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The Leading Magazine of Home, Educational, and Recreational Computing

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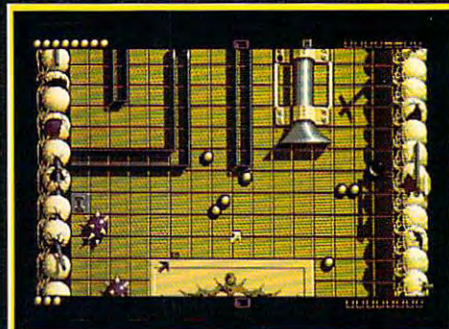
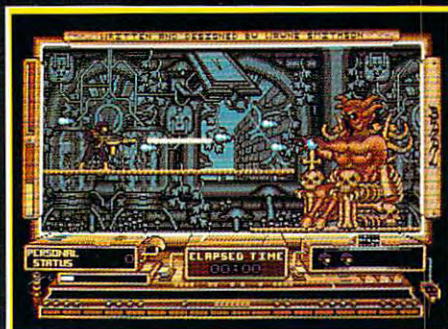
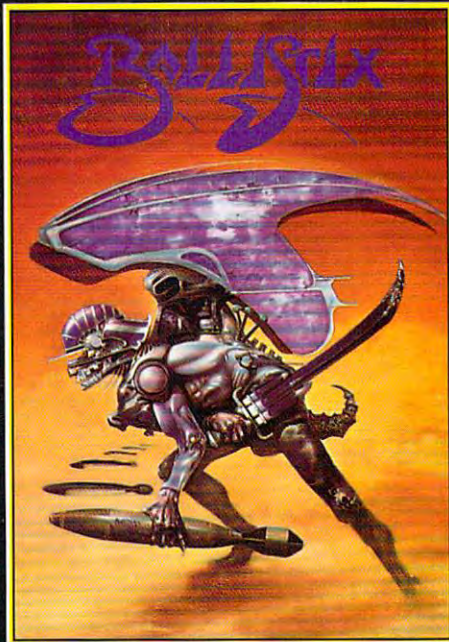
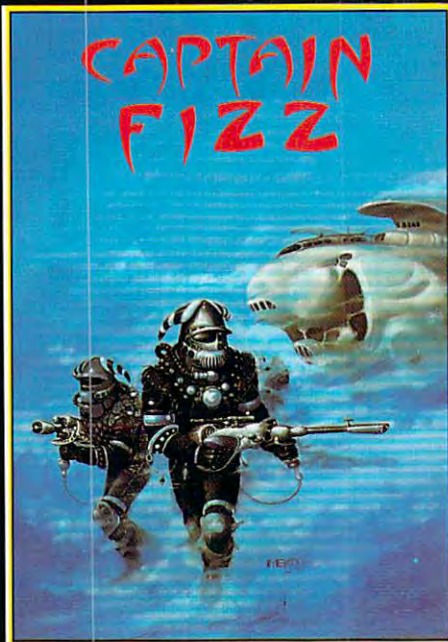
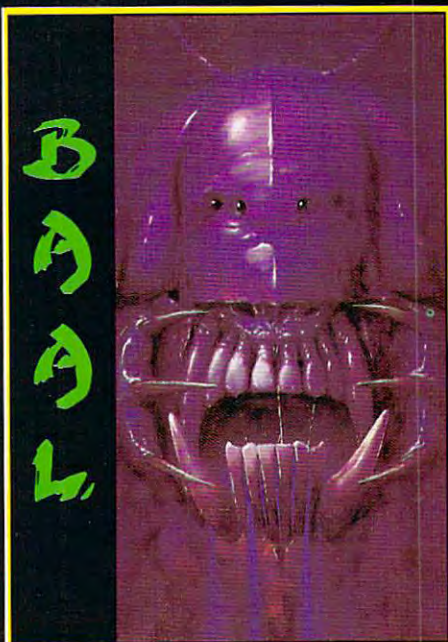
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Screen Shots from the Atari ST version
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Yup, it's a tough mission alright, but you might just win out with the right blend of co-operation, courage, laser-hot reflexes, tactical sense . . . and brains. The action is fast and furious in Captain Fizz, but if you can't work out the right tactics you'll both be dead meat.

There are 22 levels of savage and relentless action to battle through before you reach your objective, the central computer that's causing the evil infestation. You'll never get there, though, unless you put your heads together and co-operate; your buddy can't do it on his own, and neither can you. This is one program where even the easy games are hard. So remember — united you stand, but divided you fall . . .

Warning: this game is impossible to beat on your own.

Two joysticks required for two-player game.
Screen shots taken from the Atari ST version
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Two joysticks required for two-player game
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COMPUTE!

JULY
1989

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The Leading Magazine
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Computer games are hot. Nine prospects for top-of-the-charts honors in entertainment software take you from this world to the next./*Dan Gutman* — 19

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Dedicated game systems swallow cartridges, use palm-size control pads, and offer inexpensive interactive entertainment. But is that all there is?

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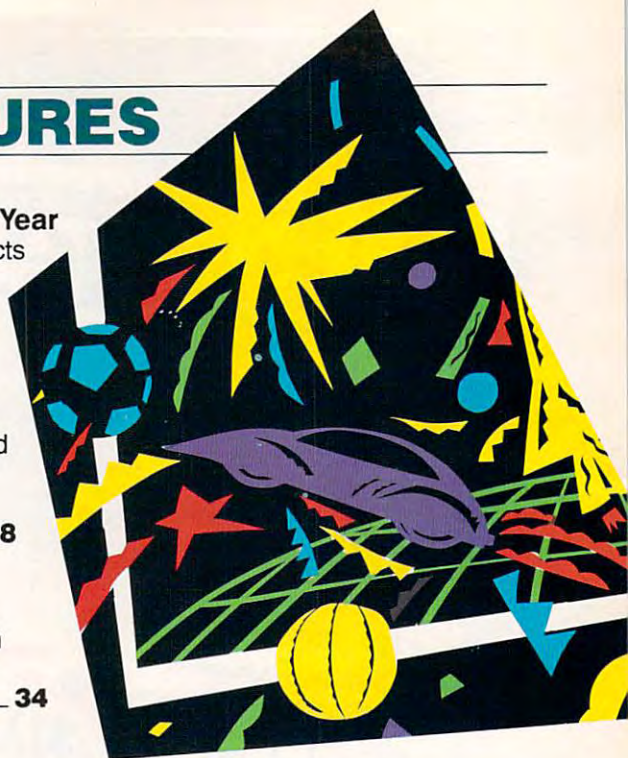
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GREGG KEIZER

**String Garlic
Around Your
Neck, Get a
Wood Stake
Ready—Yep,
Nintendo's
Here**

Who put this monkey on my back? I've got bad *Tetris* withdrawal symptoms. I see odd-shaped boxes falling in front of my eyes, rotating this way and that before they settle out of sight.

I've got an itch to play just one more round of *Arkanoid*. I keep hitting my monitor, as if it were a pinball machine that you could persuade to make the ball rebound the right way.

I've got a dream, a dream to be *president* of *Hidden Agenda's* mythical Central American country and actually make it through my three-year term without ending up on the floor of the Presidential Palace.

On and on and on it goes. There are too many games and never enough free time. If all I did was try out the computer games that drop onto my desk, you'd be looking at a magazine filled with blank pages.

I've been playing games on the computer as long as I've had a computer. Most of us are like that—game addicts, I mean. We buy a computer, rationalizing that we'll use personal finance software, word processors, even educational packages. Down deep in our selfish souls, though, we know we buy the machine to play games. And as soon as it's in the house, the computer calls its silent siren song, and before you know it, you're sitting in front of a screen, bashing keys or twisting a joystick. It's insidious.

And it's not getting any easier. This year's game crop is a bountiful one, as Dan Gutman's "Nine for '89" attests. Games today are more sophisticated, more colorful, more entertaining than ever before.

Then why did most consumer entertainment software publishers have such a lousy Christmas? Why did the bottom fall out of computer fun?

In one word: Nintendo. Dedicated game systems are back on the attack, and the Nintendo is playing point man. There's a Nintendo game system in one out of every five American households, a statistic that has computer game makers scared stiff. Software publishers saw their fourth-quarter sales dive as Nintendo's sales soared. Some computer entertainment publishers were hit so hard that they're actually on the financial ropes. Though Nintendo looked like a fad only a year ago, many industry insiders are now thinking it's here to stay.

You can see the result in computer games that push onscreen violence to the limit, that promote repetitive play, that share a numbing sameness. Computer software companies have reacted by trying to

out-Nintendo Nintendo. What a waste.

People shove a cart into the Nintendo for a variety of reasons, but the best has got to be the utter simplicity of the machine. No matter what anyone tells you, Nintendo (or any other dedicated game machine) is *not* a computer. Sure, it has a microprocessor, RAM, and video output. But it doesn't have a keyboard, it doesn't have a disk drive, and it doesn't have more than one function.

What computer game developers and publishers must do is create the kind of games that will *never* be part of the Nintendo scene. Games that won't work with a hand controller the size of a three-year-old's hand. Games that *adults* want to play. Games that let you *think*, not just think about shooting. Games like *Hidden Agenda*—a marvelous reason to spend an hour in front of your computer. Or games like *688 Attack Sub*, *Ultima*, *Guardians of Infinity*, *Earl Weaver Baseball*, or *Flight Simulator 3.0*. In other words, entertainment software that takes hold of the personal computer's ability to metamorphose into an almost limitless number of specialty game machines.

The personal computer isn't just an arcade machine like the Nintendo. It's also a text-adventure game machine, a sophisticated simulation machine, an involved sports machine, and more.

That's the power of computer fun. That's the monkey I want on my back.

This is my last issue of *COMPUTE!*. I'm stepping down as editor to, as they sometimes say, pursue other career opportunities. I'll stay with the magazine, of course, but only as a reader, just like you.

The last year and a half has been both frantic and fantastic fun. I'm proud of what *COMPUTE!* has become—the premier home computer magazine. And I'm appreciative of all who worked on the magazine, all who wrote for it (as long as they turned in their pieces on time), and all who read it each month. But I'd like to single out a few here who helped make it possible—Bill Tynan, Keith Ferrell, Janice Fary, Heidi Aycock, Pete Scisco, Caroline Hanlon, Robin Strelow, Robin Case. Thanks.

I know a bit of what *COMPUTE!* will soon bring to your home, and I can guarantee that you'll find future issues more informative, more entertaining, more educational than ever before. I'm going to keep reading *COMPUTE!*—I hope you do, too. □

TAKE COMMAND



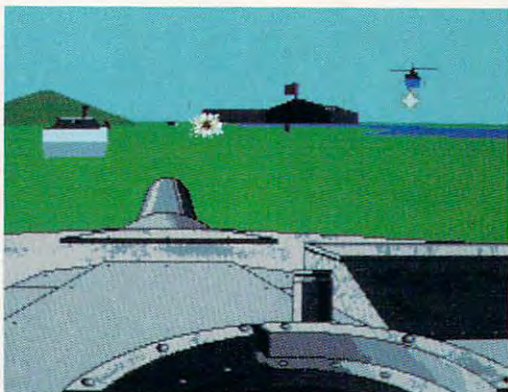
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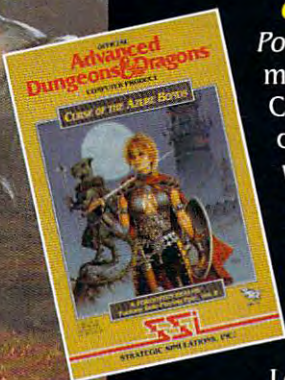
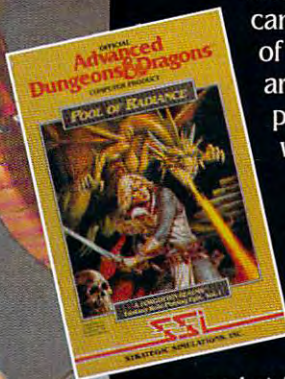


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gameplay

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Fun Beyond Your Wildest Games

You don't have to play games to play with your computer. A lot of the programs that my family and I use most are definitely frivolous—we play with them, but they aren't marketed as games.

First and foremost are graphics programs. Back when we first bought an Atari 400, we'd play with *Video Easel* (Atari) for hours. It was a very primitive drawing program—you'd draw lines with the joystick in one of four colors, but at the end you could make the picture come to life. The program would repeat everything you'd drawn, starting at the endpoint, so if you had planned it right, you'd see progressive patterns shift across the screen.

When I bought a mouse to go with my 386 machine, it was packaged with **Microsoft Paintbrush**. I started playing with it, and so did my kids. After a while, I stopped—they didn't.

I didn't realize how far things had gotten out of hand until I discovered that 9 megabytes of my 40-megabyte hard disk were taken up by .PCX files. I started browsing through them and found that the kids were doing wonderful things.

They would paint a background, for instance, and then keep calling it up to add new foreground drawings. Or they would pick up different picture elements and recombine them in sequence to tell stories.

Geoffrey has even started drawing personalized stationery for the other kids at school. They'll request something, and he'll come home, draw it, and then print out a dozen copies.

It's hard to think of an actual game that has brought my kids so much fun.

I found that Microsoft *Paintbrush* wasn't as powerful or versatile as I wanted, so I tried **DeluxePaint II** (Electronic Arts). It is more powerful, especially its brush feature, so I use it more often. But the user interface is a bit less intuitive, so the kids have never been comfortable with it. Because its gray-scale dithering is rather weak, I convert *Deluxe Paint* files and use *Paintbrush* to print them out.

Another drawing program we bought just for fun is **Floorplan** (Insight Industries). Ever since I was a kid, I've played around with house plans on graph paper, and I hoped this would be the same thing, only with computer power.

It's pretty good. I was able to draw a good-looking floor plan and designed my own interior features, too—cutest little toilets you ever saw. But I almost went crazy mov-

ing back and forth through the pop-up menus (why not some onscreen icons?), and I was really discouraged when I realized that it wouldn't print out the whole floor plan on a single sheet of paper. It took *four* different cut-and-taped sheets to get one decent printout.

Besides, I wanted the program to make it easy to design and edit a floor plan. Mark a box for a room and then mark doors and windows and have the program automatically draw them in. No such luck. I didn't expect to create elevations and 3-D wireframes, but even with its modest aims, *Floorplan* didn't really use the power of the computer. I'm still looking for the house plan program I can *play* with.

I've been a map-lover since childhood, and I've long wished for a computerized hyperatlas. If you tried the original *PC-Globe* and were disappointed, *PC-Globe+* (Comwell Systems) is worth the upgrade. Considering that it uses less than two megabytes on a hard disk, it's an extraordinary program, though it's really more a well-illustrated almanac than a true computerized atlas. The EGA graphics are superb (it also has CGA, VGA, and Hercules monochrome versions), and you can find and examine any nation in the world—cities, elevations, and major land and water features. You can even calculate currency exchanges, check out time zones, or find the distance between any two points on the globe.

But even as I enjoyed using *PC-Globe+*, I wished for more. Where were the highways? Climate maps? *PC-Globe+* could show me all the ASEAN and OPEC nations in different-colored overlays, but I wanted to call up, say, all countries with a Caribbean coastline, or all that require a tourist visa, or those once ruled by Spain. Maybe I'm greedy, but this program, as fine as it is, is only scratching the surface.

A true computer atlas will have to wait for CD-ROM. But then I'll expect to be able to pull up street maps of cities around the world, track ocean currents, or show shifting populations in different regions and countries. And while I'm wishing, why not a time-lapse history feature, in which I can see, in slow animation, the shifting borders of Germany, the decolonization of Africa, the growth of Communism, or the European exploration of the Americas?

That would be something that *only* the computer could do—and using it would be sheer play. □

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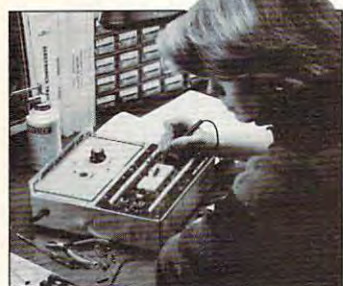


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impact

DAVID D. THORNBURG

Computer Games Are Complex and Overlooked—But Between Boredom and Anxiety Lies the Flow

I've been working with computers for 20 years, and I'm still fascinated with the variety of games that run on them. Even early time-sharing systems that used teletype terminals quite often had extensive libraries of games. The personal computer has brought even more creativity to the desktop—highly interactive games complete with sound and animation.

The world of computer gaming provides special challenges for software and hardware. A good game computer is much harder to design than a computer used for business applications. The obvious requirements of games—color, sound, flicker-free animation—aren't needed for word processors or spreadsheets. But as challenging as these requirements are, there's yet another requirement that makes game machines special—quick response time.

In business applications, the only time-sensitive areas are in the capture and display of typed characters and, for large spreadsheets or other number-intensive applications, the time needed for math calculations. But delays are psychologically tolerable—even appropriate—if the delay convinces the user that the computer is doing a lot of work. On the other hand, imagine how much fun a game would be if every time you moved your paddle the computer interrupted with a *Please wait* message!

The Atari 400 and 800 delegated sound and graphics to separate processors to insure the computer's responsiveness. This multiprocessor approach was much more sophisticated than that taken later by the original IBM PC. And yet, few people took these early Atari computers seriously—they were considered only game machines. Atari could never convince corporate buyers that a good game computer is generally more sophisticated than a good business computer.

This is still true. The Atari ST and Commodore Amiga have superior computing capabilities compared with those of the IBM PC and compatibles. Yet these high-powered computers are regarded as recreation machines.

The challenge of creating good game hardware is matched on the software side. Almost no one writes more efficient, high-quality programs than software developers in the computer game arena. Errors that business applications can tolerate will destroy a game. But, ironically, because play is regarded as less valuable than work, game programs cost a fraction of what productivity tools such as word processors cost, even

when measured on a dollars-per-byte scale.

Given the low financial reward and even lower status on the software application spectrum, then, what is it about computer-based games that keeps this field alive? What is it that keeps us coming back to the screen, joystick in hand?

The answer lies in the computer's ability to increase the level of challenge even as the game is being played. About ten years ago, University of Chicago scientist Mihaly Csikszentmihalyi's book *Beyond Boredom and Anxiety* explored why people spend hours playing chess or painting pictures or climbing mountains when there is no external reward for these activities. He and his colleagues have expanded on this work in his new book, *Optimal Experience*.

Essentially, Csikszentmihalyi says that any activity has a certain challenge associated with it. At the same time, a certain level of skill is brought to the activity. If skill greatly exceeds the challenge, boredom results. On the other hand, if the challenge greatly exceeds the skill brought to it, anxiety and frustration result. If a player's skill and challenge are matched, however, he or she may enter a state of *flow*, where time seems to evaporate. This happens for many people when they get engrossed in a good book—or when they play a good game.


Take, for example, the simple game tic-tac-toe. The first few games may be fun because your skill and challenge are matched. But then you discover how to always win or tie a game. Your skill so greatly exceeds the challenge that you become bored. A good computer game increases the level of challenge as your skill increases. As you progress from level to level, the increasing challenge keeps you on the flow side of the boundary between flow and anxiety.

I'm amazed by the intuitive sense that computer game designers bring to their craft. In ten years, I've met only one (Bernard deKoven) who was aware of Csikszentmihalyi's work, and yet every good computer game seems to have incorporated his theories of active engagement.

Does the computer's ability to support intrinsic motivation hold promise outside the domain of games? Yes. There's no reason that designers of word processors, spreadsheets, databases, and other programs can't learn from the qualities of a well-designed game. Their goal should be to decrease user anxiety and to increase flow.

After all, engagement is as important in work as it is in play. □

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letters

Lower Prices Please

After reading your article entitled "Court Games" in the April "News and Notes" column, I felt the need to respond.

I am especially concerned about the statement you made concerning "uncontrolled" cartridge manufacturing and the statement "No one wants to replay *that* game."

As a consumer, it is always pleasant to see prices drop. It is when companies like Nintendo control the supply of games and cartridges that the prices remain inordinately high. A classic example of that is the agreement between the USA and Japan which prohibited Japan from dumping computer chips in the USA. The only thing that has accomplished is to keep prices up and the supply so scarce that I had to really scratch and search to find memory for my computer.

So, think twice about us consumers when you want the prices to stay high; we just might hold off buying when it gets to that point, and who wants that?

William G. Byars
 Lubbock, TX

The No one we refer to is primarily manufacturers and publishers of Nintendo software. Considering the video-game disaster of the early eighties, when Atari game-system cartridges dropped so dramatically in price that game publishers, and then game players, were driven from the market, Nintendo's strategy may well keep its game systems in use for years, not months. Nintendo is attempting to turn a fad into a habit. Only time will tell of that plan's success.

