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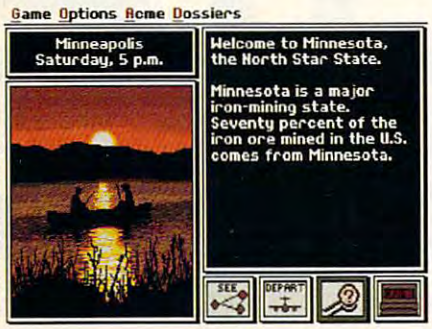

"Carmen USA" IBM / Tandy VGA screen

"Carmen Time" IBM / Tandy VGA screen

Carmen and her crafty cohorts will lead you on a merry chase.

Help!

The notorious Carmen Sandiego is on the loose. She and her gang are swiping precious landmarks and treasures all over the map. They're filching everything from the Mona Lisa's smile to the Statue of Liberty's torch.

Squads of ace detectives are already in hot pursuit: intrepid investigators like those pictured here. But Carmen's not easy to nab. She's a very furtive fugitive.

So there's plenty of challenging excitement waiting for you.

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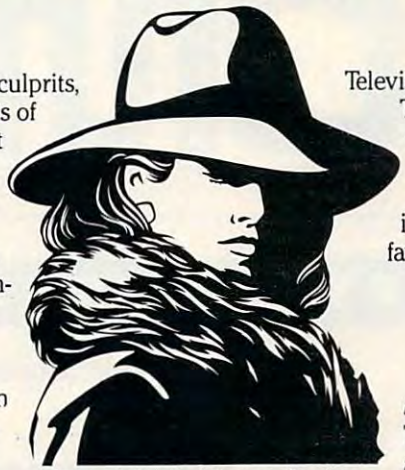
The Acme Detective Agency will quickly assign you to a case. Then get ready for a whirlwind chase.

Start at the scene of the crime, questioning witnesses. To help you decipher the clues you uncover, each game comes with a reference book packed with information about the cities and countries you'll need to visit.

Tracking down the culprits, you'll pick up all kinds of fascinating facts about geography, history and other important topics. At the same time, you'll strengthen your deductive reasoning skills as you sort through the clues.

Collar the right rascal and you'll be on your way to a promotion. . . and new and tougher cases.



Interpol sketch of Carmen Sandiego.

Listen to this eyewitness testimony:

"I've loved Carmen from the very beginning! My 16-year-old son and 13-year-old daughter, and even the neighbors, love to play, too. My kids are always trying to catch up with me! (But they never will!)" — Karen Drellich

"It's a great trivia game. I've always liked history and geography. But even so, I keep running into things I've forgotten—or never knew." — Wayne Bulette

"It's a funner way to learn geography," reports 10-year-old Detective Christina Brassey. Eighth-grade sleuth Josh Pedroli agrees. So do reviewers:

"Carmen is a smash hit," reports *Newsweek.*

"If kids get addicted to a game, it would be nice if it was one like Where in the World is Carmen Sandiego?," says Peggy Charren, President of Action Television, in *TV Guide.*

The Carmen Series has won a dossier full of awards. To learn why, conduct your own investigation at your favorite software store.

Four ways to start chasing Carmen's gang:

Where in the World is Carmen Sandiego?® Travel to exciting cities around the world, from Budapest to Bangkok. Includes *The World Almanac®.*

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"Carmen is a smash hit," reports *Newsweek.*

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Carmen Sandiego programs are available for most popular home computers at suggested retail prices from $34.95 to $49.95. Carmen *World, USA* and *Time* support Ad Lib,® Sound Blaster,™ and Tandy 3-Voice & Digital Sound.® Now available for IBM 640K hi-res VGA: *Where in the World is Carmen Sandiego? Deluxe Edition* $79.95 suggested retail. More villains, more clues, more FUN!

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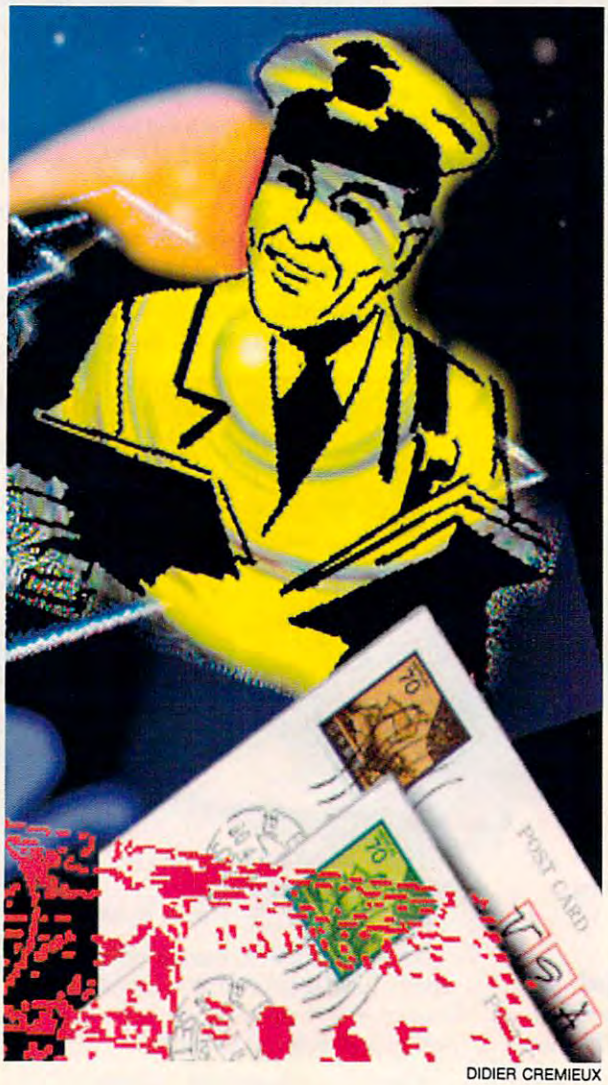

DIDIER CREMIEUX

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Mail-Order Maze G-4
MICKEY McLEAN
Learn your way through the mail-order maze. Shopping by mail can be convenient and economical, but check out these tips before you buy.

A Teacher's Game Machine G-8
DOROTHY HEMME
While some may call what she does with her computer work, this schoolteacher says it's fun to put her 64 to the test.

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FACE IT. IT'S POSITIVELY ADDICTING.

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"To rotate Shakespeare's nose or not to rotate Shakespeare's nose, that is the question."

Make like a mad scientist...build your own Frankenstein.

Discover the shape of things to come in the world of science.

Recreate the great masterpieces, and the great masters—from American Gothic to Vincent Van Gogh.

And picture this if you will—Joan of Arc's nose on Napoleon's mouth. What a combination!

Rack up the score by making perfect or mixed faces, but remember there are no points for "double chins" in this game! For an unparalleled, fun time, play FACES in the head-to-head mode. When you create a perfect face, your opponent gets a stack of face pieces dumped onto his screen. It's funny, it's obsessive, and you'll keep coming back for more of this soon-to-be-unforgettable FACES from the Soviet Union!

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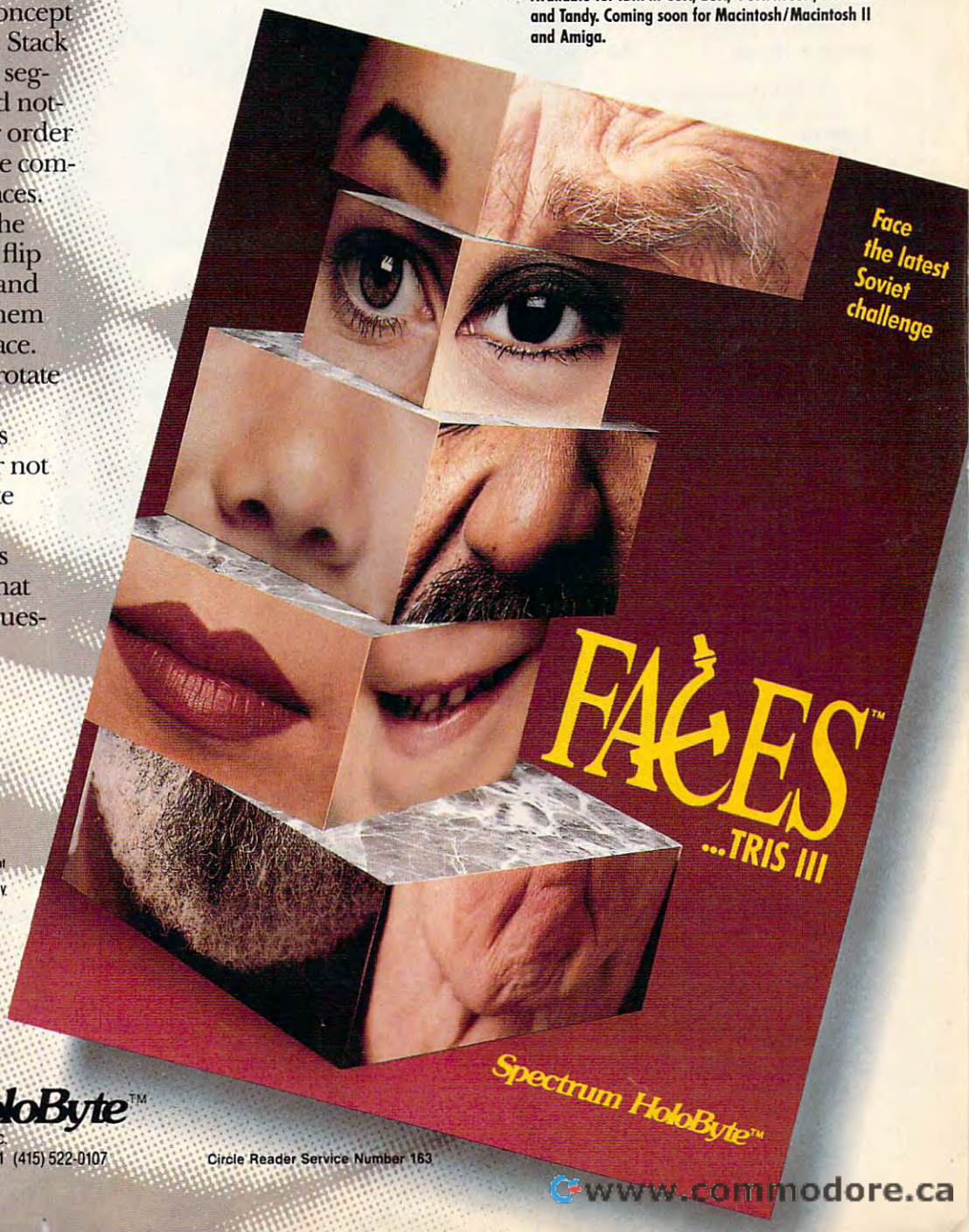

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ON THE COVER

Laurence Gartel has been creating computer-generated images since 1980. His work has appeared in the *New York Times*, *Newsday*, and *Madison Avenue*; and one of his drawings hangs in the Museum of Modern Art.

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PETER SCISCO

Revolutions change, or they die. The last decade has brought many changes to the home computing revolution, some of them subtle, some dramatic. Once fueled by the early adopters of personal computer technology, the movement is now signaled by the increased power of home computers and a growing network of support services and electronic communication. The computer's potential is no longer limited to financial managers, propeller heads, game players, math prodigies, and electronic hobbyists but is open to as many as 40 million American households.

What makes 1990 different from 1980? Why are consumers more likely to buy a home computer now, rather than ten, or five, or even two years past? The answers lie in a multitude of circumstances.

At the start of the nineties, several trends suggest a new wave of computer buyers are poised to enter the home computer market. First, after a decade of exposure to computers in schools, at work, and at home in the form of other consumer electronics items (microwaves, VCRs, automobiles, ATMs), the public is more accepting of microchip technology. Computers no longer carry the asocial, or even antisocial, connotations that stereotyped users ten years ago. An entire generation of school kids has grown up with computer technology (at least in those schools that can afford it). Parents work with PCs every day. Videogames and media coverage make computing less foreign to our lives.

Second, personal computer technology, honed by a decade of business use, is sophisticated enough to be accessible to the everyday consumer. The paradox of home computing lies here: Computers had to become powerful enough to run the sophisticated software that makes the machine simple enough for consumers to use.

Third, a wide range of support services has developed—most notably electronic information services and user groups—that gives consumers a compelling reason to buy a computer and a resource for handling problems. Services like Prodigy, CompuServe, GEnie, and America Online offer consumers what videotext never could: an easy way to shop, access information, and communicate with others who share similar interests.

IBM's PS/1, Laser Computer's P.A.L. 286, Tandy's 1000 RL, Commodore's Amiga 500C, and Apple's planned low-cost Macintosh all reflect these changes in the home computer landscape. Software like GEOS, *DeskMate,* and *Windows,* and interfaces like the PS/1 quadrant, mirror the consumer's need for something beyond the cryptic commands that once guided computer use.

In the late 1980s, Nintendo proved that if you brought out a computer (the NES is a computer) that is inexpensive, is easy to operate, and has a well-defined purpose, you could sell millions. In relative terms, the new wave of home computers on store shelves today is a result of that influence. Although much more powerful and versatile than any videogame system, these new computers incorporate ease of use, value, and targeted functionality on a much larger scale than ever before.

Home computers have finally crossed the four thresholds necessary to becoming a mass consumer item. The technology is stable (remember the Beta/VHS wars?); applications are readily available (remember black-and-white TV broadcasts on your color set?); prices have declined (remember $5,000 for an AT-compatible?); and the PC is available at mass-merchandise outlets (remember stereo specialty shops?). Everything is in place for huge growth in home computer use.

No revolution lasts without renewal. Even *COMPUTE*, though remaining the voice of home computing, is not immune to change—as you have no doubt noticed. The fire that ignited a small cadre of computer users ten years ago may now light the way toward a global community sharing the information and insight of generations. That would be a brave new world for all of us. ⊡

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LETTERS

Which Road to Sturgis?

I am a subscriber to your magazine and enjoyed your review of *Harley Davidson: The Road to Sturgis* in the May 1990 issue. I bought the program when it was introduced last November and have traveled the road to Sturgis quite frequently since.

This year we are celebrating the 50th anniversary of the Black Hills Motor Classic and expect an even bigger crowd than usual. We appreciate the mention of our event in your magazine. However, for the record, Sturgis is located in South Dakota, not North Dakota. Since you are based in North Carolina, I'm sure you can appreciate the difference.

BRUCE A. HUBBARD
PRESIDENT, BLACK HILLS MOTOR CLASSIC BOARD
STURGIS, SD

Yes, we certainly can. You can be sure we'll be studying our PC Globe *more closely from now on.*

AUTOCON Update

Thank you for including my program *AUTOCON* on your June *SharePak* disk. On page 37, however, the *AUTOCON* and *Solve It* captions got switched.

The version of *AUTOCON* included on the disk (1.3) is not the latest version of the program. The new version (1.3a) has a couple of bug fixes and several enhancements involving the update and display configurations.

I have moved since version 1.3 was issued. The new address for registrations is P.O. Box 2639, Weaversville, California 96093-2639.

LARRY WEAVER
WEAVERVILLE, CA

Food for Thought

I was shocked to find in your May 1990 issue photographs that show food and drink near a computer. I have tried to teach my students that food, drink, and computers do not go together, especially when the former is spilled upon the latter. Please be careful with the photographs. They can inadvertently send the wrong message to your readers.

COMPUTE continues to supply me with information which helps me keep up with the latest trends in computing.

TERRY ROSS LACHMAN
BRONX, NY

You're absolutely right. Even hackers, whose environment we attempted to depict in the photos, should suppress the epicurean urge to eat and drink while making merry with their favorite game, spreadsheet, or assembler. All it takes is one overturned cup of coffee or soft drink to ruin a keyboard and bring your computing to an abrupt halt.

Booting B:

I've been considering purchasing *Red Storm Rising,* the submarine simulator and the 1990 COMPUTE! Choice Award winner. Unfortunately, according to Microprose, the manufacturer, "Drive A must be a 5¼-inch drive." Drive A on my Tandy 1000 TX is a 3½-inch drive, and drive B is a 5¼-inch drive. I thought I might try the "PC Primer" suggestion in the December 1989 issue to swap drives, but Microprose uses key-disk copy protection on this game. What can be done?

CHRISTOPHER J. DUNN
GAINESVILLE, FL

As an owner of a Tandy 1000 TX, you have an easy solution to your problem. Use the setup program that comes with your TX. Other PC or compatible owners who want to boot from the B drive can use a program called B:Boot! *($19.90 + $2.00 S&H) from YWSoft, P.O. Box 2231, Bloomington, Indiana 47402, (812) 857-4772.*

Logo Recursion

I would like to respond to some of the comments in the February COMPUTE! Choice (p. 76) by Richard C. Leinecker. I was pleased to find such a positive review of *LogoWriter.*

continued on page 56

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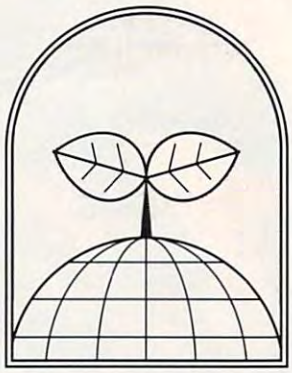
NEWS & NOTES

CLEAN IT UP

With Earth Day still in memory, the environment is on everybody's mind. "The increasing volume of landfill waste is becoming a major environmental issue worldwide," said Hideharu Takemoto, president of Canon U.S.A. The printer and copier maker hopes to combat that problem with its Clean Earth Campaign, designed to recycle used toner cartridges. Using a Canon-supplied kit, users return their cartridge at Canon's expense. Rather than refill the cartridge, Canon will recycle the materials to make new ones. The campaign begins in several Western states and will expand to other states by early 1991.
MIKE HUDNALL



Canon's cartridge recycling program is designed to conserve our environment.

TWO—TWO—TWO COMPUTERS IN ONE

It's a PC! It's a Nintendo! It's both!

Taking the adage "If you can't beat 'em, join 'em" to its most extreme, Duo Computers announced in June a combination computer/Nintendo machine that can be plugged into a television set.

Scheduled for a fall release, the DUO FC and DUO FC Plus, currently awaiting FCC approval, contain standard MS-DOS hardware along with standard NES videogame systems. Users can switch back and forth between the machines at the touch of a switch. Since the NES contains its own processor, the two systems can even operate simultaneously.

The DUO FC (Family Computer), a PC compatible, is expected to sell for $999 and be bundled with a variety of entertainment software, much of it from Capstone, Duo's sister company. The FC Plus, with a suggested retail price of $1,899, is an AT compatible with a 20-megabyte hard card. It will include over $400 worth of software.

Nintendo did not participate in the development of the FC. Duo Computers purchased its Nintendo systems on the open market and built them into the FC chassis.
KEITH FERRELL

HUNT HERE FOR HINTS

It's 10 o'clock on a Sunday night, and you can't get the Babel Fish in Infocom's *Hitchhiker's Guide to the Galaxy*. The local software store is closed, so you can't go out and buy a hint book. It's a good thing you've got the Universal Hint System (UHS).

UHS is a set of shareware and public domain programs that lets you share adventure-game hints with other computer users. You search for the mystery currently puzzling you by using the UHS Reader program. Use an onscreen invisible pen to "uncover" a number of hints, ranging from vague allusions to dead giveaways. The UHS Writer lets you create your own hint files to share with others.

You can download UHS programs and hint files from the Gamer's Forum on CompuServe and Scorpia's Games Roundtable on GEnie. UHS is available for the Amiga, Apple II, Atari 8-bit and ST, Color Computer 3, and IBM PC and compatibles. Versions are in the works for the Commodore 64 and Macintosh, as well as an online version for use with BBS software.
DENNY ATKIN

PC SOS

How often have you been frustrated by software or hardware questions? Customer support is often elusive and, if you're runnning a home office, time can be crucial. Answers to your computer problems are now an 800 number away with PC HELPLINE, which offers advice for $2 per minute, less if you buy advance time. Just call (800) 366-8125.
MIKE HUDNALL

PC Helpline

continued on page 12

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Order **New Math Blaster Plus** by December 15, 1990 and get $20 off an AdLib sound card!
AND
Take $5 off any other program mentioned in this ad!

Supports **SOUND BLASTER**

Get a Blast Out of Math!

Countdown sequence initiated 10, 9, 8, 7 . . . **New Math Blaster Plus** is on the launch pad and ready to blast off with a payload of cosmic new activities, graphics and sound effects. The Blasternaut and his robot pal Spot are waiting for you to climb on board. Join them on a space odyssey to develop basic math and problem-solving skills. Strap yourself in for a journey through four galactic activities that will rocket your math scores out of the stratosphere!

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Math Blaster Mystery
Ages 10 and up
Math problem-solving
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Ages 12 and up
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YES! I want my kids to get a blast out of math. Please rush me the program(s) checked below **TODAY**, and take $5 off each program (except **New Math Blaster Plus**).

❑ **New Math Blaster Plus!** $49.95 (MS-DOS) $59.95 (Mac: Available Winter 1990)
❑ **Math and Me** $29.95 (MS-DOS)
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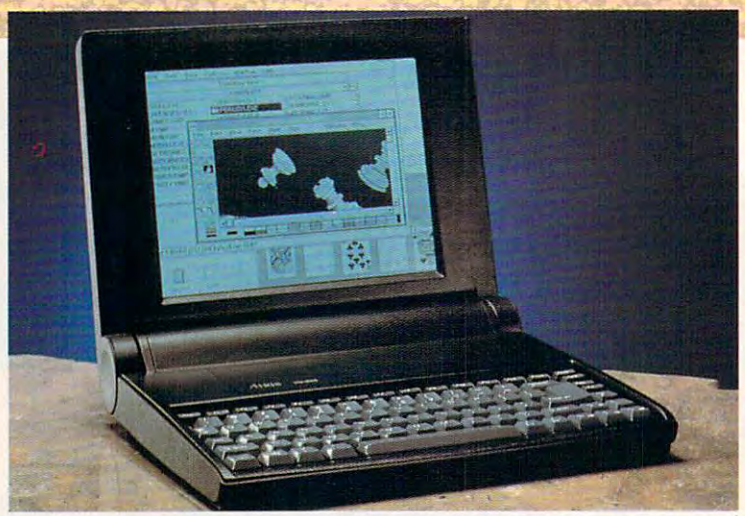
TAKE TO THE AIRIS



The Airis notebook computer, with a price tag below $1,900, puts leading-edge portable power within reach of consumers.

Some of the biggest crowds at this summer's PC Expo in New York were found gathered around one of the show's smallest—or at least newest—companies. Attracting all the attention was a notebook with a difference from Airis Computer.

The Airis VH-286 weighs in at 6½ pounds and boasts a 12.5-MHz speed. It's designed to run for 12 hours on ten standard C-size alkaline batteries; a rechargable battery pack offering 6–8 hours of operation is also available.

Standard features of the Airis include 2 megabytes of RAM, a 20-megabyte hard disk, a 2400-baud Hayes-compatible modem, auto-resume after shutdown, and a two-year parts-and-labor warranty. The notebook's screen is an 11-inch (diagonal) backlit LCD with VGA support.

Airis plans to sell the notebook computer direct beginning this fall.

KEITH FERRELL

OLD LAMP GETS NEW SHINE

GE Information Services announced September 1 a new pricing policy for its GEnie online service. Beginning October 1, 1990, a flat fee of $4.95 per month will grant users access to a host of electronic services. Those services include the GEnie Mall, Grolier's Encyclopedia, professional and leisure bulletin board areas, GEnie mail, all single-player games, news, closing stock quotes, and others.

Neil Harris, manager of product marketing at GE Information Services, said the new pricing structure reflected the wishes of GEnie subscribers. It also can be seen as a competitive move against Prodigy, which carries a flat rate of $9.95 per month.

Also new is the $6/hour fee for all modem speeds from 300 to 2400 baud during non-prime-time hours; the $18/hour prime-time rate remains in effect. To attract new users, GEnie will drop its $29.95 sign-up fee beginning October 1.

PETER SCISCO

PARLEZ VOUS FUNNY FUNNY?

Their lionization of Jerry Lewis notwithstanding, the French are making technological comic inroads with the Digital Cartoon Station. Designed to work with a 386-based PC, the system assists all aspects of cartoon animation, from initial sketches to final film or video output.

The Cartoon Station consists of a graphics tablet, a 16-million-color graphics card, a control board, and a special monitor. The system can create intermediate animated steps between drawings or work from a series of drawings to smooth out movements.

Pepe LePew may never look the same again.

PETER SCISCO

continued on page 57

XCOM's Digital Cartoon Station gets down to funny business.

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You've Been Framed!

Agent Frank McBain is dead...but why did they pin it on you? You've just 96 hours to find out...crack an international spy ring...and prevent an ***INTERNATIONAL DISASTER.***

You're American agent Mason Powers and you've just intercepted an ultra secret message about an international terrorist group. Just as you're about to brief CIA Section Chief, Frank McBain, everything goes black...and you wake up in a remote prison hospital in Turkey...with no memory of what happened and charged with the murder of Frank McBain!

A MOTION GRAPHICS™* Interactive Movie of Espionage and Intrigue

Who set you up? Who is trying to kill you? And why do you feel such *intense urgency*? The *Countdown* has begun...and you'd better find the answers fast.

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But can you complete your mission in time to avoid *global disaster*?

Motion Graphics*

Countdown is brought to you by *Access Software...the same madmen who brought you* Mean Streets. You'll experience *movie-quality Motion Graphics* action...with 256-color screens that bring new meaning to VGA. Add *RealSound* ™ high-quality digitized sound effects and you've got an interactive movie that will involve you totally...mind, body and soul.

Start the *Countdown*...and live the *ultimate* interactive movie.

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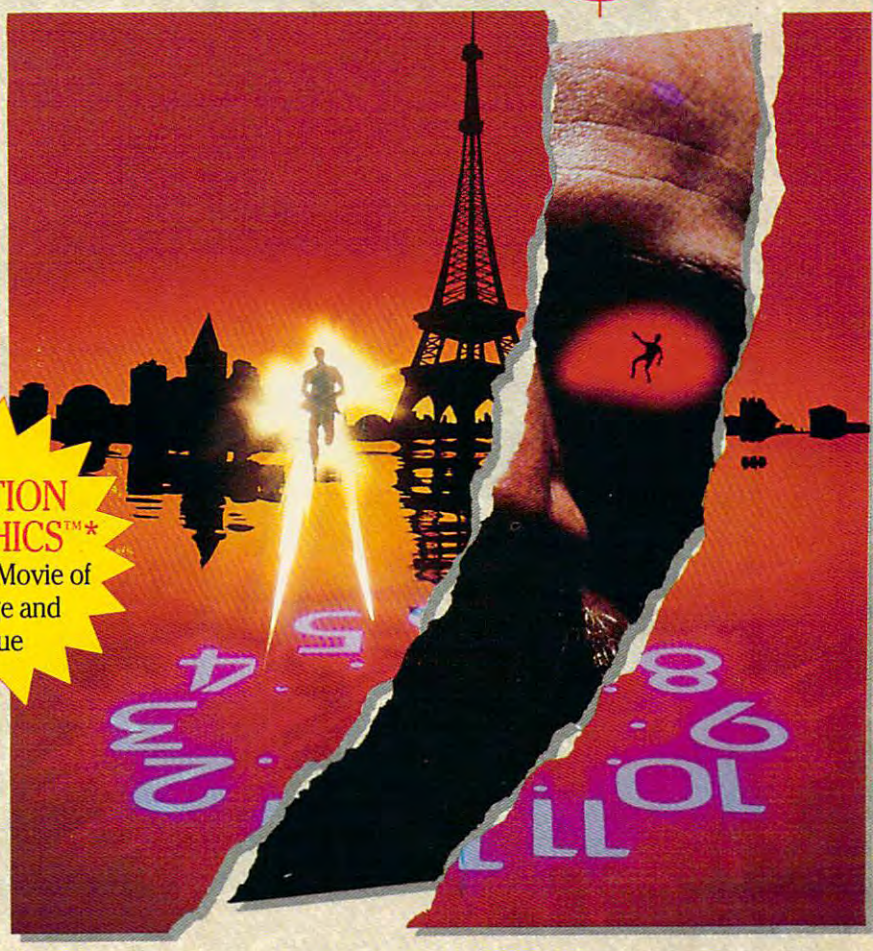

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*So Realistic, you'll think you're *there*

Countdown features breathtaking *Motion Graphics*...combining stunning *256-color* movie-quality graphics with *Real Sound*™, the revolutionary technology that gives you astonishing digitized sound effects, music and speech *without hardware. Countdown* also supports the major sound boards.

Actual 256-Color VGA Screens

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☐ YES! I want to *clear my name* and prevent a *Global Disaster* ... with the breathtaking reality of *Motion Graphics* 256-color graphics and digitized sound effects. Please rush me my copy of *Countdown. Satisfaction Guaranteed.*

☐ 5 1/4-inch Disk ☐ 3 1/2-inch Disk
☐ I've enclosed $59.95 as payment in full.
☐ Charge this order to my:
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MARK WAGONER © 1990

A FAMILY *Affair*

KEITH FERRELL

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The vacation house was called *Salubrious View,* and its vistas of tidal creeks and marshes certainly proved restful and restorative.

But during the course of a week's vacation at the North Carolina coast, one view that continually drew the attention of some members of the family was a bit more technical.

There was an IBM PS/1 in the house.

Heating Up the Home Market

IBM's sleek new machine—its base measures less than 11 inches wide and 13.8 inches deep, and it's only 3.3 inches high—along with its powerful combination of hardware, software, and telecommunications, says a lot about Big Blue's renewed commitment to home computing. It also highlights the consumer's perception of the benefits and dilemmas of home computers.

Above all, IBM's homecoming returns home computing to the forefront of the industry's attention. While Tandy and Laser (see the sidebar on page 18), among others, have continued to address home needs with their machines, IBM and Apple have all but ignored the domestic side of computing since the early to mid-eighties.

But 1990 may be remembered as the year all that changed. Apple is expected to announce a home-aimed Macintosh this month. By now, the PS/1 should be available throughout the country from retailers such as Sears.

With more fanfare and excitement than at any other time in the past five years, the computer is coming home again. And there's every indication that, at last, consumers who have resisted computers will be opening their doors to a new generation of machines.

IBM INTRODUCES THE PS/1, AND COMPUTE INTRODUCES SOME NEWCOMERS TO IBM

Big Blue House Call

IBM last made a house call in 1984 with the ill-fated PCjr, universally criticized for being underpowered and insufficiently expandable. After canceling the PCjr in 1985, IBM focused its attention on the business and corporate fronts.

But there remained at IBM a sense of unfinished business.

About two years ago, a small development group set up shop in IBM's Lexington, Kentucky, plant. Its mission: Design the machine that would lead IBM back to the home market in triumph.

To hear members of this essentially entrepreneurial team talk, consumers themselves designed the computer.

