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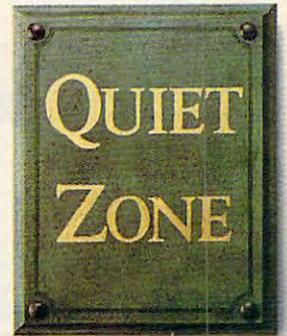


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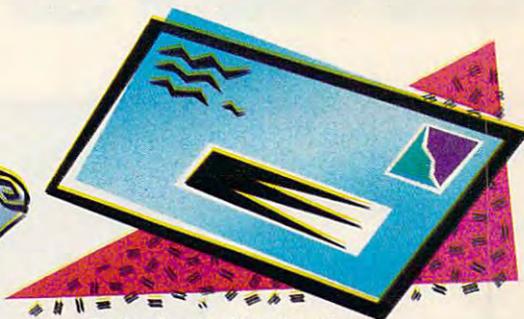
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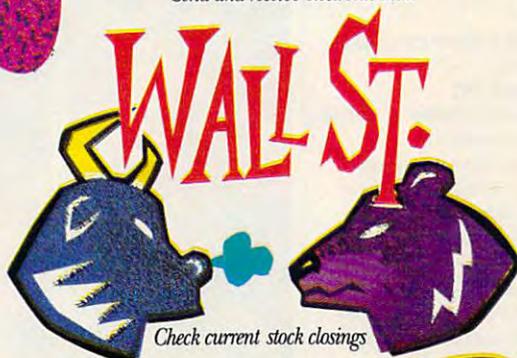
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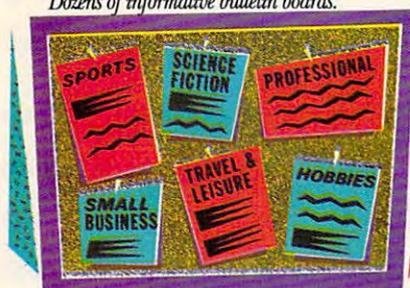
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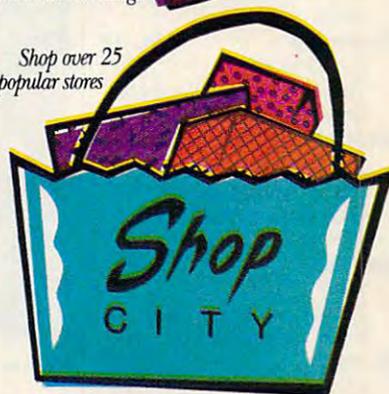
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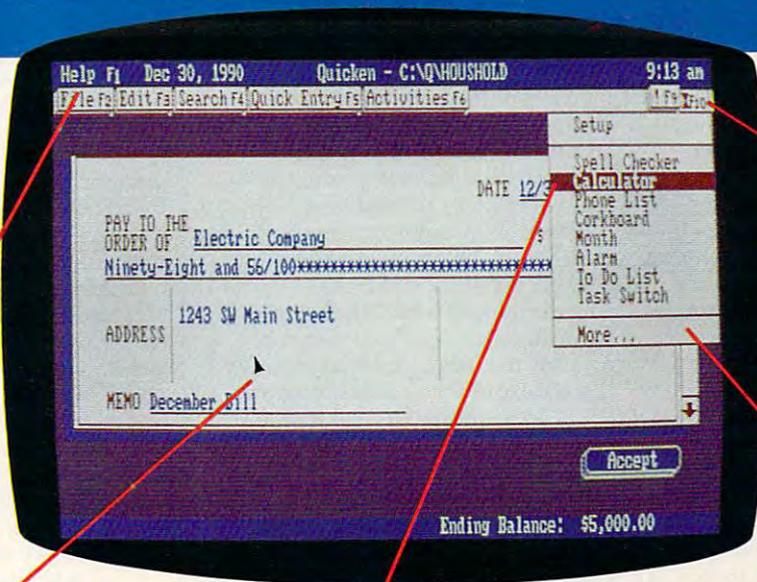
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You'll love the user-friendly look and feel of DeskMate as it guides you comfortably through your tasks. DeskMate provides a similar "environment" for different applications, so it's easy to move from one program to another.

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To move around in DeskMate, all you have to do is "roll" the mouse to point to one of the choices on your screen, "click"—and you're there!



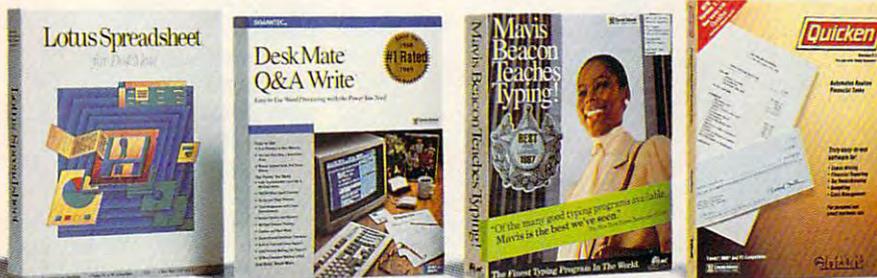
DeskMate uses handy pull-down menus—similar from program to program—to present your options clearly. Select a menu from an ever-present "menu bar" at the top of the screen. Use your mouse or the keyboard to highlight your choice.

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P E T E R S C I S C O

Except for the invention of movable type and the printing presses that it spawned, no medium has had as dramatic an effect on popular culture as the television. From its humble start half a century ago to the sophisticated array of images it presents today, television's impact has been felt by almost every civilization worldwide. More and more, our collective memory is shaped by television images.

What I remember about growing up with television: The orange glow of vacuum tubes. The mysterious white dot that lingered when the set was switched off. My family's first color set, into the house far after most of the neighbors had made the change. A set of rabbit-ear antennas that looked like a prop from a B-grade sci-fi flick and did nothing for reception. Only two channels, the local NBC and CBS affiliates.

Though it should've been a wonder, and I suppose it was to my parents and grandparents, the TV quickly became just another thing that had always been there, no stranger than the radio or the phonograph. Television in the sixties, fueled by millions of baby-boomer eyes, framed the cusp of a new American culture, one set apart from previous generations by its reliance on the moving image as an essential, if not primary, communications medium.

Almost since its inception, TV has been revealed as an enemy to literacy and critical thinking, a vulgar device of endless chatter and images, bubble gum for the eyes. Looking at television's emphasis on entertainment (even in its presentation of the

"news"), it's difficult to argue against that view. But with the advent of personal computers and the inventive fusion that's already taking place between that technology and television, the future of television may yet dismiss those arguments as shortsighted. Television provides a commonality of experience and is the cornerstone of what Marshall McLuhan called the *global village*, a phrase that takes on added meaning in the age of the personal computer.

As a multifaceted communications device, TV has surpassed all but the most outlandish predictions. And even those predictions considered too far out (or bad financial risks, like videotex) may eventually come to pass as technologies such as HDTV and fiber optics become commonplace. Even so, TV remains the Rodney Dangerfield of communications, a technological marvel taken for granted and given no respect. No one calls

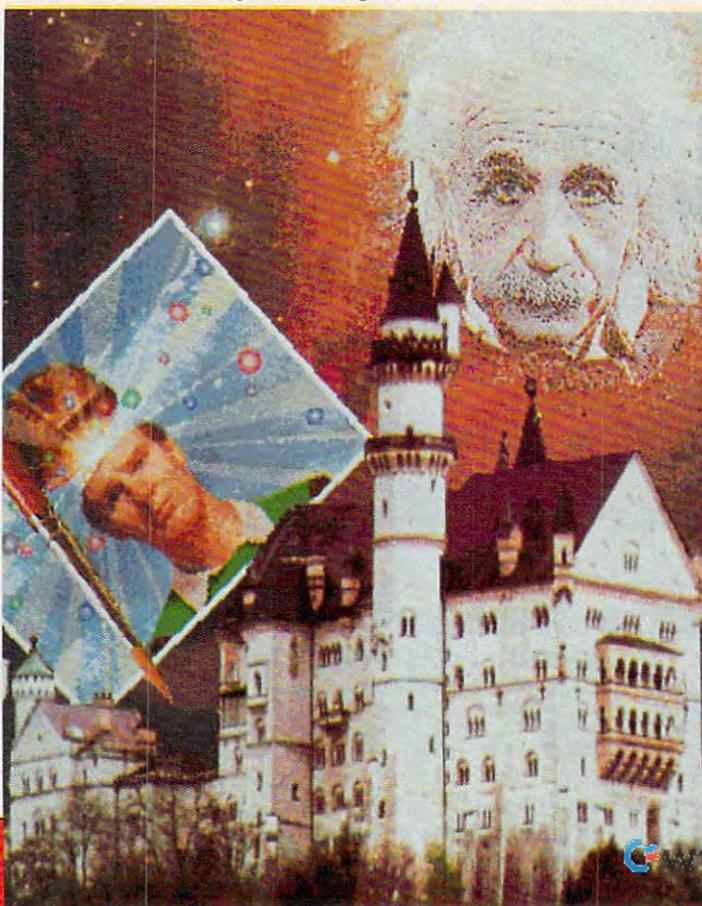
the TV the *visually enhanced audio information unit*; everyone calls it the *tube*.

Computer technology may change all of that. Televisions have for some time now embraced silicon-based circuitry at the expense of tubes, solder, and wire. The line that separates a television from a computer is blurring. Entertainment centers across the country bristle with TVs that look and act more like computer monitors than traditional television sets. Hardwired and cable-ready, the latest generation of sets represents the first step in digital-information delivery for all consumers. That delivery, from a variety of sources, is the next logical step for TV and for consumer computing.

In its ability to process information, the home computer exceeds the capability of the most advanced television. Television, by comparison, excels in its ability to disseminate information. It can be argued which

capability is the more powerful—the one that promotes an individual's access to and mastery of information or the one that carries a message to more people faster and with more impact than any other single device on the planet.

Either way, the development of the personal computer and the evolution of the TV are proceeding along paths of ultimate intersection. Where they will meet, sometime in the mid to late nineties, is a digital world of customized information delivery and manipulation. Smart TVs, customized news services, personalized entertainment venues—all coming through your door by wire. Information for the video age. □



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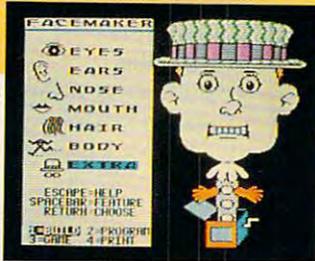


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NEWS & NOTES



Spinnaker Spins Off Titles

Spinnaker, the company responsible for such hit educational titles over the years as *FaceMaker*, *SnooperTroops*, and *KidWriter*, has decided to concentrate its efforts on productivity software. The company sold its Spinnaker and Springboard educational software lines to Queue, a Fairfield, Connecticut, software company.

Queue will continue to sell all of the Spinnaker and Springboard educational products, said Jonathan Kantrowitz, CEO of Queue. In addition, it will bring back some products that Spinnaker was no longer marketing and revise some of the older titles. Spinnaker, which began as an educational software company in 1982, sold off the titles so that it could concentrate on its BetterWorking productivity series and *Plus* hypermedia program.

—DENNY ATKIN

What Next— A Papal BBS?

Has the world got you down? Don't give up hope; call the Pope on the Popeline, a new 900 number run by Sprint USA. It features Pope John Paul II's daily message and costs \$2.00 for the first minute and \$0.95 for each additional minute. The Pope records his own messages. Call (900) 230-POPE.

—DAVID ENGLISH

New Mac Attack

Seeing an "at-home computer" market rather than a "home computer" market, Apple Computer unveiled in October a new line of lower-priced Macintosh computers, but it didn't announce the long-rumored \$1,600 color Mac.

Three new Macintosh models were introduced. The Mac Classic has the familiar upright look and built-in monochrome monitor of the SE and Plus models. The Classic comes with 2 megabytes of RAM, a 40-megabyte hard disk, and a keyboard; it carries a suggested retail price of about \$1,500. A single-floppy disk configuration is available for around \$1,000.

The Macintosh LC (for Low-cost Color) is modular, with a separate monitor and CPU. The CPU unit itself is the sleekest of all Macs, with a small footprint and thin case. Aimed at the business, education, and at-home markets, the LC with 2 megabytes of RAM, a 40-megabyte hard disk, a 12-inch RGB color monitor, and a keyboard should have a suggested retail price of about \$3,000.

The upper tier of the market was addressed by the Macintosh IIsi, another modular Mac. Configured with 2 megabytes of RAM, a 40-megabyte hard disk, a 13-inch high-resolution color monitor, and a keyboard, the Mac IIsi (for Simply Irresistible) was expected to carry a suggested retail price of around \$4,600.

Both the Mac Classic and Mac IIsi were to be available on the October 15 announcement date. The LC was, at press time, to be announced in October, but it may not be available until early 1991.

The decision to equip all configurations of the new Macs with at least two megabytes of RAM means that the computers are ready for System 7.0, the latest and much-delayed update of the Macintosh operating system software. System 7.0 is expected to be released early in 1991.

Both the LC and IIsi come with a microphone, allowing for sound input as well as output. For the education market, an Apple IIe emulation board for the LC was announced, but it wasn't expected to be ready before the spring of 1991; the board should retail for under \$200.

While the new Macintoshes don't directly address the home consumer, at least not with color, as had been widely expected, the machines do represent a substantial shift in Apple's pricing strategy. The LC fills a gap in the modular Macintosh line, providing for the first time a relatively low-cost color-Macintosh capability. Street prices for the new machines should be substantially lower than suggested retail pricing.

Apple representatives declined to comment on the recent reinvigoration of the home computer by IBM, Tandy, and others. Computers in the home, according to company spokespersons, are extensions of those in the office or the classroom rather than being true home information appliances. In other words, if you're not using a computer for work or school, you may not have much need for one at home.

Apple representatives also noted that the company's Apple II and IIGS lines would continue to be supported.

—KEITH FERRELL

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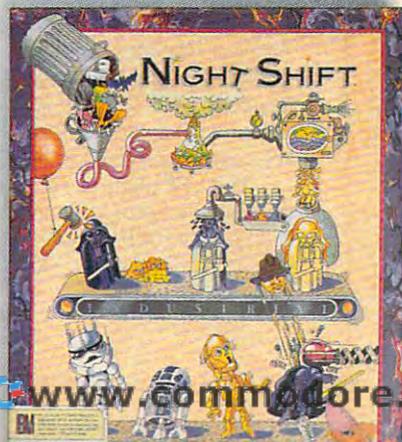
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Number 204



Supercomputer Medicine

Eli Lilly, the fourth largest U.S. pharmaceutical firm, has added a Cray-2 supercomputer to the arsenal of tools it's applying to the development of new drugs.

Because pharmaceutical research rests upon complex molecular modeling—remember those colored Ping-Pong balls and straws from high school chemistry?—the arrival of the supercomputer is expected to speed up the research process. The Cray-2 enables researchers to “build” proteins and enzymes, depict them on monitors, and simulate their interaction with experimental pharmaceutical compounds. Using the computer, scientists can rotate, assemble, disassemble, and view chemical structures in a fraction of the time previously required.

Lilly scientists and researchers have undertaken training in supercomputer operation and are applying the Cray-2 to the search for cures or treatments for AIDS, Alzheimer's disease, and other currently intractable medical challenges.

—KEITH FERRELL

Software Justice League of America

The computer software industry is increasingly litigious, and programmers are banding together to protect their ability to create new software without fear of being sued.

The League for Programming Freedom (LPF) was founded to oppose look-and-feel lawsuits, software patents, and other monopolistic computer industry practices. Richard Stallman, president of the organization, is best known as the founder of the Free Software Foundation, a group that has, among other things, worked to create a freely distributable UNIX clone called *GNU*.

The LPF points to the Lotus Development suit against Paperback Software, where Paperback was found guilty of infringing on Lotus's copyrights because its spreadsheet obeyed the keystroke commands used in *Lotus 1-2-3* and had a similar user interface. The LPF's position paper opposing the look-and-feel copyrights compares this suit to a company filing a user-interface copyright on the steering wheel.

“During the span of the copyright, we would have gotten cars steered with joysticks, cars steered with levers, and cars steered with pedals. Each car user would have to choose a brand of car to learn to drive, and it would not be easy to switch,” the paper states.

LPF members are also concerned about software patents. The U.S. Patent Office has issued patents on techniques the organization calls obvious, such as using an exclusive OR (XOR) to display a cursor (a technique used by most computers) or the technique of storing an obscured part of an onscreen window in memory so it can be redrawn quickly when the obscuring window disappears.

More than 2000 software patents have already been granted, the LPF says, with 700 granted in 1990 alone. The organization worries that if obvious or easily derived programming techniques are patented, the sheer number of patents will keep small companies out of the software business. Patent search fees and licensing costs make software development prohibitively expensive. New York-based REFAC Technology Development, for example, owner of the patent rights for the natural-order recalc technique used in spreadsheets, is demanding 5 percent of all earnings from spreadsheet sales.

The LPF plans to serve as an information resource and to actively lobby against programming restrictions. For more information, contact The League for Programming Freedom, 1 Kendall Square #143, P.O. Box 9171, Cambridge, Massachusetts 02139, or call (617) 243-4091.

—DENNY ATKIN

THE EYES HAVE IT

Computer users can dramatically reduce eyestrain by using indirect lighting, according to a new study from Cornell University.

The study compared conventional computer-area overhead fluorescent lighting with indirect, bounced fluorescent lighting. Workers who used conventional overhead lighting had 25 percent more complaints of eyestrain.

The study found 71 percent of those using the indirect lighting and 74 percent of those using conventional lighting preferred the indirect lighting. The most popular form of lighting consisted of lensed indirect fluorescent lights that focused light toward the ceiling.

—DAVID ENGLISH

Rejected Suitor

The signs read “Drop the Suit, We Have You Surrounded” and “Can Las Vegas Sue Atlantic City?” as about 320 marchers protested Lotus Development's recent bout of lawsuits protecting the look and feel of *1-2-3*. The August 2 rally at Lotus's Cambridge, Massachusetts, office was organized by the League for Programming Freedom (LPF). The LPF believes user interfaces shouldn't be copyrighted.

Highlights of the demonstration included the protesters' hex chant: “1-2-3-4, kick that lawsuit out the door; 5-6-7-8, innovate—don't litigate; 9-A-B-C, interfaces should be free; D-E-F-0, look-and-feel has got to go.”

—DAVID ENGLISH

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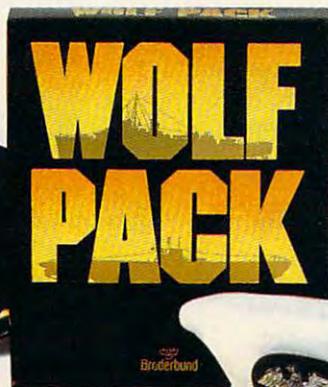
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Addams Admired

I am in the process of upgrading from a Commodore 64 to an IBM clone. Since I became interested in the PC world, I began to read your magazine and have recently bought a subscription. Let me tell you, I think your magazine is great. It has the right balance between business and entertainment software, and I love it.

I have one suggestion, though. I used to subscribe to *Commodore Magazine* before it was sold to *Run*. Since I have switched to *COMPUTE*, I only miss one thing from *Commodore Magazine*. It is a monthly column that Shay Addams wrote, which was dedicated totally to adventure (RPG) games. Mr. Addams would have reviews and hints and would keep us posted on the newest games. I really think it would be great if *COMPUTE* could adopt something like this, and I think other adventurers would, too.

JOSHUA EUDY
STATESVILLE, NC

Good news, Joshua. COMPUTE readers whose edition includes the Amiga Resource section will be able to enjoy Shay Addams's ideas on a regular basis. His column is called "Just for Fun." For the rest of our subscribers, Nebula and Hugo award winner Orson Scott Card continues his meditations on computer games every month in "GamePlay."

October Issues

I just got your October magazine, and it is GREAT! I love the new setup and the way you split up the information into different sections.

I subscribed in June and got my first magazine on September 14, and the subscription is due to expire next June, which is obviously not the full 12 months. Will I get all 12 issues?

Also, do you have a special *COMPUTE* edition for just IBM owners? That's the part I read and focus on.

One suggestion I have is to make the *SharePak* and the On Disk avail-

able for Amiga, Commodore, and Macintosh users.

I would like to mention that I thought "How to Get Started with Programming" was an excellent idea for anybody who might like to learn a little bit more about different programming, and it may even get some people interested in it. I also think that the "Feedback" column is very helpful.

STEVE RISH
INDIANAPOLIS, IN

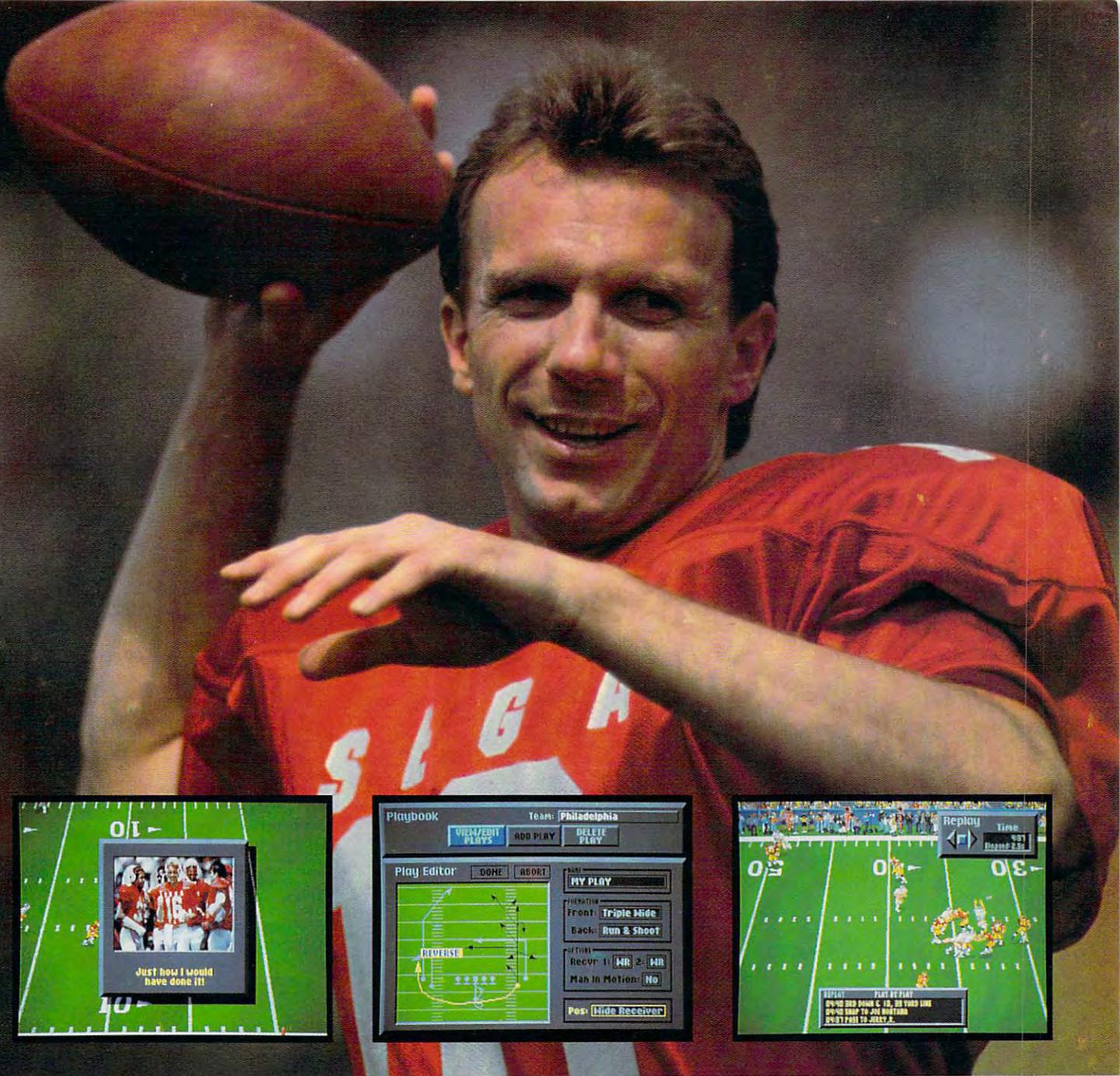
Thanks for your encouraging response to the October issue. We're glad you like the new format, and we appreciate readers' comments and suggestions.

Rest assured that you will get all of your subscription, which begins with the October issue and will run for 12 months. During the transition from our previous owner to our new corporate parent, we took a brief hiatus.

We do print a special edition just for MS-DOS computer owners. If you would like to change the edition to which you subscribe, just let us know when your subscription comes due for renewal. In the meantime, enjoy the added home computer knowledge you'll be getting in the Amiga Resource and Gazette sections.

Your suggestion about disk products for each of the sections is a good one; however, the only disk product we lack now is one for the Macintosh. Let's hear from all you Macintosh owners—would you like a SharePak disk for your Apple?

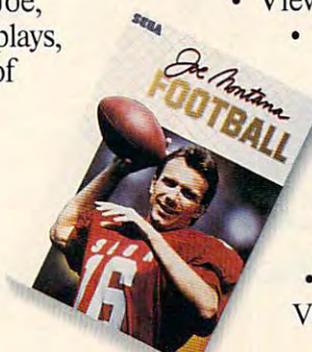
Do you have questions or comments? Send your letter—with your name, address, and daytime telephone number—to COMPUTE Feedback, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408. We regret that, due to the volume of mail received, we cannot respond individually to questions. We reserve the right to edit letters for clarity and length.



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If you've had it up to here with uninspired, overproduced, poorly acted, and badly written comedies, dramas, commercials,

documentaries, game shows, cartoons, talkfests, and newscasts, take heart. The most successful consumer electronics product of the century and the most influential information technology of all time are coming together to create hundreds, even thousands, of potential new products, programs, services, and opportunities. After half a century of analog life, television is about to become a digital medium. Your television is entering the computer age.

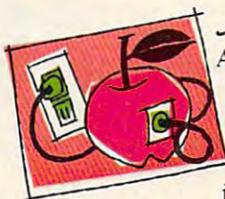
Television waves, like radio waves, use a portion of the electromagnetic spectrum, and there's only so much spectrum to go around. A variety of distribution alternatives are now available, all made for the digital world. Fiber optics can carry tens of thousands of digital signals at once—and carry them not only from source to receiver, but also from your receiver back out into the world. Compact discs and laser discs are already being used as video publishing media. Computers increasingly possess TV-like capabilities, just as TVs contain larger and larger amounts of computing power.

The ramifications of that power can only be glimpsed today. Who, 50 years ago, would have predicted the myriad ways television has changed society? Our purpose, here, is to offer a few informed glimpses, imagine a few consequences, and make some qualified guesses.

There's an underlying conceit to our speculation, and that's the idea of *interactive television*.

Once a television program—or anything—has been digitized, it can easily be manipulated. We're all familiar with the convenience of word processing, the pleasure of interactive computer games, the potential of electronic learning. Add full-motion video and high-quality digitized sound to the equation, and you're on the brink of TV that we control, rather than the other way around.

What exactly does this mean for all of us couch potatoes stretched out in front of the tube? Don't touch that dial—you're about to find out.



Apple of Your TV Eye

At Apple Computer, multimedia is where television, film, music, and interactive computer programs come together. A top-of-the-line Macintosh can display any of 16.7

million colors, providing tremendous potential for displaying lifelike pictures on your computer monitor. Link this system with the superb sound of audio CDs, the 54,000 still or moving video images available from a single laser videodisc, and the vast software storage capacity of CD-ROM discs, and you'll soon see why many in the industry think we're on the verge of truly interactive television.

Apple's CEO John Sculley himself set the tone for Apple's vision in *Odyssey*, his 1987 autobiography. In that book, he described what he called a *Knowledge Navigator*, "a tool as galvanizing as the printing press."

To make Sculley's dream come true, Apple's multimedia lab is working closely with Lucasfilm Games to develop the new visual vocabulary that will join computer graphics with video images. Much as D. W. Griffith had to invent cinematic techniques in his early films because there was no one to teach him, today's multimedia pioneers face the challenge of building an entirely new art form.

Some of the new video tools are truly startling. In one of Lucasfilm's techniques, a *HyperCard* flip-book animation moves to the edge of the computer screen, disappears, and then continues, as live video, on an adjacent television screen. A Macintosh coordinates the transfer of image from computer screen to TV screen. Apple and Lucasfilm have also collaborated with the Smithsonian Institution and the National Audubon Society to combine new technology with archival film and video.

As early as 1983, Apple acknowledged that we think visually as well as linguistically. With faster processors, better display technologies, and more sophisticated compression techniques, computers are rapidly moving toward full-motion video. By merging the best of video and computer technologies, we may soon see the day when television at last lives up to its potential—as a true window on the world and an instrument for learning about ourselves. >



The Blue Tube

Businesses and corporations are turning to television as a training aid to help improve efficiency, increase

productivity, and aid employees in acquiring new skills. IBM is already marketing a variety of interactive TV tools and applications aimed at business and institutional needs.

Big Blue's approach to interactive video training began in 1983 with a product called *Info-Window*, which combines an analog video signal, typically from a videodisc, with a personal computer equipped with a touch-screen monitor. More recently, the technology has evolved into the M-Motion Video Adapter, a system that can take an analog signal from any NTSC (American television), PAL (European television), or other video source, digitize it, and display it either full screen or in a window format on any VGA computer monitor. In effect, M-Motion lets employees watch TV at a workstation while running other computer programs.

"Employers might be a little disappointed to see you watching soaps in the afternoon," says IBM Marketing Manager Peter Blakeney, "but some of our clients require it. We sold a good number of these [systems] to the National Security Agency. They have a requirement that certain staff monitor the news services, CNN, C-Span, and a few other networks to keep as current on late-breaking happenings around the world as the CIA, FBI, or any other agency."

Operators monitor the television signal in a window while the major portion of the screen is occupied by word processing or other more traditional computer activities. If a certain story on the video feed merits more attention, the operator can at any time bring the signal to full screen and increase the volume.

In most applications, however, the video signal will come from a tape or disc rather than from a live TV signal. "There are enormous markets that we see for multimedia," Blakeney says. "There's training: industrial, on the job, and skill transfers. There's education: kindergarten on up. There's merchandising, where we place multimedia kiosks out where the shoppers are and try to compel them to buy, augmenting retail employees."