Commodore's Better

Although I love the new look of your magazine, a few things I read in your April 1989 issue just didn't sit well with me. I read "Buying Your First Computer," expecting to find at least one Commodore machine listed. But as I flipped through your choices, I was rudely shocked. The IBM PS/2 Model 25 as a good first computer? Or what about the Tandy? My first thought was that this was an April Fool's joke. I was afraid you'd become a victim of what

befalls many of your other competitors: IBM and Apple tunnel vision.

You can buy a brand new Commodore 64, with a 1541 disk drive, a pair of joysticks, ten \$30 software programs, and hook it up to your color television for the same price as an Apple IIc Plus without a monitor or any software. The Commodore 128 offers more power than a 64—and an 80-column display. I work at a computer store, and our entire inventory, payroll, and order control is done with a 128 and Precision Software's *Superbase 128*.

And where was the Commodore Colt? It's 100-percent IBM PC XT-compatible, has CGA graphics, a detachable keyboard, free *WordStar* software, and dual floppies for under \$700. It has access to the enormous library of MS-DOS productivity software, just like the Tandy and the IBM PS/2 Model 25.

And to make things worse, you didn't even mention the Amiga 500. With a street price of around \$650, the Amiga 500 makes the 8-bit Apple IIc Plus look like a Model T.

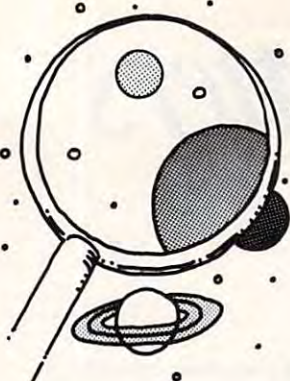
I believe, as do millions of other Commodore owners, that we own excellent, capable machinery. A computer doesn't have to be made by IBM or Apple and cost you a fortune to get the job done. So don't blackball Commodore just because it sells its products so much less expensively than its competitors. If anything, Commodore should be praised for not gouging their customers like some other microcomputer companies have been known to do.

Jeff James
 Roy, Utah

The three computers we discussed in April are all fine starter machines, as is the Commodore Amiga 500—which we plan to highlight in "Buying Your First Computer: Part II," scheduled for an upcoming issue. The two MS-DOS computers and one Apple computer we selected offer up-to-date graphics, good expansion possibilities, and a strong support base—all good reasons for considering any of them as your first computer.

discoveries

DAVID STANTON



Here's How to Beat Back the Midsummer Doldrums with Some Style

“What is there to do?” How many times have you heard that whining plea during summer vacation?

“Why don’t you go for a walk, or go swimming, or mow the lawn?” you suggest, all the while knowing the futility of suggesting anything at all.

“OK, then. Why don’t you call a friend for a game of tennis? You could always help your dad paint the garage. Or maybe you’d like to work in the garden?”

With so many useful and exciting things to do and see, it’s difficult to understand how anyone could be bored with summer vacation. Fresh air and free time seem like the perfect recipe for lifelong happiness and contentment. Truth is, though, most of us need more.

Maybe the question asked but not answered is “What can I do that will be useful but fun, challenging but manageable, entertaining but enduring?” If so, here are a few answers that just might work.

Why don’t you write and publish a book?

Monsters & Make-Believe (versions available for IBM PCs and compatibles, IBM PCjr, Apple II, and Macintosh) encourages kids to design their own monsters, write short descriptions of them, and print out the results. Because the graphics can be printed in several different sizes, children can create personalized letterheads or produce large posters. Friends can even get together and combine their efforts into a book (limited circulation, of course).

Children don’t need any special artistic talent because the friendly monsters are made from clip-art heads, torsos, arms, and other body parts. The built-in word processor is so easy to use that any child capable of writing simple words and sentences will be pumping out text in no time. And by printing in outline mode, advanced monster makers can print coloring books for their younger apprentices.

Learning Lab’s new *Monsters & Make-Believe Plus* (Apple II) adds speech capabilities when used with an Echo or Cricket voice synthesizer from Street Electronics. With this setup, kids can write stories for their nonreading siblings. What a great way to play school!

How about making a slide show about your trip to the museum?

Not only are computer-based slide shows fun to make, but they can be useful, too. Kids can write and arrange educational displays about their favorite hobbies. They

can combine text and graphics to show others about their trip to Texas or to the local shopping mall. Whatever the topic, desktop presentations are an exciting way to convey information.

With Scholastic’s *Slide Shop* (versions for IBM PCs and compatibles and the Apple II), users can mix sound, text, and graphics in their desktop presentations. Students can select art from the clip-art collection, draw their own graphics, or import pictures from Scholastic’s supplemental graphics/sound disks or even from other popular paint programs.

Once all screens have been prepared, they can be linked together into a slide display. A number of special effects assure graceful movement through the entire sequence, making the results even more satisfying.

Why don’t you get a few friends together and make your own movie?

This project, of course, takes more than just a home computer. You’ll also need a videocassette recorder (VCR), a video camera (or camcorder), and the right software. With Brøderbund’s *VCR Companion* (versions for IBM PCs and compatibles and the Apple II), aspiring directors can easily add title screens, credits, and other professional touches to their amateur videos.

Budding film editors must first connect their computer’s composite video output (most computers support composite monitors through a video-out RCA jack) to any VCR’s composite video input (another RCA jack). Once this is done, all computer output will go directly to the VCR. From there, the final picture can be directed to a television or back to a monitor. Naturally, a knowledgeable adult should supervise, but the process really is quite simple.

Connecting a computer to a VCR opens up other possibilities. Kids could create computer game tutorials by taping appropriate screens and adding a voice or music track. Input devices like *ComputerEyes* (versions for most computers) let computer buffs capture VCR screens and digitize them to use in desktop publishing applications or graphics software. But we’ll save all that for another time.

For now, why not try these few prescriptions for summer doldrums? They may come with no guarantees, but they sure beat painting the garage. □

David Stanton can be contacted via CompuServe (72407,102) or by mail at P.O. Box 494, Bolivar, New York 14715.

news & notes

Back in the U.S.S.R.

The *Glasnost*, or openness, of the Soviet Union under Mikhail Gorbachev has spread to the world of print and copy shops. Moscow is getting its first AlphaGraphics print shop, which specializes in Macintosh-based printing. *Samizdat* will never be the same.

AlphaGraphics Printshop of the Future negotiated for almost a year before getting the go-ahead to open its Moscow franchise in March. The Russian counterpart of the familiar American company will offer all of the services it offers in the U.S., including copying, desktop publishing, and printing services. Russian citizens may walk in to make copies, a practice once tightly controlled in the U.S.S.R.

Jean Miller, a spokesperson for AlphaGraphics, said that the major copying restrictions concerned pornographic and copyrighted materials. Customers also can't copy antigovernment documents, and they need a special permit to copy religious materials.

Those restrictions weren't the biggest stumbling block, however. "We did have some trouble exporting our computers to the Soviet Union," Miller said. But because the shop will only use basic Macintosh computers, the State Department agreed there was no danger exporting old computer technology.

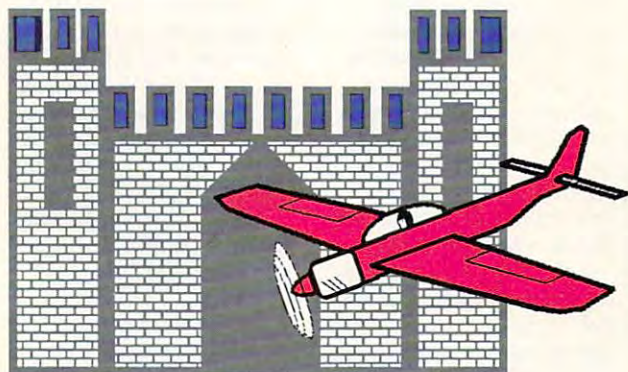
A more severe restriction is economic. The copy shop can only conduct about 30



percent of its business in rubles; the remainder must be in hard currency. Since rubles aren't exchanged on the open market, it's extremely difficult for the ordinary Russian citizen to come up with dollars or other Western currency. The store will mainly cater to businesses and professionals, like journalists.

There has been some interest in opening up other franchises in Eastern Bloc countries, but such plans aren't yet under way, Miller said. If the Moscow AlphaGraphics is a success, *perestroika* will go a long way toward bringing personal computers into the mainstream of life in the East.

— Peter Scisco



Flight into History

Visitors to the National Air and Space Museum in Washington, D.C., will soon see a computer game nestled among exhibits from NASA, McDonnell-Douglas, and other aerospace industry giants.

MicroProse's *F-19 Stealth*

Fighter flight simulator is scheduled to hold a featured spot in a new gallery, set for a May 1989 opening. The gallery, called "Beyond the Limits: Flight Enters the Computer Age," will display state-of-the-art advances in both flight and

flight-simulation technology.

Ironically, MicroProse had to simplify *F-19* somewhat in order to make the program quickly accessible to museum visitors. Project leader Lawrence Schick has overseen the streamlining of the game, which has been accomplished without reducing the quality of either graphics or flight simulation.

Original plans had called for the gallery to exhibit *Gunship*, another MicroProse product, but *F-19 Stealth Fighter* was substituted because of its technological sophistication as well as its timeliness. *F-19* was released in November 1988, on the same day the Pentagon admit-

ted the existence of the real Stealth fighter. The timing was coincidental.

MicroProse president, Air Force veteran (and well-known aviation addict) "Wild Bill" Stealey, was delighted to have his products represented in the nation's most popular museum. "We are tremendously thrilled by this honor. We think that *F-19 Stealth Fighter* fits in very nicely with the gallery's theme," Stealey said.

Visitors to the museum will find the MicroProse display near the Space Shuttle Simulator.

Off we go, into the wild blue. . .

— Keith Ferrell ▸

Fear and Boredom in Chicago

Most COMDEX attendees felt only the hot air of hype this year when the twice-yearly computer exposition breezed through the Windy City. Long known as *the* show of the year for dealers, manufacturers, publishers, and other interested parties, COMDEX is the place where companies roll out new products and talk up products to come. This year's Spring COMDEX was a yawner, though, especially for anyone interested in home computing.

Intel introduced, via an impressive video, its new 80486 microprocessor chip, which will be available in limited numbers come 1990. Unfortunately, software pub-

lishers still don't have a handle on how to fully utilize the 80386. In somewhat the same vein, PC-compatible computer manufacturers have jumped on the 386 bandwagon, putting out boxes running at 20 MHz and faster. Figure on home computer buyers sticking with the older, and slower, 286 systems for at least the next year, though.

Vendex, recently acquired by Philips, the giant Dutch electronics firm, is readying an

entry-level MS-DOS machine. The Explorer, scheduled for release in late summer, is a \$599 MS-DOS machine sporting an 8088 microprocessor; 512K of RAM; a 3½-inch, 720K disk drive; and four graphics modes, CGA, MCGA, MDA, and Hercules.

Other interesting hardware developments included several manufacturers' color LCD screens; Sharp's Wizard, a hand-held organizer; and Hewlett-Packard's new Desk-

jet Plus, a faster version of the company's versatile ink-jet printer.

Although software publishers do make it to COMDEX, not many of them fall into the home market category. Of the few new programs demonstrated, those that stand out are the MS-DOS version of The Learning Company's *Writing & Publishing Center* and Spinnaker's reworked *Eight-in-One*.

— Gregg Keizer

Viva la Revolución!

Political intrigue. Pressure from the left. Threats from the right. Conspiracies, death squads, mounting debt, and a patronizing neighbor to the north. If you can deal with all of this, you might try your hand at Springboard's *Hidden Agenda*.

The most obvious goal to this postrevolutionary game is to survive three years as *presidente*. But, as the game's designer Jim Gasperini points out, it's up to each player to decide whether or not he or she has won. At the end of the game (which is determined by a set number of turns rather than by a clock or score), you receive a verdict that describes your turn in office as viewed by future historians.

Play consists of confrontations, consultations, and encounters with various characters, ranging from firebrand revolutionaries to a represen-

tative of the International Monetary Fund. According to your aims, which you establish at the outset, you must manage political personalities and economic realities as you chart a course through murky waters.

For anyone interested in experiencing South American politics in the late 1980s, this game offers a taste of what it's



like. Gasparini hopes the game and others like it—nonlinear, interactive adventures—will attract computer users who don't as a rule play computer games. *Hidden Agenda* is a step beyond the headlines, a mirror to the complexities reflected on the front page.

— Peter Scisco

PC Gets Hyper

Apple didn't invent hypermedia. The company just took the market into its own hands by introducing *HyperCard*, hypermedia for the Mac-loving masses. In a similar move, IBM has released *LinkWay*, a mouse-based authoring and presentation tool for PCs and compatibles.

Like other hypermedia packages, *LinkWay* integrates several kinds of data—graphics, text, videodisc input, music, CD-ROM files. Information is stored in clusters and then accessed through paths.

It will display graphics in any color mode that your computer supports, including VGA for high-resolution images. A simple scripting language lets you create your own applications. To create and manipulate graphics, the program offers LWPaint. To import graphics from other programs, you can use the memory-resident LWCapture. The program's no memory hog, either, requiring only 384K with 512K recommended.



"*LinkWay* was specifically designed for the education market, but it's not limited to that," said Tony Peacock, consultant product administrator for *LinkWay*. "I would say our sales are slightly more outside the K-12 market than inside."

Peacock sees the program filling the same kind of niche that *HyperCard* fills for the Macintosh.

"Response has been very, very busy and very positive," said Peacock. "We have six different people associated with this project, and we haven't been able to do anything for about six months because the phone keeps ringing."

Single copies of *LinkWay* cost \$110. For more information, contact your local IBM dealer.

— Heidi E. H. Aycock

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Your Binary Order, Please

Finally, computers are having a truly important effect on society—speeding up service in your favorite beanery. Although they're still rare, handheld computer terminals may replace order pads, and that pencil behind your server's ear may simply become a prop.



Equipped with a radio transmitter and receiver, the Electronic Server Pad (ESP) gets your order to the kitchen faster than your server ever could. To you, it will appear that your server is simply punching in orders on a calculator. Your order shows up on a terminal at the bar or in the kitchen, and a printer at the workstation produces a hard-copy of each bill.

Your food is prepared sooner, your bill is totaled up more accurately, and your din-

ing goes more smoothly. Best of all, your server spends more time attending to your needs and less time hiking to and from the kitchen.

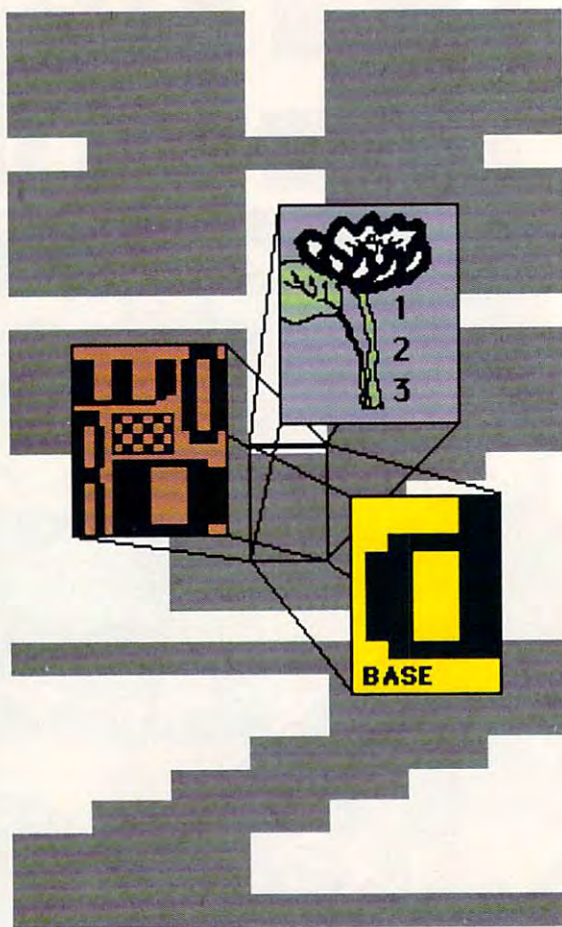
ESP-equipped restaurants get some behind-the-scenes benefits, too. Restaurant managers have a complete accounting of everything sold, and quicker service means more business.

Remanco Systems of Danvers, Massachusetts, has installed nearly 100 of these systems around the country. Bobby's Seafood Restaurant, for example, has been using ESP for about seven months. Owner Bobby Keough's staff loves the system, and he's seen his business improve. "What I can track is that we can do more business in a given period of time—probably 15 percent more at busy periods," he said.

Still relatively new, ESP may take a while to catch on. Besides facing the normal challenges of selling a new product, Remanco systems has to battle computerphobia in the restaurant community. After that breakthrough, though, Rosie may be using her favorite paper towels to wipe off her handy computer terminal.

Soon, you may be sipping your drinks before you finish ordering dinner—and servers may be earning more tips.

— Heidi E. H. Aycock



Software Goes to School

In college, even macaroni and cheese can be a luxury. Imagine, then, the financial strain that software puts on a student's budget.

To ease the burden, some software companies have teamed up with text-book publishers to offer academic editions of such productivity hits as *Lotus 1-2-3*, *Microsoft Word*, and *dBase*.

Although academic editions are often abridged, they meet the needs of college students. *Quattro: The Student Edition*, for example, has been trimmed back, but the missing features are related to business operations. The package is produced by McGraw-Hill Publishing and sells for \$34.95.

Compared to the retail price of \$247.50 and the \$45.00–\$50.00 educational discount price of the standard *Quattro*, students come out ahead with

the *Student Edition*.

Software publishers win, too. "We get value-added course material, and we get a much broader presence in the educational market," said John Seamster, Educational Sales Manager for Borland.

But unless you're a bona fide student or university employee, don't bother heading for your local campus. College bookstores carefully control who buys student editions.

"We have real strict rules," said Rose Pruette, software buyer for University of North Carolina at Chapel Hill Student Stores. "They have to fill out a form declaring they're student, faculty, or staff. If they're students, we have to see a student ID. If they're staff, we look them up on the payroll, and if they're faculty, we check their faculty card."

— Heidi E. H. Aycock ▸

The Big City is Putty in Your Hands

It's a game. It's a teaching tool. It's two programs in one. It's *SimCity*, a game that teaches people about city planning.

SimCity simulates town growth from the first groundbreaking to the inevitable traffic snarls. For each action you take, *SimCity* calculates the effect on all other elements of the city. For example, the crime rate is affected by the number of police stations which in turn affects the budget and the tax rate.

The program does such a good job of simulating city development that Maxis Software has designed a special version due out this summer.

"In the professional version, the user will be able to manipulate the model that evaluates how good the city is," said Bruce A. Joffe, a GIS (Geographic Information Systems) consultant to government agencies. Joffe was the inspiration behind *SimCity*.

Because it's a game, *SimCity* is best used as an exploratory tool. "If necessity is the mother of invention, play is its father," said Joffe. "I think it's really important to create an environment where you can play with the ideas you work with. *SimCity* lets you play with some of these more complex concepts."

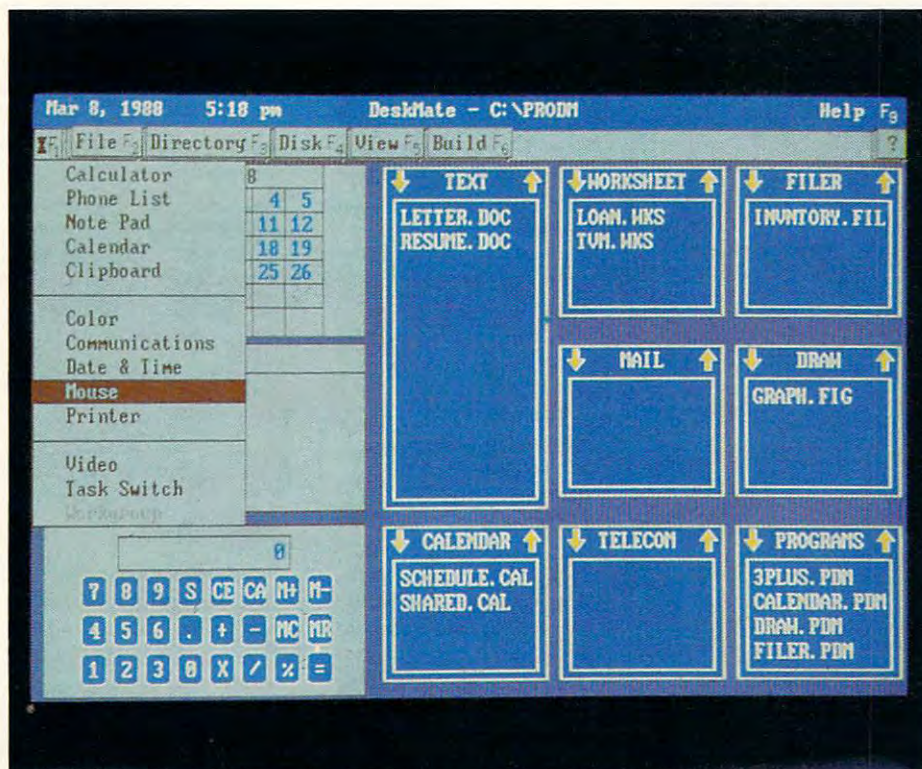


Godzilla, who plays a cameo role in the recreational version, will be optional in the professional package.

