NCP**
- ▣ SmartNotes 2.0 (Post-It-like notes) ... 49.
 - ▣ SeeMORE 1.0 ... 49.
- Quarterdeck ... NCP**
- DESQView 2.01 (operating environment) ... 79.
 - Expanded Memory Manager 386 1.0 ... 39.
- Simon & Schuster ... NCP**
- Typing Tutor IV ... 33.
 - Webster's New World Writer 1.04 ... 59.
- Softlogic Solutions ... NCP**
- Software Carousel 2.0 (everything resident) 35.
 - Disk Optimizer 2.01 ... 35.

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Software Group ... NCP

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- PFS:First Publisher 59.
- PFS:First Choice 1.0 (*nice program*) 89.
- PFS:Professional Write 1.03 119.
- PFS:Professional File 1.01 149.
- Harvard Total Project Manager 2.0. 379.

Springboard ... CP

- Newsroom (*make your own newspaper*) 35.
- Newsroom•Pro (NCP) 79.

Symantec ... NCP

- Q & A 2.0 (*database, word processor*) 209.
- Q & A Write 209.

Traveling Software ... NCP

- LAP-LINK 2.0 (5 1/4" to 3 1/2" and back) 79.

True BASIC, Inc. ... NCP

- True BASIC 2.0 59.
- True BASIC Libraries. each 32.

Turner Hall ... NCP

- Spellin! 1.0 49.
- SQZ! 1.5 (*make 1-2-3 sheets smaller*) 49.
- Note-It Plus (*notes on 1-2-3 sheets*) 49.
- 4Word 1.0 (*add word processing to 1-2-3*) 59.
- Cambridge Spreadsheet Analyst 2.02 59.

Unison World ... NCP

- Newsmaster 1.0 57.

WordPerfect Corp. ... NCP

- WordPerfect Executive 1.0 119.
- WordPerfect 4.2 (*one of the best*) 199.

WordTech Systems ... NCP

- dBXL 1.1 89.
- QuickSilver 1.1 359.

Xerox ... NCP

- Ventura Publisher 1.1 549.

EDUCATIONAL

Barron's ... CP

- Computer SAT 35.

Stone & Associates ... NCP (reqs. CGA)

- My Letters, Numbers, Words (*ages 2 to 6*) 27.
- Kids Stuff (*ages 2 to 6*) 27.

True BASIC, Inc. ... NCP

- Calculus 32.
- Trigonometry 32.
- Algebra 32.

RECREATIONAL

Accolade ... CP (requires CGA)

- Mean 18 (*great golf game*) 29.

Electronic Arts (requires CGA)

- Starlight (NCP) 32.
- Chessmaster 2000 (CP) 32.
- Grand Slam Bridge (CP) 45.

Hayden Software ... CP

- Sargon III (*Chess program*) 32.

Infocom ... NCP

- Bureaucracy Enchanter Stationfall
- Hollywood Hijinx Hitchhiker's Guide
- Leather Goddesses of Phobos each 25.
- Zork Trilogy 39.

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Microleague Sports ... CP

- Microleague Baseball (*requires CGA*) 25.

Microprose ... CP

- F-15 Strike Eagle (*requires CGA*) 22.
- Silent Service (*requires CGA*) 22.

Microsoft ... CP

- Flight Simulator 2.13 (*reqs. graphics brd.*) 32.

Mindscape ... CP

- Balance of Power (*reqs. graphics brd.*) 30.

1Step Software ... CP (requires CGA)

- Golf's Best (*Pinehurst or St. Andrew's*) 19.

Parlor Software ... CP

- Bridge Parlor (*best Bridge simulation*) 49.

Sierra On-Line ... CP

- Leisure Suit Larry (*requires CGA*) 25.
- Space Quest (*requires CGA*) 33.
- King's Quest III (*requires CGA*) 33.

Simon & Schuster ... CP

- Star Trek/Promethean Prophecy 27.

Sphere, Inc. ... NCP

- Orbiter (*Shuttle simulation, requires CGA*) 27.

Sublogic ... CP

- Jet (*requires graphics board*) 33.

XOR ... NCP

- NFL Challenge. 69.

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I/O Mini 2 C/S/P \$125.

NEW! SixPakPlus 64k C/S/P

(now upgrades to 576k) 199.

SixPakPremium 256k C/S/P

(upgrades to 1 Mb or 2 Mb w/Piggyback) . . . call

Advantage Premium 512k S/P

(upgrades to 1 Mb or 2 Mb w/Piggyback) . . 449.

RAMpage! 286 512k (upgrades to 2Mb) . . . 389.

RAMpage! PC 64k (upgrades to 2Mb) call

Hot Shot 286 call

AST Premium series boards and RAMpage! boards support EMS and fully support EEMS.

Amdek ... 2 years

Video 310A Amber monochrome monitor . . 139.

Video 410A Amber monochrome monitor . . 169.

Color 722 (EGA compatible) 499.

Compucable ... lifetime

Smartmodem-to-AT cable (9 feet) 19.

15-foot Parallel Printer cable 19.

2-Position (AB switch box, 2 yr. warranty) . . . 39.

3-Position (ABC switch box, 2 yr. warranty) . . 59.

Cuesta ... 1 year

Datasaver 200 Watt (backup power unit) . . . 339.

Datasaver 400 Watt (backup power unit) . . . 459.

Curtis ... lifetime

ACCESSORIES

Printer Stand 18.

Universal System Stand 25.

CABLES

Smartmodem-to-PC Cable (9 feet) 17.

Printer-to-IBM cable (9 feet) 17.

SURGE SUPPRESSORS

Safestrip (6 outlets) 21.

Diamond (6 outlets) 32.

Ruby (6 outlets; EMI/RFI filtered; 6 ft cord) . . 59.

Ruby-Plus (w/FAX & modem protection) . . . 69.

DCA ... 1 year

Irma 2 (3270 emulation board) 729.

Epson ... 1 year

EX-800 printer (80 column, 300 cps) 387.

EX-1000 printer (136 column, 300 cps) 537.

FX-86e printer (80 column, 200 cps) 337.

FX-286e (136 column, 200 cps) 477.

LQ-800 printer (80 column, 180 cps) 367.

LQ-1000 printer (136 column, 180 cps) 549.

LQ-2500 printer (136 column, 324 cps) 837.

LX-800 printer (80 column, 180 cps) 187.

Printer-to-IBM cable (6 feet) 15.

Everex ... 1 year

Evercom II 1200 Internal Modem 119.

Evercom II 2400 Internal Modem 199.

5th Generation ... 6 months

Logical Connection 256k 319.

Logical Connection 512k 379.

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Hayes ... 2 years

Smartmodem 1200	\$299.
Smartmodem 1200B (with Smartcom II)	299.
Smartmodem 1200B (no software)	265.
Smartmodem 2400	449.
Smartmodem 2400B (with Smartcom II)	449.
Hercules ... 2 years	
Hercules Color Card (CGA)	159.
Hercules Graphics Card Plus	189.
Hercules Incolor Card (includes RAMfont)	call

Intel ... 5 years

Above Board PC 64k (upgrades to 2 Meg)	239.
Above Board PS-PC 64k C/S/P	259.
Inboard 386/AT (requires cable inst. kit)	1199.
Inboard Cable Installation Kit	139.
Aboveboard 286 512k	
(for PC, XT, AT, XT286)	349.
Aboveboard PS/286 512k S/P	
(for PC, XT, AT, XT286)	379.
8087 (for IBM-PC & XT)	114.
80287 (for IBM-PC AT & XT 286)	195.
80287-8 (for 8 MHz AT compatibles)	249.
80387	499.

Kensington Microware ... 1 year

Masterpiece	94.
Masterpiece Remote	119.
Masterpiece Plus	109.
Printer stand	17.

key tronic ... 90 days

101 Keyboard (enhanced layout, 3 year wrnty.)	119.
5151 Keyboard	169.

Kraft ... 1 year

3 Button Joystick	33.
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Microsoft ... 1 year

PS/2 Mouse 6.1 (with Show Partner)	119.
Bus Mouse 6.1 (with Show Partner)	119.
Serial Mouse 6.1 (with Show Partner)	129.
Mach 10 (includes Windows and mouse)	369.

Migent ... 1 year

Pocket Modem (ext., 1200 baud, w/software)	169.
--	------

Mouse Systems ... lifetime

PC Mouse (with Pop-up Menu software)	99.
Bus Mouse (with Pop-up Menu software)	109.
PC Paint Plus 2.0	57.

NEC ... 2 years

Multisync monitor (EGA compatible)	547.
GB-1 (supports 640 x 480 resolution)	319.

NSI Logic ... 3 years

Smart EGA Plus	299.
----------------	------

Okidata ... 1 year

Laserline 6	call
Advanced Personality Module	159.

Orchid Technologies ... 2 years

Tiny Turbo 286	379.
PC Turbo 286e w/1 Meg (10 MHz)	729.
Jet 386 (includes cable kit)	869.
RAMquest (for PS/2 models 50/60 2 Meg)	699.

Practical Peripherals ... 5 years

Microbuffer Mini (parallel print buffer w/128k)	79.
Microbuffer Inline (par. print buffer w/256k)	149.

Princeton Graphics ... 1 year

MAX-12E Amber monochrome monitor	179.
HX-12E (EGA compatible)	499.

Toshiba ... 1 year

P321 SL printer (80 col., 216 cps, w/tractor)	\$529.
P341 SL printer (132 col., 216 cps)	739.
P351 S/P printer Mod 2 (136 col., 288 cps)	939.
T1000 Laptop Computer	call

Tseng Labs ... 1 year

EVA 480 (supports 640x480 res., includes Dr. Halo II & drivers for Autocad & Lotus 1-2-3)	319.
---	------

Video 7 ... 2 years

VEGA Deluxe (supports 640x480)	319.
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DRIVES

IOMEGA ... 1 year

Bernoulli Box 20 Meg w/PC2 card	1549.
10 Meg cartridge	57.
Bernoulli Box 40 Meg w/PC2 card	call
20 Meg cartridge	79.
PC2B (Bootable) Card	229.

Mountain Computer ... 1 year

40 Meg Internal Tape Drive (for XT or AT)	379.
40 Meg Micro Mountain External Tape Drive (XT or AT)	499.
DriveCard 20 Meg (80 ms)	479.
DriveCard 30 Meg (78 ms)	569.
40 Meg External Tape Drive w/Power Supply (for XT or AT)	599.
DriveCard 50 Meg (54 ms)	special

Seagate ... 1 year

FREE PCTV® Hard Drive Installation Tape with the purchase of either of the following Seagate drives for the IBM PC (not for AT). Specify Beta or VHS.

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30 Meg Internal Hard Drive (w/Adaptec RLL controller and cables, 65 ms)	349.
AT 30 Meg Internal Hard Drive (w/cables & instructions, 39 ms)	589.

TEAC ... 1 year

PC, XT 360k Drive (5 1/4" half-height)	109.
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Toshiba ... 1 year

PC, XT 360k Drive (5 1/4" half-height)	109.
AT 360k Drive (5 1/4" half-height)	117.
3 1/2" Internal ND-354-A Disk Drive (720k)	119.

Miniscribe Corp. ... 1 year

ScribeCard 20 Meg (68 ms)	459.
ScribeCard 30 Meg (68 ms)	479.

MEMORY

64k Upgrade Set (150 ns, set of 9)	call
256k Upgrade Set (150 ns, set of 9)	call
256k Upgrade Set (120 ns, set of 9)	call

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Fuji MD2D (10 disks per box)	\$12.
Verbatim Datalife (10 disks per box)	15.
Maxell MD-2 (10 disks per box)	15.
DS/High Density Disks for the AT (96 TPI).	
Fuji (10 disks per box)	24.
Verbatim (10 disks per box)	27.
Maxell (10 disks per box)	27.

3 1/2" Double-sided Diskettes (720k)

Sony (10 disks per box)	21.
Maxell (10 disks per box)	23.

3 1/2" High-Density Diskettes (1.44 Meg)

Maxell (10 disks per box)	59.
Fuji (10 disks per box)	55.

MISCELLANEOUS

CompuServe

CompuServe Information Service	24.
Grolier's OnLine Encyclopedia	32.

Dow Jones

Membership Kit	24.
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PC Connection

Computer Toolkit	22.
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- COD max. \$1000. Cash or certified check.
- 120 day limited warranty on all products.*
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- For all other items, add \$2 per order to cover UPS Shipping. For such items, we automatically use UPS 2nd-Day-Air at no extra charge if you are more than 2 days from us by UPS ground.

Hawaii:

- For monitors, printers, and hard drives, actual UPS Blue charge will be added. For all other items, add \$2 per order.

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- Call 603/446-3383 for information.

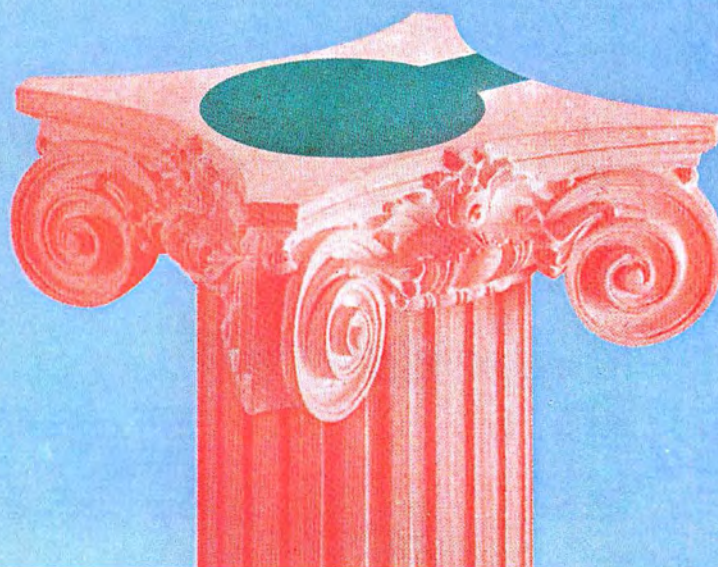
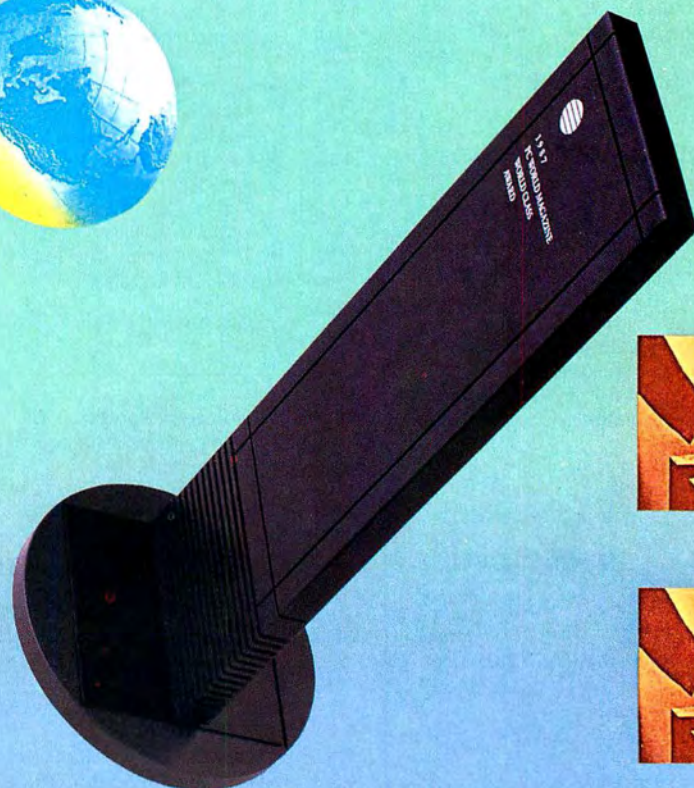
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World Class PC

Dusty Rody Pedersen





Some things, like wine, just get better with age. Consider the World Class PC contest. When it debuted in early 1983, readers cast ballots for their favorite software and hardware products in a mere 14 categories. The first-place winner of our random ballot drawing walked away with a \$14,000 system that included a state-of-the-art dual-floppy 64K IBM PC, *WordStar*, *VisiFile*, *SuperDrive*, an Epson FX 80 printer, and a 256K ComboPlus memory board from AST.

Times change. This fifth anniversary of the World Class celebration showcases a collection of 42 software and hardware products worth over \$30,000—including a \$6500 desktop computer (the Compaq Deskpro 386) that can tackle jobs once reserved for minicomputers.

Drawing conclusions based on the past five World Class contests is a risky business. But it's clear that despite the clone wars, the market shakeouts, the vaporware, and the fusillades of advertising hype, *PC World* readers can sort the wheat from the chaff. A PC compatible must be more than just fast, and a 1-2-3 work-alike had better offer more than a bargain-basement price tag. It's no accident that companies like IBM and Microsoft dominate the World Class PC contest year after year.

So it's no shock that in a year where everything old is new again, *PC World* readers opted mostly for name products with known track records. Twenty-five products were returned to first place, familiar also-rans from last year moved up, and 1986's Most Promising Newcomers (*Turbo Lightning* and the Hardcard) took top honors in their respective categories (see the sidebar "In the Winner's Circle").

For this year's tally, flip to the tables on the following pages.

Each table lists the winning product, plus contenders to the throne that received a significant number of votes. The Others category represents the combined percentage of all remaining products; the larger this number, the more products there were competing for the hearts and wallets of *PC World* readers.

■ The Envelope Please...

The World Class contest heads south this year to award first prize to Don R. Kirby, Jr., of Clearwater, Florida. It was, as Kirby notes, a fitting cap to his 60th birthday. Kirby's been an independent life and health insurance broker for 24 years and an IBM PC user for the last 3; his son is an accountant who also caught the computing bug and is currently converting his Commodore-based accounting program to the PC. Mr. Kirby will have to make room not only for a 40MB Compaq Deskpro 386—the first non-IBM system to capture the Desktop Computer category—but also for 39 hardware and software winners ranging from the Bernoulli Box to the perennially popular *Flight Simulator*.

The second-place award of a Compaq Portable II goes to Paul Dorn, who runs Ace Auto Insurance in College Park, Georgia, with the aid of an XT clone. Mr. Dorn had never heard of the Compaq Portable II. But when he learned this 10MB 80286-based machine was IBM compatible, he scotched plans to give the system to his college-bound son. The fate of Mr. Dorn's XT clone remains a mystery.

merely a barometer of public taste and shouldn't be construed as an endorsement of any product by *PC World*.

■ Hardware Huzzahs

After playing Avis to IBM's Hertz for the last five years, Compaq has finally taken the driver's seat in the Desktop Computer category with the Deskpro 386. This breakthrough product, built

while IBM's Proprinter sped to the top of the Dot Matrix/Near Letter Quality category. Small wonder. Epson hasn't come up with any new printers that quicken the pulse—and the Proprinter is a reasonably priced workhorse that bears the IBM logo. That's a tough combination to beat.

Two notable first-time winners are NEC's MultiSync monitor and Video Seven's Vega Deluxe graphics board. Canny consumers have recognized the MultiSync as the ultimate in display insurance—a monitor that works with just about any video controller. And what better mate than the Vega Deluxe, a graphics board for all seasons that supports MDA, CGA, Hercules, and EGA modes? As the interest in desktop publishing, presentation graphics, and the PS/2's Video Graphics Array (VGA) continues to grow, you can bet these two categories will be World Class hot spots.

After playing Avis to IBM's Hertz for the last five years, Compaq has finally taken the driver's seat in the Desktop Computer category with the Deskpro 386.

Paul Tutino of Oakland, California, pulls down the third prize of a Toshiba T3100, the winner in the Laptop Computer category. Tutino, no stranger to computing, uses a Compaq Deskpro and an XT clone in his work setting up turnkey building maintenance and cost accounting systems for the City of Oakland's general services department. Ever the computerphile, Tutino plans to take the T3100 on business trips—and vacations.

Unfortunately, not everyone who voted could win a World Class system. But *PC World* wants to thank readers for taking the time to sound off on favorite hardware and software. Your responses help us stay in touch with your concerns—and they keep vendors on their toes. As always, World Class results are

around Intel's 32-bit 80386 microprocessor, was also voted the Most Promising Newcomer—Hardware.

Had IBM's PS/2 line appeared in time for the contest, the results might have been different. But Compaq has earned its reputation for delivering solid machines, marketing them shrewdly, and backing them with a respected dealer network. By taking the plunge with the first 80386-based machine, Compaq stepped out of IBM's shadow—and confirmed for World Class voters that it's no copycat.

Other modest surprises abound. Toshiba's AT-in-a-laptop, the T3100, ousted the slower and heavier Data General/One. Epson, the Toyota of dot matrix printer makers, was asleep at the wheel

■ Same Time Next Year?

The World Class software story for 1987 is largely unchanged. Familiar faces—1-2-3, *WordPerfect*, *dBASE III Plus*, and others—continue to dominate the scene. The exceptions? *Harvard Presentation Graphics*, a jack-of-all-shades graphics program that whupped last year's winning duo of *Microsoft Chart* and *ChartMaster*; Microsoft's *Learning DOS*, a clever interactive tutorial that most would agree is six years too late; and *HAL*, this year's Most Promising Software Newcomer. *HAL*, the first add-in for 1-2-3, takes English phrases and turns them into executable commands, making macro creation and worksheet linking simple work indeed.

In the Winner's Circle

Those who do it better, make the cut. Witness three new products in this year's winner's circle:

Ventura: Publishing's Top Dog

Forget the PS/2. The hot story for 1987 is desktop publishing, thanks largely to the release of *Ventura Publisher*, the brainchild of three refugees from Digital Research's GEM operation. *Ventura's* Word-like style sheets, automated functions, shrewd graphics manipulation, and speediness on an XT have won it thousands of disciples, particularly those creating technical manuals, newsletters, books, catalogs, and other documents with standardized formats. Xerox Corporation currently distributes the product.

Although *Ventura* was forged in the shadow of *PageMaker*, Ventura president John Meyer quickly denies that anything was borrowed

from the trailblazing Macintosh product. "*PageMaker* is like a hand-held calculator," says Meyer. "It's a natural extension of the manual pasteup process. But you don't use a calculator when a spreadsheet is needed."

Still, Meyer and company can't ignore the numbers. By the contest's April deadline, *PageMaker* for the PC was not yet released but still garnered a healthy 17 percent of the World Class vote. Ventura chief programmer Don Heiskell is unrattled. "Nothing automates the publishing process like *Ventura*. And we've worked hard at providing great customer support. That's going to make a difference to large corporations choosing a publishing package." With Xerox aggressively distributing *Ventura* to more than 3000 outlets, and versions of the product for networks, Windows, and OS/2 in the works, chances are the choice will be an easy one.

PC Paintbrush: Not Another MacPaint

If ZSoft Corporation has a motto, it's probably Know Thy Market and Thy User.

In the last four years, the company has transformed its wildly popular *PC Paintbrush* from an electronic Etch A Sketch into a first-class illustrator's tool, presentation program, and desktop publishing sidekick.

The program was originally bundled with the Microsoft Mouse and gained favor with 1-2-3 users anxious to brighten up charts. According to ZSoft president Art Hyzer, *PC Paintbrush's* support for myriad graphics adapters and scanners sealed its success.

Marketing any icon-oriented graphics package is hazardous when Apple's lawyers are on the prowl, and ZSoft was accused of copying the

look and feel of *MacPaint*. The product was quickly "adjusted," and sailed into the arms of an estimated 500,000 customers—including artists creating logos and illustrations; video producers and animators; and desktop publishers.

Not content to rest on its user base, ZSoft is pushing further into desktop publishing with the scanner-oriented *Publisher's Paintbrush* and *Publisher's Type Foundry*, which can create fonts and large display type on any number of laser printers. This year Graphics. Next year...Desktop Publishing?

Hardcard: The Little Leviathan

Plus Development's Hardcard is the real McCoy: a single-slot, 1-inch thick, high-speed 10MB, 20MB, or 40MB hard disk drive on an expansion board that can be drop-kicked without missing a track. That's something few Hardcard copycat makers can claim.

Fewer still can tap the resources of Quantum, the hard disk sugar daddy that sunk \$22 million into Plus Development's clever idea. But the company has been repaid in spades: More than 200,000 Hardcards have been sold in the last two years, with 50 percent ending up in IBM PCs and over 20 percent in Compaq Portables. Many businesses use the Hardcard as a portable means of transferring data from one office to another; big corporations (including 60 percent of the Fortune 50) find it a quick storage fix for dual-floppy systems.

Although marketing vice president Hank Chesbrough is mum on future products, he promises that the Hardcard will "keep up with user demands." —D. R. P.

Step down a rung or two in each category, and future winners may be in sight. *R:base System V*'s menu-driven approach to data management continues to attract buyers; in the File Management category, readers with more pressing concerns than sorting records look to *Xtree*, a hard disk management program. One likely bet for 1988: BASIC will reclaim its World Class Programming Language throne, thanks in large part to Microsoft's elegant Quick-BASIC compiler and Borland International's competitive Turbo BASIC.

Of course, new categories are where the action is. In Desktop Publishing *Ventura Publisher* easily swept the field. *PC Paintbrush* handily captured the Graphics—Drawing division, while *Turbo Lightning* carried the day in a Word Processing Support Tool category crowded with spelling checkers and thesauri. And in the catchall Vertical Market Application category, voters raised their hands for *StatPac*, a statistics package that is finding favor with both professional number crunchers and managers (see "The New Statistics" in this issue.)

What products will readers acclaim in next year's World Class PC contest? It's easy for us arm-chair analysts to aim at the stars—and hit our feet. Go vote. ●

*Dusty Roady Pedersen is
PC World's Review
Editor.*

Hardware

Winning Products
From the World Class PC Contest

Desktop Computer



% of Votes* Product, Manufacturer

- 33 Compaq Deskpro 386 (Model 40), Compaq Computer Corp.
P.O. Box 692000, Houston, TX 77269
713/370-0670
List price: \$6499
- 22 IBM PC AT, IBM
- 6 Compaq Deskpro 286, Compaq Computer Corp.
- 5 IBM PC XT, IBM
- 3 AT&T 6300 Plus, AT&T
- 3 IBM PC XT Model 286, IBM
- 28 Others

81% of respondents voted in this category

Transportable Computer



- 28 Compaq Portable II (Model 20), Compaq Computer Corp.
P.O. Box 692000, Houston, TX 77269
713/370-0670
List price: \$4999
- 24 Compaq Portable III, Compaq Computer Corp.
- 14 Compaq Portable 286, Compaq Computer Corp.
- 8 Toshiba T3100, Toshiba America, Inc.
- 7 Compaq Portable, Compaq Computer Corp.
- 19 Others

46% of respondents voted in this category

Laptop Computer



- 36 Toshiba T3100, Toshiba America, Inc.
9740 Irvine Blvd., Irvine, CA 92718
714/583-3991
List price: \$4199
- 19 Toshiba T1100 Plus, Toshiba America, Inc.
- 15 Zenith Z-181, Zenith Data Systems
- 10 NEC MultiSpeed, NEC Home Electronics, Inc.
- 6 IBM PC Convertible, IBM
- 14 Others

45% of respondents voted in this category

Printer— Dot Matrix/ Near Letter Quality



Photographs by Fred Simson

- 11 IBM Proprinter, IBM
44 S. Broadway, White Plains, NY 10601
914/686-1900
List price: \$549
- 10 Epson FX-286, Epson America, Inc.
- 8 Toshiba P351C, Toshiba America, Inc.
- 6 Epson LQ-2500, Epson America, Inc.
- 6 Epson LQ-1000, Epson America, Inc.
- 5 Epson LQ-1500, Epson America, Inc.
- 54 Others

67% of respondents voted in this category

* All totals equal 100%

Hardware

Color Monitor



% of Votes Product, Manufacturer

- 51 NEC MultiSync, NEC Home Electronics, Inc.
1255 Michael Dr., Wood Dale, IL 60191-1094
312/860-9500
List price: \$899
- 7 IBM Enhanced Color Display, IBM
- 6 Princeton HX-12, Princeton Graphic Systems
- 4 Princeton HX-12E, Princeton Graphic Systems
- 4 Sony Multiscan, Sony Corp. of America
- 3 Amdek Color 722, Amdek Corp.
- 25 Others

51% of respondents voted in this category

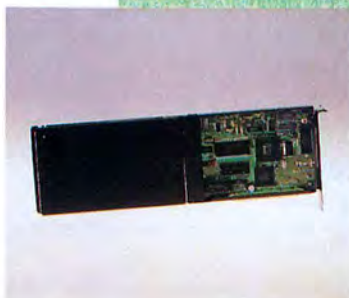
Modem



- 19 Smartmodem 2400, Hayes Microcomputer Products, Inc.
705 Westech Dr., Norcross, GA 30092
404/449-8791
List price: \$599
- 15 Smartmodem 1200B, Hayes Microcomputer Products, Inc.
- 15 Smartmodem 1200, Hayes Microcomputer Products, Inc.
- 12 Smartmodem 2400B, Hayes Microcomputer Products, Inc.
- 4 Courier 2400, U.S. Robotics, Inc.
- 35 Others

47% of respondents voted in this category

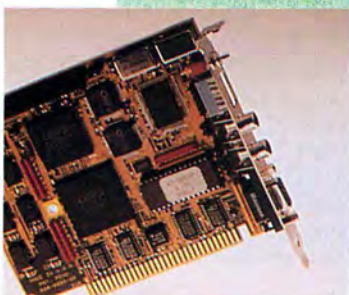
Hard Disk Drive



- 20 Hardcard, Plus Development Corp.
1778 McCarthy Blvd., Milpitas, CA 95035
408/946-3700
List price: \$895 (20MB)
- 12 ST 225 (20MB), Seagate
- 6 SST 4038 (30MB), Seagate
- 5 ST 238 (30MB), Seagate
- 57 Others

39% of respondents voted in this category

Graphics Board



- 15 Video Seven Vega Deluxe, Video Seven Inc.
46355 Landing Pkwy., Fremont, CA 94538
415/656-7800
List price: \$495
- 14 Hercules Graphics Card Plus, Hercules Computer Technology, Inc.
- 9 IBM Enhanced Graphics Adapter, IBM
- 8 Paradise AutoSwitch EGA Card, Paradise Systems
- 8 Hercules Graphics Card, Hercules Computer Technology, Inc.
- 7 Quadram QuadEGA+, Quadram Corp.
- 6 EGA Wonder, ATI Technologies, Inc.
- 33 Others

38% of respondents voted in this category

**Memory
Expansion
Board**



% of Votes Product, Manufacturer

- 25 SixPakPlus, *AST Research, Inc.*
2121 Alton Ave., Irvine, CA 92714-4922
714/863-1333
List price: \$395 (with 384K)
- 16 AboveBoard PS/AT, *Personal Computer Enhancement Operation, Intel Corp.*
- 10 RAMpage, *AST Research, Inc.*
- 9 AboveBoard, *Personal Computer Enhancement Operation, Intel Corp.*
- 6 RAMpage 286, *AST Research, Inc.*
- 6 SixPakPremium, *AST Research, Inc.*
- 4 AST Advantage, *AST Research, Inc.*
- 24 Others
37% of respondents voted in this category

**Printer—
Laser**



- 38 HP LaserJet Plus, *Hewlett-Packard*
11311 Chinden Blvd., Boise, ID 83714
208/323-6000
List price: \$3995
- 11 HP LaserJet, *Hewlett-Packard*
- 10 Apple LaserWriter, *Apple Computer, Inc.*
- 6 AST Turbo Laser, *AST Research, Inc.*
- 5 Epson GQ-3500, *Epson America, Inc.*
- 5 QMS Big KISS, *QMS*
- 4 HP LaserJet Series II, *Hewlett-Packard*
- 21 Others
36% of respondents voted in this category

Input Device



- 39 Microsoft Mouse, *Microsoft Corp.*
16011 N.E. 36th Way, P.O. Box 97017, Redmond, WA 98073-9717
206/882-8080
List price: \$175
- 17 Logitech C7 Mouse, *Logitech, Inc.*
- 16 PC Mouse, *Mouse Systems Corp.*
- 4 KB5151 Deluxe IBM PC Keyboard, *Key Tronic Corp.*
- 2 Softstrip System Reader, *Cauzin Systems, Inc.*
- 2 PC Scan, *Dest Corp.*
- 2 Digitizer, *Summagraphics Corp.*
- 18 Others
26% of respondents voted in this category

Plotter



- 47 HP 7475A Plotter, *Hewlett-Packard*
16399 W. Bernardo Dr., San Diego, CA 92127-1899
800/367-4772
List price: \$1895
- 17 HP 7550A Plotter, *Hewlett-Packard*
- 6 HP 7440A ColorPro Plotter, *Hewlett-Packard*
- 3 HP 7470A Plotter, *Hewlett-Packard*
- 2 1043GT, *Calcomp*
- 25 Others
21% of respondents voted in this category

Hardware

Winning Products
From the World Class PC Contest

Alternative Mass Storage



% of Votes Product, Manufacturer

- 45 Bernoulli Box, Iomega Corp.
1821 W. 4000 South, Roy, UT 84067
801/778-1000
List price: \$2595 (20MB dual-drive model)
- 20 Mountain Micro Bernoulli, Mountain Computer, Inc.
- 3 Hardcard, Plus Development Corp.
- 3 Everex Stream 60, Everex
- 3 DuraPak, Sysgen, Inc.
- 26 Others
20% of respondents voted in this category

Local Area Network

- 18 Token-Ring, IBM
900 King St., Rye Brook, NY 10570
914/934-4000
List price: Contact your nearest authorized IBM dealer
- 10 Netware 4.61, Novell, Inc.
- 15 Advanced Netware 286, Novell, Inc.
- 7 3Com 3System, 3Com Corp.
- 6 PC Network, IBM
- 4 StarLAN, AT&T Information Systems
- 40 Others
14% of respondents voted in this category

Most Promising Newcomer— Hardware

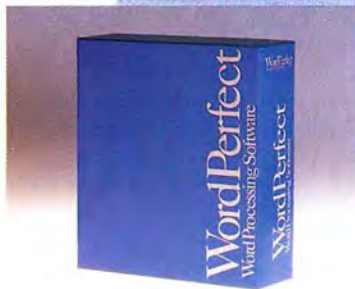


- 33 Compaq Deskpro 386 (Model 40), Compaq Computer Corp.
P.O. Box 692000, Houston, TX 77269
713/370-0670
List price: \$6499
- 5 Compaq Portable III, Compaq Computer Corp.
- 3 Zenith Z-181, Zenith Data Systems
- 2 Mountain Micro Bernoulli, Mountain Computer, Inc.
- 2 EGA Wonder, ATI Technologies, Inc.
- 2 Kodak Datashow Projection Pad, Eastman Kodak Co.
- 2 Compaq Portable II, Compaq Computer Corp.
- 2 NEC MultiSync, NEC Home Electronics, Inc.
- 49 Others
31% of respondents voted in this category

Software

Winning Products
From the World Class PC Contest

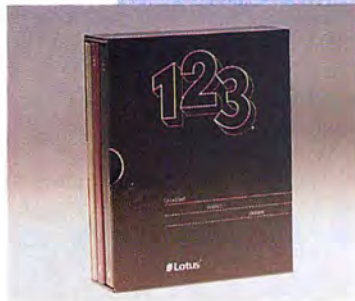
Word Processing



% of Votes Product, Manufacturer

- 34 WordPerfect, WordPerfect Corp.
288 W. Center St., Orem, UT 84057
801/227-4000
List price: \$495
 - 20 Microsoft Word, Microsoft Corp.
 - 6 WordStar 4.0, MicroPro International Corp.
 - 5 WordStar 2000, MicroPro International Corp.
 - 4 MultiMate Advantage, Ashton-Tate
 - 4 PC-Write, Quicksoft
 - 27 Others
- 84% of respondents voted in this category

Spreadsheet



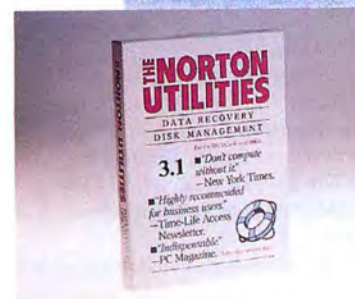
- 67 1-2-3, Lotus Development Corp.
Customer Support, 55 Cambridge Pkwy., Cambridge, MA 02142
617/577-8500
List price: \$495
 - 9 SuperCalc 3, Computer Associates
 - 5 Multiplan, Microsoft Corp.
 - 4 VP-Planner, Paperback Software International
 - 3 Symphony, Lotus Development Corp.
 - 12 Others
- 74% of respondents voted in this category

Data Management



- 43 dBASE III Plus, Ashton-Tate
20101 Hamilton Ave., Torrance, CA 90502-1319
213/329-8000
List price: \$620
 - 16 R:base System V, Microrim
 - 5 Reflex: The Analyst, Borland International, Inc.
 - 5 dBASE III, Ashton-Tate
 - 4 Paradox, Ansa Software
 - 27 Others
- 64% of respondents voted in this category

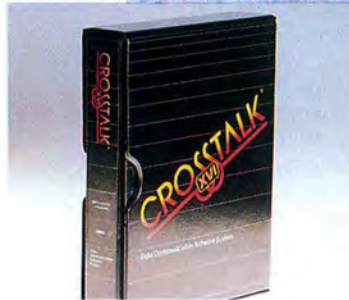
Utilities



- 43 Norton Utilities, Peter Norton Computing, Inc.
2210 Wilshire Blvd. #186, Santa Monica, CA 90403
213/453-2361
List price: \$150
 - 7 PC Tools, Central Point Software, Inc.
 - 7 SideKick, Borland International, Inc.
 - 6 Mace Utilities, Paul Mace Software, Inc.
 - 4 Fastback, Fifth Generation Systems, Inc.
 - 33 Others
- 51% of respondents voted in this category

Software

Communications



% of Votes Product, Manufacturer

- 33 Crosstalk XVI, DCA/Crosstalk Communications
1000 Holcomb Woods Pkwy. #440, Roswell, GA 30076
404/442-4000
List price: \$195
- 12 Smartcom II, Hayes Microcomputer Products, Inc.
- 4 PC-Talk III, Headlands Communications Corp.
- 51 Others
42% of respondents voted in this category

Programming Language



- 28 Turbo Pascal, Borland International, Inc.
4585 Scotts Valley Dr., Scotts Valley, CA 95066
408/438-8400
List price: \$99.95
- 22 QuickBASIC, Microsoft Corp.
- 11 C Compiler, Microsoft Corp.
- 3 dBASE III, Ashton-Tate
- 3 Turbo Prolog, Borland International, Inc.
- 33 Others
39% of respondents voted in this category

Operating Environment



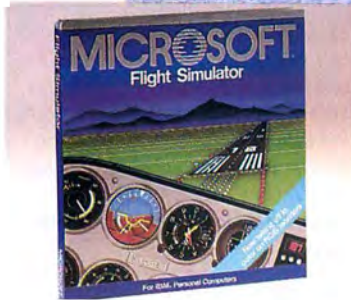
- 41 Microsoft Windows, Microsoft Corp.
16011 N.E. 36th Way, P.O. Box 97017, Redmond, WA 98073-9717
206/882-8080
List price: \$99
- 19 PC- & MS-DOS 3.20, IBM
- 11 Desqview, Quarterdeck Office Systems
- 9 PC- & MS-DOS 3.00, IBM
- 5 PC- & MS-DOS 3.10, IBM
- 15 Others
31% of respondents voted in this category

Desktop Management



- 59 SideKick, Borland International, Inc.
4585 Scotts Valley Dr., Scotts Valley, CA 95066
408/438-8400
List price: \$84.95
- 8 Microsoft Windows, Microsoft Corp.
- 7 Metro, Lotus Development Corp.
- 5 WordPerfect Library, WordPerfect Corp.
- 2 PolyWindows Desk, Polytron Corp.
- 2 DeskMate, Tandy/Radio Shack
- 17 Others
30% of respondents voted in this category

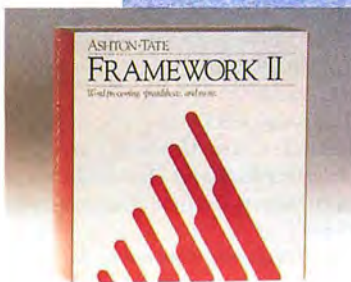
Game



% of Votes Product, Manufacturer

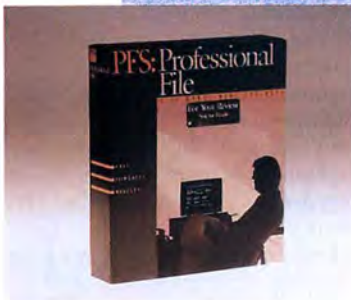
- 19 Microsoft Flight Simulator, Microsoft Corp.
16011 N.E. 36th Way, P.O. Box 97017, Redmond,
WA 98073-9717
206/882-8080
List price: \$49.95
- 12 Jet, SubLogic Communications Corp.
- 8 Star Flight, Electronic Arts
- 7 NFL Challenge, XOR Corp.
- 5 Sargon III, Hayden Software
- 4 Kings Quest II, Sierra On-Line, Inc.
- 45 Others
28% of respondents voted in this category

Integrated



- 30 Framework II, Ashton-Tate
20101 Hamilton Ave., Torrance,
CA 90502-1319
213/329-8000
List price: \$620
- 28 Symphony, Lotus Development Corp.
- 8 1-2-3, Lotus Development Corp.
- 8 Enable, The Software Group
- 6 Smart Software System, Innovative Software, Inc.
- 4 Ability, Migent, Inc.
- 16 Others
28% of respondents voted in this category

File Management



- 15 pfs:professional file, Software Publishing Corp.
1901 Landings Dr., P.O. Box 7210, Mountain View,
CA 94039-7210
415/962-8910
List price: \$249
- 11 Xtree, Executive Systems
- 9 Reflex: The Analyst, Borland International, Inc.
- 8 Q&A, Symantec
- 6 dBASE III Plus, Ashton-Tate
- 5 PC-File III, Buttonware, Inc.
- 5 Commander, Peter Norton Computing, Inc.
- 41 Others
26% of respondents voted in this category

Word Processing Support Tool



- 33 Turbo Lightning, Borland International, Inc.
4585 Scotts Valley Dr., Scotts Valley, CA 95066
408/438-8400
List price: \$99.95
- 13 WordPerfect Library, WordPerfect Corp.
- 6 Word Finder, Microlytics, Inc.
- 4 Webster's New World On-Line Thesaurus, Simon &
Schuster Software
- 4 Webster's New World Writer, Simon & Schuster Software
- 4 Outline, Brown Bag Software
- 3 MaxThink, MaxThink, Inc.
- 33 Others
26% of respondents voted in this category