Another application includes commercial and business presentations. Interactive TV presentations can be as simple as a product presentation at a sales meeting or as complex as a conceptual presentation by an advertising agency to a client.



Commodore's Comeback Console

What better way to sneak computers

into unsuspecting homes than by marrying two of the most popular home entertainment devices: the television and the CD player?

That's what Commodore is trying to do with CDTV, an Amiga-based multimedia CD-ROM player designed for home use. While appearances aren't everything, CDTV's sleek black VCR-like cabinet certainly looks more at home next to the stereo than on the computer desk.

"We've taken a Trojan Horse approach by putting computer capabilities into a familiar box; it just becomes a natural expansion of the home entertainment center," says David Rosen, Commodore's director of international marketing.

Rosen believes CDTV will be accepted by consumers who have previously avoided computers. CDTV, he feels, will be seen as an enhanced CD player. Along with computerlike educational and entertainment software, CDTV will also play standard audio CDs and CD+G (CD plus Graphics: audio discs with visuals, computer graphics, or lyric texts encoded on unused tracks). CDTV isn't being marketed as a CD player with a computer inside, but as a CD player that plays a bigger variety of discs.

"Consumers have no problem moving from a single medium to multiple media," Rosen explains. "TVs aren't just passive terminals anymore. In the past few years, consumers have been attaching VCRs, videogames, computers, and laser discs to them; and all these have made TV acceptable as an interactive medium."

CDTV's success will depend upon its software. "Consumers don't care about boxes; they care about [entertainment] programming," says Rosen. Recalling the spreadsheet that essentially created the microcomputer

industry, Commodore hopes for a CDTV version of *Visicalc*, a product so impressive, so unique, that people will buy a CDTV player just to use it.

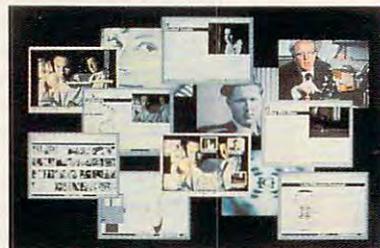
"It's like MTV and music videos," Rosen says. "Cable TV created a new entertainment genre. No one anticipated it. We don't know what we will be doing with the [CDTV] technology two years from now."



Class Act

The future of computer education is here now, and it's called *interactive video*. This technology

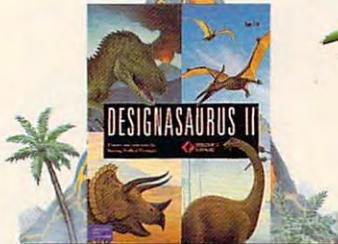
combines an interactive computer program with as much as two hours of video from a single videodisc. Sometimes a CD-ROM player is added to the mix for an additional 650 megabytes of computer-based material.



Life Story combines full-motion video, interactive text, and hypermedia indexing to make television come alive.

The Voyager Company, of Santa Monica, California, specializes in laser-disc and interactive multimedia programs. To get a sense of the breadth of Voyager's interests, look at just a few of the company's recent releases: *Eadweard Muybridge: Motion Studies*, *Vienna: The Spirit of a City*, *Bird Anatomy II*, and *The National Gallery of Art*.

Life Story, developed by Lucasfilm, the Smithsonian Institution, and Apple Computer, includes the 1986 BBC drama "Race for the Double Helix" and adds sound bites, video clips, text profiles, computer-generated diagrams, and videotaped interviews with the scientists involved in the search for the structure of DNA. The information in *Life Story* is indexed through a DNA-like double helix—one strand indicates scenes from the BBC drama while the other leads to supplemental information. >



Blast From The Past.



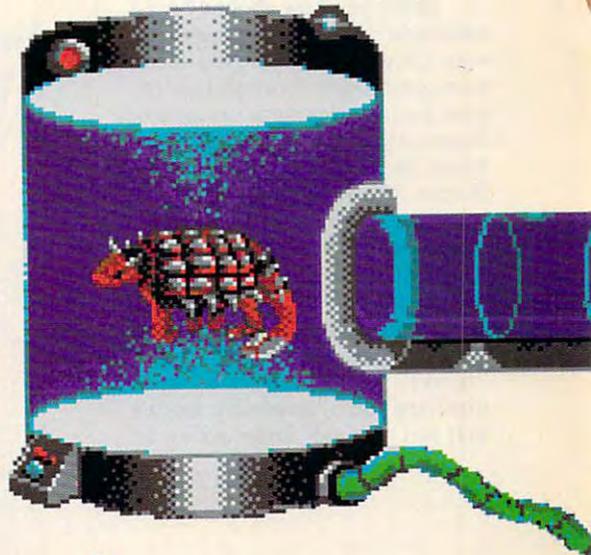
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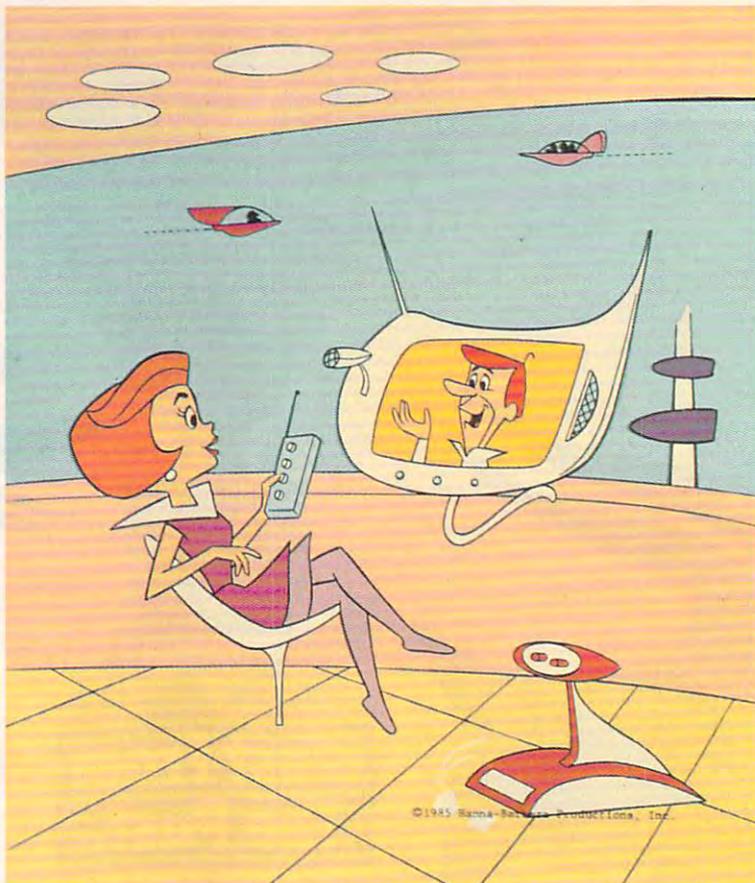
* Requires IBM PC or 100% compatible, 512K RAM and EGA or VGA. Joystick recommended.
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The Teacher's Living World is an interactive multimedia program developed on a Macintosh IIci for the St. Louis Zoo's *The Living World* exhibit. Teachers can select audio, video, graphic, and text material and save it to VHS videocassette, laser printer, or computer disk, creating their own classroom presentations. Available resources include an entire biology textbook, as much as 140 hours of full-motion color video from a special videodisc jukebox, and prepackaged "multimedia sets" that cover the most popular topics. Teachers can preview, add, delete, or rearrange their selections before recording them to videotape. They can also add their own titles and narration.

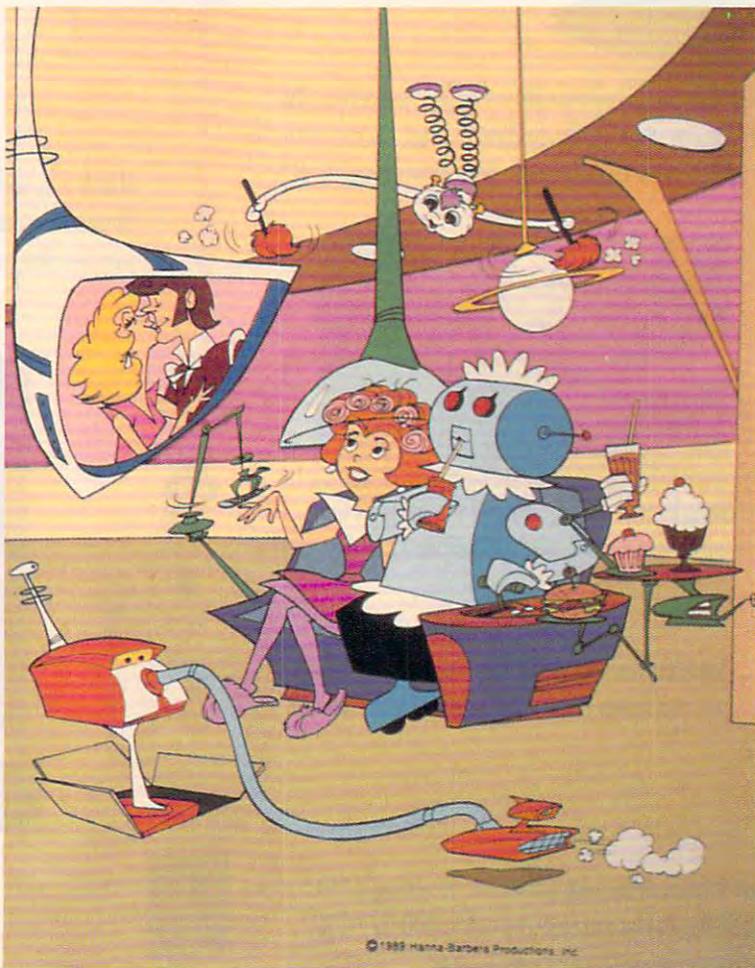
Unlike other electronic media, interactive video lets students and teachers set their own pace and actively participate in the selection of material. Attracted by the vast storage capacity of laser discs and CD-ROMs—where a single disc can contain paintings from the world's major museums or all the text from a complete encyclopedia—schools are forging computers and televisions into unique learning tools.



And Now the News

Imagine putting Tom Brokaw on hold in the middle of a story on computer technology and sending your TV out to find more details than a two-minute news story can provide. Accessing databases throughout the world, your TV assembles a package of information that you can peruse at your leisure.

Better yet, how about a "personalized" evening newscast? As your TV grows smarter, it will be able to accommodate more and more your particular programming needs. Suppose you're interested in space travel, biotechnology stocks, and the Boston Red Sox, but not at all interested in clothing fashion, movie stars, or food. Your television may soon be able to scan hundreds of news sources around the clock, collecting stories that impinge upon your interests, flagging others that it "thinks" you might be interested in, notifying you of important stories that you "should" know about. ▶



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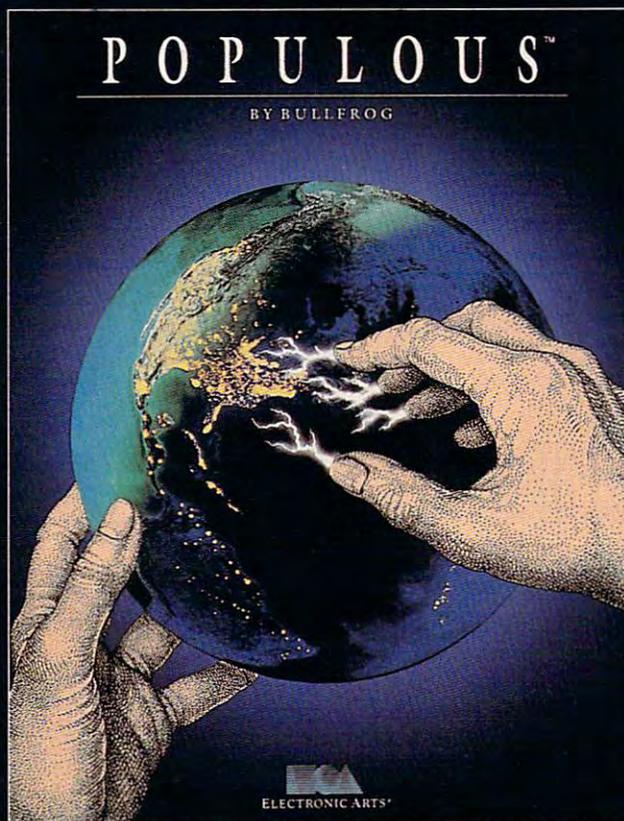
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Some of the required technology is already in place. Closed-captioning, for example, may serve a dual purpose. In addition to enabling the hearing-impaired to receive information, those captions may serve as an index to television content. "Search," you might tell your TV, "for every mention of the planet Mars in the past 24 hours." A moment later, the set reports its findings.

Rudimentary experiments with interactive news are in development. Call-in programs have long offered one level of interactivity. Earlier this year CNN experimented with viewer selection of news stories. ABC News has developed interactive videodisc presentations for classroom use. Several large news agencies have experi-

mented with videotex services, delivering wire reports directly to homes.

Tomorrow's evening news will likely be an amalgam of all these services and approaches, delivering deeper and more useful information than Edward R. Murrow could ever have imagined.



The View from the FCC

This much power will doubtless be regulated by the federal government, won't it? Not necessarily.

Since so many of the new computer/television technologies and delivery systems don't use traditional radio frequencies (RF), traditional means of regulating TV broadcasts don't apply.

"You can transmit anything you want to over fiber optic, and we don't care. Fiber is not RF, and it's outside our purview," says John Reed, electronic engineer, Technical Standards Branch, Federal Communications Commission.

It's different with traditional cable transmissions. "Cables radiate RF," Reed says, "so the FCC regulates it. But fiber doesn't radiate—only where it actually interfaces with transmission and reception equipment to convert light to RF energy does the FCC get involved."

In Reed's view, fiber is coming online just in time. "The spectrum's already too crowded," he says. "You're not going to be able to load tens of thousands of new signals onto it. There's only about two megahertz of unallocated spectrum left—and everybody wants it."

Although the FCC isn't the only government agency overseeing the media, Reed sees regulation as a minor issue. Far larger is the question of whether or not the fiber network needed to create interactive TV will ever be put into place.

"Putting in a cable system was expensive," Reed says, "but a fiber system will be even more expensive. It's going to take a lot of capital."

If broadcast television serves as an example, computer TV will also generate a lot of capital. And that should ensure solid investment.



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appear because you are female, make \$50,000, live in New Jersey, and have bought an airline ticket within the last three months. The marriage of computers and television enables advertisers to target a specific audience and to deliver very specific information.

Many of the tools and techniques of interactive television are being developed on existing telecommunications services, and some online services already carry advertising. Ads on Prodigy, for example, are tied to the gender and age of the user, as well as to the editorial content of the service.

If, for example, you spend time in Prodigy's food and wine area, you will be shown gourmet food ads. If that "leader ad" piques your interest, you can elect to see more information. According to Steve Hein, program manager of communications with Prodigy Services, the ad package immediately fills one viewer need: instant gratification. Another advantage of the self-selective ad package is that it is nonintrusive—only interested viewers receive the extended ads.



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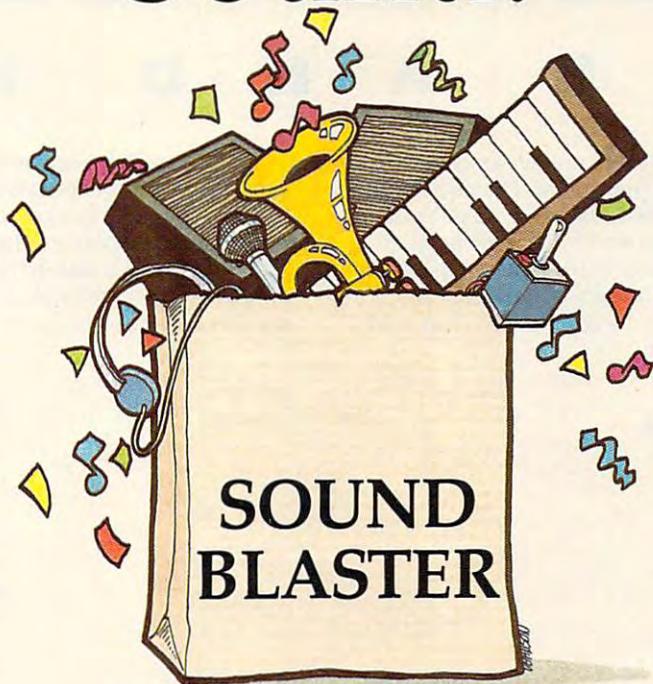
a glance at interactive TV entertainment, barely a mention of the role the phone companies may play in all of this, not even a nod at the global implications.

And there are questions yet unraised. Where do the networks fit into this brave new picture tube? What creative video tools will we have in our homes? How far can all of this go?

The answers to these questions? Stay tuned. □

Senior Editor Keith Ferrell coordinated our PC-TV connection coverage. Staff members Denny Atkin, David English, Tom Netsel, and Liz Casey worked the remote control.

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DESKTOP VIDEO

H E R E A N D N O W

Just as camcorders replaced 8mm movie cameras, within five years still-video imaging will banish 35mm cameras to the dusty shelves of the Museum of Vintage Technology. Long overshadowed by its more popular relative, the camcorder, still-image video remains an under-used technology. This is partly due to a misconception about its high initial cost. While the elaborate systems used by computer graphic artists and professional photographers (especially in the film industry) cost megabucks, savvy shoppers can assemble a consumer-grade system for about \$1,000.

The system we assembled included Canon's Xap Shot camera, a ComputerEyes Professional image-capture board, Spinnaker's graphic-editing software *Splash!*, and the graphics-printing program *Pizazz Plus*. We also tested US Video's combination VGA and genlock video card. The results we achieved with our \$1,000 video system ranged from fair to good. And with the addition of two more sophisticated editing packages—*Tempra* and *Picture Publisher Plus*—our results were nearly spectacular.

Zap—You're on TV

Manipulating complex graphic images creates heavy demands on a computer system. To avoid expiring from old age at the keyboard, you need a 286, 386, or PS/2 computer with 640K; DOS 3.0 or higher; a VGA card (preferably Super-VGA) with at least 256K (better yet, 512K or more); a multifrequency monitor; and a high-resolution mouse or trackball.

The \$595 list (\$500 street) price Xap Shot behaves much like other point-and-shoot cameras. The on-board electronic circuits determine the exposure, speed, and range to subject. A built-in LCD panel displays track numbers along with the mode (single shot or three per second), low-battery warning, and disk-related problems. A flash automatically fires in low ambient light. With its 2.8 lens, indoor pictures often require a flash.

The Xap Shot electronically records images on magnetic media. With its two-inch internal disk, the Xap Shot can be fairly described as a camera married to a portable disk drive. The resemblance is more than superficial, since the Xap Shot acts as a disk drive when displaying stored images on a computer or television. The images are filed by track number and retrieved for processing using the camera's advance and reverse buttons.

The jacketed disk accepts 50 images in the camera's 786 × 250 pixel format. Extra disks cost \$10, or you can delete the images and reuse the disk.

After you've taken your pictures, the Xap Shot links to the ComputerEyes expansion card with a single coax cable (supplied by Canon).

Importing the image into the computer proved to be as simple as Mother Goose. Digital Vision's bundled software, *Eyes*, while not quite as lovable as it could have been, streamlined the task.

Using *Eyes*, you first preview any or all on-disk images before committing to a capture. The Xap Shot's drive takes about 20 seconds to travel through all 50 tracks. When you find the image you want to digitize, you simply hit a key. Depending on the display resolution selected, the software

requires 10–25 seconds to digitize the Xap Shot's composite video signal and redraw it on the monitor.

With the image now digitized and displayed, you can perform some fundamental editing with *Eyes*—including globally raising or lowering the image's red, green, or blue components, as well as its contrast and intensity.

In addition to still video, the ComputerEyes board also captures frozen-frame video generated by a video camera. Capturing and editing full-motion video in realtime, however, requires both a digitizer and a signal synchronization device called a *genlock*. US Video's modular TVGA board lets you expand your system when and if the need arises. The company's separate genlock daughterboard and digitizer module (functionally similar to the ComputerEyes >

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Professional) piggyback onto the main VGA card. With 512K, US Video's board provides a resolution of 1024 × 800 × 256 colors.

In addition to the Xap Shot's signal, ComputerEyes can also capture images generated by VCRs, videodisc players, and still-image cameras marketed by Panasonic and Sony. While the ComputerEyes board performs well for image capture, implementing advanced editing techniques requires more potent software.

Testing the Waters

Spinnaker's *Splash!*, a hybrid paint program and entry-level editing package, includes functions specifically designed for image capture and retouching. The program's icon-driven menu, coupled with its straightforward features, makes it extremely easy to use.

Splash! includes the requisite basic editing techniques, including color fills, pattern copy/repeat, individual pixel editing, multiple patterns, brush sizes, and color swaps. Additionally, you can rotate, resize, and merge captured images.

You can experiment with the many samples included with the program, or you can import your own graphics. Although *Splash!* saves to disk in standard image formats such as PCX, TIF, and GIF, it imports only its own graphics format (SS). An odd omission, but not lethal. We used Digital Visions' software to import a TGA graphic, saved it in SS, and subsequently loaded it into *Splash!*.

Another limitation is *Splash!*'s maximum image resolution of 320 × 200 (VGA or MCGA). As a result, the image details and menu icons appear fuzzy. (Images displayed in a 640 × 480 resolution appear much sharper, but these higher resolutions are non-standard and usually require special video drivers). Also, some of the program's more advanced features, such as color blending and the alternate canvas, need clearer instructions or

THE HIGH COST OF COLOR

Electronic recording devices, including VCRs and still-video cameras, generate analog signals. The number of colors in an analog signal ranges to infinity. When converting the camera's analog signal into a digital form, video capture boards reduce the number of colors in the signal to either 16 or 256. Why? Because, in a digital format, having more colors requires more memory and incremental technology. That translates into higher prices and consumer resistance. High-end realtime digitizers from Everex, Truevision, and Matrox, for instance, cost \$2,000 or more.

perhaps a simple tutorial.

Despite these limitations, *Splash!* lives up to Spinnaker's reputation for software that's easy to learn, capable, and—with a street price of \$60 (\$99.95 list)—inexpensive.

Taking the Plunge

At four times the price of *Splash!* (\$395 list or \$300 street price), the next level in editing software delivers five times the muscle. In fact, Mathematica's *Tempra* integrates all the essential paint features with commercial-quality image-manipulation, special-effects, and text-overlay features.

With its multiple icon-based menus, backed by a logically organized manual and sample images, *Tempra* accomplishes the handholding necessary to flatten its learning curve. The program's seemingly endless array of editing features includes antialiasing (to smooth jagged lines), regional or global masking (to protect specified colors or locations), selective color swaps, color-contingent animation, image-warping with perspective, and multiple Bitstream fonts with the international extended character set. The program also automatically uses available expanded memory to execute memory-intensive functions and provides a volatile Undo buffer.

Tempra's intended market is serious hobbyists and economy-minded pros. Unfortunately, this means limited printer support. Presently, the program supports just Hewlett-Packard LaserJets and compatibles and two thermal color printers.

Dive Right In

Tempra may provide all the editing muscle you'll ever need. If, however, you decide to "go pro," you'll need the more sophisticated and exotic features found only in professional editing applications.

Astral Development's \$695 (\$500 discounted) *Picture Publisher Plus* weighs in as one of the least expensive yet comprehensive professional editing applications available. Here, the term *least expensive* is relative.

For example, *Publisher Plus* runs under *Microsoft Windows* (\$125 street price). And since time is money for professionals, add two megabytes of extended memory (\$200–\$600) to keep the current image in faster volatile memory.

This investment provides access to special effects such as texturizing, posterization, highlighting/shadowing, mosaics, multiple imported-image collages, interpretive resolution changes, paint smears, scatterprinting, vignettes, and silhouettes. Additionally, *Publisher Plus* imports scanner images (it contains a universal scanner

SETTING STANDARDS

When IBM defined the 256-color VGA graphic standard, it stopped at 320 × 200 resolution. While every major video-board manufacturer adheres to that standard, it's inadequate for image editing. At least a dozen strategies from as many vendors exist to extend VGA up to 1024 × 768 resolution with 256 colors. Therein lie the seeds of chaos.

Implementing these SuperVGA standards requires cooperation between software publishers and board manufacturers. Within certain limits, these two groups do collaborate. As a result, most image-editing software supports the extended modes of selected VGA boards made by Video Seven, ATI, Orchid, Paradise, and STB.

One caveat: Before upgrading your video card or purchasing editing software, make sure that the hardware and software are compatible.

interface) and captures images directly from selected high-end digitizer boards.

Publisher Plus includes two tutorials and numerous sample images along with detailed step-by-step installation and operation instructions.

The original *Picture Publisher* (without the *Plus*) worked exclusively with gray-scale images (256 shades from black to white). The present manuals still emphasize gray-scale imaging and deal with color imaging in an all-too-brief addendum. Considering the wealth of features in *Picture Publisher Plus*, clarity of instructions is essential. According to the publisher, updated manuals to accompany a more color-oriented revision should be available this December.

You've captured and edited the image—now you want to do more than just display it on a monitor or television. You want to print it. One option is to purchase Hitachi's \$1,400 entry-level color thermal printer (model VY-150A). You might also consider Hitachi's \$4,000 computer-compatible VY-200A.

One less-expensive option involves using the printer you already own. Application Techniques' *Pizazz Plus* enables you to do exactly that. A well-behaved RAM-resident graphics-printing utility, *PZ+* captures text or graphics screens and provides extensive printing control along with some elementary image-editing features. One of the best of its editing features provides for printing unadorned black-and-white graphics in multiple shades of gray.

With more than 400 drivers, *PZ+* lets you print graphic images on a wide variety of dot-matrix, laser, thermal, monochrome, and color printers. This \$149.99 (\$70.00 street price) utility will prove invaluable if

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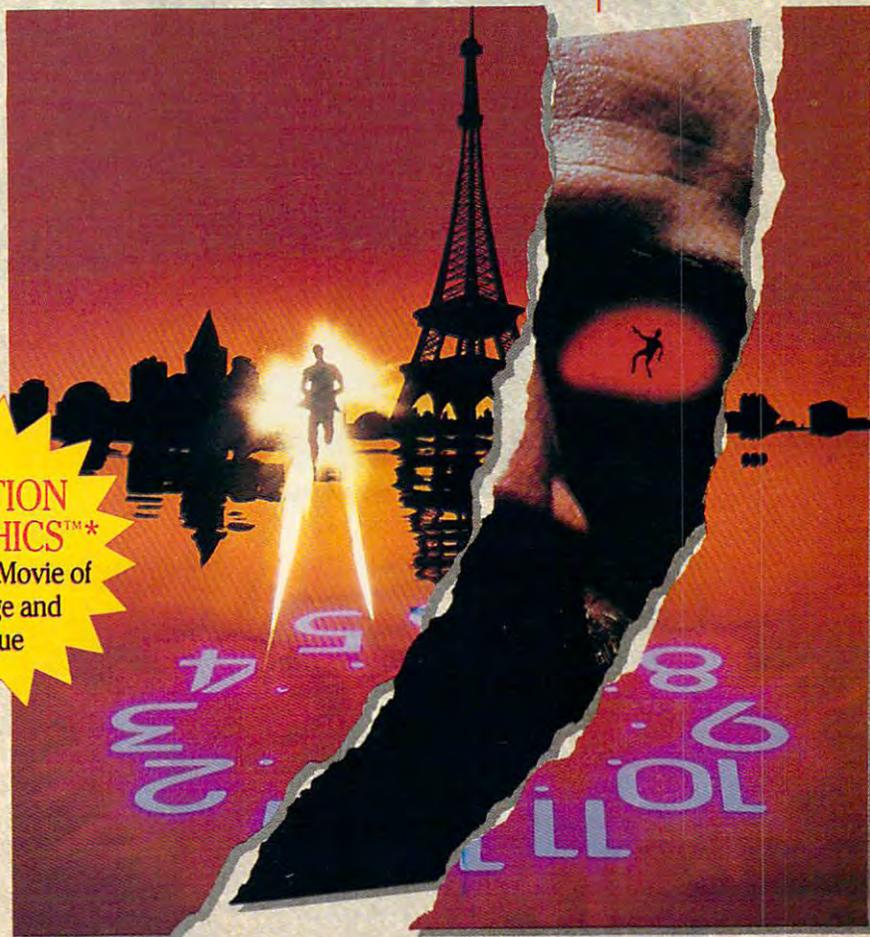
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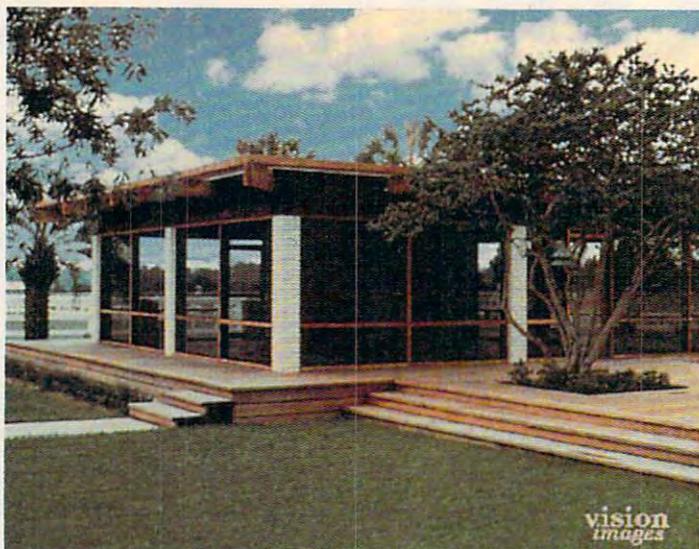
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TV or Not TV

With traditional point-and-shoot cameras available for about \$100 and superb single-reflex 35mm cameras available for less than \$500, why spend \$1,000 (and eventually more) for electronic photographs? The answer depends on your purpose. If you simply want photos for the family album, then wait until prices decline as they inevitably will. If, however, you need a photograph for a newsletter or catalog, a client, or those times when "good enough" just won't cut it, you may be ready for still-image video. □

VIDEO TO GO

For more information about the products mentioned in this feature, contact the companies listed below.