For more information,

contact Maxis Software, 953 Mountain View Drive, Suite 113, Lafayette, California 94549; (415) 376-6434.

— Heidi E. H. Aycock



DeskMate Update

It's been over a year since Tandy announced free licenses to its DeskMate graphics interface and operating environ-

ment. Back then, few more than a dozen software developers took up Tandy's offer; consumers are only now starting

to see some of those products on Radio Shack shelves across the country.

The count is up to 100 de-

velopers who are interested in DeskMate development tools. Among the latest releases to appear under the DeskMate banner is a version of Software Publishing's *First Publisher*.

"We have 10 to 12 applications available on DeskMate now, and we expect to have 25 to 30 available by the end of the year," said Ed Juge, Tandy's director of market planning.

Software publishers aren't blind to the marketing clout Tandy wields through its 6000 retail outlets. Getting into Radio Shack stores can mean lots of sales. Intuit, for example, figures that it will sell an extra 100,000 copies of the DeskMate version of *Quicken*, its home and small-business accounting package.

Besides rounding up developers for its DeskMate corral, Tandy has also begun selling the *DeskMate* integrated software package through retail software chains like Babbage's. Customers who might not normally visit Radio Shack outlets will see the package and, Tandy hopes, will give the software a try.

— Peter Scisco

The End of Wastepaper Basketball?

With the typewriter having been around all these years, the keyboard seems a natural tool for giving your computer instructions. But because the keyboard isn't suited for all applications, researchers have developed mice, trackballs, joysticks, and digitizing pads.

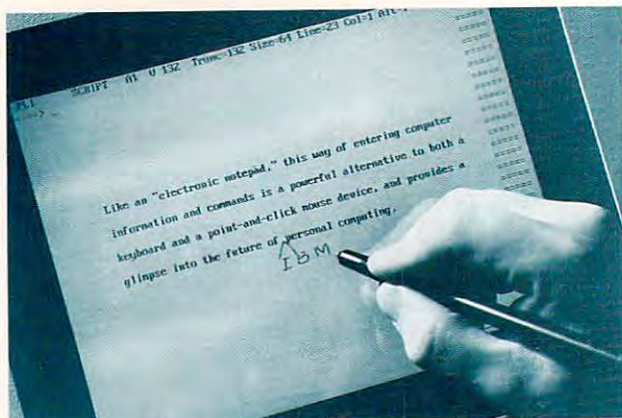
Now an IBM research team is developing an innovative computer input device that works just like a pen and paper.

In the Paperlike Interface experimental system, a stylus is used to write directly on a liquid crystal display (LCD) screen. A touch-sensitive coating determines where you are writing and reproduces your movements on the screen.

Handwriting-recognition software translates the writing and other hand-drawn marks—lines, graphics, mathematical symbols, proofreaders' marks, musical notes—into words, numbers, and commands for the computer.

The result is a more intuitive system for the computer user. For example, you could edit a text document by writing on the display, directly over the words you want to change. Or, you could add a column of numbers in a spreadsheet by drawing a line and a plus sign. And creating graphic images becomes as easy as drawing on a sheet of paper.

IBM isn't shipping any products using the paperlike interface yet, but a similar product is already available from Casio. The Screenwriter



A new IBM product may soon let you edit your word processor documents with a pen.

Digital Diary is a calculator-size device with a miniature touch-sensitive screen. It doesn't translate handwriting, but instead stores drawings as graphic images. You can combine text you've entered from the keypad with hand-drawn maps, messages, or diagrams.

A Casio representative

said sales of the Screenwriter Digital Diary have been slow and that the product may be ahead of its time. Without character-recognition ability, a paperlike interface is so close to using a real sheet of paper that people may just elect to use a 99-cent notepad.

— Denny Atkin



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Take Two Floppies and Call Me in the Morning

Common cold got you down? Hay fever, coughing, or a headache ruining your day? There may soon be a new way to spell relief: PC.

A microcomputer program that matches symptoms of common ailments with effective remedies and then recommends over-the-counter drugs has been developed by the University of Florida's Center for Computer Applications in Pharmacy.

Developed by Professor Paul Doering, the program is designed to be run on a PC equipped with a touch screen and located in a pharmacy. Customers enter their age, sex, weight, medical background, and current condition, and the computer prints a list of recommended medications, complete with product warnings.

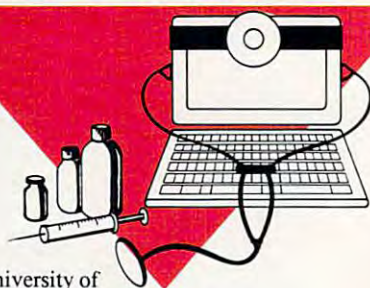
The program is especially helpful because it can identify

products that contain only the medication the patient needs, Doering said. This helps customers avoid products such as multisymptom cold relievers, which contain remedies for as many as 12 symptoms.

And, just like a real pharmacist, Doering's program won't let you take self-

medication too far. "If you've had a cough for more than ten days, it will recommend that you see a physician," he explained.

— Denny Atkin □



Clarification

The Professional Glare/Guard screen mentioned in the May *COMPUTE!* is manufactured by OCLI International of Santa Rosa, California. Lyben Computer Systems sells the screen for \$79.



Dan Gutman

This year's hottest
prospects for
top-of-the-charts
honors
in entertainment
software.

It's amazing.

Look how far we've come in just one short, dizzying decade. When we hit the eighties, state-of-the-art computer games were things like Scott Adams' *Adventureland* for the TRS-80. You were hard-pressed to squeeze a few beeps and bleeps and a smattering of primitive graphics out of the thing.

But as we charge headfirst into the nineties, computer games are beginning to rival movies and television as an entertainment medium. Mind-blowing graphics. Speech synthesis. CD-ROM. And big-name writers, artists, and

composers are turning to the computer screen as an alternative to the blank page or canvas.

For computer games, the last year of the decade may be the best. That's why the staff of *COMPUTE!* had no trouble picking nine great games for 1989. This list offers the newest, the biggest, the hottest games for your home computer. These are the games that will take you into the next decade.

If you buy only nine games this year, buy these games. You're holding the 1989 shopping list to great computer games in your hand—what are you waiting for?

Times of Lore

Most action/adventure computer games are either loaded with adventure but light on action or stuffed to the gills with action but propped up by a flimsy plot. Chris Roberts' *Times of Lore* blends the two computer challenges perfectly in an excellent introductory-level fantasy role-playing game. There's simply more depth here than in other action/adventure games.

The basic story is simple and straight out of the fantasy role-playing milieu: King Valwyn fought off an invasion of barbarians in the land of Albare and then took off for 20 years of R and R. Now, the barbarians are back and you have to summon King Valwyn.

You don't get bogged down with triviality in this game. A map is included, so you don't have to make one. To talk, you simply hit the mouth icon (Start Chitchat) and converse with 60 different characters, as well as living skeletons, ghosts, and slimes. (It helps to be talkative.) You can also examine, grab, drop, or give objects to other characters by using a joystick, mouse, or keyboard.

It's the little things and the clever touches that make a game stand out. In *Times of Lore*, shadows beneath trees add to the illusion of three dimensions. You'll hear birds chirping (Origin suggests playing the IBM version with the AdLib Music Synthesizer Card or the Creative Music System). When you enter one of the game's 45 buildings, the roof disappears to give you an aerial view.

But don't hesitate to attack—the monsters won't wait!

688 Attack Sub

The problem with submarine simulations is that reality moves too damn slow. A long-range torpedo moving at 20 knots could take as long as half an hour to reach its target. Borrrring!

And if you speed up everything, even lethargic helicopters move like frenetic Keystone Kops.

To get around that problem and make *688 Attack Sub* exciting, Electronic Arts limited the combat range of the game to 15 miles. To keep the intensity level up there, EA cut out all nuclear weapons—most gamers agree that conventional (nonnuclear) warfare is much more intriguing. The result is a game that's as swift and exciting as any Mach 2 flight simulator.

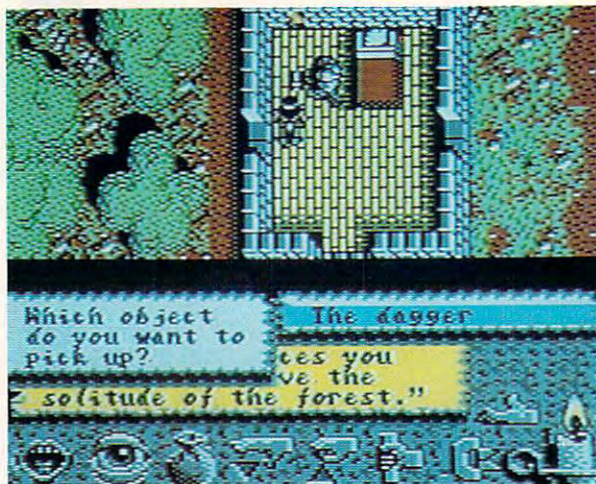
You're captaining a nuclear-powered attack sub (either an American Los Angeles-class boat or a Soviet Alpha-class sub) playing underwater hide-and-seek on any one of ten missions, including one in which you have to sink four Libyan oil tankers in the Strait of Gibraltar. You've got sonar, radio, periscope—40 controls altogether.

The designers have done their homework, so you'll learn a thing or two about attack submarines. The *cavitation gauge*, for instance, measures the vacuum created when propeller blades move faster than the water around them. This creates noise—the kiss of death for subs. You can even send out noisemakers—devices fired out of torpedo tubes to fool enemy sonar.

An intriguing addition is the modem option, which lets you play against a friend around the corner or around the world. Fascinating game. You almost feel like you've stolen government secrets.

TV Sports Football

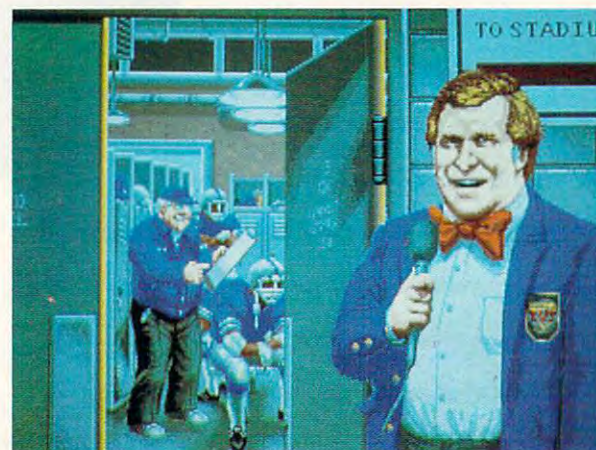
Football simulations are getting to the point where they're more interesting than watching *real* football. *TV Sports Football* is perhaps the cleverest and most innovative football simulation ever. Unlike previous efforts, which employ tiny, silly-looking stick figures running around



Times of Lore



688 Attack Sub



TV Sports Football

your monitor screen, *TV Sports Football* attempts to recreate the game the way most of us are used to watching it—on television.

For starters, while the arcade-style football game is

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loading, you see a screen that reads, "TV Sports Football... brought to you by..." and one of 12 dummy commercials appears. One is for Buffalo Bob's Famous Armadillo Burgers and shows a graphic of an armadillo with a cowboy hat sitting at a table with a knife and fork in its hands. The company's slogan: "If it's flat, it's good!"

The commercials, Cinemaware president and chief programmer Bob Jacobs says, were written by "some de-ranked people in our design and development staff."

TV Sports Football also features a pregame show (ex-jock Turk McGill talks about which teams are playing and who is favored) and a halftime show starring a beefy guy suspiciously named Don Badden. Badden comments on what happened during the first half. Occasionally, a marching band comes by or a leggy cheerleader hangs on to him. On special occasions, Morganna "The Kissing Bandit" appears out of nowhere, and the police chase her across the field.

Put aside all these game-of-the-week flourishes, though, and you have a great football simulation. You watch the action from two points of view: for field goals and extra points, your vantage point is right behind the kicker; for most of the rest of the game, you watch from above, as if you were in a blimp. "We cheat the perspective a little," Jacobs says, "so you don't just see helmets and shoes."

With many other football simulations, once you call a particular play, you're forced to run that play. *TV Sports Football* allows for some spontaneity. If you choose a pass to the wide receiver on the left, you can call an audible at the line of scrimmage and roll out, hand off, or attempt any number of other plays. You can also sit back and let the computer play for you.

Just as in the real world, *TV Sports Football's* league includes 28 teams and runs a 16-game schedule. Each team's offensive and defensive characteristics differ.

The teams on the disk are based on their NFL counterparts, but no real team names or player names have been licensed. You can edit the teams, though, to change the players' names.

The computer keeps statistics in 60 categories. You can view the weekly schedule, standings, league leaders in six categories, and stats by team. The graphics, as you would expect from Cinemaware, are spectacular.



Jack Nicklaus' Greatest 18 Holes of Major Championship Golf

With the wonder of computer simulation, you can do things that are difficult or impossible in the real world.

With *Jack Nicklaus' Greatest 18 Holes of Major Championship Golf*, you can play some of the most spectacular golf courses in the world (Pebble Beach, St. Andrews, Riviera, Royal Lytham, Baltusrol, Merion, Muirfield, Oakmont, and Augusta National, to name a few). You can belt long drives, win big money, and even play head-to-head against the man who has been called Golfer of the Century. (Jack's shot distances in this simulation have been patterned after his real game).

It's not the same as being there, but *Accolade* has come pretty close. Overhead and behind-the-tee perspectives provide a 360-degree view of the hole. The courses are complete with roughs, sand traps, water hazards, and golf-cart paths. The designers even thought to put in random pin placement, so no hole plays the same way twice. I only wish I had the option of playing left-handed, my natural side.

The computer conveniently keeps score for all players (check out Natasha, the blonde in the golfing miniskirt) and lets you know the distance of the longest drives. A little finesse is useful here—the wind gauge at the lower left of the screen tells you the speed and direction of the wind, and the break indicator helps you read the green for dead-on putts.

Still, the game is easy to get into, perhaps *too* easy. You'll be creaming 280-yard drives in no time. On my first hole at Desert Mountain, I birdied while Jack only made par—and I've never even played golf!

Great Games I Have Known

When it comes to games, I'm a grunt. A brute. Okay, I admit it. I don't willingly play adventure or role-playing games. I don't get into war simulations or intricate flight simulators. I don't have the patience for them. I like to drive fast, kill stuff, and walk away, my tensions lessened momentarily. So if the following list of my favorite games is top-heavy in mindless entertainment, well, that's the kind of guy I am.

For the pure adrenaline rush, they have yet to improve on *Robotron* (Atari) although I also get off on *Lode Runner* (Broderbund), the intense maze game *Oil's Well* (Sierra), *BallBlazer* (Lucasfilm), and the classic *Ms. Pac-Man* (Atari).

I have a weakness for driving games. Atari's *Pole Position* has had a special place in my heart for years, but *Accolade* is closing in from behind with *Test Drive II* and *Grand Prix Circuit*, both of which are spectacular.

My favorite sports game is *Accolade's Hardball* because of the realistic battle between pitcher and batter. The *Summer/Winter/World Games* group from Epyx is also the perfect panacea for computer-game zombies like myself.

When I need a little intellectual stimulation (and that does happen on rare occasion), I turn to *Balance of Power* (Mindscape), which, like *Guardians of Infinity*, is a terrific example of how the computer-game medium can be used as an educational tool without being a drop-dead bore.

The all-text games of Infocom are also great exercise for the temporal lobes, and I especially like *Hitchhiker's Guide to the Galaxy*, *Planetfall*, *Trinity*, and *The Witness*. I must confess, however, that, while I really admire the skill that has gone into making these games, I personally don't have the stick-to-itiveness to get into them very deeply. As soon as the first few puzzles trip me up, I quit.

For more mindless brain work, I'll take *Shanghai* (Activision) any day. I should also give special mention here to *Chessmaster 2000* (Electronic Arts) and *Battle Chess* (Interplay)—wonderful variations on the classic contest. And if anybody could make a game as hot as the old arcade game *Tempest*, my life would be complete.

Pick and Choose

You pay \$4 for a paperback book, \$6 for a movie, and \$13 for a CD, but when you walk into Software City it's hard to find anything to play on your computer for less than 30 bucks. Unlike computers and memory chips, software hasn't gotten any cheaper over the years. Unless you're fabulously wealthy, you've got to be so careful when selecting games.

Here are a few suggestions to help you get the most bang for your gaming buck.

▲ **Don't be fooled by slick package illustrations or magazine ads.** Frequently, the money that should have gone into creating a great game goes into promoting a lousy one. If possible, see the game yourself. Most computer stores won't allow this, but friends and user groups will. Several of the online networks have software previews to give you a teaser of new titles.

▲ **Ask for advice.** If you can't see the new games themselves, read reviews in computer magazines. Ask people on electronic bulletin boards or online networks what's new and

hot. If you've got a friend who works at a computer store, sees all the new stuff, and will give you an honest opinion, all the better. One little-known resource is the monthly newsletter "Computer Entertainer" (5916 Lemona Avenue, Van Nuys, California 91411). It looks at all the new stuff, and since it's not advertiser supported, it doesn't pull any punches.

▲ **Go for experience.** Track records count for something. If you liked Chris Crawford's *Balance of Power* (Mindscape) or Dan Bunten's *Modem Wars* (Electronic Arts), chances are you'll enjoy the next game by that game designer, too. Also, every publisher's games have a similar feel to them, so if you're happy with the Brøderbund games you've played, you might want to look at its new releases more carefully than those of other publishers.

▲ **Word of mouth.** As with everything else you buy, word of mouth is still the best salesman. If a friend has been locked in his room with a game for the past three weeks and his mother is about to call in the cops, check out the game.



Neuromancer

"You've just spent the night sleeping face-down in a plate of synth-spaghetti in a bar called the Chatsubo." So begins the wonderful world of *Neuromancer*.

As computers become more powerful, what possibilities lie ahead for the hackers of the future? The answer is provided in this fascinating game based on William Gibson's cyberpunk science-fiction novel. *Neuromancer* breaks all the rules.

Instead of mucking around in drafty dungeons, you're breaking into mainframes, circa 2058 A.D. Your fellow hackers—*cowboys*, they're called—are disappearing and you've got to find out why. After you get some cash and pick up a cyberdeck and communications software, the world—or cyberspace in this case—is your oyster. There are people to see (and steal money from), places to go (Chiba City, Japan), and security levels to invade.

You don't have to worry about hit points, puzzles, or parsers. Wars are fought with information, not swords. The only way to defeat ICE (Intrusion Countermeasure Electronics) is with your own software, which ICE will do its best to crash. There are 57 real-world locations and 40 databases to explore. You'll help your cause if you purchase a few skill chips, which are implanted into sockets in your brain (I hate when that happens!).

Computer games frequently promise to take players to another world. The inventive and witty *Neuromancer* delivers. The help and inspiration of Timothy Leary doesn't hurt, nor does the funky soundtrack by DEVO.



Arkanoid

Everything that goes around comes around. This game takes you all the way back to 1975, when two young punks named Jobs and Wozniak spent four nights designing a little ditty called *Breakout*.

Breakout was essentially an ingenious combination of *Pong* and *Space Invaders*. A layer of bricks filled the top of the screen, while the player controlled a paddle—actually a small moving line—at the bottom. A ball was set in motion, and the player used it to knock out all the bricks without letting the ball shoot past his paddle. According to Apple legend, the reason Woz wanted the first Apple computer to display color was so that it could be used to play *Breakout* in all its glory.