The PS/1's specifications were derived from long hours of focus-group conversation with thousands of consumers. Again and again IBM asked what features were most wanted, which aspects of the computer were least important and which were most essential, what applications were most likely to be used. The answers—ease-of-use, power, expandability, value—played a large part in the PS/1's design.

Equally important, the PS/1 team set some specific market goals for the new machine. It organized the target market around a school metaphor by rating consumers' computer experience on levels from freshman to postgraduate. Freshmen, for example, possess little familiarity with computers; sophomores might have some computer experience from work or school; seniors know a lot about computers; and so on. Freshmen and sophomores comprise the core of IBM's target group.

It's a large target. Depending on whose estimates you listen to, personal computers have reached somewhere between 15 and 25 percent of American homes. That leaves an enormous number of families as yet untapped by the computer industry.

Underlying all of IBM's research was a basic question: Why, considering the increases in performance relative to the decline in computer prices, has the PC failed to become a common home electronic appliance?

The answers—computers are too hard to use, the benefits of using a computer are too nebulous, it's too hard to buy a computer—also helped to shape the PS/1's design and marketing.

Home at Heart

The heart of the PS/1 is a 10-MHz 80286 processor. There are faster and more powerful CPUs on the market, but the 286 offers certain advantages. For one, the chip is plentiful and inexpensive. For another, the 286 serves well as a home information, education, and entertainment machine. Even Microsoft CEO Bill Gates has expressed faith in the 286's viability as a consumer and multimedia platform.

If the 286 is a solid but unspectacular choice, IBM's including a 2400-baud Hayes-compatible modem with each PS/1 is a much more stiking decision. According to IBM's focus group conversations, telecommunications holds great interest for home consumers.

Home Without Walls

Telecommunications has for some time been computing's great unrealized promise. Even experienced computer users to some extent have avoided the wealth of services and products available through their modems because of the difficulties involved in using telecommunications software.

IBM hopes to remedy that situation. The PC can be a doorway to enhanced productivity, electronic education, interactive entertainment—a doorway to the world.

There are other reasons that IBM is providing a modem with the PS/1. Big Blue and Sears are partners in Prodigy, a consumer-oriented telecommunications service that offers information, shopping, and other activities in a graphics-oriented format. With 400,000 subscribers, Prodigy is hardly a failure. But it has taken some heat from industry media for it's simple approach and slow response times.

On the other hand, Prodigy's friendly design encourages telecommunication novices to explore the world of electronic information. The free three-month subscription to Prodigy that comes with every PS/1 doesn't hurt, either. IBM and Sears are betting that after those first 90 days, consumers will renew their Prodigy memberships.

IBM is also gambling that telecommunications will prove easy enough for consumers that they will use the modem when technical support is required. A User's Club, with membership limited to PS/1 owners, offers online an-

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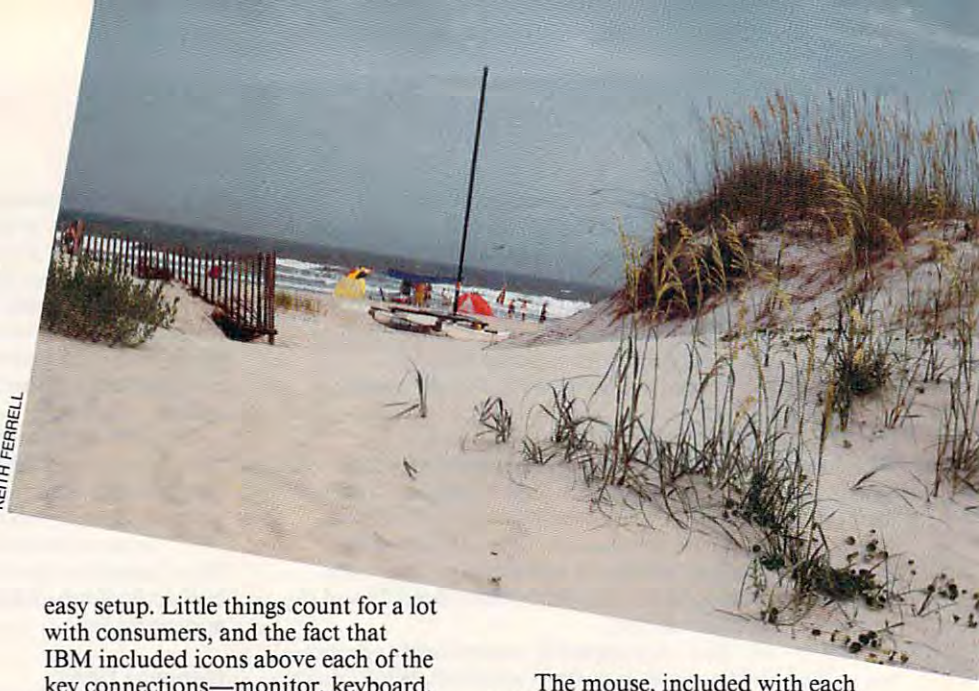
swers to consumers' computing questions. Promenade, a service supported by Quantum Computer Services, providers of PC-Link, will offer computer classes, forums, games, and other online activities this fall.



KEITH FERRELL

All in One Box

Hardware, software, telecommunications—while it looks from the outset that IBM has covered most of the marketing bases necessary to extending the number of computers in American homes, there remains the question of how the inhabitants of those homes will respond.

Fortunately, the PS/1 arrived at COMPUTE at the same time I was due to take some oceanside R & R with family, in-laws, and friends of all ages. The beach house would be filled with computer freshmen and sophomores and even a couple of seniors. No better place, I thought, than to answer that question of audience reaction.

The PS/1 we used was top-of-the-line, with a 30-megabyte hard disk and 256-color VGA monitor. It lists for $1,999.

The fact that the PS/1 arrives in a single box, with monitor, CPU, keyboard, mouse, manuals, and software, proved a big hit with my informal focus group. Considering the amount of power it contains, the box isn't very big. And although you would never mistake the PS/1 as a portable computer, it's compact enough to make it worth taking along on an extended trip. We were able to fit it comfortably into the back of our station wagon amid the suitcases, cartons of linens, fishing rods, telescope, guitars, and other vacation gear. The compact size also makes the computer a good choice for college students: It will fit nicely on a dormitory desk.

It's a Setup

Our first subjects, both attorneys, both in their 40s, had some computer experience. I'd rate them as sophomores. In fact, they have an old PC-compatible computer in their home, but it's seldom used and has prompted more than a little frustration.

Confronted with the PS/1's one-box packaging, they expressed a bit of initial skepticism that the machine was complete. Accustomed to the boat-anchor approach of big desktop machines, the size of the computer inspired some questions; *What's been left out?* was the most common.

One of the attorneys was particularly impressed with the machine's easy setup. Little things count for a lot with consumers, and the fact that IBM included icons above each of the key connections—monitor, keyboard, mouse, printer—proved one of those valuable little extras. The computer was up and running barely ten minutes after we had opened the box.

Other computer novices to whom we showed the PS/1 likewise had little trouble in setting up the machine. It took the members in our group an average of 15 minutes to go from opening the box to turning on the computer.

During one setup, however, a member of our group plugged the keyboard and mouse into the wrong ports. The resulting error message was unintelligible even to our seniors and should be made clearer for new computer users.

Screened for Consumers

The biggest surprise, though, arrives after the computer is turned on. Instead of the familiar and, to most freshmen, frightening DOS prompt, there's a bright, easy-to-understand screen divided into self-explanatory quadrants: Information (telecommunications services and tutorials), *Microsoft Works* (bundled with every PS/1), Your Software (where you can access programs you add to the machine's retinue), and IBM DOS (a menu-driven DOS shell built around DOS 4.01).

The screen icons are striking in VGA—clear and readable. The Your Software section in particular uses iconic metaphors to good effect. Each directory is presented as a file folder, and within each folder the names of executable files appear onscreen. Click on the program you wish to run, and off you go.

There's some distance to be covered, of course, between booting a computer and using a computer. IBM helps consumers bridge that distance with sophisticated system tutorials accessible by mouse.

The mouse, included with each PS/1, proved a source of some consumer confusion. One IBM executive admitted that his wife, upon her first close encounter of the mouse kind, picked up the device and pointed it at the screen, just as she would a remote control unit.

Our experience at the coast was not dissimilar. My mother-in-law was baffled when I told her to use the mouse to pick the onscreen activity she wanted to pursue. Assume nothing, I reminded myself; then I showed her what the mouse was and how to use it.

Ten minutes later, after exploring some of the system tutorials, her baffled look had disappeared and was replaced by something like delight. "I feel like I've learned something already," she said.

And she had.

Hardware, Hard Facts

None of our freshmen seemed overly concerned about what many industry watchers consider IBM's most controversial configuration decision: The PS/1 has no standard internal slots.

That isn't to say that expanding the PS/1 wasn't on IBM's mind. Big Blue's focus groups indicated that adding internal boards didn't figure highly among consumers' desires; however, the ability to keep up with technological improvements did. A three-slot expansion unit that snaps onto the bottom of the PS/1 is available for under $200. The same vertical expansion approach—like that used with rack stereo systems—is used with the PS/1's optional 5¼-inch drive.

Whereas opening most PCs is a consumer's nightmare, plunging into the PS/1 is a dream come true. The machine's front cover pops off, and the housing slides away at the touch of

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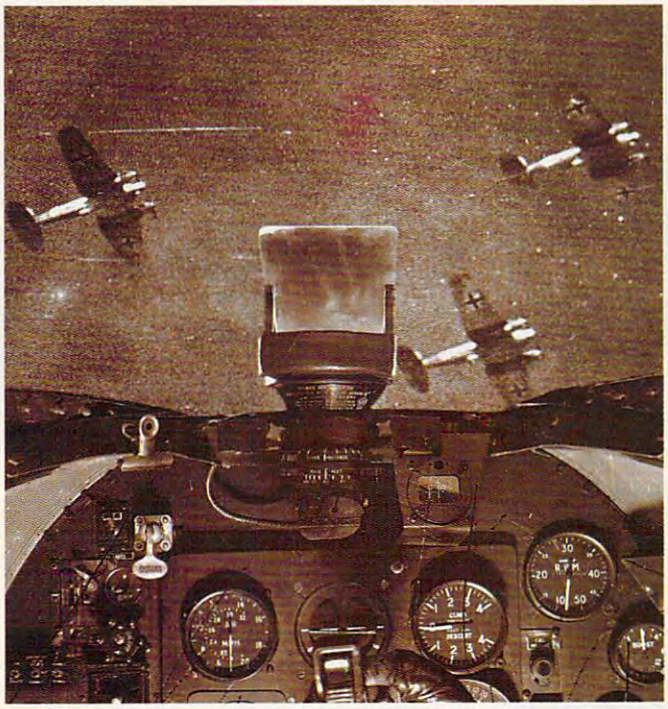

THE BATTLE OF BRITAIN. UP CLOSE AND PERSONAL.

One pilot described a World War II dogfight "like being on the inside of a beehive." And that's just what it feels like to play *Their Finest Hour: The Battle of Britain.*™ The new air combat simulator from Lucasfilm Games that's keeping simulation buffs and action gamers alike on the edge of their seats.

Their Finest Hour includes all the acclaimed features of our *Battlehawks, 1942.* Plus a few new twists.

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From the moment you pull back on the throttle, *Their Finest Hour* grips you with near-photographic realism of aircraft, smoke, terrain, and flying debris. To really get your adrenalin pumping, we've added a cacophony of roaring engines, chattering machine guns, and thundering explosions.

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Replay combat action sequences from any angle, even from the nose of a bomb!

How's That Again?

Want to show your friends how you erased that *Flying Pencil* with fancy deflection shooting? *Their Finest Hour* lets you save your proudest combat performances to disk. And relive them in real time, fast forward, or frame by frame.

Look At Life From Both Sides Now.

Take on the Luftwaffe in a tough little RAF Hurricane or fabled Spitfire. Or test your skills at the controls of the Spitfire's nemesis, the formidable Messerschmitt 109. Pulverize ground installations from your Messerschmitt 110 fighter/bomber or your screaming Stuka. Or fly as pilot, bombardier or gunner in a Junkers 88, Dornier Flying Pencil, or Heinkel Spade.

Your success in each mission impacts the next one: knock out a radar installation today, and you'll breathe easier tomorrow. Who knows—you might even change history. And if you don't like the odds, *Their Finest Hour* lets you change sides.

LUCASFILM™ GAMES

IBM screens shown. Available for IBM (includes AdLib™ sound card support), Amiga, and Atari ST.

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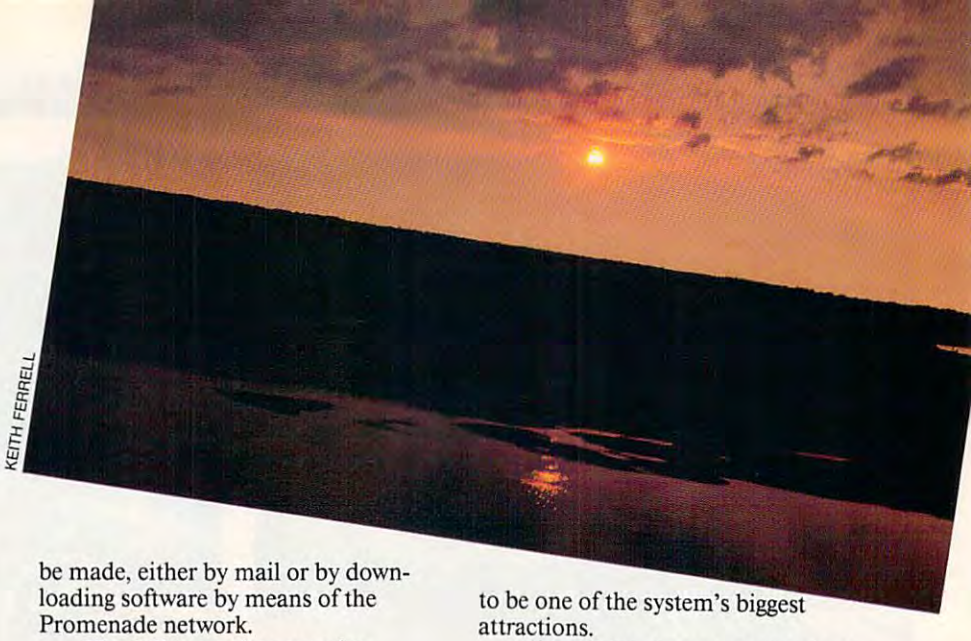

KEITH FERRELL

a finger. Adding memory (the main unit will accomodate up to one megabyte) is as simple as sliding your bank card into an ATM. An optional sound card, with MIDI port, analog joystick port, three-voice sound chip, and digitizing chip, plugs in easily. You need no tools other than your fingers.

The PS/1 Selectric Touch keyboard got mixed reviews. Most of our beach party liked the responsiveness of the keys as well as their distinctive click. One among us, however, found the keyclick distracting. (My brother—an experienced computer user—thought the keys sounded like horseshoe crabs. As to whether that was from exposure to the PS/1 or to the ocean is a point of debate.)

The group universally appreciated IBM's decision to preload software on its hard disk–equipped PS/1 models. I was a bit concerned about the fact that no floppy disk masters of the software came with the machine, but our freshmen insisted they preferred to have the software already loaded and ready to run.

IBM makes it clear in its brief Getting Started manual that one of the first things you should do with your new PS/1 is make disk backups of the software, just as you would with any software you buy. And although there isn't an official policy, IBM representatives said that should a consumer somehow cripple the preloaded software, a replacement or fix could be made, either by mail or by downloading software by means of the Promenade network.

The VGA monitor even impressed my father-in-law, an M.D. who has remained resistant to the computer age. Color VGA clarity may have spoiled him for monochrome terminals.

The PS/1's power supply resides in the monitor housing, contributing to the machine's quiet operation. It also contributes to the machine's small footprint, which was singled out by a couple of our freshmen as the PS/1's most attractive feature.

The 2400-baud modem makes even Prodigy run at an acceptable rate. Using the PS/1 in an office, we logged on to both Prodigy and the User's Club and were impressed with the responsiveness of the system's telecommunications. Consumers in IBM's test markets also find Prodigy to be one of the system's biggest attractions.

The PS/1's documentation is as sleek as the machine itself. Gone are the huge DOS notebook manuals, replaced by a stripped-down paperback volume that only occasionally veers too far into computerspeak. Those members of the group who looked at the manuals didn't seem too intimidated.

It was clear after a few days that the group's consensus on the hardware was favorable. Some of our freshmen had even become, by virtue of tutorials and effort, sophomores. A couple even began to ask questions about buying a computer.

To Market, to Market

IBM is making it as easy as it can for consumers to buy the PS/1 by selling it not only through Big Blue's tradi-

continued on page 22

Tandy and Laser: Ready for IBM

Two companies that already sell home computers offer a wary welcome to IBM on its return to the consumer marketplace.

Tandy, which has been making home computers as long as there have been home computers, has been conducting focus groups and research sessions, gathering its own consumer information. The result is a new home computer with a style all own.

Tandy's 1000 RL is aimed in some ways at people with little or no computer experience. "This is the closest we've come yet to a true appliance computer," says Howard Elias, Tandy's vice president in charge of computer merchandising. The goal of an appliance computer is to provide information tools that are as simple to use as a VCR or microwave oven.

An enhanced version of Tandy's *DeskMate* interface extends the RL's appliancelike feel. The opening screen includes larger icons, stylized representations of household-budgeting tools, memo boards for family members, and kitchen/recipe information. The kitchen, in fact, is the location many of Tandy's focus group subjects chose for their RL.

The enhanced *DeskMate* also benefits from the addition of new functions and databases, ranging from mathematical functions to airline and travel information. All of *DeskMate*'s customary functions are also included.

Physically, the RL itself is slimmer and quieter than most desktop PCs. With a 20MB hard disk, 512K of RAM, and a Tandy color monitor, the RL sells for $1,299.

While Tandy will be marketing its new computer through its Radio Shack stores, Laser Computer is meeting IBM on its own retail turf: Laser's machines are sold by many of the retailers carrying the PS/1. Laser is pleased with the proximity.

"IBM's name and reputation can only help make the public more aware of home computers," said Mike Wagner, Laser's director of marketing.

Wagner notes that Laser already markets a computer in a configuration that competes head-to-head with the PS/1's features. Laser's P.A.L. 286 is an AT-class computer with a 40MB hard disk, 5¼- and 3½-inch floppy disk drives, a VGA monitor, a 2400-baud modem, software, an instructional videotape, and a mouse. The system sells for $1,995. "Realistically, though," Wagner says, "the street price of the P.A.L. 286 is $1,495."

Laser's experience in the home market is a bit different from anyone else's: The company made its name producing Apple II–compatible computers, a line that it continues to sell.

"There's still a good market for Apple-compatible machines," Wagner says. "Parents who are concerned about education still find Apple compatibility an important consideration. Besides, they can get our Apple compatible for $400, including a monitor."

But the future belongs to MS-DOS, and Laser is ready for the future. "If IBM's presence helps the home computer industry grow, we're ready to grow with it," says Wagner. We all may be in for the ride of our lives.

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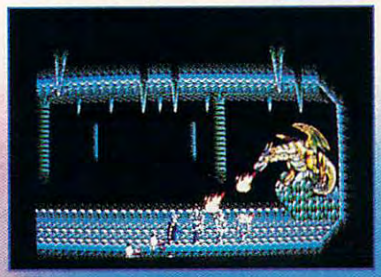

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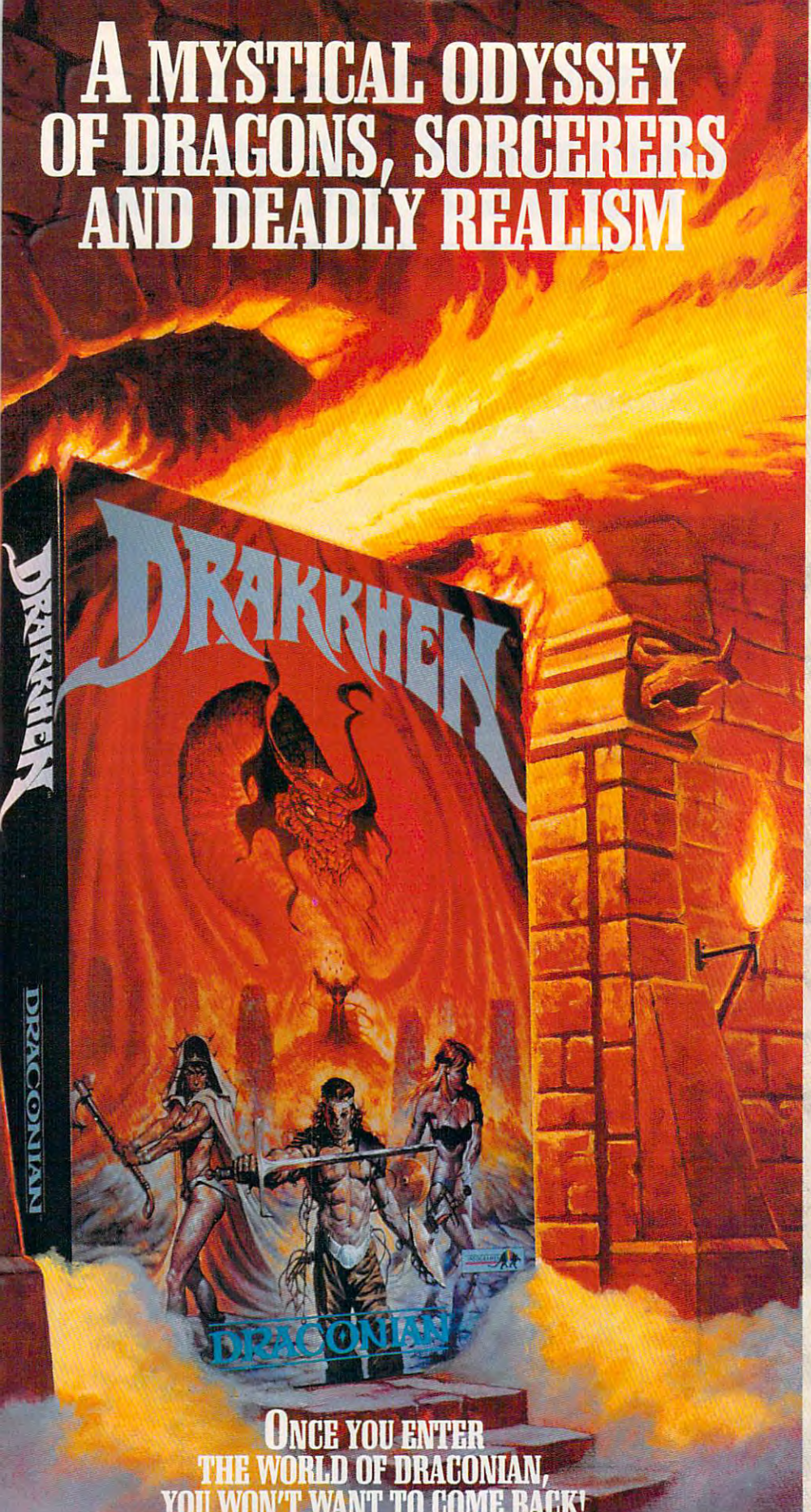

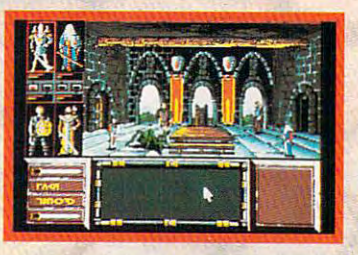

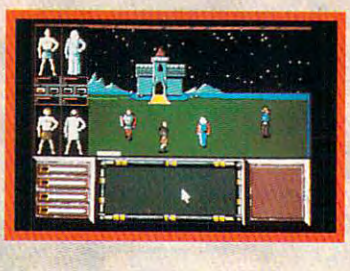

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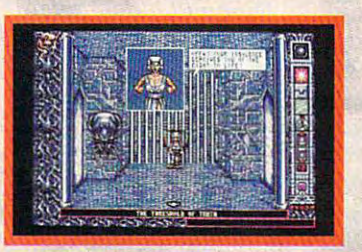

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Set on a distant planet, the *Chamber of the Sci-Mutant Priestess* combines mystic drama and humor with a sophisticated icon interface, so players can easily maneuver through the game's captivating plot.

You play the role of Raven, a Tuner, whose telepathic abilities provide a unique advantage when fighting the enemy—a monstrous race of mutants called Protozorqs.

Command eight sci-powers with "iconomized" ease as you probe the chambers of the mutants temple, searching for your abducted girlfriend while engaging in a brain-draining test of five ordeals.

Animated and colorful, the *Chamber of the Sci-Mutant Priestess* promises hours of challenging intrigue for novice and expert fantasy game players alike. Don't miss out on the first psionic thriller of its kind—from Draconian!

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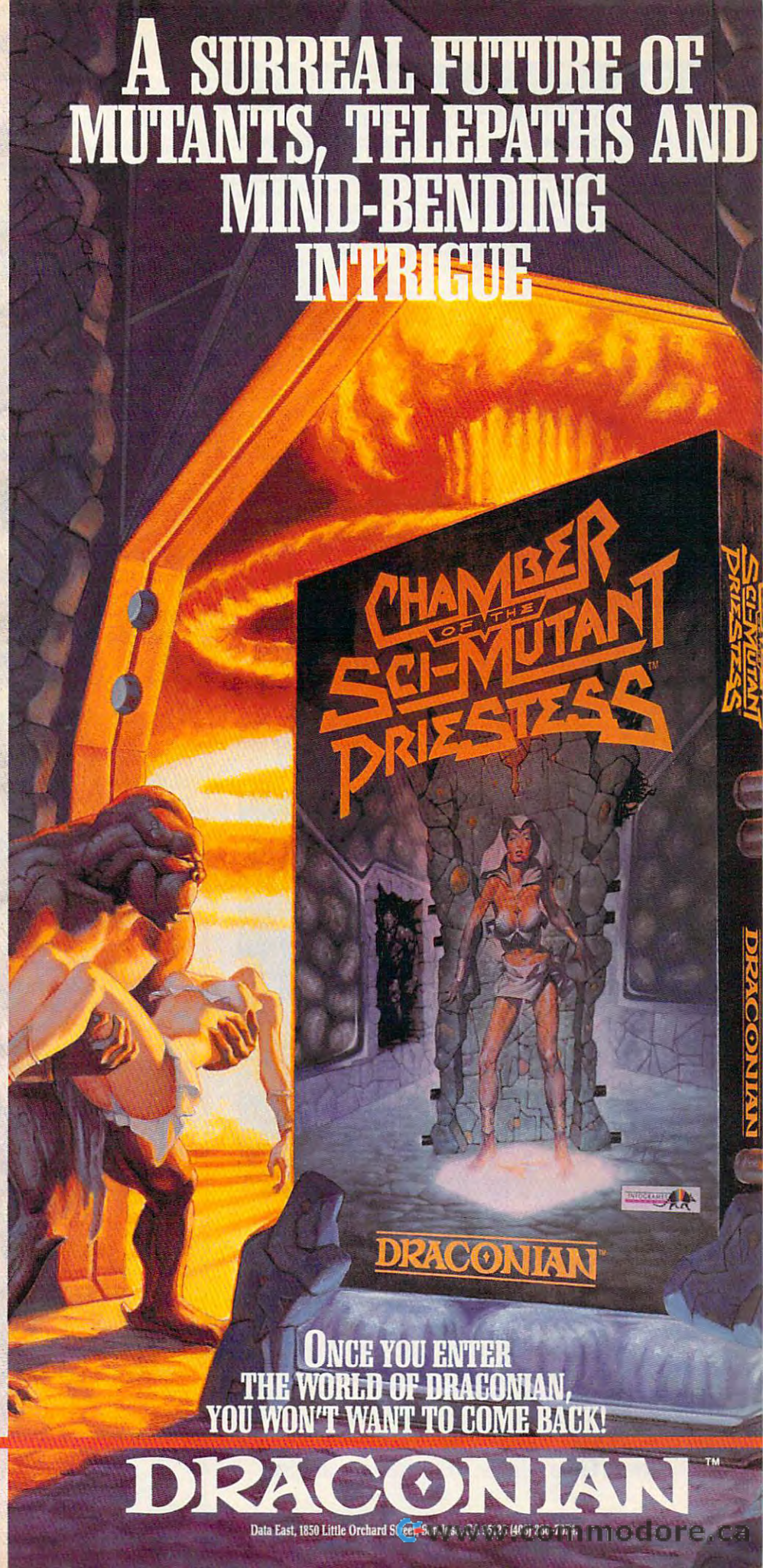

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"She had big brown eyes, the cutest laugh– and leukemia."

"Andrea was in preschool with my son.

"One day they rushed her to the hospital with leukemia. She needed blood urgently, so I went and gave... She's in remission now, but every couple of months I go and give blood.

"Because I know someone else's Andrea may need it."

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continued from page 18

tional network of computer dealers, but also through mass-merchandise retailers including Sears, Dillard's, and Dayton-Hudson. This approach to marketing is the strongest suggestion yet that IBM perceives the computer to be a consumer electronics purchase rather than a product aimed at traditional computer purchasers.

The fact that the PS/1 will be available at Sears caught the entire beach party's attention. (Dillard's and Dayton-Hudson aren't in our hometown.) Consumers who would never enter a computer store are familiar with Sears and even more familiar with the ubiquitous Sears charge card. I witnessed a couple of our freshmen mentally tabulating their current Sears balance. They want a computer and didn't particularly flinch at the PS/1's $1,999 price tag.

That acceptance is one of the keys not only to the PS/1's potential success, but also to the potential success of Tandy's new home computer and to Laser's P.A.L. 286 configuration. These three machines are just the start of a new generation of home computers.

Walls Come Tumbling Down

We've all experienced the frustration of trying to teach—or even show—someone how to use a PC. These computers break down those barriers by eliminating the well-intentioned, but sometimes overzealous and impatient expert. Thanks to the mouse, graphical interface, preloaded software, and sophisticated tutorials, computer freshmen can explore, learn, and acquire computer skills all on their own—which is itself part of the home computer revolution.

That isn't to say that there doesn't remain a learning curve with the PS/1. It's the same with any other sophisticated technology that arrives at home. (Remember when a common complaint was programming the VCR?) Computers are not yet as simple to use as other consumer electronics items, but neither are they as intimidating and complex as they once were. Novices can emerge from their first computing session feeling that they've accomplished something.

IBM's reentry into the home market doesn't automatically ensure the growth of that market, nor does IBM's name alone ensure success. But it does signal that hardware and software manufacturers are finally delivering PCs that are built around consumer literacy, rather than insisting that consumers become computer literate.

IBM's move home also promises a serious reexamination of home computing. The sheer size and marketing muscle of IBM and Sears should generate enough enthusiasm and curiosity to increase the number of consumers at least thinking about adding a home computer to their electronics arena.