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(617) 494-1200

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One Londonderry Sq.
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(603) 432-6800

Pizazz Plus

Application Techniques
10 Lomar Park Dr.
Pepperell, MA 01463
(508) 433-5201

Splash!

Spinnaker Software
One Kendall Sq.
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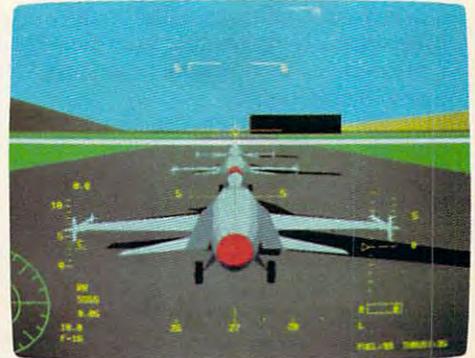
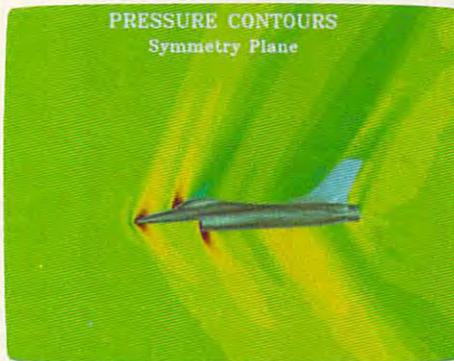
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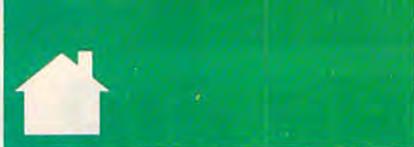
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CONVERSATIONS

K E I T H F E R R E L L

The Media Lab at M.I.T. just might be the hottest of all the world's hotspots for research into the future of television. In fact, *future television* is too narrow a phrase to describe all the areas Media Lab researchers are looking into.

"The focus of what we do and have been doing for 15 years," says Andrew Lippman, the Lab's associate director, "has to do with the merger of computing and image distribution. We variously explore that from the perspectives of education, technology, and entertainment."

Do those different perspectives change the nature of the research?

"Sometimes," Lippman says, "you think of that as interactive systems, and sometimes as high-definition television. But fundamentally and underneath those superficial distinctions, a lot of the work is very similar. It all addresses how you can smoothly merge what we've learned about computing and digital processing and image communications systems."

That smooth merger faces some obstacles, many of them imposed on television years ago. To understand the obstacles, Lippman compares TV's approach to images with the approach taken by computers.

"The focus on high-definition television, here," Lippman says, "can be encapsulated in one word: *scalability*." For example, the Macintosh's small screen has 480 lines; the screen on a NeXT computer has 700 or 800 lines. An even bigger screen would carry even more lines. "The constant in these kinds of systems is the lines per inch, the density of lines," he explains. "And as you get a bigger screen, the density stays the same, and you get more lines."

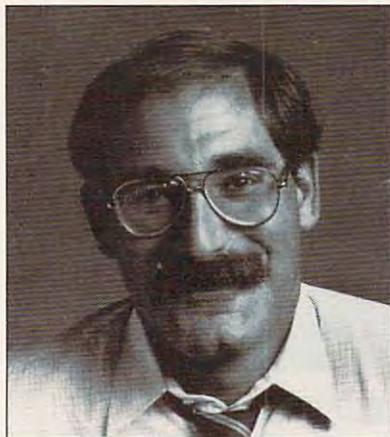
That might sound logical, but it isn't the way television works.

"Only in television do you fix the number of lines," Lippman says. "And when you want a bigger display, [you] literally take those lines and spread them farther apart. That is counterintuitive; it just doesn't make any sense.

"We might do better in the next round if, instead of designing a TV system to be 500 lines, or 1000 lines, or some number like that, we optimized it for a system where [the number of] lines was not the number you specified, just like it isn't on a computer screen."

How would such a design change our household TVs?

"Your little TV under your kitchen counter might have 500 lines on it because it's only 4 inches high," Lippman says. "The one at the foot of your bed, which is a 19-inch set, might have 1000 lines. And the one that's on your wall—the lines on that will depend on your architect more than [on] the designer of your television."



Andrew Lippman

Designer TV sets? Sure. "Likewise," Lippman says, "the *shape* will depend on your architect, as opposed to a Standards decision made in Washington. Kind of like theaters, where the shape of the screen is really the shape of the room. Maybe you should get your television set so that it's shaped to fit above the mantel, or along the wall. Scalability is the key."

The signal that scalable TVs would receive is as important as the sets themselves. "Having it be an end-to-end digital system at all phases is crucial because of the increasing number of digital channels and the increas-

ing degrees of freedom that are afforded by digital representations," Lippman says.

Marrying scalable television sets with digital signals lays the groundwork for future television.

"If you can do *that*, then you have sown the seeds for future development of the medium," Lippman says. "You're no longer just sending out an analog 30-frame-per-second, or 50-frame, or 60-frame, motion picture; you're sending out *data*."

And that is the heart of the PC-TV connection. "Your [future] TV set has already got the processing needed simply to turn that data into a picture," Lippman explains. "That's 90 percent of a sophisticated computer. We can add the other 10 percent, give the TV some smarts, and let it start to help you make up the programs."

How dramatic a shift will this be for viewers accustomed to passive television viewing?

"You know, some [personalized TV technologies] are out there, in funny ways that you don't recognize," Lippman says. He cites a viewer's ability to program a VCR to tape programs for later viewing. "You're making up your own television, but it is a crude job," he says. "The control is pretty limited. All you can tell it is clock time and TV station to tape."

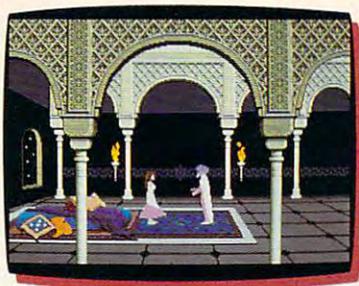
Tomorrow's television, thanks to computers, will offer more control. "If I can add content decisions to that, [for example:] 'Watch the TV *all* the time for me, and if you see anything interesting about the world oil crisis, *grab* it, and I'll ask you later.' That seems like a large step, but it's not," Lippman says.

Whatever the capabilities of upcoming television sets and systems, Lippman argues, the technologies must evolve on several fronts at once.

"The point is, can you make systems that, as they improve picture quality and give, strictly by fidelity, new degrees of freedom to existing uses like entertainment, can [those systems] also have the seeds of growth embedded within them?" □

"You really have to see it to believe it!"

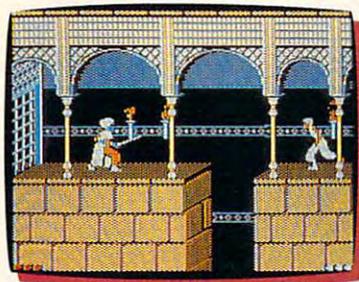
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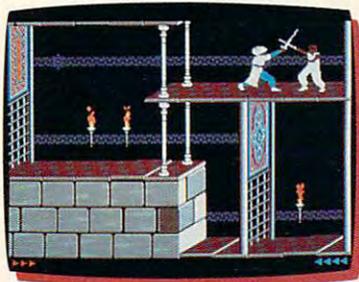
VGA SCREEN



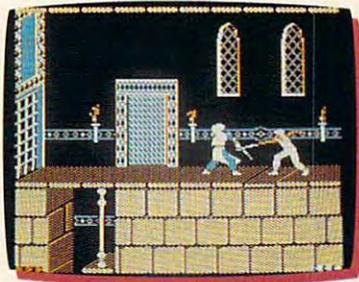
VGA SCREEN



APPLE SCREEN



EGA SCREEN



APPLE SCREEN



Lt's like an Arabian nights movie come to life . . . with you as the star! In Prince of Persia, you'll plunge into an exotic world of challenging puzzles, tumultuous action and animation so fantastic it has reviewers reaching for superlatives:

"(★★★★/★★★★) Incredibly realistic . . . The adventurer character actually looks human as he runs, jumps, climbs and hangs from ledges."

Computer Entertainer

"An unmitigated delight . . . comes as close to (perfection) as any arcade game has come in a long, long, long time . . . what makes this game so wonderful (am I gushing?) is that the little onscreen character does not move like a little onscreen character—he moves like a person."

Nibble

"Superb double-high-resolution graphics images and responsive, smooth animation work beautifully together to create an almost cinematic experience."

inCider/A+

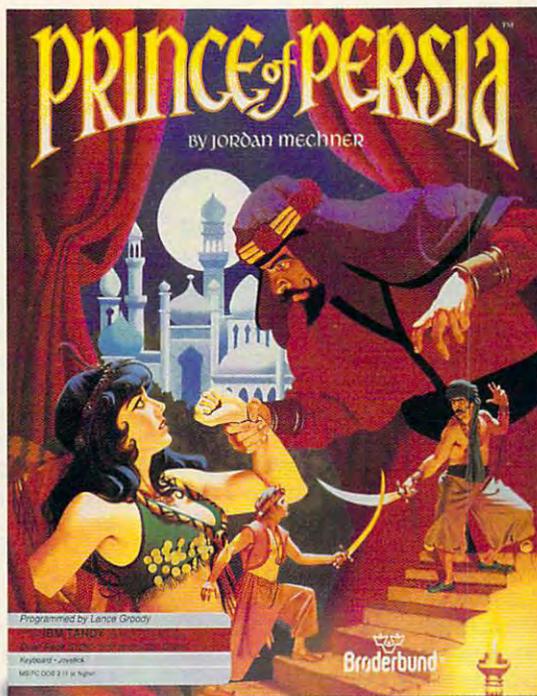
"A tremendous achievement . . . Mechner has crafted the smoothest animation ever seen in a game of this type."

"Prince of Persia is the Star Wars of its field."

Computer Gaming World

But don't take their word. You really *do* have to see it to believe it.

Available for IBM®/PC/Tandy® and 100% compatibles, Amiga® 500/1000*/2000/3000; Apple® IIe/IIc/IIc Plus/IIcs.
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*Requires Kickstart 1.2 or higher.

82PRC



SHAREPAK

R I C H A R D C. L E I N E C K E R

Listen to the computer press, and before long you'll hear the term *multimedia*. It's the merging of different technologies for more powerful presentations. Videotapes interact with computers and stereo sounds to make presentations come alive and underscore their messages. Although these high-powered applications are out of reach for most home and business computers, you can still use yours to get the most out of your stereo and VCR.

Since this month's In Focus theme is multimedia, we've filled the *SharePak* disk with programs that will help you manage your home entertainment systems. Now you can keep track of your VCR tapes and audio collections and tune your monitor for peak performance.

We screen hundreds of programs each month to bring you these fine collections. If you had downloaded the programs yourself and paid the connect charges, you would've paid many times what we charge for this disk. You don't need to spend hundreds of hours scouring the online services and mail-order catalogs for high-quality shareware. It's here on our disk, this month and every month.

Audiolog

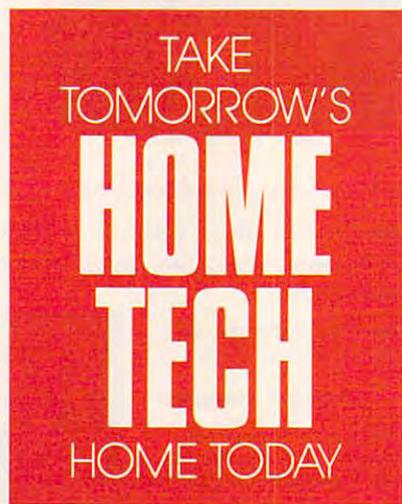
It's hard enough to keep track of current albums, tapes, and CDs that you listen to often; last year's favorites may have faded from memory. This program keeps you organized and on top of things by cataloging your audio collections. Just run the program and search one of six indexes to find what you're looking for.

Whether it's a Beethoven symphony, a golden oldie from the Tams, a big band classic from Glenn Miller, or a country ballad, you won't have trouble locating the right recording. This program tracks more than enough information to give you the full picture. Besides the title, artist, and type, *Audiolog* records the medium, label (Polydor, CBS, and so on), and comments you've entered. You can search

and edit the database or browse through it with a special option.

Printing reports is a breeze—a single keypress does it. The program runs in 256K with any monitor, so there won't be any systems left out. You don't have to be a computer expert to use the program, either. A simple, easy-to-use interface makes it a snap for even novices to use.

For audiophiles, this program is a must. Keep track of your state-of-the-art audio collection with a computer and enter the information age at home.



VideoTest

Today's monitors have come a long way from those amber and green monochrome systems. Plenty of people have graphic capabilities that make computers more friendly, pleasant, and fun. But it's hard to enjoy a fuzzy, out-of-focus game or desktop publishing program. *VideoTest* will help you adjust your monitor for maximum performance across the spectrum of applications.

And there are detailed descriptions of the internal workings of your monitor so that you have a better understanding of what's going on. (The program warns you not to open your monitor unless you're trained to do so.) You can put up dots, lines, and

crosshatch patterns for focus and contrast. Color bars will help you adjust the hue, tint, and saturation.

Of course, you could load a game or graphic application and do the adjusting. But then you may find another program doesn't look as good.

VideoTest lets you maximize performance in a more exacting way so that your system is tuned for peak performance in a wide variety of uses.

You don't have to be technical minded to use the program, either. Simple menus let you navigate with single keypresses. If you want to maximize your enjoyment and productivity by making sure that your monitor is perfectly adjusted, this easy, straightforward program is for you.

Video Librarian Version 2.1

Most households have at least one VCR. And the more people who use it, the harder it is to find the tape you want to view. That's why *Video Librarian* is so valuable. You can enter all of the information about a tape, and then the program worries about remembering the details.

There's room for everything you'd want to record. You can enter the title, starring and costarring actors, the production company, the release date, and personal comments. And it's easy to use. Options are clearly labeled along the bottom of the screen and are activated with a single keypress.

You can print reports to the printer, the screen, or a disk file. You can also generate labels for your library. Numerous search and sort options give you a lot of flexibility and power. Joining files is a single keypress away, too. The program merges all of your library entries into a single file.

Video buffs who use this program will soon be asking how they did without it. You'll never come up short when you look for your favorite Star Trek adventure. And if you're in the mood for a Woody Allen movie, let *Video Librarian* show you the list. □



SHAREPAK

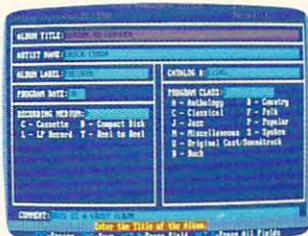
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Share in the Savings!

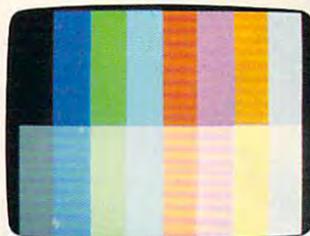
SAVE TIME—we carefully select and test all programs for you

SAVE MONEY—each disk includes two to five programs for one low price

SAVE KEYSTROKES—our free DOS shell lets you bypass the DOS command line



Audiolog



VideoTest



Video Librarian 2.1

COMPUTE's SharePak disk contains the best of shareware—handpicked and tested by our staff—to complement this month's In Focus topic. You'll sample entertainment, learning, or home office software at a great savings. Each *SharePak* disk includes two to five programs plus complete documentation for one low price:

\$5.95 for 5¼-inch disk
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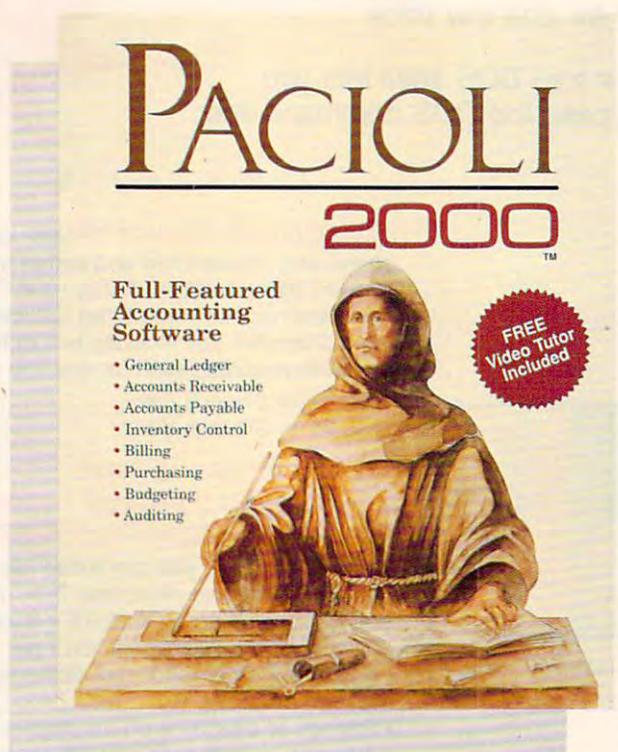
Name _____
 Address _____
 City _____
 State/Province _____ ZIP/Postal Code _____
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 Credit Card No. _____ Exp. Date _____
 Signature _____ (Required)
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HOME



In our dreams, many of us picture ourselves running businesses, making fortunes, and laughing all the way to the bank. That success, however, doesn't come easily. It requires a good idea, hard work, and careful control of every penny.

Even if an outside accountant is hired to help count the beans, the business owner must keep tabs on things as well. The owner needs a system of procedures and controls designed to keep financial data straight.

Pacioli 2000 is an accounting package that offers a growing business all of the tools it needs to organize a top-flight set of books. It's a full-featured program that you would expect to cost several times its \$49.95 price. The package includes a general ledger, accounts receivable, accounts payable, billing, inventory control, purchasing, budgeting, and auditing functions.

The options available in each of these modules give you enough latitude to customize *Pacioli 2000* to your business's needs. You can choose among five inventory costing methods, you can automatically compute finance charges due on past-due accounts receivable, and you can print checks, purchase orders, receiving slips, and invoices. All of these modules are organized in a single system, so data entered in one module is available to all the other modules.

Pacioli 2000, named for Fra Luca Pacioli, the inventor of double-entry accounting, has the flexibility to handle cash accounting, accrual accounting, inventory accounting, or accounting for a service-based company. If you're a real wheeler-dealer, this program will keep the books for up to 999 separate companies.

COMPUTE CHOICE

TONY ROBERTS

IF YOU'VE GOT ACCOUNTING SAVVY, THIS PROGRAM OFFERS YOU ALL THE TOOLS YOU'LL NEED TO KEEP A TOP-FLIGHT SET OF BOOKS FOR YOUR HOME OFFICE

FFICE

Pacioli 2000 comes with a three-part videotape to get you started. The tape includes a general section on accounting, a step-by-step section on how to use *Pacioli 2000* itself, and a DOS tutorial. For those who prefer book learning, these three sections are covered in the manual as well. Although the accounting primer is aimed at those who have a scant knowledge of accounting, no short videotaped tutorial can turn a novice into a fearless number cruncher. The video does provide plenty of basic information, however, that will give *Pacioli 2000* users a better understanding of what they're doing and why.

Help is available in most parts of the program, and it's often context-sensitive. If only a general help screen appears, there's an option to search the help index for the appropriate topic. An interesting feature of the help screen is the Date function. This permits you to change the program date without affecting your computer's system date. You can tell the program it's yesterday and finish up yesterday's transactions without changing your computer's clock settings. If you exit *Pacioli 2000* without resetting the

date, DOS will still know the correct time, your pop-up calendar will function normally, and you won't be late for that lunch date.

Once the system is set up and operating, it's easy and straightforward to use. However, unless you're familiar with accounting, setting up *Pacioli 2000* is likely to be befuddling and confusing—but not by any fault of the program. Accounting involves difficult concepts and procedures that can't be fully absorbed in a quick scan of the manual or a short videotape session. You can't invent an accounting system on the fly when using *Pacioli 2000*. You need to know what you're doing, then use *Pacioli 2000* to implement it.

One of *Pacioli 2000*'s strong points is that it does things by the book. It's rigid and strict in what it requires of its operators. The system refuses to let you exit an incomplete transaction, gently prompting you to fill in the incomplete fields. *Pacioli 2000* maintains a complete audit trail of all transactions, even aborted ones. Once transactions have been posted, you can't go back and change information. When you review your daily

journal, you'll see every completed transaction, every voided transaction, and every adjustment.

Pacioli 2000 provides a complete chart of accounts that can be used by most businesses, and it's easy to add new accounts when needed. When you're prompted for an account number by one of the modules, you can either enter the number if you remember it or press F2 to browse through the account list. If you can't find what you're looking for, you can create a new account on the spot.

The key to using *Pacioli 2000* is in creating new accounts. You create accounts for each vendor, each customer, and every product you buy or sell. As you create these accounts, you fill in an information screen that includes such entries as the customer's name and address, shipping information, and discount levels available to that customer. The next time you do business with that customer, creat-

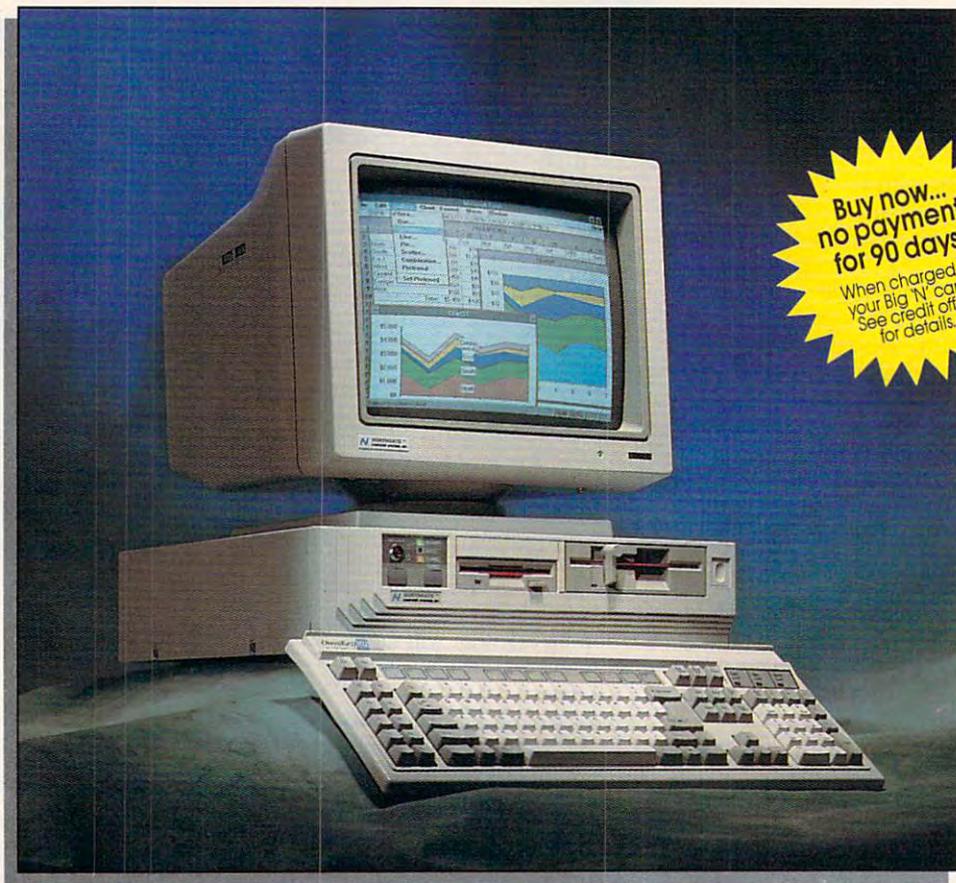
continued on page 38



Date	Account Name	Coll Invoice	Transact #	Source CL	Debit	Credit
11/02/91	None		00125			2500.00
11/02/91	None				100.00	2500.00
11/02/91	None				100.00	
Totals:					2500.00	2500.00

***Pacioli 2000* lets you enter different transaction types from a single screen.**

New From Northgate... 20 MHz Powered Up



Buy now...
no payments
for 90 days!
When charged to
your Big N^o card.
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for details.

Color monitor shown available as option.

Yes, we're a bit late to the party with SX systems. How come? We just couldn't bring ourselves to market another ho-hum SX.

So we put our research and development team on it. Boy, did they rise to the challenge! Now you can get an SX 16 or 20 MHz machine with the power to run Microsoft® Windows™ and other 32-bit software at flashing cache-enhanced speeds. And, they packaged all this power and performance into our

exclusive space-saving case — a favorite of Northgate customers!

The secret to SlimLine's space-saving design? A fully integrated motherboard designed and manufactured by Northgate! This design reduces bus load — makes the system faster and more reliable!

Motherboard features include a built-in VGA adapter (with 256K video RAM), one parallel and two serial ports, fully integrated floppy disk

controller and IDE hard drive controller. Motherboard integration also makes it easier to install modems and add-on cards.

SlimLine's triple cache boosts performance to zero wait state! You get a built-in 64K memory SRAM cache to accelerate the execution of instructions; PLUS, hard drive caching to accelerate I/O transactions; and disk caching software to speed data to and from the CPU!

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Unbeatable service! Your SlimLine 386SX is backed by toll-free technical support, 24 hours-a-day, 7 days-a-week. PLUS, FREE on-site service to most locations for one year if we can't solve your problems over the phone. And if you ever need a replacement part, we'll ship it overnight — at our expense — before you return your part.

*PC Magazine** says:
“. . . Northgate stops
at nothing to please
its customers.”

Of course, you also get Northgate's full-year warranty on parts; five years on the *OmniKey* keyboard. It's no

wonder *PC Magazine* reported:
“If you're looking for the subjective winner for customer loyalty, Northgate takes first prize.”

Now use SlimLine for 60-days — Risk Free! It won't take you 60 days to recognize the excellent quality of SlimLine SX. But we don't want to rush you. Take your time putting SlimLine to the test. If you aren't completely satisfied after 60 days, you can return it. Northgate guarantees your satisfaction. Order Today!

SlimLine 386SX System Features:

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Notice to the Hearing Impaired: Northgate has TDD capability. Dial 800-535-0602.

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Circle Reader Service Number 263

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for details.

First time ever! Now you can have Northgate Elegance™ power, speed and performance in our popular space-saving SlimLine case! Elegance 386 computers shocked the industry with a #1 and #2 sweep of *Infoworld's* 1989 best product awards; AND three Editors' Choice awards from *PC Magazine*.

Cache! Cache! Cache! Like our powerful Elegance systems, Slimline 386 features 64K SRAM

cache to zip through the execution of instructions. For even more speed, we've added a hard drive cache that makes short work of I/O transactions. To top it off, SlimLine 386 comes with Smartdrive DOS disk caching software that anticipates the information you'll need and brings it into the cache for fast access.

Better features across the board! SlimLine's motherboard is fully integrated, allowing

maximum system features in the smallest possible space. There's room for up to 16Mb of 32-bit RAM, one parallel and two serial ports, a built-in floppy disk controller and IDE hard drive controller. Plus an integrated SVGA video with 512K video RAM to speed bus throughput — makes the system faster and more reliable! And there's plenty more room for add-on peripherals — with SlimLine you get five open expansion slots.

33 Cache Systems!

Two speeds! SlimLine 386 comes with your choice of 386DX 25 or 33MHz processors. For faster math-based applications — budgets, forecasts, spreadsheets and databases — both models feature 80387 coprocessor support for adding floating point unit (FPU) speed enhancements.

All purpose systems! SlimLine Cache is the perfect network workstation or stand-alone system for business and home use. It also provides excellent support for advanced desktop publishing and graphics applications.

Or select our SlimLine 386 Power System — the same great features of the base system plus:

- 200 Mb hard drive — 15ms access
- 14" VGA color monitor
- Both 5.25" and 3.5" floppy drives
- Microsoft® Windows™ 3.0, Samna® Ami™ Professional word processing software, Informix® Wingz™ graphics spreadsheet and database software. A \$1139.00 suggested retail value at **NO EXTRA CHARGE!**
- Mouse

Industry's finest 24-hour toll-free technical support! Your SlimLine 386 Cache is backed by expert technical support any time you need it. Call toll-free, 7 days a week, 24 hours a day. **PLUS,** free on-site next day service to most locations if we can't solve your problems over the phone.

More great support! Your new SlimLine 386 Cache also comes with a one year warranty on parts and labor; five years on the *OmniKey* keyboard. And, if a part

SlimLine 386 Base System Features:

- 25 or 33MHz Intel® 80386DX processor
- 4Mb of 32-bit DRAM (expandable to 16Mb on motherboard)
- Down-scaled, U.S.-made motherboard
- 40Mb fast access hard drive; AT bus interface; 1:1 interleave; 32K look ahead disk caching
- 64K SRAM memory cache; read/write-back caching
- High density 1.2Mb 5.25" and 1.44Mb 3.5" floppy drives; also read/write low density disks
- Five open expansion slots; three full length 16-bit and 2 half length 8-bit
- 25 or 33MHz 80387 or Weitek coprocessor support
- One parallel and two serial ports
- Built-in 16-bit SVGA with up to 1024 x 768 resolution; 512K video memory
- Clock / calendar chip rated at 5 years
- 100 watt power supply
- Small footprint SlimLine case with room for two exposed and 1 internal half-height devices
- Front mounted reset and high / low speed controls
- Exclusive Northgate *OmniKey* keyboard
- 12" VGA monochrome monitor
- MS-DOS 4.01 and GW-BASIC software installed
- On-line User's Guide to the system and MS-DOS 4.01
- QA Plus diagnostic and utility software
- Smartdrive caching software
- 1 year warranty on system parts and labor; 5 years on keyboard
- FCC Class B Certified

fails, we'll ship a replacement to you overnight at our expense — before you return your part!

Now use SlimLine for 60 days — Risk Free! We're sure you'll want to keep your SlimLine Cache — so we won't rush you. Put it to the test in your office or home for a full 60 days. If it doesn't live up to everything we say, return it for a full refund — No questions asked.

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continued from page 33

ing an invoice is quick and easy: Simply type in the account number or select it from the accounts list, and the pertinent information is pasted into the invoice. Then type in the product numbers for what the customer ordered, and product descriptions and prices are filled in, and the appropriate discounts for that customer are applied.

You can operate *Pacioli 2000* by using the keyboard, mouse, or both, but mouse support is limited in some areas. For example, when scrolling through the chart of accounts, you'll need to use the keyboard Page-Up and -Down keys if you want to move more than a line at a time. The scroll bars aren't as fully featured as you might be accustomed to.