But that was 15 years ago. Now, *Breakout* is back—as *Arkanoid*. There's some hokey in the instructions about a grid monster and other science-fiction baloney, but it's apparent that what we're seeing here is *Breakout* jazzed up for the nineties.

Now the bricks are arranged in unusual configurations. Some of them burst after one hit, while others require two or more hits. Some just stay there no matter what you do. Then there are these annoying pyramid shapes and boats that float around, getting in the way and bouncing your ball off at wacky angles.

Arkanoid also borrows from another classic—*Pac-Man*. Some of the bricks turn into capsule shapes when they're hit and fall straight down. If you catch these power pills on your paddle, they may cause the ball to temporar-

The Fine Art of Cheating

The greatest pleasure for a game lover is to solve, beat, or simply excel at a challenge by relying on wit and coordination. But sometimes even the cleverest gamer gets stumped. The next time you are hopelessly lost or stuck, have given up, or are on the verge of a nervous breakdown, don't despair!

There are places to go for help:

Quest for Clues, Volumes 1 and 2 (Origin, \$24.95) are two books filled with hints, maps, and walk-throughs to post-1986 hit adventure games such as *Bard's Tale*, *Might and Magic*, *Moebius*, *Amnesia*, *Autoduel*, *King's Quest III* and *IV*, and many of Infocom's games. Author Shay Addams uses a clever code that makes it possible to find your way through sticky situations without giving the whole game away.

Addams also publishes a monthly newsletter called "QuestBusters," which is filled not only with hints and solutions but also reviews, news, and rumors—just about everything you want to know about adventure gaming. It's available for \$18 annually (\$24 for first-class mail) from QuestBusters, P.O. 32698, Tucson, Arizona 85751. For older (pre-1984) adventure games, check out **The Book of Adventure Games** (Arrays, 1984) by Kim Schuette. And COMPUTE! Books pub-

lishes Donald Trivette's **The Official Book of King's Quest**.

Several software publishers put out hint books of their own. Infocom's **Invisicues Hint Booklet** includes maps and uses a special invisible-ink process to give you only the hints you need. Booklets are available for all Infocom all-text games except *Nord and Bert Couldn't Make Head or Tail of It* (contact Infocom at 125 CambridgePark Drive, Cambridge, Massachusetts 02140). Epyx publishes **Epyx Advanced Hint Book**, which includes *The Legend of Blacksilver*, *Sub Battle Simulator*, *Space Station Oblivion*, and *L.A. Crackdown*.

Electronic Arts has a hint book for *Bard's Tale*, *Wasteland*, *Sentinel Worlds*, and *688 Attack Sub*. Origin has them for *Ultima III*, *IV*, and *V*.

Other books include offerings from Lucasfilm (*Zak McKracken*, *Maniac Mansion*), Interplay (*Neuromancer*), New World Computing (*Might and Magic*), and SSI (*Pool of Radiance*). Some of these companies will field questions over the phone.

If you're stuck and need an answer right now, log on to the gaming forums of GENie, Q-Link, The Source, People/Link, or CompuServe. You're sure to find somebody on late at night who can help you through the stickiest situation.

ily slow down, double the size of your paddle, or transform the paddle into a laser gun. And if a little spot on the right wall turns blue, you can scoot right through without having to finish the rest of the screen. There are 33 levels of this, mind you. Wicked!

Pong to *Space Invaders* to *Breakout* to *Arkanoid*. The end of the progression may not be original, but it's as hypnotic, addictive, and fascinating as any of its ancestors.



Romance of the Three Kingdoms

A smash hit from Japan, this game is based on a fourteenth-century historical novel of the same name by Lo Kuanchung. The story takes place in the year 190 A.D., when the Second Han Dynasty was dying out. You are a warlord, out to unify China.

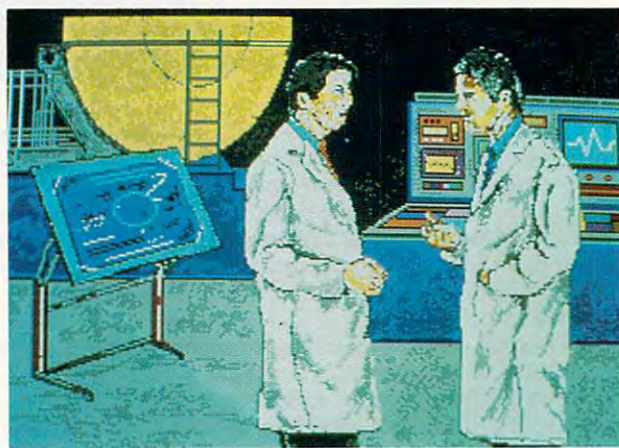
There's not much hacking and slashing here. To win the game, you've got to negotiate with other masters, win the loyalty of your subordinates, cope with disasters, and take advantage of the terrain. It's also important that you manage money and keep the peasants happy.

It's fun to spread rumors about other masters, set your enemy's food supply on fire, or offer one of your daughters to another master. If you catch an enemy master, you can behead him ("waste the malefactor," as Ro-

mance of the Three Kingdoms terms it).

Romance of the Three Kingdoms doesn't claim to be nonsexist. With command 5 (Recruit), you can give beautiful women as gifts to your generals. To get the beautiful women, simply use command 12 (Plunder).

Included in the program are five different (but equally difficult) scenarios, several maps, a time line, and graphics of 65 famous generals. The game covers 120 years of Chinese history and is a fascinating challenge.



Guardians of Infinity

One of the few games to include real-life characters, *Guardians of Infinity* is an absolutely fascinating blend of fact and fiction that will have you riveted to your seat and screen.

It starts in the year 2087, with the time continuum spinning out of control. The whole mess began, according to physicist Adam Cooper, with the assassination of John F. Kennedy. As a time-travel scientist, your mission is to travel back to Friday, November 15, 1963, and do nothing short of altering the entire course of history.

A stranger can't just walk up to the President of the United States. You've got to send your five agents—the Guardians of Infinity—to meet historical figures (LBJ, Jackie, Bobby, J. Edgar Hoover, Peter Lawford, Lee Har-

vey Oswald, and many others) to get to JFK himself. If these agents aren't arrested, kidnapped, or killed along the way, you have just 15 minutes to convince the President in a face-to-face meeting that you *are* from the future and that he should cancel his fateful trip to Dallas.

The painstaking research that has gone into the project shows on every screen. Great idea, great game. And while you fight to save the world, you hardly notice that you're also getting a pretty good history lesson. A 90-page novella is included.



Populous

Only a computer can make you a god. That's the premise behind *Populous*, a soon-to-be-released game for the Amiga that's hot, hot, hot.

You're a Divine Being, peering down on a world filled with tiny people. These folks worship you and will do your bidding, for the most part. In return, you'll pitch in with a timely earthquake or two, some serious planetary flooding, and even a volcano for good measure.

Why all the violence? Because there's another race of tiny tribespeople in the world—a race that worships a rival deity, a false god. There's just not enough room for two gods in this world, so your job is to help your followers explore, settle, battle, and finally conquer that world.

You start with three small figures (each representing a tribe) that immediately begin wandering around, looking for flat land to settle and build on. You can give them a mighty hand by leveling the earth—raising lowlands and flattening highlands is as easy as a mouse-button click. The flatter the land, the larger the structures your people can build. The larger the structures, the faster your power builds and the better your people's technology.

More structures means more people, and the more who worship you, the more power you obtain. It's to your glory, then, for your followers to proliferate across the world, settling all corners. Direct them by placing a Papal Magnet in strategic locations; your people's leader strikes out for the Magnet on command, and the others follow.

Once your people meet the enemy (not always easy, since they may be across an ocean, but hey, you're a god—build a land bridge), you can push your followers into Battle mode, whereupon they'll fight for every hut, house, keep, and castle. For unrelenting warfare, turn your leader into a Knight, a rampaging warrior who heads for the nearest enemy settlement, kills its inhabitants, and sets fire to the buildings. You can even intervene with an

act of god, whipping up a volcano, flood, swamp, earthquake—even Armageddon, if you have enough power.

Your goal is peculiarly godlike—destroy all the followers of your rival. Once you've conquered one world, you can go on to the next. There are nearly 500 worlds to explore, ranging from pastoral Grass worlds to uninviting Ice worlds. Each requires its own unique strategy for conquest.

Populous is primarily a one-player game—you against the machine. But with an opponent seated at another computer, you can play via modem or direct null-modem cable link.

Utilizing great graphics, a simple-to-learn interface, and almost unlimited variety, *Populous* is a must buy for 1989.

Where else but on a computer can you not only *play* a god, but also *be* one? □

Syndicated columnist Dan Gutman is a longtime writer in the computer field. His most recent book is *I Didn't Know You Could Do That with a Computer!* (COMPUTE! Books). He recently completed a book about cheating in major league baseball, scheduled for publication by Penguin in March 1990.

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Manufacturer	Parsons Technology	Intuit, Inc.	MECA Ventures, Inc.	Monogram Software, Inc.
Suggested Retail Price	\$29.00	\$49.95	\$219.98	\$179.95
Account Balancer	YES	YES	YES	YES
- Automatic Error Finder	YES	NO	NO	NO
Accounts Can Be Added				
When Entering Transactions (Data)	YES	YES	YES	NO
Budgeting	YES	YES	YES	YES
- Variable Budgeting By Month	YES	NO	YES	YES
Automatic Transactions	YES	YES	YES	YES
Financial Reports				
- Actual Financial Results	YES	YES	YES	YES
- Month and Year to Date	YES	YES	YES	YES
- All Months On One Report	YES	YES	YES	YES
- Budgeted Financial Results	YES	YES	YES	YES
- Actual Compared to Budget	YES	YES	YES	YES
- Actual Compared to Prior Month	YES	NO	NO	NO
- General Ledger Report	YES	YES	NO	NO
- Accountant's Trial Balance	YES	NO	NO	NO
- Net Worth Computation	YES	NO	YES	YES
Inquiry Reports				
- Check and or Deposit Register	YES	YES	YES	YES
- Account Analysis	YES	YES	YES	YES
- All Transactions with Party	YES	YES	YES	YES
- Cash Requirements Forecast	YES	YES	YES	YES
- Aged Invoices Payable	YES	NO	YES	YES
Graphics	YES	NO	YES	YES
Fiscal Year Support	YES	NO	YES	YES
Optional Password Protection	YES	NO	NO	YES
Financial Calculator	YES	NO	YES	YES
- Prints Amortization Schedules	YES	NO	YES	YES
- Prints Accumulation Schedules	YES	NO	YES	YES
Mail List Manager	YES	NO	YES	YES
- Prints Address Labels	YES	NO	YES	YES
- Prints Index Cards	YES	NO	YES	NO
- Prints Telephone Directory	YES	NO	YES	NO
- Mail Merge with Word Processor	YES	NO	YES	YES
Check Writer	YES	YES	YES	YES
- Prints Laser Checks	YES	YES	YES	NO
- Prints Any Pin-Feed Check	YES	NO	YES	YES
Personal Income Tax Estimator	YES	NO	YES	YES
Pop-up Note Pad	YES	NO	YES	YES
Pop-up Math Calculator	YES	NO	YES	YES
Capacity				
- Total Number of Accounts Per File	999	300	*	120
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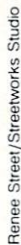
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COMPUTER IN DISGUISE?

28 C O M P U T E I



oes your next-door neighbor have a home computer?

How about a Nintendo?

At the moment, it's even money.

Computers are found in about 20 percent of American homes. So are dedicated game machines such as the Nintendo Entertainment System or the Sega Super System.

But Nintendo, Sega, and other cartridge-based game systems are gaining ground. *Fast.* Many feel that every inch gained by cartridge machines is an inch—or more—lost by personal computers. And the ground gained by the game machines, particularly Nintendo, is not measured in inches. It's measured in millions of households and hundreds of millions of dollars. Nintendo has captured plenty of both.

It's easy to understand why. The Nintendo Entertainment System (NES) offers quick and inexpensive interactive entertainment. You can get started with a Nintendo base system for about \$100—several hundred dollars less than even the least costly personal computer.

Nintendo and the industry it's spawned are poised on the lip of a success that may dwarf that of home computers. An example: In the five years since the introduction of the Commodore 64, between 7 and 8 million of the computers have been sold. But last year alone, Nintendo sold 7 million game consoles—and could have sold another million and a half had it been able to produce the machines.

With Nintendo in the forefront, videogame machines are back in a big way. Even more important, their impact on home computing hardware and software may be enormous.

Computers?

Videogame machines are built around microprocessors. The games themselves are referred to as software (or, to be precise, firmware, in reference to the fact that the games are on printed circuits and on chips). The industry was strongly affected by last year's shortage of RAM chips.

So, are they computers?

Depends on how you define *computer*.

For the sake of argument, if nothing else, let's define a computer as a microprocessor-driven device capable of manipulating data. Is Nintendo a computer?

Sandy Schneider, Mindscape's vice president for consumer software, is cheerfully equivocal: "If I had to choose, I'd say, 'Yes, NES is very computerlike.'"

What if we extend our definition to include the versatility that many people see as computers' main virtue? The same machine on which you play games can also be used for everything from processing words to crunching numbers.

Schneider, whose company not only has produced some of the most successful computer games, but also has translated hits such as *Paperboy* to the Nintendo, still sees some areas of congruence between computers and NES. "Certainly it [NES] has a microprocessor; certainly it's capable of being something other than just a dedicated game machine."

The Call of the Market



Videogames are back in a big way. Their impact on home computing hardware and software may be enormous. But do they give up versatility for performance?

But at the moment, Nintendo is a game machine—only a game machine. So why trade away the versatility a computer offers? "Marketing," says Schneider without hesitation.

"The fact that NES is a dedicated game machine is wholly related to the way the system is marketed, packaged, and promoted. The fact that there's no keyboard reflects a marketing decision. The system's solid-state software, as opposed to disks, was a marketing decision."

She stresses the thoughtfulness underlying Nintendo's strategy. The company didn't overlook the possibility of producing a more versatile platform. It just wasn't interested.

"What was marketed was a concept—an inexpensive, plug-and-play game machine. Nintendo saw a desire for easy-to-use, affordable, interactive, entertainment machines. That was the niche they went after."

And having filled it? "Nintendo doesn't need to fill the computer niche—IBM, Commodore, and Apple are doing that. I think there's a sense that if they were to try to become a computer company, they'd be overstepping the bounds they set for themselves."

Computers!

But are they computers? Some software manufacturers have no doubt.

"Of course they are," declares Bill Swartz of Koei, a Japanese publisher of sophisticated software simulations.

There's no question in his mind. Nintendo is a computer. "But so is a loom; so is any programmable device."

Swartz also denies the common description of Nintendo and other videogame consoles. "I don't think there is such a thing as a dedicated game machine."

Swartz insists. "In Japan, Nintendo is used to communicate with information services. Already the machine is flexible enough to play different types of games. For that matter, if you're willing to work hard enough, you can put spreadsheets or anything else on a Nintendo."

There's a bottom line to Swartz's argument.

"Nintendo is certainly best suited to games," he admits. "But all microprocessors take digital 1s and 0s and convert them to images on a screen, move them in and out of memory stacks. That's it. Period."

Appearances Are Deceiving

However similar the insides, game consoles don't look like computers. For one very noticeable thing, there's no keyboard.

Again, deliberate. Nintendo knows that keyboards send messages: This is a productivity machine, they say, this is where you work. Computer users know that keyboards can be used for many purposes, playing games among them. A fair portion of the rest of the world sees a keyboard and thinks typing class.

But there are no joysticks, either, at least not conventional ones. Rather, the NES's controls—its interface, in industry parlance—are streamlined, elegant, yet surpris-

ingly flexible.

You'd be unwise to underrate the effect of that interface on the audience. The absence of the keyboard speaks for itself. The absence of traditional joysticks has prompted the development of a variety of alternative input devices, from light guns to interactive exercise pads,

from nontouch input screens to a "smart" glove scheduled for introduction later this year.

The input devices offer at least the promise of spawning a wide range of game types, although most of the software produced for Nintendo has been action-oriented. Game machines have, in fact, created an arcade renaissance. Nintendo and Sega characters jump, run, shoot, drive, fly, hit, punch. Quick action is what Nintendo sells, and the consoles excel at delivering it.

Even fantasy role-playing games—perhaps the most popular entertainment software category in Japan—are more action- than role-play-oriented on the Nintendo. Compare Ninten-

do's phenomenally successful *Legend of Zelda* with, say, Origin's *Ultima* series of role-playing adventures, and it becomes clear that Nintendo offers a quicker, but also a shallower, experience.

That may be changing. Software companies are gear-



View from the Top: Nintendo Speaks

We asked Bill White, Nintendo vice president for advertising and marketing, the same question we asked others in the industry: Is the Nintendo Entertainment System a computer? His answer was emphatic, and further conversation gave us a glimpse of where the game system is headed—and why.

"Certainly it's a computer—NES has a very sophisticated custom CPU," White says. "The CPU is custom-designed to maximize play value and program speed for videogame entertainment." Those words are close to being Nintendo's credo. "Our custom design maximizes game enjoyment second to none," White says.

But it doesn't look like a computer. White agrees. "Is it a traditional computer? No, it's not. Are there traditional devices like keyboards and disk drives? No, there aren't."

In Japan, though, where Nintendo can be found in more than 30 percent of the households, there are. The entertainment system, known in Japan as Famicom, has sprouted a variety of very computerlike peripherals. There's a keyboard for those who wish to have one; so far, according to most reports, few do.

More successfully, Nintendo has marketed disk drives, modems, and fax additions to the Famicom. In some households, Famicom is the nerve center for some aspects of household communications.

Can we look for Nintendo modems and similar peripherals here?

"Potentially," White says. "The door is wide open for that."

What will it take to get such peripherals to the U.S. market? More customers, White explains.

"As the installed base of Nintendo systems grows past 20-percent penetration, both [communications] networking and PC-related peripherals become more attractive business propositions," White explains. "So we're leaving those doors open while concentrating on the home-entertainment-based videogame system."

Because the machine is installed in so many households with so many children, NES would seem a likely vehicle for educational software, yet there has been little released so far.

"Third-party software developers [such as Hi-Tech Expressions with its Sesame Street cartridge series] are already taking advantage of particular opportunities in educational and preschool software," White says. "It's a limited market. We see education as an ongoing element of the Nintendo software library but not becoming the thrust of the system."

What about new technologies such as CD-ROM and 16-bit machines? "We maintain an extensive research and development program," White says, "and are looking at several exciting new technologies."

Is the 16-bit machine expected in Japan this year? "Sixteen-bits is a vehicle for further extending the quality of gameplay," White says. "But it's not even needed in the U.S. marketplace today. It would be premature to release such a machine without a significant number of game titles to market along with it."

But when the time is right? White simply shared a contagious chuckle.

It's clear that Nintendo intends to consolidate its hold, releasing new and more sophisticated game machines as the time and market become right—and ripe.

ing up to deliver Nintendo players the same depth of gameplay that has been available on personal computers for some time. Mindscape's Schneider sees "definite growth in the direction of software games. Nintendo entertainment is spreading beyond kids, becoming very strategy-oriented."

Mindscape is hoping new cartridges such as *Infiltrator II* reach beyond Nintendo's typical audience of 8- to 14-year-old boys. "The trend toward greater memory capacity will help the development of more sophisticated games. In Japan, the games range from fast action to fantasy. Even shoot-'em-ups are evolving."

If It's a Computer, There Must Be Software

Koei is another company whose willingness to see Nintendo as a computer implies a willingness to convert traditional computer software to Nintendo's format. Koei's products include *Nobunaga's Ambition*, a detailed

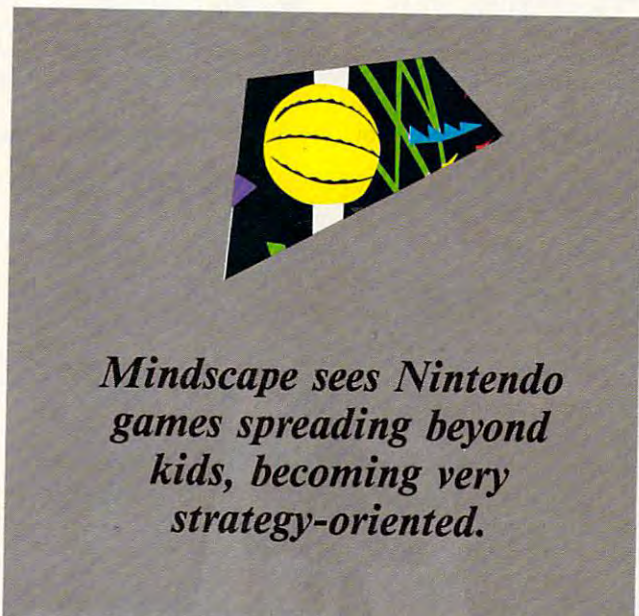
and complex recreation of sixteenth-century Japanese politics. Hardly the typical Nintendo game. Yet *Nobunaga's Ambition* is scheduled for summer release in the Nintendo format.