If the PS/1 is a big hit, we can expect heated competition to bring us even more powerful home computers at even lower prices. Software developers will have a reason to develop programs that are increasingly easier to use and that yield ever more tangible benefits.

At the PS/1 introduction, IBM vice president Jim Cannavino, attired in a very un-IBM ensemble of sweater, open-necked shirt, and casual slacks, declared the 1990s as "the decade of the home computer."

Certainly the hardware is in place and affordable, the software easier to use and more powerful than ever. It could be that we will see another 15 percent to 20 percent of North American homes adding computers over the next few years. Imagine—computers in almost 40 million homes, people reaching out to make electronic contact with each other, home businesses flourishing, home education expanding, interactive entertainment achieving new heights.

All of it made possible by home computers.

That's a salubrious view indeed. ◻

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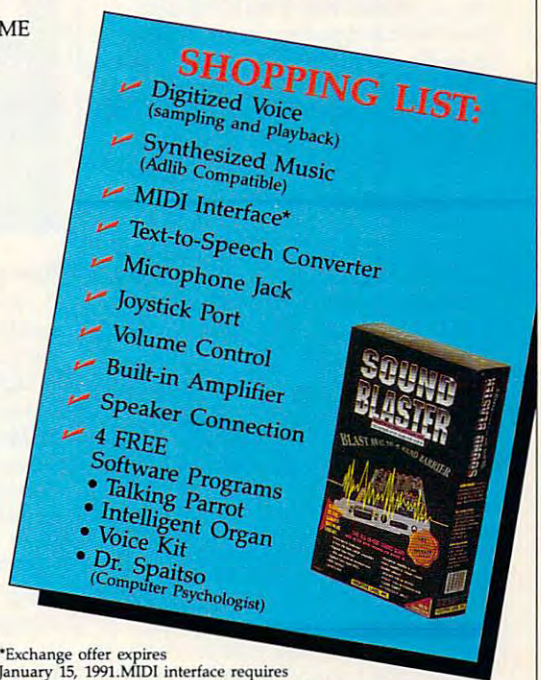

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SHAREPAK

RICHARD C. LEINECKER

Fun and games offer a great way to introduce families to the sometimes intimidating world of computing. Since this month's In Focus theme is family computing, we've filled this month's *SharePak* disk with programs that will provide your family with hours of fun.

We've screened hundreds of programs to bring you this fine collection. For every file on the disk, dozens were carefully evaluated. Had you downloaded the programs yourself and paid the connect charges, you would've paid many times what we charge for this disk. There's no need for you 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.

Amado

Challenge your mind, stimulate your brain, and excercise your intellect with this unique game. Colorful blocks in various patterns appear on the screen, and your job is to match the scrambled board with the computer-selected pattern in the fewest possible moves. You'll have to find one of an infinite number of solutions in order to make the match. Over 100 computer-generated patterns strengthen creativity and build intelligence.

Learning to play isn't hard. Just a few simple rules are involved, and easy-to-use keypresses control the action. But don't count on mastering the strategies quickly—this game is difficult to win despite its easy-to-learn rules and controls.

If you love a cognitive challenge or want to boost your brain power, *Amado* is the perfect game for you. It runs on any computer that has a color monitor.

Captain Comic

You are Captain Comic, galactic hero. Your mission is to recover from the planet Omsoc three treasures that were stolen away and hidden somewhere on the remote planet of Tambi. It won't be easy. You'll need to gather tools to increase your fighting and defensive capability, navigate dangerous terrain, and avoid or destroy a horde of deadly creatures.

And if thrilling gameplay isn't enough, superb and exciting EGA graphics give this game the look of most commercial games. Easily understood instructions and rules will get you going right away.

Don't take the challenge unless adventure courses through your veins. The weak of heart should find something more suitable, perhaps tiddlywinks. But for the courageous, your search with *Captain Comic* will lead to experiences beyond your imagination.

Funny Face

Do you remember sticking Mr. Potato Head pieces into a spud to create imaginative faces? The fun wore off, though, when the potato got old, soft, and smelly. *Funny Face* solves that problem with a computer version of the age-old favorite. Now you can use your computer to design and display your inventions instead of relying on some vagabond vegetable.

Funny Face is a creative form of entertainment. Children don't need strong artistic skills to make animation-style faces. It's as easy as picking a face part and placing it in the picture. There's no penalty for those who don't draw well. Even very young children can create funny faces with just two keys, and adults can have fun, too, making hilarious faces for each other.

Unleash your artistic talent today with this program. Even if you can't draw, you'll dazzle your family and friends with the faces you create—and there's no mess!

Fusion

It's hard to imagine getting hooked on a game in which all you do is catch falling multicolor blocks. After you see *Fusion,* you'll understand why it's so addictive. In it, you connect blocks of the same color to make them disappear.

Each level gets harder since you have to connect even more blocks of the same color to make them vanish. For the first level, you need to connect 3; on level 2, you need 4; and on level 9, you need 11. Strategy is important, and big piles are worth more points than several smaller ones.

There are lots of options. Connections may be horizontal, vertical, or diagonal. There's plenty of variety and interest to keep you going for hours and even days at a time.

Blocks are back in style and *Fusion* is the reason. Don't pass up this opportunity to play one of the most challenging and unique games to date.

Power Poker

Poker is just as popular today as it was a century ago. Although it's largely a game of chance, poker requires careful thought and a knowledge of probability. The variations created by the cards dealt and how you arrange them make the game unpredictable. *Power Poker* adds another dimension. You play on a 5 × 5 grid and try to make the hands that gain the most points. Each card serves two hands, so you have to place the cards carefully.

If you enjoy poker or consider yourself a power player, *Power Poker* is a must-have. And if you don't know the game, now's your chance to learn it. ⊡

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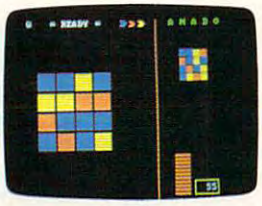
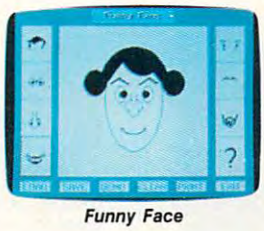


Amado

Captain Comic



Funny Face

Fusion

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CONVERSATIONS

KEITH FERRELL

Ask Emiel Petrone and he'll tell you—it's a question of standards. The international standards that allow audio CDs purchased in Japan to be used with CD players in the United States are essential to the development of an international industry. An international industry is essential for the creation and distribution of first-rate software. And Petrone, senior vice president for sales and distribution for American Interactive Media (AIM), wants to see an international industry grow around the medium of interactive compact discs.

Petrone knows all about standards. A few years ago, he helped establish the hardware standards that boosted Compact Disc Audio into the de facto standard for recorded music. Now, Petrone is involved with the establishment of CD-I, Compact Disc–Interactive, a technology that couples the enormous storage capacity of CDs with the power of the home computer.

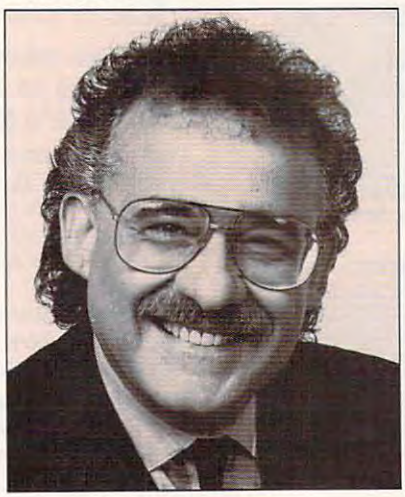
"It's difficult to verbalize a technology that's complex on the inside but simple for the end user," Petrone says. "But our premise was to marry elements that already exist in various technologies, such as compact disc or laser disc, and enhance those further by making them multimedia technologies. What we have is a fully functional multimedia unit that we call a CD-I player."

The player, which exists now only as a prototype, gives consumers the opportunity to interact with high-quality images projected on their televisions. Because compact discs can store hundreds of megabytes of information, the quality of images and sounds is superior to that achieved in most computer software, and far superior to the experience delivered by videogame consoles like Nintendo. CD-I software goes beyond the standard fare found in most of today's computer games.

A CD-I golf game, for example, might consist of digitized photos of an actual course, with spoken commentary about your play.

"Basically," Petrone says, "we're providing titles that are informative, entertaining, and educational." He anticipates AIM releasing as many as 50 CD-I software titles when the player hits the market. "Our programming will cover various genres that will allow people to interact with sophisticated programs without having to be computer knowledgeable."

In short, computer entertainment without the computer. The entire CD-I player design deliberately makes use of a familiar frame of reference. The unit connects to the family television and operates with an infrared remote control.



Emiel Petrone

"Our concept eliminates a lot of the computer lingo," Petrone says. "From a productivity level, that will still remain, of course, for people who wish to compute. But we want to reach the non–computer user, the person who would like the power of the computer, but on an easy-to-use basis."

What sounds like a dream product—several types of consumer electronics rolled into one—is Petrone's aim. "We've combined a compact disc player, a computer, and a laser disc player into one," he says. This is the sort of fusion product that has propelled the Japanese to worldwide leadership in consumer electronics, and the list of companies participating in the development of CD-I hardware reads like a Who's Who of the Pacific Rim: Matsushita, Yamaha, Sony, Pioneer, Sharp, Sanyo, Fujitsu, and Ricoh. Another one of the key players is Dutch giant Philips, making CD-I a global undertaking.

"CD-I is a worldwide standard," Petrone says. "These are the consumer electronics companies that brought you compact disc audio and laser discs." And because CD-I players will be able to play CD audio discs, there's speculation of a CD-I player that will also play laser discs. This multiplicity of function may prove important as the new standard seeks to establish itself.

To become established, of course, CD-I must first get to market and then find buyers. How much can we expect to pay for our CD-I players?

"The key price for any new piece of consumer electronics hardware is $999.99," Petrone says. "That's where the VCR started, and that's where the CD [audio] player started."

Petrone stresses that introductory prices can be misleading. "When you have more than one manufacturer, their competition works to reduce prices based on amortization and volume of sales."

Assuming that CD-I achieves high-volume sales, should PC manufacturers be worried? Is CD-I an alternative to personal computers? Already CD-I is feeling the heat from consumer computer maker Commodore, which showcased its CD-TV interactive multimedia player in June at the Consumer Electronics Show in Chicago. Commodore claims it will have 100 applications for its product when it starts shipping to retailers this fall. But from mainstream computer products, Petrone sees little competition.

"CD-I is not intended to replace or eliminate the PC," Petrone says. "It's not an alternative to the PC. CD-I is a new, revolutionary consumer product." ⊡

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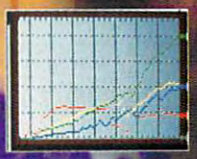

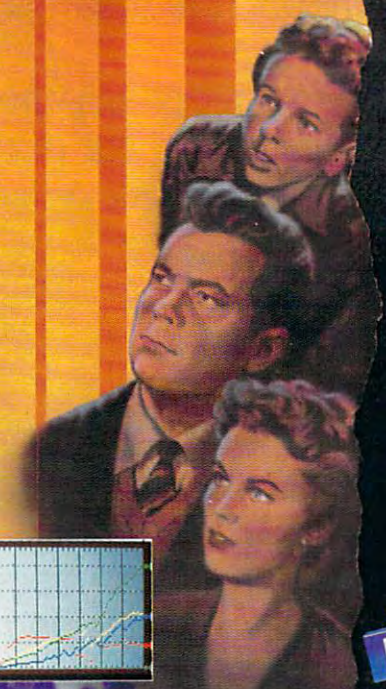

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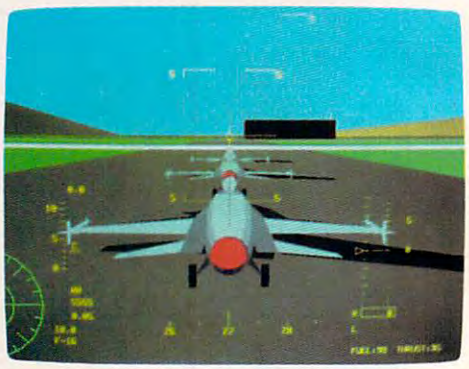

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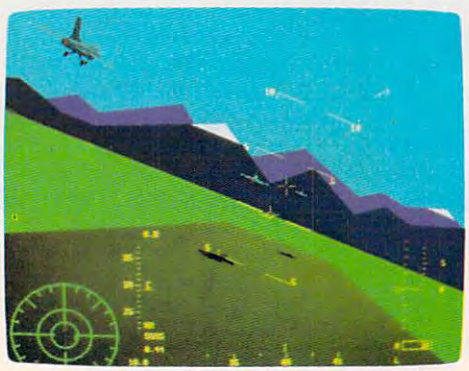

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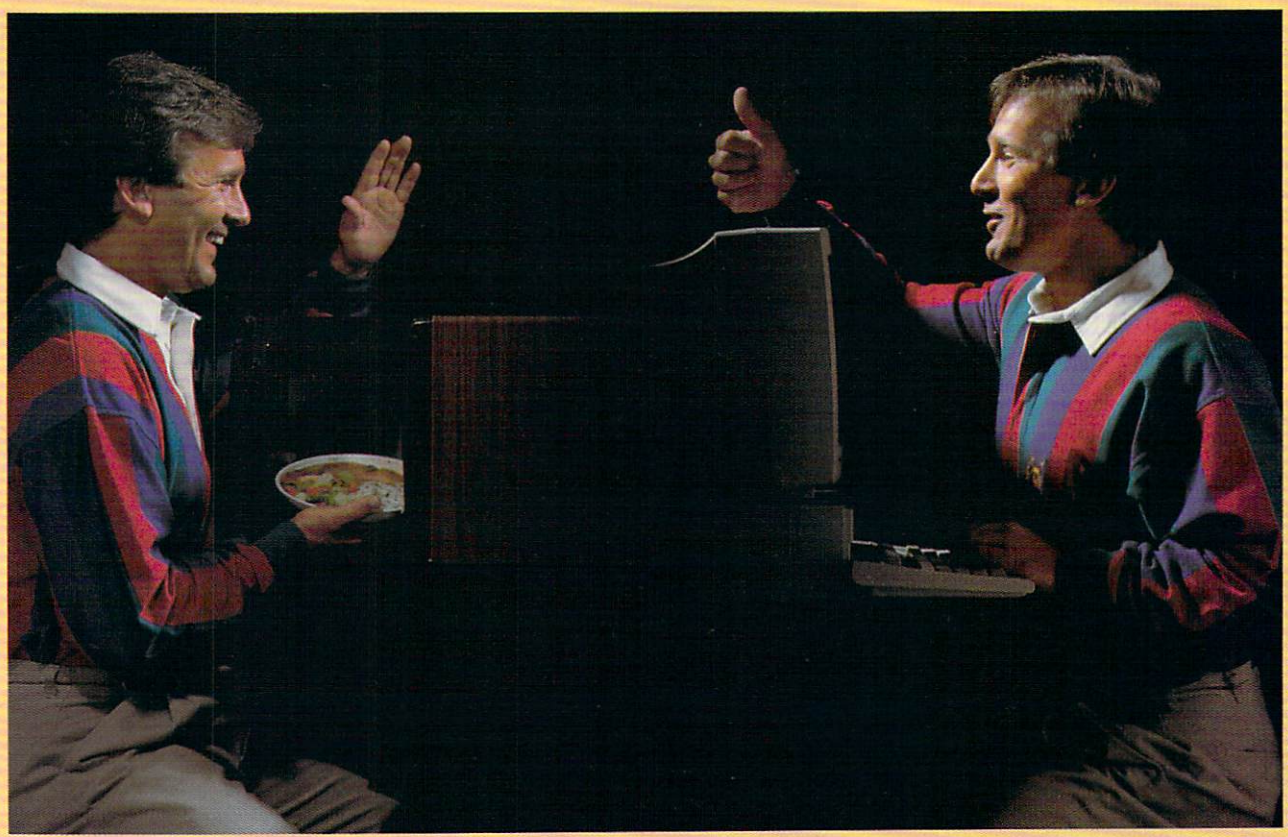
GEOS BRINGS PUSH-BUTTON COMPUTING TO THE MASSES—AND MULTITASKING TO THE PC



MARK WAGONER © 1990

The personal computer world went for a spin with Bill Gates this past summer when Microsoft finally took *Windows* 3.0 off the test track and put it on the open road. The much-anticipated graphical user interface (GUI), designed to make IBM PC and compatible computers easier to use, was enthusiastically received in most quarters. Microsoft claims that *Windows* will run on low-end PC compatibles—at least on a 286—but to

PETER SCISCO

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truly take advantage of that GUI's dramatically increased functionality, you'll need plenty of horsepower: at least two megabytes of memory and a 386 or 386SX processor—nowhere close to what most consumers own or can afford.

Enter GeoWorks (formerly Berkeley Softworks), a Berkeley, California, software company that for the past three years has been quietly tinkering in its garage with what could be the most functional and easy-to-use interface for home computers. GEOS provides a multitasking windowing environment in less than 100K of RAM, performs adequately on PC- and XT-class machines, runs even better on AT-class computers, supports dynamic memory management, and sits atop a powerful object-oriented programming environment.

If the name GEOS sounds familiar, you may remember its various incarnations as a graphical interface for the Apple II and Commodore 64—two computers that are limited by a slow processor and small amounts of memory.

Use GEOS to customize the look of your personal computer by choosing from multiple user interfaces. Create a workstation look for your home PC.

Small Packages

It's not easy getting graphical performance out of 8-bit machines with small amounts of RAM, but GeoWorks succeeded. The disciplined code that made those packages possible has served the company well in its latest venture. "Parts of the code have been written 10 or 12 times to optimize performance," says Brian Dougherty, GeoWorks' CEO.

"They are almost the only people left in this industry who can write tight code," says Jeffrey Tarter, editor of *Soft•Letter,* a software-industry newsletter. In fact, the bulk of GEOS, which occupies a little over two megabytes of hard disk space, is comprised of font files. Company officials have said that if you removed the font technology and made some minor modifications, the GUI would run on a double-floppy system.

"Highly compact, high-performance code is a lost art," agrees Dougherty. "A lot of these people came out of the videogame market," he says of the GEOS development team. Other team members learned their trade in the UNIX market, developing applications for workstations.

Videogame code must be extremely compact because of memory and processor limitations. But when GeoWorks examined the marketplace for state-of-the-art graphical interfaces, it quickly zeroed in on 32-bit workstations. The result illuminates a central paradox about GEOS and the state of current consumer computing: GeoWorks needed the high-level processing power of a workstation to create a workable, easy-to-use interface; but mass-market computers, those with the least amount of power, are exactly the systems most in need of such an interface.

Download online information while designing a document—the pleasures of multitasking with your home PC. For MS-DOS users, the long wait is over.

Window Shopping

GeoWorks' 8-bit history has also garnered GEOS support on the hardware side through Laser Computer of Zurich, Illinois. "Our familiarity grows out of our Apple II line," says Mike Wagner, Laser's director of marketing and product development. As the leading maker of Apple II clones, Laser had previous contact with Apple GEOS.

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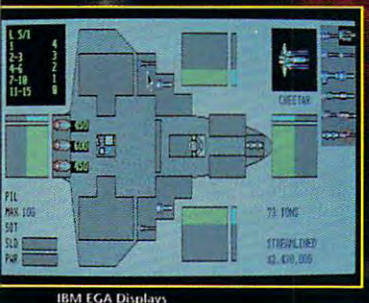

IBM EGA Displays

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In the fall of 1989, Laser was looking for the right software applications to bundle with a consumer-oriented, plug-and-play MS-DOS clone. The company studied several options, all of which presented particular problems: Either they were so basic in approach that they offered no room for growth, or they were too complex for novice computer buyers.

"By far, GEOS is the best [interface] product for the mass market," says Wagner.

That's exactly the flag Geoworks is driving for. The product was designed from the ground up for the mass market—home office, consumer, education, and small business.

SOMETHING FOR EVERYONE

Right off the showroom floor, GEOS carries a full complement of standard features, including scalable outline fonts and a WYSIWYG display. GeoWorks put a lot of time under the hood, creating an attractive interface that rivals *Windows*, Presentation Manager, even the Mac's own Finder. Best of all, GEOS should be rolling onto store shelves by the time you finish this article.

The PC version of GEOS is entirely unrelated to its 8-bit cousins, except in name. It's not an upgrade or a port; its design is modeled on workstation technology.

Perhaps the most intriguing aspect of GEOS is what GeoWorks calls its *scalability*, which enables users of varying skill levels to take full advantage of the hardware and software. That capability transforms an MS-DOS *personal* computer into an MS-DOS *family* computer. The most basic level, called Appliances, is designed for those consumers who want to make use of a computer but who have little inclination to further their knowledge of computing.

For the computer literate, the Professional level offers increased functionality by delivering more choices. For example, a novice user who wanted to type a letter could click on the Appliances icon and move immediately to the Appliances screen. There, selecting the Notepad icon brings up an elegant, simple-to-use word processor, with Print, Cut, Copy, and Paste functions.

As users learn more about the system, they have access to increasingly more complex applications. A more advanced user, by clicking on the Professional icon, would gain access not just to the Notepad, but to GeoWrite, an advanced word processor with many desktop publishing attributes.

GEOS-specific applications will still take some time to come to market, but the program compensates for that lack with a DOS room from which you can run your favorite DOS programs. Creating a button, complete with icon, is simple and even fun. Both novice and advanced users should be able to enjoy the full measure of GEOS's performance.

GeoWorks' ambitious goal is to create a graphical solution that will work with any level of machine in those environments.

"With GEOS, we hope to expand the current mass market and create new markets," Dougherty says. He has good reason to be optimistic. Tens of millions of XT- and AT-class MS-DOS computers at home and in small business are waiting for a graphical interface, now that Apple and Microsoft have given validity to icons and mice.

"The world is largely convinced that a GUI is a good thing" Tarter says. "The potential [for GEOS] is enormous."

That potential isn't limited by the desktop. Dougherty has hinted that GEOS isn't just an interface for home computers, that instead it's an interface capable of supporting a spectrum of products, from laptops and handheld systems to CD-ROM readers.

Make Mine a Cuisinart

The interface's capability to expand into more sophisticated areas was a key attraction for Laser. "You can start on the Appliances level and move to the Professional level when you're ready for it," says Wagner. That's important for a mass marketer like Laser, he says, because the sooner you can get a consumer up and running on a computer, the less chance you have of a frustrated customer bringing the machine back.

In getting users over that initial hurdle, Wagner says, GEOS succeeds admirably. And Laser isn't alone in appreciating what GEOS can do for its hardware.

"A lot of clone companies will see this as a real easy way to add value to their machines without spending a lot of money," says Tarter. That's great news for consumers, who will get the power and ease of a graphical interface as a complement to their home computer. GeoWorks will only say that it has a half-dozen hardware and software companies supporting the product at its release.

"We expect to have strong distribution and a significant impact in the marketplace," says Dougherty.

"The numbers are on their side," Tarter says. "At least two-thirds of the machines being sold are 'sub-*Windows*.' "

All of this translates to good news for users eager to explore the world of PC graphical interfaces and for consumers who have shied away from computers because of their complexity. GeoWorks has used that complexity to create a simple, effective, and efficient means for anyone who wants to use the power of a home computer.

The multitasking capabilities of GEOS make it a prime candidate for PC multimedia applications. Mixing video, text, and graphics are part of the new wave.

In the coming decade, millions of consumers will, for the first time, take to the home computing road to expand their horizons and creative opportunities. GeoWorks has crafted a great set of wheels for the trip, and GEOS makes for some great driving. ⊡

Peter Scisco, editor in chief of *COMPUTE*, is a late convert to graphical interfaces.

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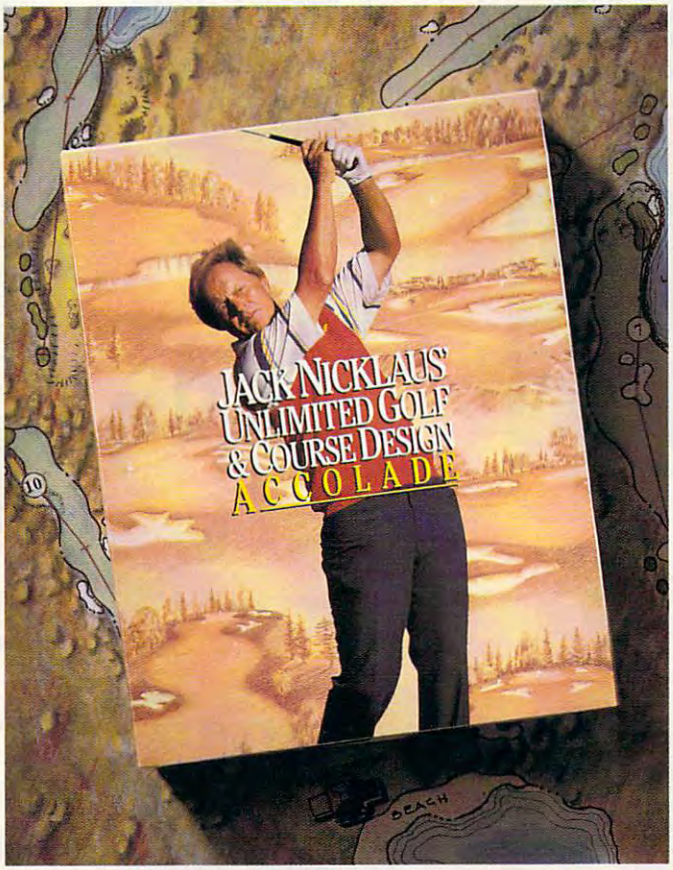

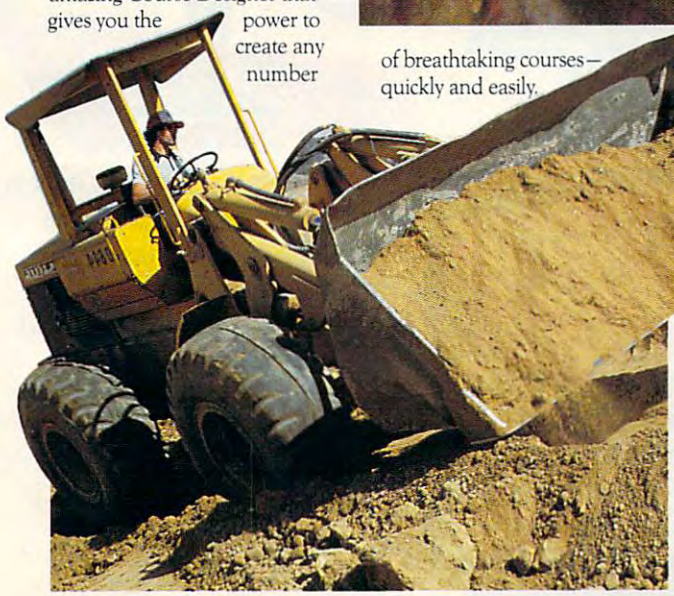

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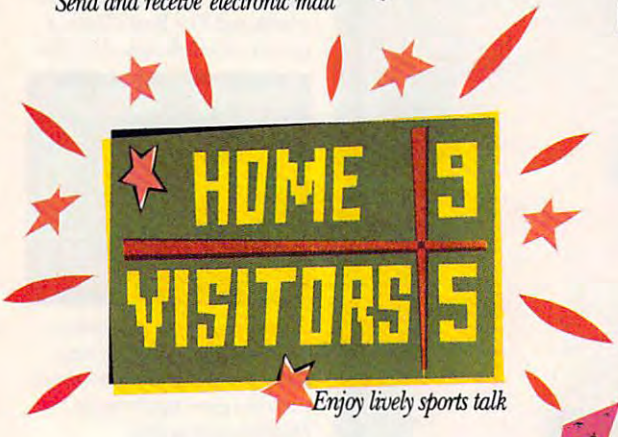

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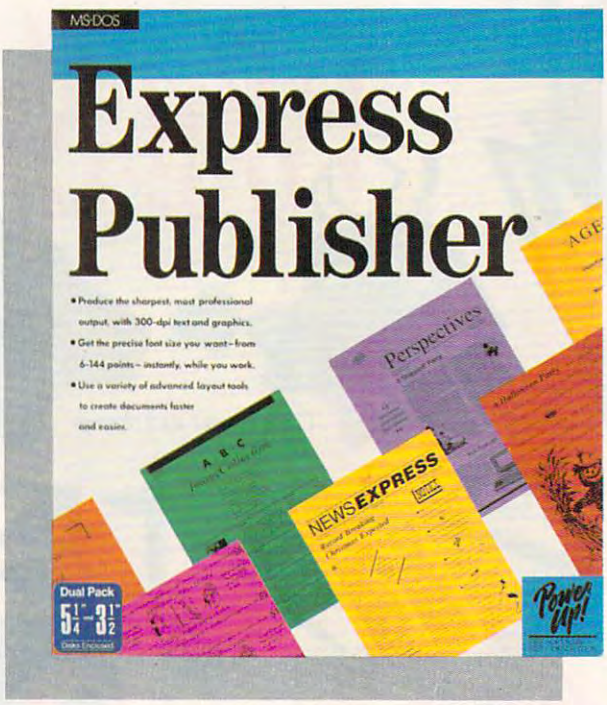

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Power Up! Software's *Express Publisher* lets you create newsletters, advertisements, invitations, and other text and graphic designs. This program packs much of the power of high-end desktop publishing software, including pull-down menus, outline fonts, drawing tools, and the ability to import text and graphics from your favorite software. Compugraphic outline fonts make *Express Publisher's* output excellent, whether you're printing on your old dot-matrix, a laser printer, or even a PostScript typesetting system.

You shouldn't encounter any major hurdles getting *Express Publisher* up and running. An automated installation program puts everything in the right place on your hard drive. If you've ever used *Windows* or a Macintosh, the program's interface, consisting of a menu bar with a horizontal row of icons below it, will be instantly familiar. Your document is displayed in a window at the center of the screen. Scroll bars let you move

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FFICE

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around the page, and a handy ruler lets you keep track of where you're editing. Although *Express Publisher* requires a mouse, most of the program's options can also be accessed through keyboard equivalents.

I tested *Express Publisher* 1.1 on two systems. First I tried it on an XT-compatible with 640K, a 20-meg hard drive, CGA graphics, an Epson-compatible printer, and a Microsoft bus mouse. I then switched to a Compaq 286 with two megabytes of memory, a 40-meg hard drive, an EGA monitor, a Microsoft serial mouse, and an HP LaserJet printer.

If you have more than 640K of memory, *Express Publisher* will recognize and use it. If your system has only the minimum 640K, the program will use your hard drive for virtual memory storage. Accessing your hard drive to complete some operations slows things down a bit, so extended or expanded memory makes your work a lot quicker. Although *Express Publisher* worked well on both systems, the combination of extra memory, processor speed, and screen resolution on the 286 machine amounted to quite a leap in productivity. I noticed this especially when waiting for page reformatting and other time-intensive functions.