This system is designed for daily use. Transactions are entered as they occur; then, at the end of the day, the printer goes to work, churning out the results of the day's activities. Invoices, packing slips, receiving slips, credit memos, account statements, and checks can be printed on forms available from M-USA. Then the daily journals are printed, reviewed, adjusted, and reprinted if necessary.

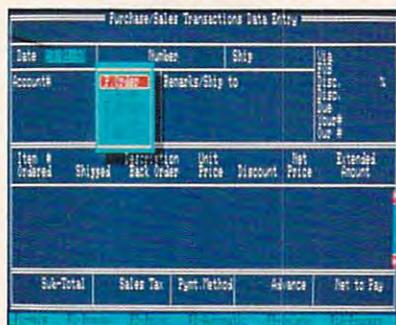
Once the daily journals are correct, the transactions are posted. Posting is the process of placing all of the day's transactions into the various accounts your company uses. During posting, several files are modified, and both the manual and the program are quite insistent that you back up your data files before posting. *Pacioli 2000*'s posting process involves a fairly painless, though time-consuming, backup process that utilizes the DOS Backup command. The procedure is automated and requires only a key-press or two to complete.

Pacioli 2000 also can be used as a point-of-sale system, printing out invoices and receipts on the spot.

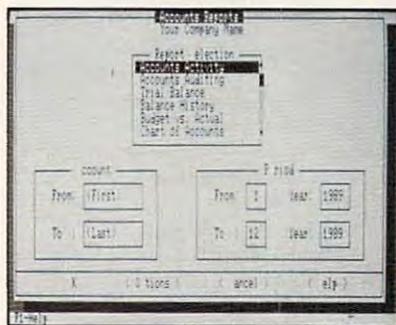
The system uses specially designed teal and gray, multipart, carbonless forms for invoices, statements, and checks. These forms and associated envelopes, cards, and labels are available by mail order from M-USA. Samples of each of the forms and checks are included in the package, so you'll be able to check with local printers to see if any of their stock matches that used by *Pacioli 2000*. M-USA claims to have the only official forms for use with the program, but purchasing forms locally, if they're available, is usually less expensive and faster.

By using *Pacioli 2000*'s checks and forms, you can significantly sim-

plify your bookkeeping work. Write a check or process an invoice, and the appropriate transactions are entered automatically in the daily journal. If you choose not to use the special forms and checks, you can still benefit from *Pacioli 2000* by writing checks and invoices manually and then entering the transactions into the sys-



Track purchase orders and sales invoices—even with no inventory on hand.



Pacioli 2000's dialog boxes can be accessed using the keyboard or mouse.

tem. *Pacioli 2000* will keep up the daily journal and general ledger. A disadvantage of this approach, besides time lost, is that you increase the chance of error because data is entered twice.

Pacioli 2000 is fairly rigid in its output. You can't adjust the check, invoice, or statement output formats. In the printer setup menu, the only options you can modify are the page length and the control codes for normal, compressed, and expanded type. A dot-matrix or other impact printer is required to print checks or forms, and the manual recommends using such a printer for reports as well. Laser printers aren't supported to any degree.

All forms and checks are sent to the LPT1 printer port, and there's no provision for redirecting them. Reports, however, can be sent to the screen or be redirected to a file, which you can edit or print later.

While using *Pacioli 2000*, you'll amass a great deal of information about your company and its vendors and customers. The program's report section gives you the tools to manage that information. The system includes several predefined reports that will satisfy most of your needs, and it includes a report generator that can be used to arrange the information for more customized reports. *Pacioli 2000* keeps up to 36 months of accounting data online, so reviewing recent history is as easy as looking at yesterday's data.

Pacioli 2000 puts a lot of accounting power into your hands. It's network ready, it offers a tiered password system to protect your data, and it allows you to enter terms and discounts on a customer-by-customer basis. The program also includes an auditing module to help you reconcile your checking accounts, verify the accuracy of your records, and keep an accurate count of your inventory. *Pacioli 2000*'s budgeting function will help you create future budgets based on past performance.

There's a great deal of capability here for a relatively small price. With *Pacioli 2000*, small and growing businesses can set up an accounting system without worrying that they're spending a lot of money on something that won't work for them. M-USA promises free customer support for registered users.

If nothing else, the experience of working with *Pacioli 2000* and coming to understand your company's financial data will make you better able to hire an accountant to do the books. As the owner, you're responsible for everything, and you can't afford to give up control of something as important as your money.

Ease of Use	★★★★
Documentation	★★★★
Features	★★★★
Innovation	★★★★

Pacioli 2000

IBM PC and compatibles with 640K, DOS 2.1 or higher (DOS 3.1 or higher for network use), and hard drive—\$49.95

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Please complete all appropriate sections, providing at least two years residence and employment history. If you are self-employed, please be sure to complete section d. **THIS IS NOT A CREDIT AGREEMENT!** One will be sent to you upon authorization of an account. (This Form Must Be Signed To Process Your Order.) All Financed Purchases Are Subject To Credit Approval. If You Have Any Credit Questions, Please Call For Assistance. Thank You!

A married person may apply for individual credit. I am applying for (check one box, please):

- JOINT CREDIT with another person. Complete entire application.
 INDIVIDUAL CREDIT complete only individual section.
 INDIVIDUAL CREDIT but rely on income of another. Complete entire application.

*If you are a married Wisconsin applicant, you must provide your spouse's information as indicated, even though your spouse may not be signing the contract.

NOTICE TO WISCONSIN APPLICANTS
You must disclose your marital status:
 married
 unmarried
 legally separated

a. Personal Information

NAME _____ HOME PHONE (____) _____
SOCIAL SECURITY NUMBER _____ DATE OF BIRTH ____/____/____
PRESENT ADDRESS _____ CITY _____ ST _____ ZIP _____
DATE OF RESIDENCE MO. _____ YR. _____ BUY RENT OTHER _____
PREVIOUS ADDRESS _____
EMPLOYER _____ DATE OF EMPLOYMENT MO. _____ YR. _____
MONTHLY GROSS SALARY \$ _____ BUSINESS PHONE (____) _____
PREVIOUS EMPLOYER _____ DATES OF EMPLOYMENT _____ TO _____
Income from alimony, child support or separate maintenance payments need not be disclosed if you do not wish to have it considered as basis for repaying the obligation.
ADDITIONAL MONTHLY INCOME \$ _____ SOURCE _____

b. Credit Information

PLEASE TELL US IF YOU HAVE: CHECKING ACCOUNT (Y/N) _____ SAVINGS ACCOUNT (Y/N) _____
BANK LOAN (Y/N) _____ HOW MANY? _____ VISA (Y/N) _____ HOW MANY? _____
MASTERCARD (Y/N) _____ HOW MANY? _____ FINANCE COMPANY LOAN (Y/N) _____ HOW MANY? _____
DEPT. STORE CHARGE CARD (Y/N) _____ HOW MANY? _____ CREDIT UNION ACCOUNT (Y/N) _____ HOW MANY? _____
OTHER MAJOR CHARGE CARDS (Y/N) _____ HOW MANY? _____

c. Joint Applicant's Personal Information

JOINT APPLICANT'S NAME _____ HOME PHONE (____) _____
SOCIAL SECURITY NUMBER _____ DATE OF BIRTH ____/____/____
ADDRESS _____ CITY _____ ST _____ ZIP _____
DATE OF RESIDENCE MO. _____ YR. _____
JOINT APPLICANT'S EMPLOYER _____ DATE OF EMPLOYMENT MO. _____ YR. _____
MONTHLY GROSS SALARY \$ _____ BUSINESS PHONE (____) _____
NAME AND ADDRESS OF NEAREST RELATIVE NOT LIVING WITH YOU _____
RELATIONSHIP _____

d. Self-Employment Information

BUSINESS NAME _____ BUSINESS PHONE (____) _____
TYPE OF BUSINESS Proprietorship Partnership Corporation IN BUSINESS SINCE _____
YOUR ANNUAL INCOME FROM BUSINESS Gross \$ _____ Net \$ _____
PERSONAL BANKER'S NAME _____ BANKER'S PHONE (____) _____

e. Customer Authorization

I authorize Northgate Computer Systems or its assignees to investigate credit records and to report my performance hereunder to credit agencies. I hereby certify that the following information is furnished to you for the purpose of obtaining credit and is true and correct of the best of my knowledge and belief. There are costs associated with the use of this credit card. To obtain more information about these costs, call us at 1-800-548-1993 or write to P.O. Box 59080, Minneapolis, MN 55459-0080.
NY—A consumer credit report may be requested in connection with this application or in connection with updates, renewals or extensions of any credit granted as a result of this application. If I subsequently ask for this information, I will be informed whether or not such a report was requested and, if so, the name and address of the agency that furnished the report.
OH—THE OHIO LAWS AGAINST DISCRIMINATION REQUIRE THAT ALL CREDITORS MAKE CREDIT EQUALLY AVAILABLE TO ALL CREDIT-WORTHY CUSTOMERS AND THAT CREDIT REPORTING AGENCIES MAINTAIN SEPARATE CREDIT HISTORIES ON EACH INDIVIDUAL UPON REQUEST. THE OHIO CIVIL RIGHTS COMMISSION ADMINISTERS COMPLIANCE WITH THIS LAW.

APPLICANT'S SIGNATURE _____ DATE _____

JOINT APPLICANT'S SIGNATURE _____ DATE _____

FOR MARRIED WISCONSIN APPLICANTS:
I acknowledge that the obligation described herein is being incurred in the interest of my marriage or family.

BUYER'S SIGNATURE _____ DATE _____

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This is not an application. A completed application and agreement must be on file prior to approval for credit.



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Are you fertilizing your mind with new ideas in your home office? You can if you follow these steps: Listen to audio cassette tapes on business topics. Join professional organizations. Attend educational seminars. Share ideas with a colleague over lunch. Talk to a customer every day.

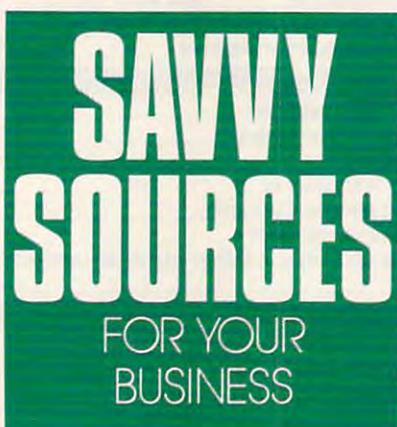
Audio cassette tapes cover such business topics as goal setting, time management, motivation, coping with difficult people, and sales. These 1- to 3-hour audio programs are informative and convenient. You can listen to an entertaining and thought-provoking discourse on a favorite topic as you drive to an appointment, jog a mile, or take a shower.

An inexpensive way to listen to the best business audio tape programs is to subscribe to The Personal Progress Library (818-242-9583), a lending library of more than 600 tapes covering management, communication, negotiation, sales training, time management, and marketing. Its authors include Ken Blanchard (*The One Minute Manager*), negotiating expert Roger Dawson, telephone communications guru George Walther, management author Peter Drucker, and customer service visionary Michael LeBoeuf.

The \$199 annual fee entitles you to borrow an unlimited number of tapes. You must pay a \$7 postage charge for each tape program. This is a small price compared to what you would pay to buy the tapes.

One of the largest and most diverse collections of business and motivational tapes is offered by Nightingale Conant (N-C, 800-323-3938). If you've ever listened to the

taped interviews and motivational speeches on airplanes, you've heard N-C authors, including Zig Ziglar. The most recent catalog features the audio cassette adaptations of such best sellers as *Wealth Without Risk* by Charles Givens, *Thriving on Chaos* by Tom Peters, *What They Still Don't Teach You at Harvard Business School* by Mark McCormack, and *Swim with the Sharks Without Being Eaten Alive* by Harvey Mackay. Each sells for \$59-\$69 and lasts about four hours. The catalog features many original self-help tapes to improve memory, avoid procrastination, manage people, promote a positive outlook on life, sell real estate, and be more cre-



ative. N-C also has two tape-of-the-month club offerings: Sound Selling (120 minutes, \$12.25 per month) and Sound Management (60 minutes, \$13.90 per month).

If you don't have time to read the best-selling business books, you might consider Fast Track (800-257-8345). It offers 40-minute abridgements of two books each month plus 5-minute interviews with the authors. An annual subscription costs \$132 a year, a bargain compared to the \$720 you would spend for two books a month at an average price of \$30. Recent titles include *Megatrends*, *Confessions of an SOB*, and *The Wall Street Journal on Managing*.

Employing a self-study approach

complete with tapes and workbooks, The American Management Association (518-891-5510) features approximately 100 programs on business topics such as marketing, finance, service organization, and manufacturing. You can learn how to write a business plan, plan your business's cash flow, write marketing plans, and analyze the competition. Prices range from \$79 to \$249, with minor discounts for AMA members.

To increase your expertise and get different perspectives on business, join a professional organization or general business group, such as the Rotary Club or the Chamber of Commerce.

Through community colleges, training companies, and numerous professional organizations, you can learn how to design newsletters, supervise people, read a balance sheet, or troubleshoot computers. Prices range from \$95 to \$895 a day. Many courses offer discounts if several people from the same company attend a session. Fred Pryor Seminars offers day-long seminars for \$99 on a variety of subjects all across the country. Call (800) 255-6139 for information.

Nothing beats face-to-face contact. Take a colleague to lunch or breakfast. You can learn from each other's experiences. Don't worry about giving away your trade secrets. The expertise you bring to your work will differentiate you from the others. After all, a competitor can't steal your creative style and personal panache that win clients. Meanwhile, you can pick up invaluable tips that can save you time and money.

Want to do your job better and prepare for the future? Who knows what your customers want better than your customers? Call a customer or prospect every day. Don't try to sell, however. Talk to learn. Ask customers: What trends are shaping the industry? What products or services will be hot in the future? What do you like or dislike about my service?

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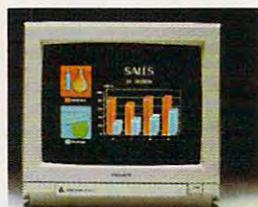
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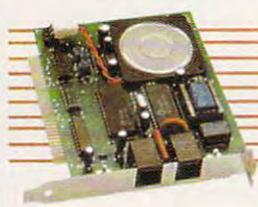
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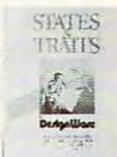
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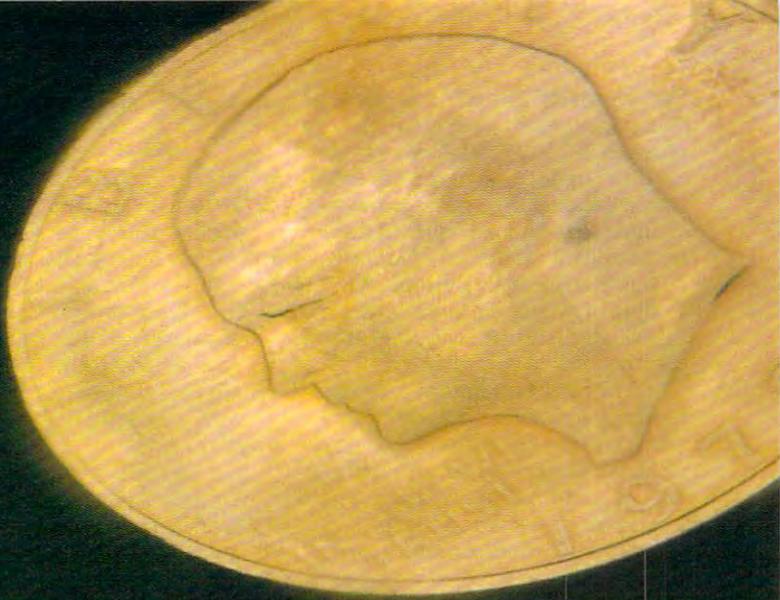
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MARK WAGONER 1990



TIME





TIME IS MONEY

R I C H A R D O . M A N N



Time is money. You spend time steadily, hour after hour, week after week, wisely or foolishly. You use time to make money or—by not using time efficiently—to lose money. This alarming realization has helped fuel the boom in datebook organizers, those ever-present leather notebooks so many people carry. Software developers, ever alert to a trend, have created equivalent time-management systems for personal computers.

The computer is a valuable ally in the struggle to convert time into money. Three classes of software assist in this battle: time managers, personal information managers, and time-tracking and billing programs. ▸

USE YOUR
COMPUTER
TO MANAGE
YOUR TIME

Principles of Time Management

"Classic time management hasn't changed in 2000 years," says Hyrum Smith, founder of the Franklin Institute, a national time-management training firm and publisher of the best-selling *Franklin Day Planner*. "Time management is simply the controlling of events. The issue is deciding which events you can control and learning how to control them."

The basic elements of time management are well known: determine goals, set up a prioritized schedule or calendar, keep notes on your daily activities, and maintain a database of important contacts and clients.

Goals. First, determine your goals. This is an essential step too often left out of time-management advice. Without clear goals, you can manage every minute of your day with perfect efficiency and still never accomplish anything worthwhile. Good time managers ensure that the right events take place.

Prioritized to-do list and calendar. Second, identify activities that lead to your goals. Put them on your daily to-do list, the basic tool of time management. Each day you need a clear picture of what you want to accomplish.

Once you have the list of your day's activities, analyze it carefully and assign priorities. When you plan the next day, carry unfinished tasks forward.

Your day-planning sheet should also have a place to show your appointments. Keep a set of monthly calendars showing your time-related commitments.

Notes on daily activities. To manage time efficiently, you need a place to keep the important notes usually written on scraps of paper and lost. If you promise to call someone next Thursday or meet with the PTA on the second Tuesday of each month, you'd better write it down where you can find it.

Personal database. Finally, you need a personal database. Addresses, phone numbers, bank account numbers, important dates such as anniversaries, and your notes from the last time you talked to someone—capture all these things in a single, accessible place.

Time-Management Style

How you choose to apply these principles will vary greatly. What works for you depends largely on your view of life, your way of thinking, and your personal style. Some of us focus on time itself while others focus on tasks, projects, and processes. Still others concentrate on the people involved. Some key on goals or results; the end

is ever in mind, and all else exists merely to create it.

How do you design a single piece of time-management software that appeals to everyone? You can't. Instead, software developers have created a variety of products, appealing to individual styles of time management.

These programs range from personal information managers (PIMs), such as *Arriba* and *Instant Recall*, to simpler daily schedule managers, such as *Top Priority*, *who-what-when*, and *OnTime*.

These programs reflect their designers' personal styles and time-management beliefs. If you find a program that shares your style, you'll really like it. If you end up with a mismatch, you'll be frustrated, wondering why the dolts who designed the program won't let you organize and manage things logically.

Fair Warning

Before we discuss these programs, you need to be aware of a problem. Smith's Franklin Institute found out the hard way that once you've used a good datebook organizer, you're unlikely to be happy with a computer-based system for long. Two years ago, a \$70,000 development effort produced the *Franklin Day Planner* on a disk. The beta testers—techie power users, all—went back to their *Franklin Day Planner* books quickly, even though the software worked perfectly.

Why? Smith says that the need to have their schedule and personal database with them at all times outweighed the benefits of computerization. "If you're into a computer for managing your time, you're into a double-entry system, like it or not," he says.

Smith's beta testers were accustomed to a superb paper-based system. For the great majority who now do little or no formal time management, however, these easy-to-use computer-based systems provide an excellent introduction to the marvels of mastering time.

Time Managers

Here are a few of the best and most popular time managers on the market.

Top Priority. The time manager known as *Top Priority* focuses on the day's activities, both to-do items and appointments. Its printed daily schedule page is a work of art, duplicating what you'd find in a normal datebook organizer, printed using decorative fonts, boxes, and lines. It provides room for handwritten changes and notes.

Top Priority's excellent manual gently teaches time-management concepts, including the importance of set-

ting goals and relating them to your daily tasks. It encourages you to organize your tasks into projects, with step-by-step tasks as subtasks, yet it handles tasks not related to a project just as easily. Priorities range from A to Z, with subtasks getting an individual subpriority.

Top Priority has no extra personal database features, but it exchanges data with Power Up!'s market-leading powerhouse *Calendar Creator Plus*.

who-what-when. Although best suited to managing projects, *who-what-when* provides dynamite ways of gaining alternative perspectives. It looks at projects from a *what* viewpoint (what's being done), a *when* perspective (how the events are sequenced and the stages of project completion), and a *who* outlook (lists of tasks assigned to different people).

While it shines at managing projects, *who-what-when* feels cumbersome when managing masses of small, unrelated tasks. It lacks a usable overall calendar view of your schedule, though it has a report showing which days have tasks in them. It has a limited priority scheme, and its old-fashioned, plain-text reports can be hard to read and use.

who-what-when excels at managing large projects, especially if there are several people involved. It compares schedules, reviews delegations, and cross-tabulates relationships among people and projects in every way imaginable.

OnTime. If you're looking for a lean, highly effective daily scheduling machine, you're looking for *OnTime*. It works on appointments and to-do items only and doesn't rely on your being at the keyboard throughout the day.

You plan your day ahead with *OnTime* and print a single two-sided planning sheet, which folds into thirds and slips into your purse or coat pocket. Inside the folded sheet is a detailed appointment calendar covering daily appointments for as many as seven weeks.

The outside fold shows today's appointments with room to add more by hand. The second fold shows your day's to-do list, sorted by priority. The final fold contains an annual calendar.

This single sheet of letter-sized paper contains all the basic information you need to manage your day. It's an elegant solution to basic time-management needs, but it doesn't capture any other data. It's direct, simple, and easy.

Personal Information Managers

One step up from the simple time managers are personal information managers. Here's a look at some of

continued on page 52

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PC Magazine, Best of 1989 Awards
January 16, 1990 issue

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Robert Cullen, Home Office Computing

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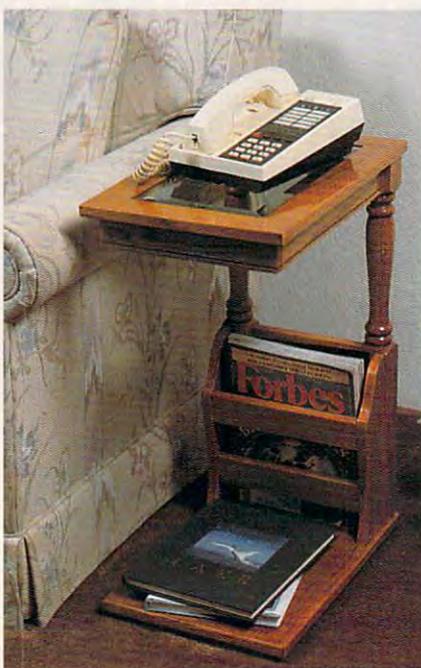
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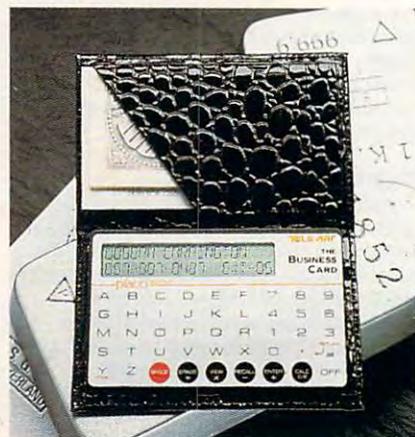
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the best and the brightest.

Arriba. The way to visualize *Arriba* is to picture a file cabinet full of folders. In each folder is a set of related information, which can be anything from simple text to a structured minidatabase of your own design. There are built-in folders for to-do list processing, a phone list, and other functions.

Arriba is fast. If you know that somewhere in all your folders is a note containing the birthday of the daughter of the president of ABC Company, for example, just search for *ABC* and *daughter*. The note is onscreen almost instantly.

But how is it for time management? It's adequate, but that's not its strong point. If you need some of the finer elements of to-do list processing and calendaring, look elsewhere. If your time-management needs are modest but the prospect of custom minidatabases is alluring, *Arriba* is for you.

Instant Recall. A fast PIM with an entirely different outlook is *Instant Recall*. It provides four basic ways of viewing your personal database: notes, tasks, schedule, and people. Depending on your style, any of these views can become the primary focus.

The step-by-step task/subtask processing of *who-what-when* and *Top Priority* won't be found in *Instant Recall*, making it more suited for work that doesn't involve a time-related series of component tasks leading to completion of an overall task.

The strength of *Instant Recall* is that it can run as a memory-resident program, ready to instantly pop up over other applications. Bigger PIMs

have TSR modules that run a subset of the program, but *Instant Recall's* entire program is there whenever you pop it up, and it only takes about 28K of RAM when dormant. *Arriba* uses about 200K to do the same thing.

Time-Tracking and Billing

If you bill clients for your time, you need a time-tracking and billing program. It simplifies your recordkeeping process and handles the drudgery of accumulating information from original sources into sorted, detailed, priced invoices for your clients.

Even if you aren't at your computer all the time, the amount of work these programs do behind the scenes justifies the occasional double-entry process of copying handwritten notes into the computer. Don't lose money because you didn't track your time well enough to bill it accurately.

TimeSheet Professional. A time sheet is a document that lists client tasks down the left and hours in columns under day headings across the top. *TimeSheet Professional* automates the process of maintaining a time sheet. You can enter time and expense amounts in any slot on the time sheet and attach long notes using a pop-up window. Notes and expenses can be printed on bills at your option.

And, of course, *TimeSheet Professional* keeps track of time for you. You just put the cursor in the cell for the job you're doing and hit a key, and it starts timing. When you stop the timer, the elapsed time is charged to the job for you.

Timeslips III. The market leader in time-tracking and billing programs

is *Timeslips III*. Its metaphor isn't the time sheet but a time slip, a small piece of paper on which you write a code and the time spent on a job. These are typically accumulated and processed by an accounting clerk who turns them into invoices. Time slips are often used by law firms and others who have too many active projects going to fit neatly onto a time sheet.

Timeslips III does more than *TimeSheet Professional*. It offers more codes, more classifications, more ways to determine billing rates, and, unfortunately, a few more ways to get confused. That's offset by an outstanding, clearly written manual.

Timeslips III is really a billing program, producing professional-looking invoices effortlessly in a variety of formats. It gets downright serious about tracking what's owed to you, even supplying aged accounts-receivable reports.

A Final Caution

These programs are fun—maybe too much fun. You can get so caught up in managing your time that you fritter away the very thing you're working to conserve. Add a computer to the mix, and the temptation to really get organized can end up eating away your precious time. Don't be overorganized, more interested in being organized than in accomplishing anything. Time management is doing the right things at the right time, not just keeping track of what you've done. □

Richard O. Mann is an internal auditor for the Church of Jesus Christ of Latter-day Saints. His book, *Working with Windows 3*, will be released in the spring of 1991.

Arriba 1.01

PC compatibles with 384K and a hard disk
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Good Software
13601 Preston Rd.
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(800) 272-4663

Franklin Day Planner (a book)

\$24.95
Franklin International Institute
P.O. Box 25127
Salt Lake City, UT 84125-0127
(801) 975-1776

Instant Recall 1.2

PC compatibles with 512K and at least a 720K floppy or a hard disk
\$99.95
Chronologic
5151 N. Oracle, #210
Tucson, AZ 85704
(800) 848-4970

OnTime 1.2

PC compatibles with 320K
\$69.95
Campbell Services
21700 Northwestern Hwy.
Suite 1070
Southfield, MI 48075
(313) 559-5955

TimeSheet Professional 1.2

PC compatibles with 512K; hard disk recommended
\$149.95
Software Partners
999 Commercial St.
Palo Alto, CA 94303
(415) 857-1110

Timeslips III

PC compatibles with 448K and a hard disk
\$299.95
Timeslips
239 Western Ave.
Essex, MA 01929
(508) 768-6100

Top Priority 1.00

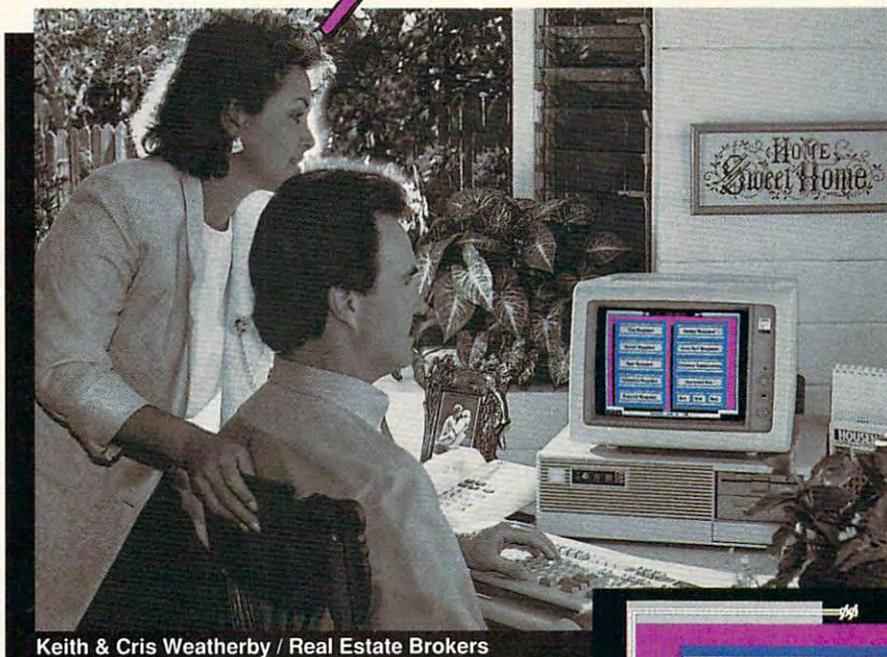
PC compatibles with 384K
\$99.95
Calendar Creator Plus 3.0
PC compatibles with 320K or Macintosh
\$59.95
Power Up! Software
P.O. Box 7600
San Mateo, CA 94403-7600
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who-what-when 2.0

PC compatibles with 512K and a hard disk
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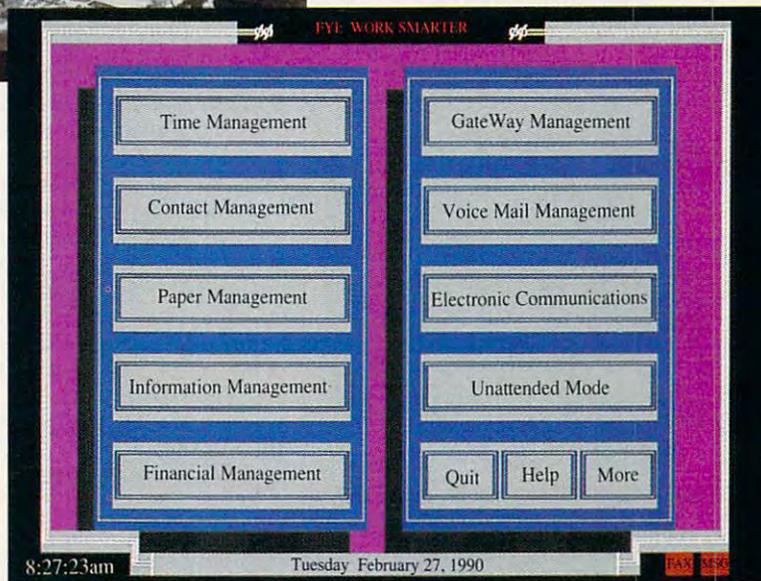
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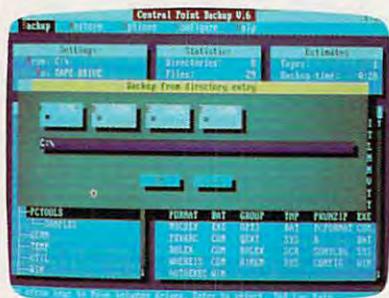
NEW PRODUCTS

EDITORS

Backup Zinger

Central Point Software is now offering the backup program in its *PC Tools Deluxe Version 6.0* package as a stand-alone program—*Central Point Backup*.