In fact, the game will stretch that format more than a little. *Nobunaga's* cartridge will contain 2.5 megabytes of data, as opposed to the cramped RAM more typical of arcade-game cartridges. Nor is *Nobunaga* a quick play like *Super Mario Bros.* Games can take hours; for advanced players, *Nobunaga* can stretch out over weeks.

"The cartridge will include a battery backup," Swartz explains. "You'll be able to save a game just as if you were playing on a floppy disk. In essence, we've put a virtual floppy inside the cartridge."

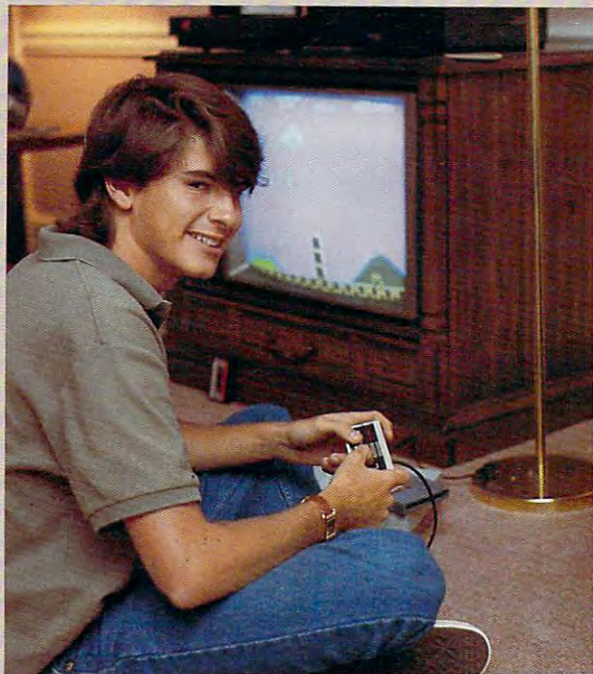
Koei is convinced that a large market exists for more challenging Nintendo entertainment. The compa-

ny's already found that market in Japan, where *Nobunaga* has been a big Nintendo hit. Swartz looks for more of the same here. >



Mindscape sees Nintendo games spreading beyond kids, becoming very strategy-oriented.

The Joy of Nintendo: A Player's Perspective



Tom Netzel

Jason Sparrow, 17, plays Nintendo games several hours a week. He wrote this guest column on his family's PC.

When I first saw Nintendo, I thought it would be a flash in the pan. It seems like every holiday season there is a new toy that retailers cannot keep on the shelves. Usually, a few months

after Christmas, the huge market for these toys disappears. Coleco, which made the Cabbage Patch Kids so popular a few years ago, nearly went under when the market for the Kids disappeared. But Nintendo, with its entertainment system, may quell this trend.

I think I know why. The Nintendo home system is easy to set up and can be hooked up to any television and be ready to play in a matter of minutes. I like this combination of a fast setup and easy disassembly. It makes the Nintendo convenient to move from television to television and place to place. I can play in more than one room in the house, which is helpful when my folks want me out of the living room. This mobility helps to explain why many video-rental stores are also renting Nintendo systems.

I really like Nintendo's controllers. The hand-held push-button controllers are light and easy to handle. They do not fatigue the hands as conventional joysticks may do after a few hours of play. The controllers are also easy to learn to use—much easier than controls on many personal computers. A while ago, I played a golf game on an Amiga; while the graphics were great, I found it difficult to get used to the controls and gave up.

Probably the best thing about the Nintendo system is the repeated challenges its games offer. *Super Mario Bros.*, the game that comes with the standard system, offers challenge after challenge, with many hidden surprises. It also has great graphics which are as good as or better than the arcade model. But the arcade model does not offer the versatility of the home system. At under \$100, the standard-system Nintendo is quite a bargain because even the game that it comes with, *Super Mario Bros.*, is a challenge that one won't quickly grow tired of.

— Jason Sparrow

In fact, he sees strong parallels between the current state of Nintendo software and that of disk-based software a few years ago. "The cartridge entertainment market is going to fragment like the personal computer entertainment market," Swartz predicts. "For computers, you've got cheap budgetware at \$7 and high-end products that cost much more. These are very distinct markets."

Koei's ambition? "We've tried to raise the stakes at the very top. I think we're going to make even clearer that a wide range of markets is interested in Nintendo. It's not aimed only at kids."

Software Slammed, Hardware Next?

Such moves may be self-defense, as well as shrewd marketing. Whether or not the game platform fits a strict definition of a computer, Nintendo has lately exerted some strict effects on computer entertainment software.

"Nintendo's success has destroyed the software entertainment market," says Bill Swartz. "The market has been significantly hurt. Retail returns are higher than anyone expected. Everyone thought they had accounted for Nintendo, but the company's still taken a huge chunk out of the traditional software market."

Sandy Schneider agrees that Nintendo has had a walloping impact on disk-based entertainment software. "Unfortunately, its effect has been extremely negative. Without question, Nintendo's success has eroded software sales. There's been a much greater falling off of disk sales than anyone anticipated."

Bill Swartz has no trouble understanding why. "We're competing for the same dollars," he says. "For software. It's a little harder to see Nintendo's effect on hardware."

Not for Manlio Allegra. One of the partners in International Development Group, which publishes *Out Run* and other Sega arcade games for disk-based computers, Allegra thinks dedicated game machines have already killed one computer. "Nintendo stopped the growth of the Commodore 64," he says.

Trip Hawkins, president of Electronic Arts, goes even further. At a recent industry conference, he said Nintendo was "the last hurrah of the 8-bit world."

With that world conquered, will Nintendo and other game-console manufacturers set their sights on the 16-bit market? You can bet on it.

16 Bits' Worth

"I'm not really sure if Nintendo is affecting the 16-bit market," Allegra says.

Not now, maybe. But 16-bit technology is attracting the console manufacturers. Sega already has a 16-bit machine on the Japanese market and is expected to introduce it here this year. Nintendo will likewise enter the 16-bit arena at some point in the next year or so.

Put even more powerful microprocessors in game consoles; do they become more like personal computers?

Not really. "You'll see different peripherals. The game experience will be more exciting, but gameplay will remain the focus," Allegra says. "You're not going to see a game machine that's doing word processing."



At a recent industry conference, Trip Hawkins of Electronic Arts called Nintendo "the last hurrah of the 8-bit world." Are 16-bit computers next in line?

A Contender

You may, however, see game platforms doing things that only a few personal computers are doing as yet.

CD-ROM, for one thing.

CD-ROM (Compact Disc-Read Only Memory) has long been touted as a breakthrough medium. CD-ROM discs look like CD audio discs and can hold hundreds of megabytes of data. For entertainment, the advantages of so much data capacity are obvious: bigger games, better-looking games, better-sounding games. While CD-ROM has begun to make an impact on business computing, its presence in the home computer environment is all but nonexistent. On game machines, however, it's a different story.

Late last year, NEC, whose PC Engine is

Nintendo's number 1 competitor in Japan, raised the game-console stakes there with the introduction of a CD-ROM drive for the Engine. Even NEC was stunned when the drive sold 100,000 units in less than four months. The huge success is all the more surprising when you learn that only three entertainment products were available when the drive was released in Japan. (PC Engine's CD-ROM drive can also play standard audio CDs.)

Richard O'Keefe, a software engineer at NEC, sees CD-ROM and other emerging technologies as natural extensions of entertainment consoles.

Does a CD-ROM drive make a game console more of a computer? Are PC Engines computers? "Do they do what a Commodore 64 does? They could," O'Keefe says. More peripherals would obviously make PC Engine more

of a computer. While remaining noncommittal even toward plans for distributing PC Engine in the United States, NEC has kept its peripherals options wide open.

"It's called PC Engine," O'Keefe explains, "because it's designed to plug into things. It's designed to be the brains of a whole bunch of different peripherals. There'll be a telephone, a color printer/digitizing tablet." The peripherals seem designed to make home entertainment systems capable of processing different types of information, more as computers do.

O'Keefe also sees a reverse flow. "There's a trend where videogames are becoming more computer-like, but computers are becoming more gamelike. The Amiga is the classic example."

Beyond Tomorrow

The long-term results of such trends? A blurring of the lines that separate computers from dedicated game systems.

"They [game machines and home computers] are going to merge," O'Keefe feels.

That's probably a pretty safe bet. A decade or so after their introduction, traditional personal computers may be nearing the limits of household penetration. While prices have dropped dramatically for even sophisticated keyboard-based systems, general consumer resistance has dwindled only a bit. The computer's very versatility may well work against it: The broad mass market that em-

braced VCRs, microwaves, and dedicated game machines is still not sure what it would do with a home computer.

But precisely as a result of those increasingly intelligent game machines, VCRs, and other appliances, that same market is becoming more and more familiar with microprocessors and the benefits these silicon marvels can provide.

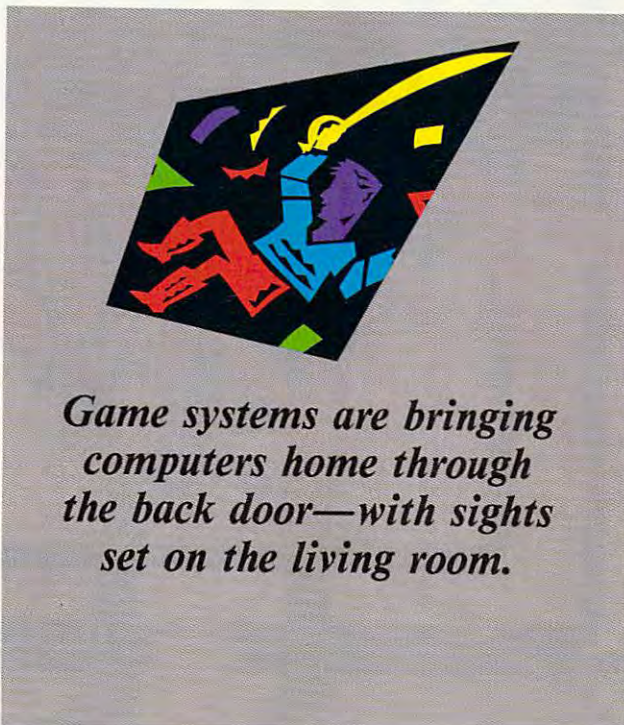
As new and more dynamic entertainment is made available for Nintendo, Sega, PC Engine, and game systems as yet unrevealed, consumers not interested in word processing, spreadsheets, or even computer games may well find themselves bringing home dedicated CPUs that are far more powerful than those which formed the foundation of the home computer industry.

Computing power may come home through the back door, and it may end up in the living room rather than in the home office.

And how will that industry respond? Many software publishers are already moving their products to Nintendo and other cartridge-based platforms. Others undoubtedly will follow.

For the long term, though, the only answer can be found in the word *Nintendo* itself. Loosely translated from the Japanese, it means *No matter how hard you work, the results are in the hands of God.* □

Keith Ferrell is features editor of *COMPUTE!*. He has three personal computers at home, plays lots of computer games, but does without a Nintendo Entertainment System.



What Do You Think?

As the experts debate, *COMPUTE!* is interested in what its readers have to say about computers, Nintendo, and dedicated game systems in general. Please take a few seconds to answer the following questions and then mail your response to *COMPUTE!* Game Systems Survey, P.O. Box 5406, Greensboro, North Carolina 27403.

Do you own a Nintendo or other dedicated game system? ☐ Yes ☐ No

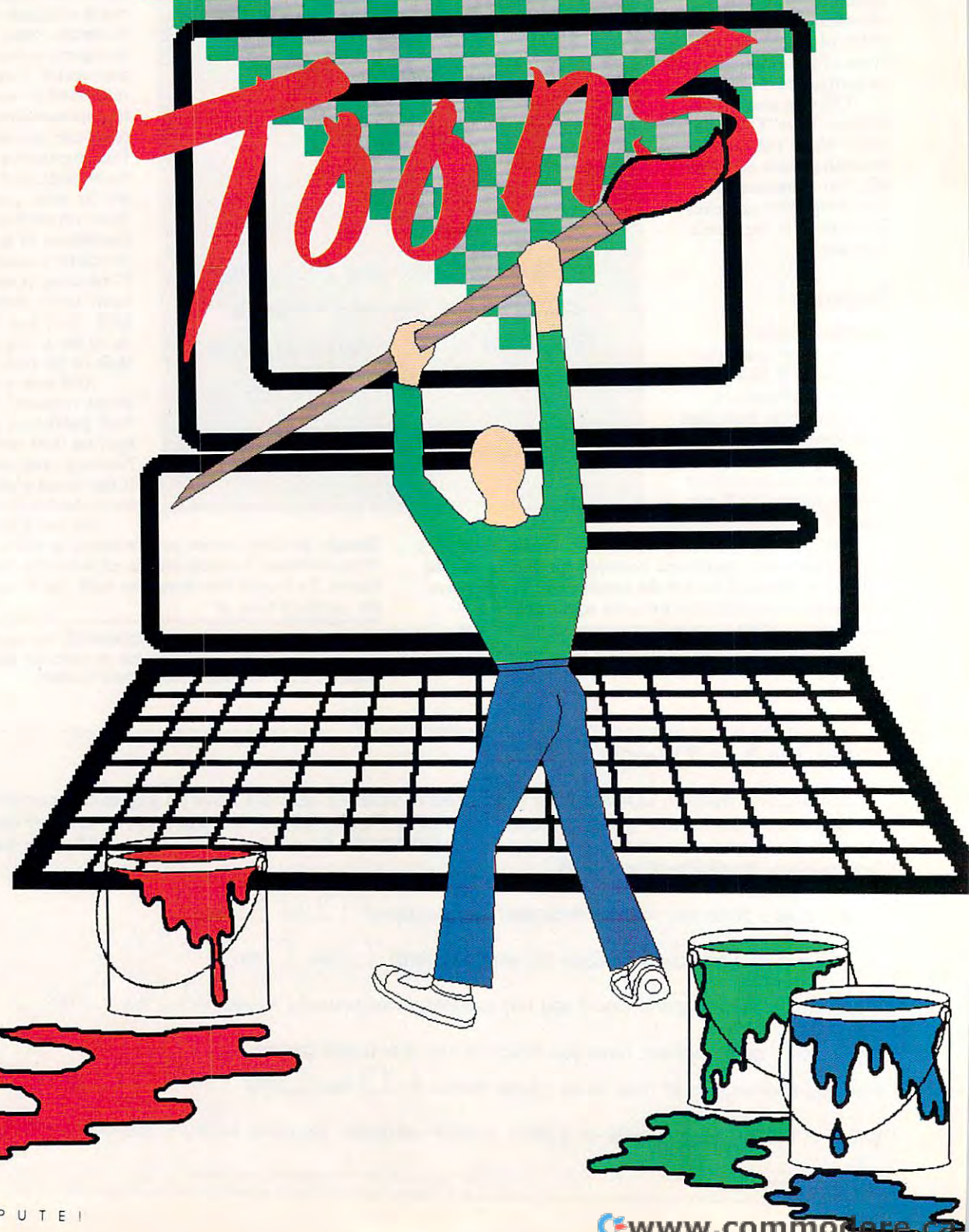
Do you use your personal computer for entertainment? ☐ Yes ☐ No

If you own a game system, would you buy another, more powerful system? ☐ Yes ☐ No

If you own a game system, have you bought fewer disk-based games than you normally would have since you've owned it? ☐ Yes ☐ No

Which of the two—a computer or a game system—provides the more satisfying game experience?

CREATE YOUR OWN
COMPUTER



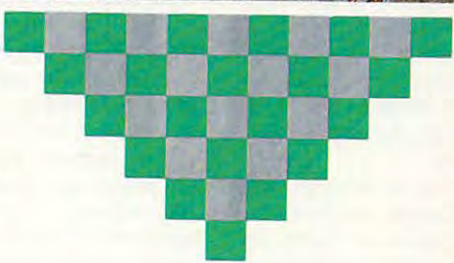
A cartoon cab with patched balloon tires puttters down a city street. The driver, a rabbit with a silly grin, waves. Suddenly the cab crashes into a fire hydrant, and the rabbit is thrown high above the street on a geyser of water. "P-p-p-lease!" pleads the hare, as he bounces to the ground, unhurt.

A scene from the sequel to *Who Framed Roger Rabbit*? No—a cartoon created with one of the new computer animation programs, packages that give you the tools to create your own computer 'toons.

Only a couple of years ago, no one thought animation would ever be possible on small computers—and who would want to make cartoons on PCs, anyway? But the revolution in easy-to-use graphics software, the migration of high-quality graphics displays to all computer platforms, and the emergence of desktop video and desktop presentations as important new uses for personal computers have provided fertile soil for the growth of low-cost computer animation. Today you can make dazzling, full-color animations on every kind of computer.

Traditionally, quality animation has been a craft that requires a long apprenticeship to master and deep pockets to fund. A new breed of animation software, combined with highly capable personal computers, has changed all that. Now, the technical details of animation creation are easier to learn, and animated efforts are cheaper to produce. Animation is accessible to anyone. A whole new generation is discovering what the great animators knew all along—that animation is one of the most effective forms of communication.

Managers use animation software to create animated charts and graphs that enliven otherwise dry presentations. Teachers use animation to present difficult-to-visualize concepts—atomic structure or the formation of black holes, for example. But animation programs are also for anyone who's spent countless Saturday morning hours watching cartoons, for anyone who dreams of creating his or her own dazzling 'toons.



ANIMATION BASICS

Whatever you can move in your mind's eye can be expressed through animation, the process of stringing together individual pictures to create the illusion of movement. The images themselves don't really move; instead, a sequence of related but incrementally changing images—called *cels* or *frames*—are displayed in succession so rapidly that, to the human eye, they appear as smooth motion. All animation—and for that matter, all video and film imagery—takes advantage of this physiological effect, called *persistence of vision*.

For animation to appear smooth and fluid, frames must be shown at a rate of at least 10 frames per second; the more frames per second, the smoother the animation. That means a lot of pictures. Ten frames per second amounts to 600 per minute—54,000 for a 90-minute program.

Luckily, your computer can do some of the work for you by automatically creating some of the frames. To do this, animation programs take two basic approaches.

Page-flipping. With the page-flipping method, also called *frame-by-frame* or *cel animation*, a series of pictures are created by the animator with a paint program. Each picture is incrementally different from the previous one. For example, a square could move from the left of the screen to the right in equal increments spread across 30 frames. When the sequence is finished, it's stored in memory or on disk as a series of bitmaps, referred to as *frames*, *pages*, or *cels*. To run the animation, the program loads all the frames into memory (or as many as will fit) and displays them in sequence at a set frame rate. When you look at the animation, the square seems to sail across the screen. If you've ever buzzed through the pages of an animation flip book, you'll understand the concept behind page-flipping.

Key-frame animation. Some animation programs take a different approach. With a key-frame animation program, sometimes called a *metamorphic animator*, you draw an object on the first frame (key frame 1), define a path for it

You too can be a Walt Disney
with one of these state-of-the-art
animation packages.

Steven Anzovin

to move around on the screen, and then change the shape of the object for a second frame (key frame 2). The program then animates the entire sequence, including moving the object around on the screen and figuring out the intermediate shapes the object should take to transform from its original shape to the new shape. The in-between images are called *tweens*, which is why key-frame animation is also sometimes called *tweening*. Obviously, such a technique saves you a lot of work.

To get a sense of what personal computer animation programs can really do, let's take a look at three popular two-dimensional animation packages—*Fantavision* for IBM PC and compatible computers, *Deluxe Paint III* for the Amiga, and *Videoworks II* for the Macintosh.

FANTAVISION

Fantavision (Bröderbund) is currently the premier animation program for MS-DOS machines; it's available for most of the other popular computer platforms, too. Operating on the key-frame principle, the program's main strength is that it can interpolate motions between two widely different frames, automatically drawing all of an object's intermediate positions. Like all key-frame animators, *Fantavision* treats shapes as *objects*, mathematically defined collections of points and lines. It can handle bitmaps, pictures created by paint programs, only as backgrounds.