Express Publisher **supports multiple text fonts, point sizes, and styles.**

Monitor resolution makes a big difference when working with *Express Publisher*. In CGA mode, the program uses 640 × 200 pixel resolution in two colors. This makes everything look skinny and tall, and you can only see a third of the page you're composing. The screen size doubled to over half a page when I switched to the 640 × 350 pixel EGA monitor.

Screen update is a little slow on some systems. Fortunately, the Display Settings options allow you to speed up operations on a slower computer or one with only 640K. You can substitute the computer's system font onscreen for the bitmapped font you're using and greatly speed things up. When you print out the final document, the smooth, bitmapped font still prints. You can change bitmapped pictures so that they display on the screen as labeled gray boxes, while the actual graphics appear when you print the document. The only problem I found with these options is that you can't see exactly what you're going to get before you print it. On slower systems, though, the increased speed, especially when typing in text, is worth the inconvenience of not working with a WYSIWYG display.

Digging into *Express Publisher*'s tool box, I discovered several useful functions, each represented by an icon or a pull-down menu item. There are tools to make boxes, lines, and circles; to let you crop, magnify, and edit graphics; to align, link, and fill objects; and to layer objects and wrap them with text. Cut, paste, search, and replace commands, common to this type of program, have been imple-

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As in the best FRPs, the knights and lords, wizards and clerics of the court of Camelot are yours to befriend and command. As they undertake their quests, they can interact with the peasants, warriors, maidens, nobles, bandits, and other folk of the time, growing and improving their abilities and skills.

Spirit of Excalibur also provides opportunities for the tactical planning of a combat simulation. Move troops to strategic points to harry or delay invaders while your knights complete their quests, obtaining the allies or weapons needed to successfully defend the realm from attack.

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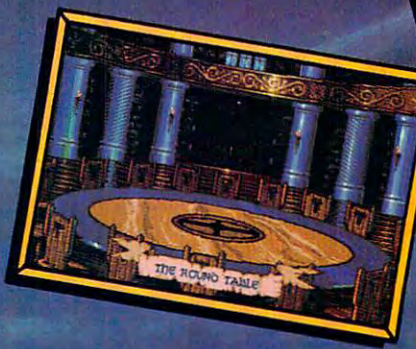

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mented in a very friendly, easy-to-use manner. To copy and paste text, for instance, you simply use the mouse to highlight the text you want to copy, select the Copy command from the Edit menu, place the cursor where you want the text to be copied to, and then select Paste. The text you've copied is instantly inserted after the cursor.

When creating a new document, you can choose from one-, two-, or three-column formats, or you can create your own. In addition, you can select page size from a list that includes letter, executive, legal, ledger, and A4 sizes. Once you've selected your basic format and page size, you can start filling pages with text and graphics. To enter text you must select the text window icon, size a text window, and place the window where you want it on the screen. You can type text into the window or import from your word processor. *Express Publisher* will directly import files from *Microsoft Word* or *Works, WordStar* and *WordStar 2000,* and *WordPerfect,* preserving bold, underlined, and italic text. You can also import unformatted ASCII, DCA, or IBM *DisplayWrite* 4.0 files.

Express Publisher includes two Compugraphic outline fonts, CG Times and CG Triumvirate (similar to Helvetica). These outline fonts can be scaled from 6 to 144 points and will print at your printer's highest resolution. On the printers I used, output of the smallest and largest characters looked very respectable. Even with 144-point type, there was very little roughness at the edges. You also have access to the fonts resident in your printer. *Express Publisher* supports the built-in draft and letter-quality fonts, font cartridges, and, as of the version 1.1 update, downloadable Bitstream and HP fonts. The fonts you choose can have many different attributes, including bold, italic, underline, subscript, and superscript. Both of the printers I tested produced sharp-looking documents using a mixture of Compugraphic and native printer fonts.

Often, certain characters may appear to have too much space between them when placed close together, such as the letters *AT.* High-end desktop publishing programs allow you to kern this space and move the characters closer together. While *Express Publisher* doesn't let you adjust the kerning of individual character pairs, you can choose to kern an entire text box. I achieved very subtle results when I applied kerning to blocks of text containing small fonts, but I found it to be most useful for spacing larger headlines out in a manner more pleasing to the eye.

If you don't have enough room in a text box for an entire article, *Express Publisher* leaves a mark at the bottom right of the box. You can resize the box or link it with another box, possibly on another page, to accommodate the spill-over text. This feature is useful for making newsletter articles flow like a newspaper, with stories continued on various pages.

You can adjust the amount of space between characters within text boxes.

There are a multitude of options for laying out high-resolution graphics with *Express Publisher.* You can import files in virtually all common graphics formats. I successfully imported files from *PFS:First Publisher* (.MAC), *PC Paintbrush* (.PCX), *Word Perfect* 5.0 (.WPG), and a scanner (.TIF). To help you get started, the *Express Publisher* disks include over 200 TIFF-format clip-art images in 300 and 150 dpi. Additional clip art and font packages are listed in the manual, or, if you prefer to do it yourself, you can use *Express Publisher's* graphic tools to make lines, boxes, circles, or fills. If you want to tidy up your pictures, *Express Publisher* lets you crop pictures or zoom in to edit individual pixels.

Express Publisher treats everything you put in the document window as an object. These objects can be text windows or graphic images. Once you've created an object, you can resize, flip, rotate, and/or invert it. You can also cut, copy, and move it freely around the document window. By clicking the Send to Back or Bring to Front icons, you can layer graphic and text objects, placing them in the foreground or background relative to the other objects. Processor speed and memory directly affect how quickly you can move things around onscreen.

Several powerful tools are available for aligning and formatting each *Express Publisher* page or the document as a whole. To quickly get going on a newsletter, for example, you can load one of the many included templates. The newsletter sample has a headline and three columns of text. All you have to do is fill in the text, add a picture or two, and you have a great-looking newsletter. *Express Publisher's* rulers and grid are helpful when you want to see where you are on a page or where your margins are. They can be toggled on and off with a menu item. Removing the ruler gives you a more complete view of the current document and, if you're using CGA, greatly expands the viewing area. You can work in inches, pixels, or picas, and you can snap objects to the nearest line on the grid or align them 15 different ways on a page. With all of these features, I had very little trouble creating a wide variety of documents with straight, neat-looking columns.

Express Publisher comes with a well-written manual bound in a large paperback book format, as well as a supplement to the manual listing corrections, tips, version 1.1 features, and additional troubleshooting ideas. The first half of the manual contains a tutorial clearly covering the basic essentials, while the rest contains appendices dealing with file compatibility, display settings, setup problems, printing, fonts, clip art, and technical support, which is provided free by writing or calling. Conveniently, all the included clip-art graphics are shown in the manual.

While *Express Publisher* is a low-end package, it has all the functions of professional desktop publishing programs that the casual user needs. Power Up! should be commended for releasing such a solid program at an affordable price and for providing good, free technical support. If your home office needs include page layout, you should book an *Express Publisher* tryout at your local software store.

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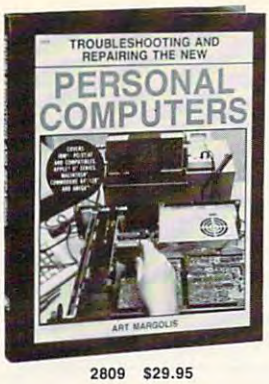

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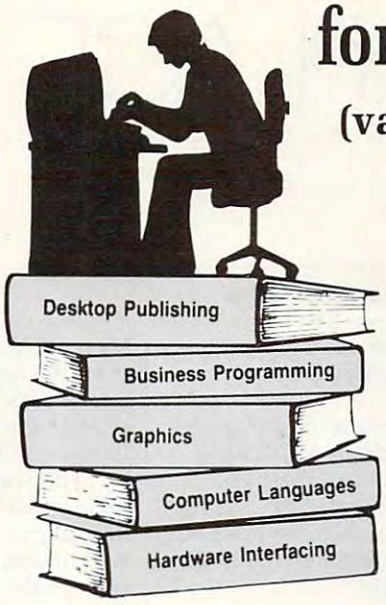

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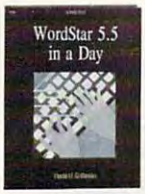

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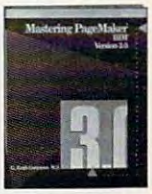

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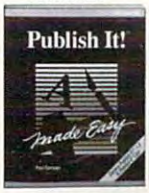

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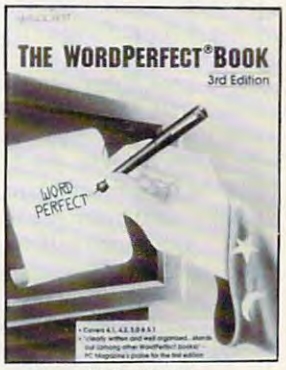

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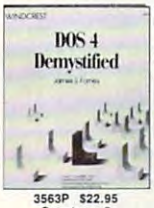

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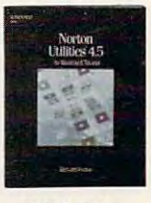

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ON THE ROAD

DANIEL JANAL

For three weeks last month, I had to leave my home office to conduct business in California. That's a long time and a long way from Fort Lee, N.J.

I needed to maintain a professional aura for my business and keep in touch with clients, reporters, and new business prospects for my public relations firm. Some careful planning led me to a strategy that would maintain client confidence and help me stay on top of my business.

First, I gave my clients a detailed itinerary of where I would be and how they could reach me. Then I told them I would check in for messages every day and call them as frequently as usual. With these two simple, effective steps, I preempted any concerns about my not paying attention to clients while traveling.

My itinerary set, I then took care of the logistics of maintaining a home office away from home.

The phone is the most direct way to stay in touch with clients and prospects—and potentially one of the most expensive. I devised several strategies to save time and money.

To avoid long-distance tolls, I wrote down the toll-free numbers for my clients and reporters.

I changed the message on my answering machine to account for my whereabouts and to leave the phone number of a friend I would be visiting in San Jose. Because I live close to New York, I had to think of a clever message that did not imply, "I'm out of the office for three weeks. Feel free to rob me anytime before April 15."

Here's what I said: "You have reached Janal Communications. You may leave a message on this tape or call our Silicon Valley office." I gave the phone number of the friend's house where I planned to stay. At the end of my message, I asked callers to leave their phone number twice. I've found that people talk so fast that it's difficult to write the number if they say it only once. When I'm on the road, I can't rewind the tape.

Many people left messages. Some left a message and called the San Jose number. Others called San Jose directly.

To save money on outgoing calls from hotels, I used my MCI calling card. I called from pay phones because most hotels charge fees ranging from 50 cents to a dollar for using the room phone—even for 800-calls. That can add up quickly!

I also got an 800 number for my home so I could call in without the additional expenses of the MCI card. An MCI representative told me the MCI card costs 75 cents a call to use, while an 800 number costs $20 a month. The break-even point came at 27 phone calls—a small number when you consider I called the New Jersey number three times a day to check messages. Long distance charges, of course, were equal in both cases.

Besides my phone and answering machine, I live by the fax. In the four months I've had my new fax machine (my second), I've received 490 faxes and sent 1247. I needed a fax service on the road, and I found it through MCI mail. All I had to do was dial my regular account number (an 800 number, so it didn't cost anything). I merely typed the name and fax number of my client, transmitted the file to MCI via my communications software, and typed the send command. My clients received faxes about two minutes later. MCI sent a receipt to my electronic mailbox, so I knew all had gone well.

This was a good solution to sending material that I had created with my computer. Fortunately, I didn't need to send hard copy or receive faxes. Had I needed to, I would have found a copy shop that offers fax services (every city seems to have several). Fees are steep—about $3 to send each page and $2 to receive. Most hotels will offer fax services for guests at a similarly outrageous fee.

My biggest fear was how I would conduct business without the piles of files I use to document my work. The best strategy was to copy all the important files to my laptop computer, a Zenith SupersPort with a 20MB hard disk. I have *WordPerfect* 5.1, *dBase III, Quattro Pro, Procomm* for online communications, and *Hotline,* an autodialer containing my entire address file—more than 1,000 names, including reporters, clients, and friends. I carried the most important parts of my office in a mere 12-pound machine.

The system worked perfectly. I called dozens of people instantly with the electronic address file, gathered tax information for my accountant with *Quattro,* and wrote dozens of memos (including this article) with *WordPerfect.* Also, *WordPerfect* converted files that I sent through the modem to CompuServe and MCI mail.

The biggest surprise came when a company called to order a directory I publish, *The Definitive PC User Group Directory.* I copied the database to a disk, wrote an invoice (printed with the help of a friend's laser printer), and sent the material via Federal Express. I can only hope they will pay just as fast!

Taking your home office on the road requires careful planning and a workable strategy. With effort and foresight, you can provide your clients with a great deal of personal service without burdening them with a great expense. ⊡

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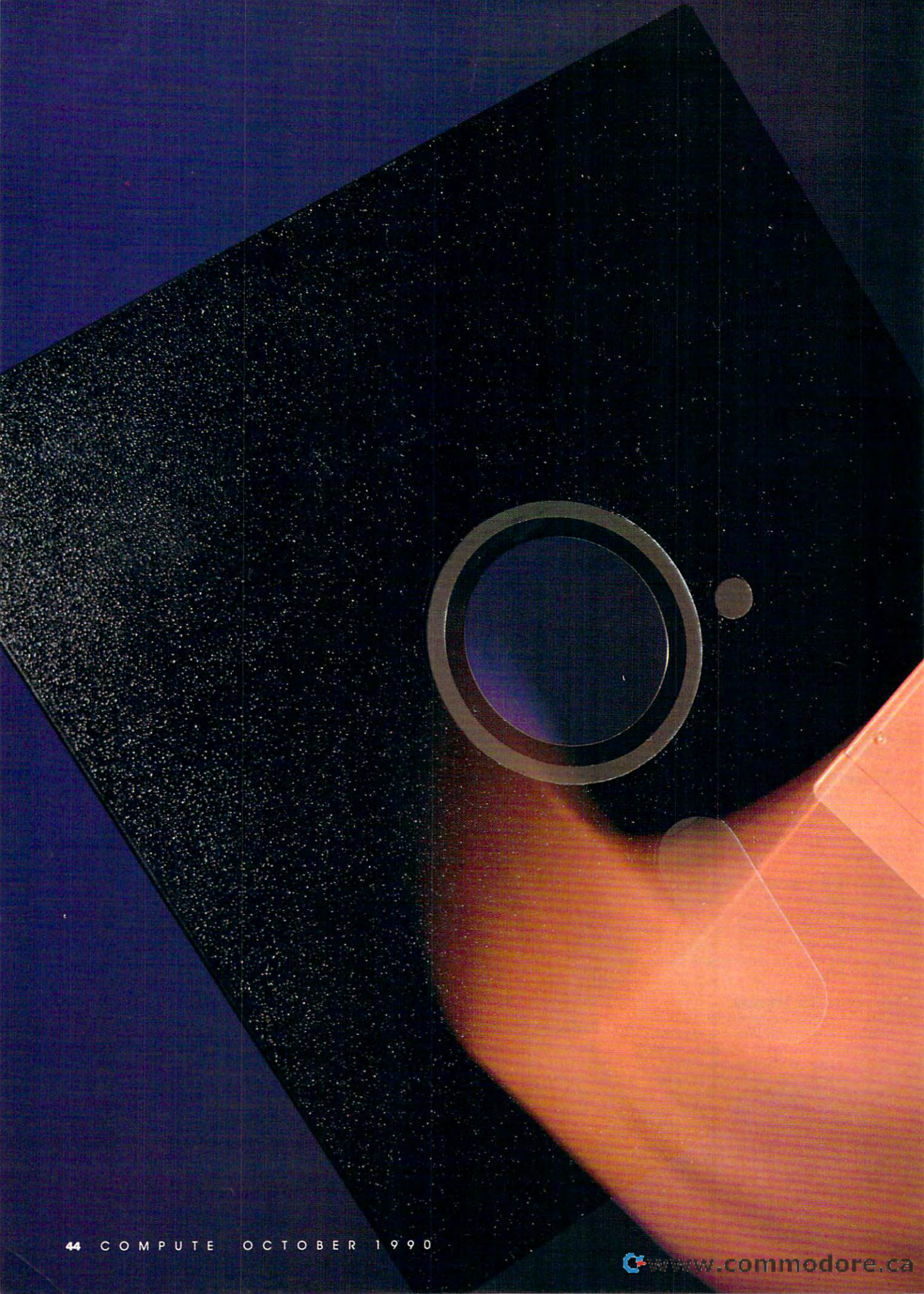

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INSTALLMENT PLAN

MARK WAGONER © 1990

YOUR HOME BUSINESS CAN PROFIT FROM SMALL IMPROVEMENTS. UPGRADE YOUR COMPUTER WITH A 3½-INCH DRIVE AND REAP BIG BENEFITS.

Personal computers designed for the home entrepreneur are shrinking in size as they grow in power. One example of that trend is the smaller, more damage-resistant 3½-inch floppy disk, which holds more data and is easier to handle than standard 5¼-inch floppies. These advantages are particularly pronounced around the home office, where storage space is at a premium and mishaps involving pets and children can be a factor. If you've been putting off adding a 3½-inch drive to your system, read on. It's really a simple operation. You only need to be able to use a screwdriver.

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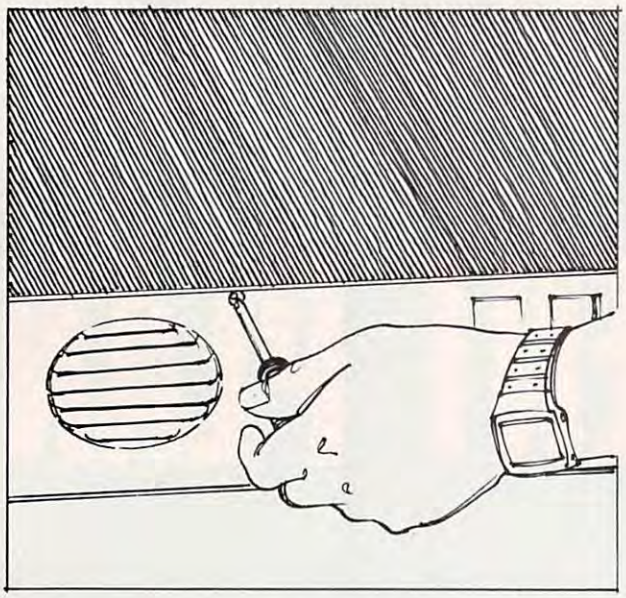
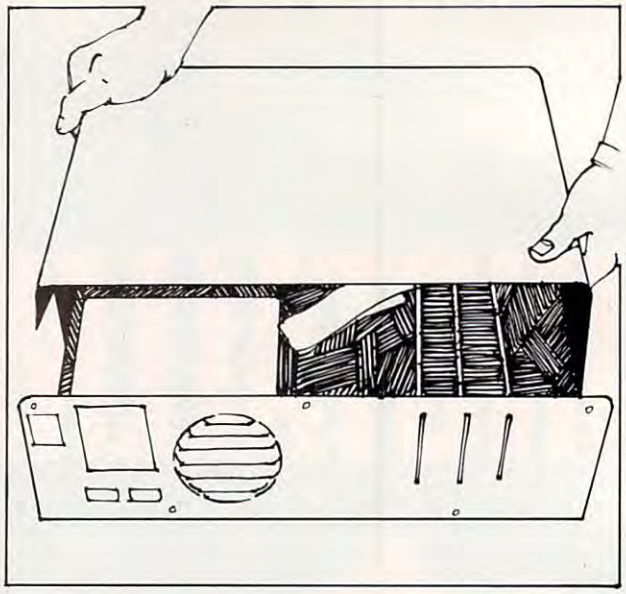


Most cases are held together by five screws, one in each corner and one in the top center of the back.



Pull the case cover forward gently but firmly. Most covers fit tightly to the case. Don't wrench or jerk the cover.

Hardware Requirements

The most important computer requirement is an empty half-height drive bay in your computer. If your computer has two full-height floppy drives or any other unit that takes up all of your front panel drive locations, you won't have enough physical space to add another drive. You might be able to remove an extra drive or exchange a full-height for a half-height one to make enough room to add another drive.

While it's theoretically possible to use a 3½-inch drive with any version of MS-DOS, versions earlier than DOS 3.2 require special patch programs or drivers. If you're using an earlier version, it's highly recommended that you upgrade your version of DOS when you install your 3½-inch drive.

Most early disk controller cards were designed to support only 360K 5¼-inch drives. Current cards are designed to support virtually any floppy drive, including all 5¼-inch and 3½-inch permutations. The documentation that came with your disk controller card or computer should specify whether or not it supports 3½-inch drives. If your controller card doesn't support the new drives, you can upgrade your controller for about $50.

Generally, 3½-inch drives aren't designed to fit into a PC or an XT drive bay. For the original IBM PC and similar cases, you should purchase a 3½-inch drive with a 5¼-inch adapter kit. The kit normally comes ready to install with the drive in the adapter. Most adapters come with a frontplate that matches the computer's case. Finally, the adapter includes patch connectors that adapt the drive's power and data connectors to the connectors used by 5¼-inch drives.

In Search of Power

If your power supply has only two disk drive power connectors or all your power connectors are in use, you need a simple power cord Y-adapter (about $3). This adapter plugs into your power supply cable and converts one power plug into two identical plugs. You don't have to upgrade your computer's power supply when you add another floppy drive because only one floppy drive will be running at any given moment. Your computer doesn't care how many floppy drives are attached; it only supplies power to one at a time.

You must choose the capacity of your drive carefully, remembering that 3½-inch drives come in several models: 720K, 1.44MB, or 2MB. Most laptops, including the IBM portable, use 720K drives. The 1.44MB drive introduced with the IBM PS/2 is also available for other MS-DOS computers. It's quickly becoming the standard for 3½-inch drives because of its relatively low cost (typically only $30–$40 more than 720K drives) and full compatibility. The 2MB and other higher capacity drives are rare at this time. Some computers have built-in disk drive controllers, making it impossible to add a controller card to upgrade to 1.44MB drives or even 720K drives. Check your manual and call your computer manufacturer's technical support number to make sure your computer can be upgraded.

Getting Down to Business

If this is your first venture inside your computer's case, you may want a technologically experienced friend to watch, just to make sure you don't make a mistake. But installing a drive is one of the simplest upgrades you can perform, and it's difficult to do it incorrectly.

The following directions and illustrations show how to install a 3½-inch drive with a 5¼-inch adapter in a generic PC clone that has an available drive bay. If you have an AT or need to remove an existing drive, there are minor differences.

You should always ground yourself before opening your computer to prevent damaging the computer by causing a static spark. Touch a bare metal part of the computer's case (such as the power supply) to eliminate any buildup of static in your body.

Always shut off your computer and unplug it before opening the case.

Many PCs have flip-top cases that open like the hood of a car. If yours has this type of case, press the two buttons on the sides of the case and flip open the top.

Most cases use five screws at the top and sides of the back panel to hold the cover on. There are several other screws that hold the power supply and

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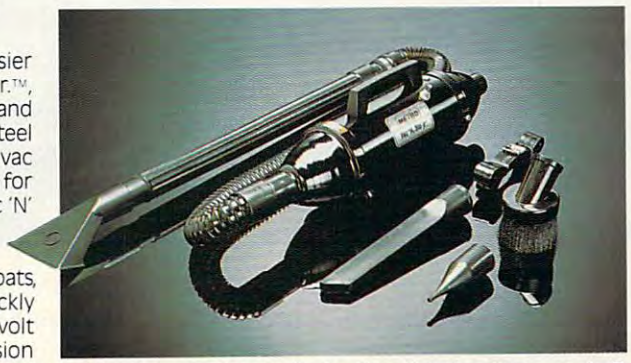

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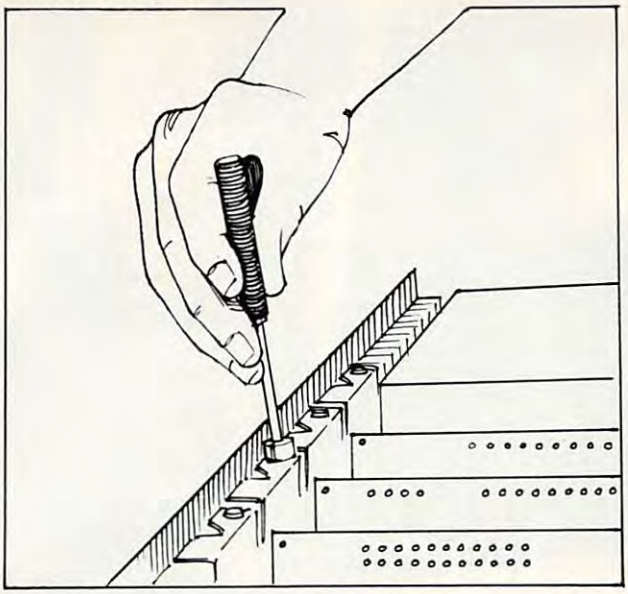


Change the drive controller if necessary. Always be sure to secure the cards in place with a screw.

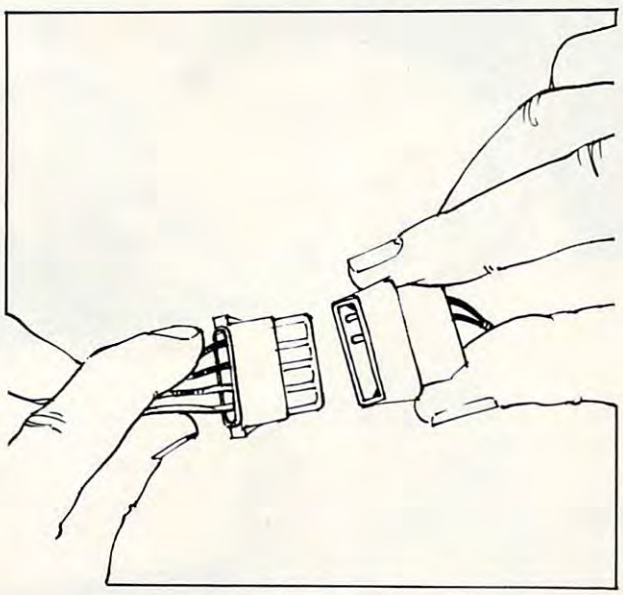
other internal components in place; you shouldn't unscrew those.

Unscrew the case screws and put them in a safe place. Slide the top of the case toward the front of the computer and take it off.

From the front of the case, remove the frontplate knockout panel corresponding to the location where you'll install your new drive. If you don't have an open drive location, you can replace an existing drive or substitute a half-height drive for an existing full-height one.

Remove the existing floppy controller card if you need to upgrade it. It's held in by one screw at the back of the computer's case. Unscrew it carefully to prevent it from falling into the case. Gently pull upward on the controller card with a rocking motion to remove it. The new disk controller's documentation should show you how to set up its jumpers, if necessary, to tell the computer what

continued on page 154



Check all the connections twice. Power connections will only fit one way, but ribbon connections can be inverted easily.

Advertorial

What to Look for In a
Home PC

If you're in the market for a home computer, here are some helpful guidelines to getting the most out of your investment.

The Right Software

Look for software that is already set up and ready to use. After all, you don't want to have to learn how to use a database just to catalog your stamp collection or set up a spreadsheet to figure interest charges. Software should be easy to use and designed specifically for the home. So you can, for instance, keep an inventory of your possessions for insurance purposes. Or make a detailed schedule for a vacation or business trip, with a list of things to bring along. Or plan meals—selecting recipes, then making a grocery list based on the number of people you're serving.

And, of course, you'll want software to help you manage your finances. Like an automatic checkbook register to do all the math for you, and then itemize your expenses for easy budgeting. And a program to manage your stock portfolio. And when you're thinking about a new house or car, you'll want a loan scheduler to find out exactly what your payments will be. Essentially, you need easy-to-use software to help you manage your finances now, so you can plan ahead for your financial future.

Of course, your home computer should be PC compatible, so you can run programs from the office as well as tens of thousands of other personal, entertainment and home education programs.

Getting Up and Running

The right computer should be so convenient that you'll use it all the time. And your system should be compact and quiet to fit well into any home environment. A definite plus is a feature that turns off the screen when not in use, keeping the computer both energy efficient and ready to use with the touch of a key.

Plus, you need to consider the keyboard. A top-of-the-line business system keyboard will make for easier, effective entry of information.

Stretching Out

Finally, you need to be able to expand whenever you're ready. Look for built-in digital audio and joystick ports so you can take advantage of a wide range of game and home education software.

Fortunately, there is a computer that meets all these requirements: the new Tandy® 1000 RL home computer. To learn more about home computing, plan to attend one of the special Open Houses being held every Friday at Radio Shack. Call any participating Radio Shack store, dealer or Computer Center for times, or to set up your own personal demonstration.

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Happy
30th
Anniversary

Aging increases the risks of certain diseases. Vitamins C, E and Beta Carotene may help reduce them.

By the time you reach your 30th Anniversary, you could be worrying about aging—and the chronic diseases that can go along with it.

Of course, a balanced diet has always been a key to good health. But now, scientific studies are focusing not only on diet, but on the potential health benefits of specific nutrients.

One area of promising research is the role that some nutrients may play in decreasing the risks of diseases which tend to develop with aging.

For example, in recent years, scientific institutions such as the USDA Research Center on Aging and the National Cancer Institute have been conducting research on Vitamins C, E and Beta Carotene—among other nutrients.

And the evidence so far indicates that assuring adequate Vitamins C, E and Beta Carotene in your diet may help reduce the risks of developing diseases such as cataracts, cancer and heart disease.

To make sure your diet has adequate Vitamin C and Beta Carotene, eat a variety of fruits and vegetables every day and add some seeds, seed oils, nuts and wheat germ for Vitamin E.

In addition to a good diet, continuing good health obviously depends on many other factors, some of which you can control, like not smoking, exercising, keeping your weight down and getting regular medical check-ups.

It's worth a little effort to reach your Golden Anniversary in good health.

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continued from page 51

size drives are attached.

If your new disk controller card uses the same data cable connector as the old one, you can use your existing cable. Just disconnect the cable from your old controller card and plug it into the new one. If you need to replace the existing cable, disconnect it from your drives and thread the new controller card's cable into place, following the same path as the old cable. In either case, plug the new disk controller card into a slot and carefully replace the screw that holds it in place.

The data cable that attaches your drives to the disk controller card has three connectors: one at the end that attaches to the disk controller card and two on the other end for the drives. The cable has a twist between the drive connectors. This twist reverses the drive select lines permitting the computer to recognize the drives separately. Drive A is connected to the end of the cable; drive B, to the middle connector. The cable's connectors are 34-pin edge connectors that plug into your drive's data connectors. Most, although not all, cable connectors have a "key" inserted to prevent you from inserting the connector backward. Double-check the edge of the ribbon cable. One edge should have a color different from the rest of the cable. This edge should always be next to pin 1 of the cable or connector where it's attached. You should attach your 3½-inch drive to the B drive connector (the one in the middle of the cable). You will probably want to keep your 5¼-inch drive as drive A since some programs require a 5¼-inch floppy in drive A to work properly.