Software

Desktop Publishing



% of Votes Product, Manufacturer

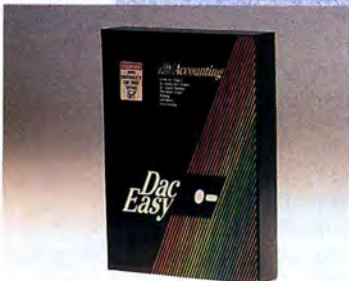
- 57 Ventura Publisher, Xerox Corp.
701 S. Aviation Blvd., El Segundo, CA 90245
213/333-9187
List price: \$895
- 17 PageMaker, Aldus Corp.
- 6 Harvard Professional Publisher, Software Publishing Corp.
- 4 ClickArt Personal Publisher, Software Publishing Corp.
- 3 Newsroom Pro, Springboard Software, Inc.
- 13 Others
24% of respondents voted in this category

Graphics—Business



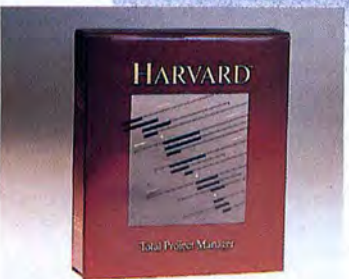
- 19 Harvard Presentation Graphics, Software Publishing Corp.
1901 Landings Dr., P.O. Box 7210, Mountain View, CA 94039-7210
415/962-8910
List price: \$395
- 14 Microsoft Chart, Microsoft Corp.
- 13 Freelance Plus, Lotus Development Corp.
- 12 Chart-Master, Decision Resources, Inc.
- 42 Others
24% of respondents voted in this category

Accounting



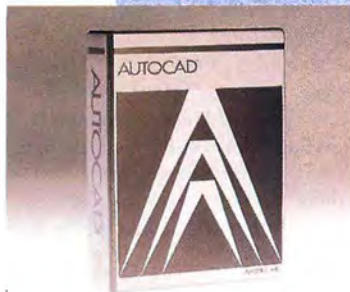
- 35 Dac-Easy Accounting, Dac Software, Inc.
4801 Spring Valley Rd. #110B, Dallas, TX 75244
214/458-0038
List price: \$99.95
- 8 Peachtree's Business Accounting System, Peachtree Software, Inc.
- 8 NewViews, Q.W. Page Associates, Inc.
- 6 EasyBusiness Accounting Series, Computer Associates
- 4 Entry Series-General Accounting, BPI Systems, Inc.
- 39 Others
21% of respondents voted in this category

Project Management



- 36 Harvard Total Project Manager 2.0, Software Publishing Corp.
1901 Landings Dr., P.O. Box 7210, Mountain View, CA 94039-7210
415/962-8910
List price: \$595
- 17 SuperProject Plus, Computer Associates
- 17 Microsoft Project, Microsoft Corp.
- 12 Time Line, Breakthrough Software
- 18 Others
19% of respondents voted in this category

Graphics—
CAD



% of Votes Product, Manufacturer

- 60 AutoCAD 2.6, Autodesk, Inc.
2320 Marinship, Sausalito, CA 94965
415/332-2344
List price: \$2850
- 11 ProDesign II, American Small Business Computers, Inc.
- 10 Generic CAD, Generic Software, Inc.
- 19 Others
19% of respondents voted in this category

Financial
Analysis



- 34 1-2-3, Lotus Development Corp.
Customer Support, 55 Cambridge Pkwy., Cambridge, MA 02142
617/577-8500
List price: \$495
- 19 Javelin, Javelin Software
- 11 Andrew Tobias' Managing Your Money, MECA
- 6 Reflex: The Analyst, Borland International, Inc.
- 3 Symphony, Lotus Development Corp.
- 3 SuperCalc 4, Computer Associates
- 24 Others
18% of respondents voted in this category

Graphics—
Drawing



- 12 PC Paintbrush, ZSoft
1950 Spectrum Circle #A495, Marietta, GA 30067
404/980-1950
List price: \$95
- 9 Freelance Plus, Lotus Development Corp.
- 7 Diagram-Master, Ashton-Tate
- 5 Dr. Halo II, IMSI
- 5 PC Paint, Mouse Systems
- 5 Publisher's Paintbrush, ZSoft
- 57 Others
17% of respondents voted in this category

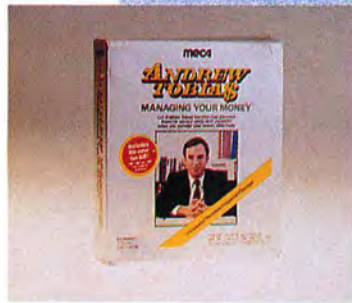
Tax Planning
or Preparation



- 38 TurboTax, ChipSoft, Inc.
4901 Morena Blvd. #801, San Diego, CA 92117
619/581-2233
List price: \$65
- 15 Andrew Tobias' Managing Your Money, MECA
- 11 PC/Tax Cut, Best Programs Inc.
- 10 Tax Preparer, HowardSoft
- 4 J.K. Lasser's Your Income Tax, Simon & Schuster Software
- 22 Others
17% of respondents voted in this category

Software

Personal Management



% of Votes Product, Manufacturer

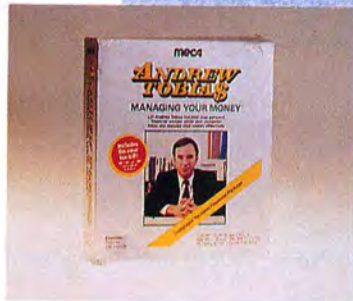
- 56 Andrew Tobias' Managing Your Money, MECA
285 Riverside Ave., Westport, CT 06880
203/222-1000
List price: \$199.95
- 15 Dollars and Sense, Monogram
- 4 PC/Professional Finance Program II, Best Programs
- 3 Traveling SideKick, Borland International, Inc.
- 3 CashTrack, Sublogic Corp.
- 19 Others
17% of respondents voted in this category

Micro-to-Mainframe Communication



- IRMA, Digital Communications Associates, Inc.
1000 Alderman Dr., Alpharetta, GA 30201
404/442-4000
List price: \$1195
- Crosstalk XVI, DCA/Crosstalk Communications
- IBM 3270, IBM
- AST-5251, AST Research, Inc.
- Reflection 2, Walker Richer & Quinn, Inc.
- Others
13% of respondents voted in this category

Investment



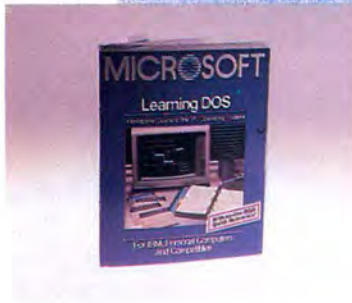
- 36 Andrew Tobias' Managing Your Money, MECA
285 Riverside Ave., Westport, CT 06880
203/222-1000
List price: \$199.95
- 6 Dollars and Sense, Monogram
- 5 Dow Jones Market Manager Plus, Dow Jones & Co., Inc.
- 5 Signal, Lotus Development Corp.
- 5 Andrew Tobias' Managing the Market, MECA
- 43 Others
8% of respondents voted in this category

Vertical Market Application



- 25 StatPac, Walonick Associates, Inc.
6500 Nicollet Ave. S, Minneapolis, MN 55423
612/866-9022
List price: \$595
- 4 Interactive EasyFlow, HavenTree Software Ltd.
- 4 PC+, SPSS, Inc.
- 4 KnowledgeMan/2, Micro Data Base Systems, Inc.
- 63 Others
6% of respondents voted in this category

Training



% of Votes Product, Manufacturer

- 20 Microsoft Learning DOS, *Microsoft Corp.*
16011 N.E. 36th Way, P.O. Box 97017, Redmond,
WA 98073-9717
206/882-8080
List price: \$49.95
- 16 Typing Tutor III, *Simon & Schuster Software*
- 8 Training Power Series, *American Training International*
- 5 Professor DOS, *Individual Software, Inc.*
- 5 Typing Instructor, *Individual Software, Inc.*
- 46 Others
6% of respondents voted in this category

Education



- 25 Study Program for the SAT,
Barron's Educational Series
113 Crossways Park Dr., Woodbury, NY 11797
516/921-8750
List price: \$49.95
- 11 Typing Tutor III, *Simon & Schuster Software*
- 5 Math Blaster, *Davidson & Associates*
- 4 Mastering the SAT, *CBS Interactive Learning*
- 4 Kids' Stuff, *Stone and Associates*
- 4 Spellicopter, *Designware, Inc.*
- 4 Turbo Tutor, *Borland International, Inc.*
- 43 Others
6% of respondents voted in this category

Most Promising Newcomer— Software




- 14 HAL, *Lotus Development Corp.*
Customer Support, 55 Cambridge Pkwy., Cambridge,
MA 02142
617/577-8500
List price: \$150
- 13 Turbo C, *Borland International, Inc.*
- 9 Ventura Publisher, *Xerox*
- 4 Turbo BASIC, *Borland International, Inc.*
- 3 NewViews, *Q.W. Page Associates, Inc.*
- 3 Manuscript, *Lotus Development Corp.*
- 54 Others
34% of respondents voted in this category

Flat-Out Performance

Offering vastly reduced glare and increased brightness, Zenith's new Perfect Monitor promises to send rival display manufacturers scurrying to their drawing boards.

TJ Byers

 Even the prettiest color monitors suffer from glare—and in environments with lots of light, a monitor's color, brightness, and contrast are often inadequate. For years, researchers knew these problems stemmed from the curved surface of the cathode-ray tube (CRT), used to maintain overall screen focus.

Now, Zenith has introduced a flat-surface CRT that virtually eliminates common viewing difficulties. The 14-inch Perfect Monitor delivers 50 percent more brightness, 70 percent greater contrast, and 95 percent less glare than a standard color monitor. This perfectly flat, square-cornered display also lends a more natural appearance to screen text and graphics by banishing geometric distortion. Straight lines actually look like straight lines.

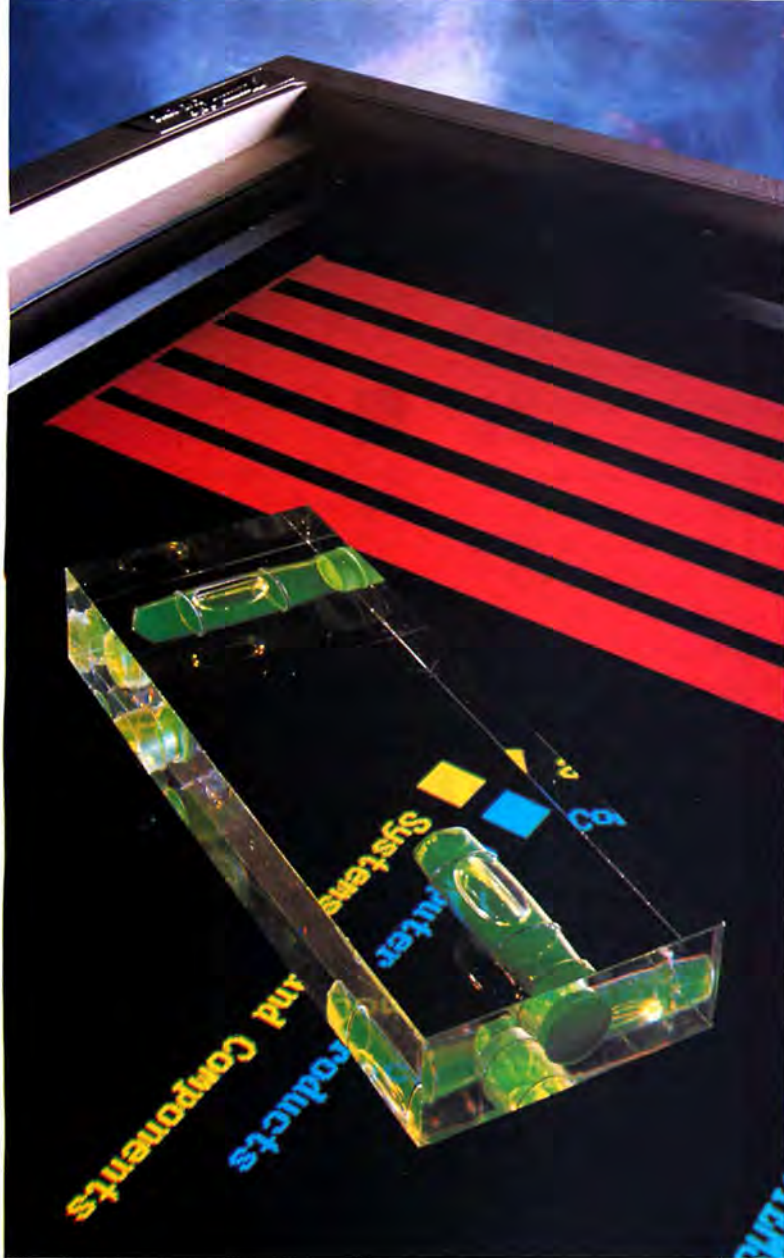
As with any new technology, the Perfect Monitor isn't cheap. The monitor itself costs \$999, while the Z-449 video board that drives it goes for \$599. The board

emulates IBM's new PS/2-based Video Graphics Array (VGA), which can produce 256 colors at a resolution of 640 by 480 pixels. Zenith's board also includes software-based emulations of the Monochrome Display Adapter, the Color/Graphics Adapter, the Enhanced Graphics Adapter, and the Hercules Graphics Card. If you own a PS/2 Model 50, 60, or 80, you'll save the cost of the board entirely, because the Perfect Monitor plugs directly into the video port on any of these machines.

The Shadow Knows

The secret to the Perfect Monitor's outstanding performance lies in Zenith's patented flat tension mask (FTM) technology. The FTM is a variation on the conventional CRT's shadow mask—a thin sheet of perforated metal that keeps colors on a CRT from running together.

A CRT works by bombarding the viewing screen with a thin beam of electrons generated by an electron gun. These electrons excite a phosphor coating deposited on the inside of the screen, caus-



Paul Franz-Moore

ing it to glow. The brightness of the excited phosphor is directly proportional to the intensity of the electron beam.

A color CRT contains three electron guns, each dedicated to illuminating red, green, or blue phosphor dots. When the CRT is on, electron guns sweep constantly back and forth across the CRT screen. To prevent the electron guns from exciting the wrong color phosphor, a shadow mask lies flush against the inside of the screen. The shadow mask is

drilled with hundreds of thousands of tiny holes, each aligned with its own trio of red, green, and blue dots, called a triad. Because each gun's electron beam comes from a slightly different angle, each hole in the shadow mask directs electron beams from all three guns to their assigned dots.

Electrons that are not on a direct path to a mask hole strike the mask and are prevented from reaching the screen. In fact, nearly 80 percent of the electrons do not pass through the mask and are subsequently absorbed by the metal in the form of heat. Herein lies the problem.

As screen brightness increases, additional heat from absorbed electrons causes the thin metal to expand, thus altering the position of the holes with respect to the phosphor dots. This effect, known as *doming*, distorts the color of the screen image.

Zenith's new flat tension mask technology prevents doming by replacing the traditional curved shadow mask—which is held relatively loosely against the CRT's inner surface—with a stiff, flat shadow mask. The new shadow mask, which is about one-fourth the thickness of a standard mask, is first stretched under extremely high tension, relieving the cold-rolled steel of any stress that may have accumulated during processing. The mask is then stretched like a drum over a metal retainer ring to ensure dimensional stability, while the ring is anchored to four mounting pegs on the CRT.

The result is a rigid, stable shadow mask that does not move

or distort even at high power levels. With the shadow mask stabilized, the difficulty of focusing on a flat screen diminishes. An FTM CRT can thus display truer colors and display them at much higher intensity levels. Typically, the Perfect Monitor's CRT can handle up to eight times more power than conventional CRTs.

Contrasting Views

Because the Perfect Monitor's CRT is significantly brighter, it can handle contrasts that would wash out on a standard color screen.

Normally, poor contrast comes from light scattered within the CRT itself. When a phosphor dot is excited to luminescence, it emits light in all directions—not just forward. Some of the light from the dots radiates sideways toward their neighbors, and some of it shines backward toward the shadow mask, where it bounces

around the inside of the tube. The result is a soft background illumination that reduces contrast.

Applying a heavy, smoky tint (not unlike that found on automobile windows) to the CRT faceplate can minimize the background-illumination problem. In theory, only the concentrated radiation from the triads penetrates this dense filter, while the weaker background illumination is absorbed completely.

To be effective, however, the filter must block about 70 percent of the light coming through the screen. In a conventional CRT, this leaves insufficient brightness for the image to be usable.

The FTM CRT, on the other hand, starts with a screen 100 percent brighter than its conventional counterpart. Even when light is subjected to heavy filtering, enough gets through to produce an image 50 percent brighter than standard CRTs', while improving screen contrast by almost

a full magnitude. Screen brightness of the Perfect Monitor is rated at 75 footlamberts as opposed to the 45-footlambert output of a conventional monitor.

It Came From Outer Space

The curved face of conventional CRTs is designed in part to help prevent implosion. Due to its flat face, the Perfect Monitor needs a special implosion panel bonded to the flat tension mask. This sheet of safety glass prevents shattering should the CRT envelope rupture. Its flat surface also makes special antiglare coatings easier to apply.

By itself, the flat screen offers essentially glare- and reflection-free viewing because it does not reflect ambient light as readily as a convex surface. At critical viewing angles, however, the highly polished implosion panel can behave like a mirror, reflecting well-lit areas around the room.

To prevent unwanted reflections, the implosion panel undergoes an antireflection treatment prior to being bonded to the CRT faceplate. Unlike contemporary antireflection methods, the treatment does not degrade the screen image.

Conventional CRTs attack reflections by trying to diffuse them. The process involves mild etching of the faceplate with sandblasting or use of a diffusion mesh similar to a nylon stocking to break up the clarity of the reflected image. Unfortunately, the same process that diffuses outside light also diffuses the screen image, thus decreasing resolution.

The flat shape of the FTM CRT lends itself to chemical antireflection treatment. Zenith applies a special thin-film optical coating to

The screen of Zenith's Perfect Monitor has a completely flat surface and square corners, reducing bothersome reflections and putting an end to geometric distortion.



Paul Farris-Moore

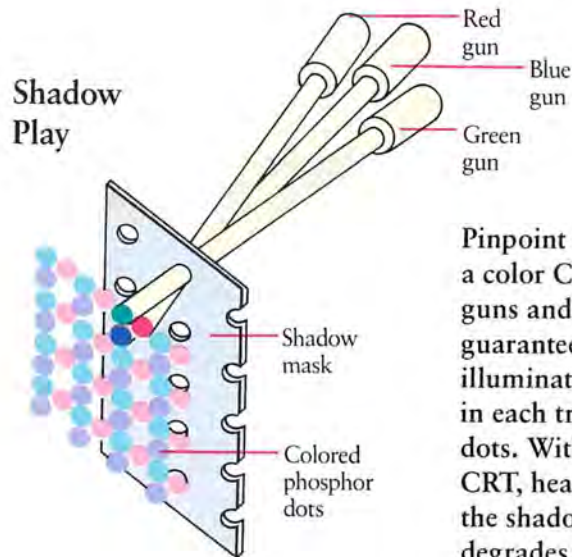
the implosion panel prior to bonding the panel to the faceplate. The antireflecting agent is identical to that used for the windows on the Space Shuttle. Unlike other antireflecting measures, this optical coating does not blur images—a critical factor for high-resolution performance.

VGA and Beyond

All the specs in the world can't convey the sheer visual impact of the Perfect Monitor. One look at the beautifully defined colors and razor-sharp lines, and you know that the Perfect Monitor represents the future of computer displays.

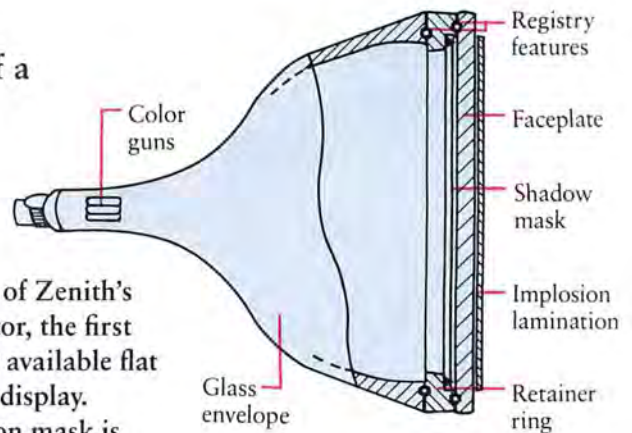
Extremely high resolution is one of the greatest potential benefits of FTM technology. Currently, the screen resolution of the Perfect Monitor is rated at the VGA's 640-by-480-pixel maximum, but the display is capable of resolutions as high as 1400 by 1200 pixels. When hooked up to a video board with enough megabytes of RAM to display millions of colors, the Perfect Monitor will be able to produce near-photographic images.

In its current incarnation, the Perfect Monitor has only one major deficiency—no multiscan capabilities (see "Magical Multiscan Tour," PCW, September 1987). Switchable scan rates would enable the Perfect Monitor to work with any standard video board; as is, the display is limited to PS/2 owners or those willing to spend \$599 for Zenith's own video adapter. At first, only users heavily involved with graphics will pay the high price for Zenith's new technology.



Pinpoint alignment between a color CRT's electron guns and the shadow mask guarantees that each gun illuminates only one color in each triad of phosphor dots. With a standard color CRT, heat buildup expands the shadow mask and degrades the display's color definition.

Anatomy of a Flat CRT



The anatomy of Zenith's Perfect Monitor, the first commercially available flat tension mask display. The flat tension mask is virtually unaffected by heat, allowing it to accommodate a brighter image without distortion.

Eventually, large production volume (brought about in part by Zenith's plans to license the technology to third-party manufacturers) will bring the price down, but patent restrictions will prevent the Perfect Monitor from being cloned any time soon. Nonetheless, determination will find a way. Competitors managed to copy the technology behind the Trinitron without violating Sony's patents, and it's a sure bet that the same thing will happen with the Perfect Monitor. Technology this hot can't stand alone. ●

TJ Byers is a Contributing Editor for PC World.

*ZCM-1490 Perfect Monitor
Zenith Data Systems
1000 Milwaukee Ave.
Glenview, IL 60025
800/842-9000
List price: \$999, Z-449 video board \$599*

The New Statistics

Statistics software for the PC is bringing sophisticated data analysis out of the laboratory—and helping businesses eliminate trial-and-error decision making.

Jeff Moad

||||| What type of consumer, by age, sex, and income, is likely to purchase a laundry soap that includes a fabric softener?

How might a company's stock value fare if management fails to increase the company's share in the sugar market?

What's the probability that a married, 45-year-old male union member with three children will vote for a Republican in the next presidential election?

Until recently, getting answers to questions like these required the use of an expensive mainframe computer running sophisticated statistics programs. If you were the analyst at a corporation seeking such truths, chances are you would have to wait hours, if not days, for enlightenment as the DP department dealt with more mundane chores—like the company payroll. By the time your query was processed, that 45-year-old potential Republican might be the father of four, at which point you would have to revise your assumptions and start all over again.

But that's beginning to change. Although PC-based statistics programs can't handle as much data or as many variables as their mainframe equivalents, they offer nearly all the same functions at a fraction of the cost. Data entry is usually easier, and the interactive nature of the PC—and the fact that only one user is in line—means the

answers come more quickly. As a result, companies big and not so big are increasingly turning to PC statistics packages to tame traditional business problems.

Of course, statistics programs for the PC are no panacea. Many are minor variations of ungainly, RAM-hungry mainframe packages that are difficult to learn and master. Even those specially designed for the PC can be imposing; either way, the program requires formal statistical training. Despite these constraints, PC-based statistical software is helping businesses save money and bringing them advanced analytical tools.

■ Filling the Coffers

Market research, one of the most common statistical software applications, helps businesses target their products more effectively. That's what happened when World Vision, a Christian humanitarian group in Monrovia, California, used statistical software to fine-tune its direct-mail campaign. World Vision, which solicits donations for causes such as Ethiopian famine relief, pulls down \$20 million a year in direct-mail donations, but it wanted to make the most of its investment in solicitation schemes.



John Van Wyk, a marketing researcher for World Vision, uses statistical software to help determine how to get the best response from direct-mail pitches.

"Planning direct-mail campaigns was pretty much trial and error," says World Vision marketing researcher Jon Van Wyk. "We would try one thing—like improving the art in a direct-mail kit—and if that seemed to bring in more money, we'd do more of it." World Vision tracked response rates with *SuperCalc*, but like most spreadsheets, the program lacked sophisticated tools that could predict how, based on historical data, changes in direct-mail packaging would affect donations.

In January 1987, World Vision began to target its appeals by experimenting with *SPSS/PC+*, a PC version of the SPSS mainframe statistics package. The organization collected extensive background information on a control group of donors, asked them to evaluate different direct-mail pitches, and ran the data through

SPSS/PC+'s t-tests and regressions. The generated analysis enabled World Vision to better target donors in specific age, income, and other categories and thus tailor mailings for maximum return.

World Vision originally selected *SPSS/PC+* because younger members of the data processing staff had used the mainframe version in college. They soon discovered that the PC version offered features not found on mainframes. Unlike its forebears, *SPSS/PC+* can be linked to *Microsoft Chart* to generate graphs that even nontechnical managers can understand. This made life easier for World Vision's statistics gurus—and got essential information to the right decision makers.



As part owner of an opinion research firm, John Fiedler says PC-based statistics make him more productive.

■ Taking the Pulse of the People

Populist, a small firm in Connecticut, also uses a PC-based statistical package to conduct market research—specifically, opinion analysis. When Populist got started two-and-a-half years ago, competing with the likes of Lou Harris required major-league money for the necessary mainframe hardware and software, according to co-owner John Fiedler. Having just wrapped up a consulting job with the Republican National Committee, Fiedler decided to start his own opinion analysis firm; the first step was to become a beta tester of *SPSS/PC+*.

"Without statistics on the PC, we probably couldn't have gone into business at all," says Fiedler.

Although its \$1 million in annual bookings places it in the minors, Populist has survived—and managed to land some major accounts, including 7-Up and the Republican National Committee. Fiedler credits his success in large measure to the interactive nature of PC-based statistics. "Frankly, when you do a lot of statistical analysis you make a lot of mistakes," he says. "You may set the test up wrong or use the wrong test or function. In the mainframe

environment, it can take an entire day to discover one mistake, and it can take three weeks to make twenty, because you're competing for time on the system. With a PC, I can make mistakes quicker, and that makes me more productive."

According to Fiedler, the big guns in the opinion research business aren't trading in their mainframes for PCs. "These companies have invested a lot in equipment, and they're reluctant to change." But that day may yet come—if only to keep the smaller, nimbler firms from whittling away at their market.

■ More for the Money

Although statistical analysis is commonly used to track and profile a product or population, the cost-effectiveness of PC-based statistical packages is just being discovered—particularly by government agencies in search of savings in an era of tax revolts and budget cuts.

That's what spurred the financially strapped public health de-

partment in California's San Bernardino County to break old habits. The agency, which has used mainframe-based statistics programs for years, recently decided to save time and money by extending its statistical analysis activity to PCs. "We didn't have the funds for analyzing mental health statistics on the mainframe, yet our department director wanted detailed information very quickly," says Betty Kettering, a biostatistician for the county.

The county settled on *StatPac Gold*, a menu-driven statistics program with an integrated tutorial feature. The product was comparatively simple to set up and use, and at \$595, was easier on the pocketbook than packages like *SAS PC*, whose annual license fee starts at \$2500.

Better still, Kettering has discovered that *StatPac Gold's* subset of mainframe statistical functions is more than adequate. Other county employees, tired of waiting for mainframe time, have come around to the PC approach and have begun borrowing Kettering's *StatPac Gold*. The movement has taken root; several other county departments have written PC statistical packages into their budgets for next year to expand data analysis and, in the long run, to save money.

■ Making a Case by the Numbers

In addition to helping cut costs, PC-based statistical software can be used creatively to improve a firm's products or services. Skadden, Arps, Slate, Meagher, and Flom, a Manhattan-based law firm specializing in antitrust cases, bought *Stata*, a PC-based package, to analyze product pricing

and other market factors in defending corporate clients charged with running afoul of monopoly laws. But Duncan Cameron, the economist hired for the job, soon discovered an unexpected legal application—determining damages in a class-action liability lawsuit against a client whose products were allegedly responsible for widespread salmonella poisoning in a large midwestern city.

In an effort to decrease the damages that might be awarded to the 20,000 people involved in the suit, Cameron established a statistical basis for settling each claim. He looked at comparable settlements based on at least eight different variables, such as time spent by a victim in the hospital. Then, with the aid of a sorting function, Cameron identified and segregated families that had been affected by the alleged poisoning, since settlements are usually larger when more than one family member is involved.

At press time, the case was still pending, but Cameron claims this is the first time statistical analysis has been used to reckon damages in a product liability case. "People used to rely on a seat-of-the-pants approach to establish damages,"

says Cameron. "They would come up with a total settlement figure, then decide how to divide it up. It was backwards, really." By quantifying the process of awarding settlements, Skadden, Arps, and company may be able to make a stronger case for lower compensation—and save its client money.

■ A Select Audience

Regardless of how inexpensive and effective statistical programs for the PC become, they'll never be for everyone. "There's a scare barrier when it comes to statistics, even though some packages are accessible and well supported," says biostatistician Kettering.

But for those with the training or the willingness to learn, PC-based statistical software is an attractive alternative to mainframe-based packages. The PC's interactive nature means data can be analyzed more quickly, providing managers with much-needed results. Moreover, the low cost of PC-based packages allows firms that wouldn't normally consider performing statistical analysis in-house to squeeze the most out of raw data. ●

Biostatistician Betty Kettering says a statistical program is helping a California public health agency save money.



Frederick Cameron

Jeff Moad is the San Francisco bureau chief for Datamation.

SAS PC

SAS Institute, Inc.

Box 8000, SAS Circle

Cary, NC 27511-8000

919/467-8000

List price: \$2500 minimum

annual site-license fee for up to 50 workstations

Requirements: 640K, 10MB hard disk, DOS 2.00 or later version

Not copy protected

SPSS/PC +

SPSS, Inc.

444 N. Michigan Ave. #3000

Chicago, IL 60611

312/329-3500

List price: \$795

Requirements: 384K, 10MB hard disk, DOS 2.00 or later version; 80287 coprocessor recommended

Copy protected

Stata

Computing Resource Center

10801 National Blvd.

Los Angeles, CA 90064

800/782-8272 outside

California, 213/470-4341

List price: \$395, with graphics \$590

Requirements: 256K, two disk drives, DOS 2.00 or later version

Not copy protected

StatPac Gold

Walonic Associates, Inc.

6500 Nicollet Ave. S

Minneapolis, MN 55423

800/328-4907, 612/866-9022

List price: \$595

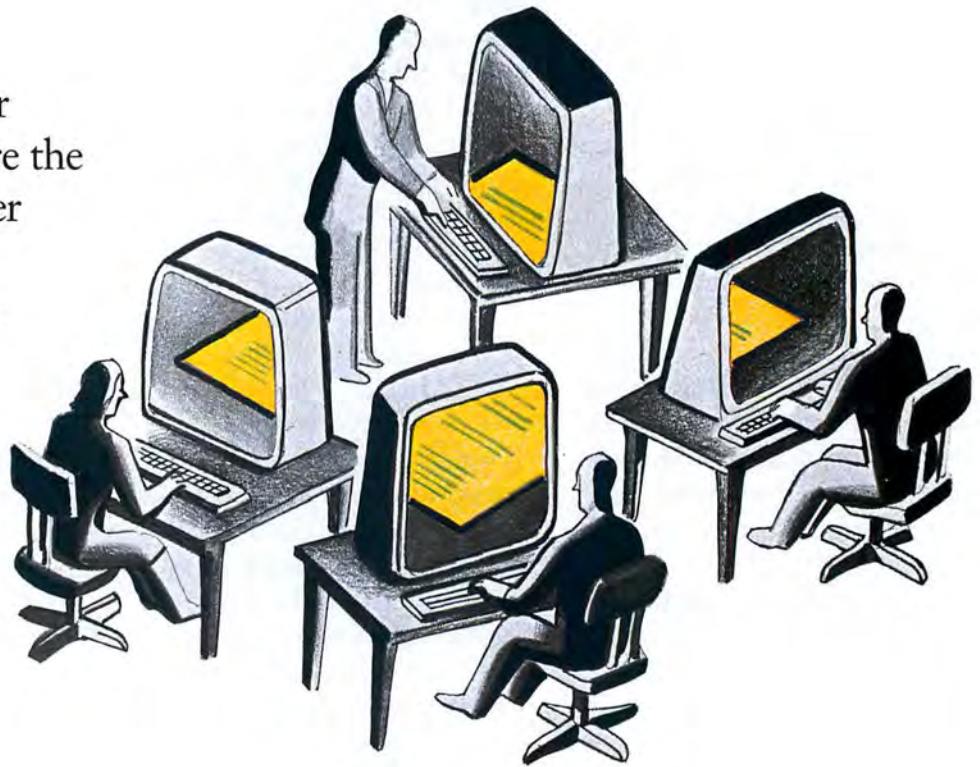
Requirements: 192K, hard disk, DOS 2.00 or later version

Not copy protected

The Work-Group Ethic


Today's single-user PC applications are the signposts to greater productivity for tomorrow's work groups.

Eric Bender



After capturing desktops across America by offering payoffs in personal productivity, PC software companies are finally tackling work-group productivity. The time seems right. Sometime this year the number of networked PCs will pass the 1 million mark, and the technology for friendly, flexible group applications is developing fairly rapidly.

The applications themselves, on the other hand, are taking longer—although a few striking examples have already debuted. Some new packages trade on the advanced messaging and data base expertise of the large-system environment, but most are evolving a step at a time from proven PC packages. In terms of innovation, “There isn’t anything impressive on larger systems,” asserts Craig Burton, vice president of business development for Novell in Provo, Utah.

 **Catching More on the Net**
PC networks once sold themselves solely by virtue of their ability to share costly peripherals—primarily big disks and printers. That remains a prime purchasing justification; even though prices for hardware like laser printers are steadily dropping, the demand for ever-fancier peripherals is likely to keep networks an economical option.

Meanwhile, the benefits of shared access to information are becoming clearer. “Simply sharing the same spreadsheet across a network boosts productivity,” observes Gregory Heumann, marketing manager for third-party products at 3Com in Santa Clara, California. The network allows users to swap files and templates quickly and consolidate worksheets from multiple users. Similarly, multiuser word processing software is speeding the writing and editing of documents and improving networkwide print spooling and style sheet standardization.

Two other types of applications that are naturals for group work—data base management and accounting—are emerging in multiuser PC net versions. The first implementations have been clumsy, often working only with the help of a computer guru or with considerable user inconvenience, but such applications have grown much more powerful and polished over time.

The march of technology has been most visible among data base managers, which are slowly evolving into sophisticated multiuser tools. For example, Belmont, California-based Ansa Software has refined the file-locking techniques of its new *Paradox* version 2.0 so that more than one user on a LAN can browse, query, sort, edit, and even create reports from a file that contains a locked record. Under this new schema, network users can see who has control of a file at any given time. Data revisions can flow safely and automatically into the unprotected records of the same file, providing real-time updates. Beginning next year, a host of data base tools will take advantage of Microsoft OS/2's protected mode to push multiuser frontiers even further.

Combining networked data bases with other applications already simplifies jobs dramatically. Heumann describes how 3Com's in-house publishing operation automatically feeds lists retrieved from a data base into a desktop publishing package for printing. “Publishing is inherently a multiuser job,” he notes.

While corporate users are laboriously reaching out from local nets to larger computers, electronic mail is coming on like gangbusters. “When E-mail is adopted in a corporation, it becomes *the* communications medium, and you just don't get memos anymore,” remarks Ronald Ferguson, marketing vice president for Innovative Software of Lenexa, Kansas. “The boss starts using it, then you start using it.” 3Com president William Krause applauds E-mail's ability to zing messages out for less than a dime per message.



George Bowers saved Sinai Hospital of Baltimore \$60,000 a year in insurance claim processing costs using The Coordinator.

Beyond E-Mail

Such network benefits are well established and will increase through incremental improvements in existing applications. But some newer packages have been designed from the ground up with work groups in mind, among them several packages that focus on the cooperative review of documents.

Best known of these is Brøderbund Software's *ForComment* (see "Author, Author, Author!," *PCW*, August 1987). Introduced a year ago by the San Rafael, California, software house, the package accepts a draft document written with one of several popular word processors, lets as many as 15 people comment on it, and collates their suggestions in one master copy the author can then revise.

ForComment not only speeds up the review process, it also makes suggestions explicit. The program is especially useful in jobs where using precise language is critical. "Most lawyers' work deals with words—clouds and streams and reams of words," notes Paula Giese, president of Compulux Services in Minneapolis, which consults with law firms. *ForComment* excels in this environment, she says. Additionally, the program helps eliminate those dreadful committee meetings that fail to produce a clear working document.

A similar document management package now in beta test—*docuFORUM* from Network Technologies of Ann Arbor, Michigan—translates the concepts of computer conferencing into the document presentation world.

This program's specialty, says marketing vice president Jeffrey Elpern, is managing hideously long and complicated documents that are subject to intensive review by several individuals. Built on a relational data base, *docuFORUM* rides herd over each segment, each draft, each comment. The program also lets authors and reviewers keep a personal record of those portions of a document they have handled. And a "document bulletin board" on each server contains documents relevant to a particular work group. The program is scheduled for release late this year.

Although they target the high-end document market, both *docuFORUM* and *ForComment* accept only text compositions. The programs can't handle graphics because graphics software standards are ill-defined, claims Elpern. "As

soon as you talk about graphics," he says, "you step off into an abyss." Such a situation could change if OS/2 becomes firmly entrenched as a standard.

While it may take some time, industry leaders have a clear vision of tomorrow's workplace as a cooperative computing environment.

Conversational Tricks

Yet another class of software seeks to improve communications among work-group members. Action Technologies' *The Coordinator* offers a set of management tools integrated with a sophisticated messaging system (see "Telephone Power Line," Kevin Strehlo, PCW, September 1987). The program is based on a controversial management theory which—to grossly oversimplify—states that businesses make most of their commitments to action during conversations between employees. The software helps participants clarify these conversations, explicitly state resulting proposed actions, and then actively track them.

Each project carries along its own record of past conversations, so that when a message arrives at the desk of another user, "it puts everything in context, like a really good executive secretary," says Chauncy Bell, president of the Emeryville, California, firm. "That makes a shocking difference in the speed at which you work."

This attention to detail up front results in fewer telephone calls (either routine or emergency) and less telephone tag, claims Bell. *The Coordinator* also helps re-

place many memos and letters, eliminates the need for some meetings, and lowers the overnight mail bill.

Sinai Hospital of Baltimore launched a pilot *Coordinator* network in March that proved very successful, according to George Bowers, assistant vice president for management information systems. Two dozen high-level executives and administrative personnel

at the 2400-employee hospital tested *The Coordinator* and found that it slashed the incidence of telephone tag. Additionally, Bowers reports, "We can resolve a lot of issues that probably would have taken two or three meetings." Most important, he adds, "Things don't drop through the cracks."

The pilot network enabled several departments to cooperatively track a claim that required external review, cutting the 30-day processing cycle down to 10 days. Bowers estimates that this tracking feature will save the hospital more than \$60,000 per year, just about paying for the pilot program.

"It takes some getting used to and can be a little scary because it forces you to make decisions," Bowers concludes. "But it also makes it easy to see who's doing



Jim Clark helps his fellow employees at Radionics of Salinas, California, save scheduling time with Higgins.

Mark Farnham

what; a couple of people have been forced out of their dank, dark corners."

Higgins by Conetic Systems is yet another package that enhances teamwork through the sharing of information. Conetic is positioning *Higgins* as "an electronic-mail product with value-added applications," says Howard Case, marketing vice president at the San Leandro, California, firm. Applications include scheduling, file maintenance, to-do lists, expense reporting, desktop accessories, and others—all linked together with a relational data base.

This underlying integration is critical, because it suggests useful new ways to combine applications—either for a single user or among several users. For instance, sales personnel can quickly create an in-depth file for a given account by attaching contact information, an appointment history, expense reports, and other relevant material. If a customer calls with a problem, the receptionist can type up the message, send it to a shared to-do list in the technical support department, and copy it to the sales force.

Most *Higgins* users emphasize its scheduling features. For example, posting schedules for key executives has saved his company a

tremendous amount of time, reports Jim Clark, administrator of a 50-PC Novell network at Radionics, a Salinas, California, burglar alarm supplier.

As far as using *Higgins* to combine information files, appointments, and to-do lists, Clark says, "It could be handy for a salesperson to remember, say, the name of the customer's dog." But, he adds, "We're so used to doing business in other ways, we wonder if it's worth the change."

Others are more ambitious. Dan Lucky, owner of Entré Computer Centres in Colonia, New Jersey, is using *Higgins* to turn his workplace into a paperless office. "We don't take paper telephone messages, we don't do our invoices by hand, and we do all our price quotations from the network," Lucky explains. "To see outstanding service requests, I only have to look at my service manager's to-do list. Why should I interrupt him with a phone call?"

True Multiuser Management

In fact, future network technology promises to increase both management oversight and the ability to more effectively marshal workgroup members to tackle really large jobs. Some managers are ready for that capability today. Jay Mossman, senior vice president of trust operations at First Republic Bank in Dallas, counts at least 30 software applications besides *Higgins* running on his firm's 200-PC network, but he would like to add a multiuser project management system, enabling employees to



With Action Technologies' *The Coordinator*, you create and track explicit commitments with your coworkers via on-line conversations. When you specify key follow-up dates for a commitment, the program automatically enters the dates in each person's calendar. The opening *Converse* window shown here also lets you review incoming electronic mail and unfulfilled commitments.

concurrently update information on large projects.

Some predict that project management will be a hot area for work-group software, but true project management is a relatively narrow application performed by only a few individuals, observes Innovative's Ferguson. Project tracking, on the other hand, affects us all and, along with the active management of work flow, is high on everyone's wish list for new group applications.

Networks will enhance productivity by actively linking employees who carry out different functions, such as writing documents and preparing them for publication. Lotus Development Corporation plans to expand such interplay by integrating spreadsheet and data base functions in future products. A manager working with a future version of 1-2-3

will be able to easily access company records managed by a Lotus/DBMS application.

Software already exists that enables two users at remote sites to work together on the same program. *In-Synch*, from American

plains, distributes templates to sales managers and then reviews worksheets with them.

In the future, work-group applications will find uses for other forms of presentation, such as images or annotated voice media.

When a Coordinator message arrives at the desk of another user, 'it puts everything in context, like a really good executive secretary.'

Video Teleconferencing, establishes a peer-to-peer connection between standard applications like 1-2-3 running on each machine. "The majority of people are using it with spreadsheets," says Neil Lewis, president of the Farmingdale, New York, firm. One marketing analyst, Lewis ex-

New technology will also raise a host of other possibilities, like employing hypertext in group documents and interrupting a user's current application to convey urgent information or provide real-time updates.