Fantavision is very easy and intuitive to use, especially if your PC has a mouse. (Drawing is possible, but awkward, with the arrow keys.) After about ten minutes of study, my seven-year-old son was able to make a simple *Fantavision* animation of shapes flying around on the screen. Tools around the edge of the screen let you create new frames, draw objects, and change colors and patterns. Some unique shape-changing tools—a grabbing hand, a point-creating finger, and a point-cutting knife—let you change the arrangement and number of points in any object from one frame to the next. Thus you can draw a bear in one frame and turn it into a bed in the next by simply rearranging the points that make up the bear. When you play the movie, *Fantavision* transforms the bear smoothly into the bed.

Special object transformations include rotating, squashing, and spinning in perspective around a center of rotation. Editing features allow you to cut, copy, and insert frames in any sequence.

Another thing that sets *Fantavision* apart from most other animation programs is its sound-effects library. The

effects include animal noises, bug squeaks, laser blasts, and several directional sounds. It's simple to attach sounds to any frame so that, for instance, a rocket's engines roar as the ship blasts off.

DELUXE PAINT III

Deluxe Paint (Electronic Arts), long the premier paint program for the Commodore Amiga, has added classic page-flipping animation in its newest incarnation.

Deluxe Paint III's animation tools are fully integrated with its paint tools. You paint a frame, create a new frame, paint another frame, and repeat the process until the animation is finished. *Deluxe Paint III* then plays the paintings in sequence at up to 30 frames per second to show the animation in its finished form. Because each frame is an individual painting, each frame can be subtly or radically different, and you can make alterations to a frame at any time. Options allow you to set the number of frames and the playing speed of your animation, navigate backward and forward from one frame to the next, add and delete individual frames, and copy the background of one frame to all frames.

One of the most useful features of any animation program is its ability to accomplish difficult moves for you automatically. While *Deluxe Paint III* can't match a true key-frame animator in this regard, it does use a combination of animation and perspective tools to take any part of a painting and move it smoothly across the background in the plane of the screen; zoom it in and out; and do complicated turns, swoops, spins, and orbits. These effects are perfect for creating animated text and logos for desktop video.

VIDEOWORKS II

Animation on the Macintosh was fairly late in coming, but *Videoworks II* (MacroMind) makes up for the delay. It combines key-frame and page-flipping techniques in one of the most comprehensive animation interfaces available. *Videoworks II* may not be an easy package to learn how to use, but once you've mastered it, you can produce very sophisticated results, especially those suited for desktop presentations.

Videoworks II's rich array of tools includes a *MacPaint*-like paint program for creating animation objects; text tools for animated titles; windows that keep track of the various animation objects (the *castmembers*, in *Video-*

CHOOSING AN ANIMATION PROGRAM

Though *Fantavision*, *Deluxe Paint III*, and *Videoworks II* are among the most popular animation packages, there are others to choose from, especially for the Amiga, a machine which just begs to be used for animation creation. But how to choose from all these other programs?

Before you buy an animation program, think about what you want to use it for and the level of your artistic and animation experience. Neophytes should start with a simple key-frame animator, like *Fantavision*. These are perfect for quick and dirty animations, when visual richness and control is less important than fast, easy results. A key-frame animation program is ideal for learning animation basics and is also appropriate for creating simple, practical animations for business presentations.

If you're already experienced with traditional film-

type animation or want a rich visual style and the utmost control over each individual frame, you'll want to consider a page-flipper like *Deluxe Paint III*. Page-flippers give results that are closest to Disney quality—you just have to have the artistic talent to bring it all off.

But you needn't restrict yourself to just one program. If you're planning to record your animation on videotape—most computer animators do—there's no reason why you can't combine the output of both key-frame and page-flipping animation programs in one cartoon. A program like *Videoworks II*, which combines both techniques, may be the best-all-around choice. That way, you can use each type of animation for what it does best and have complete freedom to devise the most incredible computer animations yet seen.

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works lingo) and the layers (tracks) they occupy; and a VCR-like remote control for playing animations forward, backward, and in a loop. The program provides multiple ways to do animations, so you can choose the one that best suits the task or makes you most comfortable. On top of that, *Videoworks II* comes with a large assortment of clip animations, ready-made short movies you can paste into your own works. A separate driver lets you incorporate

Videoworks animations into any *HyperCard* stack. In short, *Videoworks II* aims to be the complete Macintosh animation product, and just about succeeds. □

Steven Anzovin writes the "COMPUTE! Specific" Amiga column. He is the author of several COMPUTE! books on computer graphics, including *Using Deluxe Paint*, Second Edition (available now), and *Amiga Desktop Video* (fall, 1989).

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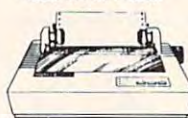
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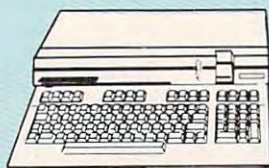
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Outperform the conventional PC/XT competition with Laser's Turbo XT-II. The Laser provides everything you expect from an XT plus such standard features as 4.77/10 MHz speed, 102 key enhanced keyboard, security lock and a clock/calendar with battery backup. Laser's compatibility is guaranteed through a 150W power supply, four accessible drive slots, (1 360K 5.25 standard) 8 I/O expansion slots, parallel centronics and RS 232 interfaces, 640K RAM standard, (expandable to 1.6 MB) along with a CGA video card already installed. Introduce yourself to the new generation XT through Laser's Turbo XT-II.

**\$629⁹⁵**

Monitor Optional
FCC Class B Approved

LASER XTE

If you are about to pick a personal computer for your home or office and you need to be one step ahead of the competition, choose the Laser Compact XTE. The Compact XTE features the same standard equipment as the Compact XT, however, 640K RAM and a monochrome/CGA/EGA video card is supplied. You won't beat its performance or extraordinary low price.

**\$619⁹⁵**

FCC Class B Approved

MITSUBISHI**MP 286L Laptop**

- 80286 Processor Running at 12 MHz or 8 MHz
- 640 KB RAM
- 11" Diagonal B&W Display
- Color Graphics Adapter
- 1.44 MB Capacity 3.5" Disk Drive
- Centronics Parallel Port
- 2 RS-232C Serial Ports
- 4 Expansion Card Slots
- MS-DOS 3.30
- GW BASIC 3.20
- Internal Speaker
- 1-Year Manufacturer's Limited Warranty

**\$2495⁹⁵****AMSTRAD****Laptop PPC 640-2**

Step into a new era of convenience and control with Amstrad's exciting new PPC 640 portable computer. The PPC 640 features 640K RAM, full sized AT 101 keyboard, Hayes compatible modem, an 8086 processor (8MHz) and your choice of either one or two 3.5" 720KB disk drives.

* limited quantities

\$699^{95*}**TOSHIBA****T-1000 Laptop**

Pick up on the T-1000 and you'll go far. Give yourself desktop PC power wherever you need it. Toshiba's T-1000 includes 512K RAM, one built-in 720KB 3.5" disk drive supertwist LCD display with CGA capability.

**\$819⁹⁵****COMMODORE COLT PC/XT \$669⁹⁵**

Monitor Optional
FCC Class B Approved

Save \$20
on any
Monitor
of your
choice!

The Commodore Colt is a computer with all the built-in features you need. The Colt includes 640K RAM, CGA video support, two 5.25 360K disk drives, serial and parallel ports with three clock speeds (4.77/7.16/9.14 MHz). Plus, look at these Commodore extras: full size keyboard, clock/calendar with battery back-up, MS-DOS 3.2 and GW Basic 3.2 and Wordstar word processor. Try the Commodore Colt in your home or office and experience what a difference it will make.

VENDEX®**\$729⁹⁵**

Monitor Optional

VTI-33-XT

- IBM XT Compatible with Award Bios
- Small Footprint
- 8088-1 Turbo Processor with 4.77 or 9.54 MHz Software Switchable
- 640K
- 2-360K Floppy Disk Drives
- Parallel Printer Port
- RS232 Serial Port
- Clock Calendar with Battery Backup on Board
- AT Style 84 Key Keyboard
- CGA/MGA and Hercules Graphics Adaptor
- MS-DOS Version 3.3
- GW-Basic

VENDEX®**VTI-55-AT**

- IBM AT Compatible with Award Bios
- Small Footprint
- 80286-12 Turbo Processor with 8 MHz or 12 MHz Software Switchable
- 640K, Expandable to 1MB
- One 1.2 MB Floppy Disk Drive
- Parallel Printer Port
- RS232 Serial Port
- Clock Calendar with Battery Backup on Board
- 101 Key Keyboard
- EGA Graphics Adaptor
- 5 total Empty Slots
- 200 Watt Power Supply

**\$1119⁹⁵**

Monitor Optional

- MS-DOS Version 3.3
- GW-Basic
- Easy Working Writer (Word Processor by Spinnaker)

CITIZEN**Mate/12 AT**

World class competition in an 80286 PC/AT from Citizen. One MB RAM is standard, along with 2 serial and 1 parallel port, EGA video card and keyboard switchable 6.25/12.5 MHz for full PC/AT compatibility. Citizen also includes added features such as, switchable 150 watt power supply, 1.2 MB 5.25" floppy drive, MS-

DOS-GW Basic software to provide for your immediate computing needs. Leave the competition behind with the Citizen Mate 12 Plus.

\$1359⁹⁵

Monitor Optional
FCC Class B Approved





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Since 1981, we have set the standard in the industry by processing orders within 24 hours - not 4 to 6 weeks. We offer next day air, two day air, standard UPS, and postal international shipping services. Our records show we fill 95% of our orders daily. Temporary shortages are normally filled within 10 days. If an order cannot be filled within 60 days, we refund your money in full, unless you choose to wait for the order and benefit from the price savings. Any time prior to shipment, you may cancel or change the out of stock product by contacting our Customer Service representatives.

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Send your order to Lyc Computer, P.O. Box 5088, Jersey Shore, PA 17740. Or, call 1-800-233-8760 or (717) 494-1030. We provide four payment methods. We have always accepted C.O.D. orders through UPS. Prepaid orders over \$50 are shipped freight-free in continental U.S. For orders under \$50, please add \$3 for freight. Orders prepaid by a certified check or money order are shipped immediately. Personal and company checks require a 4 week waiting period prior to shipping. Visa and MasterCard orders are accepted for your convenience, but we cannot pass along the 4% discount offered for cash. Prices advertised are cash prices. Purchase orders are accepted from Educational Institutions. We only charge sales tax on items delivered in Pennsylvania. For APO, FPO, and international orders, please add \$5 plus 3% for priority mail. Advertised prices and availability are subject to change. Not responsible for typographical errors.

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Simulator\$28.95

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Bonus:

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I Controller\$13.95

Epyx 500 XJ (Atari 64C)\$13.95

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buyer's guide

Desktop Publishing



Do visions of fonts dance through your head? Does printer's ink flow through your veins? Does a sidebar send your heart soaring? Whether it's printing newsletters, designing brochures, or breaking the biggest story this side of the Iran/Contra scandal, there's a desktop publishing program that will assure you a byline every time.

Mickey McLean

Byline

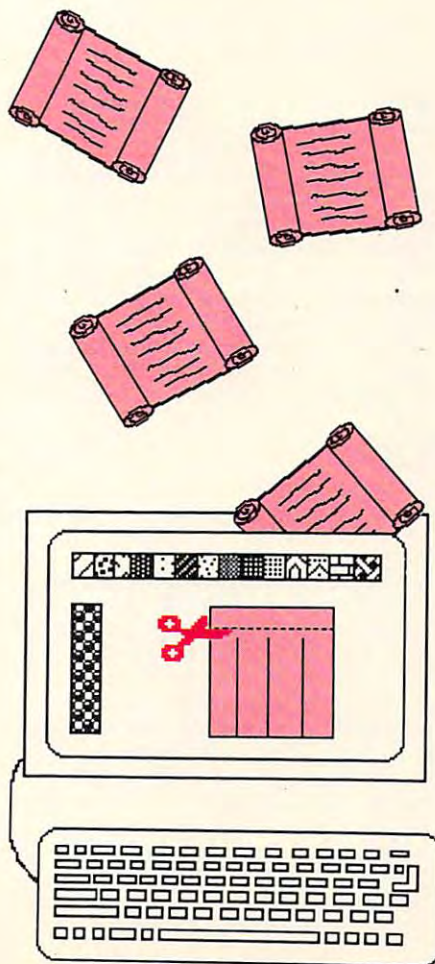
Ashton-Tate
IBM PC and compatibles
512K; DOS 2.0 or later; hard drive; and CGA, EGA, or Hercules required
\$295.00

Byline's layout system breaks down pages by elements, with each element's look and content controlled by a spec sheet. Position, size, and twist elements by indicating measurements or by moving the element on the page with a mouse or the keyboard. Features include five typefaces in sizes ranging from 8 to 144 points, various type styles, search and replace, and borders and rules. *Byline* imports text from most major word processors, graphics programs, databases, and spreadsheets.

City Desk

MicroSearch
Amiga
\$199.95

City Desk supports several printers—PostScript, Hewlett-Packard Series II, and various 24-pin printers. Providing advanced graphics editing and text-manipulation commands, this program offers many features: automatic kerning, font and type-size control, a clip-art disk, text-wrap around irregular graphics, and automatic hyphenation. *City Desk* supports *WordPerfect*, *Scribble!*, and ASCII files. Registered users of versions 1.0 and 1.1 can upgrade to 2.0 for \$35.00.



Fleet Street Publisher

Mirrorsoft
Distributed by Spectrum HoloByte
Atari ST
\$149.95

In *Fleet Street Publisher*, you create text or import text from any ASCII word processing file. Features include hyphenation, kerning, search and replace, variable line leading, preset and custom style sheets, and six different typefaces in various styles and sizes ranging from 4 to 72 points (even larger on an Atari 1040ST). Graphics come from a *Fleet Street* clip-art library or from other graphics packages. Graphics features include a pixel editor and box and rule tools in multiple line weights and shades. Page-makeup features include multiple columns, picture sizing and cropping, linked text blocks, graphics rotation, and variable page sizes.

FrontPage Personal Publisher

Arrays
IBM PC and compatibles
640K; hard drive; and CGA, EGA, MCGA, VGA, or Hercules required
\$199.95

This icon-driven desktop publishing system features a WYSIWYG display, nine type styles, automatic or manual hyphenation, an unlimited number of pages per document, and an unlimited number of columns per page. An add-on package offers near-laser-quality output on dot-matrix printers. You can import text or ASCII files from word processing programs such as *XyWrite*, *WordPerfect*, and *Microsoft Word*. You can also import images from a variety of graphics programs.

GEM Desktop Publisher

Digital Research
IBM PC and compatibles
640K, hard drive required; EGA recommended; also supports CGA, MCGA, VGA, and Hercules
\$299.00

GEM Desktop Publisher reformats by the paragraph or by the page. Through filters, the program imports text directly from many word processors. Graphics come from other GEM applications. Other features include automatic hyphenation (supports seven foreign languages), a graphics toolbox, preset and custom style sheets, text-wrap around graphics, and room for an unlimited number of fonts.

geoPublish

Berkeley Softworks
Apple II, Commodore 64
GEOS required
\$49.95

Using *geoPublish*, users can create documents with as many as 16 pages and enhanced by headlines, column layout, and art. The program imports graphics from *geoPaint*, but it also has a complete drawing program. *geoPublish* supports more than 70 dot-matrix printers and all PostScript laser printers. Other features include full-page and zoom display modes, support for more than 80 GEOS-compatible fonts in point sizes ranging from 4 to 192, and text-wrap around graphics.

IMSI Publisher

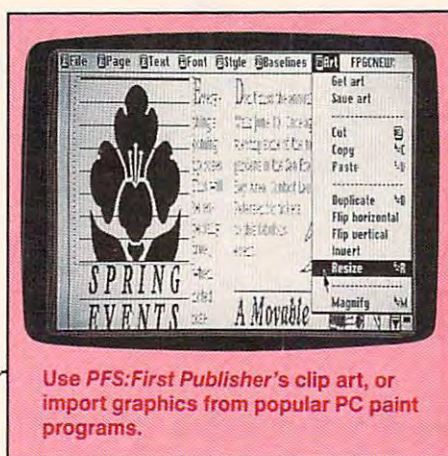
International Microcomputer Software
IBM AT and compatibles
640K; DOS 3.0 or later; hard drive; and EGA, VGA, or Hercules required
\$495.00

IMSI Publisher (formerly *Page Perfect*) combines full-featured word processing with powerful page-layout features—nine zoom levels, leading control, kerning control, preset style sheets, rules and boxes, page numbering, hyphenation, find and replace, a spelling checker, and a thesaurus. The program imports text from most word processors and graphics in TIFF format. Macros and online help round out the program.

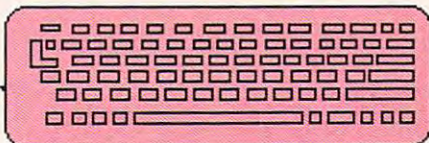
Instant Pages

Electronic Arts
IBM PC and compatibles
\$49.95

Combine text and graphics to create forms, newsletters, charts, and correspondence. Features include a text editor, automatic reformatting, lines, boxes, borders, full justification, and a variety of text styles. The WYSIWYG desktop publishing system can be menu- or keyboard-driven.



Use PFS:First Publisher's clip art, or import graphics from popular PC paint programs.



InteGraphics

International Microcomputer Software
IBM PC and compatibles
512K; DOS 2.0 or later; hard drive; and CGA, EGA, VGA, or Hercules required
\$195.00

InteGraphics is a drawing, charting, and page-layout program. Use it to create documents with as many as 999 pages, taking advantage of automatic text flow, hyphenation, leading control, graphics tools, text-wrap around page elements, preset and custom layout templates, zoom views, unlimited windows, rules, and boxes. The program imports files from many word processors and graphics programs. *InteGraphics* includes 15 fonts and supports others from the Bitstream font library. It also offers batch-mode printing, an integrated spreadsheet, and macros.

Legend

NBI
IBM AT and compatibles
640K; DOS 3.2 or later; Windows 2.0 or higher; hard drive; and EGA, VGA, or Hercules required
\$695.00

Legend integrates word processing, graphics, and desktop publishing. Features include Windows 2.0 compatibility, mail merge, footnotes, outlining, indexing, search and replace, a spelling checker, and text-wrap around graphics. Style sheets control type characteristics and formats. Documents have as many as 750 pages, 32 columns per page, and tables as large as 45 x 45 inches. Portrait and landscape pages can be mixed within the document. *Legend* imports graphics from MacPaint, PC Paintbrush, Publisher's Paintbrush, Windows Draw, and Windows Graph, as well as images in TIFF and DIF formats. Available in 3 1/2- or 5 1/4-inch formats.

NewsMaster

Unison World
IBM PC and compatibles
512K; DOS 2.1 or later; and CGA, EGA, or Hercules required
\$99.95

NewsMaster contains over 275 clip-art entries, more than 30 fonts in a variety of sizes, a screen-capture routine for importing graphics, automatic text flow around graphics, 30 fill patterns, and eight levels of zoom. Four WYSIWYG page views help users see the text, lines, boxes, and clip art on the screen, and each page can support from one to ten columns. The program supports most dot-matrix printers.

The Newsroom

Springboard Software
Apple II, Atari, Commodore 64, IBM PC and compatibles
CGA required for IBM
\$34.95 (Apple)
\$14.95 (Atari, Commodore)
\$19.95 (IBM)

Desktop publishers can use this program to create newsletters for family, clubs, school, or business. *The Newsroom* contains a word processor and over 600 pieces of clip art. Text wraps around graphics, and you can enter text in any of five fonts.

The Newsroom Pro

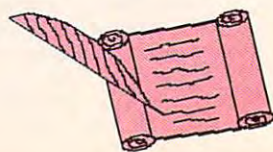
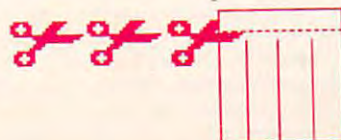
Springboard Software
IBM PC and compatibles
512K; DOS 2.0 or later; and CGA required
\$39.95

The Newsroom Pro is an advanced version of *The Newsroom*, adding 2000 pieces of clip art from the *Clip Art Collection, Volume 1* and *Volume 2*. You can create newspaper-style layouts on the screen by scrolling up and down the columns, editing text, importing graphics, resizing art, adjusting line spacing, and choosing the styles and sizes of the type.