Plug one of the power cables from your computer's power supply into the drive's power connector. The connectors are trapezoid shaped to prevent you from making an incorrect connection, so don't try to force the connectors together.

AT-style cases use rails rather than screws to hold the drives in place. The AT rails screw onto the 3½-inch drive's adapter chassis, and the drive assembly then slides into the drive housing in the computer case. XT drives screw directly into the drive mounts in the case.

Putting It Back Together

Double-check all connections before you put the computer case back together. If you're installing your drive in an AT-compatible, you'll have to run the setup program to let the computer know that it has a new drive. When the computer boots, it asks if you want to run the setup program. Follow the menus and, when the setup program asks for the drives installed, change the setup to include your new 720K or 1.44MB drive as the B drive. Some computers run the setup program when you press Ctrl-Alt-Esc while the computer is running (save your work before doing this; there's no way to exit most setup programs without rebooting).

You can check out your setup by formatting a 3½-inch floppy in your new drive and verifying the disk with DOS CHKDSK. (Power users advise new users to run CHKDSK once a day on each disk that's been written to.) If you want to format a 720K single-density disk on a 1.44MB drive, you should use the command FORMAT B: /N:9 /T:80 (assuming the 3½-inch drive is drive B).

The 3½-inch drives are quickly eclipsing 5¼-inch drives in popularity. Their compact size, higher density, and sturdier construction have made them more versatile and useful. Adding a 3½-inch drive yourself will save money and show you how simple it can be to upgrade your home office PC. ⊡

Philip Chien is a Titusville, Florida, computer writer with more than 12 years of experience with personal computers.

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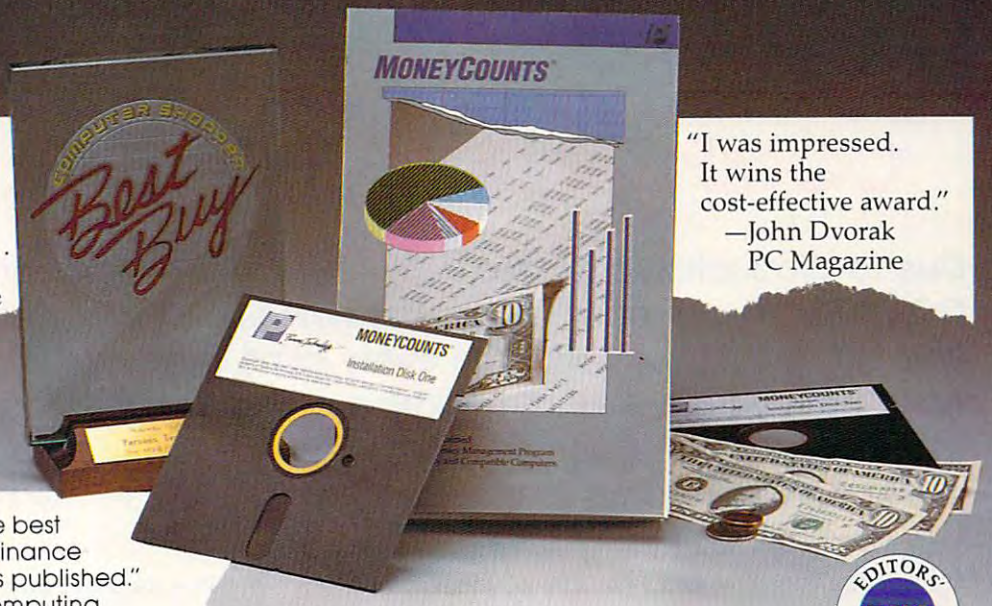

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Due to production changes instituted with the October issue of COMPUTE, all companion disks are now being mailed separately from the magazine. Although every effort is being made to have both your disk and magazine arrive on the same day, this may not occur. You should receive your disk under separate cover within five days of your magazine.

* Subscribers to disks for COMPUTE's PC Magazine, Amiga Resource, and Gazette

LETTERS *continued from page 8*

It is evident that Mr. Leinecker is an experienced programmer, but some of his concerns about Logo belie his Algol Family (BASIC, Pascal, and so on) preference. I strongly disagree with Mr. Leinecker's analysis that Logo doesn't have a set of structured control devices. Subprocedures and recursion are Logo's control devices. This is divergent thinking from structures such as WHILE DO and REPEAT UNTIL.

Recursion, although a programming technique and not a language-based control structure, is very powerful. Although Algol Family programmers generally think of recursion as a sophisticated technique for advanced programmers, recursion is quite natural in Logo.

On to variables. It is true that it seems difficult to know which punctuation to use with variables. In general, however, the double quote is used only with the primitive MAKE, and the colon is used most other times. Although colons and double quotes would seem unnecessarily complicated, variables in Logo are more powerful than in most other popular languages.

I find Logo's variables and reliance on recursion enabling and not prohibitive to my programming.

MICHAEL R. MUIR
BURNHAM, ME

Richard Leinecker responds:
All of your points are right on target. Recursion is a powerful control technique, as you point out. Your explanation of Logo's variables underscores their ease of use once you've mastered the conventions.

I don't think that children can fully grasp recursion owing to its somewhat esoteric nature. It's sort of like reading Lewis Carrol and jumping into another story. Or like an Escher print with the artist as a reflection on the art.

I use recursion on a regular basis in my programs; there's no easier way to generate a directory tree on an MS-DOS machine with its directories and embedded subdirectories. Recursion has some real dangers, though. You can run out of stack space before long and your program will crash. You can run out of available memory if you're trying to allocate it as you go. Since I usually program in Assembly language, these considerations confront me on a cold, hard level and temper my free use of recursion techniques.

The structured constructs DO WHILE and REPEAT UNTIL are also very powerful tools. That's why most high-level languages (even the recent versions of BASIC) include them. These techniques are more straightforward and easier to understand. Even the GOTO statement has its place (in spite of the stigma it carries).

While I understand and agree with your points, I still think that these features should be added to Logo.

Do you have comments or questions? Send your letter—with your name, address, and daytime phone number—to COMPUTE Feedback, 324 West Wendover Avenue, Greensboro, North Carolina 27408. ⊡

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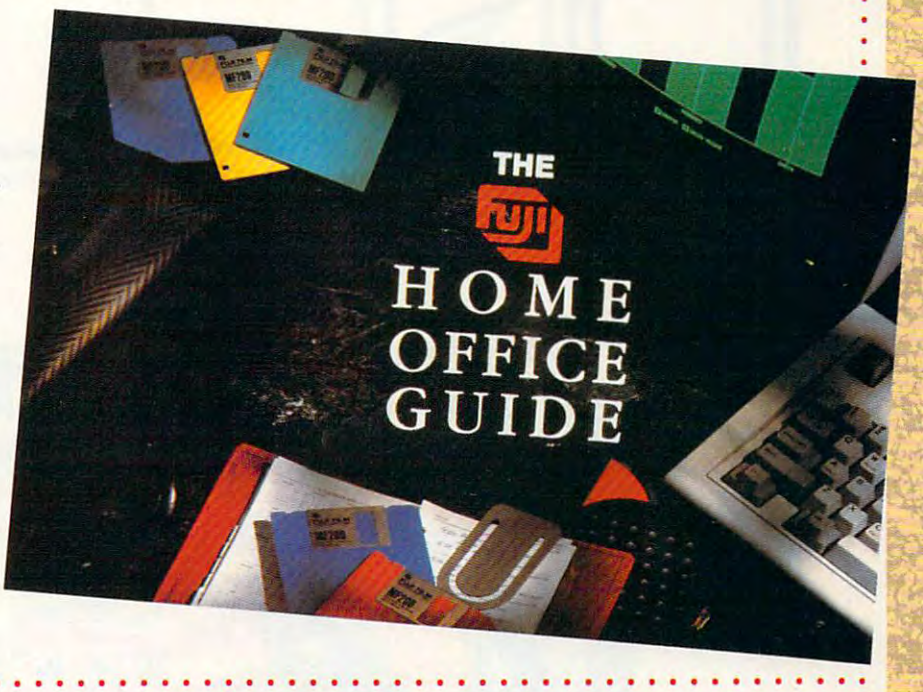
Free Home Office Guidance

If you work at home, or if you're considering setting up a home office, *The Fuji Home Office Guide* can lend you tips and advice.

The 24-page guide covers topics such as naming your business, starting your day and sticking to business, home-office do's and don'ts, and where to get government help.

The guide is available from Fuji Film Floppy Disks free of charge by writing to *The Fuji Home Office Guide,* P.O. Box 1738, Ridgely, Maryland 21681.

LIZ CASEY



New Age Software

A new trend in self-improvement software uses the computer as a mentor and self-development tool. Two companies on the forefront of this new age software are Winsight and Mindware.

Winsight's programs focus on supporting the decision-making process. You and the computer interact as you explore your knowledge and develop a plan of action. There are programs for personal growth, professional growth, and organizational effectiveness.

Mindware offers programs to help you brainstorm to shape ideas, hone your business skills, and explore your romantic compatibility with others. Mindware's programs foster personal well-being through self-awareness and creativity.

LIZ CASEY

No Trade Trade-in

Electronic Arts' recently introduced "Software for Life" has been expanded to include consumers who purchase a Sega Genesis video entertainment system.

Here's how the program works: If you own the IBM version of one of Electronic Art's programs and you want to buy the Genesis version, submit the back cover of the manual from the original software and pay half price for the Genesis version.

As Electronic Arts moves some of its games to videogame format, it wants to be sure that it brings loyal customers along.

LIZ CASEY ⊡

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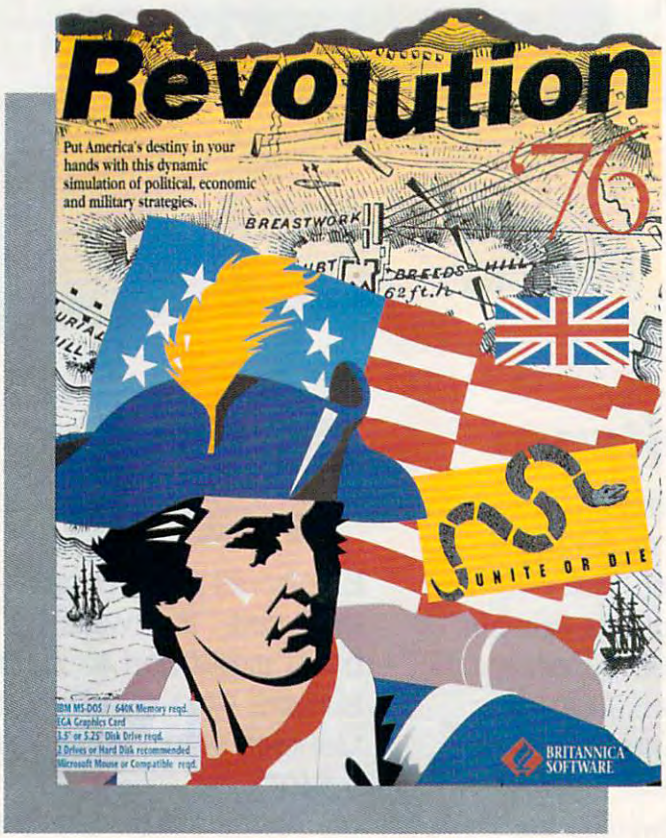

Mark Wagoner

COMPUTE CHOICE

SHAPE COLONIAL DESTINY AS YOU PLOT STRATEGY FOR AMERICA'S PATRIOTS IN THIS EXCITING REVOLUTIONARY WAR SIMULATION

CHARLES IDOL

The American Revolution typically evokes noble images of Washington crossing the Delaware or brave soldiers wintering at Valley Forge. The historical reality of this conflict is far more complex. And Britannica Software's *Revolution '76* is far more challenging and interesting than the usual war game because it acknowledges that reality as it presents you with the many problems of an emerging nation.

The scenario begins in 1775, with the colonies preparing for war with England. As manager of the American movement, you must set the stage for America's destiny, making a variety of appointments and decisions that are all part of the game's setup phase.

You'll appoint the chairmen of the Congressional committees for finance, war, navy and foreign affairs. You'll also appoint the leaders of your soldiers and the members of your

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RY

MARK WAGONER © 1990

diplomatic corps. The rebel movement was divided by political factions and regional loyalties, so pay careful attention to the information the game supplies regarding each candidate's colony, faction (radical or moderate), and special talents.

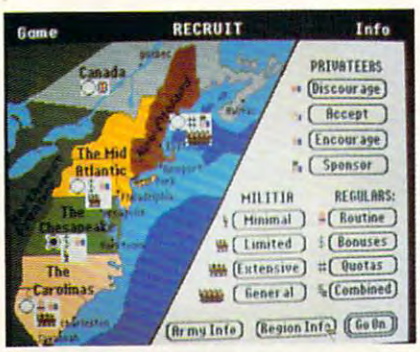
Skills in administration, negotiation, or military leadership could play a significant role in your success, of course, but so could other factors. If your appointments slight a particular region or faction, you risk offending allies and losing financial and military support. If you accede to factional demands, you might have to appoint an inept individual, a decision with its own unpleasant consequences. To complicate matters further, qualities of a candidate can change as the game progresses.

You also make decisions about how to treat Tories, set tax rates, recruit and support members of the military (privateers, militia, and regular army), and negotiate with the enemy. Here, too, your decisions can have profound implications. For example, adopting a harsh policy toward Tories in a region where Tory sentiment is strong could aggravate the movement against you and put Tory forces in the field. And as you set tax rates, remember that the colonists disliked all taxes, not just Crown taxes.

Fortunately, the game provides advisory screens about British and American activities to help you make decisions. One screen details British mobilization, another reports privateer activity, and still another allows you to click on any region or city to find out the troop strength of that location (regular and militia for the Americans, and regular and Tory for the British) as well as the identity of the general in command, if there is one.

Once you've set your policies and made your appointments, you move into other phases of the game and learn the results of your actions. *Revolution '76* provides reports of troop movements and battles, the morale and the skill of commanding generals, the strength of the British Tory party, foreign attitudes toward American support, and the terms upon which the crown will negotiate peace.

Your options for peace negotiations are surrender, granting pardons, colonial autonomy, independence,



***Revolution '76* provides detailed information to help you lead the colonies in their ongoing struggle for independence.**

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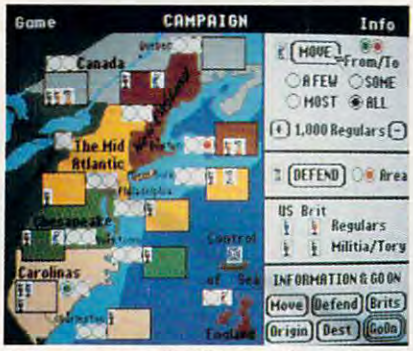
and expansion. Keep in mind that at the start of the revolution, only the radicals advocated independence. Many of the colonials would've been quite happy if the Crown had granted autonomy, allowing America self-government as a political entity of the Empire.

Premature declaration of independence will lose a great deal of your support with the moderate faction. On the other hand, not much foreign support will be found until you do declare independence. Expansion is more ambitious than independence, since it means that the Crown will have to give up claims on land west of the Alleghenies.

Foreign governments respond to your requests for support, and the



Use game-supplied information and your own strategy to control the military.

Crown lets you know what it thinks of your peace terms. After you've progressed this far, you must pause to deal with the game's copy-protection scheme. (I thought we had gotten away from those.) Included with the game is a booklet called *Historical Perspective,* which presents an excellent summary of the revolution. Unfortunately, you must use it to answer a question, which will allow you to get back to the game. With that nuisance behind you, the game continues.

A sequence of screens repeats for each phase (year) as the revolution proceeds. The first shows a progress report for the phase just completed, comparing the conditions in January and December for military control of regions and cities, colonial political support of the revolution by region, your economic status, and British political support of the war. Economically, you're operating with a budget deficit, and the status screen reports the extent of inflation.

At this point you can declare independence, select executives to replace the weak Congressional committees, confederate to supplant the weak Continental Congress, and reform the economy. Economic reforms include, in order of unpopularity, punishing profiteers, price controls, reforming the currency, and repudiating the debt. You should consider the situation carefully before you act because your actions can cost you support.

Confederation offers you the most to gain and the most to lose. You face the issues of taxation, representation, western lands, and slaves. The taxation issue forces you to choose between federal taxation and state subsidy. Although federal taxation provides stability and control of income, the colonies uniformly oppose it.

Representation can be by colony, by colony population, or bicameral, a combination of the two. Small colonies favor representation by colony; big colonies, by population. The western lands issue is to decide whether those lands are under federal control or in colony ownership. The colonies are split on this question. The slavery issue is not whether there should be slaves but how they should be counted for levy and representation. Your choices are not to count them, to count them all, or to count them partially.

After you've chosen the terms of confederation, you receive the count on ratification. If you don't like that count, you can withdraw the proposal and try again a year later. Unless the terms are quite popular, they may have a drastic effect on the American cause.

Another screen informs you of the army losses through desertion, disease, and expiration of enlistments. These losses can be heavy and may cause you to change your military strategy. A consolation is that the British forces suffer similar losses. The losses on both sides change as the game progresses.

After all of this, the cycle moves back to the administrative screen, where you set the tax rate and Tory policy. After you've made your administrative decisions, you enter a new phase (year), and the sequence repeats until the game is won or lost.

Almost all of the screens contain attractive graphics, and all of your selections are by mouse. I did encounter some problems with the pull-down INFO menus. My system locked up when I clicked on some of the choices. [According to Britannica, the menus are memory resident and could cause the game to lock up if you're making too many other demands on your computer's memory, such as using DOS 4.0 and a large AUTOEXEC.BAT file. —Eds.]

The game requires several hours to play, though you can save it for later resumption. If the British win, the screen states that the patriots, in Franklin's words, "having failed to hang together, hang separately."

If the Americans win, you're rated on your leadership with a grade of poor, fair, good, or excellent. I lost the first few games I played, probably because I wasn't paying enough attention to opposition to my actions. Then I got a grade of poor, and finally a grade of fair. I have yet to do better.

The game is challenging, interesting, educational, imaginative, and clever. It deserves better documentation than Britannica provides. The manual was written for the Apple IIGS and offers only an addendum for IBM owners.

You can choose from George Washington and other great patriots to lead the colonial government and military forces.

In spite of falling short in a couple of areas, Britannica has created an enjoyable game. *Revolution '76* challenges your abilities as a political and military strategist as it gives you a more complete understanding of this chapter of American history and a fuller appreciation for the complexities of revolution and history in general.

Revolution '76

IBM PC and compatibles with 640K, EGA, mouse; two floppy drives or hard disk recommended—$49.95

Package includes the manual, *Historical Perspective,* three 5¼-inch disks, and two 3½-inch disks.

Also available for the Apple IIgs.

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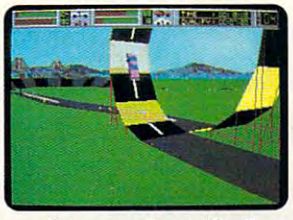

You can almost feel the gut-wrenching G-forces from the loop.

The recorder mode plays back the action from numerous camera sites.

And when you're ready for the big thrill, hook up head-to-head and race against a buddy on another computer.

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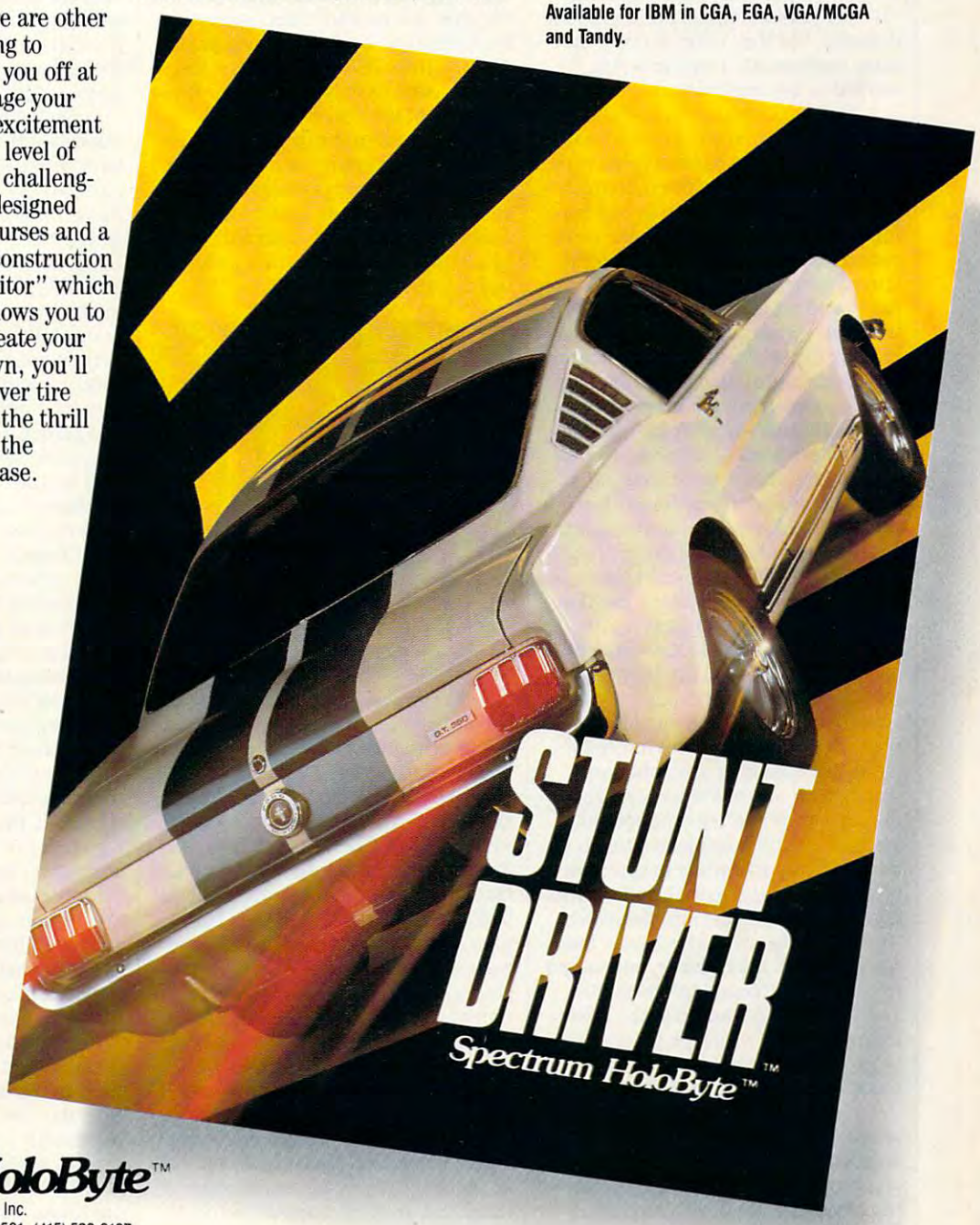

Screens shown are IBM EGA.
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PATHWAYS

STEVEN ANZOVIN

One day my son came home from school and told me he had used the class's brand-new computer to study math. "I wanted to like it, but it was dumb," he complained. "It tried to make all the problems look different, but they were all really the same underneath. I was so bored, I worked in my workbook instead."

Only eight years old, and already bored with computers. Look around, though, and you'd have to agree with the conventional wisdom that much of the computing we do is pretty boring stuff. At work, we rarely use computers for anything but writing form letters, keeping numbingly huge databases, and plugging monthly sales figures into spreadsheets. In school, our kids are exposed to a small number of approved educational programs that at best supplement the main work of learning and at worst are poor substitutes for Nintendo. At home, we play look-alike games that exercise our adrenal glands and trigger fingers but not much else. All these applications are absolutely crucial to the proper functioning of the modern world (including games, one could argue), but that doesn't make them any less boring.

What happened to the vision of computers as magical machines that would rescue us from drudgery and boredom, expand our mental and physical worlds, transform our lives? Or, to put it another way, what can you do with that box when your romance with *WordPerfect* has palled? Luckily, it's still possible to avoid boredom and find adventure in computing, if you know where to look and are willing to put some effort into the search. After all, going off-road is harder than cruising down the highway, but you get to see and do things that others miss, and you never fall asleep at the wheel. In this column, we'll look for the computing roads less traveled by, since that's where most of the fun is.

One cutting-edge application for your PC is animation. If you haven't been asleep for the past few months, you probably know what Leonardo, Michelangelo, Raphael, Donatello, and Bart Simpson all have in common. They're *toons*—that is, animated cartoon characters. With the Ninja Turtles, Simpsons, and Jetsons pulling in big entertainment dollars across the land this past summer, animation looks ready to begin its second golden age (the first was defined by the still unsurpassed Disney and Warner Bros. cartoons of the 30s, 40s, and 50s). Computers are transforming modern animation, speeding the production of traditional cartoons and making possible new kinds of animation the old Disney Studios never dreamed possible. Now the new animation technology is trickling down to PCs.

THE LATEST TOOLS CREATE MAGICAL MACHINES

The Amiga has long been the platform of choice for desktop animators, but two programs for PC compatibles have recently leveled the field. *Autodesk Animator* (Autodesk, 2320 Marinship Way, Sausalito, California 94965, 415-332-2344, $295.00) and *Deluxe-Paint Animation* (Electronic Arts, 1820 Gateway Drive, San Mateo, California 94404, 415-571-7171, $134.95) both offer complete color painting and animation environments. With these programs, you can draw an object or import a piece of clip art and then stamp the object down in various positions on a sequence of background frames. When the frames are played back, the object appears to move over the background. Or the computer can do the movement for you automatically, flying the object across the plane of the screen, making it appear to recede or come forward, and flipping it around any axis of rotation. The possibilities range from handcrafted art animation in the Disney style, with detailed characters, shadows, and the works, to ultramodern flying-glass logos that can be created in a few moments for corporate presentations and home videos.

On the Macintosh, animation is taking a different path. For example, with *InterFACE* (Interactive Facial Animation Construction Environment, from Bright Star Technology, 14450 NE 29th Street, Suite 220, Bellevue, Washington 98007, 206-451-3697, $499.95), you can create "talking agents"—customized, animated talking heads that synchronize to digitized or computer-generated speech—and put them in your own presentations to serve as narrators and guides. *HyperAnimator,* a less-expensive version ($149.00) customized for use with *HyperCard,* is also available. Future agents will graft right onto the Mac's system software, so Albert Einstein or the Joker could pop up at opportune moments to alert you to incoming E-mail messages or remind you of your mother's birthday. (Having complete control over a set of little simulated slaves inside your computer does have its appeal, but wait until they revolt and take over the machine for themselves.)

The tools for making your own toons are available, affordable, and learnable. But why bother? Cartooning is a lot of work, even with the computer's help. One good answer: Cartoons are riveting in a way that other kinds of moving images are not, a fact that the animators of the classics knew well. If you have something important to say, an animated message will hit its mark with real impact. Animation also provides reality relief. In animation, anything can happen, with no plausibility strings attached. Probably the best part is that you need please only yourself. If you can't draw even as well as Matt Groening, so what? You can still make some serious magic with your machine. ⊡

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CAN Software TEACH?

CAN SOFTWARE HELP YOUR KIDS LEARN, OR IS IT JUST MORE FUN AND GAMES?

MICHAEL C. PERKINS AND KELLY RIVERS

The screen flickers, *1 + 1 = ?* The child's eyes blink. The child hesitates, with finger poised over the computer keyboard in search of the right key. Ah, yes, 2. The child pushes the key, and the number 2 appears on the screen. Bells and whistles sound, fireworks appear on the screen, a dancing horse stands on its hind legs, and large letters flash across the screen *Good Work!* Next door, another child has entered a wrong answer, an alarm sounds, and a sad face appears on the screen. *Try Again,* it says.

These children are involved in the most common use of computers in elementary schools—drill and practice—which is little more than an electronic flashcard system. According to a study done by Johns Hopkins University, this system accounts for about 60 percent of the use of computers in our elementary schools. Many of the best-selling children's software programs represent some form of drill and practice in math, reading, spelling, and science. But is this approach really educational?

Better Than Blackjack?

Some teachers and parents are skeptical of the value of such programs, especially considering the time and expense involved in using them. Catherine Staat, an elementary school teacher in Pacific Grove, California, explains: "It's hard for me to justify spending $49.95 on a program that's basically drill and practice and can only be used on one computer. Not only are many drill-and-practice programs expensive, but I find the students quickly become bored with the frills that reward them onscreen, such as a little man shooting out of a cannon or a rabbit dancing on a wire. I sometimes think I would be better off buying a deck of cards and letting the children play blackjack. In that case, not only would several students get to play at the same time, but math concepts would be reinforced—and only for about $2."

Defending computer flashcards, however, is Davidson Software, producer of souped-up versions of drill and practice such as *Math Blaster Plus* and *Word Attack Plus.* In an August 1989 press release, Davidson cited a survey of its customers and claimed that educational software had actually increased children's grade point averages, by as much as a whole point in some cases. The company president, Jan Davidson, refers to these survey results as "quite dramatic" and argues that they serve as "objective, independent verification" of the value of these programs. Yet, in spite of this survey commissioned

MARK WAGONER © 1990

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by Davidson, how do we know that the same results couldn't be achieved with old-fashioned cardboard flashcards? Unfortunately, a comparison of computer-based learning and regular flashcards wasn't made by the Davidson study to see if there's any real difference between them.

Lynn Chan, former coordinator of California's Model Tech Project and now technology coordinator at the 550-student Skyline Elementary School in Daly City, California, agrees that drill and practice is largely a waste of time. But she does see potential in other uses of the computer. She says: "The best programs are those that involve children in some kind of genuine thinking process. I believe the best way for software publishers to develop programs like this, that can be effectively integrated into the instructional process, is to listen to teachers and use their input to produce the software that will truly supplement and enhance education rather than merely entertain or fill up time."

Attempting to address this concern, The Learning Company, a Fremont, California-based educational-software publisher that produces such programs as *Reader Rabbit* and *Math Rabbit,* defends its use of games by claiming they're more than just drill and practice. The Learning Company states that, in addition to reinforcing basic curriculum subjects, its material is designed to build thinking and problem-solving skills. The Learning Company has pursued a conscious educational strategy by producing school editions of its products with lesson sequences, skills matrix charts, and work sheets.

Stickybear Townbuilder ***is a good example of a computer-aided design program for kids.***

Road Not Taken

As an antidote, or at least as an alternative to drill and practice, many parents and teachers have shown a preference for word processing, database, drawing, desktop publishing, and even spreadsheet programs to show children how to write compositions, store and organize data, perform calculations, and generate newsletters.

Others have favored hard-core programming projects in BASIC, PASCAL, or the more experimental LOGO language, although all three languages have been criticized for their limitations.