A Ways to Go

But a few technical glitches still need to be overcome. Today, network applications generally take over the whole PC, which limits their functionality. For example, *Higgins'* mail-alert feature is attractive, comments Radionics' Clark, but to use it "you've got to be in *Higgins*, and if you're in *Higgins* you can't be in a word processor or a data base." The multitasking capability of OS/2 should eliminate that problem.

Other, more surprising problems lurk just below the surface of work-group computing, even in apparently straightforward functions like scheduling. "One of the nastiest expressions known to

```

<none> PROMISE: send June sales report
What is your promise?
To: cb-desk @ ati
Copies-to: akaplan @ ati
I promise to do as you re
It was a great month, as
You'll have the report by

Today is : Thu 9-Jul-87

Alert-date :
Attach file :
<Done>

(Press <Alt>-C to get calendar)

REQUEST: send June sales report unans'd (latest)
Date: Thu 9-Jul-87 11:11 Complete-by: Thu 9-Jul-87
From: cb-desk @ ati Respond-by: No-date
To: jsmith @ ati Domain: sales
Copies-to: akaplan @ ati, jcafee @ ati

Please send the June sales report.

2 TODAY 3 CONVERS 4 LONGRUN 5 net-hlp 6 writing 7 utility 8 commit 9 abandon
  
```

After receiving a Coordinator request, you can keep it on screen while writing a response. Files, such as 1-2-3 worksheets containing sales reports, can be attached to responses.

man is, 'Let's have a meeting,'" says Action Technologies' Bell. "The nasty part is the stream of counteroffers you get in response that can lead to very convoluted conversations."

Both *The Coordinator* and *Higgins* offer some rough-cut multi-user scheduling features, but their vendors clearly see the need for advances. *Higgins* can gather several employees' weekly schedules and display them on a bar graph; the user can then find a free half hour in the schedule and send an E-mail message to block out a meeting. Beyond that, however, the features are so complex they could bog down the net for an

hour, Conetic's Case remarks. Here again, OS/2's interprocess capabilities could quietly handle the job.

■ Making a Market

Good intentions and good reviews aside, how are early network software entrants doing at the sales counter? "*ForComment* isn't selling," reports Jeffrey Tarter, publisher of the *Soft-letter* newsletter in Cambridge, Massachusetts. "The problem is that it requires people to make a dramatic change in the way they work."

Even if revamped working styles make life demonstrably more pleasant—and many vendors' claims should be taken with a grain of salt—workers' resistance to change will die hard. Some

benefits clearly reside at the far end of a long learning curve, and customers should test group software with prototype installations before committing a significant amount of money.

Organizations must grapple with some nitty-gritty software issues, including the need for a clean user interface that easily handles group applications' ever-deepening complexity without requiring spells of maniacal typing. In addition, security and fail-safe backup procedures become even more critical when used with group applications; if the network crashes, so do your chances of getting work done.

Work-style idiosyncrasies of both individuals and work groups also determine the pace at which multiuser software is adopted. "You get extreme reactions on almost every variant of group work," notes Irene Greif, work-group product specialist at Lotus. "Give people a particular scenario, and either it will be exactly what they always have wanted or they will dismiss it as silly."

■ Beyond the PC Horizon

Still, however difficult it is to see the path toward work-group computing, multiuser products clearly will remap office systems. "When groups work together, the communications medium changes how they work," says Greif. "Almost everything we develop for groups is going to have implications for individuals."

Mail
Wednesday, February 11, 1987 (42/323)
12:38pm

Schedule for Betty Edwards
Wednesday, February 11, 1987 (42/323)

7a	8a	9a	10a	11a	12p	1p	2p	3p	4p	5p	6p	E

February 1987

Sun	Mon	Tue	Wed	Thur	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28

Date	Time	Type	Subject	From
2/11	10:13a	InProg	Office Automation Project	Betty Edwards
2/11	9:32a	Route	Management Committee Meeting	Bill Chin
2/11	9:01a	Mail	Office Automation Project	Tom Armstrong
2/10	2:09p	Route	Client Statistics	Gordon Franklin
2/10	2:04p	Answer	Staff Meeting	Sam Williams
2/10	12:32p	Phone	Kristina Wallace	(213)822-1234 Ext:1000
2/10	8:33a	Mail	Budget Recommendations	Bill Chin
2/10	8:22a	Phone	Gordon Franklin	(415)456-1000 Ext:5678
2/09	4:36p	Received	Productivity Report	Gordon Franklin

Select the option or type the Command letter

In-Basket COMMANDS: View Telephone Send Correspondence Delete Print Extract Finished

Based on a multiuser relational data base, Conetic Systems' *Higgins* combines electronic mail, scheduling, to-do lists, and a host of other functions. Here, incoming messages (including electronic-mail slips) can be reviewed alongside daily and monthly calendars.

As group applications expand over the next few years, so will the networked environments in which they run. The need to work cooperatively extends beyond departmental or geographic boundaries. In the typical corporation, "The business manager is in one spot with his or her staff, but the technical expertise is spread throughout the corporation and among outside suppliers," observes Network Technologies' Elpern. Most corporations start making intercorporate links soon after network installation, adds Bell. "We define organizations these days primarily in legal and physical terms, but these tools will allow a reexamination of that."

So, while it may take some time, industry leaders have a clear vision of tomorrow's workplace as a cooperative computing environment. Concludes Ed Belove, Lotus

vice president for corporate R&D, "The prevailing belief is that every product will become a group product, over time." ●

As PC World's East Coast Editor, Eric Bender has a Boston office and a San Francisco work group.

*The Coordinator
Action Technologies
2200 Powell St. #625
Emeryville, CA 94608
415/654-4444*

*List price: \$495 for stand-alone, \$2495 for network file server, \$995 per line for telecommunications manager
Requirements: 640K and 5MB hard disk storage, 1200-bps modem and/or IBM NETBIOS-compatible network
Not copy protected*

*docuFORUM
Network Technologies
International
315 W. Huron
Ann Arbor, MI 48103
313/994-4030*

*List price: \$145 per workstation, \$1495 for network file server plus mandatory annual \$295 maintenancesupport contract
Requirements: 640K, hard disk drive for workstations, DOS 2.00 or later version, AT or compatible with 40MB hard disk drive, Santa Cruz
Operation Xenix for server
Not copy protected*

*ForComment
Broderbund Software
17 Paul Dr.
San Rafael, CA 94903
415/479-1700*

*List price: \$195 for stand-alone, \$995 for network/work-group version for up to 16 authors
Requirements: 256K, DOS 2.00 or later version
Not copy protected*

*Higgins
Conetic Systems
1470 Doolittle Dr.
San Leandro, CA 94577
415/430-8875*

*List price: \$695 per network file server, \$1895 for Higgins Exchange wide-area electronic-mail software
Requirements: 512K, 1.5MB plus 1MB of hard disk storage on the server, DOS 3.10 for workstations; supports 3Com, Novell Advanced Netware, other NETBIOS-compatible local networks
Not copy protected*

Mail View
Wednesday, February 11, 1987 (42/323)
12:39pm

MAIL / PHONE MESSAGE

InProg: February 11, 1987 10:13am
From: Betty Edwards
To: **Gordon Franklin**
Subject: **Office Automation Project**
Copy: **Management Committee**

Memo is -
Confirmed: X Private: Urgent: X
For Your -
Information: X Comments: Action: X
Signature: Approval: Editing:

MEMO

We have received approval for the purchase equipment outlined in our Office Automation of January 15, 1987. Thank you all for

As a result of the approval, our next meeting on the specific timing of the Department. Please be prepared to discuss your area as well as a tentative implementation schedule is currently scheduled for next Friday

MAIL ROUTING
Home Domain

Tom Armstrong
Vice President of Systems
- - - MAIL GROUPS - - -
All Higgins Mail Users
Computer Department
Management Committee
User Support Department

Select the person or group to receive this memo

COMMANDS: **Select** Move Order Extract Delete View NotListed Print Finished QuitSending

When given the name of the person to contact, Higgins can automatically route messages across both local and remote networks.

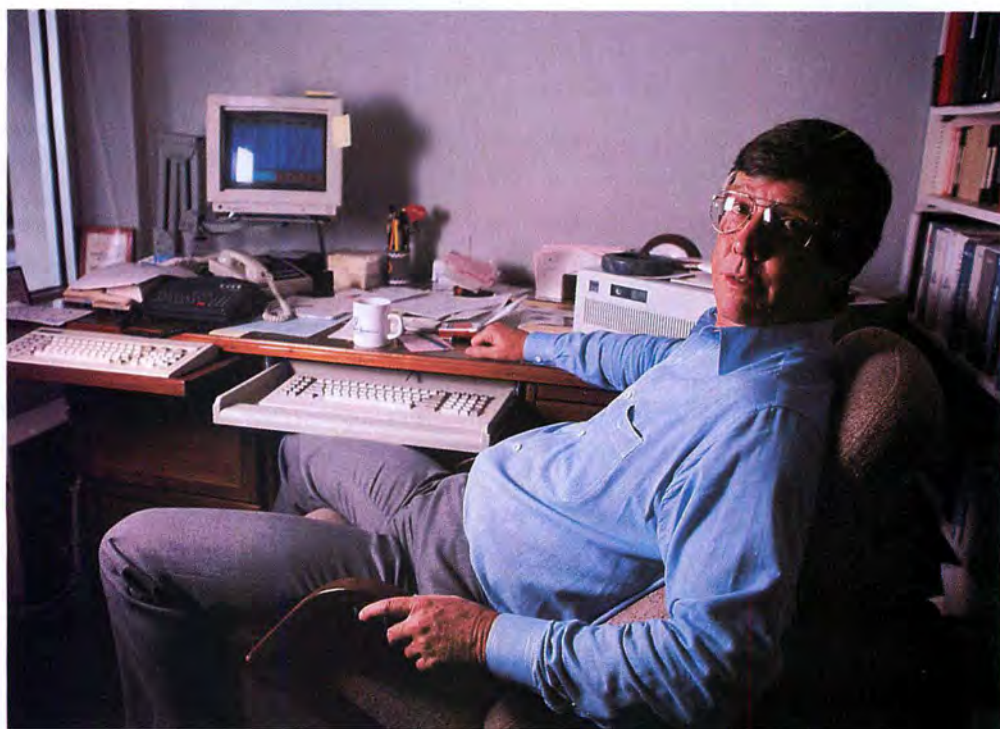
Watson at Your Beck and Call

More than a fancy answering machine, the Watson voice mail system is helping small businesses serve their customers 24 hours a day while sparing staffers the tedium of hanging on the phone.

Daniel Ben-Horin

Next to Old Maid, telephone tag has to be the world's most boring game. In setting up a simple business call, two busy people can easily spend more time trying to communicate than actually doing so. But with the Watson voice mail system from Natural Microsystems Corporation, many small businesses make contacts while doing business as usual—even in the middle of the night.

Texas stockbroker Hank Gillespie uses Watson to take customer orders and give market tips. Partly as a result, his firm's business is booming.



Watson is a plug-in circuit board that turns the PC into a voice mail center (see "Watson, It's Elementary," *PCW*, January 1986). Neatly positioned at the low end of the burgeoning voice mail add-on market, Watson acts as an information gateway for callers, directing them to the right department or dispensing information by means of a touch-tone telephone. Customers or personnel with personal access codes pick up messages meant for their ears only. Add Natural Microsystems' Voice Information System (VIS) option, and Watson turns the PC into an automatic pollster: At your order, Watson calls a list of numbers one after another, asks multiple-choice questions, and gathers touch-tone responses. Best of all, Watson works as long as you care to leave your computer on. It's a cheap way for a small business to stay open 24 hours a day—and keep up with bigger and better-staffed competitors.



Dan Seifert

Voice Mail Spoken Here The Watson voice mail system performs two key functions. First, it converts analog voice message signals to digital data that the PC can store and manipulate, using the computer's hard disk like a tape recorder. Under Watson's aegis, the stored messages are later reconverted and played back as required. Second, Watson can be accessed long-distance from any touch-tone telephone. For example, salespeople on the road can pick up and leave messages by tapping in their ID codes to access private mailboxes.

Douglas Moore of Kansas City Life has Watson warn employees whenever the main computer will be shut down for service.

Aside from a built-in 1200-bps modem and *PC-Talk III* communications software, the \$498 Watson package gives its owner a 500-record electronic card file, an on-line appointment calendar and alarm, and a call-logging feature. The almost mandatory VIS option, which costs an extra \$298 (or \$498 if bought separately), is a simple command set that lets non-technical users program Watson to make outgoing calls. To record a message, for example, you speak into the telephone at a VIS prompt. Although Watson can

run "behind" other applications, it hogs RAM and can slow your system, so some users dedicate a PC to Watson or put it to work after office hours.

Natural Microsystems has sold some 15,000 Watson systems since 1985, and it's hardly alone in the voice mail business. IDC Link Resources, a market research firm based in Framingham, Massachusetts, predicts that voice mail system sales, which stood at \$180 million in 1985, will soar to \$645 million in 1989. Typical buyers are small to medium-size businesses that want to save on staff salaries, minimize telephone tag, improve service, and get the word out about what they have to offer.

Financial planner Tony Pratt finds interactive telemarketing yields impressive results.



Jeff Robertson

Earlier this year, Natural Microsystems came out with a program called *Quickspeak*, which users should find as enticing as chopped nuts sprinkled on vanilla Watson. *Quickspeak* takes *dBASE III Plus* and ASCII text files and converts them into synthesized speech. So if you're a lawyer making a court appearance and realize you left a crucial document back in the office, you can call your PC, load the document, and have Watson read it to you. The machine won't sound like Basil Rathbone, but at least it's intelligible.

Tall Telephone Tale from Texas

"A dinosaur like Merrill Lynch could never set up a system like this," says A. C. "Hank" Gillespie, a Corpus Christi, Texas, stockbroker. "By the time it got out of committee, they would have fallen into the La Brea tar pits." The outspoken Texan is referring to the Watson system his firm, Robert Thomas Securities (RTS), installed. RTS has enjoyed an eightfold increase in business in the last year, and Gillespie feels Watson is largely responsible.

Gillespie's operation is a textbook example of how voice mail can help a little guy compete with giants the size of Merrill Lynch. He uses the system after-hours to answer calls, take buy-and-sell orders, and dispense information. When you dial RTS's special Watson number, a pleasant voice recites the tides that can lead on to fortune: "...for gold and the dollar, press 02 and the pound sign...for special-interest stocks, press 03 and the pound sign..." At night, Watson delivers Gillespie's "After-Hours Hotline"; early-bird callers get a "Premarket Commentary." The free services generate

so much goodwill, callers soon become customers.

"Using Watson," says Gillespie, "a customer can tell us, 'Send me a check,' 'close out,' or 'buy more' at any time. When I come to work in the morning, the first thing I do is ask Watson to display a log of all the phone messages it's received," he adds. "I can place orders before the market even opens."

Watson also saves RTS the rental charge for a telex machine. The firm has Watson dial ITT's telex service, load the telex control software, capture any messages, and automatically store the information on the PC's hard disk.

■ Outward-Bound Telephone Calls

Watson excels at handling incoming calls, but it can also speak for itself. Uses range from calling a list of patients to remind them of their dental appointments—as Boston orthodontist Arthur Fertman's Watson does—to hard-core telemarketing. The idea is to save the sanity of the people who might otherwise have to make hundreds of calls.

Everything's up-to-date in Kansas City, Missouri, thanks to Watson. The Kansas City Life Insurance Company's system calls users at the home office's terminals whenever the central mainframe will be down for tests or servicing; because the company is switching systems, this happens two or three times a week. Later, Watson informs users that the mainframe is running again. Before Watson, says assistant vice president Douglas Moore, "two people had to put aside normal

work for half an hour to notify users that service would be interrupted, then again when it resumed. We simply couldn't afford the wasted time."

While this may sound like nothing but a fancy wake-up service, Paul Gilpin, an independent insurance agent in Burlington, Massachusetts, uses Watson to reach out and put the touch on someone. To bypass the ordeal of cold calling, Gilpin types 60 phone numbers into his Watson-accessed data base and records a minute-long

sales pitch. He then goes about his other business while Watson makes the calls—and takes the heat when people slam down the phone.

If Gilpin is taking in money, financial planner Tony Pratt wants to teach people how to manage theirs. The owner of the Des

Soaring Voice Mail Sales (in millions)

■ Revenues from sales
■ Revenues from services



Interactive voice messaging revenues have grown steadily since 1985 and should jump dramatically by the next decade.

Source: IDC Link Resources, Framingham, MA

A Tale of Two Talkers

At Norwalk Furniture in Norwalk, Ohio, customers get their furniture—any frame in any fabric—within 30 days, or else. With 65 frames and 700 fabrics being sold at 1000 independent outlets in 38 states, that means lots of fast action based on lots of phone communication, far more than could be handled by a single-port voice mail system.

Norwalk opted for Votan's four-port *TeleCenter System*, bundled with an XT and a 60MB hard disk. The system is connected to Norwalk's Northern Telecom SL1 PBX. Two of the ports are connected to inbound 24-hour WATS lines; the other two are used for in-house messaging and for calls routed through the PBX.

Bob Gerkin, chief financial officer of the family-owned business, quickly became a voice mail devotee. Before installing the Votan system, he said, "We thought the costs and inefficiency of relying on phone communications and the postal service were the necessary evils of conducting business. Just getting in touch with the appropriate salespeople to notify

them of order changes could take a week or more."

Norwalk's salespeople learned to use the Votan voice mail system in just two days of training, and Gerkin says it has paid off in major productivity gains. He points proudly to one case where the company was able to locate, intercept, and re-route a shipment of furniture to a new customer after it had been canceled by another customer. The company was spared shipping and storage costs, lost time, and having to sell the furniture at a big discount.

When it comes to appreciation of voice mail, Gerkin has nothing on the (formerly) beleaguered secretarial staff of the Compumotor Division of the Parker Hannifin Corporation. Compumotor makes programmable motion-control components for manufacturing and maintains a staff of sales engineers in the field and diagnostic engineers at its home office in Petaluma, California. Secretaries got old before their time trans-

mitting complex technical messages between engineers. "About half-way through a message, I'd realize people were speaking a different language," one secretary says with a laugh. Then Compumotor bought Genesis Electronics's four-port *Cindi* system, which is not PC-based but is well suited to integration with a PBX system. "Now the messages go into voice mailboxes and the engineers can talk 'directly' to each other," says the secretary. "The possibility for error is reduced to zero."

—D. B-H.

Cindi
Genesis Electronics Corp.
103 Woodmere Rd.
Folsom, CA 95630
916/985-4050
List price: \$26,000

TeleCenter System
Votan
4487 Technology Dr.
Fremont, CA 94538
415/490-7600
List price: bundled with an IBM XT with 60MB hard disk \$18,450; bundled with a Goldstar GCH XT clone \$16,950
Requirements: 640K, hard disk, DOS 3.00 or later version
Copy protected

Peres, Missouri, Money Concepts franchise uses Watson to invite 2000 prospects a week to his financial planning seminars. "It just sits there and cranks out calls all day long," says Pratt. He claims Watson's interactive pitch is far more successful than either direct mail or tape-recorded telemarketing, and hopes to offer his Watson-based approach as a turnkey system for other franchises.

The Bad News Is...


Tony Pratt loves his Watson system, but he doesn't like what it does when he tries to use his PC for anything else. "The worst part is, it slows Watson down," he says. "The initial greeting comes out just fine, but then the machine

waiting. In response to the problem, Natural Microsystems recently unveiled a four-port version called Watson VBX, but it's aimed at businesses with up to 100 employees and costs a hefty \$3995. (For some Watson alternatives, see the sidebar "A Tale of Two Talkers.")

Moreover, voice digitization is a voracious consumer of hard disk space: Figure on about 10MB for every 45 minutes of messages. This may seem like a lot of messages, but if Watson's job is to accommodate several regular callers, each with his or her own mailbox, and you forget to empty the machine for a couple of days...well, you get the picture. Even Gillespie, who dumps his accumulated

their Watsons, not at them. "A big firm like Merrill Lynch puts in a big system that doesn't have any capacity for expansion," says Gillespie. "They don't call those terminals 'dumb' for nothing, you know." Watson, on the other hand, is an inexpensive, expandable, free-standing system—that seems to be helping free enterprise. ●

Daniel Ben-Horin is a freelance writer whose work has appeared in the New York Times, The Nation, and Redbook.

 *Smart users install the system on a second or third phone line and keep their spiels short so that Watson doesn't keep other customers waiting.*

pauses for several seconds, and people start wondering why it called them." Hank Gillespie concurs, and adds that trying to run Watson on a LAN is a nightmare. When RTS links its seven computers to a Tandem AT clone running EasyLAN, Watson gets unplugged.

A more fundamental problem is that the basic version of Watson has only one phone port. Smart users install the system on a second or third phone line and keep their spiels short so that Watson doesn't keep other customers

messages every morning, gets a bit exasperated. "We have Watson on an AT with a 30MB hard disk, and it eats up a ton of disk space," he says. "It just pulls it out of the sky."

Finally, it's easy to abuse Watson's talents, and telemarketing in particular can generate both good leads and bad feelings. Your stand on the subject will depend on whether Watson is making your sales calls or you're trying to have a quiet family dinner at the end of a hard day. At press time Florida and Minnesota were considering bills to outlaw computer-based telemarketing.

Despite those limitations, Gillespie and other users swear by

Quickspeak

*Natural Microsystems Corp.
6 Mercer Rd.*

Natick, MA 01760

617/655-0700

List price: \$375

*Requirements: 384K, Watson,
hard disk, DOS 2.00 or later
version*

Not copy protected

Watson

Natural Microsystems Corp.

*List price: \$498, VIS \$498, both
\$796*

*Requirements: 192K, additional
64K for VIS; hard disk; DOS
2.00 or later version*

Watson VBX

Natural Microsystems Corp.

*List price: \$3995, bundled with
an AT \$8495*

*Requirements: 640K, hard disk,
DOS 2.00 or later version*

Women in Computing: Caught in the Middle

"Stress just comes with the territory," says Excelan product marketing manager Mary Gardner (left). According to Linda Stewart (right), product manager at Excelan, "The old-boy networks still determine who gets where."



Although more and more professional women are thriving in the computer industry, men still hold the fort—and the cashbox.

*Shoshana Tembeck
and Lynn Meisch*

||||| Women are entering the computer industry in increasing numbers—and they're here to stay. But personnel managers needn't begin dismantling their affirmative action programs; inequities in pay, position, and opportunity remain.

The surge of women entering the work force has coincided with the astonishing growth of the computer industry. But are women ascending the corporate ladder in hardware and software companies? Are they optimistic about their potential for advancement? Do they enjoy wages equal to those of their male colleagues?

Instead of focusing on the few privileged women at the top or the many who work in manufacturing and data entry positions, *PC World* examined the situation and experiences of midlevel professional women—product managers, programmers, and engineers—who

could conceivably become tomorrow's CEOs. And the good news is that many of them feel the industry offers them unparalleled opportunities to use their talents and education and is paying them well to do so.

Jumping on the Bandwagon

"We're seeing many more high-powered, well-educated, forceful women now than in 1979," says headhunter Penny Horowitz of EDP World, a national agency that places computer professionals. "Our placement of engineers is still fairly low because not many women have engineering degrees. But we place female sales and marketing professionals, programmers, and systems analysts in numbers equal to men."

Because the young computer industry urgently needed bright, creative employees, many women trained in the humanities and social sciences were able to move laterally into the computer field and learn technical skills on the job. Elizabeth Young, an anthropology Ph.D. who did fieldwork on Balinese dance and theater and later coauthored *The Brady Guide to CD ROM* (Brady Books, New York, 1987), exemplifies a generation of women who successfully achieved technical proficiency while employed in the industry.

Since those early days of microcomputing, more and more women have majored in technical disci-

plines. Between 1971 and 1982, the percentage of degrees in computer science awarded to women in the United States more than doubled at the undergraduate and master's levels and more than tripled for doctorates; increases in engineering degrees awarded to women are even more remarkable (see Figure 1).

Not surprisingly, this new cadre of technically trained women has made significant inroads into the work force. Although women are still clearly in the minority in technical professions, the number of women working as computer scientists, systems analysts, and programmers had swelled by 1980 (see Figure 2). Tandem programmer Carol Shaw, creator of the adventure game *River Raid* and the first woman to be a game designer at Atari, considers the gains a major triumph. "When I went to college in the early 1970s, I was the only woman in most of computer science classes," she notes. "And when I started my career, I was often the only woman programmer on the job."

Nonetheless, women in the computer industry haven't outpaced their professional peers in other fields. Although in 1984 28.5 percent of systems analysts were women, female banking

**Tandem
programmer
Carol Shaw:**
“I hope that
eventually we
won’t need to
write articles
on the status
of women in
this industry.”



and advertising professionals constituted 37.1 percent and 46.9 percent of the work force, respectively, according to *Working Woman* magazine’s 1984 *Working Woman Report*.

Environmental Hazards

Female professionals face a host of barriers—both social and biological—to prospering in the work force that their male peers never contend with. The difficulties begin early, when a child’s chances of becoming a programmer or engineer are influenced by cultural norms. “Computer science is still viewed as man’s work, and unfortunately, that stereotype is reinforced in many ways,” says Barbara Simon, research scientist at IBM in San Jose, California.

“How often do you see girls playing video arcade games? What movies have you seen in which the computer whiz is a woman? We’re lacking role models.”

From kindergarten through MIT, boys are claiming computers as their province in far greater numbers than girls. Organizations such as the Math/Science Network based in Berkeley, California, hope to redress the imbalance by encouraging girls to study science and technology. Linda Dalton, who contributes time to the Math/Science Network in Salt Lake City, Utah, is executive assistant to the CEO at Iomega, maker of the Bernoulli Box. As one of a pioneering group of women who majored in electrical engineering at the University of Utah, Dalton had to fight off the pressure to conform: “I remember being pointed toward teaching and secretarial work in college.”

Channeling women into “feminine” fields is still common, and hostility toward women who pursue technical degrees sometimes takes surprising forms. Graduate computer science students at MIT issued a report in 1983 detailing discriminatory acts against women; in one case a student was physically yanked out of her seat in front of a computer by a male student who wanted to use the machine.

Although social pressures are largely intangible, they may help to explain women’s reluctance to pursue technical degrees beyond the master’s level. Less than 10 percent of computer science Ph.D.’s were awarded to women in 1984, compared to 29.3 percent of master’s degrees. “There are vacancies in R&D computer engineering positions nationwide,” says Sheila Humphreys, academic coordinator for the electrical engineering and computer science department of the University of California at Berkeley. “But women who don’t get a Ph.D. aren’t even in the running for these top positions.” And until more women pursue advanced studies in engineering and computer science, they’re not going to snap up those choice industry positions.

Biology 101

Even in the best of all possible worlds, women face a career-stopping choice that men don’t—bearing children. With the computer industry changing so fast, a woman who takes time off to have a baby may have trouble getting

back on track. Celeste Baril, now a software engineer at Equatorial Communications in Mountain View, California, struggled to balance private life with career when she decided to have a child. While employed at Tymnet, she set a company precedent by negotiating to work at home for four months after a three-month maternity leave. Says Baril: "I was granted the extra four months because Tymnet couldn't afford to lose me at the time. I don't think I would have had that option a year later when the staff had been beefed up."

Paid maternity leave and job protection during leave—a given in 117 countries—are considered luxuries in the United States. The lack of these benefits is part of a larger problem: Both male and female professionals are expected to devote all their waking hours to their careers, and that leaves little time to raise a family. And because most women traditionally perform more than their share of child rearing—even if employed full-time—they carry a heavier burden overall than men.

Furthermore, the high divorce rate leaves many mothers raising children entirely on their own. "Having a family has been a conflict for me," says Iomega's Linda Dalton. "People work here until midnight three or four nights a week, but I have to get home to my kids. Being a single parent certainly influences the type of position a woman will opt for." Clearly, until society makes greater allowances for men and women who decide to have children, and until both sexes share child rearing tasks equally, the de-

cision to have families will impede women's career advancement.

Meanwhile, other long-established obstacles persist. "Even if you're willing to put in what it takes to work your way up, you might not get there," notes 20-year industry veteran Linda Stewart, a product manager at Excelan, a manufacturer of local area network hardware and software in San Jose, California. "I think the old boy networks still determine who gets where."

Some women simply sidestep this problem by starting their own companies. "Being a woman in someone else's company was a barrier to moving toward the top, so I went out on my own," says Barbara Wallace, president and founder of KDS Corporation, an expert systems software company in Wilmette, Illinois. Peggy Zientera, who is writing a book about

women who have launched their own computer-related businesses, contends their overriding motivation is to dodge discrimination and other career roadblocks. "All of these women insist that in dealing with their male counterparts, they don't encounter sexism. For them, it's an open industry," says Zientera.

Other women simply choose not to pursue the highest positions. "I'm satisfied with my job as a programmer; I have no interest in becoming a manager," says Tandem's Carol Shaw. Advancement is sometimes viewed as a mixed blessing—for good reason. "Women who aim for the top know they're subject to the same stress-related diseases and problems as men. It just comes with the territory," says Mary Gardner, Excelan's product marketing manager.



Photographs by John Harding

Pat Becker, director of marketing at Tandem: "The winning combination is an electrical engineering degree with an MBA."

Is Bigger Better?

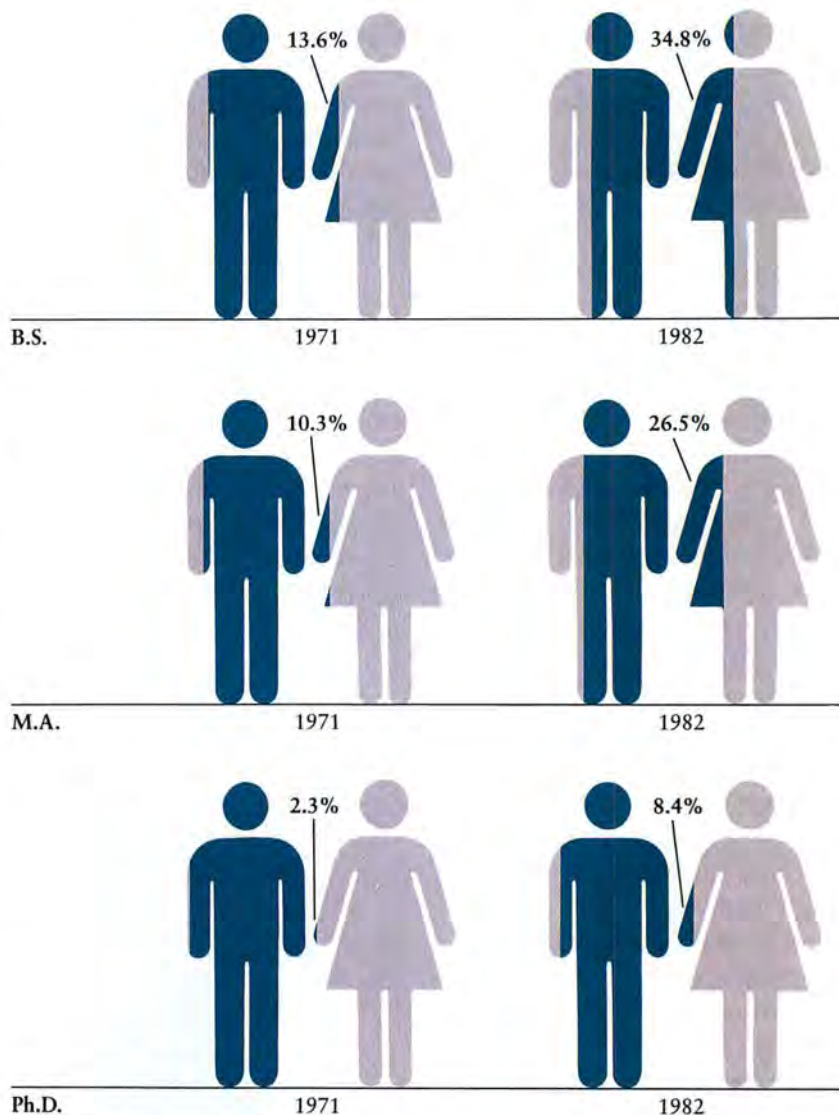
Despite the difficulties that impede professional women, those who have the right education and experience *are* making great strides. "It's selective at the top for both men and women," points out Pat Becker, a 15-year veteran of the industry, now director of marketing at Tandem. "If you look at the profile of any male CEO, president, or senior executive, you'll find he has extensive technical skills and business experience. I hope companies won't use any other criteria to promote women to those top positions."

Not surprisingly, smaller firms have provided better opportunities for women than have large corporations. "The organization of smaller companies is more fluid; the hierarchical mentality isn't as entrenched," says Elizabeth Young, a software specialist at Thomson Computer Products in Los Angeles.

Excelan is a good example. At this small company, women are making great strides: Four out of five senior product managers and half the marketing staff are women. By contrast, industry giants IBM and Hewlett-Packard employ less than 30 percent of their professional female workers in programming, systems analysis, personnel, public relations, and sales and marketing. And according to company statistics for 1985 and 1986, only 16 percent of female employees at IBM and 25 percent of female employees at Hewlett-Packard were managers in any area. Despite its reputation as "good for women," the PC industry hasn't opened its arms as wide to female professionals as have other fields.

Women and Technical Degrees: Big Increases, Little Equality

Source: U.S. Department of Education



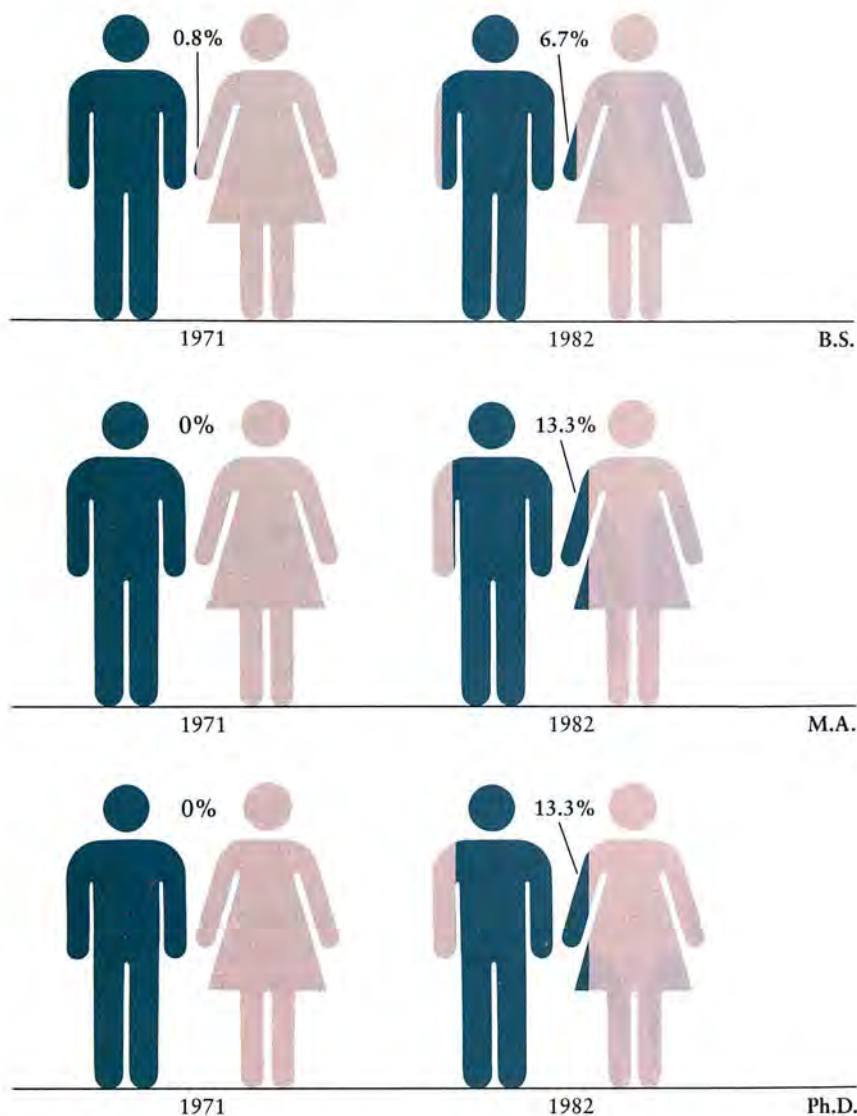
Money Talks

Although most of the women we spoke with agreed that discrimination is largely covert, men still bring home the lion's share of the bacon. Nationally, from housekeepers to CEOs, women earn 64 cents on the dollar compared to men, a figure that has held firm for 50 years.

Even in the computer industry, where many female professionals

make just as much as men, pay inequities abound. A 1984 Stanford Education Policy Institute report on women in computer-related occupations, *Integrated Circuits/Segregated Labor*, found that among computer scientists, systems analysts, and programmers, women's hourly wages were consistently

Figure 1: The percentage of women earning degrees in computer and information sciences (left) and engineering and related technologies (right) has climbed, but the figures are still relatively low.



lower than men's, even when age and educational levels were the same.

Nonetheless, the second-highest-paying occupation in the United States for women is systems analyst; programmer ranks seventeenth. Because 82 percent of American women earned less than \$20,000 annually in 1982, a woman who lands a job today in

the computer industry for \$35,000 a year might consider herself lucky. What she might not realize is that a man with an identical job has probably bargained for more money.

Perhaps because they earn higher salaries than most other female workers, many female professionals in computing assume that no pay discrimination exists in their companies. But Nancy Lanning, who works at Lotus De-

velopment Corporation in quality assurance and documentation, says unequivocally, "Salary discrimination is definitely a problem. In the past nine years I've worked mainly for smaller companies, and I've seen telling payroll and personnel records."

A surprising—but likely—explanation for pay inequities comes from Paula Hawthorne, vice president of software engineering at Britton Lee, a data base software vendor in Berkeley, California. "Overt discrimination is not prevalent; it's just that women don't know how to fight for higher pay. When I began working in the industry, I didn't realize how amenable the system was to negotiation. Women need to be feistier in bargaining for better wages."

The Long Haul

"If I were giving advice to my 12-year-old daughter, I'd tell her the winning combination is to get an electrical engineering degree with an MBA," says Pat Becker of Tandem. Without a technical background, it's extremely difficult for women to reach the highest organizational levels. But most of the women interviewed felt that they and their female colleagues will eventually break into top positions, once they've gained the requisite experience.

Women who try to join the industry in the near future will discover more stringent requirements for entry-level positions. Dataquest, a market research firm in San Jose, projects that the growth rate in the hardware industry will stabilize at 11 to 13 percent over the next decade. As the industry

No Parity in Sight for Female Workers

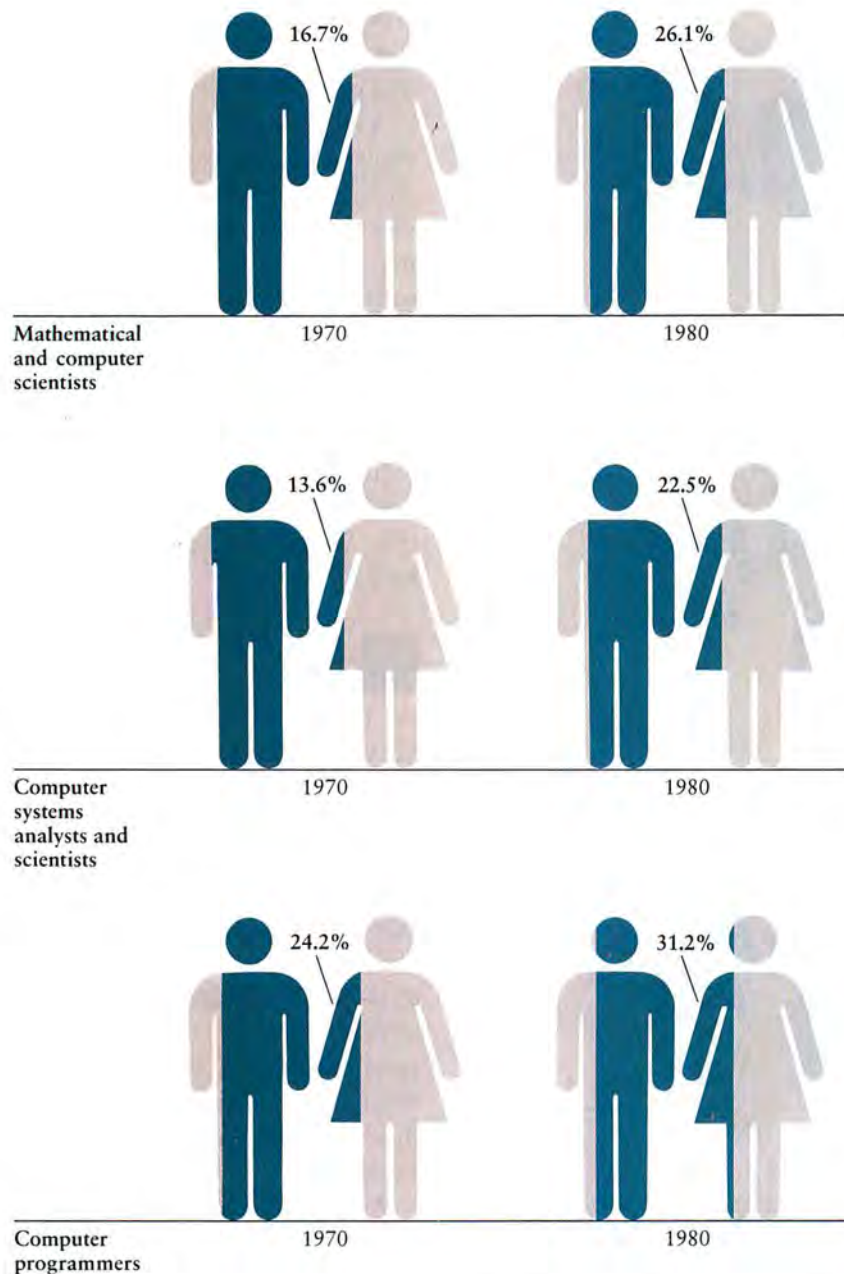


Figure 2: Although the percentage of women working in technical fields jumped significantly in the 1970s, women are clearly underrepresented.

Source: U.S. Census Bureau

matures, training in technical fields will become mandatory for would-be employees.

At the same time, the male-dominated computer industry will have to adjust to a new generation of female workers who won't take no for an answer. "Women in their twenties have a much better attitude and a lot more knowledge about how to get the jobs they deserve—more so than older women," says Excelan's Linda Stewart. But these women, like those who have been in the industry for years, can't expect to achieve their goals overnight. "The world changes slowly," Stewart observes. "An elephant has a large turning radius."

Most women look forward to the day when gender is not a crucial factor in employment. "I hope that eventually we won't need to write articles on the status of women in this industry," says Carol Shaw. If that hope is to be realized, women who want to climb the computer industry ladder had better pack up their portable PCs, head for the computer science department of the nearest university, and prepare themselves to give battle in the corporate arena. ●

Shoshana Tembeck is a freelance writer and former managing editor of the Morrow Owners Review, a magazine for CP/M computer owners. Lynn Meisch is an anthropologist and the author of a travel guide to South America.