Pacesetter

Gold Disk
Amiga
512K required
\$149.95

A WYSIWYG page-composition and -layout program, *Pacesetter* contains a built-in word processor and a graphics editor. It also accepts text and graphics from programs such as *TextCraft*, *Scribble!*, *Deluxe Paint*, and *Aegis Images*. *Pacesetter* offers point sizes as high as 800 points; borders, shading, and shadows; rule, grid, column, and margin indicators; measurement in inches or picas; and centering or justification of type. Multiple-page documents can be printed in a variety of page sizes and formats.



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GAMES

ARCADE GAMES (106) Has Kong, 3-D Pacman, Bricks, Pango. (Requires color.)
BASIC GAMES (107) Pacman, Lunar Lander, Startrek, Meteor, Breakout, and others.
CARD GAMES (109) Canasta, hearts, draw poker & bridge.
STRIKER (110) Defender-like game. "Top Gun" in space.
FLIGHTMARE (112) Futuristic fighter pilot game. (Requires color graphics adapter.)
SLEUTH (117) Who done it?
DND (119) Like Dungeons and Dragons.
ROUND 42 (120) Better than Space Invaders. 42 levels.
GAMES IN BASIC (124) Lander, biorhythms, desert, Phoenix, Star Wars, others.
QUEST (152) Role playing adventure fantasy game. (Requires CGA.)
SPACE WAR (158) Dogfight in outer space, using phasers, photon torpedoes, etc.
BRIDGE PAL (171) Complete game of contract bridge, with tutorial.
FENIX (193) Just like the famous arcade game.
PINBALL GAMES (197) Pinball, Rain, Twilight Zone, Wizard, etc.
KID-GAMES (GAM8) Animals math, clock game, alphabet, etc.
CHES (GAM9) Incredible. 2D and 3D. Many levels. Play back moves, store games.



EGA RISK (GAM11) World domination in great color. Includes EGA Asteroids.
PC PRO-GOLF (GAM27-28) Great graphics. Complete 18 hole, 72 par course. (CGA)
PEARL HARBOR (GAM32) Shoot down Jap Zeros before they destroy U.S. Fleet. (CGA)
ULTIMA 21 DELUXE (GAM34) Best Blackjack game around. Includes Video Poker.
FORD SIMULATOR (GAM37) Great driving simulation. (Requires CGA.)



MUSIC

PIANOMAN 4.0 (301) Turn your keyboard into a piano.
PC-MUSICIAN (302) Compose, save, and play music.

WORD PROCESSING

PC-Write 3.0 (434, 435, 436) (3 disks) Newest version! Very popular and complete. Includes spelling checker.
PC-TYPE+ (421-423) (3 disks) Excellent. Includes mail merge, 100,000 word spelling checker. Interfaces with PC-File+, PC-Style.
MAXI-MAX (432) 59 macros to use with Word Perfect 4.2 or later. 11 templates for forms, border designs, etc.

GRAPHICS

KEYDRAW CAD SYSTEM (1001, 1002, 1065, 1066) (4 disks) Popular. Also uses mouse. (Requires color graphics).



SIDEWAYS (1007) Prints text sideways. Useful for Lotus.
SIMCGA/HGCIBM (1027, 1062) (2 disks) Use with Hercules graphics card/compatible to run programs requiring CGA on your monochrome PC.
IMAGE 3-D (1048) Create and edit 3-D objects. Move, scale, rotate and tip image.
FINGERPAINT (1050) Use keyboard or mouse to draw. Like MacPaint. (Requires CGA or EGA.)
DANCAD 3-D (1051, 1052) (2 disks) Create 3-D graphics. Rotate, magnify, etc. Runs on CGA, EGA, or Hercules.
FANTASY (1057) Create flowing graphic images with mouse or keyboard. (CGA).
FLOWCHARTING (1078-1079) Complete system for flow charts, organizational, electrical, etc., with symbols.

SPREADSHEETS

AS-EASY-AS (505) Great. Includes screen help menus. Utilizes function keys. A Lotus clone that reads Lotus files.
PC-CALC+ (512-514) (3 disks) Jim Button's famous Lotus clone.

BASIC

PC-PROFESSOR (1401) BASIC tutorial. Good.
BASIC PROGRAM GENERATOR (1402) The menu driven way to write programs.
B-WINDOW (1407) Give windowing capabilities to your Basic program.

UTILITIES

HOMEBASE (2608, 2612, 2613) (3 disks) Complete desktop organizer. Great.
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BAKER'S DOZEN (2821) 13 utilities from Buttonware.
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MARKET CGA (BUS17) Performs sophisticated analysis on stocks, funds, etc. (EGA version is BUS16).
BILLPOWER+ (BUS 40, 41) (2 disks) Bill clients for time and materials, advances, retainers, etc. Computes, taxes, past due interest, etc. Has full G/L.
CPA LEDGER (706-708) (3 disks) Complete general ledger for corporations, partnerships or sole proprietors.
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PAYROLL USA (725-726) Up to 2,000 employees in any state. dBaseIII and Lotus compatible. Complete P/R system.
EXPRESS CHECK (786) Check account with running balance, monthly reports, etc. Prints checks.
FINANCE MANAGER II (774-775) (2 disks) For personal or small business financial management.

DOS

DOSTUTORIAL (1301) Teaches you to use DOS.
STILL RIVER SHELL (1304) Run DOS commands from a menu. Makes DOS easy.
BATCH FILE TUTORIAL (1305) Utilize batch file processing.
MORE DOS TIPS (1318, 1323) (2 disks) More about DOS.
HELP DOS (1326) On line DOS help with menus. Includes DOS dictionary of terms and a hints menu.

RELIGION

THE BIBLE (3301-3306) (6 disks) Old Testament, King James version.
THE BIBLE (3307-3308) (2 disks) New Testament, King James version.
WORD WORKER (3309-3310) (2 disks) Bible search program. New Testament, King James version.
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AMY'S FIRST PRIMER (248) Child's learning game teaches letters, numbers, keyboard.



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PC-TOUCH (204) Learn typing.
BASIC TUTORIAL (208) Learn programming with BASIC.
BEGINNING SPANISH (211) Tutorial.
SPANISH II (232) Sequel.
BIBLEQ (214) Learn the Bible with this Q-A tutorial.
FACTS 50 (239) Geography lessons for U.S. Nice graphics.



SPREADSHEET TEMPLATES

LOTUS MACROS (601) Save hours of work. (Req. Lotus)
LOTUS SPREADSHEET TEMPLATES (602) Ready-made. (Requires Lotus 1-2-3)
GOAL-SEEKER V3.5 (624) Achieve objectives by changing spreadsheet and seeing result. (Requires Lotus).
LOTUS TUTORIAL (630) Learn Lotus (requires Lotus).

APPLICATIONS

FORM LETTERS (1907) Commonly used form letters and business applications.
E-Z FORMS (1908) Make forms to meet different needs.

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HOME INVENTORY (1966) Track all your possessions.
BIORHYTHM (1990) Display the 3 biological cycles; physical, emotional, intellectual.
FAMILY HISTORY (2203-2204) (2 disks) Create files and genealogical reports.
LOTTO PROPHET (2364) Best Lotto program we've seen.
CITY DESK (2513) Simple desktop publisher.

TELECOMMUNICATIONS

Q-MODEM 3.1 (1101, 1102, 1144) (3 disks) Powerful but easy to use. Fast.
RBBS V16.1A (1107-1109, 1150) (4 disks) Multi-user bulletin board system.
PROCOM 2.43 (1156) Outstanding modem software.

SECURITY/HACKING

COPY PROTECTION I (1219) Instructions for unprotecting commercial software.
COPY PROTECTION II (1220) More software unprotect.
COPY PROTECTION III (1221) More software to unprotect.
FLUSHOT (1225) Checks software for viruses.

DATABASE PROGRAMS

PC-FILE dB (853, 854, 855) (3 disks) Newest version! Rated better than dBase III+.
FILE EXPRESS 4.0 (803-804) Powerful system. Allows 32,000 records. Sorts to 10 fields.
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Pagebuilder

CSI Publishing
IBM PC and compatibles
EGA, VGA, or Hercules required
\$300.00

This graphics-based publishing/presentation program features word processing functions, business graphics, and a library of over 200 illustrations that can be scaled, rotated, or combined with text. The program also includes image scanning for logos and photos. Sixteen Compugraphic fonts are included along with Bitstream font compatibility. A slide-show feature enables users to prepare pages of color text and graphics with variable time delay for presentations.

PageMaker

Aldus
IBM AT and compatibles, Macintosh
640K; DOS 3.0 or later; hard drive; Windows 2.03;
and EGA, VGA, or Hercules required for PC
Hard disk, System 4.1, and Finder 5.5 required for
Macintosh
\$795.00 (IBM)
\$595.00 (Macintosh)

PageMaker uses a paste-up-board metaphor, with rulers and alignment guides to control the automatic flow of text on a page. As many as 20 columns can make up a page, and users can control leading, kerning, hyphenation, and text formatting. Other features include onscreen color palettes, style sheets, 20 templates for easy page layout, and file filters that allow you to import *Lotus 1-2-3* files and *dBase* files. *PageMaker* accepts text from most popular word processors and graphics packages. On the IBM AT, *PageMaker* runs under Microsoft Windows.

Pages

Pinpoint Publishing
IBM PC and compatibles
512K and DOS 3.0 required
\$79.95

Pages includes features found on high-end programs, such as cropping, letter spacing, and positioning by coordinates. The program includes four standard page layouts that can be modified or used as templates. Users can create page elements in *Pages* or import them from third-party programs. Other features include search and replace; four typefaces and font sizes ranging from 6 to 126 points; and tools for drawing lines, boxes, circles, and other shapes.



Professional Page for the Amiga was one of the first desktop publishing programs to feature full-color and mechanical separations.



PageStream

SoftLogik
Amiga, Atari ST
\$199.95

PageStream features color separations, text and graphics rotation, fully scalable characters, search and replace, and several typographical controls (such as leading, kerning, tracking, and justification). Text and graphics can be imported or exported through modules that support other Amiga programs and file formats. *PageStream's* electronic paste-up tools include rulers in nine different standard units, snap-to user-editable grids and guides, and alignment and viewing options. *PageStream Jr.*, a scaled-down version for the Atari ST, is available for \$89.95.

PaperClip Publisher

Electronic Arts
Commodore 64
\$49.95

Use *PaperClip Publisher* to produce multiple-column page layouts for newsletters, fliers, greeting cards, résumés, and brochures. The program supports documents with as many as 50 pages. Other features include a place on the screen for temporary text and graphics, a refresh feature that automatically updates any altered part of a document, the ability to move articles from page to page, and WYSIWYG display.

Personal Newsletter

Softsync
Apple II, Commodore 64
GEOS required for Commodore
\$59.95 (Apple)
\$29.95 (Commodore)

Personal Newsletter's package includes the program and a library of clip art. Designed to be used in conjunction with GEOS, the program accepts input from a joystick, a mouse, a graphics pad, or a light pen. Users can lay out and align windows for text and graphics. As many as 20 windows can be used on a single page. Features include automatic word-wrap to fit windows, and an 80-column work screen.

PFS:First Publisher

Software Publishing
IBM PC and compatibles
512K; DOS 2.0 or later; and CGA, EGA, VGA, or Hercules required
Tandy or compatible; 640K; DOS 3.2 or higher; and CGA, EGA, VGA, or Hercules card required for DeskMate version
\$129.00

PFS:First Publisher produces documents of as many as 99 pages. A WYSIWYG display aids the layout process, and other features include as many as four columns of variable widths on each page, editing tools, graphics tools, formatting options, text-wrap around graphics, and many different typefaces. Users create text in *PFS:First Publisher* or import it from other word processors. The program imports graphics from *PC Paintbrush*, *PC Paint Plus*, and *PC Windows Paint*. Clip art comes with the package, and a special version runs under DeskMate.

Professional Page

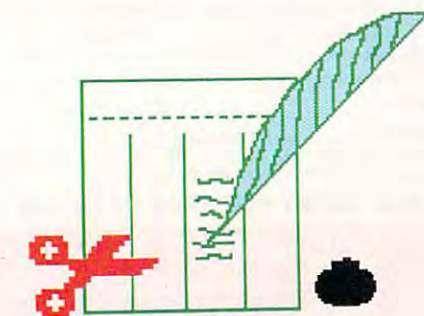
Gold Disk
Amiga
1 megabyte required
\$395.00

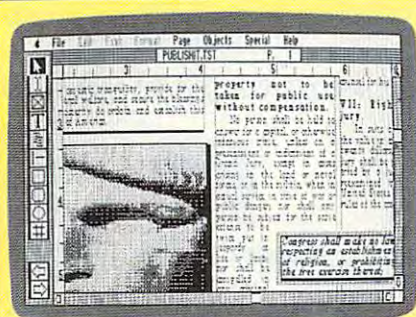
Professional Page is a desktop publishing package that includes full-color and mechanical separations, color printer support, CAD, and WYSIWYG word processing. Word processing features include control over color of text blocks, search and replace, hyphenation, font sizes as large as 127 points, and a variety of text styles. Text and IFF graphics can be imported. Included are five levels of magnification, page-composition tools, boxes, and draft and thumbnail printing. Dot-matrix and PostScript printers are supported.

Publisher PLUS

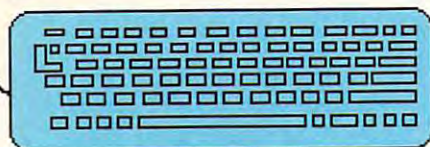
Northeast Software Group
Distributed by Brown-Wagh Publishing
Amiga 500
\$99.95

An upgrade of *Publisher 1000*, this WYSIWYG desktop publishing package features a variety of Amiga fonts and shade patterns, plus a pattern editor, kerning, micro-justification, leading, and font scaling. Multiple text columns can be linked across as many as 999 pages. The program supports PostScript laser printers.





Publish-It! uses the GEM windowing system, so what you see is really what you get.



Publish-It!

Timeworks
Apple II, Atari ST, IBM PC and compatibles,
Macintosh
128K enhanced required for Apple II
512K; DOS 2.1 or later; and CGA card required
for PC
512K required for Macintosh
\$129.95 (Apple—called *Publish-It!2*)
\$129.95 (Atari ST)
\$199.95 (PC—available on 3 1/2- and 5 1/4-inch disks)
\$395.95 (Macintosh)

Publish-It! for the PC and ST features a GEM user interface—pull-down menus, icons, scroll bars, and dialog boxes. Features include text-wrap around graphics, search and replace, onscreen kerning, automatic hyphenation, clip art, and a graphics toolbox. *Publish-It!* imports text from most popular word processors or other programs with ASCII text format and graphics from many popular graphics programs. *Publish-It!2*, for the Apple II series, is an enhanced version that features extended memory support, compatibility with *The Print Shop*, and transparent text frames.

Publish-It! Lite!

Timeworks
IBM PC and compatibles
512K; DOS 2.1 or later; and CGA, EGA, MCGA, or Hercules required
\$59.95

Publish-It! Lite! is designed for less experienced desktop publishers. It includes basic layout, word processing, typesetting, and graphics features for creating memos and newsletters. You can modify the page layout for new designs, and the WYSIWYG display shows the document as it will print. Users can create text with the program or import files from many popular word processors. *Publish-It! Lite!* includes a graphics toolbox, clip art, hyphenation, bullets, and sample layouts. You can also import graphics from popular graphics packages.

QuarkXpress

Quark
Macintosh
1 megabyte required
\$795.00

This integrated desktop publishing program for the Macintosh features word processing, graphics editing, spell-checking, text-wrap around graphics, and global search and replace functions. Layout and typography features include kerning, leading, and special effects with fonts. Users can create custom colors by using a selection of color models. Process separations of items can also be printed. *QuarkXpress* imports artwork created by third-party graphics programs.

RagTime 2

Cricket Software
Macintosh
512K and hard disk drive required
\$395.00

RagTime 2 integrates word processing, spreadsheet, and page-layout capabilities. It uses a frame metaphor to aid layout—page elements are arranged in frames of different types (word processing, graphics, spreadsheet, and so on) and sizes. A Create Form option saves frequently used layouts and automates repetitive tasks. Other features include hyphenation in English and Spanish, a spelling checker, text-wrap around page elements, overlapping frames, a split screen, a whole-page view, kerning, and optional character spacing.

Ready,Set,Go!

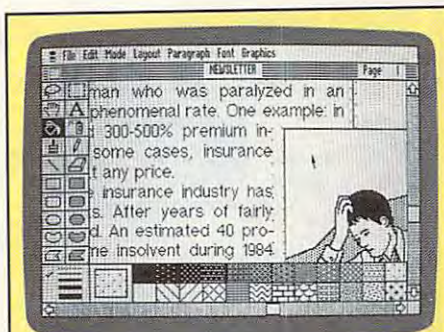
Letraset
Macintosh
512K required
\$495.00

This page-layout program features snap-to design grids, preset grids, automatic and arbitrary runarounds, global search and replace, tabloid-size page formats, a graphics toolbox, kerning and word spacing, and a 100,000-word spelling checker. *Ready,Set,Go!* offers full support for encapsulated PostScript files and can reproduce high-resolution graphics from scanners that support gray-scale TIFF. The program offers a variety of type sizes and font styles, and over 50 fill and pen patterns. Users can work with the built-in word processor or import documents from many popular Macintosh word processors or ASCII files.

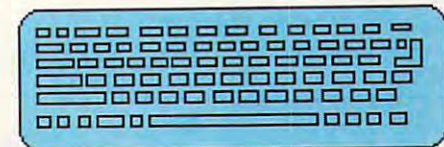
Shakespeare

Infinity Software
Amiga
512K required; 1 megabyte recommended
\$225.00

Users can mix full-color graphics with text. Users can work in and change to any resolution, and they can change the number of bit-planes at any time. Graphics tools include rules, boxes, and borders, plus some tools that allow stretching and cropping images. *Shakespeare* supports color printers, 24-pin printers, the Apple LaserWriter Plus, and Linotronic Imagesetters.



Springboard Publisher's drawing functions rival those in dedicated paint programs.



Spellbinder Desktop Publisher

L/Tek
IBM PC and compatibles
CGA, EGA, or Hercules required
\$595.00

This program combines a full-featured word processor with custom page-layout features. The WYSIWYG word processor includes all standard text-editing features, plus mail merge, a database, sorting, and a 50,000-word spelling checker. It also imports ASCII files. For page composition, *Spellbinder* uses preset or custom style sheets. Other features include kerning, leading, hyphenation, rules, boxes, zoom views, and three fonts. Pictures come from popular graphics packages.

Springboard Publisher

Springboard Software
Apple II, IBM AT and compatibles, Macintosh
640K; DOS 3.0 or later; hard drive; mouse; and CGA, EGA, or VGA required for PC
System 4.2 and Finder 6.0 or above required for Macintosh
\$139.95 (Apple)
\$129.95 (IBM)
\$199.95 (Macintosh)

Springboard Publisher offers the features of a word processor, graphics package, and page-layout program—as many as nine columns per page with individually sized columns and gutters, full-page view, automatic page numbering, rulers, multiple font sizes and styles, tabs, a set of graphics tools and manipulation options, and zoom views. Documents created with *Springboard Publisher* are limited in size only by disk space.



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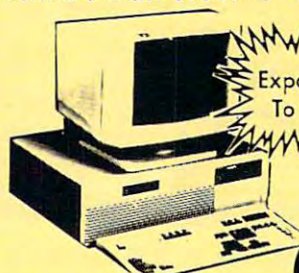
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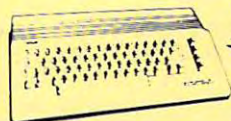
Intec Multisync Monitor shown \$399.95

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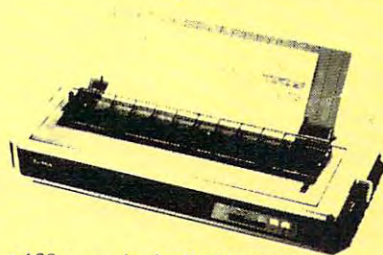


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Brother M1109	4.95	5.95	7.00	
C. Itoh Prowriter Jr.	7.00	9.00	—	
Citizen 120D/180D	5.00	6.00	7.95	
Commodore MPS 801	4.50	5.25	5.75	
- MPS 802/1526	6.25	7.25	—	
- MPS 803	4.95	5.95	7.00	
- MPS 1000	3.95	4.95	6.75	
- MPS 1200/1250	5.00	6.00	7.95	
- 1525	6.50	8.00	—	
Epson MX80/LX800	3.75	4.25	6.75	
IBM Proprinter	5.75	8.00	12.00	
Okidata 82/92	1.75	2.25	4.50	
Okidata 182/192	6.50	7.50	6.00	
Panasonic K-XP 1080	6.75	7.75	—	
Seikoshia SP 800/1000	5.25	6.50	7.95	
Star NX10/NL10	5.00	6.00	7.95	
Star NX1000	4.50	5.50	6.75	

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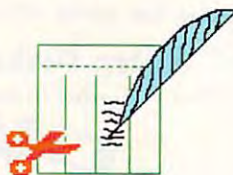
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buyer's guide

Typesetter PC

Xlent Software
IBM PC and compatibles
640K and CGA or Hercules card required
\$29.95

With *Typesetter PC*, users can combine text and graphics anywhere on the page. Graphics can be imported or created in the program with the included drawing tools. Document pages have a resolution of 240 x 145 dots per inch and can be printed in near letter quality on most dot-matrix printers. The program can also invert, flip, or rotate an icon, screen, or page.