The new interface in *Central Point Backup*, the most graphical in any character-based DOS backup program, makes it easier to select files and options and thereby encourages you to perform regular backups. You can save the program's options and selections, making it easy to launch subsequent backups and restore your data directly from the DOS command line. With the built-in scheduler, you



Central Point Backup has an easy-to-use interface that simplifies backups.

can perform unattended backups. To help ensure data integrity, the program offers complete bit-for-bit verification of all backed-up data, as well as a Compare feature, which checks the backup against current files. National Software Testing Laboratories tests have shown *Central Point Backup* to be the fastest backup program on the market. The program also compresses data by as much as 60 percent without increasing backup time.

Central Point Backup lists for \$99, and you can upgrade to *PC Tools Deluxe* for an additional \$50. *Central Point Software, 15220 NW Greenbrier Parkway, #200, Beaverton, OR 97006*
Reader Service Number 351.

Opening Up Windows

Microsoft is offering its Supplemental Driver Library (SDL), a collection of device drivers supporting approximately 126 hardware peripherals, including printers, video displays, pointing devices, and other peripherals that run under *Windows 3.0*. Some of the drivers provide support for new peripherals, while others provide enhanced performance or new features for previously supported peripherals. This is the first in a series of periodic releases of additional *Windows* device drivers.

The SDL has a broad distribution scheme to give you fast and easy access to the drivers you need. Moreover, the SDL disks can be freely copied and distributed among licensed *Windows* users within a company. You can download the SDL from online services such as Microsoft OnLine, CompuServe, and GENie at no charge. Optionally, you can order the SDL from Microsoft directly by calling (800) 426-9400. There's a nominal \$20 charge to cover the cost of the 3½- or 5¼-inch disks on which the SDL is distributed.

Microsoft, One Microsoft Way, Redmond, WA 98052-6399

Reader Service Number 352.

Micro Micro

Isotropic Computer, a PC designer and manufacturer, is producing the smallest 80286-based motherboard on the market. Based on the revolutionary Chips and Technologies Single Chip AT (SCAT) product, the diminutive board measures 4 × 7 inches. It operates at 12 MHz or 16 MHz, and plans call for a version that would operate at 20+ MHz (as soon as C & T offers the faster chip). Features include a variety of memory configurations—up to 16MB—with a selection of plug-in memory boards, selectable wait states, full LIM EMS 4.0 support, BIOS shadow ROM support, and a socket for an 80287 coprocessor. Isotropic is the first manufacturer to develop and release a system board based on this C & T design.

Isotropic's motherboard will be 100-percent IBM compatible and will initially be offered in a slimline cabinet and a regular AT-style cabinet. *Isotropic Computer, E. 5920 Seltice Way, Post Falls, ID 83854*
Reader Service Number 353.

Fun with Words

Ever wish you could supply the definition and have your computer come up with the right word? Now you can with *Inside Information* from Microlytics. It's a comprehensive hierarchical dictionary that organizes the English language into categories of defined words. According to the company's president, Mike Weiner, "*Inside Information* presents the ideal organizational structure for language in the electronic age."

The program begins with seven general word classes: Nature, Science & Technology, Domestic Life, Institutions, Arts & Entertainment, Language, and the Human Condition. The seven classes are broken down into 20 subclasses, 125 categories, 700 subcategories, and more than 65,000 root-word entries. You can view the words with an Outline view, which lists the information vertically, or with the Reverse Dictionary view, which lets you type in a few descriptive words and receive a list of possible answers. For example, with the Reverse Dictionary, you could type in *left side of ship* and get *back port*. The MS-DOS version of *Inside Information* is available for \$119.

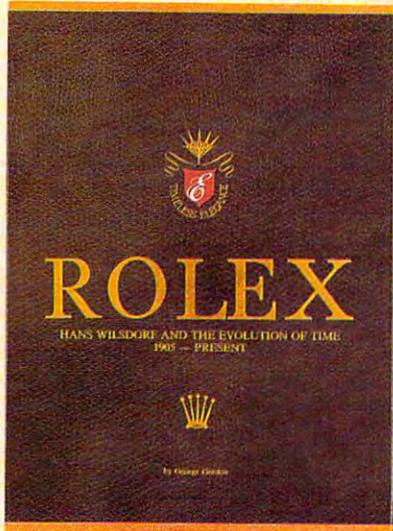
Microlytics, Two Tobey Village Office Park, Pittsford, NY 14534

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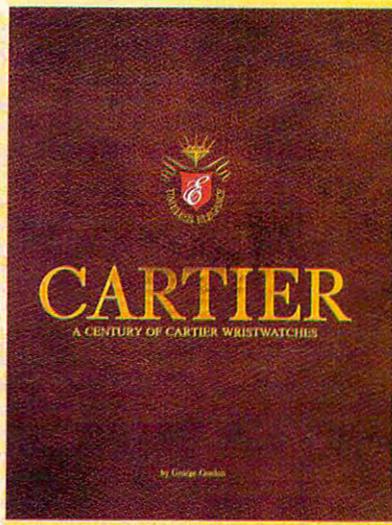
Friendly Persuasion

Presenters interested in winning friends and persuading strangers will want to know about *Persuasion 2.0*. It makes presentations easier and more intuitive by using the advanced graphics capabilities of *Windows 3.0*. Not only does it present pretty pictures and graphs, it also incorporates an outliner and a word processor, which can help you prepare speaker's notes ▶

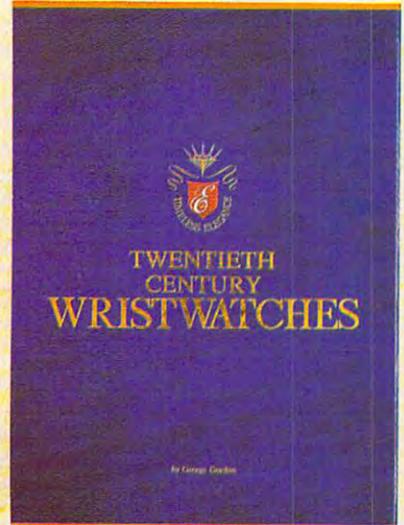
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INTERNATIONAL COLLECTORS OF TIME ASSOCIATION

A new international club for collectors and dealers of wristwatches is being formed with headquarters in four cities, Milan, London, New York and Hong Kong. Called "International Collectors of "Time Association", the club's purpose is to provide an avenue for the exchange of ideas and information between wristwatch collectors.

Each chapter will have its own Board of Directors to oversee that area's activities.

Four meetings of the International Collectors of Time Association (ICTA) are planned per year. The first meeting will be in May, 1990 in Hong Kong at the Park Lane Radisson. The second meeting is scheduled for September, 1990 in London at the Churchill Hotel, followed by the third conference in New York in December, 1990. More details will be provided later, but the Hong Kong meeting will give collectors an opportunity to meet other collectors and dealers from around the world.

We want to organize meetings in Italy, Japan, France and Germany. If you would like to help organize one of these meetings, or any of the three already scheduled, please contact one of the clubs.

A magazine comes complimentary with your membership. Published in English, bi-monthly, it will contain reviews on what's happening in the wristwatch market around the world with reports on sales and auctions, and news about new products just being designed. There will also be a question and answer column for collectors and dealers, as well as a column where watches can be sold or bought. If you have any interest in writing an article for the magazine, sharing an old catalogue or have stories about yours or others' wristwatches, the editor would like to hear from you. The association plans a new book next year, and your wristwatch could be included if you so desire.

Membership fees are US\$75.00 per year. (If you require your magazine sent airmail, there is an additional US\$25 charge.)

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I might be interested in attending the Hong Kong, London, New York meeting. 'Please send me more information.

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I want to help organize one of the meetings, Location: _____

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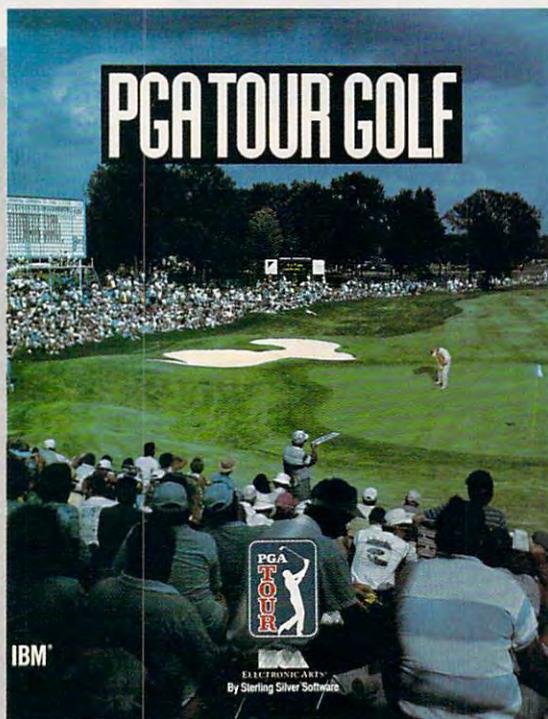
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ENTERTAINMENT



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PETER SCISCO

COMBINE REALISTIC PLAY, SPECIAL EFFECTS, TOURNAMENT PLAY, AND THE ABILITY TO PLAY WITH SOME OF THE PGA'S TOP GOLFERS, AND YOU HAVE A GOLF GAME THAT SCORES AN EAGLE

The key to any sports simulation lies in its ability to mimic the real thing. Most golf games pin their hopes on copying famous courses and in offering PC duffers a choice of clubs. Some go so far as to include wind and other environmental factors. *PGA Tour Golf* does all of these things and goes one better: It puts you on the professional tour, where you play against the big boys.

Put your skills to the test on any of three Tournament Players Club golf courses: Avenel, Sawgrass, or the PGA West Stadium. But before you go out on the tour, you'll want to visit the Pro Shop. This opening screen provides menus for Play, File, View, Stats, and Options and is a good example of the detail built into the *PGA Tour Golf* interface. You can pull down menus and play the game with keyboard commands, a mouse, or a joystick. From the Pro Shop Play menu, for example, you can hone your driving and putting skills, play a Practice Round, or move to a Tournament.

The other Pro Shop menus handle game files, scorecards, and statistics. Every time you play, *PGA Tour Golf* adds to your stats, giving you a steady chart of your progress—or lack of it. The Tour, after all, consists of more than one game. Trying to stay at the top of the rankings is as much of a challenge as is sinking a 40-foot putt.

INNOVATION



The mechanics of *PGA Tour Golf* follow the traditional power-bar method: You aim your shot by moving a cross-hairs cursor to the right or left; then you press the space bar or a button (joystick or mouse) for distance and accuracy. Overswinging (moving past the 100-percent power line) increases the chance of a hook or slice. Accuracy depends on your striking the space bar or pressing the button at the point at which the power indicator returns to the 0-percent line. Hooking and fading the ball around obstacles plays a role as well, and it's good to practice these techniques on the driving range.



An arsenal of special shots enhances the realism in this duffer's dream.

Graphically, the game is a pleasure to watch. Until you strike the ball, your view is from behind your player, looking down the course toward the green or fairway. Once you've struck the ball, however, the view switches to a point farther down the links, and you have a TV view of your ball as it lands in the fairway—or as it misses its target and falls into the rough or another hazard. The bounce and roll of the ball is very realistic, with some shots spinning back or rolling forward depending on how you strike the ball.

The graphic presentation is enhanced with fly-by views of each hole, accompanied by a tip from a top PGA golfer. Beginning at the pin, the camera rolls back down the fairway toward the tee, illuminating the

approach to the green and the hazards that threaten your success. On a fast machine, say a 12-MHz 286 or a 386SX, these views are a lot of fun to watch (at least at the beginning). But I turned them off when playing the game on a Tandy 1000 because it took so long to run the graphics sequence. To its credit, *PGA Tour Golf* allows you to make such adjustments, enhancing your enjoyment of the game no matter what kind of computer you own.

Out on the links, the game suggests the right club for every situation, but you can put it back in your bag

and choose another if you like. You can even choose the mix of clubs you want in your bag at the start, which lets you customize the game to your golfing style. Unlike most golfing simulations, the club you have at any given point on the course is not simply rated at a certain distance at 100 percent (that is, a 9 iron isn't always rated at 112 yards); rather, the potential distance of any club is affected by the lie of the ball. For example, that same 9 iron might be rated at 112 yards from the center of the fairway but only 57 yards from the deep rough—and even less if your ball is half-buried in the rough.

Once you're on the fairways, it's easy to see why this game earned the endorsement of the PGA Tour: The detail of play is accurate right down to the lie of the ball and unpredictable gusts of wind. The wind meter at the bottom left of the screen swings around with every gust and stops only when you begin your swing. On a long hole, you may want to wait for the wind to swing your way before trying that long drive.

You not only have to deal with the wind, but you also must contend with the vagaries of the ground. If your ball is sitting in the fairway, for example, you would get a better shot than you would if the ball is half-buried in heavy rough. Special pop-up overlays describe the condition of your lie before every shot except for the drive off the tee. I found the information crucial to my making decisions along the course, but if you find these screens distracting, you can turn them off.

Golf is a lot more than just swinging a club, of course. Like great pool players, great golfers know how to work a ball to get the best roll, the fortuitous bounce. When you're approaching the hole, *PGA Tour Golf* gives you a choice of shots to make from its Options menu when you select Special Shots. Shortcut keys for these shots are also available, so you don't have to go through the motions of pulling down the menus. The F7 key, for example, lets you chip your shot. There are also options for punching your shot (great for getting out of deep rough with some measure of accuracy, with the sacrifice of distance) and for pitching your shot out of bunkers.

In any case, whether you chip the shot from 13 yards out and send the ball rolling across the green for the birdie, punch the ball low to get out of the rough, or putt the ball from the

fringe of the green, you'll appreciate the variety and realism that these shot options add to the game.

When you do reach the green, *PGA Tour Golf* brings to the screen a topographical representation of the green, with a grid that helps you identify the breaks—both their angle and severity. Using the F1 and F2 keys, you can walk around the green to ex-



Start the tournament at the pro tent.



Tips from the pros can help you plan a strategy from the tee to the green.



Use the game's topographic grid to read the green and sink that birdie.

amine your shot from different angles. The distance your ball lies from the hole and the distance your ball sits above or below the cup are listed at the top of the grid screen. That information is indispensable to making a successful putt. In a nice touch, the game allows you to aim your shot from the grid screen by positioning the crosshairs; when you return to the normal view, your target position is carried over.

After a few practice rounds, if you feel ready to go for the money,

you can take your bag on the tournament circuit to compete against some of the biggest names on the men's tour. (It's unfortunate that Sterling Silver Software doesn't offer an LPGA mode. I should think that there are some women out there who'd enjoy a good computer golf game. Maybe in a later version or as an add-on disk—right, guys?)

The tournament mode brings in the great golfer's equalizer: psychological pressure. If you make the first cut, you advance to the second round (no mean feat). Make that cut and then the next and you find yourself among the money winners. *PGA Tour Golf* keeps stats on all the golfers, including the pros, so that you can check your standings against the top money winners at any time.

The tournament mode brings in a few more graphical touches, such as a pop-up screen that announces the standings from time to time as you play. For example, before making your approach shot to the 8th hole, you may learn that Hale Irwin birdied the 16th to move into third place. At the end of each hole, the leader board screen gives you a quick picture of the standings. It lists the players, what hole they're shooting, and their stroke total. Page through the leader board to find out where you are in the pack; then plot your comeback or watch yourself fade. Without a doubt, you'll soon find yourself caught up in the action and trying to make up lost ground or trying to defend your narrow lead. But stay steady—golf is played by the stroke, not by the putt.

Golf is one of the fastest growing sports in the country, which may have something to do with the booming success of computer golf games. With its attention to detail, its special graphics effects, its tournament mode, and its realistic play, *PGA Tour Golf* scores an eagle.

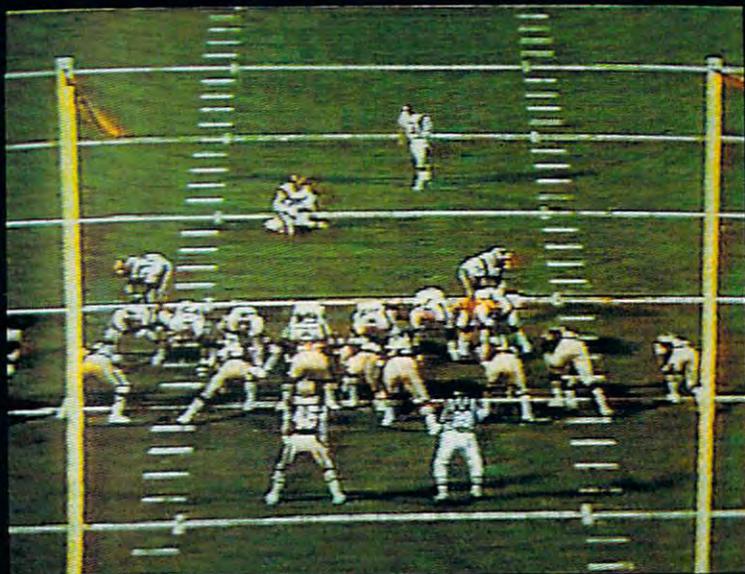
Playability	★★★★★
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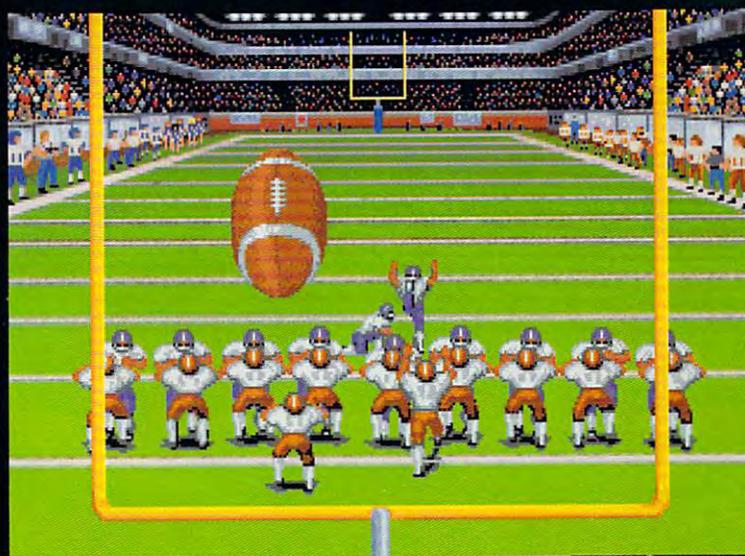
Package includes 55-page manual, quick-reference card, golf scorecard, and two 5¼-inch disks

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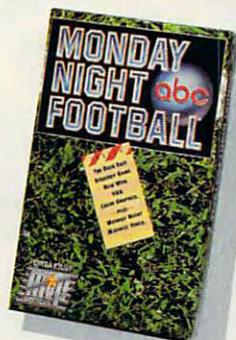
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Uncover the mysteries of lost civilizations, explore a spectacular underground city and meet the exotic princess Aiela on this perilous journey into a jungle kingdom.

Ultima VI

Sail from Britannia, land of magic and adventure, into the dark recesses of the Underworld, and emerge in the strange world of the Gargoyles.

Bad Blood

The pureblood humans have a new leader, and he wants to wipe out any 'tainted' races. You set out from your tribal village to find a way to stop his march of destruction.

SIERRA ON-LINE

King's Quest V

Brave King Graham returns in the long-awaited Chapter 5 of Roberta Williams' popular computer adventure series. Features 'cinemagraphic' Hollywood animation, making it play like an interactive movie.

Space Quest IV

The hilarious adventures of Roger Wilco, who has a run-in with the Sequel Police, a crack team of intergalactic assassins. He enlists the help of the Latex Babes of Chronos, as well as the Time Rippers-rebel fighters from the future.

Fire Hawk: The Exder—The Second Encounter

Constant challenge and nonstop arcade action, as you don a battle suit that can transform from a giant robot to a super-jet, and battle bloodthirsty aliens.

Mixed-up Mother Goose

Mixed-up Mother Goose transports children to Mother Goose Land, where they help her sort out some of her most popular rhymes. Then, they spring to life in brilliant color.

A-10 Tank Killer

Take command of the ugliest, most indestructible, devastating plane ever built. Rip apart enemy tanks with your 30mm "tank killing" cannon, and laugh while sustaining damage that would cripple any other plane.

Rise of the Dragon

This futuristic private-eye drama combines interaction, puzzle-solving, cinematic storytelling techniques, no-typing "point and click" interface, and Dynamics VCR Interface for the feel of a 'graphic novel'.

Stellar 7

A stellar arcade game of tremendous scope, featuring twenty different enemies, each with their own distinctive intelligence, and stunningly beautiful, handpainted planetary backgrounds.

Red Baron

Players engage in World War I aerial combat. Experience close range dog-fights, battle Zeppelins, fly nighttime missions and face famous flying aces such as the Red Baron himself!

Heart of China

A 1930's action adventure game set in revolutionary China, that features complex character interaction, puzzle solving and full soundtrack.

SPECTRUM HOLOBYTE

Flight of the Intruder

Scream down the aircraft carrier runway at the throttle of an A-6 Intruder jet fighter and battle MiG 21's, SAM's and anti-aircraft flak.

Faces...Tris III

The newest challenge from the Soviet Union. Stack falling blocks of face segments in proper order to create complete famous and not so famous faces.

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GAMEPLAY

O R S O N S C O T T C A R D

Some people judge a simulation game by how closely it resembles doing the real thing. I think those people are crazy. That's because most simulations represent tasks that real people do—as their jobs. As work. The people who really do these jobs usually find them to be so wearying and difficult that they can't wait to get home and relax by playing a game on the computer.

Admittedly, some people are frustrated with their careers and have fantasies of doing something else for a living. Those people probably appreciate a chance to do every tedious detail of somebody else's job. I don't think flight simulators are particularly fun. To me they seem like astonishingly boring work. Obviously, some people really enjoy these simulations.

Most of us, however, buy games not to work, but to play. To me that means the game author's job is to analyze the real-world job, discover the parts that are fun, and then let the player do only those parts while the computer takes care of all the icky boring tasks.

If this were done well, almost any job could become a game. But it isn't usually done well. Many game writers seem to work overtime to ensure that their simulations make the player do all the boring jobs while the computer gets to do most of the cool stuff.

There was only one *SimCity*, a unique bright spot in the endless tedium of simulation games. Then I played *Sid Meier's Railroad Tycoon* (Microprose).

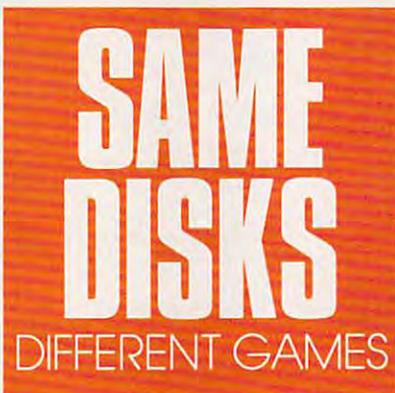
After giving up on *Design Your Own Train* as a monster from Interface Hell, I had begun to despair of anyone's ever doing an adequate job of making a computer simulation of a model railroad.

Well, *Railroad Tycoon* is not a simulation of a model railroad. It's a simulation of entrepreneurial economics in the transportation business.

Of course, if they put "simulation of entrepreneurial economics" on the box, nobody would buy it. But if the interface is humane and the simula-

tion lets you do the fun parts, almost anything can be fun.

Much of the freshness of the game comes from the fact that the landscape is never the same twice, both because the game is transformed by the player's choices and because every time you play, the landscapes are transformed so that towns that were big the last time you played are nothing much this time. The world is always new, and it's always different because you're playing.



But there's something else going on here, too. Human beings have a fundamental hunger to create things, to make things grow. I think that's much of the appeal of *Risk* and its best-ever computer offspring, *Romance of the Three Kingdoms*. These aren't war games. They're games about assembling empires.

That's what the great entrepreneurs do, too. John D. Rockefeller didn't conquer his competitors in order to beat them—he was perfectly happy to buy their companies and leave them in command. He wasn't trying to win, nor was he trying to get rich (he gave away large amounts of money long before he had that much of it). Instead, he was trying to create the perfect oil company, one that included everything from the wellhead to retail sales. Like Alexander the Great, he didn't want to destroy his rivals; he simply wanted to become so large that he could contain them all.

That's the impulse behind *Railroad Tycoon*. Or is it?

Here is what's really glorious about this game. The game's authors don't make you play it just one way. What if you're one of those crazy people who actually want to do the day-to-day work of scheduling a railroad? I know they exist—they're the ones who build the huge model train layouts in their basements, put on engineer's caps, and stay there for hours just running the trains and making them keep to a schedule without colliding. You can change an option in *Railroad Tycoon*, and the computer stops scheduling your trains for you. Now you get to do it, and if you blow it, trains crash.

That's the key: If you want to do the scheduling, you can do that, and the game will be fun for you. But if, like me, you think of it as having to do the scheduling, you can skip that, and the game will be fun for you.

And that isn't the only way that game writers have opened up the game for us. We can keep business competition on a friendly basis or make it a cutthroat kill-or-be-killed affair. We can fuss with the details of a complex economy, worrying about which cargoes will be carried where, or we can keep it simple and spend our time trying to grow the railroad into new markets.

The same great displays, the same intuitive interface, the same fun animation routines—but you're playing at running a railroad while I'm playing at building a transportation network, and she's out to kill the competition, and that truly crazy person over there is playing at macroeconomics. Same box. Same disks.

I tell you, folks, this is a dangerously radical idea—letting the player decide what kind of game he wants to play. If other game writers start doing the same thing, the real world might grind to a halt as games become so much more fun than reality that nobody can stand to go to work anymore. I know what I'm talking about. It's already happened to me. □



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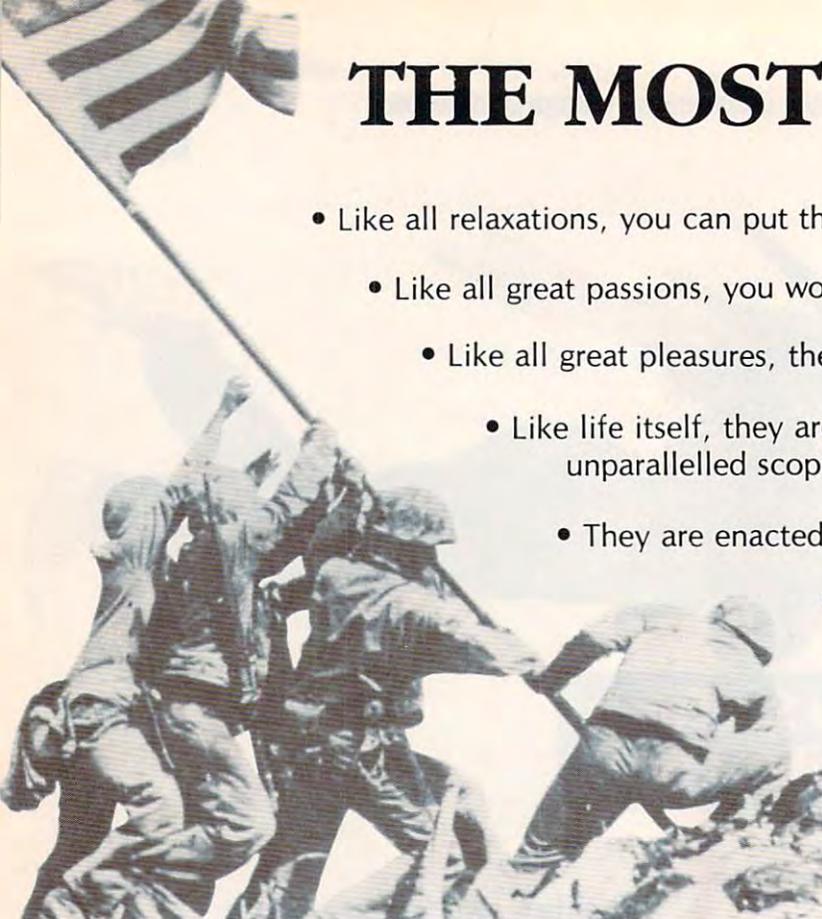
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* Requires IBM PC or 100% compatible, 512K RAM and EGA or VGA. Joystick recommended. [†] If adequate use of this product fails to improve your child's spelling grades, Britannica Software will exchange it for another product of equal value or refund your money completely. See package for details. © 1990, Britannica Software, Inc.