Fortunately, in addition to word processing and programming, there are imaginative alternatives that go beyond the dancing rabbits and exploding rockets often found in drill and practice.

Included in these alternatives for children's computing are computer-aided design (CAD) programs, simulation programs, learning games, and thinking-skills programs.

Junior Designers

As CAD packages reach into more areas of industry—where they're used to create such things as airplanes, home interiors, landscapes, and clothing—the opportunity for children to experiment even on low-powered computers with CAD is that much more exciting and useful. These programs also help children develop good computing habits, including improved concentration, greater patience, and better thinking skills.

Some good examples of CAD programs for children include *Stickybear Townbuilder* (ages 5 to 7, from Weekly Reader Software), *Car Builder* (ages 9 and up, from Weekly Reader Software), *SimCity* (ages 12 and up, from Maxis Software), and *AutoCAD* (ages 12 and up, from Autodesk).

Candice Tasaki, a longtime user of *Car Builder* and *Stickybear Townbuilder* in her years as a computer coordinator and now as a classroom teacher in the San Jose Unified School District in California, says these programs are particularly well received by students. "Initially, the students are a bit thrown by the apparent complexity of the CAD process, but I've found it grows on them in a hurry," explains Tasaki. "I particularly like the fact

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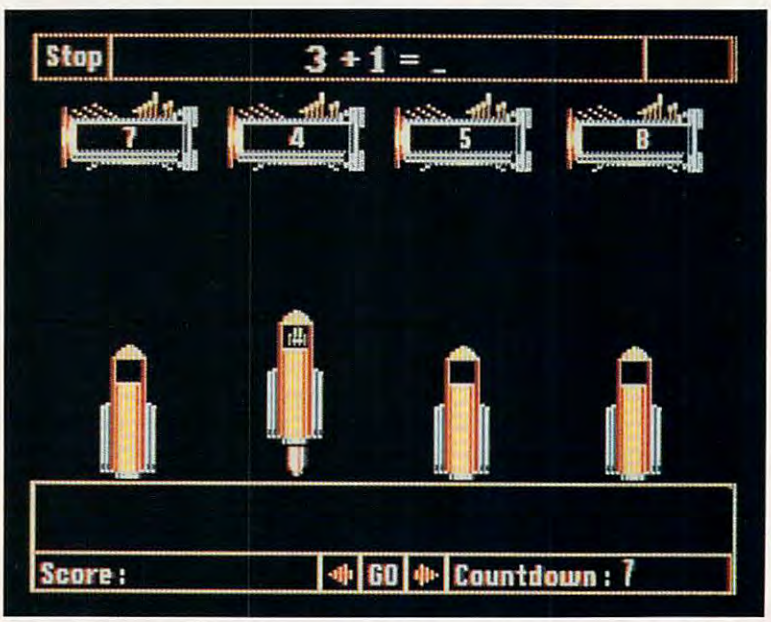

Math Blaster Plus ***combines a drill-and-practice tutorial with an arcadelike game.***

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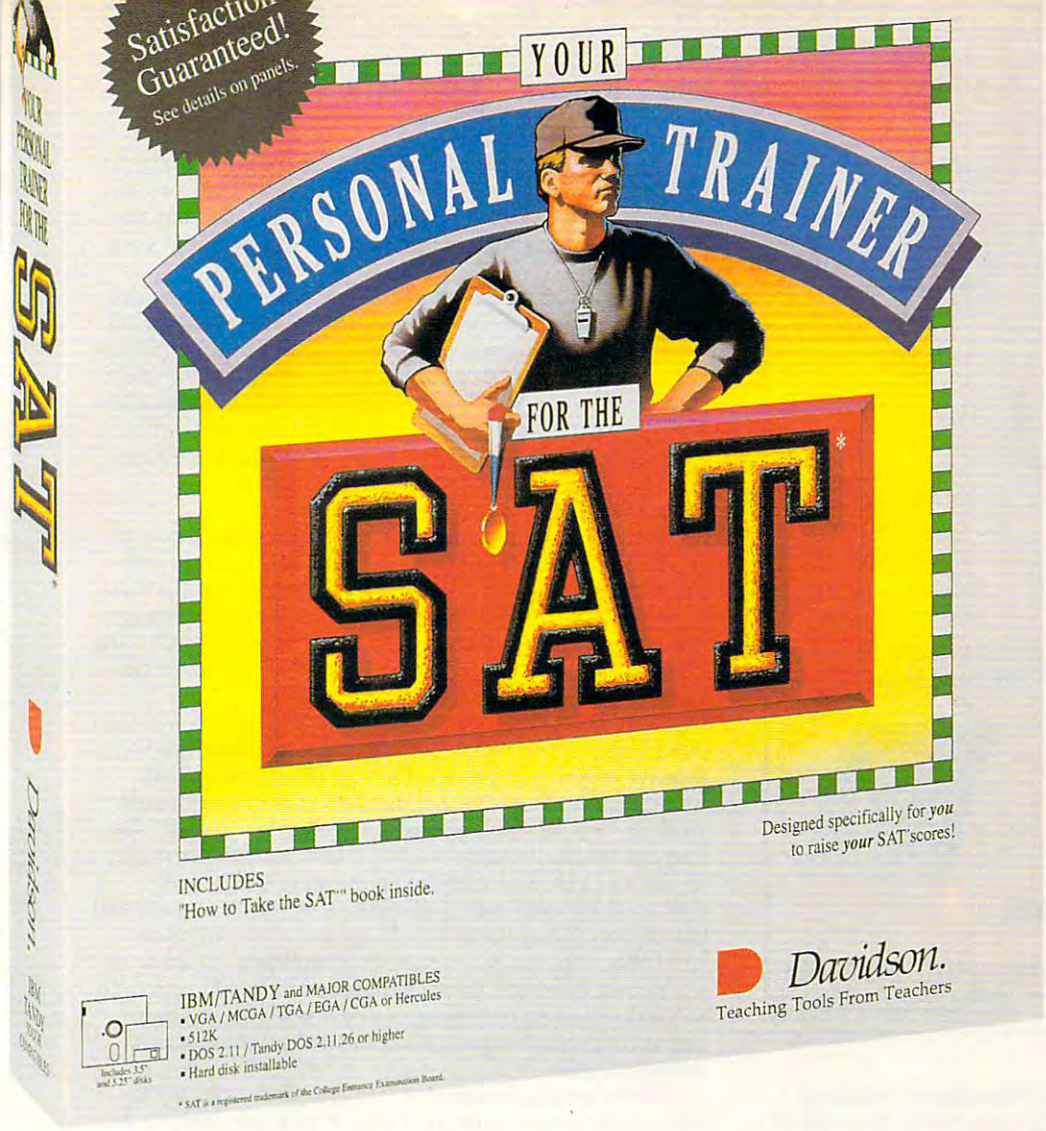

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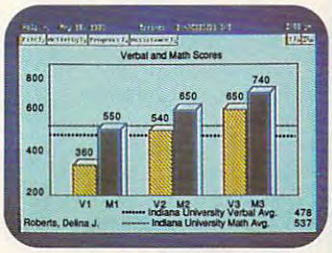

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continued from page 66

that the programs are teaching so many things, including the value of reading and following instructions, the value of trial-and-error experimentation, and the value of the computer as an instrument of design."

Tinker, Tailor, Soldier, Spy

Another innovative alternative to the computer flashcard system is simulation. Computer simulation programs allow children to role-play, for example, as pioneers, business people, detectives, or space travelers. In doing this, children are challenged to plan ahead, solve problems, organize data, make deductions, and learn from their mistakes.

There are many excellent simulations available, including such well-known titles as *Seven Cities of Gold* (Electronic Arts), *The Ancient Art of War at Sea* (Brøderbund), *Balance of Power* (Mindscape), and *Zork II* (Infocom/Electronic Arts), as well as the classic flight simulator programs. Two other programs that quietly have survived the test of time to the point of becoming classics are *Oregon Trail* and *The Market Place.* Both are published by Minnesota Educational Computing Corporation (MECC).

In *Oregon Trail,* children pose as trailblazers who must cross rivers, fight diseases, hunt for game, and survive harsh weather as they travel the 2,000-mile Oregon Trail in the year 1848.

David Ellison, an English and history instructor at Barnard-White middle school (grades 5–8) in Union City, California, swears by the *Oregon Trail* program. In addition to the built-in interaction of the online material on *Oregon Trail,* Mr. Ellison also has his students keep a diary and write a paper about their experiences on the trail. "Before using programs such as *Oregon Trail,* " he says, "I used to be very anticomputer, but I'm now very procomputer because of the way a simulation can make an otherwise remote subject, such as the pioneer experience in American history, come to life."

In *The Market Place,* children have the opportunity to run apple stands, plant shops, and lemonade booths as they learn the practical side of pricing, advertising, and business profits by working with bar graphs, spreadsheets, and sales reports.

Jim Mcloud, a teacher at Addison School in Palo Alto, California, says, "In addition to using *The Market Place* to teach business concepts, I've also liked the fact that the program has served as an opportunity for applied math, where students are doing calculations that have some demonstrable practical result that goes beyond the usual word problems or busy-work drills found in the typical math textbook."

Play Till It Smarts

Some educational programs such as the Carmen Sandiego series (from Brøderbund), though definitely not drill and practice, are harder to classify and can best be described as *learning games.* At the same time, given the notorious ignorance American students have of history and geography, the imaginative challenge presented by the Carmen series can only be welcomed by parents and teachers.

Kim Ford, computer coordinator for grades 4–8 at Carden El Encanto School in Santa Clara, California, has had a positive experience with the Carmen programs and has found them to be among the most popular programs with students. But she explains that they have their place: "The Carmen programs really cannot be said to teach geography or history in the way a textbook or lecture traditionally does, with the conveyance of certain facts, such as dates and places, and concepts, such as the causes of the American Civil War, that can be tested through multiple-choice or essay exams. Instead, I think Carmen serves as a fun stimulus to take an interest in geography and history, as well as to call into play the knowledge a student already has about these subjects."

Other programs focus on *thinking skills* even as they retain some game elements. A couple of good examples are *Think Quick!* (The Learning Company) and *The Factory* (Sunburst Communications). With these programs, children get involved in all kinds of mind-stretching activities, including taking part in trial-and-error processes, gathering and classifying information, and learning to visualize, observe, and solve problems.

Defending the value of these types of programs, Tom Sarnicola, computer coordinator at St. Emydius School in San Francisco, California, says: "While the results are not as clearly measurable as a straight simulation or as emotional as a game, I still like to watch my students go to work in solving the problems that confront them through these thinking-skills programs. I feel they are using a part of their brain that might not otherwise be called into play by traditional subjects."

Are We Learning Yet?

So is educational software truly educational? There's no question that educational programs can vary in their ability to teach our children. If a school or a parent is going to buy a computer or spend $40 on a program just to do math problems or practice spelling, it would be better to buy a box of flashcards.

But if a child can use a computer in a way that takes advantage of its real capabilities—to write a school paper, design a product, or learn from a simulation—then the potential of this new technology is finally being tapped. ⊡

Perkins and Rivers are independent computer-education consultants. They have written extensively about computer education for children.

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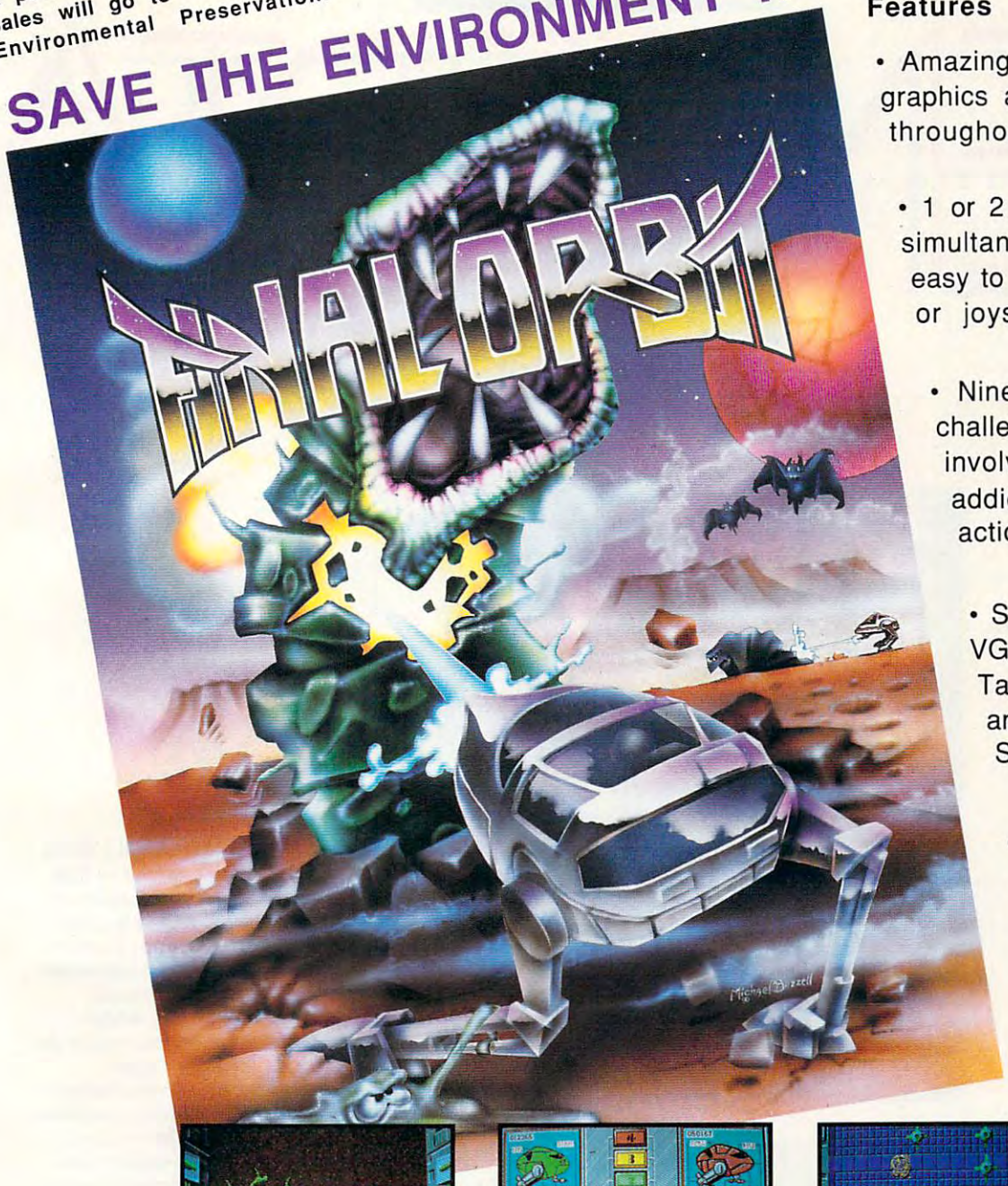

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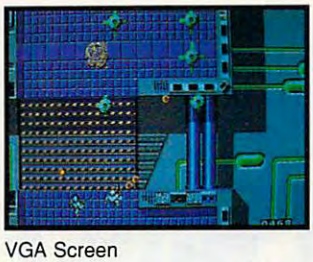

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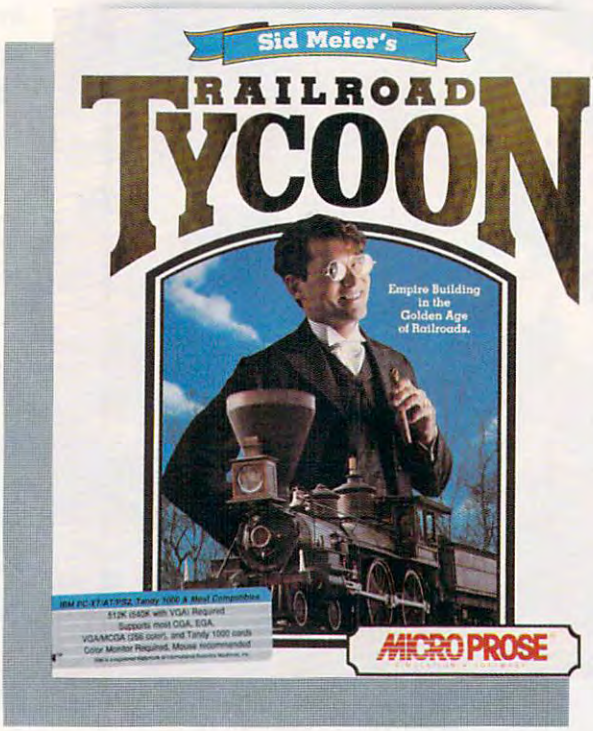

Mark Wagoner

COMPUTE CHOICE

FORGE RAILS ACROSS THE PRARIES AND KEEP THE BIG IRON ON TRACK, AND YOU'LL GET RICH QUICK

GREGG KEIZER

Iron horses once ruled the world. From their jolting start in England to their continental sweeps over America, railroads made fortunes and forged nations for more than a hundred years. Rails stretched across prairies, smoke streamed through mountain passes, wheels groaned over countless ties—all in the name of industry and progress.

People have always been attracted to trains, as if the complex machines were alive. Maybe it's the breathing, huffing sounds a steam engine makes, or the way a whistle echoes in the distance on a summer night.

In a stunning departure from its standard fare, Microprose has exploited this fascination and come up with a compelling world-building simulation of railroads, trains, and empires. Not only is *Sid Meier's Railroad Tycoon* the company's only simulation sans combat, it is possibly its most detailed and realistic one. The worlds you make with *Railroad Tycoon* may exist only inside the computer, but they're as real as they can get without smoke in your eyes and sparks in your hair.

Railroad Tycoon is a capitalist's dream. Making money, a lot of it, is the idea. Your railroad prospers if you deliver goods and people from one

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INMENT

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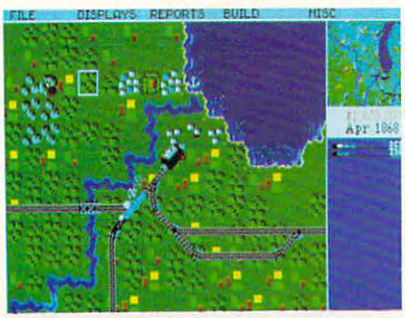
place to another on time and to the right places. To get rich, you've got to take your tiny company—with no track, no trains, no passengers, and no freight—and turn it into a giant. An initial investment of a million dollars (or pounds, if you're playing on European turf) is the start of your budding empire. You grab for a piece of the American Dream by making almost every kind of decision imaginable, from surveying the grade for new track and bridging rivers to scheduling trains and getting the right goods to the right markets. If all this sounds too involved, don't worry; *Railroad Tycoon*'s interface is among the best in the simulation business.



Keep the Chicago Zephyr running on time and you'll profit considerably.

Open *Railroad Tycoon*'s box and you'll find three 5¼-inch disks, a 180-page manual, a much shorter technical supplement, and two laminated player's reference cards. Installing the simulation on your hard disk is fast and easy, unless your only 5¼-inch drive is B:. In that case, you'll have to forgo the automatic installation and copy the files manually. If you don't have a hard disk drive, make backup copies of the disks and get ready for some swapping during play. *Railroad Tycoon* requires a 512K IBM PC or compatible and works in CGA, EGA, MCGA, Tandy 16-color, and VGA modes. The game is virtually unplayable in CGA; it's impossible to tell where your trains are, and the types of goods and cars all look alike. A mouse isn't required, but I wouldn't want to play this game without one. The program supports the Ad Lib and Roland sound boards and the Tandy sound chip for enhanced sound effects. Traditional blips and beeps are there for the rest of us.

Nearly every aspect of building and running a railroad is packed into *Railroad Tycoon,* so read the manual before you start. Don't let the size of the manual spook you, though. Once you've played a session or two you'll be amazed at the game's elegant simplicity. Hats off to designers Sid Meier and Bruce Shelley for the snappy interface. Pull-down menus and full mouse support let you access detailed info about your trains and stations by pointing and clicking. In fact, productivity software designers could learn a thing or two from *Railroad Tycoon*'s interace. My only complaint was that some choices are irreversible. I laid a lot of track I didn't want, and I built

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more than one expensive station terminal when I meant to make a cheaper depot. This game needs an undo function.

You get to pick which territory you'll conquer: the eastern U.S. of 1830, the western U.S. of 1866, England of 1828, or Europe of 1900. I enjoyed the domestic scenarios the most—especially the western U.S., since the city names were familiar—but those less ethnocentric may find the crowded lands of Europe and England just as much fun. To keep you coming back, *Railroad Tycoon* changes the landscape each time you play. Though towns, cities, rivers, and mountains stay put, Chicago may be a broad-shouldered metropolis in one game and just a burg near a lake in another. Raw materials, industries, and competing railroads shift from place to place, too, so that no two worlds are exactly alike.

Your most important decision is where you'll lay your first stretch of track. It's best to start in a city near natural resources your trains can transport. Look for population centers in the largest scale display (there are three scales in all, from continental to local); search the surrounding countryside for coal mines, oil wells, ranches, grain elevators, and lumber mills; then survey the terrain. The flatter the ground and the fewer hills, mountains, and rivers in the area, the less money you'll spend laying track.

Connect two cities with a rail line; then start buying engines and cars. More decisions. You must have the right kind of cars for the goods you'll move. Passenger cars won't transport petroleum, and livestock won't get into coal hoppers. You choose engines from the actual machines of the period; faster, stronger locomotives cost dearly, while slower, punier engines may not pull their weight. It's easy to strike an economical balance between fast passenger and mail trains and slower freight trains at the start, since you own just one stretch of track and are moving just one or two types of goods. It gets much harder as your empire grows. Even so, *Railroad Tycoon* makes it as painless as possible to track the trains you own, their composition, scheduled stops, and whereabouts. A miniature display is always onscreen and a more detailed report is a keypress or mouse click away.

The initial million dollars slips through your fingers fast. You can raise more money by selling another bond, but then you'll be saddled with interest payments. As in real business, it's best if you can expand your company with its profits. That's only possible if you've made the right moves and your trains carry lucrative cargoes. Hunt through the countryside for raw materials such as coal, oil, and lumber. Spot the industries that produce steel, food, paper, and manufactured goods. Lay rails to connect everything and then ship stuff to cities where demand is high. Quickly tote passengers and mail between towns. Do all this and your trains will rack up thousands of dollars each trip.

Building an expensive iron bridge can prevent a more expensive collapse later.

To really dive into *Railroad Tycoon,* you'll want to choose something called Complex Economy. Here, each city produces certain goods and only pays for what it needs. You've got to match markets to producers exactly. An interesting way to really turn a profit is to ship raw materials to one city, coal for instance, where it's turned into steel. That steel is then taken to another city where it's transformed into manufactured goods. Transport those goods to yet a third city and you've turned one car of coal into two more carloads, each one a revenue maker.

Want to play dispatcher and run your trains like an incredible model railroad? *Railroad Tycoon* lets you manually direct trains by overriding the simulation's automatic signaling. You can push two fast trains down the same stretch of track or pause a freight train to let a mail train make its schedule. Screw up and trains collide, a disaster for your line since accidents make shippers pull cargo from your trains. Even more insidious is the occasional bridge washout. If you don't react in time, trains hurtle off the edge, *Bridge on the River Kwai*–style. The animated scene, one of several, seems a sop to past Microprose simulations. Thankfully, you can turn off the animations and imagine train wrecks and bridge building yourself.

You aren't building your empire in a vacuum. Three other companies compete in your world, run by the computer and headed by real railroad personalities from the period. They'll try to beat you to the best markets, box in your lines, and generally make your life miserable. You can counter by pushing track into a competitor's station to start a rate war. If you're not prepared to give that city topnotch service, however, you'll likely lose the war and your investment. A more direct way to your competitor's throat is to buy enough stock in his line so that you can take control. It works the other way, too, so start worrying when someone begins eyeing *your* stock. You're out of a job if a takeover is successful.

Documentation is extensive, though I found things unclear in places. I still don't know how to accurately read parts of a station's shipping report, for instance. And it took me several tries before I figured out how priority routing and manual switching work. Overall, however, the manual spells out the simulation in prose worth reading.

I've never owned a model train, but that didn't keep me from spending hours with this program. The simulation is so complete, so complex in its world building, that I can't begin to describe all its details or subtleties. At the same time, *Railroad Tycoon* is a lot of pure fun. Assembling trains and then watching them negotiate tracks, pull into stations, and huff and puff their way up grades is almost as much fun as running a model railroad in your basement. Only the smell of an overheated transformer is missing.

Working on several levels—miniature world of railroads, capitalism at its best (or worst), exploration (and exploitation) of unchartered lands—*Railroad Tycoon* is a welcome change from military simulations. After all, there's more than one way to ruthlessly destroy an enemy. *Sid Meier's Railroad Tycoon* is about more than just trains. It's about power, fame, and fortune.

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GAMEPLAY

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In the halcyon days before IBM's big, blue eyes focused on microcomputing, anybody with a computer could learn to create good games. Even I, knowing nothing, could create stuff on my Atari and my 64. Self-taught home computer wizards could make those machines stand up and dance. And they could do it with only 48K.

When the PC came around, all of a sudden it seemed you had to be a corporation to make games. Even home hackers ended up with game designers overseeing projects, an art department doing graphics, programmers doing the scutwork, and marketing types making all the decisions that mattered.

In short, it looked like home hackers were either going to have to get serious about game design or get out of the business.

But a guy named Scott Miller in Garland, Texas, didn't know that home game design was dead. He got one of the original 1980 IBM PCs and, using whatever language came to hand (now he works with *Turbo Pascal* 5.0), he started creating a series of games called Kroz.

Kroz—Zork backward. But unlike the Zork games, Kroz games weren't text, they were graphics. You didn't read descriptions and then type words; you used the arrow keys to move a player-figure around the screen. Mazes, obstacle courses, tricks, traps, monsters, magic spells—it's hard to think of many ideas in the fantasy games that aren't present in the Kroz series.

Miller didn't eat up memory with vast graphics displays. His whole game uses the standard IBM character set. The player-figure is a little yellow happy face. Monsters are those weird Greek characters, or an *A* with an umlaut; different-shaded blocks represent different kinds of walls; diamonds, clubs, and hearts all have specific meanings.

You can play a whole game on a monochrome screen with a pathetic amount of memory—or on a 386 screamer with VGA—and it looks good and plays wonderfully. It takes every bit as much dexterity, both mental and manual, as, say, *Lode Runner*. True, you have to use your imagination a little more, but because Miller has been both clever and clear, you soon forget that you're looking at the standard character set.

The only way Miller could have an art department and a programming department and a game-design department would be through multiple personalities, because he does it all. His marketing department, on the other hand, is huge but costs him nothing: He puts out Kroz as shareware.

Here's how it works. He creates three games at once—a trilogy—and then chooses one of the games to distribute as shareware. There are dozens and dozens of shareware libraries; they all get Kroz for free and distribute it free to their membership.

The shareware game is complete. If you're content with just one Kroz game, you never have to pay.

But anybody who has played one Kroz game wants to play more. And to get the other two games in the trilogy, you have to go to Scott Miller. Even then, though, you're paying less than the most heavily discounted "professional" games. For each trilogy, including hint books, maps, and information about secret easier-play modes, you pay $20 (or, if you want, $7.50 each for individual games). You can buy all six in the first two trilogies for $35. If you want his huge new game, *Lost Adventures of Kroz,* you pay $20. In short, you can get all the Kroz games for $55.

And I assure you, it's worth many times that, compared with what you usually get for 50 bucks these days. Miller is clever (downright twisted sometimes), and you'll enjoy the contest as you try to outwit him, whipping your way through walls and monsters. Start with one or buy them all—you'll feel that you've gotten a great game for *less* than it was worth.

You make checks and send orders to Apogee Software, 4206 Mayflower, Garland, Texas 75043. Apogee Software sounds like a corporation until you realize that it consists entirely of Scott Miller. When you get your disks, it's because Miller sat there at his hot new PC running batch files to copy the programs onto the disks he sends you. *Every* disk is personally handled by the game designer.

In case you're getting inspired to go back and pick up where you left off in your own game programming, here's a piece of good news: It's profitable. Miller averages between 50 and 60 orders a week, with highs over 200. He makes a decent profit because he has *no* overhead—unless you count the fact that a few years ago he had to get an apartment of his own because his operation had taken over his parents' house.

Miller is just beginning to get Kroz onto the online services—he only got his first modem a few weeks ago. And he's going international; a European disk magazine, *Otic International,* is translating Kroz's instructions into several languages and distributing it over there. He's even working on an EGA version.