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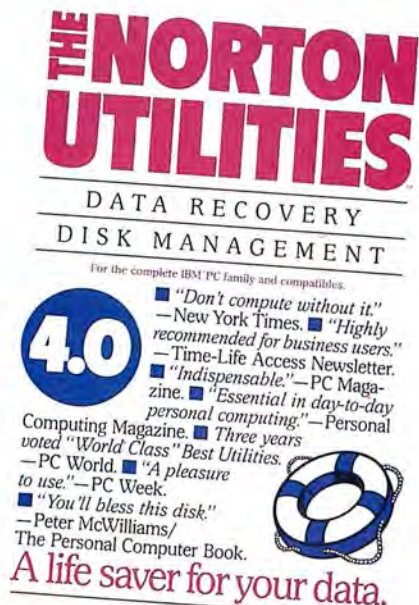
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interface makes the Utilities so quick and easy to run it's ridiculous.

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Because the Advanced Edition contains all of the features, functions and enhancements of Version 4.0.

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- Fields Perform All Built-in Math Functions

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- Vertical & Horizontal Windows
- Spreadsheet Macros

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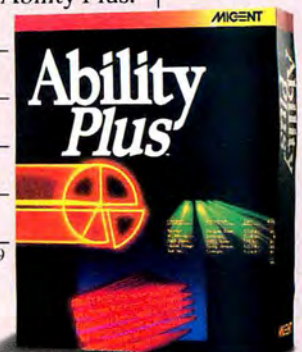
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The Word on Style Sheets

Microsoft Word's style sheets can lend documents a handsome, uniform appearance, but most people don't realize how easy they are to use. The author of a best-selling book on Microsoft Word shows you how.

Peter Rinearson

Whenever *Microsoft Word* is at work, its style sheet capabilities sit patiently on disk, waiting to be discovered. Sometimes the wait is a long one, as busy people think to themselves, "I know style sheets must be useful. Someday, when I have more time..."

But style sheets are far too valuable to ignore or put off, because they virtually automate the task of making a letter, memo, report, or other document look just right. For producing a single, long document that requires complex, repetitive formatting, style sheets can be an obvious boon. And where a department or company that uses *Word* relies on the same set of style sheets, it's a simple matter to achieve professional-looking documents, freeing up time for more important matters—like refining the content.

Style Sheet Basics

With most word processing programs you format a document by embedding commands in text. Typically, you save these commands and the text itself in the same file. But with *Word's* style

sheets, text and formatting instructions are split into two files: a text file with a .DOC extension, and a style sheet file with an .STY extension, whose formatting instructions you can apply to any document.

A single .STY file can contain about 120 sets of instructions for formatting characters, paragraphs, and *divisions*, *Word's* term for document segments that are page-size or larger. Each instruction—called a style—controls one or more aspects of formatting, including indentations and tabs; placement of titles, headings, and footnotes; margins and complex columnar schemes for tables or newsletters; and character attributes such as boldface, underlining, and italics.

Once you've attached a style sheet to a document, you activate the formats through <Alt>-key combinations. You assign these macrolike designations, called key codes, during style sheet creation. A system of key-code assignments that is consistent between style



Paul Marzoff

sheets gives you the ability to switch style sheets on the fly, a painless way to experiment with document design.

However, you don't need to create your own key-code assignments to capitalize on the power of style sheets; *Word 2.0* and later versions offer several simple style sheets on their Utilities disk. This article shows you how to use and extend the resources of one style sheet, SEMI.STY (named for the semiblock style, a conventional format for business letters). You'll use SEMI.STY to format a letter, and you'll edit a set of SEMI.STY instructions and add a new running head style. Finally, you'll practice switching style sheets. By the time you finish, you should be ready to create style sheets of your own.

Styling a Business Letter

Similar in appearance to *Word's* document window, *Word's* Gallery is the place where you view, define, revise, retrieve, and save style sheets. To view the contents of the SEMI.STY style sheet, load the file into the Gallery by issuing **< Esc > Gallery Transfer Load**, typing *semi*, and pressing **< Enter >**. For reference, you may then print out SEMI.STY by selecting the Print option from the Gallery menu, or simply refer to Figure 1. You can use the Gallery's Insert and Format commands, described later in this article, to create SEMI.STY from scratch.

To the left of each style in Figure 1 is the two-character key code used to implement formatting instructions. When a style sheet is tied to a document, the key code you execute for a given paragraph style appears in the leftmost column—dubbed the style bar—in *Word's* document window. Thus, before you work with a style sheet, it's helpful to turn on the style bar.

Begin by opening a new document. Select **< Esc > Window Options**, and press the **< Tab >** key four times until the style bar field is highlighted. Type **Y** for yes, and press **< Enter >** so that the style bar will display key codes. The initial indication that the style sheet is active is an asterisk in the style bar.

At this point, you're ten simple steps away from a semiblock business letter. The sample letter in Figure 2—complete with key codes—will provide the text.

Attaching the style sheet. After pressing **E** to go back to Word's main menu, select *Format Style Sheet*. Then, in response to the Sheet prompt, type **semi** and press **<Enter>**. SEMI.STY is now attached to a blank document on the screen. The key code SP, which stands for Standard Paragraph, appears in the style bar. This is the default format for all SEMI.STY paragraphs.

The letterhead space. The semiblock style sheet lets you begin a letter with either a return address or a printed letterhead. Assuming you use letterhead, hold down **<Alt>**, type **LH**, and press **<Enter>**. This key code inserts

using another of Word's handy functions—the glossary. Simply type **date** and press **<F3>**.) Create a new paragraph by pressing **<Enter>**.

The inside address. Hold down **<Alt>**, type **IA**, and press **<Enter>**. Type a name and address, ending each line by pressing **<Enter>**.

The salutation. Press **<Alt>** - **SA**, type the salutation ('Dear Mr. Hope:' in the sample), and press **<Enter>** to create a new paragraph.

The body. Change the style by holding down **<Alt>** and typing **SP**, which creates the five-space first-line indent characteristic of semiblock paragraphs. Type the body of the letter, pressing **<Enter>** after each paragraph. Remember to press **<Enter>** once after the final body paragraph.

too long, the TI style instructs Word to break it into two lines and indent the second line three spaces. If you want to break the title before Word does so automatically, press **<Shift>**-**<Enter>**.

The reference initials. Hold down **<Alt>** and type **RI**. Then press **<Enter>** one or more times, depending on how many line spaces you want below the author's title. Finally, type the initials of the author and the typist.

That's it! Your letter is formatted and ready for printing.

■ A Style of One's Own

Sooner or later, you'll want to change a style sheet, possibly as a prelude to building your own. It's not hard to modify a style sheet, although you may have to put some thought into its design.

To modify the semiblock style sheet in Figure 1, start by entering the Gallery and reloading SEMI.STY with the *Transfer Load* command. Observe that the style sheet has 12 sets of instructions, beginning with 1 S/ Division Standard. The number 1 merely indicates that this is the first style in the style sheet; S/ is the key code for the standard division style.

A division style controls the page layout of a document or a major segment of a document. SEMI.STY has only one division style, and because it's the "Standard" one, it acts as the default format of the document. The last entry in the style sheet—number 12—is available for underlining characters. The remaining styles control the most frequently used paragraph styles (including headings, titles, and address blocks).

To read a style, look at its top line. One of three words—Character, Paragraph, or Division—follows the key code and indi-

With Word's style sheets, text and formatting instructions are split into two files: a text file with a .DOC extension, and a style sheet file with an .STY extension.

two blank lines; when they are added to the top margin provided by SEMI.STY, you'll have a total of 2 inches of blank space at the top of the page. Press **<Enter>** to start a new paragraph, which automatically receives the LH designation. Until you issue a new **<Alt>**-key command, Word continues the current format.

The date. Press **<Alt>** - **DA** to activate the date style for the new paragraph, and then type the date. (You can insert the system date by

The closing. Hold down **<Alt>** and type **CL**, the key code for the closing style. Type **Sincerely**, and press **<Enter>** to form a new paragraph.

The signature. Press **<Alt>** - **NA**. The cursor jumps down four lines. Then type the name of the author of the letter and press **<Enter>**.

The author's title. Press **<Alt>** - **TI**, then type the title. If the title is


```

1  S/ Division Standard          SEMI-BLOCK LETTER, 6" WIDTH
    Page break. Page length 11"; width 8.5". Page # format Arabic. Top
    margin 1.67"; bottom 1"; left 1.25"; right 1.25". Top running head
    at 1". Bottom running head at 0.83". Footnotes on same page.
2  LH Paragraph 10             ADJUSTABLE LETTERHEAD SPACE
    Modern b 12. Flush left, space after 2 li.
3  RA Paragraph 14             shift-- RETURN NAME, ADDR
    Modern b 12. Flush left, Left indent 3.2", space before 1 li (keep
    in one column, keep with following paragraph).
4  DA Paragraph 7              DATE
    Modern b 12. Flush left, Left indent 3.2", space after 1 li (keep
    in one column, keep with following paragraph).
5  IA Paragraph 11             INSIDE ADDRESS/Mr. Jim Smith
    Modern b 12. Flush left, Left indent 0.5" (first line indent -
    0.5"), right indent 2.8" (keep in one column, keep with following
    paragraph).
6  SA Paragraph 13             SALUTATION / Dear...
    Modern b 12. Flush left, space before 1 li (keep in one column,
    keep with following paragraph).
7  SP Paragraph Standard       STANDARD PARAGRAPH
    Modern b 12. Flush left (first line indent 0.5"), space before 1
    li.
8  CL Paragraph 21             COMPLMNTY CLOSING/Sincerely
    Modern b 12. Flush left, Left indent 3.2", space before 1 li (keep
    in one column, keep with following paragraph).
9  NA Paragraph 8              AUTHOR'S NAME (BELOW SIGNTR)
    Modern b 12. Flush left, Left indent 3.2", space before 3 li (keep
    in one column, keep with following paragraph).
10 TI Paragraph 9              AUTHOR'S TITLE (AFTER NAME)
    Modern b 12. Flush left, Left indent 3.5" (first line indent -0.3")
    (keep in one column, keep with following paragraph).
11 RI Paragraph 17             REF INITIALS, ENCLOSURES, CC
    Modern b 12. Flush left, Left indent 0.2" (first line indent -0.2")
    (keep in one column, keep with following paragraph).
12 UC Character 1              UNDERLINED
    Modern b 12 Underlined.
13

```

(C) 1984-6 Peter Rinearson

Figure 1: A printout of Microsoft Word's SEMI.STY style sheet. The two-character key codes appear along the left margin. Once SEMI.STY is attached to a document, you use these codes in combination with the <Alt> key to implement the listed styles.

icates the style's usage. The subsequent word or number is the variant, a unique identifier for each possible paragraph, character, or division style.

The combination of usage and variant identifiers provides a formal name for the style, such as Paragraph Standard, Character 10, or Division Standard. The right side of the top line is reserved for a remark, which usually contains a brief description of the style.

The remaining lines of the style list all the formatting associated with it. For paragraph styles, the first part of the description lists the default font for the paragraph—Modern b, in the example. Formats for indenting and line spacing conclude the description.

Once you understand how to read a style sheet, modification is a straightforward process. Suppose, for example, that SEMI.STY's LH style inserts too few lines to accommodate your letterhead. To increase the number of lines, begin by highlighting the LH instructions, and select *Format Paragraph*.

The default LH style reads 'space after 2 li', which means that two blank lines will be inserted. Use <Tab> to move to the space-after field, choose the *Format Paragraph* command, and specify a new number of lines (you can even use decimal fractions, such as 2.5 or 1.2). Press <Enter> to carry out the change, and use the Gallery's *Transfer Save* to store the edited style sheet. When a document is formatted with SEMI.STY, calling on LH tailors the spacing to your letterhead.

A New Style

After you've got the hang of modifying styles, it's a small step to creating new styles from scratch. In fact, you have to learn only one new Gallery command, *Insert*. In this example, you'll create a running head (or header) style that places an addressee's name, a page number, and a date at the top of each page of a document.

Begin by highlighting the place where you want to insert the new style (the order of styles has no effect, so it doesn't matter where you insert it). Select *Insert* to summon four fields to the bottom of the screen: key code, usage, variant, and remark. Filling in these

Figure 2: With SEMI.STY attached and the style bar turned on, Microsoft Word displays the key codes associated with each paragraph.

```

LH
DA   September 1, 1987

IA
IA
IA   Mr. Ray O. Hope
IA   Shakey Airways & Deliverance Co.
IA   Rancho del Sol, CA  90400

SP      Thank you very much for the memorable air service you arranged for us
      during our recent trip to California. I won't soon forget the surprise
      rolls over Mt. Shasta. If you were less concerned about safety, these
      maneuvers might have caused some anxiety, but your insistence that we all
      wear parachutes inspired our confidence that you are suitably cautious. By
      the way, we don't hold you the least bit responsible for what happened to
      Mother.

SP      We also were impressed by your willingness to describe the extra
      features aboard your small plane. For instance, until you told me I never
      would have guessed how important it is to have liberal amounts of duct
      tape around the windows of the passenger cabin. And I was impressed that
      the airplane was able to maintain level flight even when you climbed in
      back to share the flight with us and point out sights of interest. Isn't
      technology wonderful?

SP      All in all, it was an education and a pleasure. I hope to take
      you up next summer on your offer of scuba-diving lessons off Shark Point.

CL                               Sincerely,

NA                               U.N. Wise
TI                               Founder and President
RI
RI   UW:mw
  
```

fields produces the information that appears as the first line of the style's description.

Although you can choose any unique two-character combination as the key code, RH is the most obvious, so enter this pair of letters in the key-code field. Press **< Tab >** to move to the usage field, which gives you a choice of specifying RH as a character, paragraph, or division style. Select *Paragraph*, because you wish to create a style that controls both line and character formatting.

Now move the cursor to the variant field. *Word* will display 1, an unused variant identifier, as a default; accept the default by

pressing **< Enter >**. (If you press **< F1 >**, a list appears showing other available number or word identifiers.) Press **< Tab >** to get to the remark field and (if you wish) enter **RUNNING HEAD / To, pg#, date** as a description. The latter part of this description will remind you that the running head should contain the addressee's name, the page number, and the date.

When you press **< Enter >** to insert the new style, *Word* supplies the default font, Modern a. (When *Word* is configured for most printers, Modern a will also have a specific name, such as Courier.) The default paragraph alignment, flush left, is also displayed.

Refining the running head style is the next step. If you wish to change the style's default font

from Modern a to Modern b, issue *Format Character*. Press **< Tab >** until the font-name field is highlighted, type **Modern b**, and press **< Enter >** to carry out the change.

Next, to adjust line spacing and indentation, select *Format Paragraph*. Press **< Tab >** to move to the left-indent field and type **1.25**, the number of inches that the header will be indented. Then move to the first-line field and type **0**. Now **< Tab >** your way to the space-before field and type **0**. Pressing **< Enter >** executes the *Format Paragraph* command.

Listing 1: Adding a running head style to the SEMI.STY style sheet requires a venture into Microsoft Word's Gallery.

13 RH Paragraph 44
 Modern b 12. Flush left, Left indent 1.25". Tabs at: 4.25" (centered), 7.2" (right flush).
 RUNNING HEAD / To, pg#, date

Finally, to create two tab stops in the running head—one for the page number and one for the date—issue the *Format Tabs Set* command. To set the first tab, <Tab> to the alignment field, press <Space> to highlight Center, <Tab> back to the position field, type 4.25, and press <Insert>. To set the second tab, type 7.2 in the position field, highlight Right in the alignment field, and press <Enter>. The result should be formatting identical to that of the running head style in Listing 1.

Once you've added the running head style to SEMI.STY, save the style sheet with the Gallery's *Transfer Save* command. To use the running head style when writing a letter, open a new document and attach SEMI.STY using the same *Format Style Sheet* sequence described earlier.

Before you format the first paragraph as a running head, press <Enter> to insert a carriage return, then move the cursor up so the carriage return is highlighted. Now press <Esc> and select *Format Running-head*, which instructs Word to print headers automatically on multi-page documents. The program provides options for printing the header on even and/or odd pages, as well as for skipping the first page. Select from among these parameters, and press <Enter>.

Finally, enter <Alt>-RH to apply the running head style to the

paragraph. Per your style sheet entry, a 1.25-inch indent will appear, ready for you to type the addressee's name. Press <Tab>, and the cursor will move to the point where you type the page number; press <Tab> again and type the date. Your custom header is now ready.

A Style That Grows on You

Now that you have a sense of how simple style sheets work, you may want to move on to more powerful ones that can handle tables, indented quotations, proportionally spaced reports, and so forth. Soon, you may accumulate a whole arsenal of style sheets that suit your needs to a tee.

In the long run, you may find that Word's ready ability to apply different style sheets to the same document is the greatest benefit of all. For example, just a few keystrokes will switch a SEMI.STY letter to FULL.STY, another style sheet that comes with Word 2.0 or later versions. This second type of style sheet creates a full-block format—that is, each paragraph is flush with the left margin of the page.

To switch your letter from SEMI.STY to FULL.STY, select *Format Style Sheet* and type full. Press <Enter>, and—voilà—the change is made.

As you can see, once you've spent the few hours it takes to start using, modifying, and even creating style sheets, implementation is an easy matter. Using the display of key codes in the Gallery as a reference, you can turn out a standard array of complex documents in a fraction of the time it would take to match the format of previous hard copy. ●

Peter Rinearson is the author of Word Processing Power with Microsoft Word. His latest book, coauthored with JoAnne Woodcock, is Microsoft Word Style Sheets, a step-by-step guide that includes more than 100 Microsoft Word style sheets. This article is adapted from that book.

Microsoft Word
 Microsoft Corp.
 16011 N.E. 36th Way
 Box 97017
 Redmond, WA 98073-9717
 206/882-8080
 List price: \$495

Microsoft Word Style Sheets
 Peter Rinearson and JoAnne Woodcock
 Microsoft Press, Redmond, Washington, 1987
 261 pages
 Softcover \$17.95, companion disk \$19.95

Import Text and Numbers Into 1-2-3

Two little-known 1-2-3 commands let you neatly import ASCII files into your worksheets.

John Walkenbach

Unless they do their computing in a vacuum, 1-2-3 users often have to work with numbers from outside sources: a budget report downloaded from the company mainframe, a marketing consultant's *WordPerfect* consumer survey, or a sales report put together by a traveling salesperson with a laptop PC. While 1-2-3 makes analyzing such data easy, getting it into a worksheet and formatting it are often major stumbling blocks. Most of us just bite the bullet and rekey the data.

Save your fingers. 1-2-3 releases 2.0 and 2.1 have two commands that make importing ASCII files straightforward. This article details the steps you must take to import text and numbers from practically any source into 1-2-3 by combining its /File Import Text and /Data Parse commands. /File Import Text brings the file into a

worksheet as a single column of labels. The /Data Parse command does the parsing, converting the data into discrete columns of labels or numbers. Learning to use the commands together isn't that easy, but mastering them will more than repay the effort.

Note that the procedure outlined here is limited to files in ASCII format. It isn't needed for *dBASE*, .DIF files, or other files that 1-2-3 can translate directly into its native .WK1 format.

An Overview of the Import Business

At first blush, 1-2-3's /File Import Numbers command would seem to be the way to bring a document containing numbers into a worksheet. But /File Import Numbers is a stickler for form: It works properly only when the source file contains all numeric data and each number is separated from the next by a space, a comma, or a minus sign. Real life rarely supplies files in this form.

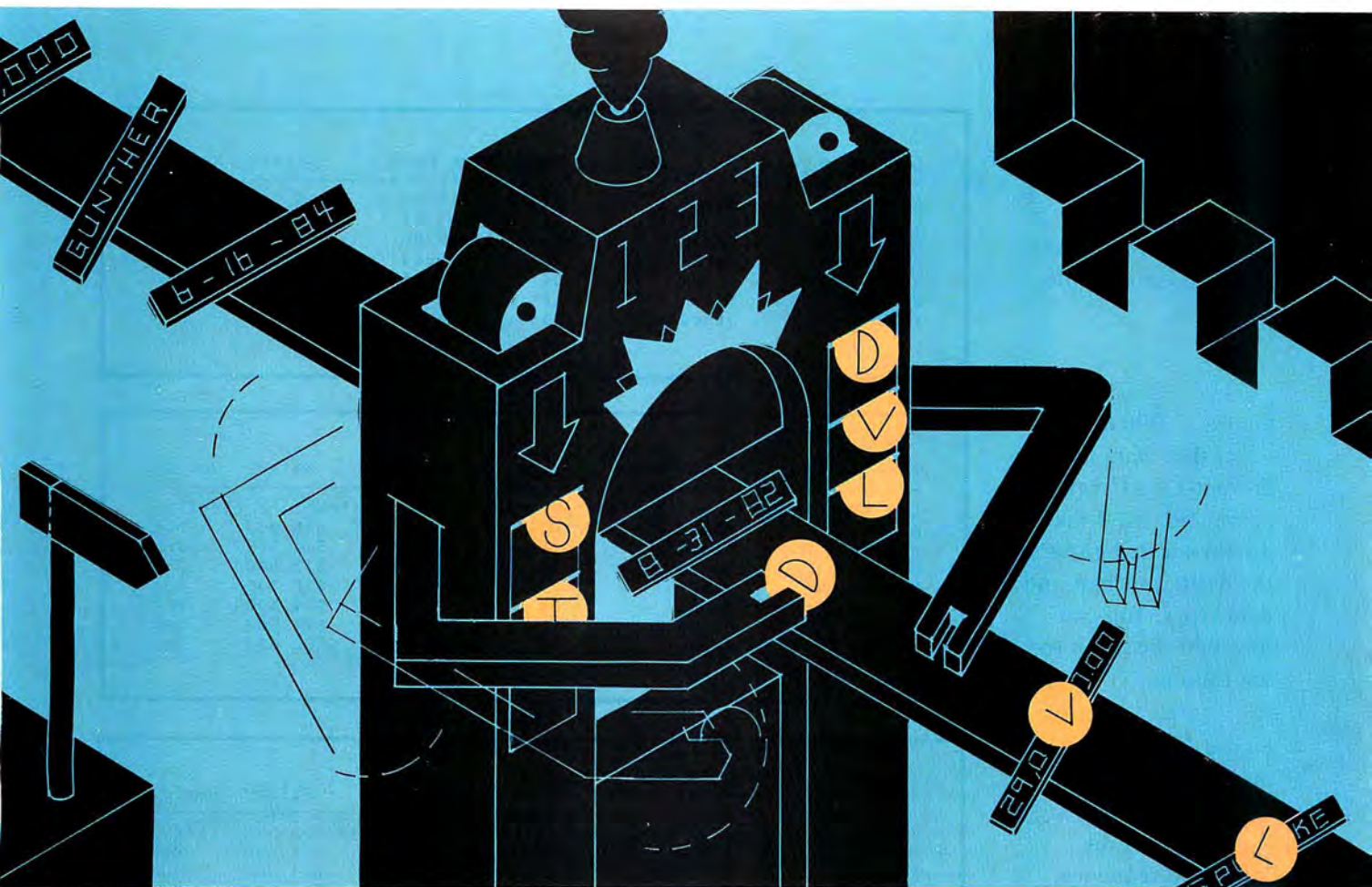
Successfully importing an ASCII file containing both text and numbers is a two-step process: First, you use the /File Import Text command to import the file as text strings. The imported text will occupy a single column, and each line will show up as a

left-aligned label preceded by an apostrophe.

Next, you turn to version 2.0's /Data Parse command to break up each line of text into individual numeric and text cell entries. The beauty of the /Data Parse command is that it can separate text from numbers but also works with pure text files. For example, if you had a word processed document with the months laid out across the top of the page and sales activity detailed below each heading, you could easily import the document and then line up the information in columns in the worksheet.

Let's assume you want to import the file shown in Figure 1, produced by a personnel management program and saved in ASCII format. It's an unassuming business report listing employee names, department codes, and so on, but swallowing its mix of words and numbers is a major challenge for 1-2-3.

To begin the process, open an empty worksheet and move the cursor to the cell that will mark the upper left corner of the data to be imported. Select /File Import



Text. 1-2-3 will prompt you for the file name, expecting the imported file to have a .PRN extension and reside in its default data directory. You can override the default prompt by pressing <Esc> and entering the full path and file names—for example, C:\DATA\STAFF.DAT <Enter>. The data will pop into the worksheet as left-aligned labels in a single column. Everything that you do from that point is a matter of helping the new arrival adjust to its surroundings.

The Importance of Being Formatted

Once the data is in the worksheet, you will issue the /Data Parse Format-Line Create command. This generates the format line that determines how the imported text and numbers will appear.

The format line works the same way as a ruler line in a word processing program like *WordStar*: All data below the format line is formatted in one way until either the data is exhausted or 1-2-3 encounters another format line. And the format line is a powerful tool: If you had identically structured reports from a number of salespeople, you could import all the files into a single worksheet and use a single format line to parse all the data at once.

Characters permitted in the format line are L for Label, V for Value, D for Date, T for Time, and S for Skip (i.e., ignore the data below). In addition, the right

angle bracket (>) indicates a continuation of the previous format code, and the asterisks (*) define what 1-2-3 thinks the width of the field should be, according to the data in the row below it. Editing the format line is a matter of changing or moving these symbols.

Before you direct 1-2-3 to create a new format line, examine the data. In many cases—including this one—the imported file comes with column headers, which are typically all text. Since you want to parse both the numbers and the text below them, ignore these headers for the time being. You should start with the first line that is representative of the data in the entire file.

Figure 1: 1-2-3 release 2.0's /File Import Text and /Data Parse commands will let you import this report into a worksheet in apple pie order.

Last Name	First Name	Dept	Hire Date	Salary	Review
Au	Wayne P.	02	4-13-86	\$26,000	Dec
Fotilla	Claudia	11	1-03-82	\$24,555	Jun
Hamilton	David	03	11-29-80	\$32,000	Jun
Montavanni	Mark	03	12-15-84	\$32,090	Jun
Raddon Jr.	Frank	04	10-02-86	\$24,500	Dec
Shirley	Susan F.	12	4-23-81	\$17,500	Dec
Yerkes	James	03	6-30-67	\$102,000	Dec

Figure 2: When you select the /Data Parse Format-Line Create command, 1-2-3 takes an uneducated guess at the desired format and data types. You can now edit the result to your liking.

Last Name	First Name	Dept	Hire Date	Salary	Review
L>*****L>>>*>*****V>*****L>>>>*****V>>>>*****L>>					
Au	Wayne P.	02	4-13-86	\$26,000	Dec
Fotilla	Claudia	11	1-03-82	\$24,555	Jun
Hamilton	David	03	11-29-80	\$32,000	Jun
Montavanni	Mark	03	12-15-84	\$32,090	Jun
Raddon Jr.	Frank	04	10-02-86	\$24,500	Dec
Shirley	Susan F.	12	4-23-81	\$17,500	Dec
Yerkes	James	03	6-30-67	\$102,000	Dec

Figure 3: By editing the format line with the /Data Parse Format-Line Edit command sequence, you can shape the data into final form.

Last Name	First Name	Dept	Hire Date	Salary	Review
L>>>>>>>>>>L>>>>>>>>>>V>***D>>>>>>*****V>>>>>>****S>>	Au Wayne P.	02	4-13-86	\$26,000	Dec
Fotilla Claudia	11	1-03-82	\$24,555	Jun	
Hamilton David	03	11-29-80	\$32,000	Jun	
Montavanni Mark	03	12-15-84	\$32,090	Jun	
Raddon Jr. Frank	04	10-02-86	\$24,500	Dec	
Shirley Susan F.	12	4-23-81	\$17,500	Dec	
Yerkes James	03	6-30-67	\$102,000	Dec	

Move the cursor down to the first row of numbers and select */Data Parse Format-Line Create*. 1-2-3 takes its best guess and automatically creates a format line that approximates how you might format the data in that line (see Figure 2).

Because the command works with the first row of data, 1-2-3 shows the first field (Au) as only 2 characters long. It also incorrectly identifies a middle initial as a separate field, and it mistakenly identifies the column of dates as a label. Fortunately, the format line is easy to edit.

Editing the Format Line

By selecting */Data Parse Format-Line Edit*, you highlight the format line. You then use 1-2-3's editing keys to add the proper format symbols and refine the parsing. <CursorRight> and <CursorLeft> move you through the format line to the characters you want to edit, works like <Backspace>, <End> moves the cursor to the end of the line, and <Insert> toggles between insert and overstrike modes.

To edit the format line in our example, begin by adjusting the field lengths and eliminating the extra field created for the middle initial. Replace the first group of asterisks in the Last Name column with right angle brackets to indicate that the field continues. Do the same for the First Name field, typing over the erroneous ‘*L’.

To fix the Date field, enter **D** (for date) in the correct column. (1-2-3 put an 'L' one column to the right because the date in the first line starts with a single digit.)

This is also the time to weed out any unnecessary material. To eliminate the Review column, for example, put an S in the format line (see Figure 3).

Last Name	First Name	Dept	Hire Date	Salary	Review
L>>>>>>>>>>>>>>>>>>	L>>>>>>>>>>>>>>>>>>V>	***D>>>>>>>>>>>>>>>>>>	>>>>>>>>>>>>>>>>>>>>>>>	V>>>>>>>>>>>>>>>>>>>>>>	S>>>>>>>>>>>>>>>>>>>>>>
Au	Wayne P.	02	4-13-86	\$26,000	Dec
Fotilla	Claudia	11	1-03-82	\$24,555	Jun
Hamilton	David	03	11-29-80	\$32,000	Jun
Montavanni	Mark	03	12-15-84	\$32,090	Jun
Raddon Jr.	Frank	04	10-02-86	\$24,500	Dec
Shirley	Susan F.	12	4-23-81	\$17,500	Dec
Yerkes	James	03	6-30-67	\$102,000	Dec

Figure 4: With the /Data Parse Go command, 1-2-3 culls the five lines and pours the data into the output range below. All that's left to do is adjust column widths.

Parsing the Text

Before you can parse the text, you must supply 1-2-3 with two more pieces of information: the size of the input column (how many lines you want to parse) and the location of the output range (where the parsed data should be placed in the worksheet).

Select */Data Parse Input-Column* and highlight the left-most column of data, beginning with the format line; then press **<Enter>**. In this example, only the first five names are highlighted. Next, specify an output range by selecting */Data Parse Output-Range*. You can either enter the range's cell coordinates or its range name, or point to the range with the cursor keys; you need indicate only the cell in the upper left corner of the output. Press **<Enter>** to confirm the range, then select */Data Parse Go*. The selected data is parsed and poured into its new home on the worksheet (see Figure 4).

As you can see, all the elements identified in the format line are now in separate columns. Numeric data is formatted as numbers and text as labels. Only a few

holes remain to be patched. First, you must reset the column widths to put some space between the cells. The Salary field lost its currency formatting, so you'll have to reformat the column using the */Range Format Currency* command, which inserts commas and dollar signs.

Closer examination also reveals that the Date fields are parsed as labels rather than dates. This may be acceptable in some situations, but it prevents you from using the fields with 1-2-3's date arithmetic functions. What happened? 1-2-3 didn't recognize the hyphens in the dates. Had the numbers been separated with slashes, the dates would have translated into the serial-date format 1-2-3 uses. The simplest way to parse the dates correctly is to use a text editor to search for hyphens and replace them with slashes before importing the file into 1-2-3.

Finishing Touches

With the data parsed, you can now return to the row holding the column headers. To avoid having to reenter the titles, you can parse them with a second format line and move them to the output range; to make room in the target range, you may have to

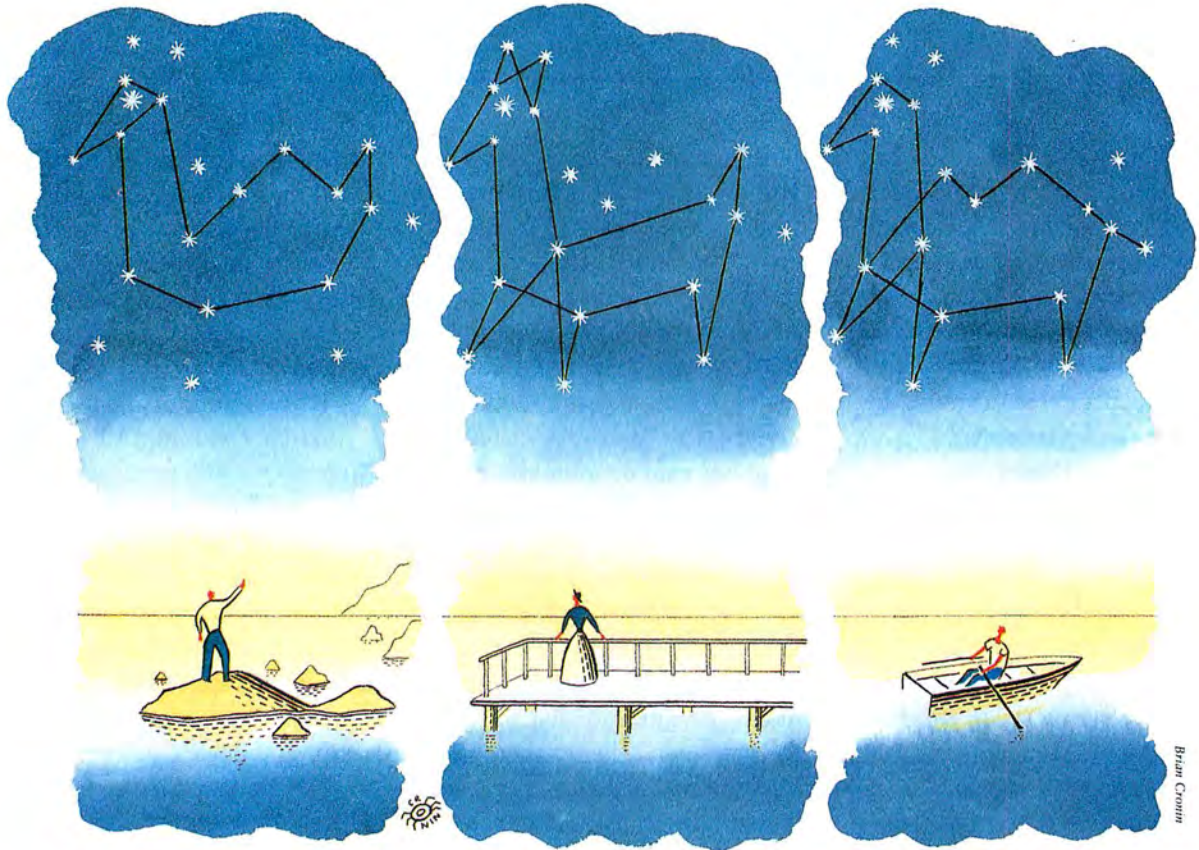
issue the /Worksheet Insert Row command. In our rather simple example, however, it's probably easier to type the labels anew in the output range. When you're done, you can erase the imported data.

If you're importing a large file, you may run out of memory during the parsing process. This isn't uncommon, since both the imported file and the parsed text are in memory at the same time. To free up memory, you can specify that the output range overwrite the input data. Just make sure you save the original worksheet before issuing the parse command.

1-2-3's data parsing capability isn't widely known, but it can save you hours of unnecessary rekeying. If the data you need resides on disk, there's an excellent chance you can get it into your worksheet. ●

John Walkenbach is a manager of consumer research at a major savings and loan association in Southern California.

Build a Better Budget With Reflex



Before you commit your next budget to a spreadsheet, consider a data manager for painless budget creation and reporting. Here's how you can apply Reflex to the task.

Ron Feldman

Scarcely an organization exists that doesn't need a budget. From the Fortune 500 to the slightly less ambitious corner video emporium, budgets are the fundamental tool for keeping track of financial health.

On the simplest level, a budget consists of revenue, expenses, and profits projected to occur over a period of time. Budgets traditionally replicate categories of a company's accounting system, and the budget planner makes an educated guess about what these account balances will ultimately be. A typical budget report arranges months across the top and accounts (revenue and expenses) down the left side, with net income totals at the bottom of each column.

For a small organization, a simple spreadsheet-based budget is frequently the most appropriate approach. The worksheet that includes budget inputs also serves as the finished report. Spreadsheets require that you pay close attention to any summaries, which must precisely reference the correct cell addresses if totals are to be accurate. If multiple spreadsheets representing budgets for different departments are consolidated, the format must be identical for each one.

For multiunit organizations, it can be significantly more convenient to implement a budget with a data manager rather than a spreadsheet. The example in this article illustrates how to create templates for a budget data base and for multiple reports within a small or medium-size business. Although a variety of data management programs are up to the task, this model uses *Reflex: The Database Manager* from Borland International, a program that features a talented, accessible report writer with which you can quickly generate an array of smartly formatted reports from a single data base.

Reflex is a RAM-based, graphics-oriented file manager with extra analytical oomph. The program's five views encourage easy data aggregation and manipulation. Form view permits you to build the data base; List view displays that data much like a spreadsheet; Crosstab view compares data between records; Graph view plots data; and Report view enables you to generate output to your specifications (see "Reflex Workshop's Forms That Fit," PCW, March 1987).

The budget process begins with the desired outcome—in this case, the kinds of reports you want to generate. With that information, you can begin to structure the data base and shape report templates.

Reports to Start By

Suppose you're the manager of the Paperless Office Business Supply Company, a single-store outlet in a booming shopping mall. You're beginning to budget for the coming fiscal year, which runs from April through March. You'll want to create at least four basic reports: Department Summary, Department Detail, Account Summary, and Account Detail.

The first report is a summary of sales and expenses by department. Paperless Office has three departments: Administration/Accounting, Shipping/Receiving, and Floor Sales. Other expenses consist of the cost of goods sold (COGS) for the products you buy from wholesalers.

This summary report enables you to see trends in spending by department at a glance, and to compare the expenses of the various departments with each other and with net income. If you notice blips in expenses or revenues, you'll want to investigate more thoroughly. You can then turn to your second report, Department Detail, which lists spending by account for each department.

Run Date: May 26, 1987		FY89 BUDGET												
Dept Number & Name: #00 SALES		REPORT #2: DEPARTMENT DETAIL (\$K)												
Acct#	Acct Name	Apr-88 Budget	May-88 Budget	Jun-88 Budget	Jul-88 Budget	Aug-88 Budget	Sep-88 Budget	Oct-88 Budget	Nov-88 Budget	Dec-88 Budget	Jan-89 Budget	Feb-89 Budget	Mar-89 Budget	Total FY89 Budget
4111	Typing Paper	5.0	3.0	5.0	4.0	3.0	5.0	5.0	5.0	6.0	7.0	3.0	2.0	53
4112	Notebook Paper	4.0	3.0	4.0	2.0	2.0	4.0	5.0	2.0	2.0	3.0	2.0	2.0	35
	4110 PAPER	9.0	6.0	9.0	6.0	5.0	9.0	10.0	7.0	8.0	10.0	5.0	4.0	88
4141	Paper Clips	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	12
4142	Scissors	2.0	1.0	1.0	1.0	2.0	2.0	1.0	2.0	1.0	1.0	1.0	1.0	16
	4140 ACCESSORIES	3.0	2.0	2.0	2.0	3.0	3.0	2.0	3.0	2.0	2.0	2.0	2.0	28
	4100 STATIONERY	12.0	8.0	11.0	8.0	8.0	12.0	12.0	10.0	10.0	12.0	7.0	6.0	116
4211	Electric Typewriters	5.0	4.0	4.0	3.0	3.0	6.0	5.0	4.0	4.0	4.0	3.0	2.0	47
4212	Manual Typewriters	1.0	1.0	1.0	1.0	1.0	3.0	2.0	1.0	1.0	1.0	1.0	1.0	15
	4210 TYPEWRITERS	6.0	5.0	5.0	4.0	4.0	9.0	7.0	5.0	5.0	5.0	4.0	3.0	62
4251	Secretary Chairs	5.0	4.0	5.0	4.0	5.0	4.0	5.0	4.0	5.0	4.0	5.0	4.0	54
4252	Executive Chairs	3.0	3.0	3.0	2.0	2.0	4.0	3.0	4.0	4.0	3.0	3.0	4.0	38
	4250 CHAIRS	8.0	7.0	8.0	6.0	7.0	8.0	8.0	8.0	9.0	7.0	8.0	8.0	92
	4200 EQUIPMENT	14.0	12.0	13.0	10.0	11.0	17.0	15.0	13.0	14.0	12.0	12.0	11.0	154
DEPARTMENT TOTAL		26.0	20.0	24.0	18.0	19.0	29.0	27.0	23.0	24.0	24.0	19.0	17.0	270

The Department Detail report lets you zero in on individual line items. Note the several levels of subtotaling.

At times, however, looking at spending by individual department will be less revealing than comparing total company spending within specific areas—telephone expenses versus postage expenses, for example. In this case, the Account Summary report will be useful, breaking down total company spending for each account number.

When viewing the third report, you might want to examine a given department's contribution to a specific expense—say, postage. You could scour the Department Detail report and then dig for that department's postage expenditures. Better to save time (and your eyes) by generating an Account Detail report itemizing departmental contributions to an account's revenue or expense totals.

Designing the Template

Once you've determined the desired report types, you'll need to define the data base and create a template that can subsequently be filled in with the appropriate

dollar guesstimates. This budget model is, of course, generic; you'll need to substitute your own account names and organizational units.

Begin with the Form Design screen, the birthplace for *Reflex* fields. The Paperless Office budget contains just four variables: Department, Month, Account, and Dollar Amount (\$ Amount). The eight fields in this model will generate various levels of summary reports. *Reflex* permits many more fields than this; the actual number will vary based on the kinds of summaries your organization requires.

Fortunately, you needn't tediously key data into every last field. *Reflex* includes powerful record replication and search-and-replace capabilities, which promote quick, error-free data base creation. In addition, the Translate option in *Reflex2* (the data base's report writer) makes reeling in 1-2-3 data a manageable, though exacting, task.

The simplest data base setup procedure involves creating one department—call it a Master Department—that will contain every account you plan to use, but with dollar amounts of zero. When the structure is complete, you can copy this file and use it as a template for each department.

You might set up the Master Department data base accordingly: Create a record for every account number (Acct #). Fill in only the account number and account name (Acct Name) fields—*Reflex* does not require that you fill in all fields for each record—and leave everything else blank. The Paperless Office example uses four-digit account numbers, but you can use account numbers of any length.

Now turn to *Reflex*'s Field and Sort Settings Tool. With this function, you perform a number of search-and-replace operations to fill out the remaining fields. Begin by moving the cursor to the Formula column of the department number and name (Dept # & Name) field and enter !#00 MASTER DEPARTMENT.