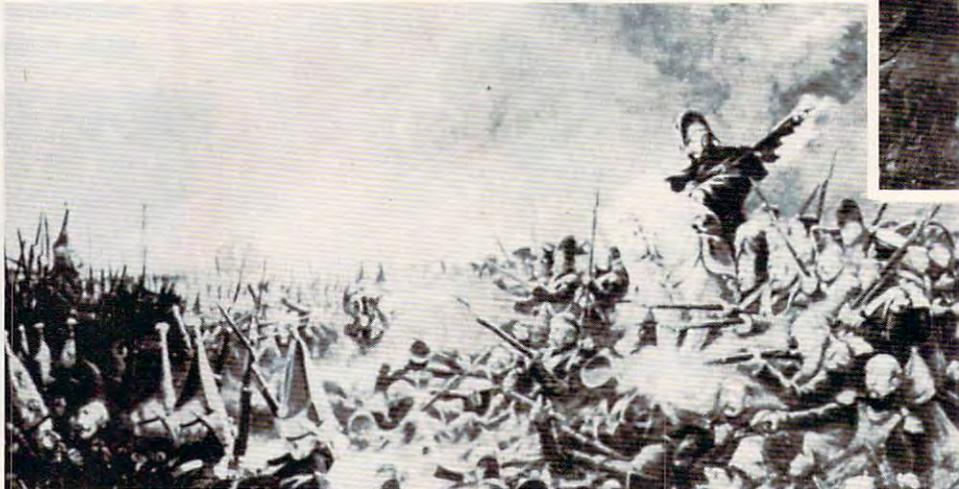
THE MOST REMARKABLE

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The Quebec Conference. From left to right, in the foreground: Mackenzie King, prime minister of Canada, Franklin Roosevelt and Winston Churchill.



It was a desperate plight in which the 14th Regiment of the Line found itself, the French square harshly pressed.

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British ships of the line after Nelson's triumph at Aboukir Bay.

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WORLD WAR II

THE NAPOLEONIC WARS

and MUSKETS & MULES

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A French hussar and a dragoon talk with their sentries posted nearby.



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THE NAPOLEONIC WARS

Between 1798-1814 a struggle for world hegemony was waged.

From *Napoleon Buonaparte's* decision to invade Egypt, to *Alexander I's* to champion Mecklenburg, the decision which led to the downfall of *Napoleon*, the history of Eurasia twisted and turned. History could have diverged profoundly from its actual course. *Nelson* should have caught *Napoleon en route* to Egypt destroyed him and inadvertently preserved the Republic. *Napoleon* should have triumphed in 1813.

The tapestry of these struggles was dark to its creators, its final outcome obscure and inevitably the result of a panoply of individual efforts. For example, the French were undone in Spain by *Napoleon's* inability to personally supervise the campaign.

MUSKETS & MULES

During the years 1805-1810 a four-cornered struggle for hegemony raged over German and Italian speaking Europe. Empires rose and Empires fell. In the course of this epochal clash of powers the first French Empire under the Emperor *Napoleon I* broke the back of the Habsburg Empire, twice defeated the Empire of all the Russias and virtually dismembered the Kingdom of Prussia.

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- The Japanese Empire
- The United States of America
- The Italian Empire
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- Nationalist China
- Other Power (e.g. Poland)

- | | |
|---------------------------|-----------------|
| (1 to 2) | (1 to 3) |
| Field Commander | Army |
| Strategic Commander | Navy |
| Political Leader | Air Force |

THE NAPOLEONIC WARS

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- Great Britain
- The Habsburg Monarchy
- The Empire of all the Russias
- The Kingdom of Prussia
- The Ottoman Empire
- Other Power (e.g. Spain)

- | | |
|-------------------------------------|------------|
| (1 to 2) | (1 to 2) |
| Field Commander | Army |
| Strategic/Political Commander | Navy |

MUSKETS & MULES

Please number countries in order of preference: (1 to 3)

- French
- Austrian
- Russian
- Prussian

C-12

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MIND



GAMES

COMPUTE'S EDITORS INVITE YOU
TO LEAP INTO THE WORLD OF
IMAGINATION. ARE YOU GAME?

ILLUSTRATION BY JANICE R. FARY

One of the joys of computer entertainment is the imaginative journey it takes you on. After playing games for a while, you might even begin to invent your own scenarios. That's just what our editors did, and this is the result.

Evolution from Stepping Stone Software

Up from the primordial ooze swims a tiny one-celled animal, searching for food. As our prehistoric Pac-Man gobbles its way toward the surface, make sure it avoids becoming someone

else's meal. It must survive to produce future generations in this computer simulation called *Evolution*.

Use your joystick to guide your munching microbe through a miniature smorgasbord, where every choice affects future generations. Try to dine selectively, but watch the clock. Food is plentiful near the surface, but so is the sun's dangerous radiation. Should your character feast in the bright sun, or should it grow at a slower rate in deeper but safer water? Your choices will affect its descendants.

When and if your creature

reaches a certain size, the game jumps a billion years to the age of dinosaurs. Your creature has evolved, but what it has become depends on your actions at the previous level. Too much red plankton and you're a Tyrannosaurus Rex, a nasty dinosaur—but one teetering on the edge of extinction. A diet of green amoebas, plus a sampling of air without too much radiation, produces something warm-blooded that crawls ashore on two legs.

On the next rung of this evolutionary ladder, your creature may resemble early man or something else entirely. If you've come up with three wings and five horns, you may find yourself in Mother Nature's garbage can with a *Do you want to play again?* message on your screen.

Qualities in a mate can also affect change. You can probably thank your grandparents for your big feet, blond hair, or tendency to gain weight. But remember, a few extra pounds might have permitted an early ancestor to survive a famine. When an Ice Age threatens, do you select a mate who looks good in a skimpy bearskin or one who can survive the winter on a single woolly mammoth burger?

How well you solve different problems determines the game's outcome. If you barely make it through each stage, make questionable choices, and show limited mental agility, you could end up on display in a zoo—or become vice president. But if you show some initiative, find food and shelter in a reasonable time, and use tools to good advantage, then your creature might end up looking something like yourself—sitting at a computer, playing a game.

If you solve every problem quickly and intelligently and demonstrate academic, artistic, or cultural tendencies, then your creature could become a genius—a scientist, perhaps, whose latest invention has just destroyed the world. Go that far and you may find yourself at the beginning again—as a tiny one-cell creature swimming toward the light in some primordial ooze, searching for food.

TOM NETSEL

Find the Public Bathrooms in New York City from After Hours Software

You and your family are vacationing in New York City, and your youngest needs to go to the bathroom. Your goal: to find a public bathroom in the shortest possible time. Ask for directions from the people you meet, but you'll lose points and valuable time if you mistakenly ask another tourist. You'll also lose points when you encounter angry store managers who yell *Employees only!* ▽

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NASA modeling at your command

Select and clear a site for the Lunar colony ... build landing pads ... erect habitat modules ... supply essential life-support services to the colonists ... all using socio- and econometric models from KDT Industries, a NASA contractor.

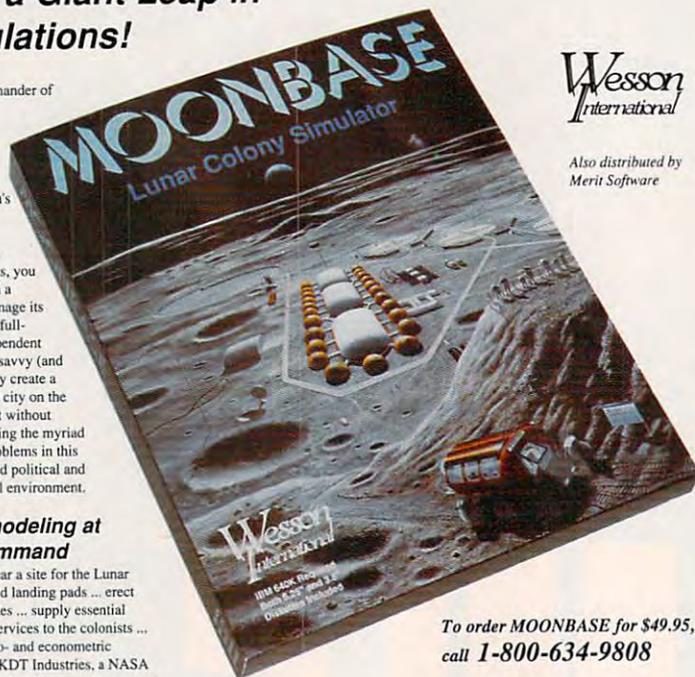
Explore and exploit the Moon's surface

Explore and lunar surface for new mining sites. Process the raw materials you find into oxygen, water and helium-3. Build hotels for fat cats from Earth. Can you make enough profit to declare independence?

Air leak in solar station #3!

Pressure loss ... radiation leaks ... power outages! Any accident can break your tenuous hold on this hostile surface.

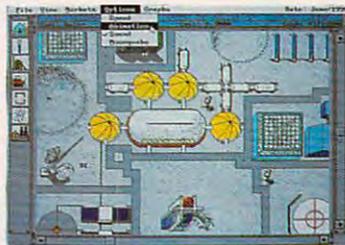
Will Project Moonbase flourish or die, Commander?



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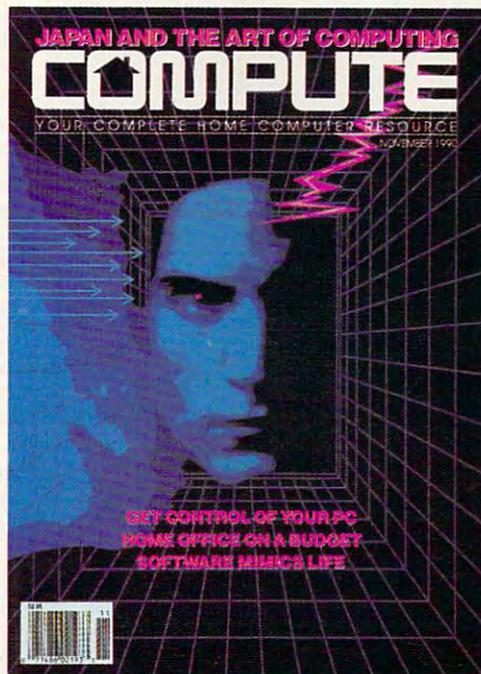
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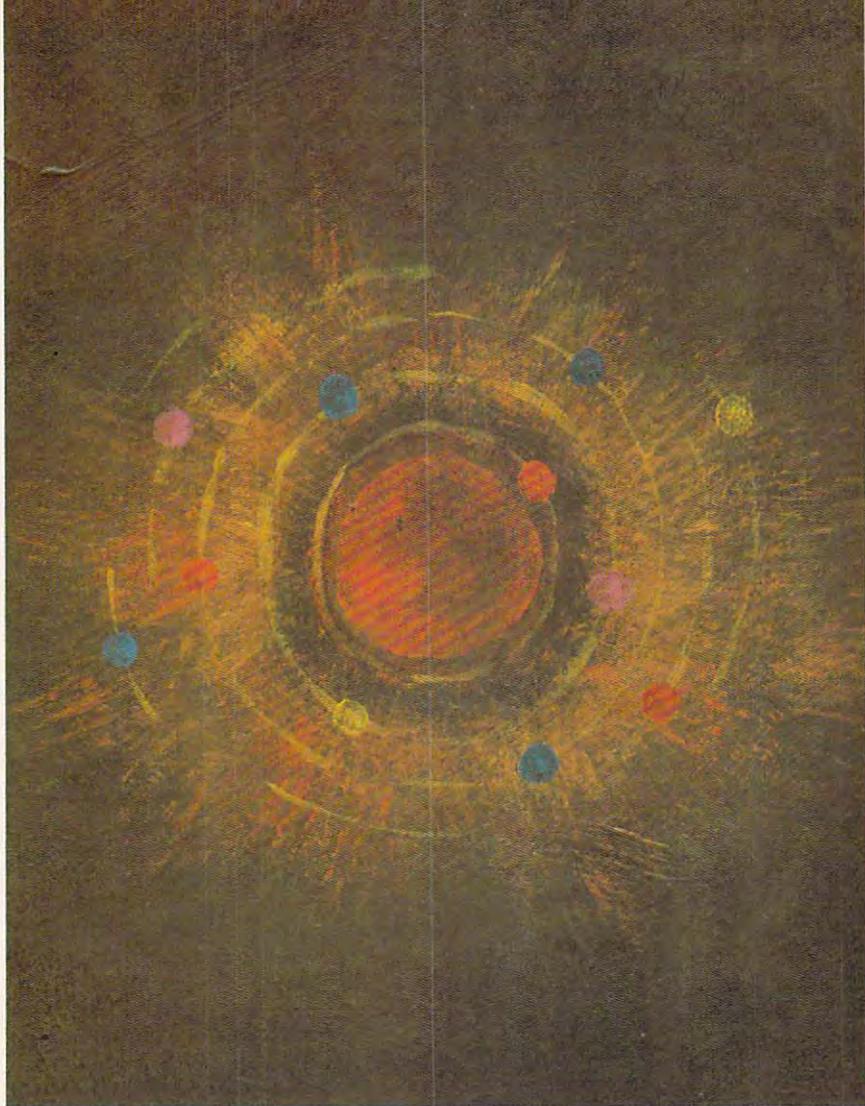
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YLCU5





Your obstacles include 8th Avenue women-of-the-night (*Johnny! Suzie! Close your eyes!*), Canal Street cab drivers (*Sure lady, I know where that is.*), and Bowery bums (*Clean your windshield?*). The winning locations include any NYC public library, museums on free-admission days, most department stores, and your cousin Fred's condo over on the East Side.

The game uses sampled sound and digitized pictures. You'll hear the roar of real cars as you rush to cross the street ahead of the light. You'll see the variety of gestures New York cab drivers are famous for as they explain just where you should go. Experience the full palette of your graphics adapter when you become lost backstage during the July 4th extravaganza at Radio City Music Hall.

Earn additional points for spotting the English-speaking cab drivers, waiters who aren't aspiring actors, and lawyers who turned down the Trump divorce case.

A special version of the game called *Find the Public Bathrooms in Homer, Alaska* offers native New Yorkers a challenge of their own. Look for additional modules in the

Find the Public Bathrooms series, including *Graceland on Elvis's Birthday* and *London During a Plumber's Strike*.

DAVID ENGLISH

Colony: A Universal Game from KF Software.

Science fiction that takes science and fiction seriously—this is the kind of game I've been waiting for.

The best of print science fiction endeavors to deal with the universe head-on, creating a self-consistent fictional environment with inviolate internal rules. Unlike cinematic science fiction, seriously written science fiction doesn't sport spacecraft making hard banking turns while firing all phasers. Alien civilizations are only rarely bent on conquest, and the universe is, if not hostile, at least not benign. The environments in which those stories play themselves out are rich but often bleak, and always unforgiving.

We've seen little of this in interactive science fiction. Most interactive science-fiction games involve either interstellar wars or interstellar trading, or some combination of the two. Virtually all of the games are lad-

en with silly names for alien races, self-referential jokes and asides tossed out between combat encounters, and cleverness taking the place of thought.

It doesn't have to be this way, as *Colony* shows. Like much of the best science fiction, this game deals with the exploration of the universe, the discovery and colonization of new worlds.

Colony takes place in a rigorously Einsteinian universe. That means no faster-than-light travel; voyaging from solar system to solar system can take decades or even centuries. Sound boring? Not necessarily.

Time compression eliminates most of the tedium: One minute of realtime equals one year of travel time, for example. Much of the drama in the early phases of the game stem from precisely the amount of time and isolation your travelers must endure. Communication with the home planet grows more time consuming with each moment of travel. Gradually, the ship's complement develops its own social structure, different from that of earth. A generation is born in space with no memory of Terra.

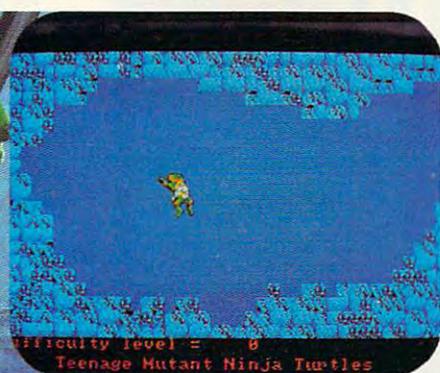
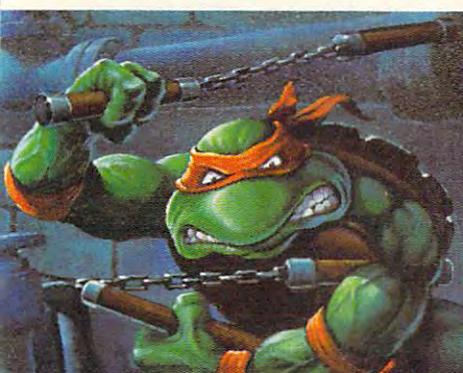
There are technical and mechanical problems as well. Difficulties with the ship, scientific mysteries from the universe outside, or sociodynamic issues raised by the ship's self-contained population—there's plenty to do between the stars. Handled properly, a voyage of centuries flies by.

But this game doesn't end when you reach the destination star system; that's just the start. You must examine planets, analyze environments, and plan settlements. Or you may have to change plans: Close examination may show that your destination worlds are unsuitable for colonization. You may have to seek new worlds among the star systems, refurbish the ship, and begin the journey again.

The only way *Colony* really cheats is in the exuberance with which it tosses earthlike worlds through the firmament. Those worlds are needed for the game's next phase, colonization and expansion. There are globes to explore, filled with promise but also promising peril to the unprepared. Hundreds of scenarios are possible on each world. Some planets may bear intelligent lifeforms with whom interaction is possible. Others may harbor dread diseases—whose effects may not be evident until years of game time have elapsed.

This is a wonderfully open-ended game, without artificial time-length or number-of-turns rules. If a colony flourishes, for example, there's no reason why its citizens shouldn't decide to assemble and launch their own ex-

FOUR COMPUTER HACKERS ARE ABOUT TO RAID YOUR DISK DRIVE.



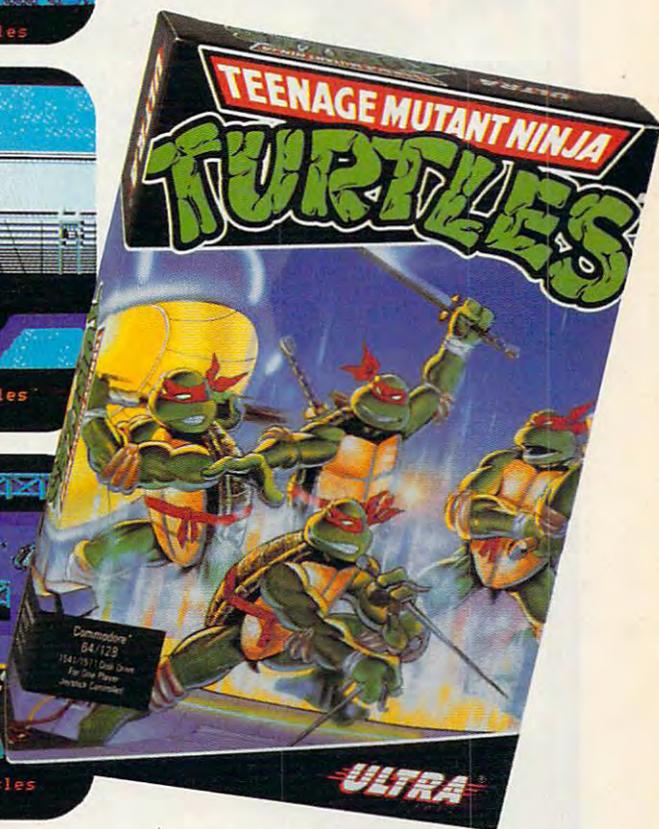
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pedition to nearby stars.

The universe awaits.

KEITH FERRELL

Rev One Point Oh! from Shrink Wrap License Software

Are you one of those folks who has to be the first on the block with the latest software package? Now you can relive those anxious moments when you first booted that new operating system with *Rev One Point Oh!*, a joint venture of some of the world's largest software companies.

Part game and part historical-

education software, *Rev One Point Oh!* simulates the first releases of a number of famous software packages and operating systems. PC users will thrill to the experience of trying to get *Lotus 1-2-3* to run under *Windows 1.0*. Amiga users will meet their old friend, the flashing red Guru Meditation error, while running an eerily accurate simulation of *Kickstart/Workbench 1.0*. And Mac users will hardly be able to contain their excitement as they attempt to run Macintosh *WordPerfect 1.0* under the first release of *MultiFinder*.

The object of *Rev One Point Oh!* is to try to get as much work done as possible before you crash the system. It's fun for the whole family. Cheer Dad on as he attempts to create a document in the first release of *Page-Stream. No Dad! Don't select Variable Zoom with the mouse accelerator active!* Too late. A flashing red *Game Over* box appears at the top of the screen. Watch the kids show up their parents by getting *Flight Simulator 1.0* to run in the OS/2 DOS compatibility box.

Look for the new Gamers Edition of *Rev One Point Oh!*, in which you try to land your plane in the Atari ST *Falcon 1.0* and attempt to launch a single attack in any of the first 16 releases of *Harpoon*.

Rev One Point Oh! version 1.032 costs \$59.95. Bug-fix upgrades from version 1.031 are available for only \$49.95—if you send in pages 13–20 of your manual and your copy-protected boot disk.

DENNY ATKIN

Blind Date Simulator from Take a Chance Technologies

Experience all the excitement and nervousness of a real blind date as your computer selects from thousands of character traits to create a unique partner for each new game. Use your mouse or joystick to select your on-screen personality—which may or may not be compatible with your blind date's personality.

The game package includes rose-colored glasses (*Gee, you look just like someone I used to know.*) a fake beeper (*I'm sorry, but I reaaally have to go.*) and a stiff upper lip (*So, you're into Satanic rites. That's interesting.*).

You can choose from 20 different date scenarios, including your high school reunion (everyone's successful except you), an afternoon at the museum (your date thinks you're a celebrated artist), and a Wayne Newton concert (you wanted Mozart, your date wanted Romanian folk music, so you compromised).

The game provides for an optional modem hook up so two players can play together as a couple. Take a Chance Technologies is sponsoring a RoundTable on GEnie so players can find additional dates. You can contact other players by leaving online messages such as *Call Nancy for a good time or You smiled at me on the IRT to Houston Street. I was wearing the plaid tee shirt.*

Look for other exciting new simulators in the Blind Date series, including *Meet the Parents*, *Honeymoon in New York City*, and *Quick and Easy Guide to Divorce*. □

DAVID ENGLISH

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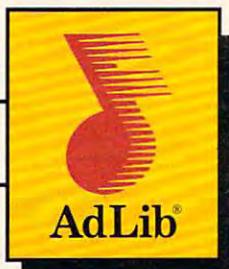
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System Requirements: IBM-compatible; 512K RAM; VGA, EGA, CGA or Hercules® monitor.
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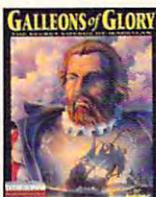
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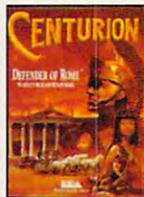
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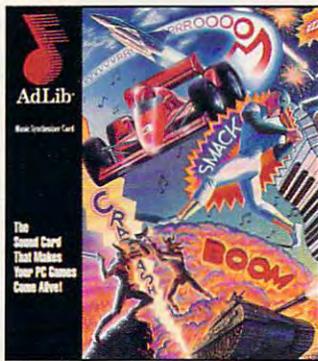
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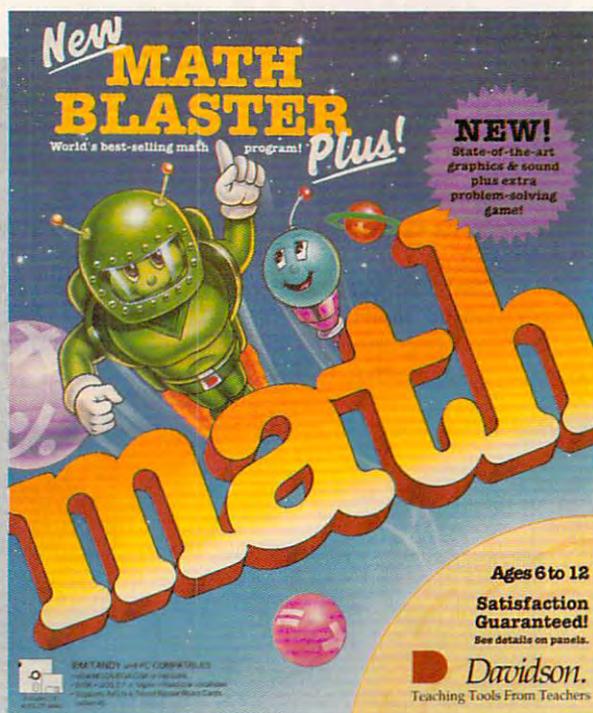
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DISCOVER



Easy to understand, a cinch to use, and recognizably educational—since the early days of educational software, these qualities have contributed to the widespread popularity of drill-and-practice programs. Today, they continue to be one of the most popular kinds of applications.

The underlying premise is straightforward. You're given a simple problem to solve and instructed to type in the correct answer. If you get it right, you get a reward. If you miss it, the program shows you the right answer and repeats the question. After being endlessly and patiently tested on a specific subject, just about everyone finally memorizes the correct answers.

In many subject areas, this method is probably the most effective. After all, if you practice your math facts often enough, eventually you'll remember them or at least become faster at figuring them out.

While early versions of drill-and-practice programs were effective, students would often lose interest. Many times, the rewards were a simple "Very Good" or an animated graphic. But who really cares if the bunny hops across the screen or the bear reaches the berries? Kids often don't, and once a kid loses interest in the reward, that's the end of the drill as well.

The programs kids don't like don't sell well, and eventually developers started to get the hint. While some developers completely stopped making drill-and-practice programs, others took a different approach—they took a good hard look at arcade

COMPUTE CHOICE

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LESLIE EISER

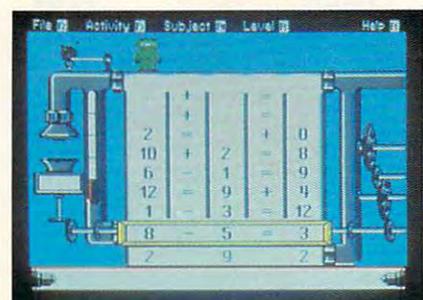
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MARK WAGONER © 1990

games. To keep those quarters falling into the slots, arcade games must offer a specific challenge, have multiple levels to explore, and be fun to play. These developers speculated that drill-and-practice programs might be more successful if they managed to combine good educational theory with interesting rewards. In fact, a really well-crafted drill-and-practice program can provide almost as much fun as a good arcade game. And unlike an arcade game, it can provide excellent educational content.

Davidson & Associates' newest version of the very popular Math Blaster series is just such a program. The *New Math Blaster Plus* offers dynamic graphics and sound, an exciting new problem-solving game, and plenty of what Davidson is famous for—well-written, well-researched, and highly effective drill.

Just watching the opening credits is fun. Blasternaut and Spot, his one-wheel robotlike friend, zoom past in a spaceship and then stop to say hello. A main menu that looks reassuringly like other Math Blaster menus ap-



Different levels of difficulty will keep youngsters challenged and interested.



pears next. Tantalizing titles like Rocket Launcher, Trash Zapper, Number Recycler, and Math Blaster appeal to the children who will be using the program. Pull-down menus along the top of the screen let you or your youngster easily control the program options. There's even a record-keeping command to turn on if you plan to let the computer keep track of your student's progress. A built-in editor is provided to make it easy to design your own problems if you or your child wants to focus in on a particular concept.

And as for the sound and graphics, seeing and hearing are believing. On just a plain MS-DOS machine, the sound was good. On a machine equipped with an Ad Lib or Sound Blaster Music Card, the sound effects will blow you away. Even the graphics take advantage of the capabilities of the computer you use. In VGA color, the flying objects seem to take on a life of their own. But enough about the trappings. What is the program itself really like?

Of the four games included, Rocket Launcher is the easiest to rec-

ognize as drill and practice. There are two modes of play. In the Study mode, equations such as $6 + 7 = 13$ are flashed on the screen, and then a second later one of the numbers in the equation is replaced by a blank line. Your goal is to solve the problem correctly by typing in the missing number and pressing Return. After several problems have been solved in this way, Blasternaut will board his spaceship and head for the stars. In the Solve mode, equations always appear with the blank for the missing number. Again the goal is the same: Get enough answers right in a row to allow Blasternaut to take off.

Trash Zapper is a cute drill-and-practice game with a unique environmental theme. Because of the presence of Trash Aliens, the space near Blasternaut's planet has been polluted with old bottles, paper garbage, and even the rings from soft drink cans. Can you help out? For every five problems you solve correctly, you'll get to blow some trash out of the sky by moving the gun sights and firing the Zapper. Hit the trash directly, and it vanishes. Miss, and you'll have wasted a valu-

able shot. When time runs out, it's back to solving problems again. The only way out of this cycle is to press Esc and return to the main menu.

In another of the four games, Math Blaster, Blasternaut has to fly up to the ship bearing the correct answer to the math problem displayed. To arrive safely, he'll need your help dodging the space trash circling the planet. Take too long maneuvering him around, and the Trash Aliens will descend to the planet's surface. Move too quickly, and you risk having Blasternaut hit by a flying brick. As in any good arcade game, you can gain additional lives, provided you correctly solve several problems in a row. Watch out, though; he'll lose those extra lives in short order if you don't learn how to maneuver him quickly. Every piece of trash he collides with slows him down and costs him a life. At higher levels, the speed at which the Trash Aliens descend increases, and there's more and more space trash to deal with. Just knowing the right answer isn't quite enough. Getting Blasternaut through the space trash unharmed before time runs out is harder than it seems.

So much for the drill portion of Math Blaster. What's the reward? After five correct answers, you have a chance to increase your point score by helping to feed Blasternaut. He's free to fly around the screen catching the food that appears randomly on the screen while he dodges the rocks and bricks floating through space. Everything he catches adds points to the total score. Interestingly, you receive extra points for choosing good things to eat. It's nice to know that fish and carrots count for more than ice cream sundaes, hamburgers, and French fries. Eventually, dinnertime is over, and then it's back to solving problems. When you've exhausted all of Blasternaut's extra lives, the game ends. Is your total point score good enough to put you in the hall of fame? If not, try again. If you make it, don't rest on your laurels; do it again!