So all you would-be home hackers, get back in front of that monitor where you belong and start writing. The world needs more cheap, but excellent, games. ⊡

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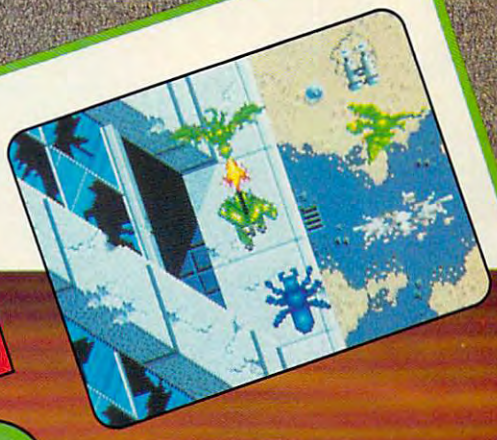

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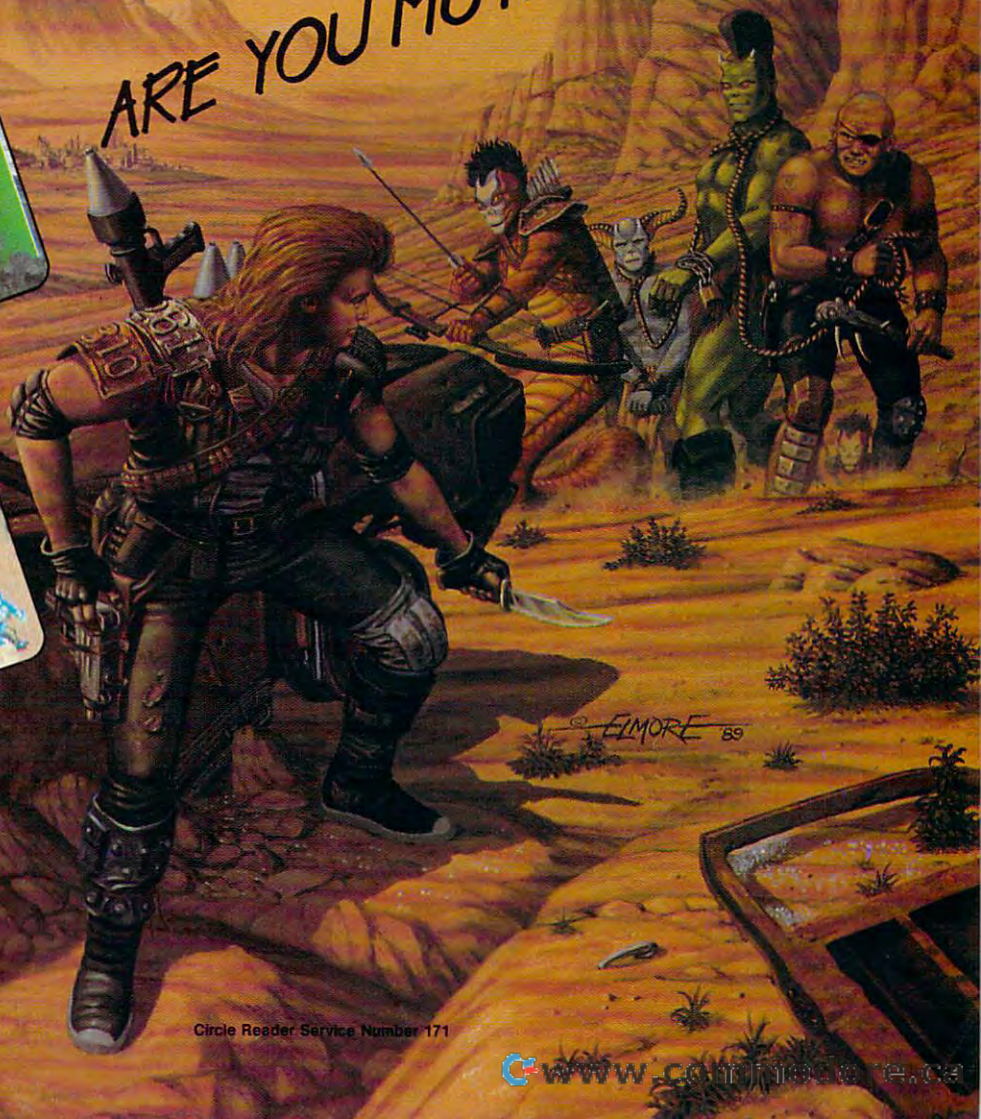

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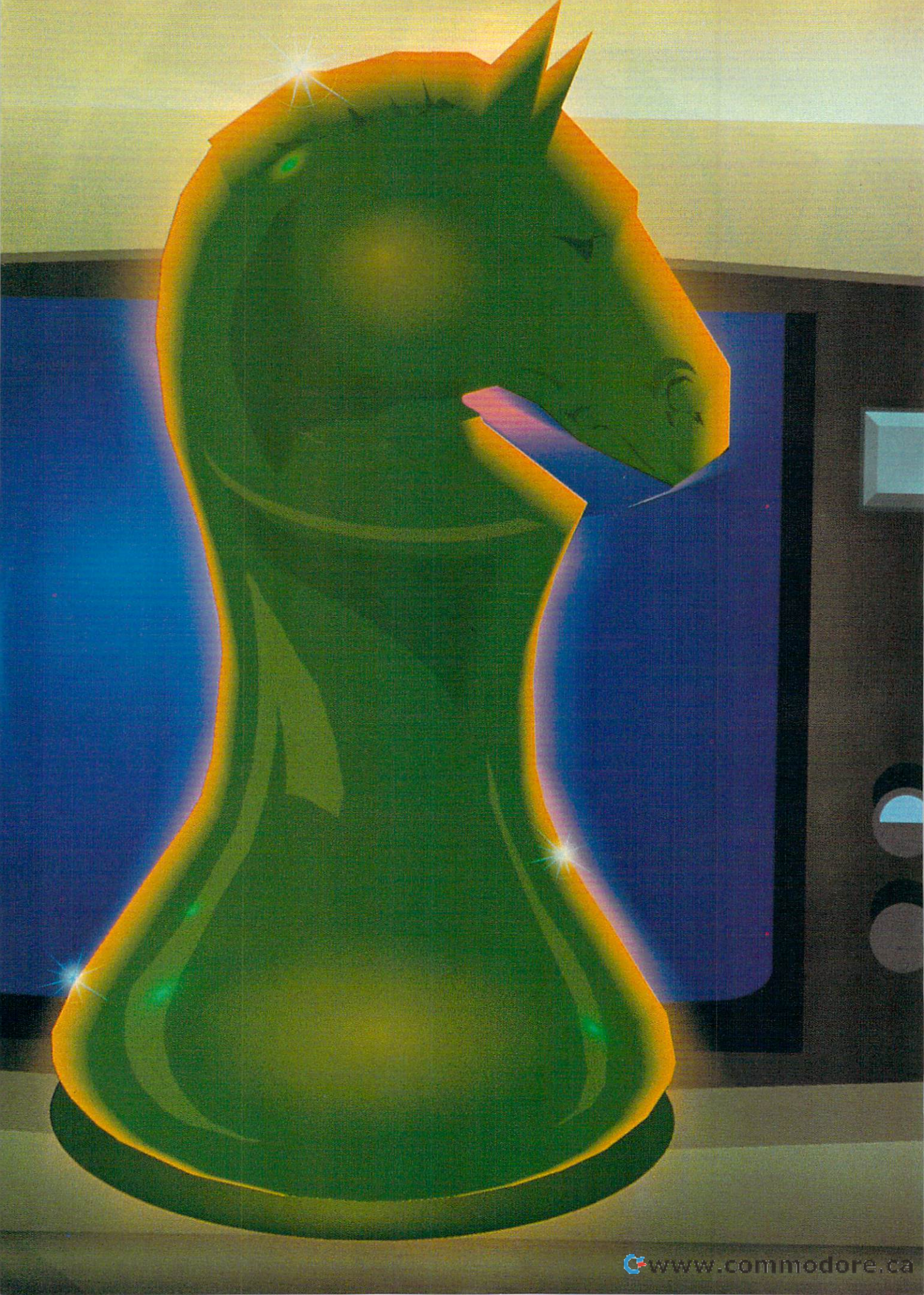

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THE DESIGN GAME

NOT LONG AGO, IT TOOK ONLY ONE PERSON TO WRITE AN ADVENTURE GAME. TWO TOP GAME DESIGNERS REVEAL WHAT IT TAKES TO WRITE ONE TODAY.

TOM NETSEL

You're a programmer with an intriguing story about a hero on a quest to save the world. You've got monsters, sound effects, and a catchy musical score to accompany your outstanding graphics. You've got all the ingredients for a best-selling adventure game—or have you?

"The old-fashioned way of getting into the adventure market—a guy out in his garage, writing a game and sending it to a publishing house—just doesn't cut it anymore," says Chris Roberts, game designer at Origin Systems and author of *Times of Lore* and *Bad Blood*. In the past few years, game design has become a team effort.

Specialization is the buzzword in the adventure game industry now, and the game designer's role has changed. "Game designers today come up with the overall concept and feel of the game, and the direction they want it to take," the British-born Roberts says. "I go with an idea or a concept rather than a particular story line. I guide it but let the specialists take care of their sections."

Those specialists include writers, experienced in fantasy or science-fiction markets, who take Roberts' concept and create a story. Graphic artists, programmers, and musicians also contribute their talents to produce the kind of state-of-the-art product that's demanded by today's sophisticated game players.

Cheap Labor

It wasn't too long ago that Roberts did all the work himself. "In the early days it was great," he says. "Back in England, I did my own graphics, my own programming, my own game design. It was very cheap, and so any royalties I got were like money in the bank."

Roberts created those first games to please himself, but he says game design now is market-driven. "In the old days, I used to ask myself, 'What do I think is fun?' Now it's, 'What do I think is fun, but what will everyone else think is fun so we can sell a lot of copies and pay everyone's salaries?' "

A typical project may require four or five artists, one or two programmers, and at least one writer. As a game nears completion, Roberts usually pulls in a musician who spends a month or two composing a musical score for the game. "There's a lot of specialization now," he says. "It makes the product a lot more professional, slick, and better, but obviously it costs a lot more." ▷

IMAGE ELECTRONIC

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Richard Garriott, co-founder of Origin and designer of the popular Ultima series, has seen similar changes. "In the early days, in *Ultima I* through *III,* I did everything," he says. "I designed the game, I wrote the story, I programmed the code, I drew the graphics, I drew the maps of the worlds themselves, I generated the text for the conversations of every individual in the game. You really had to be a jack of all trades back then."

But with *Ultima IV,* the games became bigger—too big in fact. Garriott needed help, and some of the code was outside his range of expertise. He hired programmers for *Ultima IV* and *V.*

With *Ultima VI,* the design process has evolved even further. "In that program, I wrote not a single line of code, not a single word of text, and I drew no art," he says. "We're now in the era of specialization."

Garriott manages the Ultima product line. The story concept is his, as are the internal data structures and how the data is manipulated. But Garriott leaves much of the hands-on work to his staff. Programmers implement the code, artists draw the graphics, and writers create the conversations between the characters that Garriott creates.

Although Garriott no longer writes code, he says his programming background is vital to his game design. "I know what can be accomplished and how hard it is for my programmers to accomplish it. That lets me make intelligent choices about what a player should or could be able to do in the game."

Role Reversal

As the roles in game design have changed, so has the design process. Originally, a designer had a story idea and then decided what to put in the story. The game grew and evolved as features were added. "Now, we do a top-down design" Roberts says, "We ask, 'What sort of game do we want? What sort of technical innovations is it going to have? What sort of story is it going to have?' "

From that point, the writer details the story and breaks down the plot elements. The programmers then decide what code they need to implement the story. Of course, the project evolves during the production, and there are always some surprises along the way, but the top-down approach helps a designer itemize his or her needs and define the tasks for the various specialists. "It helps us develop games more quickly and efficiently," Roberts says. "With the evolutionary development process, there's a lot of time wasted trying to think what you're going to do next."

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How They Got Started

Richard Garriott, a.k.a. Lord British, is a co-founder of Origin Systems and game designer of the popular Ultima series.

Richard Garriott

Garriott was introduced to computers in 1974 as a freshman in a Texas high school. BASIC programming was the only course. Since teachers at that time knew little about computers, Garriott and two other students proposed a computer class of individual study, without a teacher. "Oddly enough," Garriott says, "the administration agreed to our idea, and the project I chose was writing fantasy games on the computer."

All the games were dungeon adventures that involved fights with monsters, with letters representing monsters and asterisks representing walls and corridors. Garriott never named his games, he gave them numbers. By the time he graduated from high school, Garriott had written 28 versions of the game.

After high school, Garriott worked as a salesman in a computer store, and it was there he saw his first Apple II. He added graphics to game 28 to see how it would look on an Apple.

"That game was never meant to be published," Garriott says. "It was only meant as a personal development project." The computer store owner was so impressed with it, however, he suggested that Garriott try selling it. Garriott made a couple of hundred copies, packaged them with a sheet of instructions in plastic bags, and sold them in the store. The whole investment cost about $200.

A few weeks later, Garriott got a telephone call. Someone at a software company called California Pacific had seen the program and wanted to publish it. "I flew to California, I signed a piece of paper, and they started mailing me money," Garriott says. "That is literally how I got into this business."

Chris Roberts

The way graphics could be made to move on a screen was what first attracted Chris Roberts to videogames. "I've always been fascinated by moving graphics around on a screen," he says. "I guess that was my inspiration to start working on computer games."

In 1981, as a teenager in Manchester, England, Roberts got his hands on his first computer, a ZX 80, also known as the Sinclair Timex. He started by trying to make shapes move. Soon after that, he graduated to a BBC Micro, which was an Acorn computer with a 6502 microprocessor. It was on this machine that Roberts started working seriously on games by learning assembly language. "Back then you needed assembly language to write games because that was the only way to get the speed for the computer graphics," he says.

Roberts never took a course in computer science in high school, but after graduation, he took an extracurricular course in BASIC programming at the University of Manchester. His instructor was the editor of a magazine that dealt with the BBC Micro computer, and he asked Roberts to contribute BASIC programs for the magazine. "I wrote games for a couple of issues," Roberts says, "and that's how I got started."

From there, Roberts got a job as a designer with Ocean Software, one of Europe's largest publishing firms.

***Chris Roberts is a game designer at Origin Systems and the author of* Times of Lore *and* Bad Blood.**

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continued from page 78

Efficient game design has become a business necessity. People demand bigger games with more graphics and more disks, but the price has remained fairly constant, and sales have not increased that much. "It's getting more risky each time you do a game," Roberts says, "so we're trying to cut down on the inefficiency in software development."

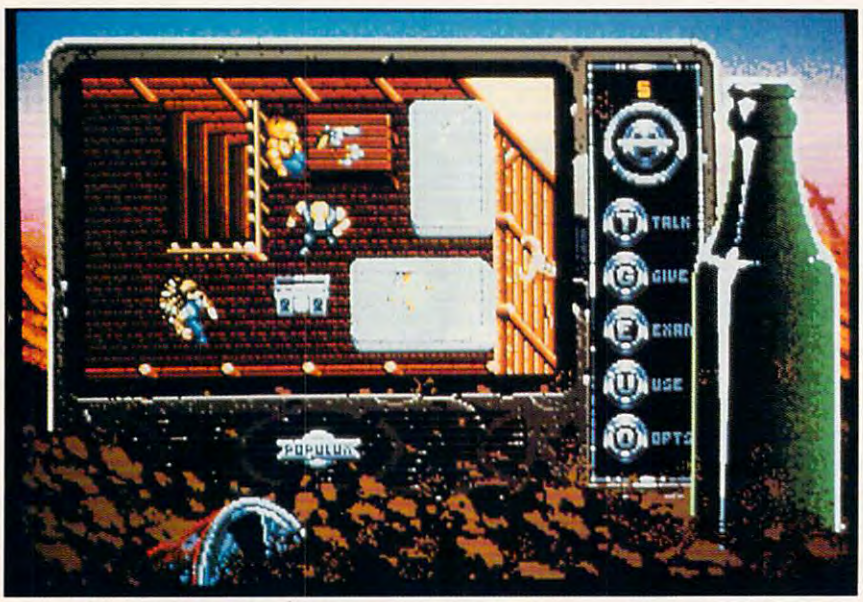
Garriott favors a slightly different approach to game design but he also starts with one main concept. "I want to know the overall goal so I can decide what kinds of activities I'm going to support," he says. "But I don't nail down any specific activities because I don't have a technology that I know can pull it off yet."

Once his goal is clear, Garriott then starts building the data structure and technology that can support various activities, but without wasting code. For instance, suppose he has a rickety bridge that will collapse if you cross it with too much weight. "If you walked across the bridge without it collapsing, you'd never know I wrote that piece of code," Garriott says. "But if it collapsed and you died, that's a lot of code for a one-shot deal." Garriott avoids large pieces of code that get used only once.

He also strives to develop a diverse palette of activities to keep players entertained. "You spend the first few hours doing one kind of activity," he says. "Then, before you get bored, I introduce a new activity and function as vastly different from the previous one as I can."

One scenario might require you to interact with people and do some intellectual puzzle solving. "Then because you can play some of the game's musical instruments, that activity might be featured for a while before you go off to solve some mazes or dungeons," Garriott says. If play is repetitious, it's boring, and Garriott never wants that said about his games. ⊡

***Garriott didn't write a single line of code for his latest game,* Ultima VI.**



Bad Blood's *design team included programmers, writers, artists, and musicians.*

How You Can Get Started

Software companies rarely sign contracts with someone unknown. They're more likely to sign with development groups or houses rather than individuals. A talented programmer should try for a staff position with a development group or a major company, such as Electronic Arts, Brøderbund, or Origin.

But to get that first programming job, you have to be noticed. "In my experience, the best you can do is demonstrate talent and hope that a publishing house will hire you," Chris Roberts says. "It's tough, but one thing I definitely would say to anyone who wants to break in is to have a crack at it. Send the company a disk with something on it, something neat with five minutes of graphics."

He says a demonstration disk packs more impact than a letter that simply describes your talents. "Even if they're not going to publish it," he says, "a demo proves you have the ability to do it."

Roberts also recommends getting fired up and fighting for your goals and ideas. "First of all, have a vision. But then I think you need an incredibly large ego. Basically, you need this innate belief that your vision is right. And, by God, this is the way it's going to get done, even if you have to go through hell or high water to get it done."

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GAMESCOPE

Here are some tips for Activision's *MechWarrior*. I've played FASA's *Battletech* role-playing game for some years, and with *MechWarrior*, I've been able to put my strategies to the test.

Starting the game, a player can either keep the Jenner mech or sell it for a Locust. Selling the Jenner will give you more cash, which will be necessary later in the game. I choose the Locust for its speed, though it's the lightest and least powerful mechs. Repair the mech to full battle strength before starting the campaign.

Once you've chosen your mech, you should choose a defense contract from a ruling house. If one is not available, try again after visiting the saloon or checking the newsnet. House Davion or House Steiner offer the most money for any contract, and often the most salvage rights for disabled mechs. Negotiate for the highest money and salvage rights possible, but be alert for a halt in negotiations. Asking for too much can make you lose the contract.

The designers of the game apparently made the opposing forces oblivious to almost everything but the mission at hand. If an enemy mech is defending a fuel depot, the enemy mech will ignore you unless you confront it head on. You need only bypass the enemy (done fastest inside a Locust) by going wide around either side and attacking from the rear. The rear armor and leg armor of mechs are the weakest. You can defeat the largest mech (the BattleMaster) with the smallest (the Locust) by getting behind him. Then you need only stay close to the target and attack the legs of the larger mech. This results in large salvage profits. It's wisest to attack the farthest enemy mech first, then move to the next one and repeat the attack. Speed is necessary to defeat all the enemy mechs before they complete their mission, hence you should use the Locust. Using this attack, you can quickly increase your bank account and hire trained help.

When the Dark Wing is finally found, it's best to have your crew equipped with the heaviest and most powerful mechs (BattleMasters). I've found, though, that you should have more long-range firepower than your crew. I have used a Warhammer to defeat enemies from long range, before massed firepower could be used against me. Defeating the Dark Wing is a challenge in itself, and saving the game before going into combat is wisest. A player should also have a large stock of spare ammunition stored aboard the spaceship before attacking the Dark Wing. With a little luck, and after finding the right mech for the task, you can save your family's reputation and return home a hero.

MASTERING MECHS AND GUNSHIP GLORY

An important feature of the game is its open-endedness. Once you've won the game, you can continue to play until you're killed. Each mission is a test of skill and luck, so fight on.

Tom Biggerstaff
Leesville, LA

Winning at Gunship

When playing MicroProse's outstanding *Gunship* game, these tips may gain you promotion and decorations instead of an early flaming demise.

Don't take the direct route to your target because you're likely to overfly an enemy antiaircraft site. Instead, set your map INS cursor on the nearest mountain in the desired directions, and fly to that mountain at an altitude of 500 feet or below. Then slide around the base of the mountain to the next one. By hopping among the mountains, you can take advantage of their radar shadows to shield yourself from enemy observation. Another good technique is to skirt the very edge of the battle area (the edge of the screen). You can't be ambushed from that direction.

Keep your eyes glued to your Threat Display, too. When you see a threat displayed, it is usually best to attack and destroy it immediately, before it can react and begin shooting at you. The enemy is much more dangerous and harder to destroy once it has tracked you with its radar. If your flight path takes you too close to an enemy threat concentration, dive for the deck and fly away at high speed on a course that avoids the cluster—preferably placing mountains between you and the enemy. Do not attempt to fly over the enemy concentration, as you're likely to be shot down.

Also, as a precaution, you should practice autorotations using a dummy pilot who is expendable. This can save your military career and your life if you are hit and cannot continue in flight. You will be able to autorotate to a safe landing instead of crashing in flames. Finally, be sure to save your military records (roster.fil) to a blank disk after every successful game. This file can then be copied back to the *Gunship* play disk should you ever need to restore your records to an earlier point. Then, if you're killed or missing in action, you can resume life as a medalled, ribboned officer, instead of starting over as a rookie slick-chest sergeant.

Don Harmon
Merritt Isle, FL

If you have game tips and shortcuts of your own, we'd like to hear from you. Send your tip, no matter how brief, to COMPUTE Feedback—GameScope, 324 West Wendover Avenue, Greensboro, North Carolina 27408. If we publish your suggestion, we'll send you a gift. ⊡

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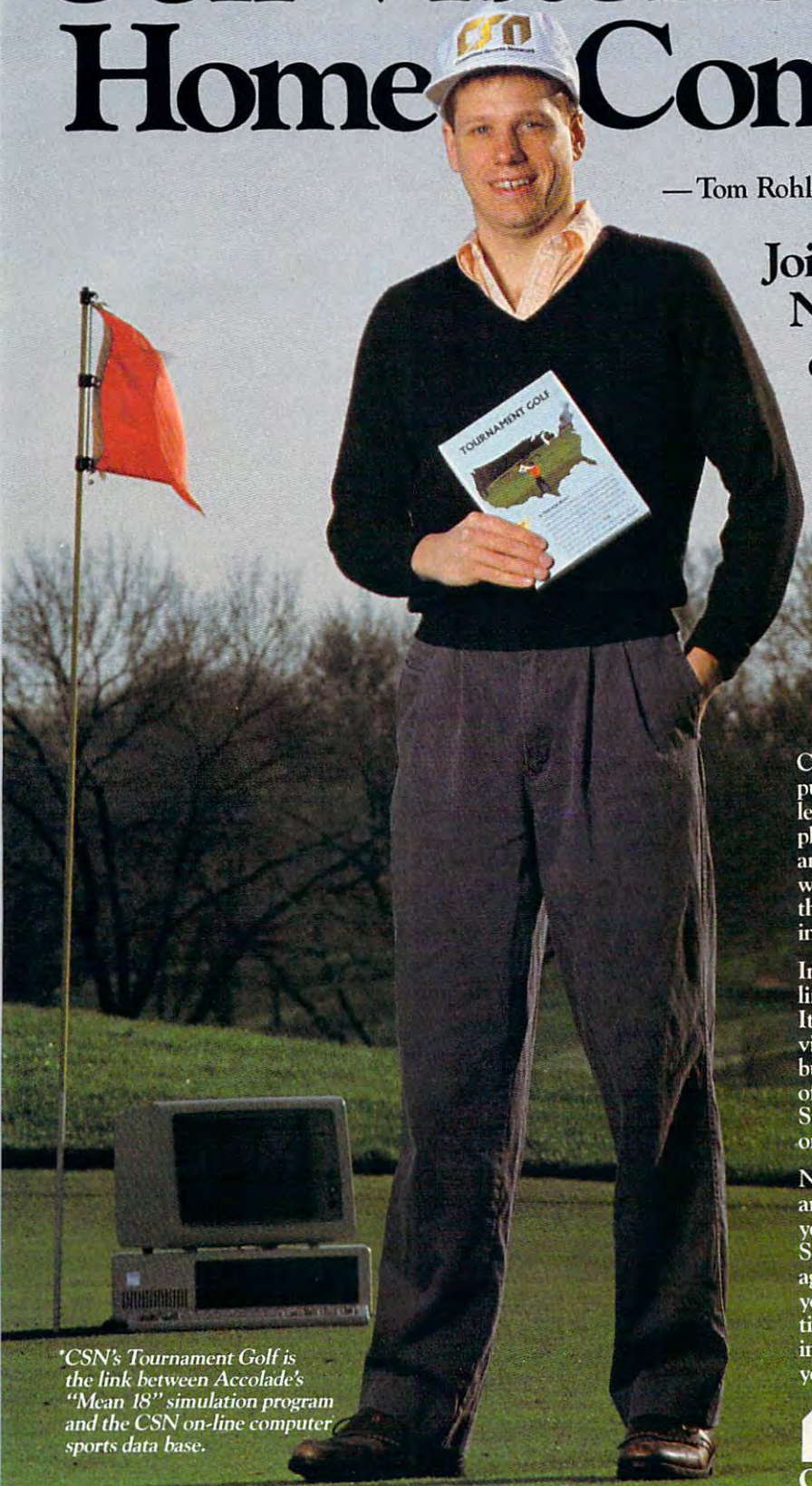

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L I Z C A S E Y

I'd Like to Dedicate This Game To . . .

Mediagenic has taken a different approach to customer service with its Bulletin Board DJ, which maintains the Activision BBS, a dedicated gaming bulletin board system. Known as Radio Activision and nicknamed *Rad,* the DJ acts as a personal link between the company and game players around the country. You can reach Rad on GEnie, Delphi, CompuServe, QuantumLink, PC Link, America Online, Connect, or the Activision BBS.

In addition to providing hints and tips, Rad plans to sponsor contests, share sneak peeks at new games, and schedule conferences and chat sessions. Reach Rad on the Activision BBS by calling (415) 329-7684. In order to make a Rad connection, you'll need a modem and standard communications software.

Mediagenic, 3885 Bohannon Dr., Menlo Park, CA 94025

Reader Service Number 351.

Spring Cleaning

Suncom Technologies' two computer vacuum and cleaning kits help keep your PC working efficiently.

Suncom's basic cleaning kit contains a mini vacuum and six antistatic wipes.

The basic kit features a battery-operated mini vacuum cleaner and six antistatic wipes. The cleaning and vacuum kit offers a mini vacuum cleaner, 3½- and 5¼-inch disk head cleaners, a mouse-roller cleaning kit, ten antistatic wipes, and ten drying towelettes.

The cleaning and vacuum kit includes disk-head and mouse-roller cleaners.

The basic kit retails for $19.99, and the cleaning and vacuum kit retails for $29.99. Both come with a one-year warranty from Suncom.

Suncom Technologies, 6400 W. Gross Point Rd., Niles, IL 60648

Reader Service Number 352.

Blackened Disk

Cajun Edge has just released *Disk Labeler Supreme,* a disk-labeling and management program for the IBM PC and compatibles.

This program uses pull-down menus and pop-up help screens so you can generate disk labels in your choice of two sizes and four styles. You can use the Quick Labels Menu to quickly make disk labels without using the more advanced features of the program. The Master Catalog stores a record of the disk and file information to help you keep your files organized.

Disk Labeler Supreme is available for the IBM PC, XT, AT, PS/2, and compatibles with DOS 2.1 or higher and 512K; it retails for $79.95. Cajun Edge will mail 100 free disk labels on receipt of the completed registration card.

Cajun Edge, P.O. Box 2457, Hammond, LA 70404

Reader Service Number 353. ▷

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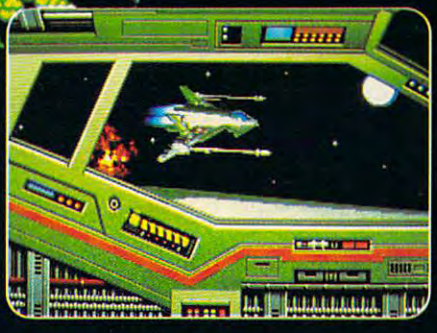

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Circle Reader Service Number 169

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NEW PRODUCTS

continued from page 84

Space Math

NUMBEROIDS from deep space entertains as it teaches. This educational math package from The Gopher Gradeworks uses music and arcade-style graphics to keep your child's interest level high while he or she is learning to add, subtract, multiply, and divide.

The program features adjustable play speed and on-command math tables. The package also comes with the Space Traveler Lap Desk, which includes a scratch pad and pencil.

***NUMBEROIDS from deep space* uses arcade-style graphics to entertain your child while teaching math skills.**

NUMBEROIDS from deep space is available for the IBM PC and compatibles for $39.95.

The Gopher Gradeworks, 8640 M Guilford Rd., Suite 204, Columbia, MD 21406

Reader Service Number 358.

Bright Banners

Brighten your banners, signs, and graphics with the BANNERBRITE collection of Day-Glo computer paper from Banner Band.

The 45-foot roll of continuous-feed paper is 9½ inches wide with ½-inch margins. BANNERBRITE comes in Day-Glo red, green, orange, and pink and retails for $14.95 a roll.

Banner Band, 533 N. Wolf Rd., Wheeling, IL 60090

Reader Service Number 354.

What's Cooking?

East Hampton Industries' updated version of *A>COOK, The Complete Computer Recipe System* (version 2.0) contains over 100 recipes and a built-in word processor to assist you in adding or editing recipes. Recipes can be classified and recalled under four different categories. Also, a hard disk user can store over 14,000 recipes.

A>COOK runs on all IBM PCs and most compatibles with 256K and DOS 2.0 or higher. The package retails for $39.95.

East Hampton Industries, 81 Newtown Ln., Drawer EEEE, East Hampton, NY 11937

Reader Service Number 360.

My Money

MySoftware's *MyCheckbook* is a personal finance program that lets you print checks and organize your finances.

MyCheckbook helps you monitor your finances with features like categorized expenses, budgeting reports, payee reports, and a check register. The all-in-one screen approach lets you see your statement balance, current balance, projected balance, payee history, and category history as you write a check.

MyCheckbook requires 384K and DOS 2.0 or higher and is available for MS-DOS machines for $19.95.

MySoftware, 1259 El Camino Real, Suite 167, Menlo Park, CA 94025

Reader Service Number 355.

Makes Sense

MCE, a division of Lawrence Productions, has developed *LOOK, LISTEN & TOUCH* to help parents and teachers assess which of a child's senses—sight, sound, or feeling—contributes most to the learning process.

By knowing their keenest learning sense, students can study the sensory-specific study techniques provided and improve their study skills. The program features a printout option for teachers and parents that shows the learning style of each student.

The package includes a teacher's manual, which contains goals, objectives, prerequisite skills, and suggestions for integrating *LOOK, LISTEN & TOUCH* into an instructional unit. It sells for $82.50.

Lawrence Productions, 1800 S. 35th, Galesburg, MI 49053

Reader Service Number 361.

Animalistic Tendencies

Personalize your computer with Celsus Designs' Computer Critters, plush animal companions that attach to your computer monitor. The varmints come in four species: a toothy green dragon complete with tail, a carrot-carrying pink bunny rabbit, a brown bear cub, and a friendly bulldog.

Stare at your computer screen, and Computer Critters will stare back.

Designed to liven up drab computers, the Critters attach to your monitor with Velcro. The rabbit and bear each retail for $29.95; the bulldog and dragon, for $34.95. Celsus plans to release more creatures from the animal kingdom in the near future.

Celsus Designs, P.O. Box 5401, Hacienda Heights, CA 91745

Reader Service Number 357.

Words in the Bank

Scholastic Software has announced the release of *The Bank Street Prewriter* to help students in grades 5–12 create and manage ideas for writing.

The program offers three modules: Brainstorming, Prompted Writing Activities, and Outlining. Brainstorming helps students get started with activities including free writing, invisible writing, and goal setting. Prompted Writing Activities encourages students to develop ideas for over 20 specific styles and forms of writing. The Outlining tool is also included to help students organize their ideas.

The Bank Street Prewriter is available for Apple II computers with 128K and MS-DOS computers with 256K for $32.95.

Scholastic Software, P.O. Box 7502, 2931 E. McCarthy St., Jefferson City, MO 65102

Reader Service Number 362.

www.commodore.ca

64/128 VIEW

TOM NETSEL

A funny thing happened to *Gazette* on the way to the printer this month. Actually, it began several months ago, when COMPUTE! Publications' parent company, Capital Cities/ABC, decided to divest itself of its consumer magazine division. *COMPUTE!, COMPUTE!'s Gazette, COMPUTE!'s Amiga Resource,* and *COMPUTE!'s PC Magazine* were up for sale.