Run Date:	May 26, 1987													
	FY89 BUDGET													
	REPORT #1: DEPARTMENT SUMMARY (\$K)													
DEPARTMENT	Apr-88 Budget	May-88 Budget	Jun-88 Budget	Jul-88 Budget	Aug-88 Budget	Sep-88 Budget	Oct-88 Budget	Nov-88 Budget	Dec-88 Budget	Jan-89 Budget	Feb-89 Budget	Mar-89 Budget	Total Budget	FY89 Budget
#00 SALES	26.0	20.0	24.0	18.0	19.0	29.0	27.0	23.0	24.0	24.0	19.0	17.0		270.0
GRAND TOTAL REVENUE	26.0	20.0	24.0	18.0	19.0	29.0	27.0	23.0	24.0	24.0	19.0	17.0		270.0
#01 COGS	10.0	9.0	9.0	9.0	10.0	15.0	15.0	12.0	12.0	12.0	10.0	8.0		131.0
#10 ADMINISTRATION/ACCOUNTING	1.0	1.0	1.0	1.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0		19.0
#40 SHIPPING/RECEIVING	2.0	2.0	2.0	2.0	2.0	4.0	4.0	4.0	4.0	4.0	2.0	2.0		32.0
#80 FLOOR SALES	5.0	3.0	3.0	4.0	4.0	4.0	4.0	5.0	4.0	4.0	2.0	3.0		46.0
GRAND TOTAL EXPENSE	16.0	15.0	15.0	16.0	17.0	25.0	26.0	23.0	22.0	20.0	13.0	15.0		228.0
NET INCOME	10.0	5.0	9.0	2.0	2.0	4.0	1.0	0.0	2.0	4.0	2.0	1.0		42.0

The resulting Department Summary report cleanly sketches the departmental big picture.

The exclamation point advises *Reflex* to place the string that immediately follows in the department number and name field of every record. Select the Formula box of the Month row and enter **!4/01/88**. This will place 4/01/88 in the Month field of every record.

In Paperless Office's accounting system, all revenue accounts bear numbers between 1000 and 4999. All expense accounts are between 5000 and 9999. Scroll down the Formula column to the account type (Acct Type) row and enter **!@IF(Acct # < 5000, "REVENUE", "EXPENSE")**.

By examining the Paperless Office general ledger, you can pinpoint the summary accounts that encompass the individual accounts. First, highlight the Type box of the Summary Acct row, press **< F10 >**, and choose Text. Select that row's Formula box and begin entering summary account names; for example, **!@IF(Acct # THRU (5111,5119),"5110 PAPER COGS", Summary Acct)**.

This command tells *Reflex* to find all records with account numbers between 5111 and 5119 (which include the accounts for

Typing Paper COGS and Notebook Paper COGS) and enter 5110 Paper COGS in the summary account field of that record; otherwise, leave the summary account field alone. Scroll down to the Formula box of the category row and repeat the previous procedure, but for different ranges—for example, **!@IF(Acct # THRU (5111,5199),"5000 STATIONERY COGS",Category)**.

Although this admittedly time-consuming procedure must be done for each summary account, you can abbreviate it by using any keyboard macro processor (like *SuperKey* or *Keyworks*) with a learn mode.

Filling Out the Fields

You should now have a data base complete with all fields except dollar amount—for one month. To create a data base for an entire year, select the Vary tool. You vary the month field by entering **From 5/01/88 To 5/01/88 By 1** and **All Records**. This will create a new record with the date 5/01/88 for every previous data base record.

Now, filter the data base for all the records of a single month—say, 5/01/88. Repeat the procedure, but change the date to 6/01/88.

This will create an additional set of records for June. Continue this procedure until you have 12 months' worth of records.

Your data base template is nearly finished—it contains everything you need but dollar amounts. For a small organization you might be ready to enter those figures; however, when you're dealing with multiple departments, it's probably easier to create a data base template for each department and merge the completed data bases when you're ready to generate reports. Having saved the Master Department file, you can again trot out the search-and-replace routine to change the department name as appropriate—#10 Administration/Accounting, for example. That done, save it as the blank template for that department's budget.

It's finally time to fill in the numbers—that is, the projected expenditures or revenues in the dollar amount field for each record. Although *Reflex* provides more robust reporting capabilities than a spreadsheet, it gives ground

where straightforward data entry is concerned. A spreadsheet allows for a full year's worth of data on each row, but each "row" of the budget data base displayed in *Reflex*'s List view (see Screen 1)—the most convenient format for entering data—represents only a month's worth of data.

The Right Reports

To illustrate the report creation process, it's useful to dissect one report in detail. With *Reflex*'s report writer, it's fairly easy to spin off the remaining reports by editing this initial report.

With *Reflex*, you can create an almost endless parade of reports, each one interpreting the underlying data base in a different way. The reports depend on the field names of the active data base; you obviously won't want to alter a field name without amending the report form accordingly. Begin by entering the Report view in *Reflex2* and load the budget data base. You'll be faced with a blank screen.

(Because *Reflex* response time depends on the number of records in RAM, when designing reports it's a good idea to load only a small data base or retrieve just a portion of the larger data base using Partial Retrieve. Once you've saved a report template and are ready to print the report, load the full data base and reload the report template.)

The first template will generate the Department Detail report. Although you're likely to scan a summary report before proceed-

ing to an itemized budget, the report creation process is inverted; it's best to begin with the maximum amount of data and then edit detail as needed.

To whip this and all reports into shape, set the sort order of the fields using *Reflex2*'s Sort Settings Tool. The sort order is a vital setting that you'll modify, depending on the report you want. For this report, the sort order should be set as follows:

- 2 Dept # & Name
- Month
- 5 Acct #
- \$ Amount
- 1 Acct Type
- 4 Summary Acct
- 3 Category

(Because the month and dollar amount fields are not part of a hierarchy, you need not sort on them.)

The completed Report Design is shown in Screen 2. The "when printed" column—the column at the extreme left—displays row

flags that tell *Reflex* when to print each row. The first seven rows serve as headers. Row 1 includes a predefined @Today field, which prints the system date; row 3 contains the Dept # & Name field, which will print on each page; row 5 is a row of labels for account number, account name, each month, and a total FY89.

Dollars are the stuff of budgets, of course, so the first numeric field—in row 8 under the heading Apr-88—merits closer scrutiny. Note the entry on the topmost edit line: =@IF(Month = 4/01/88, \$ Amount, @NULL). This is a conditional formula that says, search the data base for anything with a date of 4/01/88 in the month field. When you find it, print the dollar amount; otherwise leave it blank.

This formula will not, however, print the dollar amount of every record with a date of 4/01/88. It is further restricted by the flag in the

'Notebook Paper									
Views	Edit	Print/File	Records	Search	List				
LIST									
Dept # & N	Month	Acct	Acct Name	\$ Amount	Acct Type	Summary Ac	Categ		
#00 SALES	Jul-88	4111	Typing Pa	4	REVENUE	4110 PAPER	4100		
#00 SALES	Aug-88	4111	Typing Pa	3	REVENUE	4110 PAPER	4100		
#00 SALES	Sep-88	4111	Typing Pa	5	REVENUE	4110 PAPER	4100		
#00 SALES	Oct-88	4111	Typing Pa	5	REVENUE	4110 PAPER	4100		
#00 SALES	Nov-88	4111	Typing Pa	5	REVENUE	4110 PAPER	4100		
#00 SALES	Dec-88	4111	Typing Pa	6	REVENUE	4110 PAPER	4100		
#00 SALES	Jan-89	4111	Typing Pa	7	REVENUE	4110 PAPER	4100		
#00 SALES	Feb-89	4111	Typing Pa	3	REVENUE	4110 PAPER	4100		
#00 SALES	Mar-89	4111	Typing Pa	2	REVENUE	4110 PAPER	4100		
▶ #00 SALES	Apr-88	4112	Notebook	4	REVENUE	4110 PAPER	4100		
#00 SALES	May-88	4112	Notebook	3	REVENUE	4110 PAPER	4100		
#00 SALES	Jun-88	4112	Notebook	4	REVENUE	4110 PAPER	4100		
#00 SALES	Jul-88	4112	Notebook	2	REVENUE	4110 PAPER	4100		

Screen 1: In this snapshot of the budget data base from *Reflex*'s List view, accounts have been sorted by account number and month.

“when printed” column, which in this case is 5-Acct #. Because the account number entry is fifth in the sort order, the statement will print only those records that fit all the previous sort conditions.

The Attributes Summary tool lets you total all data fitting these criteria. You trigger such an operation with the @SUM prefix (note that it does not appear in the edit line). The @SUM attribute is quite handy; it will total multiple records for a particular department/account/date combination, as long as all the fields (except \$ Amount) match. This is especially important in the subtotal rows, which will total the dollar amounts for accounts that have matching summary account, category, and account-type labels.

Fixing the Formulas

The formulas entered below each month's label vary in only one respect; the date in the formula changes from 4/01/88 to 5/01/88, 5/01/88 to 6/01/88, and so on. The formulas under Total FY89 are a bit different: Instead of specifying a particular date, the formula specifies a range by using 'thru (4/01/88, 3/01/89)', the span of the budget period.

You can once again spare yourself time at the keyboard by creating a single formula for April 1988, copying it across the entire row, and then editing it for each month. While *Reflex* supports variable-length fields, budget reports call for columns of uniform

position and width. Accordingly, before copying the formula cell, use the Set Column Width command to set the column to six characters wide and the Attributes Variable-Width command to set the column width to Width Shown and Position as Shown. With six characters, you can nicely fit a year in 132 columns.

As it happens, the formulas entered under the month headings in rows 10, 12, and 15 are identical to those in row 8; the results differ because of the row flags in the “when printed” column. Once you've created one row of formulas, copy that row and simply edit the row flags.

By labeling report rows, you'll know precisely what's being printed. Row 8 includes the account number and account name fields, which correspond to the row flag in the “when printed” column.

(Note that the first occurrence of Acct Name is a label; the second represents an actual field.) For every account number, a new line is printed displaying the account number, account name, and dollar amounts.

Similarly, row 10 includes a column for the summary account and row 12 contains a column for the category. Row 15 could include a column for department number and name, but because the header provides that information, the row label simply prints 'Department Total'.

The resulting report will print the summary account immediately below the individual accounts, the category below the summary account, and the department total below the category. The @New Page in row 17 is a special field

=@IF(Month = 4/01/88, \$ Amount, @NULL)

Report	Edit	Print/File	Search	Attributes			
Report Design							
Head	Run Date:	@Today		FY89 BUDGET			
Head				REPORT #2: DEPARTMENT DETAIL (\$K)			
Head	Dept Number & Name:	Dept # & Name					
Head	Acct#	Acct Name	Apr-88	May-88	Jun-88	Jul-88	Aug-88
Head			Budget	Budget	Budget	Budget	Budget
Head							
5-Ac	Acct	Acct Name	@SUM@	@SUM@	@SUM@	@SUM@	@SUM@
4-Su		Summary Acct	@SUM@	@SUM@	@SUM@	@SUM@	@SUM@
4-Su		Category	@SUM@	@SUM@	@SUM@	@SUM@	@SUM@
3-Ca							
2-De		DEPARTMENT TOTAL	@SUM@	@SUM@	@SUM@	@SUM@	@SUM@
2-De							
2-De		@New Page					

Row: 8 From Col: 39 through Col: 44

Summary

Screen 2: From the Report Design component of *Reflex2*, you can quickly assemble the rows of formulas that the Department Detail report requires. Note the complete field listing at top left.

that produces a page break, doing so every time the department number and name field changes in accordance with row flag instructions.

By modifying this template, you can easily build the other three reports. In the Department Summary report, the row 2 header has been altered appropriately, and rows 3 and 8 through 14 have been deleted (see Screen 3). The department total row has been re-labeled with the Dept # & Name field. Row 9 is similar to the previous report's row 7; here, however, the label has been changed to Grand Total, and the row flag has been modified to summarize revenues and expenses.

Because both revenues and expenses are totaled, it makes sense to include a row for profits—thus the Net Income label in row 13, with a row flag set to print at the conclusion of the report.

To tally earnings in the Net Income row, change the equations

in the columns under the month headings. In lieu of the \$ Amount in the previous formulas, use this conditional statement: @IF(Acct Type = 'EXPENSE', -1 * \$ Amount, \$ Amount). This expression says, if the account type is expense rather than revenue, make the dollar amount negative by multiplying by -1; if it's not expense, leave it positive. Expense accounts are thus subtracted from revenue accounts, yielding the Net Income for that month or for the entire fiscal year.

To create an Account Summary template, you'd blend the detail lines from the Department Detail report with the Grand Total and Net Income lines from the Department Summary report. The summary report is distinguished from the detail report simply by a change in sort order that places the department number and name field fifth rather than second. The resulting report summarizes the budgeted dollar amount for all departments. And you can prepare

the Account Detail report—the fourth in this series—just by adding a row to the Account Summary report. This row prints Dept # & Name details for each account number.

You can, of course, create countless other reports. *Reflex* is well suited to those who want to be free to change their minds—by adding fields for actuals or actual-budget variances, for example—during the budget process. As a new fiscal year begins, you can create reports displaying budgeted figures, actual expenditures, and the variance for the month and year-to-date.

The possibilities are enticing. If you decide to branch out, this budget structure can grow with you. You'll easily be able to total the revenues (or expenses) of every store in your empire, yet itemize contributions by various units. If your data bases are ungainly or you want to run multiple reports, you can automate budget reporting with a macro processor.

As the macro program performs the dirty work, you can take it easy. And take a bow for fighting the battle against budgetary overruns. Who knows—you might even be winning. ●

Ron Feldman is a financial analyst for a software company.

Reflex: The Database Manager
Borland Int'l
4585 Scotts Valley Dr.
Scotts Valley, CA 95066
408/438-8400
List price: \$149.95
Requirements: 384K; DOS 2.00 or later version; CGA, EGA, or Hercules Graphics Card

=@IF(Month = 4/01/88, @IF(Acct Type = 'EXPENSE', -1 * \$ Amount, \$ Amount), @NULL												
Report	Edit	Print/File	Search	Attributes								
Report Design												
Head	Run Date:	@Today	FY89 BUDGET									
Head	REPORT #1: DEPARTMENT SUMMARY											
Head												
Head	DEPARTMENT	Apr-88	May-88	Jun-88	Jul-88	Aug-88						
Head		Budget	Budget	Budget	Budget	Budget						
Head												
2-De	Dept # & Name	@SUM(C	@SUM(C	@SUM(C	@SUM(C	@SUM(C						
1-Ac												
1-Ac	GRAND TOTAL Acct Type	@SUM(C	@SUM(C	@SUM(C	@SUM(C	@SUM(C						
1-Ac	=====											
1-Ac												
Conc												
Conc	NET INCOME	@SUM(C	@SUM(C	@SUM(C	@SUM(C	@SUM(C						
Conc	=====											
Conc												
Conc	New Page											

Screen 3: The Department Summary report design is little more than a slimmed-down version of the Department Detail template.



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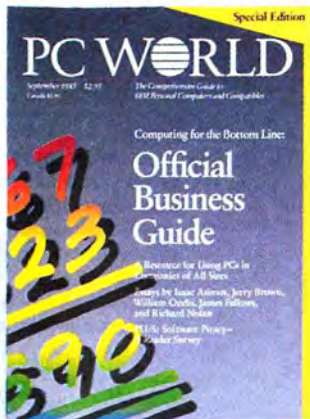
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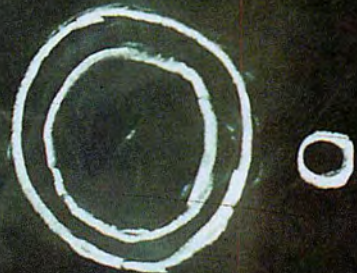
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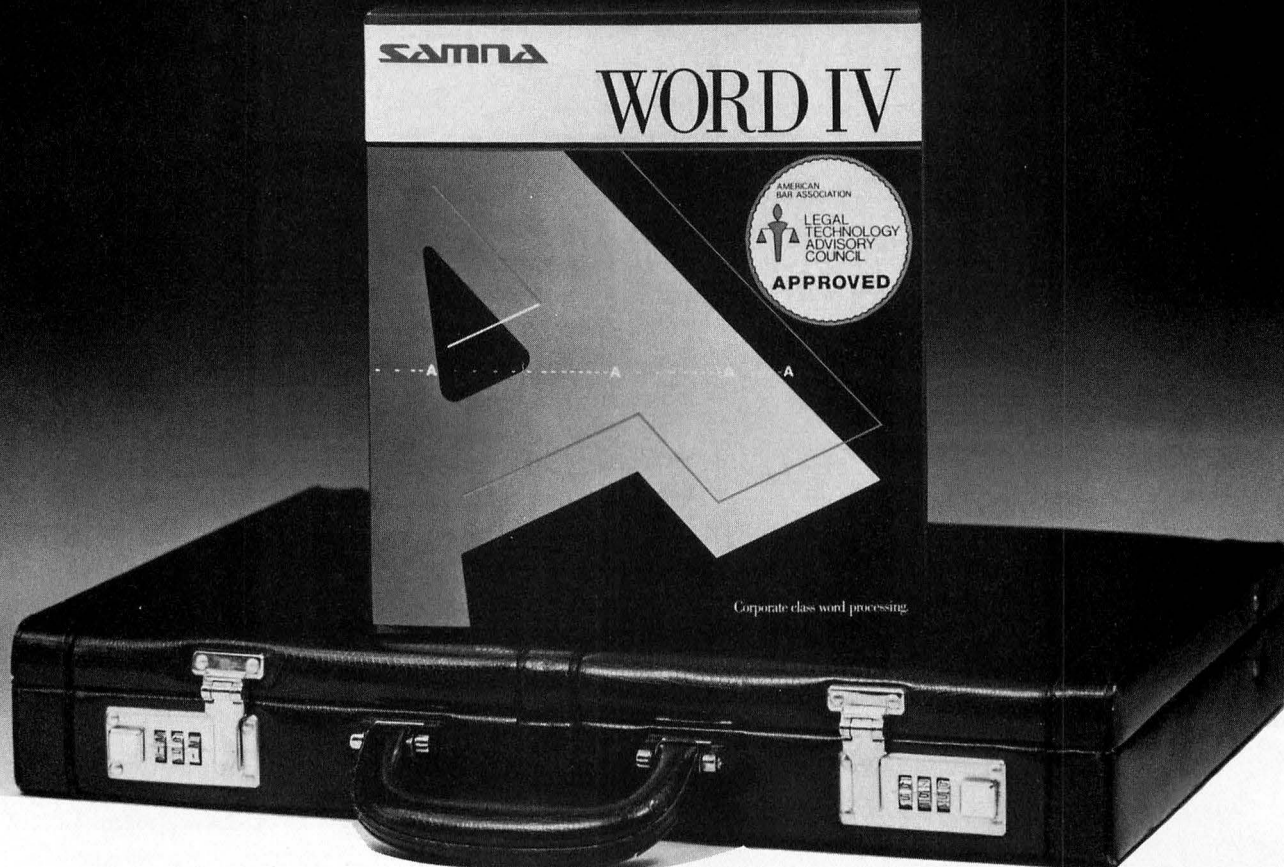
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The Upgrade Path

Hands-on advice for upgrading PCs, compatibles, and peripherals

This month: A reset button (at last) for the PC, a throttle for the AT, a whispering power supply, and more

Edited by Robert Luhn

Do-It-Yourself Reset Button

Optimism and disaster often go hand in hand. The PC user who tries to squeeze just one more pop-up utility into memory is apt to discover that a formerly civilized pop-up notepad, on-line calendar, and macro processor have turned into street brawlers. As you take in the grisly scene of battling pop-ups frozen in midswing, you numbly press <Ctrl>-<Alt>- over and over, to no avail. On an IBM PC, AT, or compatible, the only solution is to turn the system off, wait, turn it back on, and wait again.

Why IBM has steadfastly refused to include reset buttons on its systems (when clone makers have done so for years) is unknown, but no matter. The Irata-Reset from Irata Systems can rectify this oversight for only \$24.95.

Installing the Irata-Reset is usually short work. The reset button

is mounted on a special slot cover. You slip the cover behind a spare slot, tighten it down, and link an attached cable to a power cord connected to the motherboard. Press the button while the system is running and the Irata-Reset resets the PC's clock chip, which in turn resets the CPU. The system restarts, and you're back in business.

To put the Irata-Reset in its place, turn off the machine, remove all external cables, and take off the system cover. (If the system has a hard disk drive, you should first park the drive's read/write heads. Older systems usually come with the appropriate utility; newer systems and hard disk drives often park the heads automatically.) Ground yourself thoroughly, replace a slot cover with the Irata-Reset, and screw it down. To minimize restart strain, put the Irata-Reset in back of the leftmost (and most easily reached) slot.

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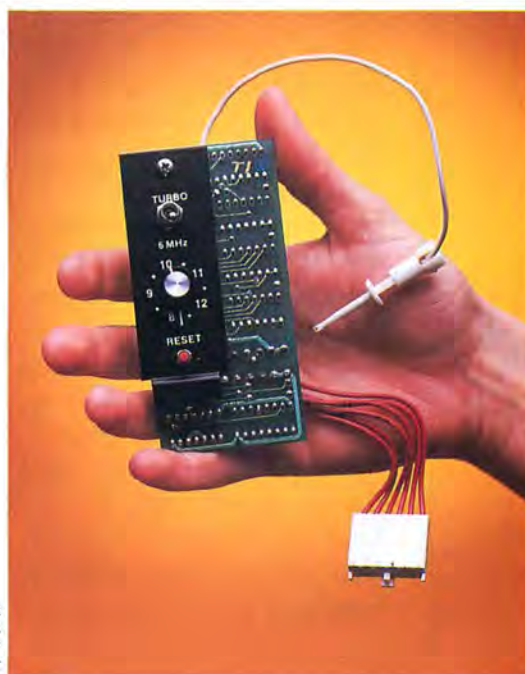


Figure 1: To power this do-it-yourself reset button, mate its connector with the power supply and plug the assembly into the motherboard.



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The Upgrade Path

If the system is packed with expansion boards, mounting the reset button is a bit more complicated. You can remove the button from its slot cover and, in a PC, fasten it to the hole on the backplane directly above the keyboard connector. In an AT, you must remove the rectangular access plate on the backplane between the system fan and the keyboard connector. With a crowded PC or AT clone that lacks such ports of entry, your options may be severely limited. The manual suggests drilling a hole in the chassis. Don't. Metal shavings produced by drilling will thoroughly short out the system. A saner solution is to remove the mounting bracket from a short board lacking external connectors (such as a memory board) and squeeze the Irata-Reset bracket into the space.

Locate the two white power supply plugs attached to the motherboard at the back of the system and pull off the plug closest to the backplane. (In the PC and the AT, the plug resides in sockets P1 and PS8, respectively, and is labeled P-8.) Take the white female Irata-Reset connector and push it into the now-vacant socket. If it isn't properly keyed, snap off the tiny plastic tab on the underside of the connector—but *don't* remove the plastic clip on the other side. Finally, take the system's dangling power supply plug and mate it with the male socket on the top of the Irata-Reset (see Figure 1). Reassemble the system, and you'll be able to break up memory-resident log-jams with the push of a little red button.

Note that the Irata-Reset must be directly connected to the reset pins built into the motherboards of newer PC and AT compatibles. Instead of fiddling with power cords, you simply connect the Irata-Reset's cable to the clone's reset pins. These pins are usually located between the power supply and the first slot, but, as always, check the system manual before taking this step along the upgrade path. —R. L.

Irata-Reset
Irata Systems, Inc.
2562 E. Glade
Mesa, AZ 85204
602/926-7969
List price: \$24.95

Poor Man's Turbo Board

Kicking the PC AT into high gear can be expensive or frustrating. If you've got the bucks and you're in a hurry, an Intel Inboard 386/AT with its 80386 microprocessor is the ultimate, all-inclusive speed boost. But if money is definitely an object and you don't mind digging into the AT's innards, consider the AT TurboSwitch II from Megahertz Corporation.

The TurboSwitch is a backplane-mounted circuit board with an external processing-speed dial, a reset button, and a normal/turbo speed toggle (see Figure 2).

(continues)

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Once linked to the AT's motherboard, the TurboSwitch essentially takes the place of the crystal that controls the 80286's clock speed, pushing the microprocessor to rates as high as 12.5 MHz. However, the manufacturer's somewhat oxymoronic boast that "depending on your system, TurboSwitch guarantees a 33 percent increase in processing speed" should be viewed with some skepticism. On the 8-MHz Enhanced PC AT upgraded here, the speed gain was closer to 26 percent.

Advertised ease-of-installation claims should also be taken with a grain or two. Although mounting the control-laden TurboSwitch faceplate on the back of the AT is simple work, connecting the device to the motherboard is not for casual upgraders. The process involves attaching a power cord to the motherboard, plugging a slender 6-pronged wire into an empty 80287 socket, removing the system clock crystal, and attaching a tiny clip with a too-short wire to the motherboard. (If an 80287 is installed, you must attach a different wire to pin 35 of the chip.) If you're upgrading an Enhanced AT, expect to remove the hard disk drive and the floppy and hard disk controller cables so you can get to the crystal. The entire job takes a little over an hour and requires the services of a small flat-blade screwdriver and a Phillips screwdriver.

Park the AT's hard disk, turn off the system, unplug all external cables, and take off the system cover. Ground yourself properly and remove the rectangular access

plate on the AT's backplane. Since the AT used in this upgrade is relatively new and contains speed-restricted ROMs (information revealed thanks to a short DEBUG routine supplied in the manual), the board must eventually be connected to the AT's 80287 socket with a supplied orange wire. At this point, however, merely remove the TurboSwitch from its box, locate the pin labeled "80287" near the bottom of the board, and attach the wire to it.

You mount the TurboSwitch on the backplane by slipping the faceplate onto the bottom of the access hatch from inside the AT. You may have to push the AT's power cables out of the way and move the battery pack (attached to the inside of the system on a Velcro strip) to the left to make room. Line up the screw holes on the faceplate and AT chassis and tighten the TurboSwitch into place.

The TurboSwitch gets its juice by tapping into the motherboard. To make the connection, pop the white power supply plug (P-8) off the motherboard, stick the power connector hanging off the back of the TurboSwitch into the vacated socket, and then push the AT's power plug into the white male connector on the back of the TurboSwitch board, with the label P-8 facing up.

Integrating the TurboSwitch's circuitry with the AT's is a bit tougher. The first step is to link the TurboSwitch to the 80287 socket. As you face the front of the AT, take the six gold-plated pins at the end of the orange wire attached to the TurboSwitch and plug them into the front leftmost holes in the socket. Make sure that the pin soldered to the orange wire is at the rear.

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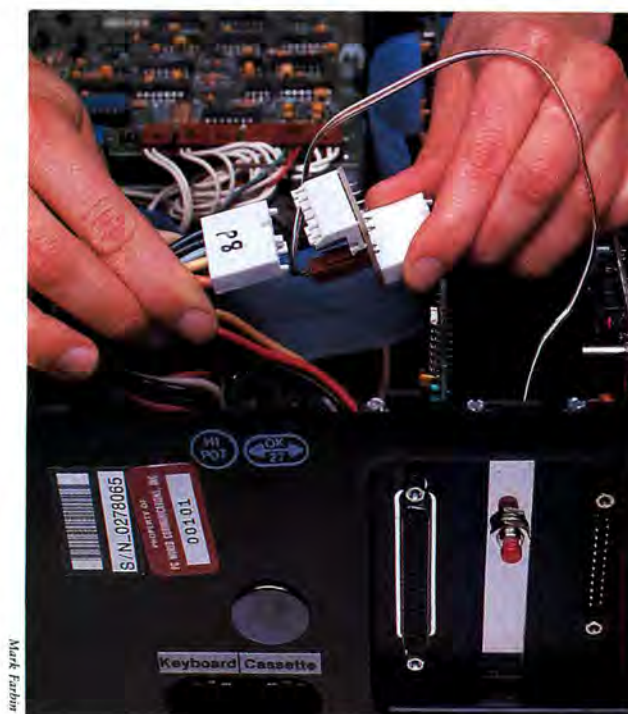


Figure 2: It's not a turbo board—but it does the job for only \$129. Wire the TurboSwitch to a few key points on the AT's motherboard, turn the knob, and you can boost an 8-MHz 80286 to as high as 12.5 MHz.



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The manual then directs you to remove the system clock crystal on the AT's motherboard. The diagram in the TurboSwitch manual makes this look like short work. Unfortunately, the manual (and the TurboSwitch) are cast with owners of the original AT in mind. If you have an Enhanced AT, for example, you'll discover

that the schematic and your system's motherboard don't quite match—and that the crystal in question is tucked underneath the AT's hard disk drive.

Slide the hard disk out about halfway, and the crystal—a shiny square metal case paired with two white cylinders immediately to the right of the 80286—comes into view. To remove the crystal, place your thumbnail between the cylinders and the metal case, press down ever so slightly on the case, and push to the right. The crystal will slide out of its mooring.

To finish the job, take the tiny white spring hook attached to the TurboSwitch and clip it around the leg of the crystal socket closest to the backplane. (This may be easier said than done; the wire

above, the TurboSwitch-equipped Enhanced AT ran at 8, 8.5, 9, 9.5, 10.5, and 11 MHz. The second time around, the AT happily restarted at 10 MHz and 11.5 MHz. A Megahertz representative admits that the TurboSwitch can be a little flaky and suggests that you test a desired speed by turning on the system instead of pressing the reset button. If your AT won't consistently start up at that setting, opt for a slower and more reliable speed. —R. L.

AT TurboSwitch II
Megahertz Corp.
2681 Parley's Way, Bldg. 2-102
Salt Lake City, UT 84109
801/485-8857
List price: \$124.95

A Quiet Power Supply

A quiet PC power supply is an idea whose time has come. Most replacement power supplies are made in Taiwan and sound like small aircraft taking off. And though they faithfully duplicate the IBM power supply (down to the spelling errors on the warning label), they seldom work as well. Of the four no-name power supplies I've tried in my XT, one lasted six months, another was dead on arrival, a third ran three days and then exuded a foul-smelling liquid on my desk, and the latest is still going strong after six months.

(continues)

on the TurboSwitch tested here wasn't long enough. In this instance, expediency ruled—I unscrewed the TurboSwitch's faceplate so the clip could reach. But if your TurboSwitch comes up short, return it to Megahertz for a replacement.) Reattach the floppy and hard disk controller cables, bolt the hard disk back into place, and reassemble the AT.

To find out just how fast the 80286 can go, flip the TurboSwitch toggle up in Turbo mode, set the dial to 8 MHz, and turn on the AT. If the system starts up successfully, set the dial to 8.5 MHz and press the red reset button on the TurboSwitch; if the system starts up again, set the knob at 9 MHz and repeat the procedure, cranking up the speed by .5 MHz each time. Don't be deterred if the system flashes a '108—System Board Error' message at one setting; a higher setting may still work.

Unfortunately, it's not clear which setting is the highest. Following the procedure outlined

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Software Publishers Association
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The Silencer 150 from PC Cooling Systems should quiet concerns about both noise and reliability. It's American-made, comes with a one-year warranty, and is 8dB quieter than the PC XT's original equipment. It fits easily in a PC, XT, or XT 286 and, with a 150-watt power rating, can drive even

XT, you may have to loosen the hard disk drive and slide it forward an inch or two to gain the necessary leeway. Finally, lift the old power supply out. Now you can reverse the process and install the Silencer. (Unlike most replacement power supplies, the Silencer is not mounted with the original

The Silencer 150 should quiet concerns about both noise and reliability. It's American-made, comes with a one-year warranty, and is 8dB quieter.

the largest internal hard disks. Because the Silencer accommodates two fans working in tandem, it keeps your PC doubly cool.

Installation takes less than half an hour. Turn the system off, detach all external cables, and then remove the PC's hood. Use a small flat-blade screwdriver or a $3/16$ -inch hex nut driver to remove the four screws holding the current power supply on the backplane. Unplug the power supply from the motherboard and all disk drives. Note the positions of the two motherboard connectors—they aren't interchangeable, and some power supply connectors aren't properly keyed to prevent you from swapping them. When in doubt, remember that the connector closest to the PC's backplane has five wires.

Next, pull the power supply $1/2$ inch up and toward the front of the machine to release it from the clip hidden underneath. On an

four screws. Instead, four metric screws are provided, so you'll need an ISO Phillips or a number 2 Phillips screwdriver.) For safety's sake, cover the Silencer's two extra disk drive connectors with insulation tape to prevent short circuits.

On my Silencer, the power switch housing was slightly too low and had to be bent to slot into the PC's backplane. Otherwise, the power supply has worked like a charm. Of course, the Silencer isn't totally silent; subjectively, the computer seems about one-third as loud as it did with a no-name Taiwanese power supply. But the Silencer has certainly freed me from a source of constant irritation. Now, when I sit down at the keyboard, I can finally hear myself think. —Michael Covington

Silencer 150
PC Cooling Systems
31510 Mountain Way
Bonsall, CA 92003
619/723-9513
List price: \$149

Son of Snappy Keyboards

If the "enhanced" style keyboard supplied with late-model PC ATs, the PS/2 series, the Compaq Deskpro 286 and 386, and a rash of new compatibles leaves your pinky feeling tired and confused, take note. Like you, the people at DataDesk International believe that the <Ctrl> key should be where God intended—below the <Tab> key and above the <Shift> key. And thus they've created the Turbo-101, a 101 keyboard that can satisfy all comers.

The Turbo mimics IBM's new layout to a key, but unlike most enhanced keyboards, it can work on the PC, XT, AT, 386-based systems, and compatibles with the flip of a switch. Better still, flip another switch on the keyboard and the <CapsLock> and <Ctrl> keys switch places. It's enough to make a *WordStar* devotee reach for a hankie.

Although the Turbo doesn't match the solid feel of the IBM product, it beats Compaq keyboards fingers down. Installing the keyboard is simplicity itself: Turn off the system, set the two switches on the Turbo, plug the keyboard in, and turn the system back on. You can remap the keyboard at will with *Keyworks*, *SuperKey*, and any number of other macro processors. DataDesk even throws in a copy of *Turbo Lightning*.

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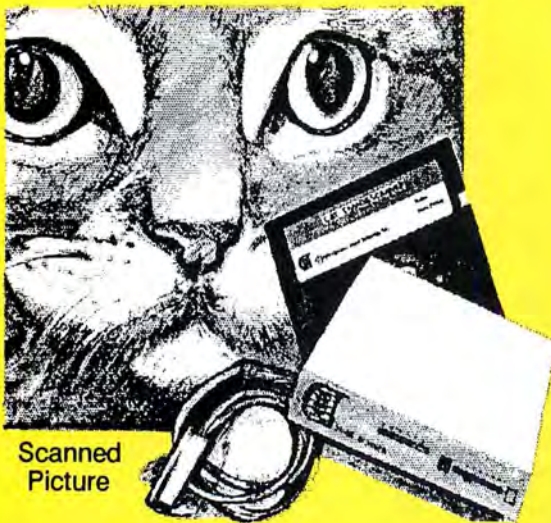


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Note, however, that <F11> and <F12> are actually wired as <Alt>-<F9> and <Alt>-<F10>, and that version 3.0 of *Keywords* gives the Turbo fits. But these are minor quibbles. This is a rock-solid product that does double duty and then some. —R. L.

Turbo-101

DataDesk Int'l
 7650 Haskell Ave.
 Van Nuys, CA 91406
 800/826-5398, 800/592-9602
 California, 818/780-1673
 List price: \$149.95, AT&T PC
 6300 \$189.95, PCjr \$169.96

Upgrade Update

In July's *Upgrade Path* the address listed for Dresselhaus Computer Products, maker of Dots-Perfect, was inadvertently garbled. You can reach the company at 8560 Vineyard Ave. #405, Rancho Cucamonga, CA 91730; 800/368-7737, 714/945-5600.

Michael Covington is a researcher with the Advanced Computational Methods Center at the University of Georgia in Athens, Georgia.

Please forward submissions and queries to The Upgrade Path, PC World, 501 Second St., San Francisco, CA 94107 or electronically to MCI Mail PCWORLD/179-3813, CompuServe 74055,412, or The Source STE908. Articles submitted by mail should be accompanied by a self-addressed, stamped envelope and an ASCII file of the item. ●

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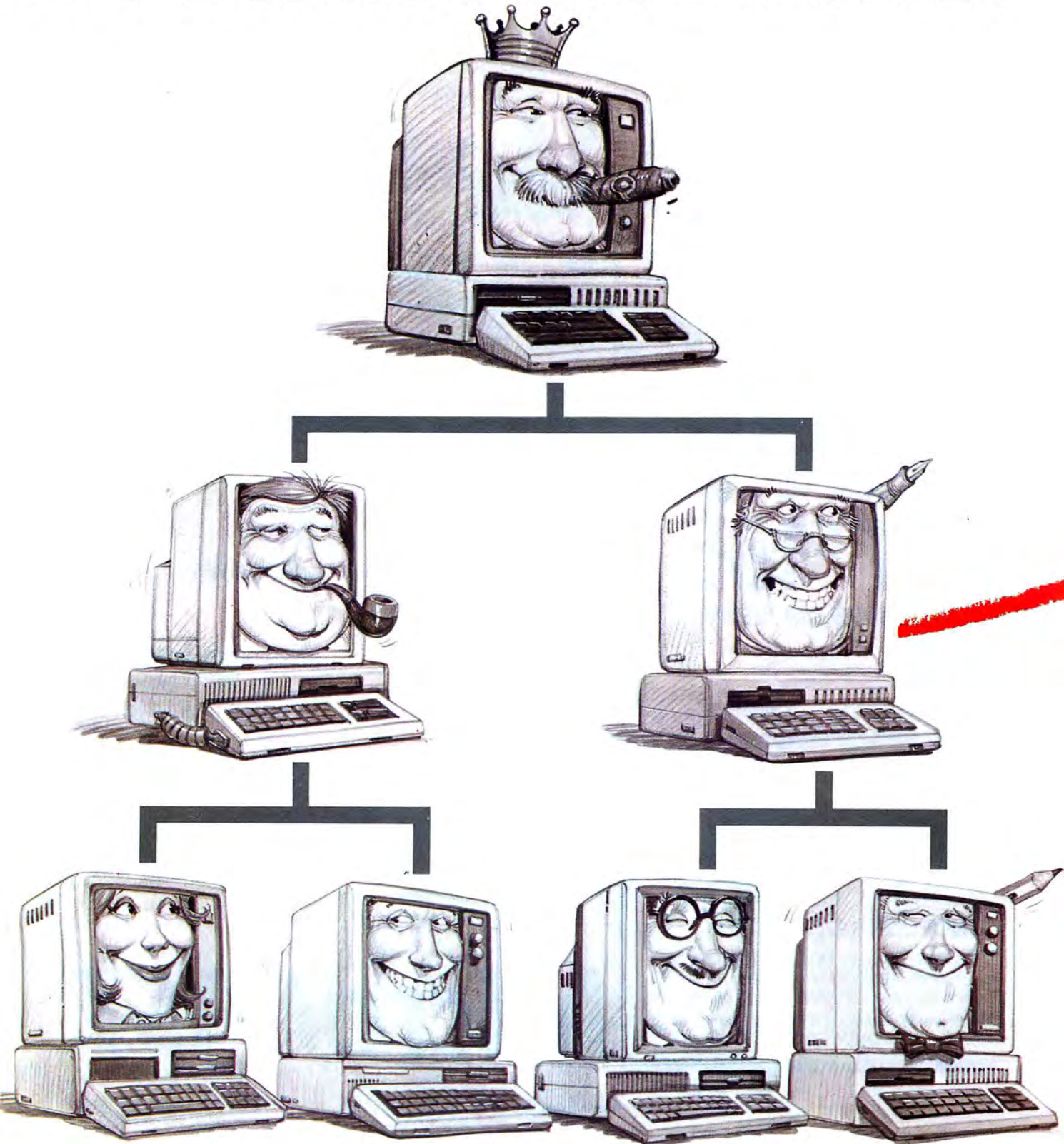
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Digital Communications Associates, Inc.
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Bernoulli Box	
(20 + 20)	\$1899
Bernoulli 10 MB	
Cartdg. Tr	\$169
Bernoulli 20 MB	
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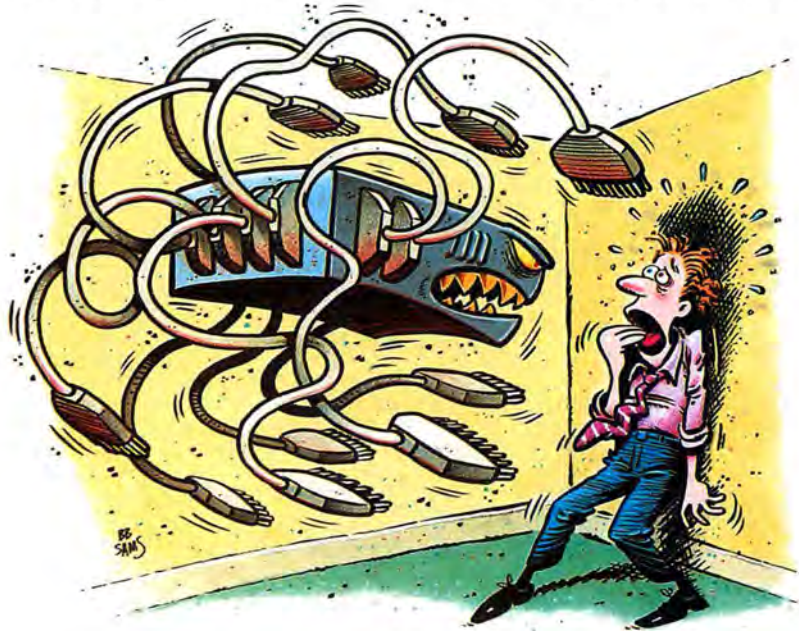
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Don't Get Boxed Into a Corner!



Once upon a time, if you wanted several computers to share one or more printers, the only available solution was a multi-port printer sharing box. At first glance these boxes appear to be a relatively cheap short-term solution, but there are *several* drawbacks. First, inputs and outputs are limited both in number and parallel/serial compatibility. Cable lengths are limited to 10' for parallel connections or 50' for serial, and all these computer and printer cables must run back and forth to the switch box. So aside from creating quite a wiring bill, this means all equipment must be relatively close together. Furthermore, a single box reduces user control to just "printing and praying", tends to be easily overloaded, and when it breaks—or even just hiccups—the entire office goes down with it. Talk about putting all your eggs in one basket!

We saw the emergence of fast laser printers and high-powered micro's, and thought that for a company to tie all this high-tech equipment into a single box is akin to a major airport trying to get by with one air traffic controller. Foolhardy false economy!

Enter the Systemizer...

So we drew upon our expertise as the world's oldest and largest specialist in printer buffers, spoolers and adaptors, and created the first *networking printer buffer*: the Systemizer.

Up to fifteen computers, when each is equipped with a Systemizer, can access as many as fifteen printers, plotters and modems. We call this *distributed buffering and sharing*, and it

fixes everything that's wrong with the single-box method of sharing printers. Our network can extend as far as 1200 feet, using low-cost 4-wire phone cord. With Systemizers each user has his own high-speed desktop printer buffer, parallel/serial adaptor, and a personal control panel for directing when and where work is to be printed, reprinting copies, aborting jobs, etc. Hundreds of organizations like Exxon, NASA, 3M and the U.S. Air Force have purchased thousands of Systemizers because of their flexibility, systemic reliability and user friendliness.