Number Recycler isn't just good drill and practice; it's an excellent problem-solving game. At first, 18 numbers fill a grid separated by + and = signs. Your task is to create five different equations by sliding the numbers down a chute one at a time. If you slide down more than one number, the first ones will be zapped and put out of play. Planning ahead is essential if you plan to work your way past the fifth level. To make the game a real challenge, try using either a +

or - in the equations. You get points for every correct solution, and you get plenty of practice making bad decisions before learning how to predict just which equations work out the best in the long run.

What shoves the *New Math Blaster Plus* up the ladder from good to excellent is the variety of possible levels and subject areas. This isn't a program your youngsters will outgrow



Avoid orbiting paper and other trash.



Choose from four different games.



Interesting graphics make learning fun.

quickly. First and second graders will be challenged by the addition and subtraction problems, third and fourth graders will find the multiplication and division problems hard to do quickly, and fifth and sixth graders can use the program to review and strengthen their arithmetic skills, even while they practice solving problems with percents. And their brothers and sisters in high school will be challenged by the upper levels in Number Recycler.

Need to keep records of your

youngsters' achievements? The handy recordkeeping routines will automatically track their progress. Each time a child solves a reasonable number of problems correctly, an entry goes into the record, and the program offers to print a reward certificate. These can provide students with a permanent memento of their achievements with the *New Math Blaster Plus*.

Potentially very important to the teachers or tutors who use this package is a handy test-printing routine. You can print out problems similar to those on the screen and let children work on them at home or as a timed review. These can be handy if you plan to quiz your child yourself and want a paper record of the results.

I had only a few problems with this generally excellent program. The older students found Rocket Launcher pretty boring. Even the second game could be quite a bit better if a scorekeeping mechanism were added along with a hall of fame. Speaking of halls of fame, it would be very nice if the names and scores on the list could be erased. That way children wouldn't have to compete with their best scores on lower levels each time they attempted a new level or a new subject group. And the lack of a speed control in the option menu meant that faster computers often played quicker than children could think. This became a problem only on the upper levels of Math Blaster, but it did prove rather daunting to the children who got that far only to be shot down completely.

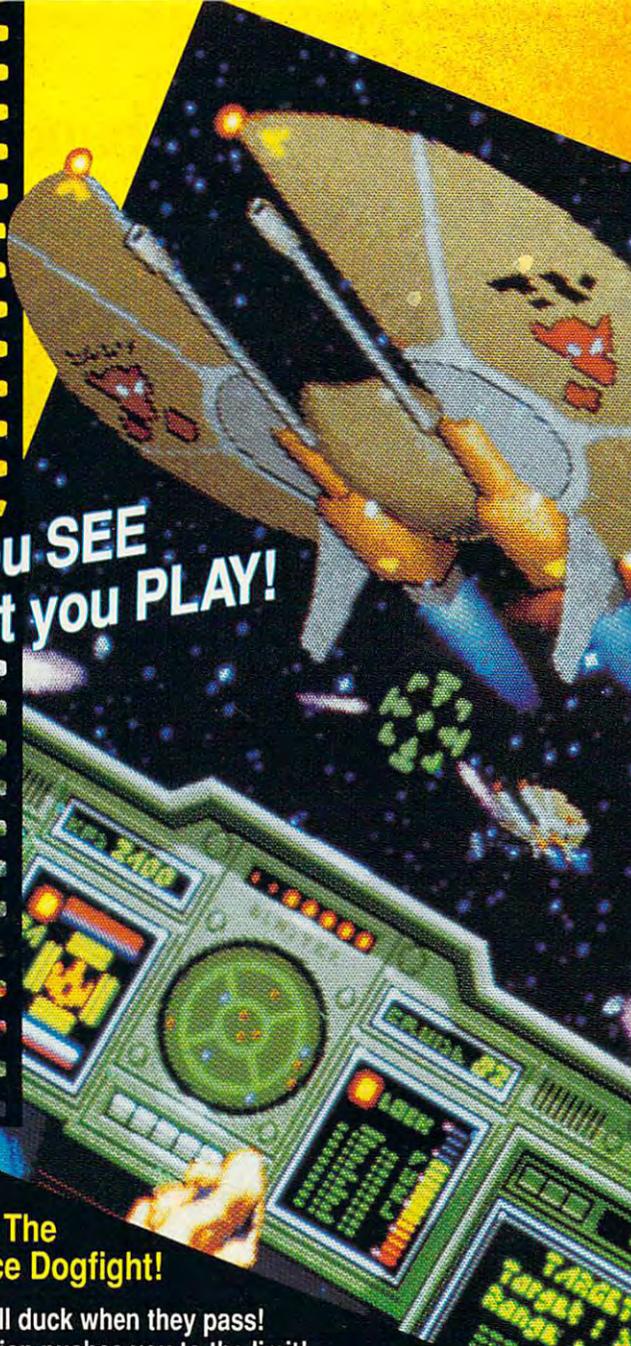
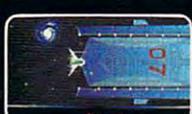
If you're looking for a solid educational game that offers excellent practice in arithmetic for your children, look no further. With the creative enhancement of the drill-and-practice motif, I can solidly recommend the *New Math Blaster Plus*. It's colorful, it's effective, and it's fun!

Educational Value	★★★★★
Documentation	★★
Originality	★★★★
Graphics	★★★★

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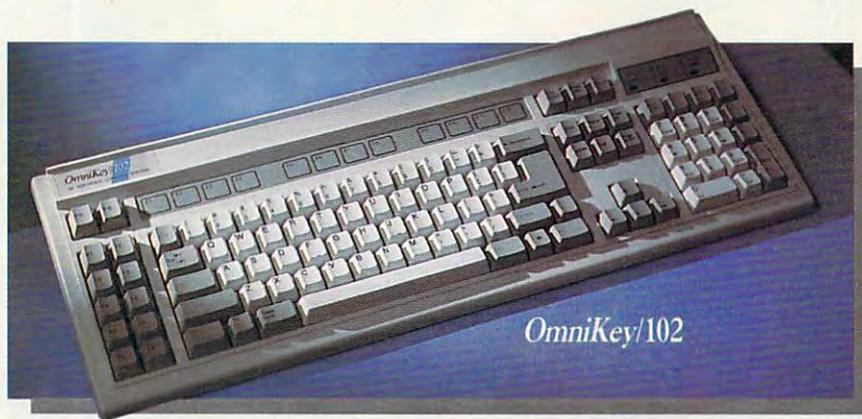
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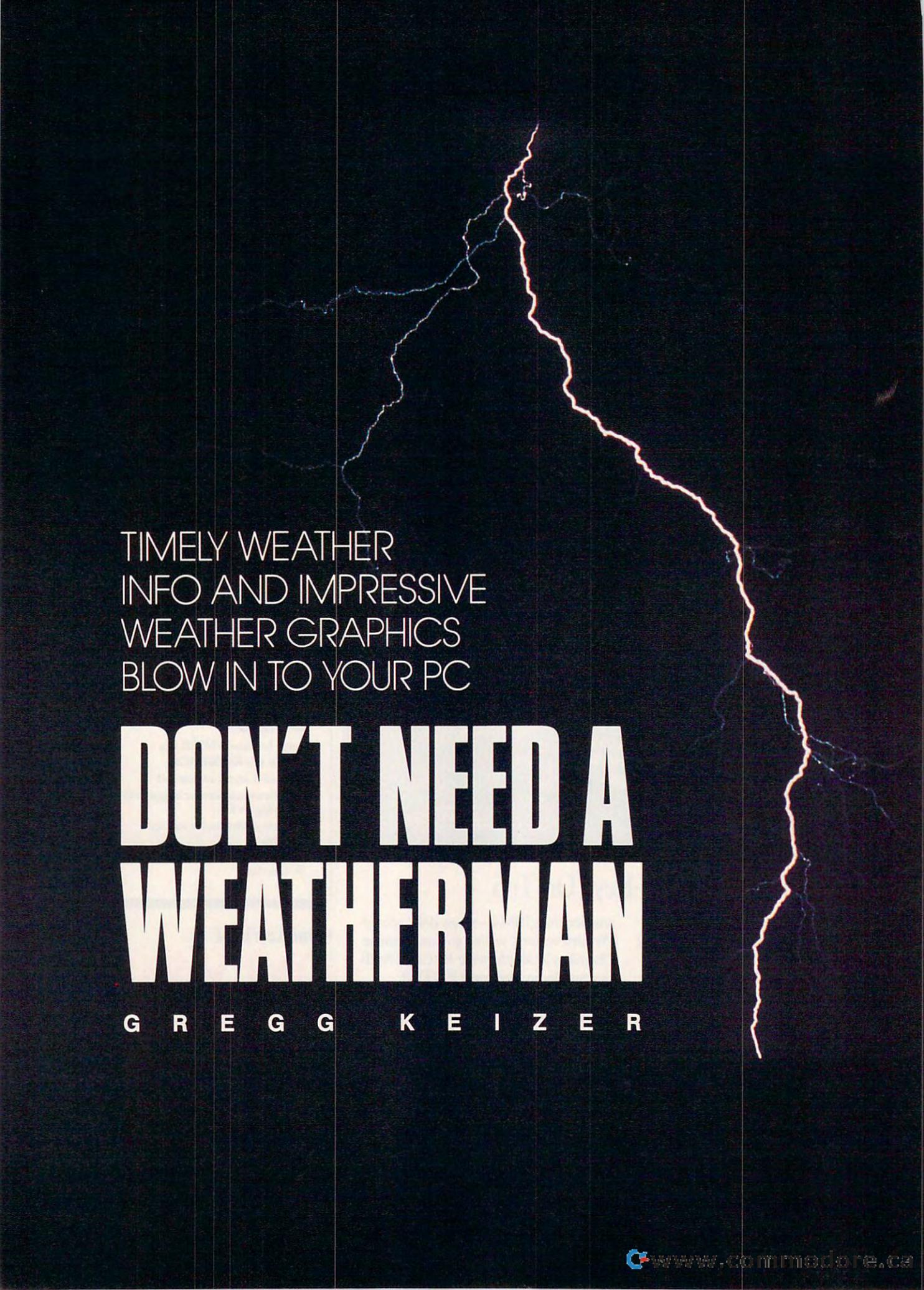
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G R E G G K E I Z E R

Hot in the summer, cold in the winter. Windy today, windier tomorrow. Snow from October to April? You bet. That's the weather where I grew up. Brutal storms that swept across the prairie, rain that was rarely where it needed to be when it needed to be there—it was a farmer's nightmare and not much better for a city dweller.

I follow the weather. We all do. Weather's right up there next to sports as part of the fabric of American conversation. It's no surprise, then, that there are so many ways to find out what the weather's going to be like: TV, radio, colorful maps in newspapers, or just watching the sky for clouds and smelling the air for rain.

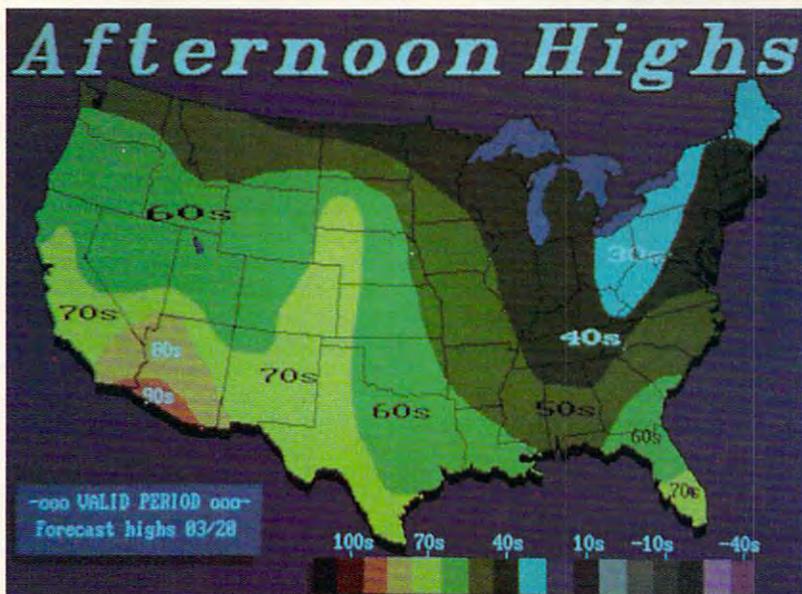
You can do better than that. Put that PC of yours to work as a personal meteorologist, crunching numbers and drawing graphics. All you lack is the raw data—the weather observations and recordings. No, you don't have to check a rain gauge every hour or stare at a thermometer all day long. The National Weather Service (NWS) already does an excellent job of gathering weather data. You just need to get your hands on it.

That's where two programs—*Accu-Weather Forecaster* and *WeatherBrief*—come in. These packages put you in touch with two of the largest commercial weather information databases in the country, *Accu-Weather* and *WeatherBank*, both of which get their basic information from the NWS. Connected to one of these databases via modem and telephone line, your computer can channel an enormous amount of weather info into its hard disk and onto its screen.

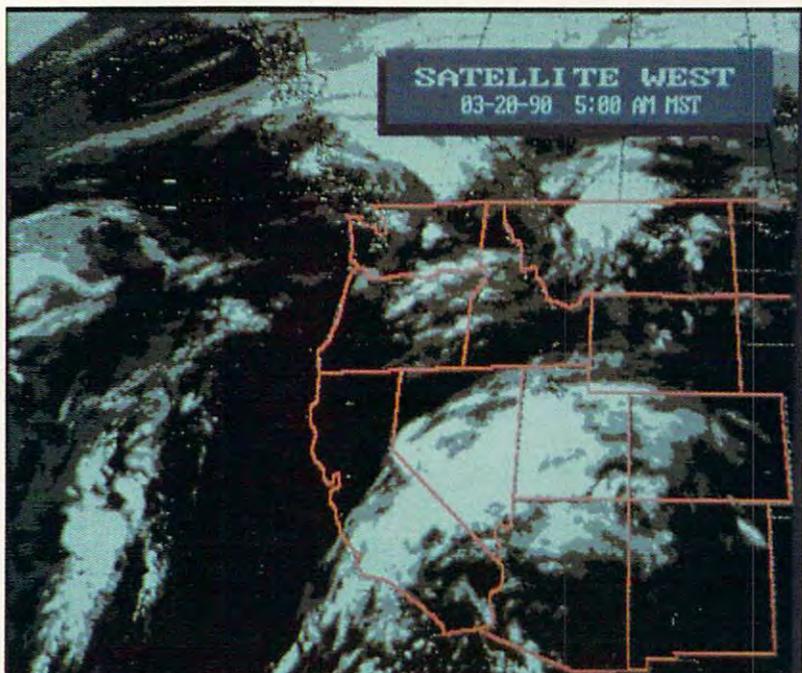
It's one of the most innovative uses of a home computer.

Weather on the Way

Accu-Weather Forecaster and *WeatherBrief* are remarkably similar in their operation. Both programs let you select the weather information you want *before* you call the database—that cuts down on connect time and thus cuts costs (the *Accu-Weather* and *WeatherBank* databases charge connect time by the minute). Once you've selected the information, each program automatically dials its database, pulls down the information you requested, then breaks the connection. Once you're off the phone, the programs build maps and compile lists of



WeatherBrief's colorful maps make the weather interesting and understandable.



WeatherBrief's satellite photos offer you a remarkable perspective on the weather.

up-to-the-minute information. Just as impressive, both packages let you download TV-style weather graphics and specialty maps that look amazingly like what you see on local newscasts.

WeatherBrief is the less expensive of the two packages and in many ways is the easier to use. Even though it's crammed with options, this is the better program for be-

ginning weather enthusiasts.

Before dialing the *WeatherBank* database, you use *WeatherBrief's* simple menu system to select from the dozens of available information choices. *WeatherBrief* lets you cluster those requests in up to eight different groups and save them for later use. I created several of these groups—one for local area weather information, another for national weather forecasts,

and a third world weather.

These information choices make WeatherBank a weather buff's candy store. Here are just some of the things you can ask *WeatherBrief* to retrieve for you: current conditions for any major NWS reporting station, 6- and 10-day forecasts by state or city, radar maps of any of six regions, cloud-cover maps, precipitation forecast maps, lightning-strike maps, satellite pictures of the United States, even custom-created TV-like graphics that show national 30-day temperature and precipitation forecasts.

When you're satisfied with your selections, *WeatherBrief* dials and logs on to WeatherBank; then it pulls down data while you wait. The time online depends on the number of items and the complexity of any graphics you've selected. Simple data requests are the fastest, taking less than two minutes. Satellite pictures and custom graphics can make your online time jump dramatically; in one test session, *WeatherBrief* was on the line for over 17 minutes. It's easy to spend five or six dollars in a single session if you're downloading a lot of graphics or pictures.

But the wait (and maybe even the money) are worth it. Although the

simpler items—current conditions, perhaps—are in text form, *WeatherBrief*'s maps are dazzling on an EGA or a VGA monitor. Satellite pictures and custom graphics like the drought index I downloaded are even more impressive; you won't mistake them for what you see on TV, but they're close.

I thought the text information was the most valuable, though I was tempted by all the color maps and fancy graphics. It was fascinating to see complete weather reports, including current temperatures, humidity levels, and tomorrow's forecast highs and lows—all from cities across the country. I especially liked tracking a hurricane's progress up the Atlantic seaboard. There's a certain satisfaction in knowing that your PC can access weather forecasts, warnings, and observations only moments after they've been posted by the NWS. Not even the Weather Channel is faster.

System Box Blizzard

Accu-Weather Forecaster does much more than simply download information and present it to you. It gathers raw data from the Accu-Weather database and then creates a variety of maps, charts, pictures, and lists to vis-

ually describe the weather.

With the exception of its excellent TV graphics library, *Accu-Weather Forecaster* doesn't ask for specific information requests. Instead, you identify two NWS stations—the one nearest to you and another you'd like information from—and decide how many major stations around the country will be polled by *Forecaster*. The program does all the rest.

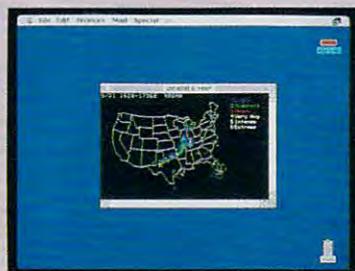
Logging on to the Accu-Weather database and culling its data are handled automatically once you've given the program a telephone number, account name, and password. One nice touch is that *Accu-Weather Forecaster* estimates your online time before you call.

As long as you stick to requesting data, not graphics, *Forecaster* quickly grabs the last 24 hours' worth of observations from your two primary stations, the last hour from all stations within a specified area, and the last hour from 100 major stations around the country. You'll be on the line an average of four to five minutes. Offline, you can view that data any number of ways.

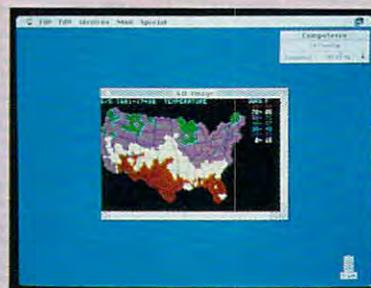
Create a chart showing the rise and fall of temperature, precipitation, wind speed, and barometric pressure



Prodigy's weather map gives you a quick look at the national forecast.



More than 100 radar sites across the country supply information for CompuServe's map of precipitation intensities.



CompuServe gathers information for its temperature map every 15 minutes.

WIRED FOR WEATHER

If your weather information needs are limited, *WeatherBrief* and *Accu-Weather Forecaster* may be too much of a good thing. Fortunately, your computer can tap other electronic resources to tell you what it's going to be like outside.

CompuServe, the telecommunications giant, offers extensive weather information and news among its hundreds of services. Nine types of National Weather Service-style reports appear in text format, ready for you to read while online (or capture as a text file for later reading). Although reports are limited and sometimes several hours old, they duplicate some of those you can retrieve with *WeatherBrief*.

CompuServe also has three maps you can view or download; even in color, though, they're crude when compared to those on WeatherBank or Accu-Weather.

Prodigy, another major player in telecommunications, also has a weather section, which was recently improved. It now has three national weather maps, one showing weather for the current day, another showing fronts and isobars for the current day, and the third showing weather for the next day. Seven regional weather maps have also been added. City weather reports have been expanded to include temperature in Fahrenheit and Centigrade, winds, air

quality, a three-day forecast, and the times of sunrise and sunset. The number of cities has been expanded to 235 domestic and 100 frequent international travel destinations. In the major metropolitan areas, there are reports for the cities in the region. And the outdoor reports have been expanded to include reports on beach/boating, skiing, and foliage reports.

Neither CompuServe nor Prodigy offers up the weather info that *WeatherBrief* or *Accu-Weather Forecaster* makes available. But keep in mind that getting weather info via CompuServe or Prodigy is less expensive than it is with WeatherBank or Accu-Weather.

over the past 24 hours. Or view 11 different national maps that show temperature, wind velocity, visibility, and more in either symbol or colored-bar contour fashion. Choose Picture and *Forecaster* draws a graphical display of the selected station's report, complete with cloud cover, thermometer, and barometer. Or simply list the data on the screen for quick comparisons between locales. A separate function lets you check out local reporting stations' forecasts, as well as the national weather summary.

Accu-Weather Forecaster doesn't cheat you out of great graphics, either. Its newest version makes it easy to select and download any of 145 different television-quality weather maps, graphics, and pictures. By and large, they're much more impressive than the ones you'd see with *Weather-Brief*. Check out the maps that show such things as wind chill and the heat index or the satellite pictures that look almost as good as those you see on the local news. The enhanced radar maps are especially striking.

The versatility of *Accu-Weather Forecaster* justifies its higher price. Where *WeatherBrief* simply downloads data and, with some exceptions, displays it for you, *Accu-Weather Forecaster* transforms raw weather information into interesting graphic interpretations. It makes the weather easy to follow and even easier to understand.

Who'll Stop the Rain?

Both programs give your computer a perfect excuse to dial the phone. Each offers a slick entrance to a complex database, then lets you extract just the information you want. But they're different enough that if you're a well-heeled weather enthusiast, you'll want both.

I thought *Accu-Weather Forecaster* the better all-around value (even at its higher price), but just barely. It excels at displaying current weather conditions, and its television graphics are second to none. But it's weak in pro-

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viding forecasts and the more esoteric weather information.

WeatherBrief lets you dig through such weather information as long-range forecasts, alerts and warnings, hurricanes, and interstate highway travel reports. It's slightly easier to use, yet it can still overwhelm you with facts and figures about the weather.

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PATHWAYS

S T E V E N A N Z O V I N

Sixty-five million years ago, the earth was utterly dominated by huge, powerful, and specialized reptiles. Underfoot scurried small furry beasts, not awesome but agile and adaptable. A short time later (geologically speaking), the dinosaurs were gone, and we mammals had the place to ourselves. A similar evolutionary trend may be taking place right now in the digital world as palmtop computers—those small, portable machines also known as handhelds or personal organizers—challenge laptops by evolving capabilities only desktop PCs had a year or two ago.

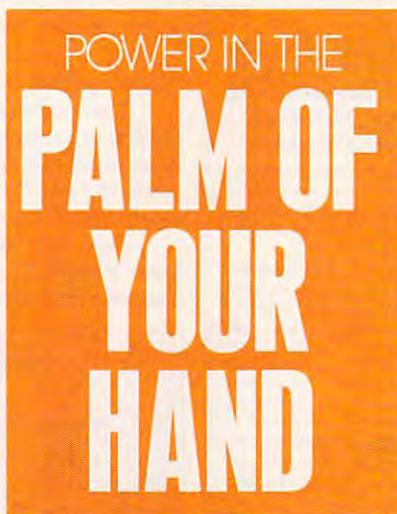
Palmtops differ from laptops in that they're smaller, less powerful, and can run only a limited number of applications. While most laptops aim to give you as much of the functionality of a desktop machine as possible, with portability as a bonus, palmtops are definitely minimalist. The typical palmtop looks like a glorified calculator and weighs less than a pound. It has a tiny LCD screen that shows no more than eight lines of 40 characters, offers a QWERTY or an ABC keyboard with keys so cramped that only a lemur could touch-type, and comes standard with 64K of RAM. You can't run standard PC applications on most palmtops; you're limited to applications specially created for them.

But what the current crop of palmtops do, they do well. Most often, these handy machines keep schedules and address books for execs on the go. Enter your daily or weekly schedule into one of the calendar programs that come standard with nearly all palmtops, and the machine will beep you shortly before each appointment. You can then check the screen for time, place, and notes as you get on your way—a priceless aid for all of us who are chronically late, lost, and unprepared. The integral address book keeps thousands of names and numbers more accessibly than in a paper Filofax or Day-Timer. Palmtops include calculator and world-clock functions as well.

All this might not be enough to

tempt you to shell out as much as \$400 for a palmtop and accessories, but they can do even more. Most palmtops offer additional software on slide-in IC cards. You can get language translators, dictionaries and thesauruses for law and medicine, spreadsheet and expense-account programs, travel planners, wine advisors, and even *Tetris*.

Two top-of-the-line models currently duking it out in the savagely Darwinian palmtop market are the Sharp Wizard OZ-7200 (Sharp Electronics, Sharp Plaza, Mahwah, New Jersey 07430; 201-529-8200; \$300) and the Casio B.O.S.S. SF-9000 (Casio, 570 Mt. Pleasant Avenue, Dover, New Jersey 07801; 201-361-5400; \$260).



Though useful, each has design flaws. The Wizard has a smaller 8-line × 16-character display, a hard-to-use ABC keyboard, and a maximum 32K of additional RAM (with an optional IC card). The B.O.S.S. (Business Organizer Scheduling System) accepts up to 64K of additional RAM and has a bigger 6-line × 32-character display and a QWERTY keyboard, but the keys are flat, not raised. Both models offer a range of software, but the IC cards are expensive, ranging from \$50 to \$180.

Under intense selection pressure, each company is developing new, im-

proved palmtops. The latest models are the Sharp Wizard OZ-8000 and the Casio B.O.S.S. SF-9500. Both should be available by the time you read this. Since the new Wizard will sport a larger display and QWERTY keyboard like the B.O.S.S.'s, and since the new B.O.S.S. has raised keys for easier typing, it may be difficult to choose between the machines themselves—an interesting example of convergent evolution. Instead, you'll want to make sure that you can get the external applications you need for your work. Miniaturized versions of some popular PC applications should be appearing by the end of this year.

When it comes to palmtops and desktops, the dinosaurs-vs.-mammals analogy at the beginning of this column isn't quite right. The big dinos were never really threatened by their furry cousins; it was the other way around—protorats and premonkeys made good eating for the smaller sorts of saurians. But desktops and palmtops have a symbiotic, rather than predator-prey, relationship. The palmtop manufacturers, realizing that most buyers also use a desktop computer, try to make it easy to move data back and forth between machines. Both the Wizard and the B.O.S.S. can interface with PCs and Macs and transfer data to and from programs like *Lotus* and *HyperCard*. (The simplest way to print out information from a palmtop is to move it to your PC first.)

Given their limited abilities, palmtops are no threat to the dominance of desktop PCs—yet. But laptops are a different story. Why lug around a 6-plus-pound laptop to do what a half-pound palmtop can do for you, at a sixth of the price? Within a year or two you'll see palmtops with voice annotation (voice-recorded messages) and text-to-speech capability, crisper displays, touchscreens that recognize your handwriting, and some type of integrated circuit-based mass storage. So as palmtops get more powerful, they may mean extinction for some species of laptops—it's a simple matter of survival of the smallest. □



PC VIEW

C L I F T O N K A R N E S

Finally, *Windows* 3.0 is here, and it's made a big splash. Everyone agrees that its sculpted buttons and full-color icons are beautiful, but some argue that Microsoft has pushed the product too hard, hyped it too much, and oversold it in general.

Windows 3.0 certainly has its detractors, but its release is quickly emerging as the most important event since the introduction of MS-DOS itself. Interestingly, *Windows* finds itself in nearly the same situation DOS was in after its introduction.

When the first version of DOS hit the streets, a lot of people scoffed at it. After all, there was already a mature, well-supported operating system widely available: CP/M. Who needed another entry to confuse the marketplace?

There was no software for MS-DOS, everyone claimed, and the system didn't support a hard disk (many CP/M systems had hard disks at the time). And the floppy disks didn't hold enough data—a measly 160K compared with CP/M's 360K or more. Although MS-DOS was touted as a 16-bit wonder, the PC's standard configuration used just 64K—no more RAM than the 8-bit 8080- and Z80-based CP/M computers.

As more software appeared for the PC, industry pundits began to say that perhaps MS-DOS would coexist with CP/M. And it did just that—for a while.

But as we all know, DOS completely replaced CP/M. Why? It's simple: Although the first MS-DOS machines were really no better than their CP/M counterparts, MS-DOS and its PC engine had more *potential*. True, IBM's

early DOS computers came with just 64K, but they could address much more. When RAM prices came down, 640K soon became the standard. Fast, large hard disks also became plentiful. These two factors—increased RAM and fast, large hard disks—ensured the eventual success of MS-DOS.

The situation between *Windows* and DOS parallels that ten-year-old duel between DOS and CP/M. *Windows* is the new kid on the block, and it faces many of the criticisms that met DOS at its introduction. But *Windows* has greater *potential*—especially when matched with the right hardware.

When you run *Windows* in real mode on an 8088- or 8086-based PC, DOS leaves it at the gate. *Windows* is clunky and impossibly slow.

But things start to change with a 286 computer. In standard mode, AT-class machines sporting a megabyte or more of RAM can multitask *Windows*

applications and single-task most DOS programs. *Windows* is still a little sluggish, but with it, you can really *use* your extended memory to run applications. The first time you get a message that says something like *2,714K free*, you'll catch a glimpse of the new life *Windows* can breathe into your computer.

On 286 machines, *Windows* and DOS run neck-and-neck, but deciding between the two is easy. If you run a lot of *Windows* applications, *Windows* clearly gets the nod. If you spend most of your time tooling around in DOS, *Windows* won't offer you much.