That's when General Media came to the rescue. COMPUTE Publications (without the exclamation point) now joins the firm that publishes *Omni, Penthouse, Longevity,* and *Four Wheeler* magazines. With the buyout, however, came a major restructuring.

We no longer produce four separate products. Instead, we publish one basic magazine, *COMPUTE,* with separate machine-specific editions for owners of Amigas, PCs, and 64/128s. In this way, subscribers get the computer-specific information they've come to expect plus entertaining and informative *COMPUTE* features, articles, and reviews dealing with the personal computer world at large.

While the name on the cover is different, I think 64 and 128 owners will find that Gazette has retained its identity. Look through this issue and you'll see many of your favorite columns and features—and yes, we still have the type-in programs for Gazette subscribers and newsstand buyers.

There have been changes, however. For many years Lance Elko edited *Gazette* magazine, and, although he did an outstanding job, Lance felt the time had come for him to pursue other interests. We wish him the best. This issue marks my debut as editor, and I'll do my best to continue with the tradition of excellence that Lance fostered and maintained.

As for the contents, they have changed little. "Feedback" and "Letters to the Editor" have been combined into one column, now called "Feedback." This is where we'll try to answer your questions and publish your suggestions, comments, tips, quips, and gripes.

To find out what's new in the 8-bit world of Commodore, check out "News & Notes." Formerly called "Commodore Clips," this is where we'll announce new software and hardware, the latest facts and rumors from Commodore, and other items of interest to 64 and 128 owners.

Returning are many of your favorite columnists. Larry Cotton's tutorial on BASIC programming and Jim Butterfield's machine language series are both here. Also continuing are Randy Thompson's "Programmer's Page" and "D'Iversions," Fred D'Ignazio's look at technology.

"The GEOS Column" has been a semiregular feature, but since many of its articles are submitted by readers, we'll need your help if it is to remain. We do have a few surprises coming up for GEOS fans, but we still need to hear from you.

We also want to hear from BASIC and machine language programmers. Just as in the past, if you write original 64 or 128 games, utilities, or productivity programs, keep those submissions coming. The type-in programs have always been an integral part of the Gazette concept, and we want to continue bringing you the best in original programs. Of course, those programs are also available on the *Gazette Disk.*

We're also looking for authors to write articles, features, and reviews. If you have expertise in a certain field and can communicate that knowledge, we'd like to hear from you. We also need computer artists (see "News & Notes" in this section).

We want the Gazette pages to remain a major resource for 64 and 128 users, but we need your help. Whether you're into telecommunications, desktop publishing, graphics, music, programming, or game playing, all of you dedicated 64 and 128 users constitute a vast wellspring of information. We want to tap this wealth of knowledge and share it with all our readers. With your help and support, we at Gazette will do our best to meet your computing needs into the next decade. ⊡

DIDIER CREMIEUX

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NEWS & NOTES

CALLING ALL ARTISTS!

Is there a Rembrandt or van Gogh inside you, trying to get out? If so, we want to see your 64/128 masterpieces. Starting with the November issue of *Gazette Disk*, we'll publish the best examples of original 64/128 art submitted by our readers. Five top entries will appear each month in the "Gazette Gallery," a new feature found only on the *Gazette Disk*.

Send your *Doodle, Koala,* or other popular 64/128 paint-program pictures to the address below. (No more than five submissions per disk per month, please.) We pay $50 for each piece of art we accept and $100 for the one we judge Picture of the Month. Enclose a self-addressed, stamped disk envelope if you want your disk returned.

Gazette Gallery
COMPUTE Publications
324 W. Wendover Ave.
Greensboro, NC 27408

War Strategy

Strategic Simulations (675 Almanor Avenue, Sunnyvale, California 94086) has released *War of the Lance* ($39.95), the first Advanced Dungeons & Dragons strategic war game for the Commodore 64. Set in the Dragonlance game world, this one- or two-player game requires you to make alliances, conquer nations, and destroy enemy troops.

You command the Whitestone forces of good against the evil Highlord Dragonarmies. The full campaign lasts for six game years, which takes 30 turns. You may engage in battles to conquer enemy countries or try to gain alliances by sending diplomats. Representatives of your armies can also be sent on quests for magic that will make your forces even more powerful.

A strategic map allows you to track the movements of the different armies. The zoom function permits you to direct the war on a tighter scale. You can watch the details of battle by selecting the tactical view.
—MICKEY McLEAN

Own Your Own Stables

Owners of *Omni-Play Horse Racing* from SportTime Computer Software (3187-G Airway Avenue, Costa Mesa, California 92626) can now expand the playing style and graphics of their game with the *Stable Owners* option module ($19.95). It's one of several modules scheduled for release. The modules allow you to customize your game, making it as basic or as complex as you desire.

With *Stable Owners,* you add a new perspective to the game by joining the elite class of thoroughbred owners, giving you control over the destiny of your own horses. Put together your own personal stable of Claiming, Allowance, and Stakes horses. Hire jockeys and match their skills against the competition as you enter them into the races of your choice. Up to four players can participate.
—MICKEY McLEAN

Dinosaurs, Business, and Tennis

DigiTek Software (8910 North Dale Mabry, Executive Center, Suite 37, Tampa, Florida 33614) has announced three new products for the 64/128: *Dinowars, Big Business,* and *Tie Break Tennis.*

Dinowars ($29.95) is a combination of a strategy-board game and an arcade-action adventure. Also included is an animated encyclopedia and an action-only mode. Players control any of eight different dinosaurs, each with its own strengths and weaknesses, in combat over a kidnapped dinosaur egg. The game features massive dinosaurs that stand as tall as two-thirds of the screen.

For competition with a more current flavor, try *Big Business* ($29.95), a humorous simulation of a large manufacturing company. Three players each start with equal assets and market the same product, competing to acquire the greatest net worth by game's end. While some aspects of the game are strictly entertaining, the core of the program is an accurate economic model. Factors such as interest rates, inflation, market climate, prices, and availability of raw materials are calculated.

When you're ready for a little exercise, step onto the court for *Tie Break Tennis* ($29.95). This realistic tennis simulation puts more than a dozen techniques at your disposal: crushing serves, forehand, backhand, topspin, slice, lob, overhead play, slam, volley, passing shots, drop shots, and soft balls. The game features speech and sound effects and a TV-style presentation. Play singles, doubles, or tournaments on clay, grass, or asphalt, and even select your choice of racquets. Compete against a computer or human opponent.
—TOM NETSEL

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Order Hours: Mon-Thurs,9am-7pm/Fri,9am-4:30pm/Sat-Closed/Sun,9:30-6(ET)

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COMMODORE 128D

C-128D w/Built-in Disk Drive

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C128D

128D COMPLETE PACKAGE

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- Commodore Color Printer
- 12" Monitor

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128D DELUXE PACKAGE

- Commodore 128D Computer with Built-in Disk Drive
- Magnavox RGB Color Monitor
- Commodore Color Printer

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COMMODORE 64C

Includes: 1 Joystick (a $19.95 Value)

$139.95

C64C

COMMODORE 64C TEST PILOT PACKAGE

- Commodore C-64/C Computer
- Commodore 1541-II Disk Drive
- Ace Joystick

5 SOFTWARE PACKAGES INCLUDES:
Advanced Tactical Fighter · Infiltrator II · Harrier · Crazy Cars · Tomahawk

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COMMODORE 64C COMPLETE PACKAGE

- Commodore C-64/C Computer
- Commodore 1541 Disk Drive
- Commodore Color Printer
- 12" Monitor
- 10 Diskettes

$289

COMMODORE 64C COLOR PACKAGE

- Commodore C-64/C Computer
- Commodore 1541 Disk Drive
- Commodore Color Printer
- Color Monitor
- 10 Diskettes

$339

COMMODORE 1571 DISK DRIVE **CALL**	COMMODORE 1541II DISK DRIVE **$159**	COMMODORE 1084 MONITOR **$279**
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GSX-140	$329.95
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COLOR OPTION KIT FOR GSX PRINTER	CALL
PANASONIC	
KXP-1180	$159.95
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1764 Expansion Module	$129.95	XETEC S. Graphix Sr. Interface	$49.95
CARDCO G-WIZ Interface	$49.95	XETEC Supergraphix Gold	$74.95
C-64/C-64C Power Supply	$29.95	XETEC Lt. Kernal 20MB Hard Drives for:	
C-1670 Modem	$79.95	C-64C	$729
COMMODORE 1350 Mouse (128, 128D only)	$16.95	C-128 & 128D	$849
COMMODORE 1351 Mouse	$49.95	Excellerator Plus Power Supply	$39.95
		C-128 Power Supply	$79.95

SEE OUR AD IN THIS MONTH'S AMIGA SECTION OF THIS MAGAZINE FOR GREAT AMIGA SPECIAL VALUES

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DIDIER CREMIEUX

MAIL-ORDER MAZE

BUYING SOFTWARE AND HARDWARE BY MAIL IS EASY, IS CONVENIENT, AND CAN SAVE YOU MONEY. BUT THERE ARE SOME TIPS YOU SHOULD KNOW BEFORE YOU PLACE AN ORDER.

MICKEY McLEAN

Because of our busy lifestyles, mail order's convenience makes it an attractive alternative to driving out to the shopping mall and fighting for a parking place. Computer users were taking advantage of mail order long before it was chic to have Lands' End and L. L. Bean catalogs stacked on your coffee table. It's also a good way to save money and locate hard-to-find items.

If you glance at computer magazines from the past ten years or so, you'll notice a multitude of companies selling products with an 800 order number—but much has changed over the past decade. Mail order had a bad name years ago, mainly because of a number of unscrupulous dealers who deceived consumers. The U.S. Postal Service responded by cracking down on this type of activity, forcing many unscrupulous dealers out of business. As a result, the mail-order business has gained a new respectability in recent years.

This doesn't mean you should throw caution to the wind, but now you can order products with confidence and usually receive a guarantee that you'll be completely satisfied or get your money refunded.

www.commodore.ca

Reputation

Before shopping for the software or hardware you need, seek out a dealer who best meets your needs.

"Check out the reputation of a company," says Les Lawrence, president of Software Support International. "Watch the company's advertisements, and find out how long they've been in business."

Mark Lane, manager of Software Discounters of America, agrees, "The bigger the company, the bigger the ad, and the longer they've been in business, the more you know what kind of commitment they have."

Other factors to consider are the type of guarantee offered, the return policy, how fast products can be delivered, and the knowledgeability of the staff. Whether or not a company accepts your credit card, ships C.O.D., offers rush service, or ships to military or international destinations could also be important to you.

Friends, co-workers, or fellow user-group members can be a good source of information. Ask around and find out which companies they've had success with.

"Not all companies are alike," says Janet Brito, president of Briwall. "And there are not many left to choose from in the Commodore market."

Lane says that since the 64/128 market's days are numbered, consumers should look to a company that already carries multiple formats.

"I carry all formats, therefore I don't have to run away from the Commodore market," he says. "I'll stick with it. I'm not sure others will stick around, but I'll try hard to get all the new titles I can."

Price vs. Service

The first thing most consumers look for in a mail-order ad is the price of the product and how it compares with what other mail-order firms or the local computer store is offering.

When dealing with mail-order companies, comparing prices has added importance. For example, several companies will match any current nationally advertised price on the exact same item less shipping and sales tax. The only stipulations are that the product has to have been advertised recently and you must be able to verify its price.

Briwall's Janet Brito believes that low prices are important but should not be the most important factor when you're choosing between mail-order companies.

"There are some mail-order companies out there that advertise products at the cheapest price, and that's all they'll give you," she says. "I get very irritated when people call just to compare prices. They don't consider other factors such as service and support. They need to be a little less concerned about pricing and think about how they're being treated after they've ordered."

On the other hand, Les Lawrence believes low prices are the main reason why consumers use mail order and that they should not expect much beyond that.

"Customers have to realize we have cut prices to rock bottom," he says. "They shouldn't always expect free customer support and 100-percent satisfaction. It's difficult at the prices we charge. Somebody has to pay the bill."

Lawrence also believes that customers have a responsibility to research the market well and know what they want before ordering.

"Customers should go into a purchase with eyes wide open and know what they're buying before they buy—they shouldn't play games with mail order."

Piracy Problems

Software piracy has hurt the computer industry in more ways than one, and publishers are not the only ones who have suffered. The practice of illegally copying games has put a large dent in the mail-order trade and has changed the way some are doing business.

Janet Brito says that she started noticing people purchasing four or five games at a time from her company and then returning them a few weeks later. After repeated instances of this suspicious behavior, the company decided to change its return policy.

"We've stopped taking back entertainment titles because of the copying," she says.

Brito adds that despite this change in policy, the company will consider issuing a refund on an entertainment title if a customer has a legitimate beef.

Operators Standing By

After digesting the information in this article and the reference guide on page 6, you should be able to go to the mail-order ads in this magazine, make comparisons, and place an order with confidence. Who knows? You may find it so easy that you'll never set foot in a shopping mall again. ▷

FRIENDLY TIPS

This list of tips from representatives of major mail-order houses should help you get through the ordering process with few or no problems.

1. If you have detailed questions about a product or the company, call the customer-service or technical-support telephone number, not the order number.
2. Place your order during normal business hours, when the company is better staffed and able to answer your questions.
3. To receive prompt service, it's best to call in midweek (Monday and Friday are the busiest days for orders).
4. When comparing prices between companies, be sure to add in all shipping costs and credit card surcharges.
5. Be prepared to pay sales tax should you reside in the same state as the mail-order company.
6. Look for a company that has a computerized inventory so you can find out immediately if a product is in stock.
7. Determine whether a company charges your credit card before shipping the product.
8. Make a note of the name of the company you ordered from, the date you placed the order, the total price of the order, and the name of the person who handled your order.
9. Value good service and after-sale support more than unit price.
10. If a company has served you well in the past, stay loyal.

BE PREPARED

Before placing an order with a mail-order company, be ready. You can save yourself and the company a lot of time.

1. Read the company's ad carefully and take note of its ordering, payment, shipping, and return policies. If you have any questions about its policies, ask before you order.
2. Know which products you want to order, including any specifications.
3. Write down any questions you have about your order.
4. If you're paying by credit card, have your card number, expiration date, and the name of the cardholder in front of you.
5. Have the proper shipping address ready. If a company ships primarily by UPS, you'll need to provide a street address (a post office box number is unacceptable).

www.commodore.ca

continued from page G-5

MAIL-ORDER REFERENCE GUIDE

The following grid lists the services and policies of six of the major mail-order houses in the 64/128 market.

This chart contains information obtained from advertisements and company representatives. It should be used strictly as a reference. Company policies are subject to change, and there may also be some exceptions to stated rules and regulations. It is recommended that you contact each company to make direct inquiries concerning policies that interest you and will apply to your order.

$ — Less than $5 **$$ — $5–$10** **$$$ — $10–$15** **+ — Plus actual shipping charges**
• Yes **○ No**

BRIWALL

Service and Support	
Sells Software	•
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Toll-Free #	○
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Online Ordering	•
Telex Ordering	○
24-Hour Ordering	•
Payment	
Personal Checks	•
Holds Personal Checks	○
Certified Checks	•
Money Orders	•
VISA	•
MasterCard	•
American Express	○
Other Credit Cards	○
Credit Card Surcharge	○
Charges Card Before Shipment	○
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Charge	$[3]
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Charge	$$[4]
U.S. Mail	•[5]
Charge	$
Overnight	•
Charge	$$$
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Charge	$
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Toll-Free #	○
Ordering	
Toll-Free Order #	•
Fax Ordering	•
Online Ordering	•
Telex Ordering	○
24-Hour Ordering	○
Payment	
Personal Checks	•
Holds Personal Checks	N/R
Certified Checks	•[1]
Money Orders	•
VISA	•
MasterCard	•
American Express	○
Other Credit Cards	•[2]
Credit Card Surcharge	○
Charges Card Before Shipment	○
C.O.D.	•
Educational Purchase Orders	○
Shipping	
UPS	•
Charge	Call[3]
UPS 2-Day	•
Charge	Call[4]
U.S. Mail	○
Charge	N/A
Overnight	•
Charge	Call[3]
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Charge	Call[3]
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Sells Software	•
Sells Hardware	•
Years in Business	9
Matches Competitors' Prices	•
Offers Catalog	○
Customer Service	•
Toll-Free #	○
Technical Support	•
Toll-Free #	○
Ordering	
Toll-Free Order #	•
Fax Ordering	•
Online Ordering	○
Telex Ordering	○
24-Hour Ordering	○
Payment	
Personal Checks	•
Holds Personal Checks	•
Certified Checks	•
Money Orders	•
VISA	•
MasterCard	•
American Express	•
Other Credit Cards	○
Credit Card Surcharge	•
Charges Card Before Shipment	•
C.O.D.	•
Educational Purchase Orders	•
Shipping	
UPS	•
Charge	Call
UPS 2-Day	•
Charge	Call
U.S. Mail	•
Charge	Call
Overnight	•
Charge	Call
International Shipping	•
Charge	Call
APO/FPO Shipping	•
Charge	Call
All Orders Insured	•

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Service and Support	
Sells Software	•
Sells Hardware	•
Years in Business	23
Matches Competitors' Prices	•
Offers Catalog	•
Customer Service	•
Toll-Free #	○
Technical Support	•
Toll-Free #	•[1]
Ordering	
Toll-Free Order #	•[1]
Fax Ordering	•
Online Ordering	○
Telex Ordering	•
24-Hour Ordering	○
Payment	
Personal Checks	•
Holds Personal Checks	•
Certified Checks	•
Money Orders	•
VISA	•
MasterCard	•
American Express	•
Other Credit Cards	•[2]
Credit Card Surcharge	○
Charges Card Before Shipment	○
C.O.D.	•
Educational Purchase Orders	•
Shipping	
UPS	•
Charge	Call
UPS 2-Day	•
Charge	Call
U.S. Mail	•
Charge	Call
Overnight	•
Charge	Call
International Shipping	•
Charge	Call
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Charge	Call
International Shipping	•
All Orders Insured	•

[1] U.S. and Canada.
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Sells Hardware	○
Years in Business	7
Matches Competitors' Prices	○
Offers Catalog	•
Customer Service	•
Toll-Free #	○
Technical Support	○
Toll-Free #	○
Ordering	
Toll-Free Order #	•[1]
Fax Ordering	•
Online Ordering	•[2]
Telex Ordering	○
24-Hour Ordering	○
Payment	
Personal Checks	•
Holds Personal Checks	•
Certified Checks	•
Money Orders	•
VISA	•
MasterCard	•
American Express	○
Other Credit Cards	○
Credit Card Surcharge	○
Charges Card Before Shipment	○
C.O.D.	○
Educational Purchase Orders	•
Shipping	
UPS	•
Charge	$
UPS 2-Day	•
Charge	$
U.S. Mail	•
Charge	$
Overnight	•
Charge	Call
International Shipping	•
Charge	Call
APO/FPO Shipping	•
Charge	$$
All Orders Insured	•

[1] U.S. and Canada.
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Sells Hardware	○
Years in Business	3
Matches Competitors' Prices	○
Offers Catalog	•
Customer Service	•
Toll-Free #	○
Technical Support	•
Toll-Free #	○
Ordering	
Toll-Free Order #	•
Fax Ordering	•
Online Ordering	○
Telex Ordering	○
24-Hour Ordering	○
Payment	
Personal Checks	•
Holds Personal Checks	○[1]
Certified Checks	•
Money Orders	•
VISA	•
MasterCard	•
American Express	○
Other Credit Cards	•[2]
Credit Card Surcharge	○
Charges Card Before Shipment	○
C.O.D.	•[1]
Educational Purchase Orders	•
Shipping	
UPS	•
Charge	$
UPS 2-Day	•
Charge	$+[3]
U.S. Mail	•
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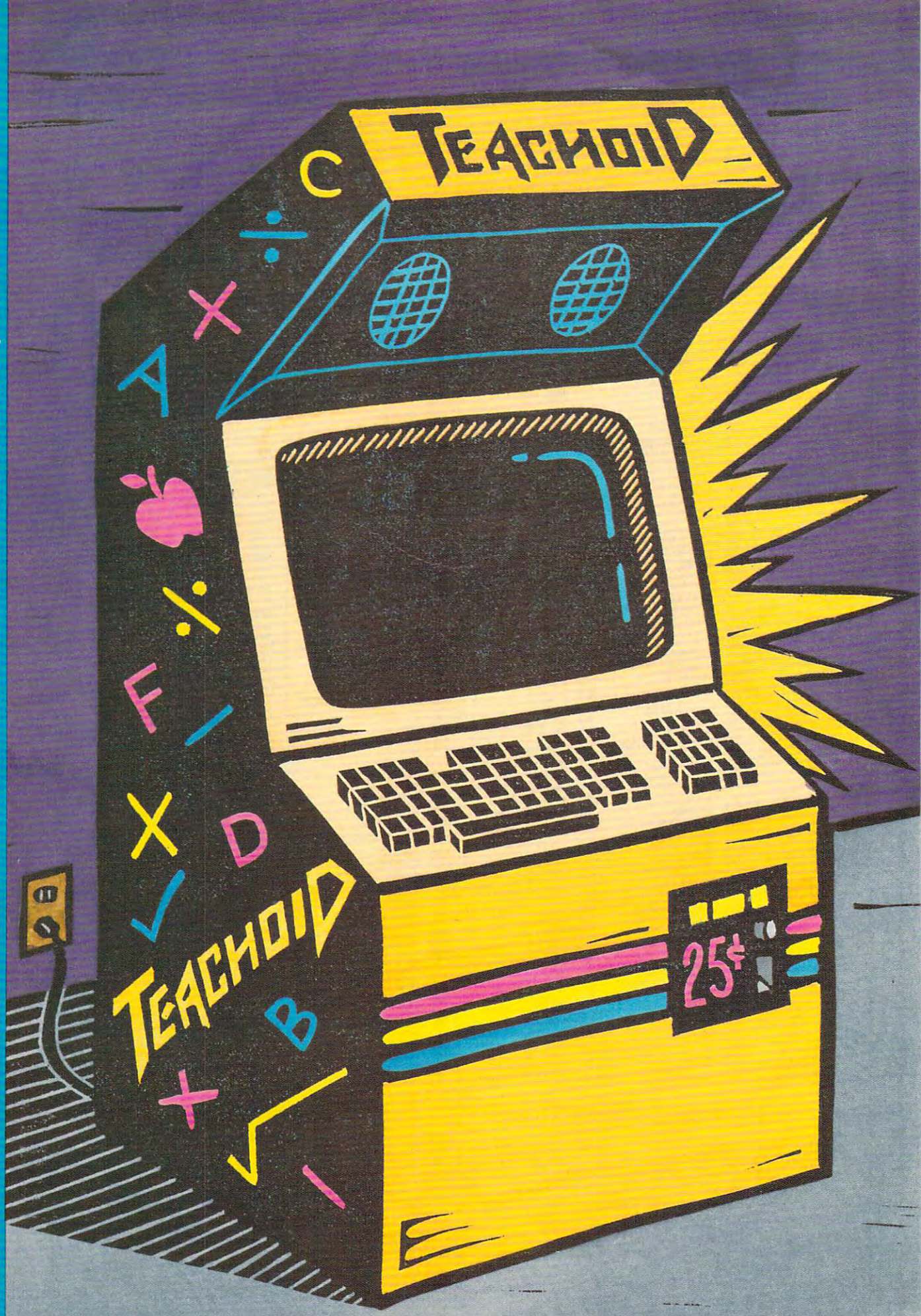

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A TEACHER'S GAME MACHINE

D O R O T H Y H E M M E

Commodore is a game machine, right? Well, I don't play many games, at least not the joystick, shoot-'em-up variety. I leave those to my 14-year-old son. When I play "computer," I like to find and run useful programs that will expand my creativity and lighten my work load. That's a game to me—and it's fun.

So what can I do with my game machine? To borrow a cliché from literature: "How do I love thee? Let me count the ways." If you're an educator or a parent, you might count the ways, too. As a high school English teacher, I must grade volumes of paperwork and record those grades. Of course, I first have to generate the assignments so students can submit their papers to be graded in the first place. From generating assignments to helping me with dozens of other classroom tasks, the 128 makes my work a snap. In fact, handling chores such as these have become my favorite computer games.

Although I started my computer system with a 64, a 1541 disk drive, and a composite monitor, I upgraded several years ago to a 128, a 1571, and an RGB 80-column monitor. I'll have to admit that the disk drives are slower than I like, so I also bought a Mach 128 cartridge for greater speed and two-key loading. That made a big difference.

First, the 80-column mode is ideal for word processing. Its higher resolution makes it much easier on my tired old eyes. Also, many word processors have a preview mode for 80 columns that doesn't require scrolling from side to side or shrinking the text onscreen. My handouts and tests have to be precise, and I don't have the time to print several versions to see exactly what any change or modification will look like. I like the convenience of the 80-column screen.

I have several word processing packages, including COMPUTE's *SpeedScript 128*, GEOS, and Professional Software's *Fleet System*. I use this last program most often because of its built-in spelling checker. I also like its flexible page length, from three-line mailing labels to legal-size documents. Of course, I have all my tests, handouts, and notes on disk, and this makes inserting, cutting, and pasting information for new tests and assignments very easy.▷

COMMODORE—GAMES—FUN. THESE THREE WORDS ARE LINKED IN MANY PEOPLE'S MINDS, BUT THIS TEXAS TEACHER FINDS HER 128 IS FUN EVEN IF THE GAMES SHE PLAYS ARE DIFFERENT.

DAVID R. STREET

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Next is the printer. The right printer is a must, but with all the printing chores teachers face, one printer is not always enough. I have a great Star SG10 dot-matrix printer that does a superb job on most anything from near-letter-quality printouts to graphics, and its ribbon is cheap. It prints through carbons, ditto masters, and NCR paper. In addition, I also have an old daisywheel Smith-Corona TP1 for times when I need true letter-quality printouts. Finally, I own an Okimate 10 for printing in color. In bold or enhanced mode, the Okimate will also print on clear transparencies for overhead projectors when the need arises.

Power User

Now, how about software? That's the heart of computing, isn't it? I don't do much programming, but I'm a power user of what others more gifted than I can create. After I've made an assignment with a good 80-column word processor or test generator and the students have turned them in, it's time to record their grades with a spreadsheet.

I have downloaded dozens of public domain programs from Q-Link, including gradebooks. All of these programs have features I use each six weeks when I'm creating new roll sheets for temporary grade listings, for progress reports I send to students' homes, and for seating charts. However, the spreadsheet I particularly like is the Epyx version of *Multi-Plan* in both 40 and 80 columns.

I'm required to average grades every three weeks for all of the students I teach, including those governed by the University Interscholastic League for extracurricular activities. *Multi-Plan* does the averaging and helps me spot potential problems. If grades suddenly drop, deficiency reports go out. These reports help parents and other teachers become aware of any learning difficulty a student may have before it gets out of hand.

I also need averages at the end of the six-week grading period for report cards. I can't see spending time averaging grades for 150 students from scratch every three weeks on a calculator—not when my computer averages and saves it all. It all boils down to saving time.

There are always students who forget to do assignments or fail to make up work when absent. *Multi-Plan* allows me to create a spreadsheet with headings that literally spell out what the assignment was, what the grade was, and if it was a daily or a major grade. I post these grades on the bulletin board by student ID number—no names, please! This usually gets them to make up the missing work. It's amazing how quickly students want to get something done when they see how zeros affect their grade averages.

Also, this method keeps me accurate. If I've goofed on entering a grade or forgotten to update make-up work, students are quick to point out my mistakes. Often, spreadsheet columns are too wide for the page, so *Sideways* from TimeWorks is a great program for turning the figures 90 degrees so they'll print on one long sheet of paper.

Most teachers regard the paperwork associated with the teaching profession as a chore. But Dorothy Hemme actually enjoys making assignments, averaging grades, and writing reports—as long as she can do them on her 128.

Notice This

In addition to helping with my administrative chores, the computer helps me grab the kids' attention. We use Brøderbund's *Print Shop* and Unison World's *Printmaster* for signs around the room dealing with novels and characters. I also print individual signs and have them laminated for each passing student who is engaged in an extracurricular activity such as football, choir, or drill team. These signs are posted on a wall in a special area of my classroom.

Banners grab students' eyes and draw attention to coming attractions at school. The Okimate helps with the artwork. I quit oil painting years ago when I ran out of room at home and my small kids were into everything, but now I create pictures with a light pen and print them with the Okimate.

And how do I reward my students for a job well done? I print blank certificates with Spinnaker's *Certificate Maker* and then run them off on the school's photocopy machine on blue paper—our school color. I buy the paper by the ream at an office supply store with my own money. I fill in the students' names and then hand out certificates for every excellent essay, for those who make the honor roll, for improvement, and for students who worked hard on certain projects.

For Excellence

In addition, I send my own newsletter to the students' homes. Yes, I am also into desktop publishing. At appropriate times during the year, I publish a newsletter for students and their parents to let them see what we've accomplished in class. After experimenting with *Newsroom* and *Personal Newsletter,* I switched to *Paperclip Publisher* from Electronic Arts shortly after it arrived on the scene. I include graphics and as many names of students achieving excellence as I can muster. Students and parents tell me that these newsletters and certificates wind up on refrigerator doors and are great for brownie points with parents.

Being the computerphile that I am, I recently invested in Berkeley Software's *geoPublish,* but only after buying the 512K geoRam. Again, for me the irritation of the Commodore is its lack of speed, not its capabilities. After experimenting with geoRam, I know that the cartridge will save me considerable time, since I won't have to wait for text and clip art to load from disk every few seconds.

IBM? Who Needs It!

A word to IBM PC clone and Mac users: Sure, more than likely you have greater memory and greater speed—I envy those features. Talk of 286s and 386s and what they can do is heady stuff, and I love Mac graphics, but you paid more for your system. As an underpaid educator, however, I cannot afford such things—but I've found I don't need them.

Commodore garnered the low end of the computer market early because most home computer users could not afford expensive office machines. Over the years, I've spent quite a few hard-earned dollars for my machines and peripherals, but it has always been to upgrade the same machine. I've never felt the need to buy a new brand.

By now, if you still think the Commodore is a game machine, perhaps you're right. I'll admit I play with my 128 every night, and I have a lot of fun with it. While I might not blast aliens or search for treasure in monster-infested dungeons, I do get a kick out of the "games" I play with my computer. It's not my fault if some people insist on calling it work. ⊡

Dorothy Hemme teaches 11th grade English at Clements High School in the Fort Bend School District in Sugar Land, Texas. In 1984, Hemme hooked a 64 to a black-and-white television and booted her first word processor. She hasn't touched a typewriter since.

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