And Now, the Systematic

Occasionally major customers have had us customize their Systemizers' operation to fit a specific operating environment. After a year of doing this we recognized some patterns to these requests, and as a result created a new product: the Systematic. A lower-priced, slimmed down and highly automated version of the Systemizer, the Systematic specifically addresses two common applications.

The first is where each user already has a printer, but also wants access to either a co-worker's printer or a shared community printer. Many companies have discovered that giving users access to each other's printers increases productivity and reduces "printer envy". Plus, they can gain additional benefits by sharing a community *super* printer, like a laser, plotter or 500 cps line printer. With Systematics at each workstation, users have their own desktop printer buffer (which is far superior to a software spooler) as well as easy access to both a primary and alternate printer.

The second application is where the company wants a cluster of PC's, along with perhaps a mainframe, to share one, or at most two printers, again usually some combination of laser printers, plotters or line printers. In addition to buffering and routing data to the right printer, the Systematics act as universally adaptable gateways into the printer sharing network.

Total Flexibility

Systemizers and Systematics may be intermixed within the network, so now you can get all the benefits of distributed buffering and sharing, tailored to your needs and budget!

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Consumer Watch

Advice and information for the computer consumer

Does a product advertised as "the best" have to live up to that claim? A revealing look at high-tech advertising and your rights under the law.

Anita Amirrezvani

An Uneasy Business

In the late 1870s, the success of an ad campaign for Lydia Pinkham's Vegetable Compound ("a sure cure for all female weaknesses") astounded the fledgling advertising trade. Sales skyrocketed when ads showed a drawing of the wholesome Quaker woman with the caption, "Yours for health."

Of course, grandiose promises haven't been confined to any one period or industry. When the PC debuted, common wisdom held that this electronic slave would work flawlessly, triple productivity, and generally make life easier. "There's always been a lot of hype and overpromising in computer advertising," says Efrem Sigel, editor of *Computer Publishing & Advertising Report*, a Larchmont, New York, newsletter.


Advertising executives are among the first to admit that promises about computer products haven't always been fulfilled. "We've seen a lot of smoke and

mirrors in the industry," says Alan Kerr, an account supervisor for Chiat-Day in San Francisco. In a famous 1968 court case, for example, Control Data Corporation sued IBM, claiming the company had advertised nonexistent computers to stave off competition, and won a large out-of-court settlement. Other companies have used test-marketing schemes to gauge potential interest in products that didn't exist. "In the late seventies and early eighties, some entrepreneurs ran ads about products they envisioned. Only if the ad got a good response did they make the product," says Kristin Zhivago, whose Palo Alto, California firm, Zhivago Advertising, services high-tech accounts.

Few companies ever get called on the carpet for such deceptive practices, and even when they do, the penalties are few. In 1985, the

(continues)





Federal Trade Commission (FTC) fingered Commodore Computer for advertising in 1983 that the Commodore 64 could run CP/M programs with the help of an optional microprocessor—and not making that option available within a reasonable period. No penalty was imposed, according to Joel Winston, manager of the advertising review program in the

Rules of the Game

Advertising executives insist that honesty in advertising is crucial. Says Zhivago, “I’ve sat in meetings where clients say, ‘Our product doesn’t have that capability yet, but it will,’ and I tell them, ‘Sell what you have.’”

Under the Federal Trade Commission Act and most state laws, ads cannot contain false state-

Tips for Reading Ads

Today’s high-tech ads certainly puff their products—but that’s not all they do. Although most vendors won’t go on record about their competitors’ ads, privately they complain the ads are frequently misleading, particularly regarding product performance. Tests are often set up to show a product in its best light. “AT clones are sometimes pitted against a 6-MHz PC AT—a product IBM doesn’t even make anymore,” says industry watcher Russ Walter, author of *The Secret Guide to Computers* (22 Ashland St., Somerville, MA 02144).

And vaporware is hardly a thing of the past. Advertising executives are quick to point out the pressures manufacturers face—intense competition, unexpected technical glitches, a three- to four-month lead time for placing ads, as well as a climate of expectation. Still, “it’s just bad business to announce a product and not be able to deliver,” says Chiat-Day’s Alan Kerr.

Although industry analysts say today’s ads are more targeted and technical to appeal to a savvier audience, that’s no plus for the uninitiated buyer. Says David Horowitz, longtime consumer advocate and star of the NBC TV show “Fight Back! with David Horowitz”: “By and large, computer advertising is confusing. Whoever is writing computer ads simply doesn’t have the neophyte

(continues)

‘By and large, computer advertising is confusing. Whoever is writing computer ads simply doesn’t have the neophyte in mind,’ says longtime consumer advocate David Horowitz.

FTC’s department of consumer affairs; Commodore simply signed a cease and desist order agreeing not to advertise capabilities until they’re actually available. But even a slap on the wrist like that doesn’t happen very often.

Fortunately, both the industry and consumers are changing. “As the industry has matured, it has drawn professional businesspeople who know their company’s reputation is on the line and want to come through for customers,” says Zhivago. Meanwhile, consumers’ knowledge about computer products has increased, and ads mirror this change. “High-tech ads—particularly on television—have gone from being metaphorical to showing how computers can solve practical business problems,” says Jon Berry, San Francisco bureau chief for *Adweek*.

ments, make false claims based on supposedly factual evidence, or omit information that leads you to believe something that isn’t true. Moreover, bait-and-switch advertising, an effort to lure consumers into buying something other than what was advertised (often at a higher price), is specifically prohibited.

But ads don’t always have to be literally true; “puffing” a product is legal. “Puffing is defined as an exaggeration that’s so obvious, virtually anyone is capable of recognizing it,” says Ginger Taylor, manager of the advertising review program for California’s department of consumer affairs. “The most common examples of puffing are words like *exciting*, *glamorous*, *lavish*, *best*, and *perfect*. When advertising claims can be scientifically analyzed or tested, they’re no longer considered puffing.”

The new shape of AT power.



Now AT-class performance doesn't have to come in an intimidating package. Or with an intimidating price tag.

The Cordata slimline 4200 uses advanced VLSI technology to provide AT-power in a low-profile design that complements your decor. And your budget. Instead of dominating them.

It's the ideal solution for first-time PC users who need serious computing power, not to mention experienced users considering enhancement boards, and those in need of a powerful network workstation.

Trim your PC down to size. Along with your PC budget. Call (800) 621-6746 (in California, 800-331-5867) for the name of your nearest Cordata 4200 dealer.

And choose a beauty. Instead of a beast.



2001 Corporate Center Drive, Newbury Park, CA 91320
Telephone (805) 375-1500. In Europe: Holland 31 324-01811.

MS-DOS is a trademark of Microsoft Corporation

CS4200 includes 16-bit 80286 8 MHz computer with 640K memory and AT-style keyboard, clock/calendar with battery back-up, hardware reset switch, front-mounted on/off switch, half-height 360K floppy drive, second 360K floppy or 20MB half-height hard disk drive, power cord and monitor power outlet, MS-DOS 3.20, GW BASIC 3.11, full documentation and manuals, CGA double-scan graphics, 4 available expansion slots, parallel and serial ports. Optional video display monitor and EGA graphics. Specifications subject to change without notice.

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How to keep track of absolutely everything* for \$99.⁹⁵



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30 MINUTES?!"
"Why am I just finding out we're two weeks
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Only one PC software can answer all of these questions quickly and easily—the DayFlo TRACKER, the first Information Tracking System (ITS) for IBM PC/XT/AT® and compatibles. Now, at a special introductory price!

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Get started immediately with the 50+ standard forms and report formats provided in TRACKER and the handy Application Pack—using simple menus. Customizing forms is easy too. And recalling records is done naturally using your own combination of key words. No more lost data! Then use the report writer to print out letters, labels, lists, etc. It's hard to believe so much sophisticated technology can be so easy to use—and so inexpensive. Order now at the special introductory price or call DayFlo for more information at (800) 367-5369. In California (714) 474-2901.

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TRACKER

DayFlo Software
17701 Mitchell Avenue North
Irvine, CA 92714



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First 2500 orders only

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(\$189.90 value) \$99.95

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☐ Please charge my: ☐ Mastercard ☐ Visa

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Address _____ Elsewhere \$15.00)
City _____ State _____ Zip _____ California residents
Telephone _____ add 6%: \$ _____
Total: \$ _____

Mail to: DayFlo Software, 17701 Mitchell Avenue North, Irvine, CA 92714.

Sales/Order Information: 1-800-367-5369. In California: 1-714-474-2901.

Not copy protected, 30-day money-back guarantee.

Requires DOS, 384K RAM and hard disk on IBM PC or compatible.

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in mind." When reading ads, novices and veterans alike should take care not to misunderstand subtle points. CompuAdd, a mail-order firm in Austin, Texas, advertised an AT clone in *PC Magazine's* May issue that contained a "20MB Seagate hard drive fully installed, with 65ms access time, an industry favorite." Seagate is indeed an industry favorite, but a hard drive running at 65ms is rather slow, points out Russ Walter. The hard disks on IBM ATs run at 40ms.

Before ordering a product (especially from a mail-order outlet), ferret out all the facts. If a hard disk's speed or a program's version isn't listed, ask the vendor before buying. If you're interested in purchasing a PC clone, pin down who manufactures it. Mail-order clones advertised by different outlets may in fact be manufactured by the same company. Club AT's clones, for example, come from Everex, a manufacturer in Fremont, California, that sells compatibles to 11 other distributors marketing the machines under their own labels. Uncovering the source of the product before you buy can help you judge quality; likewise, after the sale it may help you get repairs or warranty service if the vendor ever goes out of business.

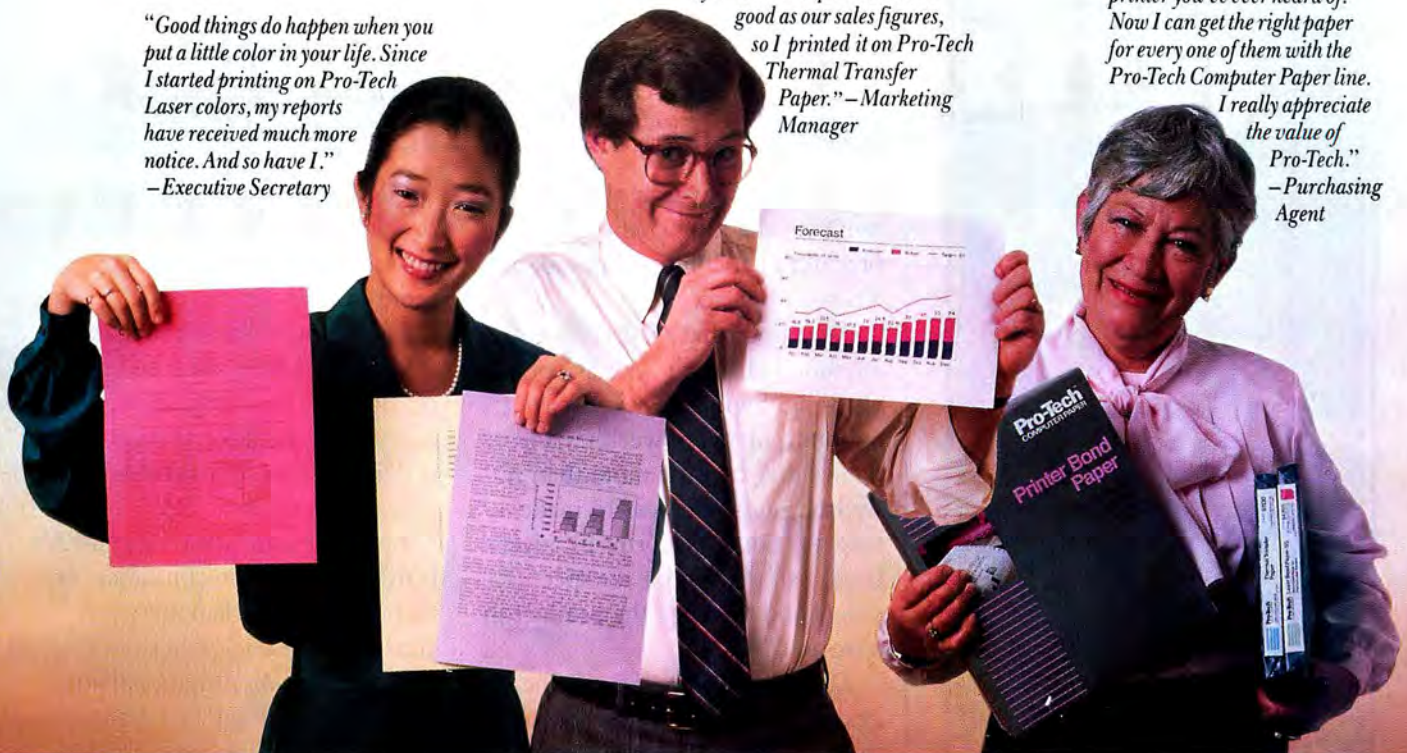
When reading software ads, remember that product feature lists are hardly gospel. Besides, a key issue is the implementation of those features. "Sometimes products do what they're supposed to

(continues)

"Good things do happen when you put a little color in your life. Since I started printing on Pro-Tech Laser colors, my reports have received much more notice. And so have I."
—Executive Secretary

"We've had a great year. I wanted my Year End Report to look as good as our sales figures, so I printed it on Pro-Tech Thermal Transfer Paper." —Marketing Manager

"We have every kind of computer printer you've ever heard of. Now I can get the right paper for every one of them with the Pro-Tech Computer Paper line. I really appreciate the value of Pro-Tech."
—Purchasing Agent



Why people love their Pro-Tech Computer Paper.

Who wouldn't love a computer paper specially designed for the printer they use?

The Pro-Tech family of specialty computer papers and film provides the consistency and reliability required for superior image quality and is specifically designed for dot matrix and daisywheel, ink jet, laser and thermal transfer printers as well as pen plotters. Pro-Tech enhances your printer's performance. And your image.

The complete line includes: Laser Papers for hi-speed and desktop laser printers (in white and colors, 25% cotton and other special finishes), Ink Jet Paper, Thermal Transfer Paper, Pen Plotter Paper, Printer Papers (in bond, 25% cotton and other special finishes) and Transparency Film. You'll love them.

Pro-Tech™

Because the right paper and film makes all the difference.™

Yours Free!

For free samples of the right paper for your printer, contact Pro-Tech today. Return this coupon to: Pro-Tech Sampler Kit, c/o James River Corporation, Groveton Division, Groveton, NH 03582 or call toll-free Mon-Fri 8:00-5:00 EST...

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Name

Title

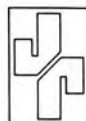
Company Phone

Address

City

State Zip

My computer printer is a
(Manufacturer—Make—Model No.)



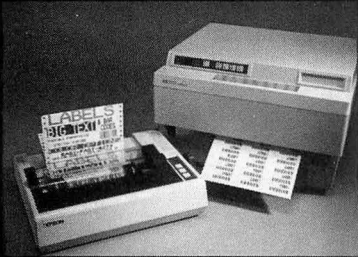
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PCD 10/87

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do, but so awkwardly that you don't get the full benefit of the product's capabilities," points out Kristin Zhivago.

Note, too, that magazines usually don't check the validity of advertising. Similarly, new-product announcements in weeklies and dailies may be little more than rewritten press releases. To make sure a product performs as advertised, call the vendor for spec sheets and then test the product in a store.

As always, the best medicine against rip-offs is prevention. Says the FTC's Joel Winston: "Don't assume what the advertiser tells you is completely accurate—read the fine print, be skeptical about claims, ask questions, shop around."

Where to Turn

Under the law, "advertising" includes not only ads in publications, on radio, and on TV but product literature, demonstrations, and verbal assurances. If you buy a product on the basis of claims that you later decide are false or deceptive, you have several avenues of recourse.

First, try to resolve the complaint with the company, documenting your efforts. If you don't get satisfaction, you can sue for damages in most states, but "usually it's not cost-effective for an individual to bring an action against an advertiser," says Ginger Taylor of California's department of consumer affairs.

Getting the word out about a problem often helps resolve it; no business wants a customer to mouth off about a product. If you see a deceptive ad in a magazine, send a complaint letter and a copy of the ad to the publication; it may reject any advertising it feels is deceptive or demand that advertisers clean up their act.

Both the state attorney general's office and the state consumer protection office mediate between consumers and local businesses. To complain about national ads, you can write the FTC. Although the FTC won't pursue individual complaints, it will prosecute a company if it finds a pattern of abuses.

You can also turn to the advertising industry's self-regulation unit, the National Advertising Division (NAD) of the Council of Better Business Bureaus. Since its creation in 1971, NAD has reviewed more than 2000 complaints about truth or accuracy in national advertising and asked for modification or discontinuation of ads in about half the cases. If you think an ad is false, "send a copy of the advertising if it's in print; if it's on TV or radio, transcribe it if possible and mention when and on what station it appeared," advises NAD vice president Ron Smithies. NAD's address is 845 Third Ave., New York, NY 10022.

(continues)

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Epson

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Consumer Watch



Shop Talk

Before Its Time

In February, I sent \$29.95 to Peter Norton Computing for an advertised upgrade to version 4.0 of the *Norton Utilities*. The check cleared March 2, but I didn't receive the upgrade.

I called several times to check on the order and received a variety of excuses: "It wasn't released until the first week of March... We're at least four weeks behind in shipping...If you don't get it next week call again."

After 91 days, I think I should get a refund.

(name withheld by request)

Norton Computing responds:

There's no excuse for the bad service we gave the customer, only an apology (which we sent, along with a refund check, the same day we got the complaint) and some explanation.

Frankly, we blew it when we released the latest update to the *Norton Utilities*. We got many, many more orders than we expected and more than we could handle with the quality of service that everybody expects from us. We're working hard to fix that, and we're trying to do the right thing.

In this case, the right thing was to send the customer a refund and an apology. We earned the righteous indignation expressed in the letter; now we want to earn back the customer's goodwill. We like our customers a lot.

Peter Norton
President

Small but Vital

Recently my company bought a Toshiba 1100 + portable as a loaner machine for our sport and field writers, who write articles while traveling in campers, boats, and RVs. We chose this product because one of its options is a 12-volt DC auto adapter that would allow our writers to power the PC in the field.

After attempting to purchase the \$40 adapter from more than 30 sources without success, I wrote Toshiba and asked for help. One month later, I still haven't had the courtesy of a reply.

William C. Carey
Salem, Oregon

Toshiba America responds:

Toshiba sells its products through computer specialty retailers and distributors. Unfortunately, many resellers feel these accessories are troublesome to keep in stock because they are low-cost or low-demand items. In fact, some resellers will tell a customer the accessory is not available even though Toshiba can provide it.

In response, we've established Toshiba Accessories Direct (TAD), which sells accessories directly to end users. TAD can be reached at 800/433-5999. We're sorry to hear Mr. Carey was not informed about this service.

Philip J. Vertin
Vice President, Sales

(continues)

How to tell the difference between DESQview™ 2.0 and any other environment.

Selecting DESQview, the environment of choice, can give you the productivity and power you crave, without the loss of your old programs and hardware. If you like your existing programs, want to use them together, transfer data between them, print, sort, communicate with or process-in-background, yet still have the need to keep in place your favorite PC(8088, 8086, 80286 or 80386), DESQview is the "proven true" multitasking, multi-windowing environment for you. Best of all, DESQview 2.0 is here now, with all the money saving, time saving, and productivity features that others can only promise for the all-too-distant future.

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"I wouldn't want to run an IBM



One picture is worth a thousand promises.

or compatible computer without DESQview"—InfoWorld, Michael Miller.

"A colossus among windowing environments"... "will run almost anything"—PC Week, Marvin Bryan.

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No other environment has consistently pioneered features, openness, and productivity. See for yourself. Send in the coupon. The possibilities are endless with DESQview 2.0.

Attention Programmers: For more information about Quarterdeck's API, and future 386 program extensions, call us today.

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IBM Personal Computer and 100% compatibles (with 8086, 8088, 80286 or 80386 processors) with monochrome or color display; IBM Personal System/2 • Memory: 640K recommended; for DESQview itself 0-145K • Expanded Memory (Optional): expanded memory boards compatible with the Intel AboveBoard; enhanced expanded memory boards compatible with the AST RAMPAGE • Disk: Two diskette drives or one diskette drive and a hard disk • Graphics Card (Optional): Hercules, IBM Color/Graphics (CGA), IBM Enhanced Graphics (EGA), IBM Personal System/2 Advanced Graphics (VGA) • Mouse (Optional): Mouse Systems, Microsoft and compatibles • Modem for Auto-Dialer (Optional): Hayes or Compatible • Operating System: PC-DOS 2.0-3.3; MS-DOS 2.0-3.2 • Software: Most PC-DOS and MS-DOS application programs; programs specific to TopView 1.1, GEM 1.1 and Microsoft Windows 1.03 • Media: DESQview 2.0 is available on either 5 1/4" or 3 1/2" floppy diskettes

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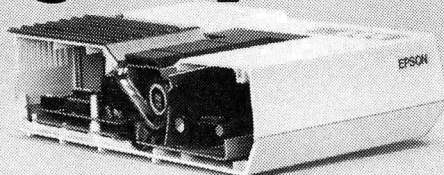
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Consumer Watch



Another Day, Another Dollar

In May 1986, I bought an XT with a hard disk from Arbor Distributing, a distributor for International Manufacturing and Marketing (IMM) in Methuen, Massachusetts. Because I had experienced power line problems while using my old computer, I also purchased an uninterruptible power supply.

In February 1987, the power supply failed. When I called Arbor Distributing to get warranty service, I discovered that the company's phone line had been disconnected. I turned to IMM for help, but all I got was the runaround.

Stephen J. Knight
Denver, Colorado

Editor's note: Small wonder. International Manufacturing and Marketing filed for bankruptcy under Chapter 7 of the federal code on May 26, 1987. The case number is 87-806-HAL. If you think the company owes you money, fill out a proof of claim form (available at many stationery stores or from the court) and address it to Clerk, 1101 Boston Federal Office Building, 10 Causeway St., Boston, MA 02222. At press time, the deadline for filing a claim had not been set. For more information, call the court at 617/565-6071.

PC Plaudits

In March, I purchased a 30MB Seagate hard disk drive and an Adaptec 2070A RLL controller

(continues)

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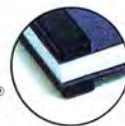
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for my AT&T 6300 from Discount Micro World in San Rafael, California. Following instructions, I installed the hard drive and controller, but the drive wouldn't boot. When I called Discount Micro World, Seagate, and Adaptec for assistance, no one was able to solve the problem. I explained what had happened to Discount Micro World and within two days received a new RLL card from another manufacturer. I was up and running within 2 hours, and the drive and controller have worked flawlessly since.

All three companies generously tried to help solve my problem. Unlike the other mail-order houses I've dealt with, the people at Discount Micro World bent over backward: They forwarded the problem to their technical support staff, provided names and numbers for technical assistance, and even followed up a few weeks later to make sure everything was working correctly.

*Jim Garretson
San Rafael, CA*

Editor's note: To use Adaptec's 2070A RLL controller with the AT&T 6300, you must have version 1.21 or later of AT&T's motherboard ROM BIOS, according to Tim Katona, senior product manager at Adaptec. Before you add a controller to your system, check on its compatibility with your PC and hard disk by calling the manufacturers in question.

Software Support: You Tell Us

Have you purchased pay-as-you-go software support plans from companies such as Ashton-Tate, Lotus Development, MicroPro, and Paperback Software, or from independent support specialists? As a follow-up to our report ("Software Support...Please Hold," PCW, November 1986), we'd like to hear about your experiences. Write and tell us whether you're getting your money's worth and what improvements you'd like to see.

Update

Recently, several of the companies *PC World* has contacted on behalf of readers have responded by sending those readers free software or other goods. For the protection of vendors, *PC World* will not publicize such acts of generosity. Our goal is to help readers solve problems with computer products, not to put unfair pressure on vendors to supply gifts.

Got a gripe? Want to set the record straight? Write Consumer Watch, PC World, 501 Second St., San Francisco, CA 94107, or use MCI Mail PCWORLD/179-3813, CompuServe 74055,412, or The Source STE908. Include your name, city, state, and daytime telephone number with all correspondence. Letters may be edited for length and style. Due to volume, we cannot acknowledge every letter. ●

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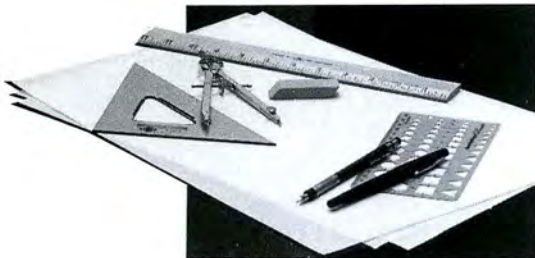
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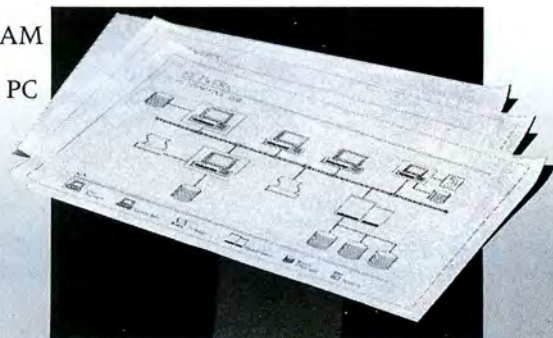


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Sourcebooks

Further explorations into personal computer technology

This month: Seasoned advice on stretching your on-line dollar, sound reasons to keep human experts on tap a while longer, and two detailed guides to desktop publishing perplexities

Michael Harper and
Marlene Nesary



On-Line User's Bible

How to Look It Up Online: Get the Information Edge with Your Personal Computer
Alfred Glossbrenner
St. Martin's Press, New York,
1987
486 pages
\$14.95 softcover

Alfred Glossbrenner's *Complete Handbook of Personal Computer Communications* quickly became the bible on telecomputing when it appeared in 1983. *How to Look It Up Online* is a good bet to achieve similar status. Although the new book includes a three-page "quick-start guide to modems and communications software," it otherwise assumes that you have such basics under your belt and want to buckle down to the task of mining all the gilt-edged information buried deep in the data base hills.

The first 150 pages—Part I—cover general topics, including tools and techniques for searching any data base. The advice is bold and—at first sight—heretical. Don't waste time poring over the vendor's manual, urges Glossbrenner: Put it away and call customer service (after all, you're paying for it) to find out how to get started. After that, learn commands as you need them—instead of trying to digest a whole manual when you

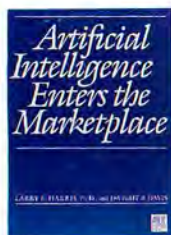
don't know enough to recognize which parts are important and which aren't.

But Glossbrenner's advice isn't all ad hoc; he also emphasizes the importance of study and preparation for an efficient search and provides much sound information. (For example, don't search the last two-and-a-half years of *Business Week* for articles containing the word *industrial* unless you really want to wade through 19,000 items.)

Part II takes about 100 pages to profile some of the major services. Sometimes Glossbrenner comes in with both fists swinging—he terms the Dialog guide's 17-page Introductory Overview "a joke." Such criticism often translates into useful tips. For example, although the Dialog sign-up materials don't mention the fact, Glossbrenner explains that whenever you're on line, Dialog charges as if you were connected to a data base—a needlessly expensive arrangement, which he tells you how to bypass.

Part III outlines approximately 100 leading data bases, including some that allow you to access most of the world's magazines, get information on insider trading, and obtain a TRW credit report on any one of millions of businesses. Glossbrenner's knowledge of the on-line universe appears to be encyclopedic, and he presents it in enjoyable, lucid prose.

(continues)



The Brakes on AI?

Artificial Intelligence Enters the Marketplace

Larry R. Harris and Dwight B. Davis

Bantam Books, New York, 1986

193 pages

\$16.95 softcover

Artificial intelligence is computing's new growth industry, and venture capitalists who see it as a potential gold mine are likely to be proved right in the long run. But the results business users can realistically expect out of AI in the next few years fall short of the more extravagant product claims and media hype.

That's the sobering message of this excellent analysis of the current state of AI. Harris and Davis are hardly AI detractors. Larry Harris was a professor of computer science at Dartmouth before founding the Artificial Intelligence Corporation and marketing his own AI/natural-language product, *Intellect*. But the fact that this warning comes from a deeply committed insider makes the book all the more persuasive. Prospective buyers of AI products should read it before reaching for their checkbooks.

Some of the authors' reservations about the pace of AI development spring from their grasp of

extrinsic factors, such as the paucity of AI-related education in our universities, researchers who want to solve theoretically interesting problems rather than practical ones, and the public's Big Brother suspicions about AI. But Harris and Davis's most important argument concerns an intrinsic limitation: the rule-based programming that underlies most natural-language processing and expert system applications.

Instead of giving the computer a program of step-by-step instructions, rule-based programming provides a set of facts (the data base) and a set of rules, then lets the computer search for a sequence of rules that—when applied to the facts—will solve a problem. However, only problems that involve many facts and have relatively straightforward inference requirements are suited to this approach. (Process monitoring and certain kinds of diagnostic problems are the most common examples.) But for more complex tasks, the rule-based program is much more difficult to design and may not work at all. In essence, Harris and Davis are saying that the more expertise a problem demands, the less likely an expert system is to solve it.

The authors emphasize that our practical experience of rule-based programs is still limited and successful commercial application meager. The best chance of success comes when a program is designed with a narrow focus—when it's written to solve a well-defined, well-chosen problem. Such programs are unlikely to be available over the counter, unless a specific problem is widespread enough to

make developing and marketing an AI-based solution worthwhile. Thus, for the foreseeable future, expert systems will require expert in-house programmers.

Tool kits that help users build expert systems are available, but Harris and Davis are not unduly impressed. Because tool kits evade the real difficulties (how to handle deeply ambiguous or sight-recognition problems, for example), they are not practical for end-users. Instead of addressing specific problems, the marketers of tool kits are just repackaging existing in-house technology. This is fine for "sophisticated users who are willing and able to dirty their hands with programming," but the average consumer will have to wait awhile for practical, accessible AI solutions.



Desktop Publishing Doubled Up

The Art of Desktop Publishing: Using Personal Computers to Publish It Yourself, Second Edition

Tony Bove, Cheryl Rhodes, and Wes Thomas

Bantam Books, New York, 1987

296 pages

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Publishing From the Desktop
John Seybold and Fritz Dressler
Bantam Books, New York, 1987
299 pages
\$19.95 softcover

With power comes complexity, and desktop publishing is no exception. As the professional publishing process moves from graphics house and printshop to PC and laser printer, the would-be self-publisher confronts an increasing array of options, each more potent—and more elaborate—than the last.

It's hard enough to make purchase decisions about individual components—CPU; printer; and word processing, graphics, and page layout software—but the difficulty grows exponentially with the need to assemble a well-integrated system. *Publishing From the Desktop* asks whether the everyday user “can absorb the complexities of the publishing process all piled up together on one desktop.” Seybold and Dressler say yes, but mainly because the near future will bring natural language interfaces and other AI-informed technologies that “will offload from their users the complexities of any or all publishing tasks.”

In the meantime, anyone who wants to produce something more sophisticated than a simple mimeograph-quality announcement of a garage sale or a lost kitten needs a reliable guide. *The Art of Desktop Publishing* and *Publishing From the Desktop* both qualify. Their approaches differ radically, but they complement each other rather than compete.

The Art of Desktop Publishing is heavily product oriented. The authors describe the desktop publishing process fully and clearly, but the description is seamlessly integrated into product evaluations that are based on their considerable expertise. (Tony Bove and Cheryl Rhodes founded *Desktop Publishing* magazine, which has now become *Publish!* magazine.)

Bove and Rhodes describe desktop publishing fully and clearly, and the description is seamlessly integrated into product evaluations.

In their product reviews the authors remain watchful of the need for integration and compatibility. For example, they remind you of the extra outlay required for a high-resolution monitor if you choose *PC Paintbrush* instead of *PC Paint*, and they review ways to interface a PC with a PostScript printer like the Apple LaserWriter. For would-be desktop publishers, they suggest choosing a word processor with built-in PostScript support; using *Microsoft Windows* or Digital Research's *GEM*; plugging in Tangent Technologies' PC MacBridge board; and investing in a network such as 3Com's Etherseries or Centram's TOPS to maximize product capability.

The Art of Desktop Publishing makes short work of complexities without oversimplifying. The authors assume no prior knowledge—they even explain briefly what a modem is and does—but never patronize the reader. Rather, they address the needs of the person intending to use a home print-

er for final copy as well as those of the writer/editor involved in professional page composition and typesetting.

Publishing From the Desktop also represents substantial expertise, but of a decidedly different kind. John Seybold introduced computerized photocomposition to this country. He and Dressler base their book on the premise that “only by understanding the

requirements of professional publishing can we understand and evaluate desktop systems.” The book emphasizes processes and techniques at the high end of the market. For example, the authors discount the viability of using the laser printer for final output because it is too slow for a large number of copies, is limited to 300-dpi resolution, and requires that you be “willing to forgo the use of any but the crudest halftones.”

The book details the art and technology of the publishing process, including intricacies of typefaces and typesetting, niceties of composing text, considerations of page composition, and subtleties of graphics technology. The inner workings of laser printers are thoroughly explained, as are features and capabilities of the new, low-cost optical scanners.

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Seybold and Dressler assume that a general understanding of technique and technology is the proper basis for buying decisions. Once you know what can be done with current hardware and software, you can decide how much of it you need. Only near the end of the book do the authors discuss "defining your needs" and "choosing your system." Generally,

Books in Brief

■■■■■

A serial port is a serial port is a serial port, right? Wrong. Shattered nerves and manifold swear-words naturally follow from that naive assumption about how standard the standard RS-232 serial port really is. But with RS-232

Seybold and Dressler's book will be useful to the executive in charge of choosing and managing an in-house publishing operation.

you're encouraged to think overall strategy, not specific methods.

Particularly valuable are several pages of important questions a prospective buyer should ask: Is the display of the what-you-see-is-what-you-get variety? How are formatting codes entered? Can you obtain interim output on a line printer?

The final chapters compare the Macintosh with various configurations of the PC (no clear winner here). Appendices listing vendors and products round out this practical volume.

Seybold and Dressler's book will probably be more immediately useful to the executive in charge of choosing and managing an in-house publishing operation than to the user planning to get involved in the nitty-gritty. Nonetheless, both *Publishing From the Desktop* and *The Art of Desktop Publishing* are recommended reading for all prospective desktop publishers, whatever the level of their ambitions and their bank accounts. —M. H.

Simplified: Everything YOU Need to Know About Connecting, Interfacing, and Troubleshooting Peripheral Devices, you can sort out the snarly variations. Bryon W. Putnam of the University of California Computer Facilities Services has written a great little hardbound reference book for power users, computer hobbyists, technicians, and consultants. He deals with the basics of analog and digital communication systems in the first chapter, then moves on to ASCII codes and characters, RS-232 pinouts and voltage levels, start- and stop-bit streams, terminal emulation, modem setup and protocols, cables in all their glory, and techniques for troubleshooting and installation. Definitely techie and thoroughly indispensable at \$19.95. Prentice Hall Press, Englewood Cliffs, New Jersey, 1987; 190 pages, hardcover.

■■■■■

Framework devotees will warm to *Framework II Applications* by Richard H. Baker, now in its second edition. Although the author claims his book is for nonprogrammers, he offers three levels of custom applications for use with Ashton-Tate's venerable integrated package: formulas for building spreadsheets, macros using <Alt>-key combinations, and program listings that work with *Framework's* FRED language. Eight chapters (half the book) focus on specific business applications, including managing human resources, inventory, and projects; building business plans; collecting bills; and supporting decisions with *Framework's* statistical tools. Baker also throws in system design tips and offers advice for using *Framework* in desktop publishing and telecommunications. Keep this \$19.95 handbook next to your *Framework* manual. Tab Books, Blue Ridge Summit, Pennsylvania, 1987; 320 pages, softcover.

■■■■■

Data base guru Miriam Liskin says only three PC data bases have real application generators: *dBASE III Plus* (her home environment), *Paradox*, and *R:base System V*. If *R:base* supplies the data base engine for your custom efforts, you'll be interested in Michael R. Peretta's *R:base System V Techniques and Applications*. An *R:base* consultant with a dozen years' development work to his credit, Peretta shows novice programmers how to efficiently apply *R:base* forms and tables to a

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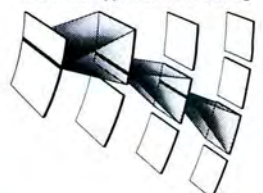
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

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Sourcebooks

task. He also covers typical end-user considerations and provides a line-by-line listing of code for several major types of R:base business applications. His chapter on time-processing techniques is in itself likely to be worth the \$19.95 price tag to many R:base developers. Que Corporation, Indianapolis, Indiana, 1987; 278 pages, softcover.

Most users of *Microsoft Word* never touch its powerful but complicated style sheet functions. If *Word* expert Peter Rinearson's "The Word on Style Sheets" in this issue whets your appetite, his and JoAnne Woodcock's book *Microsoft Word Style Sheets* is the logical next step. They run through the basics of using, creating, and modifying *Word*'s built-in style sheets, then press on to seven chapters of custom style sheets. They've built a consistent set of styles to format indexes, tables of contents, manuscript drafts, reports, newsletters, memos, press releases, and résumés. Follow the instructions in their \$19.95 book and add these valuable style sheets to your *Word* directory. Or buy these (and more) style sheets on disk for \$19.95 extra. Microsoft Press, Redmond, Washington, 1987; 330 pages, softcover.
—M. N. ●

Michael Harper teaches English at Scripps College in Claremont, California. Marlene Nesary is an Assistant Editor for PC World.

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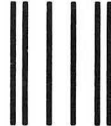
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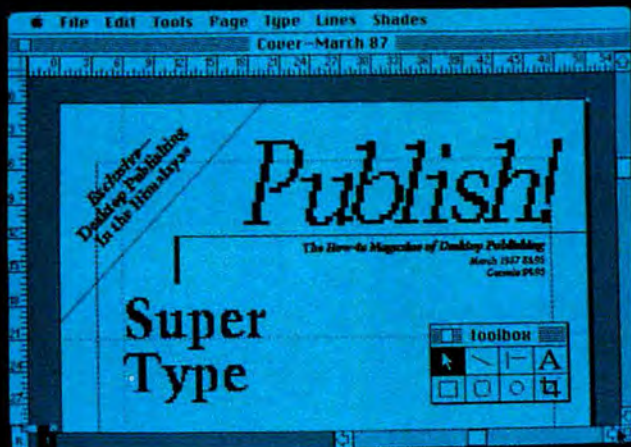
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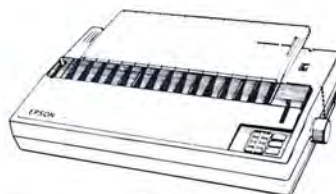
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LANGUAGES

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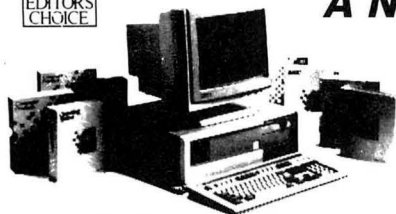
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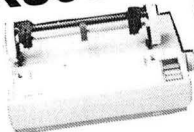
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Software smarts substitute for machine muscle, WordStar learns to live with 640K, XCOPY takes the pain out of COPY, and a change in MS-DOS 3.20 calls for a new BACKUP strategy

Karl Koessel

Brains Versus Brawn

Q. I am a fiction writer in search of the ideal word processing system. For the past three years I have been computing on a Compaq Portable with WordPerfect 4.0 and 4.1 and printing with an Epson FX-80. Although I have had no problems with this system, I now find the processing speed unsatisfactory.

My novels average anywhere from 70,000 to 100,000 words (about 350K to 500K). I can edit large text files; WordPerfect stores on disk those portions that don't fit in memory. However, when I'm editing a large document (100K or greater), it takes forever to jump from the beginning to the end of the file or to go to page, say, 235 using <Ctrl>-<Home>. Therefore, I break my novels into manageable 40K chunks, though that's obviously inconvenient.

Unless someone offers a more enjoyable word processor, I plan to stay with WordPerfect. Will a Compaq 12-MHz 80286 or 16-MHz 80386 system enable me to work on a novel as one large file and not take so long to go from alpha to omega? What about IBM's new Personal System/2 models? Will upgrading my computer help solve my problem at all? I shudder to think that I may make the wrong, and costly, purchase decision.

C. W. Nelson
Ketchum, Idaho

A. IBM and Compaq personal computers all use an Intel 8088/8086, 80286, or 80386 microprocessor. Each processor is more powerful than its predecessor and runs faster.

However, all these processors run your word processing software in their most basic mode—

none of their highly touted strengths save speed are exercised. Consider also that for WordPerfect, jumping from the first page of a document to the last is a *disk-intensive* task; processing speed has negligible impact. Sure, the faster processors will put some spunk into WordPerfect, but just upgrading from a floppy disk drive system to one with a hard disk should reduce traversing a document to one-tenth the wait.

When looking at hard disk systems, you'll find that models with faster processors generally have faster hard disks. But this isn't always true, so pay attention. Remember also that disk I/O speed isn't simply a factor of average access rating but is also affected by the capabilities of the disk controller and by the disk's interleave ratio (which determines how many times the disk must revolve for the controller to read a single track of data).

Now that you've learned how to measure computing muscle, take a look at your word processor. It may be "enjoyable," but is it right for a 500K novelist? Other word processors, such as Microsoft Word and Lotus Manuscript, manage their documents differently than does WordPerfect and can thereby jump from the beginning of a file to its end nearly as quickly as from one page to the next. The solution is one of brains, not brawn. Perhaps a new version of WordPerfect will be so endowed.

WordStar's Whimsical WINSTALL

Q. I'm running WordStar (version 3.30) on an IBM XT with 640K and a 20MB hard disk drive.

(continues)

When I try to run the installation program WINSTALL to change the word processor's default settings, I always get the error message 'Too little memory.'

When the XT is first started, all 640K passes the power-on memo-

Restart the XT to install the RAM disk. You're now ready to run WINSTALL. After you have configured WordStar to your liking, delete the RAM disk DEVICE command line from the copy of CONFIG.SYS that's in the Word-

I know that with a hard disk manager, such as Xtree or one of my public domain utilities, I can view a directory listing, mark off a set of files to be copied, copy them, and repeat the process for another group, but that is still quite tedious. Can you suggest a simpler technique?

Charles Porter

Santa Clara, California

DOS 3.20 introduced the command XCOPY to ease the chore of copying a select group of files, including files in lower-level directories.

ry test. Why does WINSTALL think that there isn't enough memory?