On a 386, it's a different story. In its 386 incarnation, *Windows* 3.0 can multitask *Windows* applications and DOS applications. It can even multitask DOS applications in windows. And it uses not only extended memory, but also virtual memory (hard disk space configured as memory). When you run *Windows* 3.0 and get a

message that says *14,412K free*, you'll feel some of 3.0's power on a 386. With 386 hardware, *Windows* 3.0 is recommended even if you don't use a single *Windows* application.

So, what about the future of DOS and *Windows*? Or perhaps it would be better to ask about DOS *versus* *Windows*. Like the CP/M-DOS battle, it all depends on hardware. As the PC's hardware improved and became less expensive, the power of DOS led people away from CP/M. The same thing is going to happen with *Windows*. As 386 hardware becomes more common, so will *Windows*. With *Windows*, just like with DOS ten years ago, it's not really a matter of *if*; it's a matter of *when*. □



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CAPTAIN COMIC	GA 156	The best! In stunning color. Mario Bros' style game. (EGA Req'd)
CYRUS EGA CHESS	GA 161	A challenging opponent for chess if you have EGA to show fine detail
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NEWS & NOTES

Colorful Entry

Epson is entering the image-processing market in a colorful way, introducing the ES-300C color desktop scanner. The new scanner utilizes 8-bit monochrome processing to produce 256 shades of gray and 24-bit color processing with a resolution of 300 dots per inch (dpi).

Advanced scanning technology, combined with a unique direct-print

function and comprehensive bundled software, allows users to capture, edit, paint, and print in both the PC and Macintosh platforms.

The scanning mechanism includes a one-pass color technology known as TruePass. Alternating red, blue, and green light bars scan each line of the image, separating the colors simultaneously. This results in faster processing and greater accuracy than that of conventional desktop scanners, which blend a series of separate scans using a single light bar and colored filters.

The TruePass system also allows color corrections to be performed during the scanning process, and the ES-300C can be used with Optical Character Recognition software that converts text into images users can then store, edit, and retrieve in the PC environment.

The ES-300C is available from Epson-authorized resellers. The manufacturer's suggested retail price is \$1,995. Interface kits are \$495 for the PC version.

Epson America, 2780 Lomita Blvd., Torrance, CA 90505

Qume Does It Again

Qume, a leader in low-cost high-performance laser printers for the personal computer market, has done it again. Its new CrystalPrint Express is a 12-page-per-minute (ppm) PostScript-compatible laser printer that produces output with 600 × 300 dpi resolution. This means the new CrystalPrint Express is capable of print resolution twice that of most widely used laser printers today, at a speed 50 percent higher. The new printer's suggested retail price of \$5,595 is comparable to the price currently asked for other 8-ppm laser printers with lower resolution.

Qume, 500 Yosemite Dr., Milpitas, CA 95035

Parting the Clouds

Astronauts aboard NASA space shuttles are getting a clearer picture of photo opportunities with satellite images printed on Seikosha's high-resolution video printer.

With it, NASA Houston produces detailed, up-to-the-minute weather maps with data from geostationary satellites. Houston transmits satellite pictures to the shuttle astronauts as they prepare to photograph environmentally sensitive areas. Each photo session has only a narrow window of opportunity, and the satellite-generated weather maps let astronauts preview the photographic conditions they will encounter *before* they encounter them.

The Seikosha printer was selected because it can produce weather maps using a 64-tone gray scale. NASA feeds the printer output into a special fax machine for transmission to the shuttle. The VP-3500 video printer is a 300-dpi thermal printer that can reproduce a video image of up to 1280 × 1240 pixel resolution. It retails for \$6,700.

Seikosha America, 10 Industrial Ave., Mahwah, NJ 07430 □

Those Pesky ELF's

Computer monitors, like most electronic devices, generate a wide range of electromagnetic fields. Research into potential health hazards from exposure to magnetic fields started over a decade ago, with studies focusing on electric power lines. Recently, there has been concern raised about the possible harmful effects of long-term exposure to very-low-frequency (VLF) and extra-low-frequency (ELF) emissions generated by computer monitors. Fortunately, there are already some alternatives to the standard computer monitors normally available in the U.S., monitors that conform to more stringent standards for VLF emissions.

Sigma Designs, for example, now sells IBM-compatible and Macintosh monitors that meet the low VLF emission standards set by the Swedish government. Sigma is developing monitor technology that will meet new standards for ELF emissions that are expected to be set by Sweden next year.

Sweden has received international attention as the most progressive country in regulating magnetic field emissions. Sigma says it will deliver monochrome and gray-scale monitors with both low VLF and low ELF technology in the first quarter of 1991.

Cornerstone Technology is another monitor manufacturer that's already offering low-radiation displays.

In both cases, the low-radiation option adds \$150-\$200 to the regular suggested retail price of the offered displays.

Sigma Designs, 46501 Landing Pkwy., Fremont, CA 94538; Cornerstone Technology, 1990 Concourse Dr., San Jose, CA 95131

News & Notes by Alan R. Bechtold, editor of *Info-Mat Magazine*, an electronic news weekly published by BBS Press Service.

THESE PIRATES HAVE TONGUES AS SHARP AS THEIR SWORDS.



Lucasfilm™ Games' swashbuckling new graphic adventure lets you trade insults with some of the saltiest seamen to ever sail the seven seas.

In *The Secret of Monkey Island*,™ you'll sling one-liners with a fast-talking used ship salesman, a sarcastic swordmaster, a wisecracking corpse, and a prisoner whose breath would stop a horse. You'll also hunt for buried treasure, chase after a beautiful woman, and—perhaps—unravel one of the twistiest plots in the history of adventure gaming.

You're short, broke, clueless and friendless.

And you've just arrived on Méléé Island seeking fame and fortune. Explaining to anyone who'll listen that you want to be a pirate.

Being the easy-going types they are, your new pirate pals invite you into the club. Just as

soon as you've completed three *tiny* trials.

Among other things, you'll need to sedate some piranha poodles, burglarize the governor's mansion, and do business with the scum of the earth. And if that's not enough, you'll have to figure out whether the 300-pound voodoo priestess covets your rubber chicken, fetid fish, pack of breath mints, or...

If the brigands don't grab you, the graphics will.



Lucasfilm Games set today's graphic standards with games like *Loom* and *Indiana Jones and the Last Crusade*. Now *The Secret of Monkey Island* ups the standards a few more notches with stunning 256-color VGA graphics (16-color EGA version also available), proportionally scaled animated characters, and cinematic pans and camera angles.

Our acclaimed point 'n' click interface

has been improved even more. So have our sound effects, which are backed by a captivating calypso and reggae music track.

Enter the Monkey Island Treasure Hunt and win a FREE Carnival Caribbean cruise!

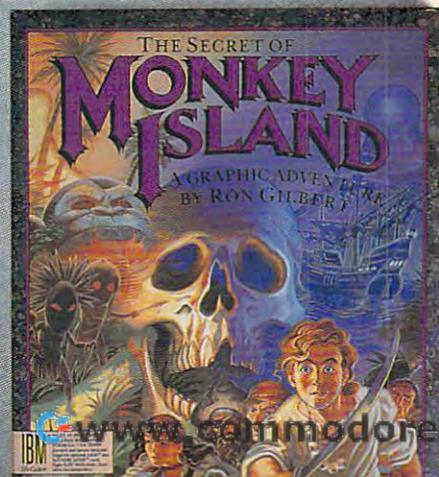
If you can solve a few sneaky puzzles in a special demo of *The Secrets of Monkey Island*, you might just win one of the sweetest prizes since Captain Kidd's treasure chest. A Carnival Cruise for two, one of a hundred AdLib™ sound cards, or one of hundreds more prizes! You'll find the demo and complete rules in specially-marked boxes of 3M diskettes. Or send a self-addressed, stamped disk mailer to: Monkey Demo, PO Box 10228, San Rafael, CA 94912.



So act fast, think fast, and enter fast. Because while playing *The Secret of Monkey Island* is an adventure, winning the Treasure Hunt is a real trip.

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The Secret of Monkey Island is available for IBM and 100% compatibles in 16-color EGA and 256-color VGA versions. Visit your retailer or order directly with Visa/MC by calling 1-800-STARWARS (in Canada 1-800-828-7927). ™ and © 1990, LucasArts Entertainment Company. All rights reserved. IBM is a trademark of International Business Machines, Inc. 3M is a trademark of 3M Corp. AdLib is a trademark of AdLib, Inc. Cruise prize arranged with the "Fun Ships" of Carnival Cruise Lines, The Most Popular Cruise Line in The World; ship's registry, Bahamas and Liberia.

Circle Reader Service Number 189



FEEDBACK

QUESTIONS FROM OUR READERS

About two years ago I purchased an IBM Model 30. Recently, I bought a 5¼-inch drive to go with it. Many programs that come on 5¼-inch disks demand to be placed in drive A, which is my 3½-inch drive. What can I do about this situation?

MADHU POCHA
MANCHESTER, MO

The simple solution is to issue the DOS command ASSIGN A B. This command will make your computer think that drive B is drive A. That way, you can install your program or run it in your 5¼-inch drive. When you've finished, either reset the computer or issue the DOS command ASSIGN, which returns things to normal.

The complicated, permanent solution only works if you're using an internal 5¼-inch drive. Reverse the position of the drives with respect to the flat data cable that serves the drives. Although this is a simple operation, if you're slightly nervous about going into the innards of the computer, you'd be wiser to let a qualified service technician make the switch for you.

Most people would be satisfied just making the software switch with the ASSIGN command. You could even place the ASSIGN command in your AUTOEXEC.BAT file to make the change automatic. If you do this, include the complementary command ASSIGN B A, which will allow you to use your 3½-inch drive as drive B.

One word of caution on using this command: Some commercial programs, especially games, are encrypted with heavy copy protection. Therefore the ASSIGN command may not work with some commercial packages.

Keeping It Clean

I am concerned about the care and maintenance of my hardware, particularly the heads on my disk drives. Could you give me some general rule

of thumb for cleaning the disk drive heads and maintaining other components of the hardware?

HENRY ZIMOCH
CHICAGO, IL

How often or how rigorously you should clean your hardware is directly related to the dirtiness of the immediate environment. If you smoke, live in a dusty home or an area of heavy pollution, or own an ultrasonic humidifier, you should clean your computer often with a vacuum cleaner or compressed air and keep your keyboard covered with a thin plastic cover.

If you're in a truly nasty situation, such as on a factory floor or in a trailer at a construction site, you should consider purchasing a hardened or ruggedized computer. These computers are designed to withstand shocks. Some use refrigeration or special filtering for cooling or eliminating dust- or chemical-laden outside air.

If your computer is in an average office or home environment, you should clean it about once a month or quarter. Failure to do so may result in a build-up of dust on the cooling vents and internal components. All electronic devices generate heat, and some are very intolerant of high temperatures.

Begin by backing up and optimizing your hard disk. Then unplug the computer, open the computer case, discharge any static in your body by touching the power supply housing, and blow out all the dust with compressed air. Remember that dust is also harmful to you, so wear goggles and a mask to protect your eyes and lungs. When all the dust has been blown out, close the case and replace any screws that you removed.

If your floppy drive has been giving you problems, run a disk-head cleaner to clean the dust and debris that may have accumulated on the disk drive heads.

No matter what the manufac-

turers claim, all head cleaners are at least a little bit abrasive, so experts recommend only using a head cleaner when your drives are acting up.

Use an antistatic wipe to clean the monitor screen (some experts recommend dryer sheets or a weak solution of fabric softener and water—about three parts water to one part fabric softener). Don't use a commercial window cleaner on your screen. Some monitors have an outside coating to protect the glass and prevent glare. A glass cleaner can remove or damage this protective coating.

One computer writer has been known to clean his keyboard by carrying it into the shower with him, but for obvious reasons we can't recommend that. Instead, purchase a portable vacuum cleaner like the Mini-Vac (from The GiftHorse, Department C-P, 4975 Hunters Run, Colorado Springs, Colorado 80911) and vacuum the keys periodically, or blow the spaces between the keys with compressed air.

Cotton swabs and isopropyl (not rubbing) alcohol are good for cleaning tight corners. Here's a hint worthy of Heloise: Post-It notes can be used to remove things that fall in crevices. Dust and hair stick to the adhesive.

Most of the exterior of your computer can be cleaned with a mild solution of soap and water (or fabric softener and water in the proportions listed earlier).

Readers whose letters appear in "Feedback" will receive a free COMPUTE's PC LCD clock radio while supplies last. Do you have a question about hardware or software? Or have you discovered something that could help other PC users? If so, we want to hear from you. Write to COMPUTE's PC Feedback, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408. We regret that we cannot provide personal replies to technical questions. □



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MARK WAGONER 1990

BECOMING A PC ENVIRONMENTALIST

In the natural environment, important things lie unseen, hidden in the bushes. Your computer is no different. Lurking in a little corner of your PC's memory is information that most users never see: the DOS environment. The environment is a special area in memory that contains information on your computer's basic setup. Once you understand the basics of the DOS environment, you'll be able to use it to speed up your batch files, get more out of many commercial and shareware programs, alter your system's prompt, and even move the main DOS file, `COMMAND.COM`, out of your root directory and into a new location. First, though, you need to understand how the environment works.

Get SET

The basic command for viewing and manipulating the DOS environment is `SET`. To see what is currently contained in the environment, type the command

`SET`

at any DOS prompt and then press Enter. `SET` is an internal command, so it operates no matter what disk or directory you're using.

When you give this command by itself, you'll see something like this:

```
COMSPEC=C:\COMMAND.COM
PATH=C:\;C:\DOS;C:\UTILITY
PROMPT=$PSG
DATA=C:\DATA \
```

TO SQUEEZE
EVERY OUNCE
OF POWER
FROM
YOUR PC,
YOU'LL HAVE
TO MASTER ITS
ENVIRONMENT

Your screen will probably look different, depending on how your system is set up, but those four lines represent every type of information that can be stored in the environment. Here's a look at each line.

COMSPEC—Your Way Home

The `COMSPEC` line tells DOS where to find a copy of `COMMAND.COM`, the program that interprets everything you type at the DOS prompt. When you boot up, whether from a floppy disk or from your hard disk, DOS automatically includes this line in the environment. It's very important for the system to know where to find `COMMAND.COM` because programs can use the memory space normally taken up by `COMMAND.COM`. When you exit a program, the PC reloads `COMMAND.COM` from the location named in this line. >

G E O R G E C A M P B E L L

Floppy disk users are familiar with this DOS error message:

Insert disk with COMMAND.COM in drive A and strike any key when ready

(The exact wording may vary depending on your DOS version.) The message means that DOS tried to load COMMAND.COM but couldn't find it in the location specified in the COMSPEC. The same principle applies on hard disks, but since COMMAND.COM is usually where COMSPEC thinks it is, you rarely see the message.

It's possible to tell DOS to find COMMAND.COM somewhere other than its usual place. Suppose you want DOS to find COMMAND.COM on drive B. You might want to do this if the program you're running from drive A is too big to allow you to keep COMMAND.COM there, too. You could copy COMMAND.COM to another floppy, insert it in drive B, and then give this command before running your program:

```
SET COMSPEC=B:\COMMAND.COM
```

Now, when you exit the program, DOS will look for COMMAND.COM on drive B instead of drive A. Hard disk users can do the same thing, placing COMMAND.COM in a directory other than the root directory of drive C.

PATH Through the Woods

The second line in the example above displays the DOS PATH. Most hard disk users are familiar with the PATH command. It allows DOS to find and run COM, EXE, and BAT files from any directory, as long as the program is located in one of the directories named in the PATH statement.

You would ordinarily include a PATH statement in your AUTOEXEC.BAT file. While hard disk users make good use of this statement, floppy users can also benefit from adding a path statement to their AUTOEXEC.BAT file. You don't need the SET command to create or change your PATH. The line below will allow floppy disk users to run programs on either drive A or B, regardless of what the prompt says.

```
PATH=A:\;B:\
```

For more information on the PATH command and its syntax, consult your DOS manual.

PROMPT Input

Next in line is the PROMPT command. It's amazing how many users skip this valuable command. In the example above, the PROMPT line

looks like this:

```
PROMPT=$P$G
```

That line displays a DOS prompt that shows the current directory. It's a big help in finding your way around your PC. If you always see a prompt that only shows the currently logged drive and a greater-than sign (like C>), it's time to fix up your prompt.

Where Is the Environment?

Finding the exact location of your DOS environment can be difficult. That's because it keeps moving. Each time a program is executed, it gets a copy of the master environment. But since DOS and other programs need to be able to find this elusive area of memory, each program contains a pointer to its own private environment, and this pointer is always located at the same spot in memory—offset 2C hexadecimal in the current segment.

This offset is in an area called the PSP, or Program Segment Prefix. The PSP contains a lot of useful information, but we're only concerned with the environment here.

To see your DOS environment in memory, you'll need to use the DOS external command, DEBUG. Simply type

DEBUG

at the DOS prompt.

Now, at the - prompt, enter D 2C. This tells DEBUG to display the memory at address 2C (the hexadecimal numbering system is assumed). You'll see something like this:

```
23A4:0020 A3 1F 4E 01
```

The first two values, A3 and 1F on this PC, form the address of the current environment, but, for technical reasons, DOS stores address bytes in reverse order, so the real address is 1FA3. Since this is the address of a segment, to see its contents you'd type

```
D 1FA3:0
```

at the DOS prompt (be sure to substitute your computer's values for the ones above). You'll see the text of your environment, beginning with your COMSPEC statement. To quit DEBUG, type Q at the - prompt.

To verify that your PC's environment moves around, type COMMAND at the DOS prompt. This will invoke another command interpreter and another environment. Now load DEBUG and type D 2C again. This time you'll get different addresses. To verify that these point to the environment, reverse them and enter the D command. You'll see the same environment headed again by your COMSPEC command. To remove the extra COMMAND.COM, type EXIT at the DOS prompt.

— Clifton Karnes

Just give the command PROMPT=\$P\$G at any DOS prompt. This command will cause your prompt to display the complete path of the current directory, which can be very useful in a complex directory structure. Hard disk users will benefit most from this command. You can include the command in your AUTOEXEC.BAT file to automate the process.

There's even more to the PROMPT command. You can add other features and even your own text. Each feature is preceded by a dollar sign. Try these:

\$D	Current Date
\$T	Current Time
\$G	The greater-than symbol (>)
\$V	Your DOS version
\$_ (underscore)	Moves to the next line

You can even include your own text just by typing in the words you want. For example, type this command on one line at the DOS prompt:

```
PROMPT=Hello! It's $T on $D$_You're using DOS $V$_in the $P directory. Give a command:
```

Using ANSI.SYS, you can even add colors and more to your prompt. For more information on these extra features, see the PROMPT and ANSI.SYS entries in your DOS manual or read the article "FYI: ANSI.SYS" in the May 1990 issue of *COMPUTE!'s PC Magazine*.

Customizing with SET

The fourth line in the sample environment above, which reads DATA=C:\DATA, won't appear the first time you run the SET command. It's an example of information you place into the environment for your own use.

You already know how the PATH command works: It lets DOS find programs and batch files on disks and directories other than the one to which you are currently logged. If only your programs could use PATH to find their data files! DOS versions 3.3 and later include the helpful APPEND command, but many programs offer their own tools for locating data files or for other information.

By including a variable in the environment area, you can often tell a program where to look for its data or for information telling it how you want it to run.

WordPerfect is a good example of this. It uses a number of special start-up options. For example, if you start *WordPerfect* 5.1 with the command

```
WP /d-C:\TEMP /m-DOITNOW
```

the program will send all its temporary files to the C:\TEMP directory

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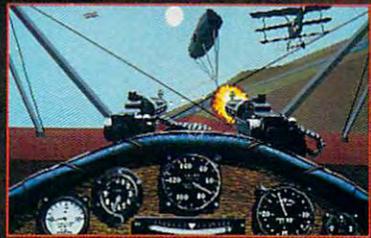
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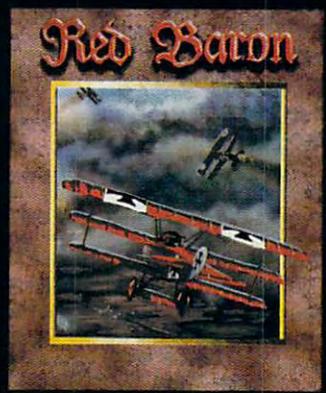


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and immediately run the macro named DOITNOW. That's handy, but it's a lot of work to type.

There's a shortcut, though. *WordPerfect* checks the DOS environment each time it runs. By including an environment variable containing the information it needs, you can tell *WordPerfect* what to do without all that typing. The SET command is the key. Here's what you'd use to duplicate the command above:

```
SET WP=/d-C: \TEMP /m-DOITNOW
```

Now, just by giving the command WP, you can provide the same information you laboriously typed out before. If you include this SET command in your AUTOEXEC.BAT file, *WordPerfect* will always start just the way you want.

Many other programs have similar capabilities. To check on the software you use, try looking in the index of the manual for the words *environment* and *SET*. Each program uses environment variables in a different way. Some, like *WordPerfect*, use them to help users cut down on complex command line switches, while others use the environment to find data files. In either case, a little study can save keystrokes, cut down on all the things you have to remember, and increase your productivity.

The SET command can create an environment variable, but it can also remove one. To clear a variable, give the command this way:

```
SET VARIABLE=
```

By naming the variable, but not adding a value to it, you tell DOS to delete the variable from the environment. Don't place any spaces around the equal sign.

Batch File Environmentalism

There's one more way to make the DOS environment work for you. Many users find that batch files are an indispensable part of their daily computing. What most people don't know is that you can supercharge your batch files by letting them get information from your DOS environment.

As we've seen, environment variables have two parts. First comes the variable name, then an equal sign, followed by the data in the variable. Batch files can access the data by using the variable name. For example, if you use a modem to download files from bulletin boards, you've discovered that they're usually stored as archives containing several files. It's often convenient, especially with shareware programs, to examine the documentation before extracting all

of the files. README, README, README.DOC, and MANUAL.DOC are common names for documentation.

Here's a way to extract all the documentation files from a whole list of ZIP files, sending them all to a special directory on your hard disk, ready to read. The batch file uses PKUNZIP to do the extracting.

Before running this batch file, however, you must use the SET command to establish an environment variable. Let's call our variable UNZIP. Here's the command:

```
SET UNZIP=READ*. *.DOC *.TXT
```

Now you can use the variable UNZIP in a batch file to represent all those wildcard characters. You won't ever have to type them again. Before showing you the batch file, though, you need to know some other information. For this example, let's assume that the program PKUNZIP.EXE is in the current directory or in the PATH. All the ZIP files are stored in the directory C: \ZIPS, and we'll send the documents to the directory C: \TEMP. You can substitute your own information. Here's the batch file, called UNZIPIT.BAT:

```
PKUNZIP C: \ZIPS \*.ZIP %UNZIP%
C: \TEMP
```

It's just one line, but it has enormous power. Just give the command UNZIPIT and the batch file will cause PKUNZIP to extract every documentation file from a whole list of ZIPPED files and send them to your temporary directory for reading.

The key here is the use of percent signs (%) on both sides of the environment variable name. When DOS sees that, it checks the environment

for the variable UNZIP and then automatically inserts everything on the other side of the equal sign as the contents of that variable.

Now, suppose that you wanted to switch to extracting all the EXE files from your list of ZIP files. You could write another batch file, but there's a better way. Just give this command:

```
SET UNZIP=*.EXE
```

Now, instead of extracting documentation, your UNZIPIT.BAT file will extract only the EXE files, still sending them to the C: \TEMP directory. If you want all files extracted, use the SET UNZIP=*. * command.

This is a simple example, but it's easy to see how you can use environment variables to enhance the power of many of your batch files. Remember, you can establish the variable automatically at boot time by including the SET command line in your AUTOEXEC.BAT file.

Sizing Up the Environment

If all this sounds interesting and you're ready to start typing PROMPT, PATH, and SET commands right and left, hold on a second. DOS allows only limited room for the environment. In DOS versions 2.0-3.2, only 128 bytes are allowed. Later versions of DOS let you use 160 bytes. That's the equivalent of about two lines of text on your screen.

Keep adding to your environment with long PATH and PROMPT statements, or use too many environment variables, and DOS will complain with this message:

Out of environment space

This space limitation is pretty severe, but there's a way around it. The

SET and PROMPT at a Glance

SET

The SET command sets an environment variable name. This command has several forms.

SET	By itself displays the current environment.
SET name=	Deletes the variable name.
SET name=value	Places value in the variable name.

PROMPT

The PROMPT command sets the DOS prompt. The most common setting is \$P\$G, which displays the current path followed by a greater-than (>) sign. Here's a complete list of PROMPT options:

\$B	Vertical bar ()	\$P	Current path
\$D	Current date	\$Q	Equal sign (=)
\$E	Esc character	\$T	Current time
\$G	Greater-than sign	\$V	DOS version
\$H	Backspace	\$_	Enter
\$L	Less-than sign	\$	Dollar sign
\$N	Default drive		

The command PROMPT by itself sets the prompt to its default, \$N\$G.

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technique varies with the DOS version, and there are two completely different methods.

For DOS versions 2.1-3.0, the only way to increase the size of the environment is to load a second copy of COMMAND.COM, telling the second copy that you want a larger environment space. Here's the command, which you should give from the directory containing COMMAND.COM:

```
COMMAND /E:size /P
```

Replace *size* with your desired environment size, in bytes. You can use as many as 32,768 bytes, but 512 or 1024 is usually enough. If you're using DOS 2.1, you may see an error message about a search path not being found, but you can ignore it.

This method works, but it has a disadvantage: Since it loads a second copy of COMMAND.COM, you'll lose about 20K of memory when you use it. You can avoid this memory loss if you use DOS version 3.1 or later.

With these later versions, you can use the SHELL statement in your CONFIG.SYS file to increase your environment space when you boot up, without losing memory. To do this, include the following line as the first line in your CONFIG.SYS file:

```
SHELL=C:\COMMAND.COM C:\
/P /E:size
```

Substitute another drive and path, if your copy of COMMAND.COM is in another location. The second C:\ tells DOS where to set the COMSPEC variable.

The /P entry is essential. If you leave it out, the system will lock up and you'll have to reboot from a floppy disk.

Finally, specify the size for your environment. With DOS 3.2 or higher, give the size in bytes, up to 32,767 bytes. DOS 3.1 is different, requiring the size to be in multiples of 16, and is limited to 992 bytes. For version 3.1 you must specify the size between 11 (176 bytes) and 62 (992 bytes). That's usually enough, but if you need more than 992 bytes, use the method described above for earlier versions.

BASIC and the Environment

If you program in any variety of BASIC, from the lowly BASICA/GW-BASIC interpreter to the *Quick-BASIC* 4.5 compiler, you can read or change any part of the DOS environment from within your own programs. Two simple BASIC commands handle all of the work.

First, you may want to set a new

environment variable from within a program. One good reason to do this is to tell your program where its data files are located. To do this, you use the ENVIRON statement. Here's an example. Suppose you want to let your program know that all its files are in the directory C:\BASIC\. To add this to the environment, use a line like this in your program:

```
ENVIRON "DATA=C:\BASIC\"
```

It's just like using the SET command from the DOS prompt, as described earlier in this article. Don't use any spaces around the equal sign.

Similarly, you can set the PATH, COMSPEC, PROMPT, or any other valid environment string with the ENVIRON statement. To set a new

Using EnvEd to Alter Your DOS Environment

While the SET command, described above, is one way to alter the data in the DOS environment area, it's inconvenient at times. Adding a directory to your PATH statement, for example, means typing the entire path from start to finish.

On this issue's disk, you'll find *EnvEd* (for Environment Editor), a program written by Jeff Bowles. It lets you edit your DOS environment, using the familiar keystrokes you use with your word processor. You can use *EnvEd* to insert, delete, or alter any of the data in the environment. It's especially useful for changing your PATH statement without retyping the whole thing.

EnvEd uses the same commands as *WordStar*, but you don't have to be a *WordStar* guru to use it. The cursor, Ins, Del, and Backspace keys are all you need. To start the program, give the command ENVED while in the directory containing the ENVED.EXE file.

The program begins in Insert mode, which means that anything you type on an existing line will push other characters to the right. Press the Ins key to toggle between this mode and overtype mode. Overtyping mode causes you to overwrite existing text as you type. To delete characters, just use the Del or Backspace key.

Once you've finished making your changes, save your work by pressing Ctrl-K, X (hold down the Ctrl key while you press K and X). If you decide not to make any changes, just press Esc to exit the program without saving. It's that easy.

You'll be able to use all of the environment functions listed in the main article while using *EnvEd*. Just type them in, but don't type SET—it's not needed. *EnvEd* keeps track of the amount of memory available for the environment, and it won't let you exceed that limit.

PATH, for example, the BASIC line would look something like this:

```
ENVIRON "PATH=C:\;C:\DOS;
C:\BATCH"
```

Getting access to information stored in the environment is just as easy. To do this, you use the ENVIRON\$ function. For example, to find out what directory is stored in the DATA environment string, you'd use a line like this:

```
DATAS$ = ENVIRON$( "DATA" )
```

The quotation marks inside the parentheses are required. Now, you can use that information in your program. If you use the line

```
PRINT DATAS$
```

BASIC will display everything after the equal sign (=) from the environment. Using the example above, you'd see this on your screen:

```
C:\BASIC\
```

Now, let's use this environment information to open a sequential data file called CONFIG.DAT. By using the environment, you can open this file, even if you've changed directories within your program. Here's a BASIC fragment:

```
FILENAME$ = DATAS$ + "CONFIG.DAT"
OPEN FILENAME$ FOR INPUT AS #1
```

BASIC will open the file C:\BASIC\CONFIG.DAT and allow you to read information from that file.

Here's a final example. You can combine the ENVIRON statement and ENVIRON\$ function to alter your PATH statement. Suppose you want to add a new directory to your path. The following line will add the directory C:\UTILITY to the end of any existing path. If no path exists, then the line will create one.

```
ENVIRON "PATH=" +
ENVIRON$( "PATH" ) + ";C:\UTILITY"
```

Try using these commands in your own programs and see how much you can do with them. Remember that you'll need line numbers if you're using BASICA or GW-BASIC.

Making the most of your PC's environment is an important step in becoming a true power user. As you become more familiar with these environment tools, you'll add to your productivity and use your PC more effectively. For more information on any of these topics, check your DOS or BASIC language manual. □