Charles G. Jeffcoat

Columbia, South Carolina

A. There's a bug in your version of WINSTALL. It thinks too much memory is too little. The installation program will run if you reduce the amount of free memory in your system. Creating a 200K RAM disk will do the trick.

Copy your system's CONFIG.SYS file from the root directory of your hard disk into the WordStar directory. (If your system doesn't have CONFIG.SYS, just open a nondocument file with that name.) Assuming that the file VDISK.SYS from your DOS disk is on drive C: in a directory called \DOS, insert the line **DEVICE = C:\DOS\VDISK.SYS 200** at the beginning of the CONFIG.SYS file. Save the file, exit WordStar, and copy CONFIG.SYS from the WordStar directory to the root directory of drive C: (**COPY CONFIG.SYS C:**).

Star directory. Save the file and copy it to the root directory of drive C: so that the next time you start the XT, the maximum amount of free RAM will again be at your disposal.

Floppy Copy of Hard Files

Q. I frequently need to copy large groups of files to floppy disks. For example, I often want to give a copy of my entire hard disk directory of public domain utilities to someone whose system does not have a hard disk. This task becomes extremely laborious when copying the files requires more than one floppy disk. The first disk is no problem. When I issue COPY C:\path. * A: the system copies as many files from the hard disk directory as the floppy holds, and then displays the message 'Insufficient disk space'. The second and subsequent disks, however, require me to copy individually each file in the directory that didn't make it onto the first disk. For my public domain directory, this can mean nearly 100 separate COPY commands.*

A. DOS 3.20 introduced the command XCOPY to ease the chore of copying a select group of files, which can include the files in lower-level directories. XCOPY duplicates the source's directory structure onto the target disk, creating lower-level directories as needed. Although the copying process won't be effortless, you can use XCOPY to streamline it.

In its simplest form, XCOPY works like COPY. For example, XCOPY C:\DOS*. * D:\DOS-COPY*. * does virtually the same thing as the command COPY C:\DOS*. * D:\DOS-COPY*. *. The difference is that if the directory DOSCOPY does not exist on drive D:, XCOPY creates it; COPY does not, displaying an error message instead.

Furthermore, XCOPY recognizes command parameters that COPY doesn't. If the XCOPY command is followed by /S, all the files in directories under C:\DOS will also be copied into directories of the same name, created under D:\DOSCOPY. Empty subdirectories underneath C:\DOS are

(continues)

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not created on the target unless the /E parameter is also included with the XCOPY command. If /P follows the command, a prompt is displayed along with each file name, asking whether or not that file should be copied.

The XCOPY command's /M switch facilitates copying a group of hard disk files when the files won't all fit on one floppy disk.

Other parameters perform other tricks. For example, /V causes DOS to verify the copies, and /W instructs XCOPY to wait for the target disk to be inserted before beginning its chores. But the /M switch facilitates copying more files than will fit on a single disk. When the /M parameter follows an XCOPY command, XCOPY copies only those specified source files whose archive bit is on, and then turns off those archive bits.

Therefore, to copy all the files in your public domain utilities directory (let's assume you call it \PUBDOM), first turn on the archive bit for all the files in \PUBDOM with the DOS command **ATTRIB + A C:\PUBDOM*.***. Then use the command **XCOPY C:\PUBDOM*.* A: /M** to copy all the files that will fit onto the floppy in drive A:. After each source file is copied, its archive bit is turned off. When the target disk can't hold any more files, copying stops, and the error message 'Insufficient disk space' is displayed. You then replace the target disk

with a formatted blank and issue **XCOPY C:\PUBDOM*.* A: /M** again. Since the /M switch is present, XCOPY does not copy the source files whose archive bit is off. Therefore, all the files that have already been copied are skipped,

and copying begins with the first file whose archive bit is still set. If a third disk is required, just repeat the same XCOPY command again.

Automated MS-DOS 3.20 BACKUP

Q. I use a simple, short batch file to back up selected office management files from my hard disk. It begins with the command BACKUP C:\STAR\DIR. A:, which erases all the files in the root directory of the backup disk before backing up the specified set of files. (Because the disk has no sub-directories, this procedure lets BACKUP use the entire disk.) The next ten BACKUP commands in my batch file employ the /A switch. Like the first BACKUP command, they back up selected files; however, the /A causes these backup files to be added to the files already on the backup disk(s), and no erasing occurs.*

On my original PC-DOS 3.10 system, the batch file required me only to change backup disks; the process was otherwise automatic.

However, now that I have upgraded to MS-DOS 3.20, each BACKUP command in the batch file causes execution to pause and display the unenlightening message 'Source disk is nonremovable; Insert target disk in drive A;; Strike any key when ready'. I then have to "kick start" each of the 11 BACKUP commands as well as change backup disks.

Having to strike a key for each new BACKUP command I encounter seems like a step backward, especially since those commands simply add files to the disk(s). Is there a patch or possibly an unpublished switch that will cause MS-DOS 3.20's BACKUP command to function like PC-DOS 3.10's?

*William E. Kenny
Trenton, New Jersey*

A. Although there isn't a way to make MS-DOS 3.20's BACKUP command act like PC-DOS 3.10's, you can use redirection to pass the now requisite keystroke from a 1-byte disk file (see "Elegance or Simplicity?" in this month's *.* column). You might name that file A_Y_KEY and create it with the following steps: Type **COPY CON A_Y_KEY** and press <Enter>. Then type **Y** and press <Ctrl> -Z followed by <Enter>.

However, it may be wiser to modify your backup procedure. Currently, only the first backup disk's files are erased before the current backup files are written. After that disk has filled, subsequently backed-up files are added

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to a second disk. After a number of backups, that disk will become full, and a third disk will be necessary. Eventually, the third disk will fill, and a fourth will be needed, and so on. Each backup requires more disks, most of which contain outdated data from previous backups that will never be needed. The /A switch quickly loses its appeal.

Consider this alternative: Make a subdirectory under \STAR called BACKUP. Change your backup batch file so that it copies all the files that you want to back up into the BACKUP directory; for example, the first line would read COPY C:\STAR\DIR.* C:\STAR\BACKUP. Subsequent lines would copy other sets of files to the BACKUP directory. Finally, a single BACKUP command (BACKUP C:\STAR\BACKUP A:) would back up the files.

Because there is only one MS-DOS 3.20 BACKUP command, the user is spared from having to activate subsequent BACKUP commands. And avoiding the use of BACKUP's /A parameter ensures that each backup disk will be erased before files are backed up, keeping the number of backup disks to a minimum.

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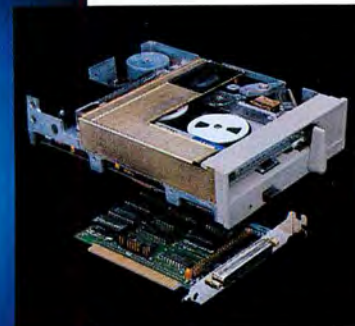
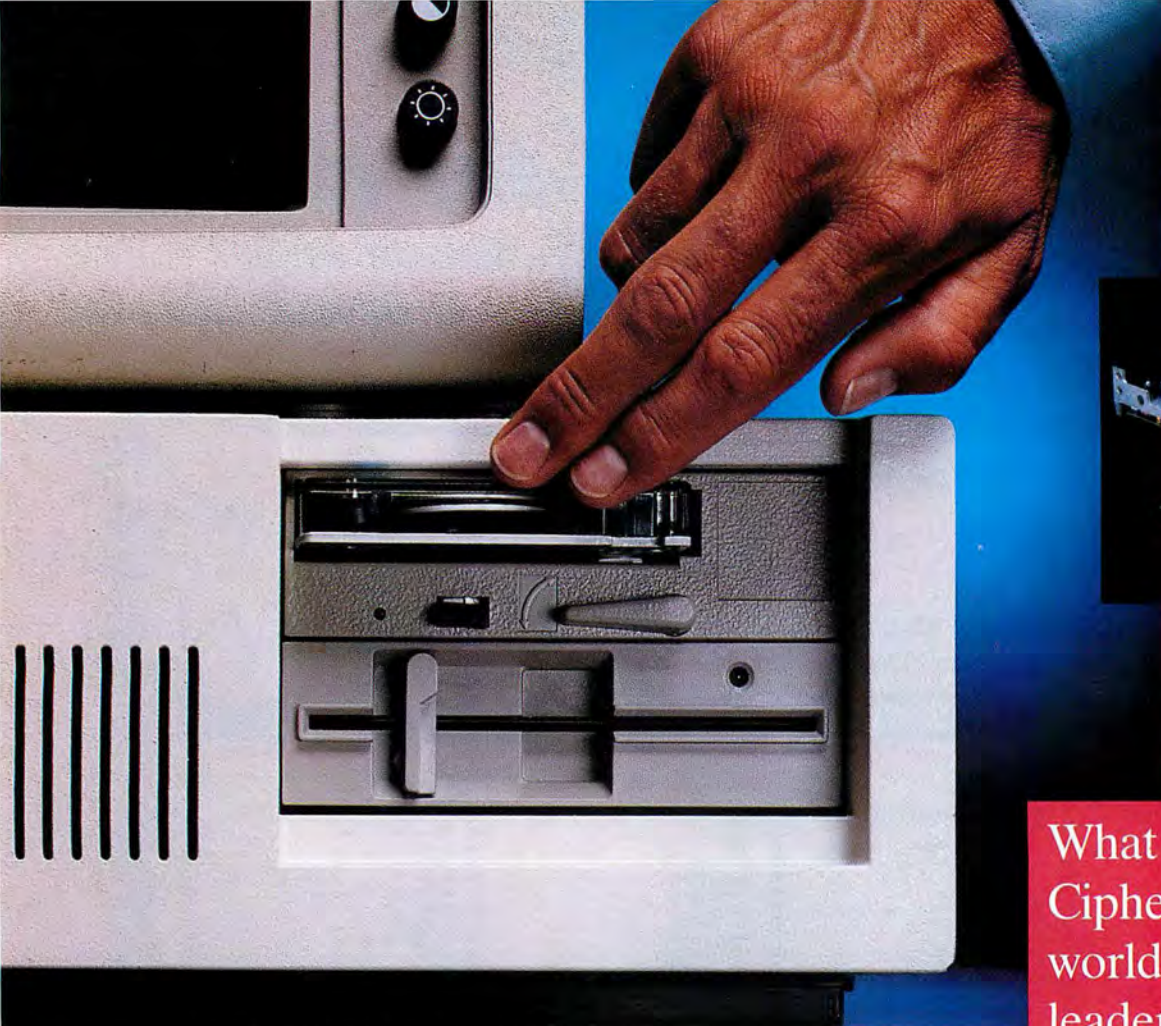
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Copy files from within Turbo Pascal, format stacks of disks simply, learn dBASE's function key codes, check printer status from within a batch file, calculate how much disk space a group of files needs, and discover DOS's <F7>

Edited by Mike Cushman

Turbo Pascal Copy

I do a lot of programming with Turbo Pascal and make extensive use of RAM disks and memory-resident software. Occasionally the system locks up because of conflicts among memory-resident programs or because of a fatal bug in a Pascal program that I'm debugging. Therefore, I wanted to be able to save my program on a floppy disk as well as on the (default) RAM disk.

However, Turbo Pascal doesn't allow you to save the work file on different drives; making a copy on another drive requires exiting to DOS.

To be able to have my cake and eat it too, I wrote TPCOPY.PAS [Listing 1], which copies files without forcing me to exit Turbo Pascal. Now before I debug a program and risk losing its current version, I save my current program on the RAM disk, load and run TPCOPY to copy files from the RAM disk to a floppy, then reload and debug the current program.

Although TPCOPY is extremely simple, I save a lot of time with it. I never have to leave Turbo Pascal while developing an application and have only the minor inconvenience of restarting the system if it does lock up.

*Patrick Daspit
Lakewood, Ohio*

Elegance or Simplicity?

I admire the elegance of Stephen Carpenter's patch to FORMAT.COM, which causes FORMAT to alternate repeatedly between drives A: and B: without the need for keyboard input ["Mass Format," *.* , PCW, June 1987]. However, FORM.BAT [Listing 2] and its accompanying file,

CR_Y_CR, do almost the same thing but with considerably less struggle. They have the added advantage of working with any version of DOS from 2.00 on.

FORM.BAT is a simple endless loop; when execution reaches the bottom of the batch file, the GOTO command sends it back to the top. The < redirection symbol causes FORMAT to take its input from the file CR_Y_CR, which contains three keystrokes, <Enter>Y<Enter>. [To create CR_Y_CR, type **COPY CON CR_Y_CR** and press <Enter>. Press the three keys <Enter>, Y, and <Enter>. Next press function key <F6> and then <Enter> to save CR_Y_CR.] The variables %1 and %2 allow FORM.BAT to accept format parameters such as /S and /4. (Don't use /V; FORM.BAT can't handle it.) Each ^G causes the PC's speaker to beep; you create ^G by holding down the <Ctrl> key and pressing G, not by typing ^ and G.

To use FORM.BAT, simply enter the command FORM followed by the desired optional parameters. To abort the batch format, either press <Ctrl>-<Break> or open the disk drive doors.

*Tony Lima
San Carlos, California*

Keep dBASE III Plus Functioning

Here is an undocumented tip for dBASE III Plus programmers. The INKEY() function returns values when the function keys are pressed (alone, or in combination with <Ctrl>, <Alt>, or <Shift>), but the only function key listed in the manual is <F1>, which returns a

(continues)

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```
program TPCopy.pas;

const
  RecSize  = 128;
  BufSize  = 200;

type
  String65 = string[65];

var
  Source, Dest      : File;
  Buffer             : array[1..RecSize, 1..BufSize] of Byte;
  RecsRead          : Integer;
  OK                : Boolean;
  SrcDrv, DstDrv    : Char;
  SrcName, DstName  : String65;

begin {Main Program}
  ClrScr;
  Write('Enter file name to copy: ');
  ReadLn(SrcName);
  Write('Enter source drive: ');
  ReadLn(SrcDrv);
  Write('Enter destination drive: ');
  ReadLn(DstDrv);
  DstName := DstDrv + ':' + SrcName;
  SrcName := SrcDrv + ':' + SrcName;
  Assign(Source, SrcName);
  Assign(Dest, DstName);
  ($I-)
  Reset(Source);
  ($I+)
  OK := (IOResult = 0);
  if OK then
    begin
      Rewrite(Dest);
      WriteLn('Copying ', SrcName, ' To ', DstName);
      repeat
        BlockRead(Source, Buffer, BufSize, RecsRead);
        BlockWrite(Dest, Buffer, RecsRead);
      until RecsRead = 0;
      Close(Source); Close(Dest);
    end
  else
    WriteLn(SrcName, ' Not Found...');
  ClrScr;
end.
```

Listing 1: TPCOPY.PAS is a Turbo Pascal program that copies files from one disk to another without leaving Turbo Pascal.

value of 28. The other keys return values as shown in Table 1. As the table shows, function keys <F2> through <F10> return negative numbers, despite the manual's claim that INKEY() values are all positive.

The function keys can be extremely useful in constructing menus and in controlling program flow in many other ways. These values also work with *Quicksilver*, *Clipper*, and *FoxBASE*.

Glen Alcott
Elmhurst, New York

```
:top
FORMAT B: X1 X2 < CR_Y_CR
^G
FORMAT A: X1 X2 < CR_Y_CR
^G
GOTO top
```

Listing 2: FORM.BAT repeatedly formats the disk in drive A: and then the disk in drive B:, beeping after each disk is done.

(continues)

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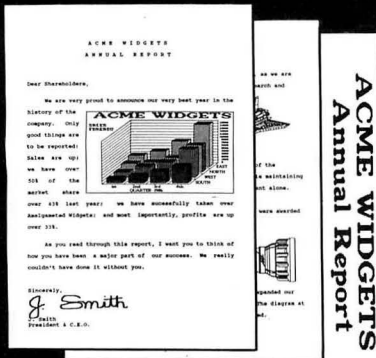
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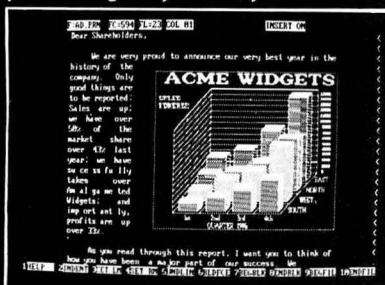


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Table 1: The dBASE manual states that INKEY() returns a value of 28 for the function key <F1>. Here are the values that INKEY() returns for the other function keys.

Keys	Values
<F2> to <F10>	-1 to -9
<Shift>-<F1> to <Shift>-<F10>	84 to 93
<Ctrl>-<F1> to <Ctrl>-<F10>	94 to 103
<Alt>-<F1> to <Alt>-<F10>	104 to 113

```
echo off
pstat
if errorlevel 1 goto ready
if errorlevel 0 goto notready
:ready
dir > prn
goto exit
:notready
echo ***** Printer is not ready! *****
:exit
echo on
```

Listing 3: This sample batch file demonstrates how to check the ERRORLEVEL value returned by PSTAT.COM.

Printer Status via Errorlevel

Because there is no way to check printer status from within a DOS batch file, I wrote a very short program called PSTAT.COM that determines whether the printer connected to LPT1 is ready to receive data. After the program is called, the printer's status can be checked by testing ERRORLEVEL.

PSTAT sets ERRORLEVEL to 0 if the printer is not ready to receive data or to 1 if the printer is ready. PSTAT can be used with an AUTOEXEC.BAT file as a re-

minder to turn the printer on before beginning a session or within batch files that use DOS redirection commands for printing.

Remember that a batch file must test for the largest ERRORLEVEL first. [An example of how to use PSTAT and check the returned ERRORLEVEL is shown in Listing 3, a simple batch file.]

Bill Norswether, Jr.
Chicago, Illinois

(continues)

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xxxx:0100 **SUB AL,AL** ; Clear register AL

xxxx:0102 **MOV AH,02** ; Prepare Int 17 call to read status

xxxx:0104 **MOV DX,0000** ; ...of printer on port 0 (LPT1)

xxxx:0107 **INT 17** ; Get printer status

xxxx:0109 **CMP AH,90** ; Is printer busy or not selected?

xxxx:010C **JNZ 0110** ; If so, skip next line

xxxx:010E **MOV AL,01** ; Set ERRORLEVEL return code to 1

xxxx:0110 **MOV AH,4C** ; Prepare DOS call EXIT

xxxx:0112 **INT 21** ; Exit to DOS

xxxx:0114

-N PSTAT.COM

-R CX

CX 0000

:14

-W

Writing 0014 bytes

-Q

Figure 1: To create PSTAT.COM, a simple utility that returns an ERRORLEVEL of 1 if the LPT1 printer is ready, load DEBUG and enter the bold text shown here, pressing <Enter> at the end of each line.

Editor's note: To create PSTAT.COM, load DEBUG from a copy of the DOS Supplemental Programs disk or from your hard disk. Then enter the text shown in bold in Figure 1, pressing <Enter> at the end of each line, including the line that ends with ':0114'. Don't bother typing in the remarks (which begin with semicolons), because DEBUG doesn't see them. Note also that you can ignore the value xxxx, which varies from machine to machine but does not affect the creation of PSTAT.COM.

files, and wondering how much space a set of files would require (but not wanting to drag out a calculator), I wrote FSR.COM. FSR determines how many bytes are needed on 360K and 1.2MB floppy disks and on hard disk drives to save one, some, or all of the files stored on a particular disk or directory.

Without parameters, FSR provides information on the default drive and directory. A typical example is shown in Figure 2. The first line indicates the actual number of bytes used by the files. The second, third, and fourth lines indicate how many bytes are needed to store the files on the various media. Storage requirements vary

(continues)

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due to the different minimum storage allocation units, usually referred to as cluster size, of each medium. The cluster sizes for the 360K and 1.2MB disks are 1024 and 512 bytes, respectively. The cluster size for a hard disk is typically 2048, 4096, or 8192 bytes, depending on the hard disk's capacity and the DOS version. This means that a 1-byte file occupies 512 to 8192 bytes of floppy or hard disk space. FSR determines the actual cluster size for the default or selected drive.

FSR can also be used with optional drive and/or path and file name parameters. The syntax is FSR [drive:][\path\filename]. The file name can include the wild-card characters ? and *. For example, FSR C:\BASIC*.BAS displays the file storage requirements for all files with a .BAS file name extension in the BASIC directory of drive C:. If a path other than the root (\) is specified, then a file name must also be included. For example, FSR \BASIC*. * displays requirements for all files in the BASIC directory of the default drive. FSR \ displays requirements for all files in the root directory of the default drive.

The FSR assembly language listing [Listing 4] includes comments describing the internal operation of the program. FSR.ASM can be compiled with the IBM or Microsoft assembler. However, it's probably easier to create

(continues)

197642 bytes in 36 file(s)
217088 bytes on 360KB diskette(s)
206848 bytes on 1.2MB diskette(s)
237568 bytes on default/selected drive and/or
directory with cluster size of 2048 bytes

Figure 2: Sample output displayed by FSR.COM

```
;FSR.ASM
;Program to determine how many bytes are needed on 360K and 1.2MB disk
;to save all or specified files stored on a default or selected disk drive
;and/or directory with the indicated cluster size
;compile: MASM FSR; link: LINK FSR; convert to .COM: EXE2BIN FSR FSR.COM

cseg          segment para 'code'
              assume cs:cseg
main          proc      far
              org       100h
start:        jmp      begin

header        db        10,' File Storage Requirements  FSR '
              db        '[drive:][\path\filename]',13,10,'$'
drive         db        0,': '
root          db        '\ '
global        db        ' *.* '
buffer        db        65 dup(0)
tot_bytes     dw        0,0
filect        dw        0           ;number of files
dsk36_bloks   dw        0           ;1024 bytes/block
dsk12_bloks   dw        0           ;512 bytes/block
defsel_bloks  dw        0           ;cluster bytes/block
cluster       dw        0           ;bytes/cluster
asc_bytes     db        10,8 dup(0),' bytes in '
asc_files     db        4 dup(0),' file(s)',13,10
asc_dsk36     db        8 dup(0),' bytes on 360K disk(s)',13,10
asc_dsk12     db        8 dup(0),' bytes on 1.2MB disk(s)',13,10
asc_defsel    db        8 dup(0),' bytes on default/selected disk drive and/or '
              db        ' directory',13,10,'          with cluster size of '
asc_clus      db        6 dup(0),' bytes',13,10,'$'
errmsg        db        10,' Invalid parameter(s) '
              db        'or file(s) not found',13,10,'$'

begin:        lea        dx,header      ;print header
              mov        ah,9           ;call DOS display
              int        21h           ; string service

;get current drive

              lea        di,drive       ;storage area for drive
              lea        dx,global      ;we may need this address later
              mov        ah,19h         ;call DOS report current
              int        21h           ; drive service
              add        al,41h         ;convert to ASCII
              stosb                    ;store it

;check for parameters

              cld                        ;clear direction flag
              lea        di,buffer      ;set up register for storage
              mov        si,80h         ;start of data transfer area
              lodsb                    ;get first byte
```

(continues)

Listing 4: This assembly language program, FSR.ASM, calculates the number of free bytes needed to copy a set of files from a particular disk or directory onto floppy and hard disks.

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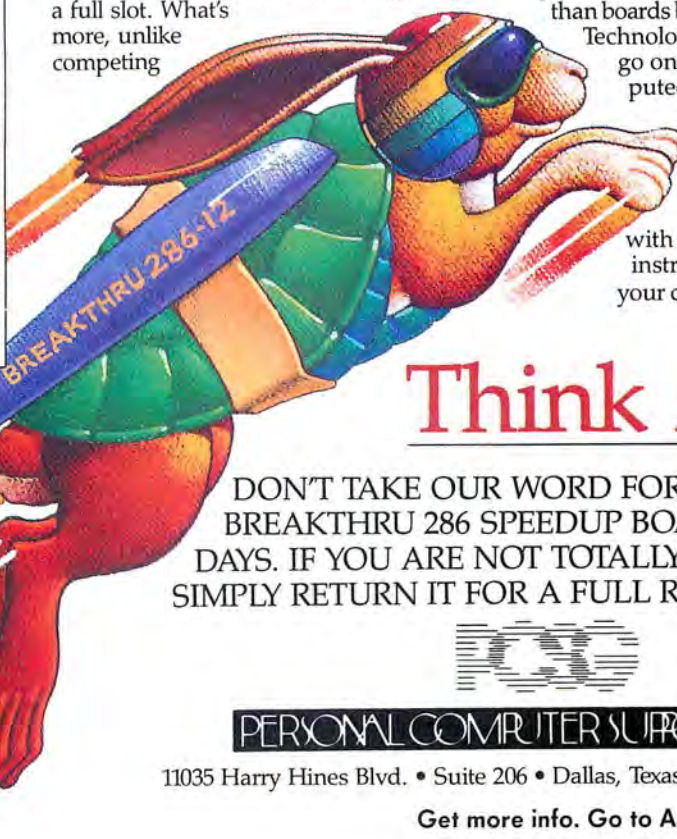
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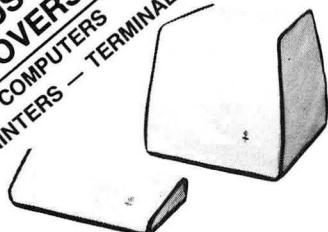
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```

cmp     al,0                ;no parameters entered?
jnz     aa1                ;yes - parameters were entered
call    add_global         ;no - add global chars
jmp     find_clus          ;proceed with search
aa1:    cmp     al,2        ;did user enter just '/'?
jnz     aa3                ;no
inc     si
lodsb
cmp     al,'\'             ;yes - backslash entered?
jz      aa2                ;yes
jmp     error              ;no - error exit
aa2:    lea     si,drive     ;move drive, '/' and
mov     cx,6               ; global chars into buffer
rep     movsb
jmp     find_clus
aa3:    cmp     al,3        ;did user enter just a drive?
jnz     aa7                ;no
inc     si
lodsb
or      al,20h             ;yes - make lowercase if not
already
cmp     al,'a'             ;is it a or greater?
jge     aa4                ;yes
jmp     error              ;no - error exit
aa4:    cmp     al,'o'      ;is it o or less?
jle     aa5                ;yes
jmp     error              ;no - error exit
aa5:    stosb              ;store drive letter
lodsb              ;get next byte
cmp     al,':'             ;is it a colon?
jz      aa6                ;yes
jmp     error              ;no - error exit
aa6:    stosb              ;store it
call    add_global         ;add global chars to buffer
jmp     find_clus
aa7:    cmp     al,4        ;did user enter drive, ':' and '\'?
jnz     aa8                ;no
inc     si               ;yes - get next byte
mov     cx,3              ;get all 3 chars
rep     movsb
call    add_global         ;add global chars to drive, ':', '\'?
jmp     find_clus
aa8:    inc     si          ;user must have entered a path
aa9:    lodsb              ;load character
cmp     al,0dh             ;is it end of entry (ASCII 0)?
jz      find_clus          ;yes
stosb              ;no - store character
jmp     aa9               ;get another byte

;find cluster size on default/selected drive

find_clus: mov     si,[80h] ;start of data transfer area
mov     di,[si]            ;get first byte
cmp     dl,2               ;0, 1, or 2 parameters entered?
jle     bb1                ;yes, default drive requested
mov     di,[si+2]          ;see if drive letter or '\? entered
cmp     dl,'\'             ;was it '\'?
je      bb1                ;yes - default drive requested
mov     di,[si+3]          ;examine next byte
cmp     dl,':'             ;was it ':'?
jne     bb1                ;no - default drive requested
mov     di,[si+2]          ;yes - second byte contains drive letter
jmp     bb2                ;no - drive letter entered
bb1:    mov     di,0         ;default drive
bb2:    and     dl,0Fh       ;convert to drive number (1=a, etc.)
mov     ah,36h             ;call DOS get disk free
int     21h                ; space service
mul     cx                  ;(bytes/sector)*(sectors/cluster)
mov     cluster,ax         ;store cluster size (bytes)

;get file and byte totals

lea     dx,buffer          ;start of pathname in memory
mov     cx,20h             ;attribute to search for
mov     ah,4Eh             ;call DOS find first-start file
int     21h                ; search service

```

(continues)

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```

        jnc     found_first      ;file found - proceed to find next
        jmp     error           ;no file found or invalid path
found_first: call    tally       ;add to running total
find_next:  mov     ah,4Fh      ;call DOS continue file
            int     21h         ; search service
            jc      filect_up   ;no more files found
            call    tally       ;add to running total
            jmp     find_next   ;look for another
filect_up:  mov     ax,tot_bytes ;low word of total bytes
            mov     dx,tot_bytes+2 ;high word of total bytes
            lea     di,asc_bytes+8 ;end of output string
            call    ascii       ;convert to ASCII

            mov     ax,filect   ;get total number of files
            xor     dx,dx       ;clear high word
            lea     di,asc_files+3 ;end of output string
            call    ascii       ;convert to ASCII

            mov     ax,dsk36_bloks ;total blocks for 360K disk
            mov     bx,400h     ;bytes/cluster (1024)
            mul     bx          ;obtain total bytes
            lea     di,asc_dsk36+7 ;end of output string
            call    ascii       ;convert to ASCII

            mov     ax,dsk12_bloks ;total blocks for 1.2MB disk
            mov     bx,200h     ;bytes/cluster (512)
            mul     bx          ;obtain total bytes
            lea     di,asc_dsk12+7 ;end of output string
            call    ascii       ;convert to ASCII

            mov     ax,defsel_bloks ;total blocks for default/selected disk
            mov     bx,cluster  ;bytes/cluster
            mul     bx          ;obtain total bytes
            lea     di,asc_defsel+7 ;end of output string
            call    ascii       ;convert to ASCII

            mov     ax,cluster    ;cluster size
            xor     dx,dx         ;clear high word
            lea     di,asc_clus+5 ;end of output string
            call    ascii       ;convert to ASCII

            lea     dx,asc_bytes  ;start of printout
            jmp     exit

error:      lea     dx,errmsg
exit:      mov     ah,9           ;call DOS display string
            int     21h         ; service
            int     20h         ;call DOS program terminate service

main        endp

;subroutines

add_global  proc     near        ;add '.*'
            xchg    si,dx        ;location of global chars
            mov     cx,3         ;number of chars

rep         movsb
            ret

add_global  endp

tally       proc     near        ;accumulate byte and block totals
            xor     dx,dx        ;clear register
            inc     filect       ;add 1 more file to file count
            mov     bp,9Ah       ;location of files in psp
            mov     ax,[bp]      ;get low word
            mov     dx,[bp+2]    ;get high word
            add     tot_bytes,ax ;add low word to total
            jnc     no_carry     ;
            inc     tot_bytes+2  ;add 1 to high word
no_carry:   add     tot_bytes+2,dx ;add high word to total

            mov     bx,400h      ;bytes/cluster for 360K disk
            mov     cx,dsk36_bloks ;current block count
            call    tally2       ;update block count
            mov     dsk36_bloks,cx ;store new block count

```

(continues)

Listing 4 (continued)



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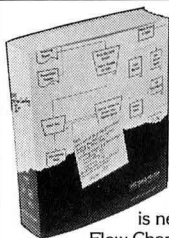


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```

mov     bx,200h           ;bytes/cluster for 1.2MB disk
mov     cx,dsk12_bloks    ;current block count
call    tally2            ;update block count
mov     dsk12_bloks,cx    ;store new block count

mov     bx,cluster        ;bytes/cluster for default/selected disk
mov     cx,defsel_bloks    ;current block count
call    tally2            ;update block count
mov     defsel_bloks,cx   ;store new block count

tally   ret
endp

tally2   proc    near      ;update block count
push    dx               ;save for next step
push    ax               ;save for next step
div     bx               ;divide by cluster size
cmp     dx,0             ;is there a remainder?
jz      aak              ;no
inc     cx               ;yes - add another block to total
aak:    add     cx,ax      ;add number of blocks to total
pop     ax               ;get back low word
pop     dx               ;get back high word
ret
tally2   endp

ascii    proc    near      ;32-bit binary integer to ASCII
;low word in ax, high word in dx
;ASCII output ptr (lsd first) in di
;save high word in bp
xchg    bp,dx            ;divisor (10) in bx
mov     bx,0Ah           ;conversion for ASCII in cl
asc1:    cmp     bp,0      ;done with high words?
jz      asc2             ;yes
xchg    bp,ax            ;no - high word in ax, low word in bp
xor     dx,dx            ;clear register
div     dx,dx            ;divide high word by 10
xchg    bp,ax            ;new high word in bp, low word in ax
div     bx               ;div low word + high word remainder
or      dl,cl            ;convert remainder to ASCII
mov     [di],dl          ;quotient into storage
dec     di               ;step back 1 byte
jmp     asc1             ;go again
asc2:    xor     dx,dx    ;clear register
div     dx,dx            ;divide low word by 10
or      dl,cl            ;convert remainder to ASCII
mov     [di],dl          ;quotient into storage
dec     di               ;step back 1 byte
cmp     ax,0             ;are we done?
jnz     asc2             ;no
ret
;yes - return
ascii    endp

cseg     ends
end      start

```

Listing 4 (continued)

```

1000 DATA "FSR.COM"
1010 DATA 1,E9,96,01,0A,20,46,69,6C,65,20,53,74,6F,72,61,67,-1,21
1020 DATA 2,65,20,52,65,71,75,69,72,65,6D,65,6E,74,73,20,20,-1,EA
1030 DATA 3,46,53,52,20,5B,64,72,69,76,65,3A,5D,5B,5C,70,61,-1,7E
1040 DATA 4,74,68,5C,66,69,6C,65,6E,61,6D,65,5D,0D,0A,24,00,3A,-1,04
1050 DATA 5,5C,2A,2E,2A,*79,0A,-1,38
1060 DATA 6,*8,20,62,79,74,65,73,20,69,-1,83
1070 DATA 7,6E,20,*4,20,66,69,6C,65,28,73,29,0D,0A,-1,92
1080 DATA 8,*8,20,62,79,74,65,73,20,6F,-1,8F
1090 DATA 9,6E,20,33,36,30,4B,42,20,64,69,73,6B,65,74,74,65,-1,82
1100 DATA 10,28,73,29,0D,0A,*8,20,62,79,-1,EB

```

(continues)

Listing 5: Merge these DATA lines with X-MAKER2.BAS (Listing 6) to create FSR.COM using BASIC.

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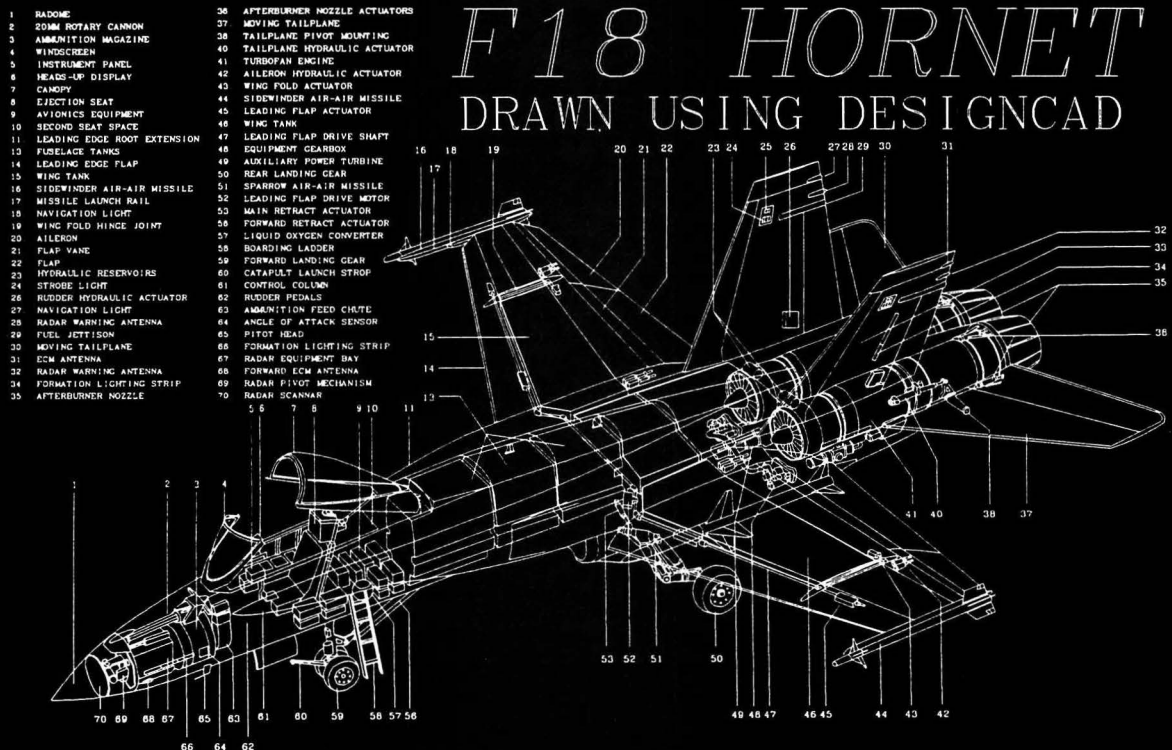
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Listing 5 (continued)

```

1110 DATA 11,74,65,73,20,6F,6E,20,31,2E,32,4D,42,20,64,69,73,-1,E9
1120 DATA 12,68,65,74,74,65,28,73,29,0D,0A,*8,20,-1,DC
1130 DATA 13,62,79,74,65,73,20,6F,6E,20,64,65,66,61,75,6C,74,-1,90
1140 DATA 14,2F,73,65,6C,65,63,74,65,64,20,64,69,73,68,20,64,-1,74
1150 DATA 15,72,69,76,65,20,61,6E,64,2F,6F,72,20,64,69,72,65,-1,AE
1160 DATA 16,63,74,6F,72,79,0D,0A,20,20,20,20,20,20,20,20,-1,30
1170 DATA 17,77,69,74,68,20,63,6C,75,73,74,65,72,20,73,69,7A,-1,9D
1180 DATA 18,65,20,6F,66,*6,20,62,79,74,65,73,-1,2A
1190 DATA 19,0D,0A,24,0A,20,49,6E,76,61,6C,69,64,20,70,61,72,-1,8D
1200 DATA 20,61,6D,65,74,65,72,28,73,29,20,6F,72,20,66,69,6C,-1,88
1210 DATA 21,65,28,73,29,20,6E,6F,74,20,66,6F,75,6E,64,0D,0A,-1,C7
1220 DATA 22,24,80,16,03,01,B4,09,CD,21,8D,3E,3F,01,8D,16,42,-1,FE
1230 DATA 23,01,B4,19,CD,21,04,41,AA,FC,8D,3E,45,01,8E,8D,00,AC,-1,31
1240 DATA 24,3C,00,75,06,E8,0A,01,EB,59,90,3C,02,75,15,46,AC,-1,78
1250 DATA 25,3C,5C,74,03,E9,F0,00,8D,36,3F,01,89,06,00,F3,A4,-1,EF
1260 DATA 26,EB,40,90,3C,03,75,22,46,AC,0C,20,3C,61,7D,03,E9,-1,CC
1270 DATA 27,D5,00,3C,6F,7E,03,E9,CE,00,AA,AC,3C,3A,74,03,E9,-1,47
1280 DATA 28,C5,00,AA,E8,CB,00,EB,1A,90,3C,04,75,0C,46,B9,03,-1,6C
1290 DATA 29,00,F3,A4,E8,BB,00,EB,0A,90,46,AC,3C,0D,74,03,AA,-1,FB
1300 DATA 30,EB,F8,BE,8D,00,8A,14,80,FA,02,7E,0B,8A,54,02,8D,-1,1F
1310 DATA 31,FA,5C,74,03,EB,03,90,B2,00,8D,E2,0F,B4,36,CD,21,-1,76
1320 DATA 32,F7,E1,2E,A3,92,01,8D,16,45,01,89,20,00,84,4E,CD,-1,2F
1330 DATA 33,21,73,03,EB,72,90,EB,8D,00,84,4F,CD,21,72,05,EB,-1,DC
1340 DATA 34,77,00,EB,F5,2E,A1,86,01,2E,8B,16,88,01,8D,3E,9C,-1,76
1350 DATA 35,01,EB,CB,00,2E,A1,8A,01,33,D2,8D,3E,AA,01,EB,8B,-1,59
1360 DATA 36,00,2E,A1,8C,01,8B,00,04,F7,E3,8D,3E,BC,01,EB,AB,-1,EA
1370 DATA 37,00,2E,A1,8E,01,8B,00,02,F7,E3,8D,3E,E1,01,EB,9B,-1,59
1380 DATA 38,00,2E,A1,90,01,2E,8B,1E,92,01,F7,E3,8D,3E,06,02,-1,F1
1390 DATA 39,EB,89,00,2E,A1,92,01,33,D2,8D,3E,61,02,EB,7C,00,8D,-1,91
1400 DATA 40,16,94,01,EB,05,90,8D,16,68,02,84,09,CD,21,CD,20,-1,6D
1410 DATA 41,87,F2,B9,03,00,F3,A4,C3,33,D2,2E,FF,06,8A,01,8D,-1,E5
1420 DATA 42,9A,00,8B,46,00,8B,56,02,2E,01,06,86,01,73,05,2E,-1,1D
1430 DATA 43,FF,06,88,01,2E,01,16,88,01,8B,00,04,2E,8B,0E,8C,-1,89
1440 DATA 44,01,EB,28,00,2E,89,0E,8C,01,8B,00,02,2E,8B,0E,8E,-1,83
1450 DATA 45,01,EB,18,00,2E,89,0E,8E,01,2E,8B,1E,92,01,2E,8B,-1,8F
1460 DATA 46,0E,90,01,EB,06,00,2E,89,0E,90,01,C3,52,50,F7,F3,-1,5E
1470 DATA 47,83,FA,00,74,01,41,03,C8,58,5A,C3,87,EA,BB,0A,00,81,-1,2A
1480 DATA 48,30,83,F0,00,74,0F,95,33,D2,F7,F3,95,F7,F3,0A,01,-1,57
1490 DATA 49,88,15,4F,EB,EC,33,D2,F7,F3,0A,01,88,15,4F,3D,*2,75,-1,08
1500 DATA 50,F2,C3,-1,53,-1

```

Listing 6: X-MAKER2.BAS, *.*'s program-making program

(continues)

```

10 DEFINT A-Z : KEY OFF : DEF FNHEX(X$)=VAL("&h"+X$)
20 MSG$="Now testing for data errors...please wait" : GOSUB 190
30 SUM=0 : READ LN : IF LN<0 THEN 80
40 READ H$ : IF VAL(H$)<0 THEN 70
50 IF LEFT$(H$,1)="" THEN GOSUB 210 : GOTO 40
60 SUM=(SUM+FNHEX(H$))*2 : SUM=(SUM\256)+(SUM MOD 256) : GOTO 40
70 READ CKSUM$ : IF (SUM MOD 256)=FNHEX(CKSUM$) THEN 30 ELSE GOTO 170
80 MSG$="Press any key except ESC to create "+FS$+" : "
90 GOSUB 190 : AS=INPUT$(1) : PRINT : IF AS=CHR$(27) THEN END
100 LOCATE 6,1 : PRINT "Working..."
110 OPEN FS$ AS #1 LEN=1 : FIELD #1,1 AS BX$
120 READ LN : IF LN<0 THEN 160
130 READ H$ : IF VAL(H$)<0 THEN READ CKSUM$ : GOTO 120
140 IF LEFT$(H$,1)="" THEN GOSUB 240 : GOTO 130
150 LSET BX$=CHR$(FNHEX(H$)) : PUT #1 : GOTO 130
160 CLOSE : PRINT : PRINT FS$+" has now been created." : END
170 PRINT : PRINT "Error in DATA line";STR$(LN);" : "
180 PRINT "Check your work." : BEEP : END
190 CLS : LOCATE 3,1 : PRINT "X-Maker II" : RESTORE : READ FS$
200 LOCATE 5,1,1 : PRINT MSG$ : RETURN
210 ZZ=VAL(MID$(H$,2)) : FOR I=1 TO ZZ
220 SUM=SUM*2 : SUM=(SUM\256)+(SUM MOD 256)
230 NEXT : RETURN
240 ZZ=VAL(MID$(H$,2)) : FOR I=1 TO ZZ
250 LSET BX$=CHR$(0) : PUT #1 : NEXT : RETURN

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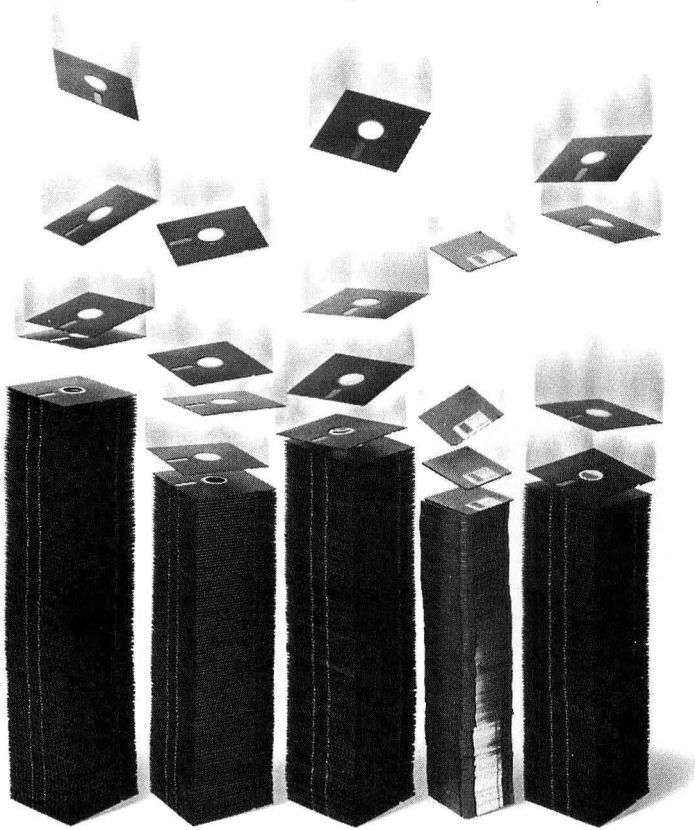
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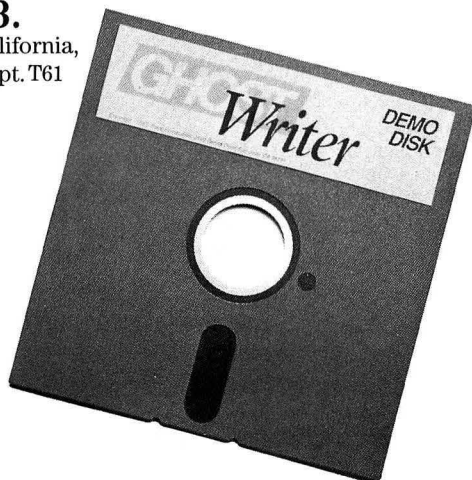
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John D. Haluska
El Segundo, California

Editor's note: FSR.COM is great for determining whether a group of files will fit on a given disk, but if they don't, it can't help you copy the excess files onto a second disk. Nor does FSR.COM take into account files in directories beneath the one being investigated. To learn how to copy a hard disk directory's files and, optionally, its subdirectories' files, see "Floppy Copy of Hard Files" in this month's Help Screen.

<F7> Defined

The user guide that comes with DOS explains how to use the DOS editing keys **<F1>** through **<F5>**, and the DOS manual tells us that under DOS, **<F6>** is defined as Control Z, the end-of-file character (ASCII 26). Undocumented, however, is **<F7>**, which produces a Control @, the null character (ASCII 0). (If you press **<F7>** in DOS, **^@** is displayed.)

(continues)

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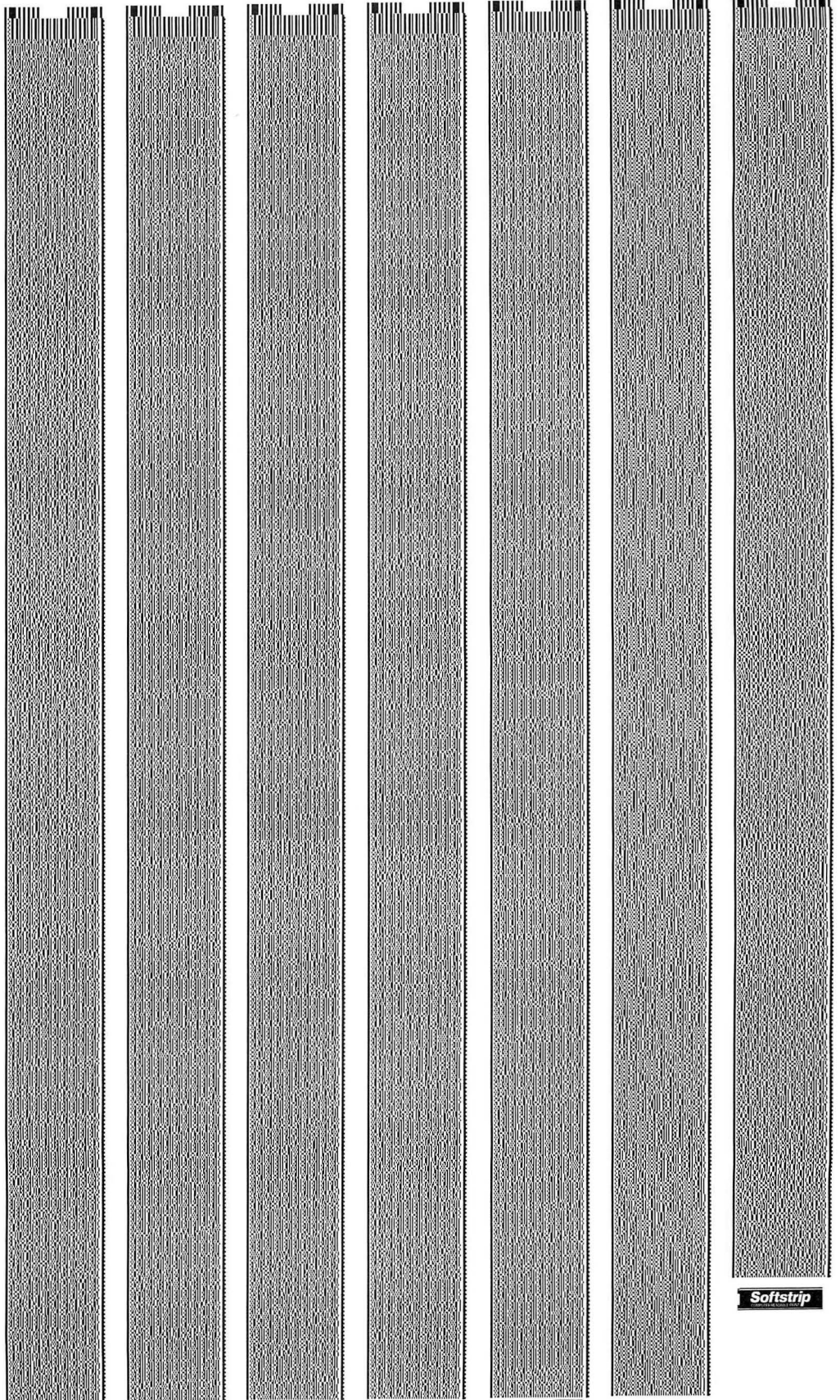
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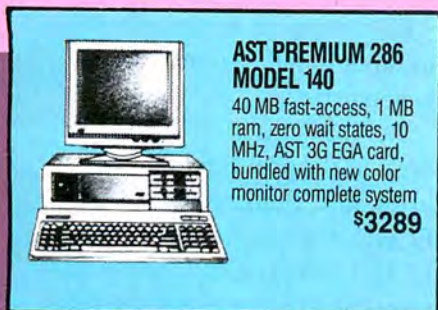
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<F7> seems to be the only way to input a null character from the keyboard.

Recent items in *.* have addressed the problem of echoing a blank line. I recommend using ECHO ^@ (created by entering ECHO and pressing <F7>). At run time this command will echo a carriage return and a linefeed neatly and cleanly. Now that other readers know what <F7> does, they may find other uses for keyboard input of the null character.

Jim Esser

San Jose, California

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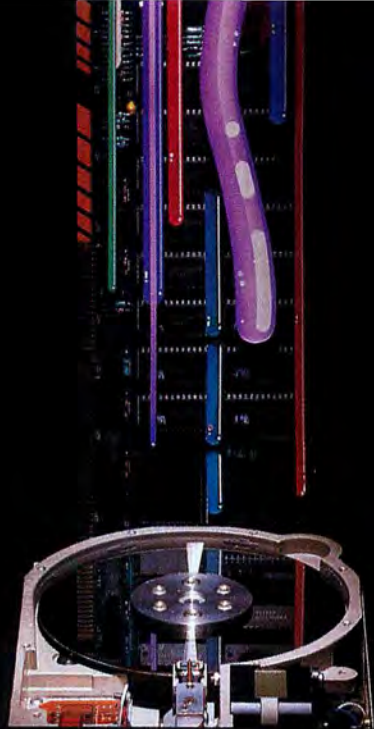


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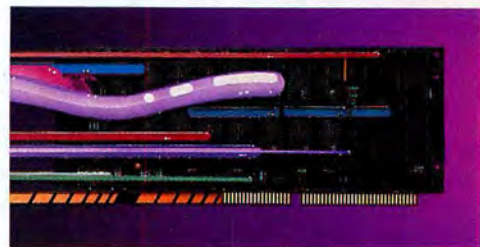
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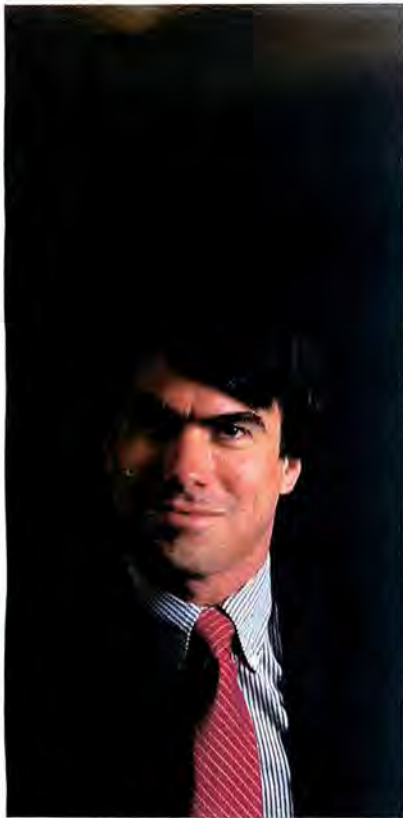
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Kevin Strehlo

GEMs in the Rough

Digital Research, the company that tried to do it all, plans a quiet comeback.

Sitting alone in the Las Vegas airport bar, John Rowley, the young president of Digital Research (DRI), waited for his flight back to Monterey, California. When I offered to buy him a drink, Rowley welcomed me to the table.

It was January 1985. Two days before, Rowley had been uncharacteristically restrained on the Consumer Electronics Show floor as he demonstrated DRI's *Graphics Environment Manager (GEM)* operating environment on the hot new Atari ST. But *GEM* turned out to be a hit at the show, and now Rowley was expansive. *GEM*, whose PC version had been announced two months before, would unify all the personal computers in the marketplace. It would become *the* environment for software developers.

In the glory days, DRI's CP/M had been *the* microcomputer operating system. Now it was a relic. Its next generation, CP/M-86, had never taken off in the United States, though it showed surprising strength in Europe. Concurrent CP/M-86, the multitasking operating system that followed,

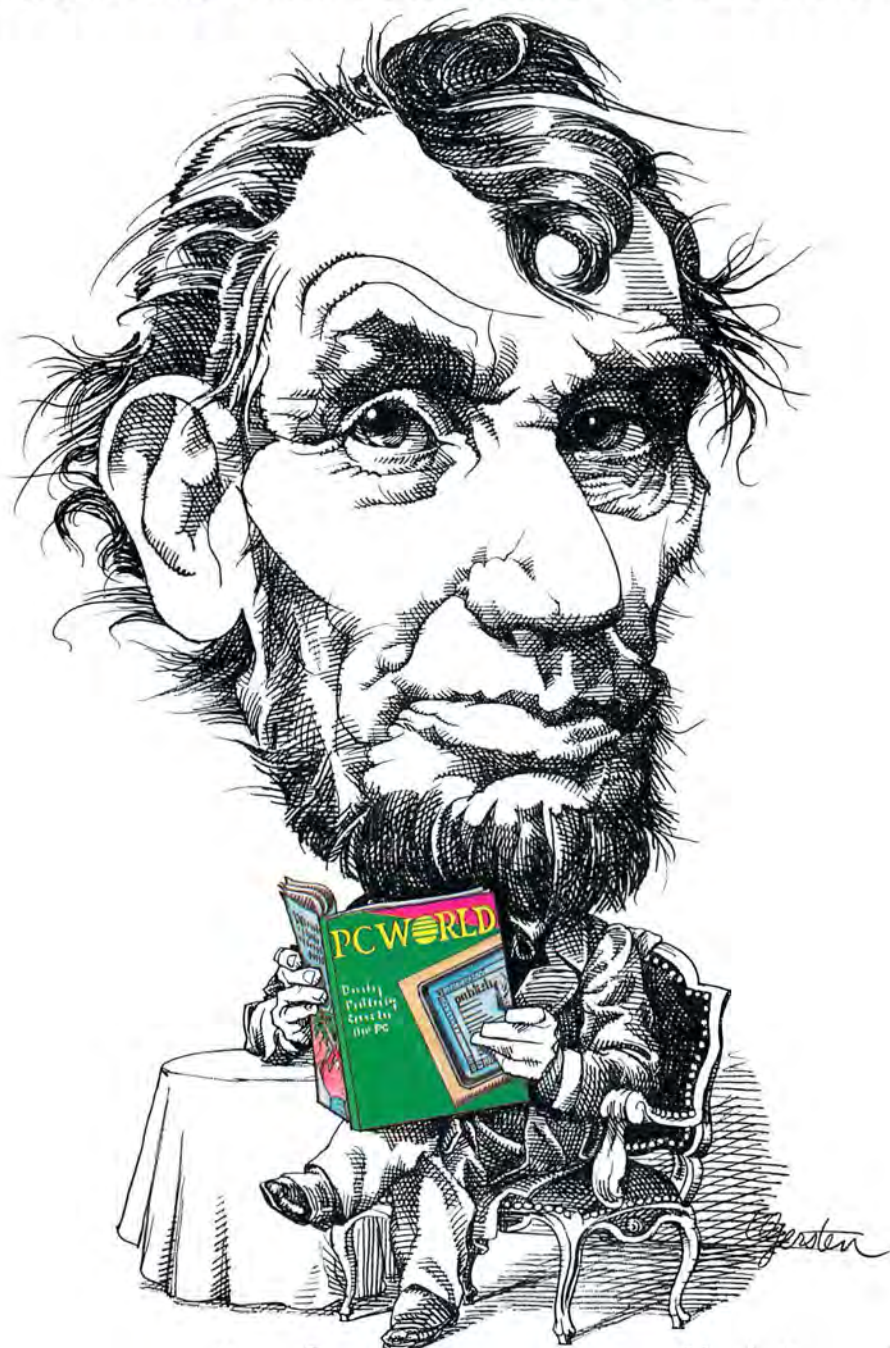
seemed ahead of the standard PC hardware.

Some observers blame Rowley for the company's decline. They can't understand why CP/M programmer Gary Kildall and his wife, Dorothy McEwan, who handled the business side, handed over the reins to Rowley, a young, relatively inexperienced manager from Intel.

Other outsiders traced DRI's decline to a pre-Rowley incident—the day Kildall went flying instead of meeting the IBM team from Boca Raton, Florida. Kildall flew to a long-standing business appointment in San Jose, California, leaving McEwan to negotiate with the potential customer, as was customary. A hitch developed—McEwan and DRI's lawyer didn't like the agreement IBM asked them to sign, namely, the standard IBM secrets disclaimer exempting Big Blue from legal action if the behemoth happened to develop something that resembled products discussed at the meeting.

(continues)

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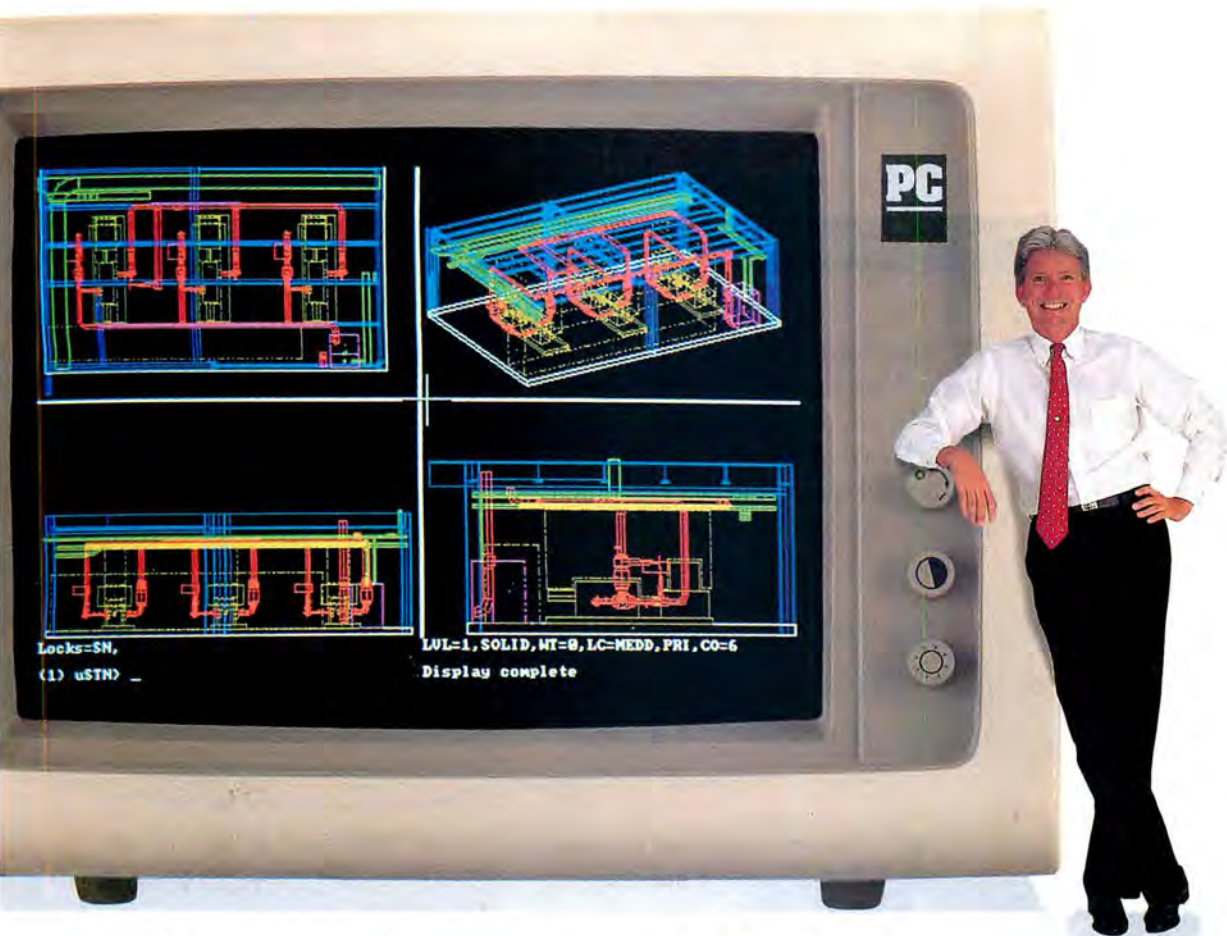
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When DRI hesitated, IBM postponed plans to buy CP/M for its new personal computer. Within weeks, Microsoft's Bill Gates seized the opportunity by acquiring a CP/M clone soon dubbed MS-DOS.

The industry had left DRI behind, and Rowley knew it.

"We're coming back strong," he bluffed, downing his drink. He claimed that the Atari GEM would run on the PC with minor alterations and suggested that

with Don Heiskell, head of the graphics group. Beebe hoped that Heiskell, noted for writing small, fast programs, would balance Lorenzen's penchant for creating brilliant interfaces that used huge amounts of code.

"At first, it was a marriage made in hell," Beebe says. Personally and professionally, the long-haired Heiskell and the preppy Lorenzen clashed. But over time they began to complement each other and became fast friends. They dubbed their software *Crystal*, in response to rumors about the IBM *Glass* product that later surfaced as *TopView*.

Still, *Crystal* languished until Gary Kildall decided to show it off at an industry forum in Phoenix. Working around-the-clock one weekend, Kildall helped create the first real demo. But still he doubted DRI could afford to make *Crystal* shine. Beebe convinced Kildall that his two crack programmers were better suited for the job than was a large team. *Crystal* received the go-ahead, and Tom Byers joined the pair.

Running first on an Apple Lisa, the skunk works program got a boost when Atari executive Sam Tramiel, who had come to see another demonstration, caught a glimpse of *Crystal*. "We want it," he said simply. Atari paid to have the software finished for the 68000 microprocessor, and that sale funded the 8086 version as well.

By the time GEM finally went out the door, excitement had spread through DRI. "Everyone

(continues)

'Rowley was first and foremost a salesman,' noted one DRI insider, who was certain Apple hadn't seriously considered reselling GEM.

As the personal computer market coalesced around MS-DOS and the PC, Microsoft grew stronger. DRI, meanwhile, had too many balls in the air. "We had all kinds of things to support," Kildall recalls. "There were all the versions of CP/M, which were still bringing in pretty decent revenues. But there were also lots of products that weren't—different versions of linkage editors, languages on an array of different processors, and so forth."

The result was a company that sprawled across the entire microcomputer map. "And there just weren't enough experienced people to hire," says Kildall. The company remained a reflection of the industry at an earlier stage—a gangly adolescent.

Kildall points out that it's all too easy to blame the captain of DRI's ship for rough weather, and he has nothing but kind words for Rowley. Still, it's clear that the glowing picture Rowley painted that day in the Las Vegas airport was merely a vain attempt to recapture the glory of DRI's youth.

IBM was very interested in reselling GEM. Then he leaned forward and said in a lowered voice, "You know, Apple is close to going with GEM, too."

Years later, I drew a laugh when I told a DRI alumnus about the meeting. "Rowley was always first and foremost a salesman," noted one DRI insider, who was certain Apple had never seriously considered reselling GEM. "First Rowley would sell himself on an idea, then he'd try to sell the world on it. He must have been practicing the sell on you."

Rowley was a late convert to GEM. He had originally planned to push Concurrent PC-DOS at fall COMDEX 1984. Tom Byers, GEM product manager, feared GEM wouldn't be in the DRI booth at all, but he got his chance when Concurrent CP/M-86 was delayed.

"[GEM] was definitely a skunk works project from day one," recalls Allan Beebe, former DRI head of languages, operating systems, and graphics. It was Beebe who matched Lee Lorenzen, "a sharp young man" working on operating system user interfaces,

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involved got some major bonuses," Byers says. "I mean, we're talking down payments for houses."

But GEM's light slowly began to fade. Rowley's strategy depended too heavily on selling GEM to IBM's Entry Systems Division. "Much too much energy was spent there," a former manager says. A salesman was even stationed full-time in Boca Raton, but he didn't succeed. Whether IBM was too committed to its

ket GEM leaked to the trade press, and IBM withdrew support. Second, when Apple leaned on DRI about GEM's resemblance to the Macintosh user interface, DRI agreed to stop shipping the program until it was changed. Third, bowing to the Apple onslaught and cash-flow concerns, DRI withdrew advertising from September to December 1985. Instead of enjoying a big Christmas season, GEM Draw sales dropped to one-quarter of what they had been

Meanwhile, confusion in the operating environment arena may let GEM sparkle again. More than a million GEM Desktops have been shipped, and now it seems that Presentation Manager, the graphic user interface for Microsoft's new OS/2 operating system, may need to be significantly rewritten for Windows applications. Some software companies will skip Windows and write for Presentation Manager when it becomes available in 1988; that delay may offer an opportunity for GEM.

Even if Presentation Manager takes off immediately, GEM is in good shape, maintains Dick Williams, DRI's new president. DRI is developing a simple translation layer that, he hopes, will allow GEM applications to run on Presentation Manager with fewer changes than those required for Windows applications.

But Ventura's John Meyer may be the Windows bellwether. He acknowledges that if Windows gets a big boost—say, when Microsoft finally releases Excel for the PC—Ventura will have no choice but to move *Ventura Publisher* to Windows, even though it will take a big hit in performance. The current software runs well on an XT; a Windows version would require an AT.

The numbers during Rowley's five years as president make it hard to think of his tenure as a failure. DRI staff went from about 80 to more than 600. Although the company is private and doesn't reveal revenues, the *Soft-Letter* newsletter estimates

The numbers during Rowley's five years as president make it hard to think of his tenure as a failure.

own TopView project or had its eye on Microsoft Windows, GEM's failure was a demoralizing blow.

Many other manufacturers considered GEM but didn't buy, leaving Atari as its only major U.S. customer. GEM's champions suggested taking it retail in a big way, but Rowley wasn't convinced. Says Byers, "I wasn't fired, but I knew I was a marked man. Suddenly the memos didn't come to me anymore."

Ironically, after Byers left DRI to form Turner Hall, publisher of 1-2-3 add-ons, Rowley performed an about-face that puzzled observers, pouring close to a million dollars into advertising GEM. At first GEM products succeeded in retail sales, reports Bill Higgs, the GEM product manager who followed Byers. Then three things happened.

First, an IBM white paper about the company's plan to mar-

during the summer doldrums.

Lorenzen and Heiskell made one last pitch to save their baby. Seeing the success of Aldus's PageMaker on the Macintosh, they asked Rowley to let them develop a GEM-based desktop publishing package. Rowley said there was no way DRI would enter that business, so they left with another DRI employee, John Meyer, and started Ventura Software. Bestseller *Ventura Publisher* was the result.

Ventura Publisher has done as much to keep the GEM environment vibrant as all other third-party GEM packages put together. And following Rowley's departure late last year, DRI has finally come around to attacking that market with the less powerful but easier-to-learn GEM Desktop Publisher.

(continues)

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that sales climbed to \$45 million in 1984 and stayed at that level for a year.

But in 1986 sales dipped to \$29 million. Despite several serious rounds of layoffs, insiders say, DRI was bleeding red. At year's end the board of directors asked Kildall to step in and take over day-to-day management.

Having his hands full with his KnowledgeSet CD ROM venture and knowing that management isn't his strong suit, Kildall began to look for a new president. He found Dick Williams, then an IBM vice president.

Williams knew that DRI suffered from "lousy marketing" and that its U.S. organization was in chaos. Asked to explain why DRI's European operations did so well, he responds simply: "They were farther away from Monterey."

In the end, DRI's technology convinced Williams to take the plunge. If anything, he says, DRI's software has been ahead of hardware technology—a cutting allusion to complaints that Microsoft's OS/2 lags years behind the hardware.

Indeed, IBM's benediction on multitasking may be another opportunity for DRI. The long-awaited OS/2 may well be the platform from which software makes the next great leap forward. But it's a large, shaky platform still under construction.

In contrast, DRI began marketing multitasking operating systems for IBM PCs four years ago and retains a vocal core of loyal customers. They point to Concurrent DOS 286, which IBM bought for sophisticated point-of-sale sys-

tems. Another offering, Concurrent PC-DOS Expanded Memory, broke the 640K memory barrier more than a year ago, letting users with Enhanced Expanded Memory Specification boards run multiple DOS sessions.

Williams has no illusions that this dictates a changing of the guard. Microsoft will continue to thrive unchallenged in the general-purpose operating system market, he concedes. But he hopes that simply by filling niches left open

Williams says DRI's software has been ahead of hardware technology—a cutting allusion to complaints that OS/2 lags years behind.

Some argue that Concurrent products aren't as ambitious as OS/2, but for the short term that may be another plus. "OS/2 is bigger than MVS," says Williams with some amusement. MVS, a high-end IBM mainframe operating system, took less than a megabyte of memory in its initial release. The development version of OS/2 demands 1.5MB. The stack of OS/2 developer's manuals weighs 75 pounds.

Despite its size and complexity, OS/2 can't run multiple sessions of DOS 3.30 programs in the 80386 processor's virtual 8086 mode or exploit the large, unsegmented address space of that chip. DRI's Concurrent DOS 386 has done both since it began shipping in June of this year.

"So what is everyone waiting for?" asks Garry Silvey, president of the Concurrent Users Group, in an open diatribe against OS/2 recently posted on the CompuServe bulletin board. "The bottom line is that developers have a choice. They can do nothing, they can rewrite 95 percent of the software for an operating system that will have a limited life span and questionable market appeal, or they can get behind Concurrent."

by Microsoft, DRI can gain strength and then build from that base toward more general-purpose products.

"That's why Concurrent DOS is focusing on the multiuser operating system application. That's why we have high hopes for the FlexOS real-time operating system in manufacturing. Those are niches we can satisfy better than an operating system aimed at the general-purpose market."

While DRI remains one of the top ten independent microcomputer software houses, few predict that the glory days will return. "Technical excellence is never enough," Williams emphasizes. But his experience at IBM, a company known more for sharp marketing and solid support than for technical excellence, should help. If DRI combines its hard-earned software wizardry with well-focused marketing and support, a long string of good days may lie ahead. ☉

Kevin Strehlo looks for PC tales from an office on the edge of Silicon Valley.

Next in PC World

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386 ROUNDUP

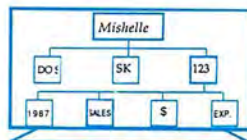
While everyone continues to wait for IBM's vaunted Model 80 to appear, *PC World* reviews 386-based systems that are here now. Computers from PC's Limited, Kaypro, and Acer Technologies are not only challenging the Compaq Deskpro 386 on its own turf, they're heading IBM off at the pass with high-end computing power that's available today.

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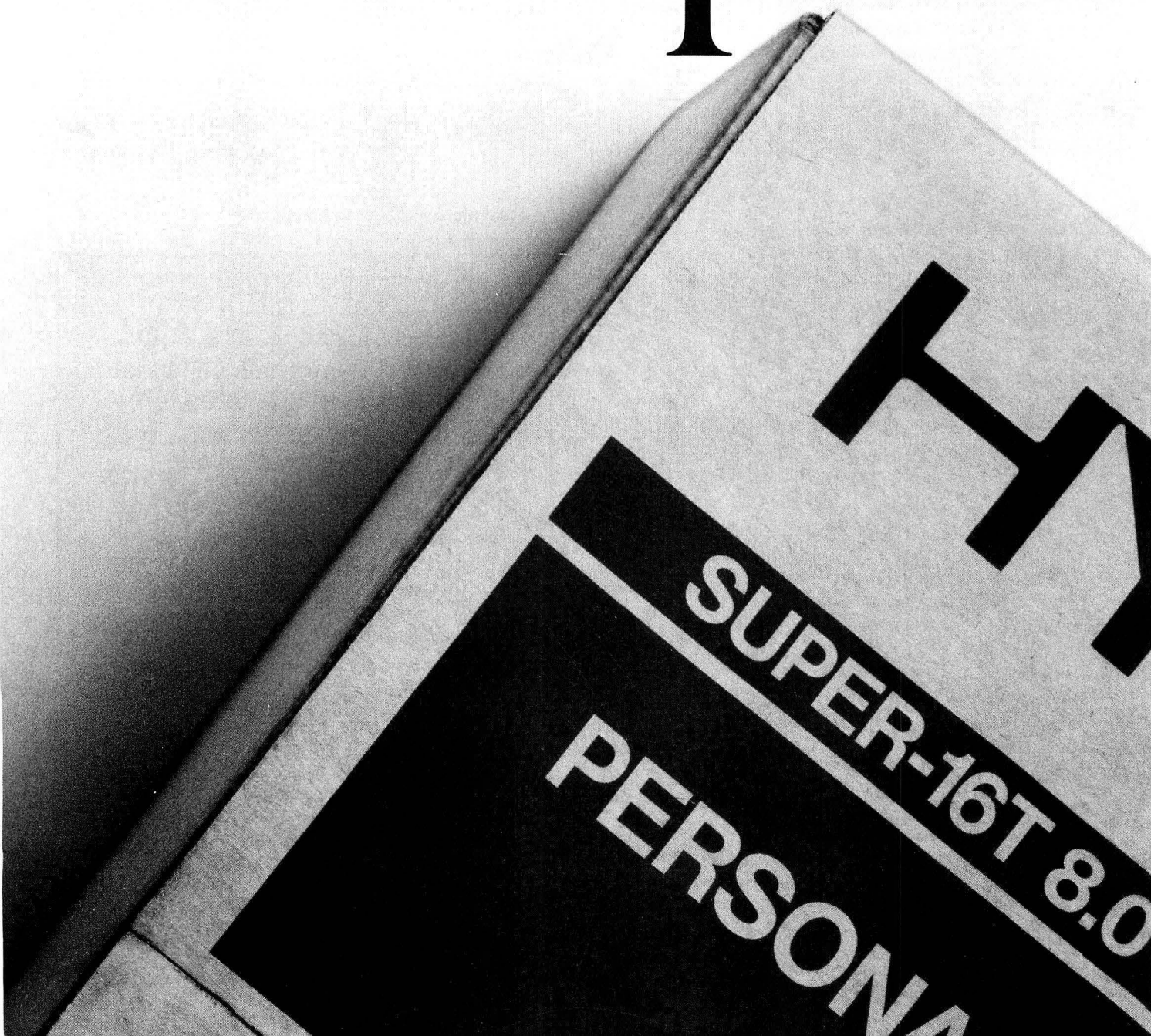
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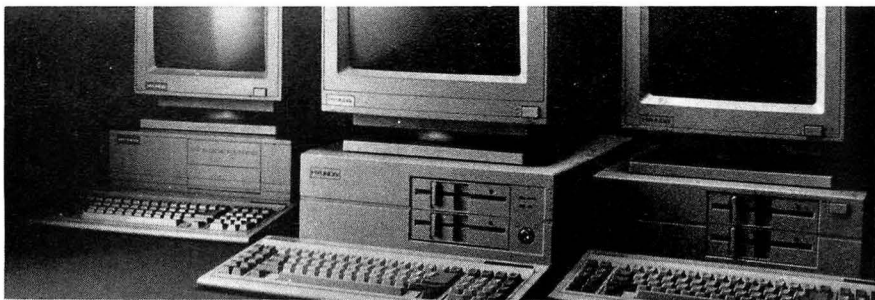


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- Other

2. Number of employees in your company:

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- 26-99
- 100-499
- 500-999
- 1000 or more

3. Plan to buy:

- Now
- In 4-6 months
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- More than 12 months from now
- For reference only

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- 1
- 2-4
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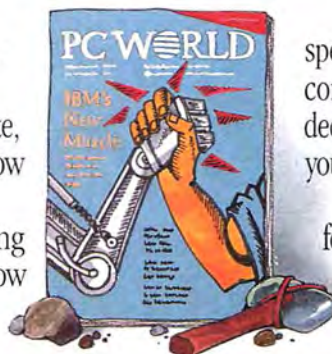
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Jeff Kurzius

Another Angle: A Fractured Fairy Tale

The way computer salespeople tell it, office automation is easy. Just put your money down, spread a few computers around, and productivity will skyrocket.

But it just doesn't work that way. They forget to mention a few things, like disk drive failures, hardware repair bills, software and cabling incompatibilities, and training demands. Once you're computerized, even an empty laser toner cartridge can bring an important project to a halt. But don't call the guy who sold you the printer. He's probably out of the item.

Unlike with most office products, integrating computers into the workplace can't be summed up in a few well-chosen marketing phrases. Hidden problems and hidden costs are everywhere, but all computer companies do is toss buzzwords at you—multitasking, no-wait states, artificial intelligence. "Want to install a LAN? No problem," they say. But when the inevitable problems arise, these guys are as hard to find as a good piece of LAN software.

Computers can't do a thing for productivity until the proper

foundation is laid. Some of the process is incredibly prosaic—setting hardware switches, choosing COM ports and phone lines, installing software. User training is far more bedeviling and expensive.

Training is fraught with more intangible problems, such as the difficulty of data input for non-typists or simple computer phobia. One middle manager I know received his new computer on a Wednesday. By Thursday, he had left it dangling by its LAN cable over the partition between his office and the vacant one next door. We have since brought him around; his computer is now on his desk, and he even uses it occasionally.

What's the solution? My company is lucky enough to have found one. Since we spend about \$20,000 a week on computer equipment, the company can afford its own computer support staff. We've learned the hard way how to match different computer vendors' capabilities to our employees' needs—what they can't give us, we do for ourselves. Most companies can't afford to allocate such resources to computerization. Smaller businesses that make fewer purchases have much less clout. Most have to rely on local

retailers for support or stumble through the process with staff members for whom computing is only an avocation.

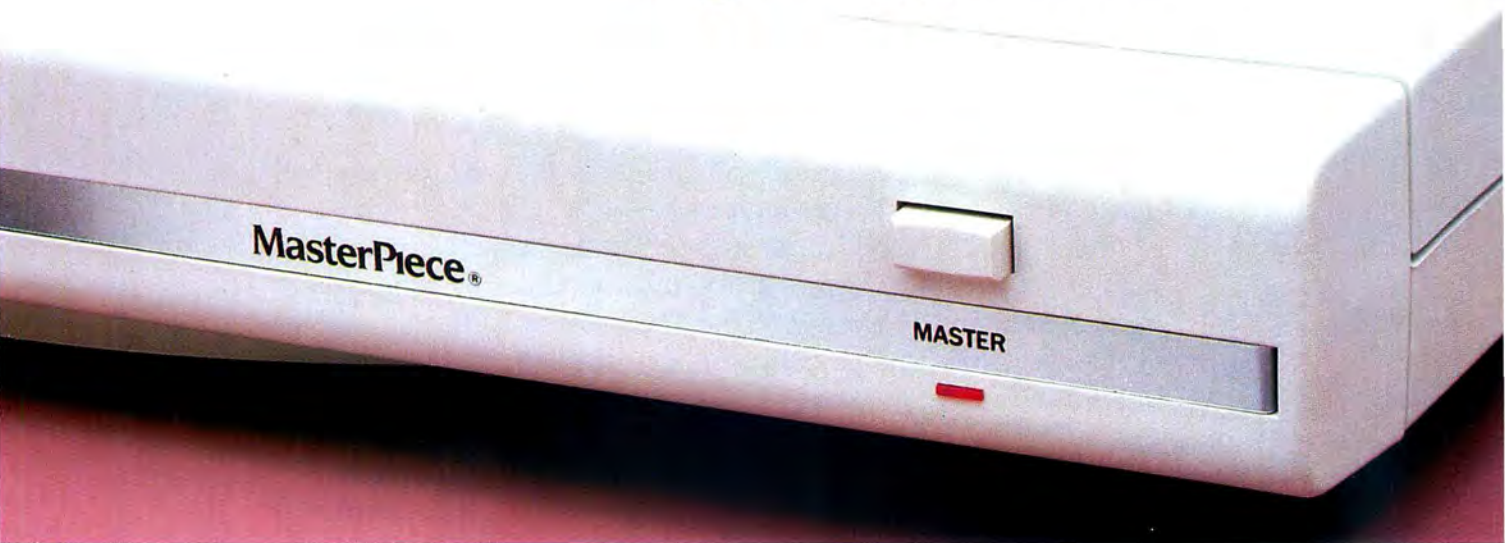
Large businesses and small could use a good computer sales pitch interpreter—one that could do some error checking on the platitudes and promises we hear. Better still, how about injecting some reality into the sales process?

My message to computer vendors is this: Turn down the volume on your sales pitches and turn up the heat under your user support. Let's do business, but don't treat me like a one-time sale.

Jeff Kurzius is assistant vice president in charge of systems and training for office automation products at Citicorp Real Estate in New York.

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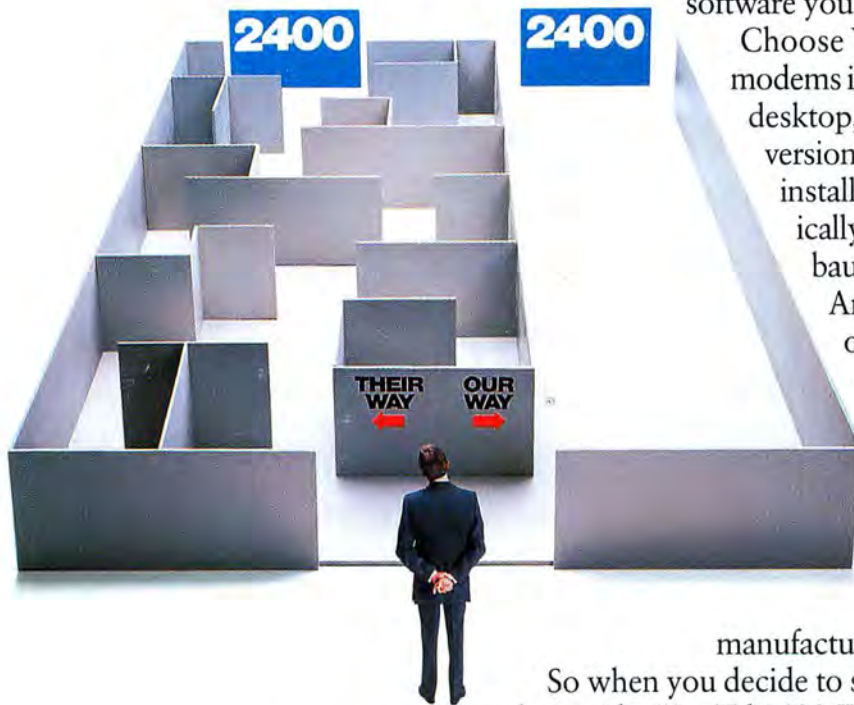
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