Ventura Publisher

Xerox
IBM XT and compatibles
640K; DOS 3.0 or later; hard drive; and EGA or VGA required
\$895.00

Preset and custom style sheets are used to format documents. Layouts have as many as eight columns per page. Other features include kerning, hyphenation, detailed type-size control, and zoom views. Documents can hold as many as 128 chapters. Text and graphics are imported from many popular programs. Print features include large print sizes such as 18 x 24 inches broadsheet for typesetters, shingling pages together, online access to the PostScript font library, and the ability to convert Hewlett-Packard soft fonts to Xerox Ventura FNT files.

Publishers of Desktop Publishing Programs

For more information about the desktop publishing programs listed in this buyer's guide, contact the publishers listed below:

Aldus
411 First Ave. S.
Suite 200
Seattle, WA 98104

Arrays
6611 Valjean Ave.
Van Nuys, CA 91406

Ashton-Tate
20101 Hamilton Ave.
Torrance, CA 90502-1319

Berkeley Softworks
2150 Shattuck Ave.
Berkeley, CA 94704

Cricket Software
40 Valley Stream Pkwy.
Malvern, PA 19355

CSI Publishing
13721A Roswell Ave.
Chino Hills, CA 91710

Digital Research
Box DRI
Monterey, CA 93942

Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404-2497

Gold Disk
P.O. Box 789
Streetsville
Mississauga, Ontario
Canada L5M 2C2

Infinity Software
1144-65th St.
Suite C
Emeryville, CA 94608

International Microcomputer Software (IMSI)
1299 Fourth St.
San Rafael, CA 94801

Letraset USA
40 Eisenhower Dr.
Paramus, NJ 07653

L/Tek
P.O. Box 2399
Davis, CA 95617

MicroSearch
9896 Southwest Frwy.
Houston, TX 77074

Mirrorsoft
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Suite 325
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Boulder, CO 80301

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Suite 112
Emeryville, CA 94608

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300 S. Jackson
Suite 100
Denver, CO 80209

SoftLogik
11131 S. Towne Sq.
Suite F
St. Louis, MO 63123

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162 Madison Ave.
New York, NY 10016

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P.O. Box 7210
1901 Landings Dr.
Mountain View, CA 94039-7210

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7808 Creekridge Cir.
Minneapolis, MN 55435

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444 Lake Cook Rd.
Deerfield, IL 60015

Unison World
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Alameda, CA 94501

Xerox Ventura Software
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Dallas, TX 75266-0512

Xlent Software
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Reading & Me	Print Power
Word Attack Plus	Remote Control
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PC Squashes Files; 64 Really Moves; Inside Apple; Amiga Saves the World; Mac Gets Wingz; New Moon over ST

MS-DOS

System Enhancement Associates (SEA), the company that created ARC, has just released another compression utility—one with a twist. *AXE* (SEA, 21 New Street, Wayne, New Jersey 07470; 201-473-5153; \$50) compresses .EXE and .COM files into *executable* files. The compressed file has a decompression loader appended to its beginning; when you call the program, the *AXE* code expands the .EXE or .COM file.

According to SEA, *AXE* files are usually about 20 percent smaller than the original .EXE or .COM file. They usually load more quickly, too.

I tried *AXE* on 11 files with less impressive results. SEA says that *AXE* reduces file size by 10 to 60 percent, with typical reductions of 15 to 23 percent. My average reduction was 13 percent, with a range of 3 to 21 percent. Still, 13 percent can add up to a chunk of disk space when you spread that percentage over hundreds of files.

The thing that started to bother me was how slowly some of my compressed files seemed to be loading. In the *AXE* manual, SEA says: *Compressed programs require a certain amount of time to decompress when loaded. However, the actual load from disk is faster than for uncompressed programs. . . . In some cases, the load time for a compressed*

program may be slightly longer than for an uncompressed program. This small difference is usually not noticeable.

Most of my files were loading noticeably slower, so I ran some benchmarks. First, I removed all TSRs and my disk cache so these wouldn't affect the results. Then I selected four files to test. I loaded each original .EXE file three times, clocked each trial with a stopwatch, and averaged the results. I repeated the process with *AXE* files.

All four *AXE* files loaded more slowly than their original counterparts. The biggest difference occurred with *Grand-View*, which loaded in just under two seconds in its native form but took nearly six seconds in its *AXE* incarnation.

If space is crucial, *AXE* can definitely ease the pressure caused by crowded magnetic real estate, and you may even develop some extra patience while you wait for your programs to load. But the program does slow down the loading process.

More Lucid

Lucid 3-D is a small, powerful, optionally memory-resident spreadsheet that made headlines when it was originally released by Personal Computer Support Group. In addition to its ability to link several spreadsheets in a 3-D matrix, it was praised for its full mouse support and thoughtful design.

Dac Software recently acquired PCSG, and it has released a new version of *3-D* bearing the Dac name. *Lucid 3-D*, version 2.0, by DacEasy (Dac Software, 17950 Preston Road, Suite 800, Dallas, Texas 75252-5740; 800-877-8088; \$99.95) is not just a re-release of the PCSG program—it's a major upgrade.

At the top of the list of new features, spreadsheet size

is increased, limited only by available RAM. This feature is especially handy because the new version of *Lucid* allows you to read huge 1-2-3 and dBase files directly (previous versions of *Lucid* require a separate conversion program). In addition to expanding the RAM and conversion vistas, features include the ability to link 3-D ranges, assign colors to ranges, and transpose columns and rows in *Lucid*'s clipboard.

For many users, the new *Lucid*'s most welcome addition is its graphing module. With previous versions of the program, you need an external graphing program such as *Harvard Graphics* or a memory-resident tool such as *Graph-in-the-Box* (which works very well with *Lucid* and is recommended by the program's designers).

Lucid's own graphing module is powerful and, above all, easy to use. The module is a memory-resident program that you invoke before you call *Lucid* (which itself can be loaded either as a memory-resident program or as a one-time command). Loading the graphing module may seem like extra bother to some, but when you don't need graphs, you simply don't load the module, and you can use the freed memory for your elephantine spreadsheets.

Creating a graph in *Lucid* is as easy as pie. First you define a range of numbers and, if you wish, their labels. Then a menu drops down, displaying *Lucid*'s range commands. Select Graph and you're on your way. You can choose from bar, stacked bar, line, filled scatter, 3-D perspective, and pie graphs. After you've chosen the type of graph you want, select View and your graph appears on the screen, labels included. To return to the spreadsheet, press any key or click a mouse button. *Lucid 3-D*'s graphing module supports color and most common PC

COMPUTE! *specific*

video modes.

When you're satisfied with your graph, you can print it or save it to disk. The 3-D aspect of *Lucid's* graphing may not be on a par with dedicated graphing programs, but even demanding users should be pleased with the results.

Power Pak Pack

PC-Kwik Power Pak was mentioned in the April 1989 "MS-DOS Specific" as being bundled with several computers. In fact, it's not bundled with all the machines listed. *PC-Kwik Power Pak* comes with Dell's Enhanced DOS 4.0 software package (which is optional when you buy a Dell computer), and it's packed with the complete line of Toshiba laptops.

Products that use Multi-soft technology (but don't include the *Power Pak*) are available from ALR, AST, Everex, GRiD, Hewlett-Packard, Intel, Iomega, Mitsubishi, Northgate, and Plus Development.

Even though you may not get *Power Pak* with a hardware purchase from one of these manufacturers, PC-Kwik offers discounts to owners of any hardware with which Multisoft products are bundled.

Missing Link

Have you ever wondered what the strange, three-pronged female outlet in the back of your PC is for? It won't accept a normal electrical plug, but logic dictates that it must have been put there for a reason. If you have a genuine IBM PC and IBM monitor, your monitor may plug directly into this outlet.

If you have a compatible, the socket is almost certainly just sitting there waiting to be used. To help the millions of PC owners take advantage of the convenience of this extra outlet, Mark Twain Computer has started shipping *The Cable the Cloners Forgot* (Mark Twain Computer, 900 North 3rd Street, La Grange, Missou-

ri 63448; 800-637-2984; \$9.95), a special cable you can plug into this unused socket to provide instant-on power to your monitor, printer, or anything else, for that matter.

Although you can use the cord to supply power to any peripheral, it's probably easiest to use it for your monitor so that your computer and display power up simultaneously. Another feature of *The Cable the Cloners Forgot* is that a computer setup with a system unit, a monitor, and a printer can be powered from a standard two-plug wall outlet, without requiring either an extension cord or a power strip for your printer.

— Clif Karnes

64 & 128

Certainly, the Commodore market doesn't suffer from a lack of disk speed-up products, and just as certainly, the 1571 and 1581 are pretty much fast enough on their own. So the expected response to a new one is *Why bother?* Of particular interest, though, is JiffyDos, a disk-speed-up system from Creative Micro Designs. What could 64 and 128 owners possibly want with yet another speed-up system?

Well, a couple of things. First, JiffyDos is *not* a cartridge, like Epyx's *FastLoad* or Cinemaware's *Warp Speed*. You can save your slot for your favorite cartridge products.

Second, JiffyDos works with more programs because it replaces the Commodore-

supplied chips in the motherboard. It's harder for you to install, but it's also harder for your software to get around. Because some programs disable the cartridge port, they may load more quickly running under a cartridge system, but loads from inside the program, such as screen loads, are still just as slow as before. With JiffyDos, the software is much more likely to work faster at all stages.

To install JiffyDos, you replace the Kernal ROM chip in your computer and the DOS ROM chip in the disk drive. Because there are two separate ROMs, you must order JiffyDos to match your specific system. If you have a Commodore 64 with a 1541 and a 1581, for example, you should order three chips (one for the computer and one for each drive). If you have an unenhanced 128D, the chips come as a package. Any combination is possible, and the chips are designed to work together.

I replaced my 128D ROMs in about a half-hour. This included figuring out how to open the case and how to get the internal 1571 drive out of the way. It also included the appropriate prayers, since I know virtually nothing about electronics. The most disturbing instruction for me was to drill a small hole in the back of the 128D's casing, in which you mount a small switch to turn JiffyDos on or off (you might want to disable it). I compromised by hanging it out where the two parts of the case meet. A warning is in order, though: Opening your computer or your drive will void warranties on your equipment. You might want to have your Commodore dealer perform the installation.

JiffyDos offers many useful commands. You can, for example, display directories without disturbing the program in memory. Other features initialize and reset disk drives, validate and format disks, copy and combine files, and even disable the 1541 head bump. You can also chain DOS commands together and disable any or all JiffyDos function-key assignments.

JiffyDos is almost completely compatible with Commodore 64/128 software, and

the manual tells you the kinds of programs it won't help. It won't affect programs with built-in fast loaders (GEOS and so on) because these programs bypass the standard disk routines—and subsequently, they bypass JiffyDos, too. Fragmented files (those scattered about the disk) naturally hinder JiffyDos, so it's best to save them to a new disk for maximum speed-up. JiffyDos also slows down when it disables sprites during loads and saves.

Owners of 1541 drives (or 1571s acting as 1541s) will benefit most from JiffyDos. In my unscientific tests, JiffyDos's program loads were five times faster than those on an unenhanced 1541. Particularly impressive was the way in which JiffyDos handled programs most cartridges can't manage. *PaperClip II* and *Delphi's Oracle* (from Batteries Included) finally worked at a usable speed.

Do I recommend JiffyDos? Let's put it this way: I certainly won't be giving it up. I'll keep searching for the best possible 64/128 disk-enhancement system, but for now JiffyDos is clearly in front of the pack.

JiffyDos costs \$59.95 for the 64 with any drive, \$69.95 for the 128 with any available drive, and \$29.95 for additional drive ROMs. Contact Creative Micro Designs at 50 Industrial Drive, P.O. Box 646, East Longmeadow, Massachusetts 01028; (413) 525-0023.

Computerloo

With all the war games available in 64 game-land, it's hard to believe that publishers have almost completely ignored entire historical periods. But in computer war games, as in their paper counterparts, certain periods of history just don't sell. Anything covering World War II to the present has a built-in audience, and the American Civil War has its proponents as well. But anything before 1861 or between 1865 and 1939 leaves most gamers cold. ▸

That's what makes SSI's *Battles of Napoleon* (\$49.95) especially welcome. Napoleon is hardly a historical unknown, but there has been almost no Napoleonic activity from the major game producers. With *Battles of Napoleon*, however, and SSG's upcoming Napoleonic series, the field is opening up.

In *Battles of Napoleon*, you take the role of either Napoleon or the commander of the Allied army. The game simulates four battles: Borodino, Auerstadt, Quatre Bras, and, of course, Waterloo. As with all SSI war games, the rules are extensive and the manual is excellent. The short introductions to the historical scenarios nicely encapsulate the battles, and you also get a good feel for Napoleonic warfare from the rules of play.

Two features deserve special attention. The first is the Computer Directive Table, from which you choose a strategy for the computer player. There are nine possibilities, ranging from a computer commander who gives up ground easily to one who will counter-attack at every opportunity.

The second feature is a separate scenario-creation system, complex enough to warrant a separate manual. You can plug in army values, terrain values, and even the values for certain combat techniques. Alternatively, the computer will fill in most of these values for you. So *Battles of Napoleon* is a highly flexible and completely open system.

For more information, contact SSI at 1046 North Rengstorff Avenue, Mountain View, California 94043; (415) 964-1353.

Other Diversions

Stand your computer at attention and prepare for *Combat Course*. As its name suggests, you work your way through various tests to evaluate your skill as a soldier. The physical course challenges your obstacle-course abilities. The risk course adds land mines and other treacherous items. In the combat course, you display

your weapons-handling prowess with rifles, grenades, and bare hands. And in the combined course, you face a mixture of all the other tests. Using the Cobra Construction Set, you can make up your own obstacle courses, offering an almost unlimited number of game variations. *Combat Course* (\$29.95) comes from Mindscape, 3444 Dundee Road, Northbrook, Illinois 60062; (312) 480-7667.

To people who lamented Infocom's departure from the text-adventure genre, the latest entries from Software Toolworks and Datasoft will be welcome new friends. *Time and Magik* (\$29.95) is actually a collection of three adventures linked by the global quest of recovering the Red Moon Crystal and fighting for the existence of time. The interface for this game is very strong. Sharing *Time and Magik's* parser, *Lancelot* (\$29.95) follows the Knights of the Round Table. The story line is based on Thomas Malory's classic *Le Mort D'Arthur*. Both games are intriguing. They are distributed by Electronic Arts, 1820 Gateway Drive, San Mateo, California 94404; (415) 571-7171.

— Neil Randall

APPLE II

If magazines are any indicator of a computer's health, then there's reason to worry about the Apple II.

A+ magazine, the leading Apple II-specific publication in both circulation and page

length, was sold in March to its prime competitor. Careful followers of Apple II magazines weren't surprised by the demise of A+, since rumors had been circulating for some time that Ziff-Davis, the magazine's publisher, was considering leaving the Apple II market. What marks the deal as unusual, though, is that it involves two archrivals in the computer-magazine publishing business: Ziff-Davis and IDG Communications, publisher of *InCider*, the second largest magazine in the Apple market.

IDG bought A+'s name and subscription list and will add both to *InCider*, starting with the June issue (which should be on the newsstand by the time you read this). The magazine, called *InCider/A+*, will have a combined circulation of more than 200,000, making it the largest Apple II-specific magazine.

A+'s vanishing act was seen by a number of software publishers as yet another indicator that the Apple II line is floundering. Advertising in Apple II magazines has declined by more than 15 percent since 1984, sales of Apple II software (as reported in last month's column) were basically flat for 1988, and Apple itself is sending mixed signals about the Apple II's future.

The departure of A+ leaves three Apple II magazines on the newsstand racks: *InCider/A+*, *Nibble*, and *Apple II's Buyer's Guide*.

Inside Ingenuity

Face it—hard disk drives haven't been a big priority for Apple II computers. Perhaps it's because Apples have been most comfortable in the home and the classroom, not in the office. Or maybe it's because Apple II software just hasn't been big enough to demand a hard disk drive.

There are plenty of hard disk drive choices for the Apple II, of course, ranging from First Class Peripherals' Sider series to CMS's line of inexpensive drives. All Apple II hard disk drives share one trait, though—they're external

devices that sit on the desk. Unlike IBM PC and Macintosh users, Apple II owners haven't been able to free up desk space by sticking a hard disk drive inside the computer case. Until now.

Applied Ingenuity, a company that got into the Apple II market by selling IIGS memory boards, recently launched its InnerDrive line of internal hard disk drives for the Apple IIe and IIGS.

Installing an InnerDrive is ingeniously simple. Pop off the cover of the case, gently disconnect the power-supply lead from the circuit board, and remove the entire power-supply unit from the computer. InnerDrive, which has a built-in replacement power supply, snaps into the vacated spot. Connect InnerDrive's power lead to the circuit board, plug in a controller board (slot 7 is best), replace the cover, and you're ready to rock 'n' roll. InnerDrives come formatted and include a customized version of GS/OS (so running hard disk drive install software to copy programs from floppies is not a good idea) as well as the standard Apple system software tools to back up and partition the hard disk. You can literally run programs from your InnerDrive within ten minutes of unpacking the box.

File organization and maintenance is easiest on the IIGS, since its Finder lets you quickly organize folders and files. Program loads and file access are considerably faster with InnerDrive; large programs are especially grateful for a substantial storage device. *AppleWorks GS* and its three-disk collection of programs and utilities, for instance, beg for a hard disk drive.

InnerDrive is not a SCSI drive, so it's not as fast as Apple's own hard disk drive. On the other hand, you don't need to buy a SCSI card for it.

A 20-megabyte InnerDrive costs \$499; a 40-megabyte drive runs \$649. Apple IIe and IIGS computers take different drives, so be sure to specify which one you're after. For more information, contact Applied Ingenuity at 14922 Ramona Boulevard, Unit M, Baldwin Park, California 91706; (818) 960-1485.

Works Free

There isn't a computer user born who can pass up free software. That's especially true of classroom computer users, who are often tied to limited budgets.

K-12 MicroMedia Publishing is offering a free sampler disk of its *SchoolWorks* template files. *SchoolWorks Sampler Disk* includes seven *AppleWorks*-compatible templates designed for school applications.

Each *SchoolWorks* disk contains approximately 35 *AppleWorks* templates aimed at teachers, administrators, media specialists, and special educators. All that's needed is a copy of *AppleWorks*. *SchoolWorks* software is not copy-protected and comes with a free site license which allows unlimited copying within a school building.

For your copy of *SchoolWorks Sampler Disk*, send \$3 for shipping and handling to K-12 MicroMedia Publishing at 6 Arrow Road, Ramsey, New Jersey 07446. Specify which disk format you require (3½- or 5¼-inch). You can contact the company at (800) 922-0401 for a catalog listing all *SchoolWorks* software.

Apple II Forever?

More signs have surfaced that Apple is arguing the fate of its Apple II line. According to reports, Apple is questioning whether development in the 12-year-old computer line should continue.

Much of the uncertainty around the II seems to be related to Apple's constant talk about a future low-end Macintosh for the K-12 educational market. The top brass at Apple have repeatedly stressed that although such a machine is a year or two away, it is on the drawing board. If a low-end Macintosh is available, Apple II supporters worry, where is the II's place in Apple's plans?

Even more worrisome to Apple II fans is Apple's own estimate that the Macintosh will account for nearly a quarter of the company's sales to

the important K-12 educational arena, a place where the Apple II has for years found a welcome home. If the current Macintosh machines are pushed extensively into the classroom, and educational software developers follow (as they're being asked to by Apple), then one of the Apple II line's most important reasons for being will be gone.

Although the announcement of an enhanced Apple IIGS is still expected at the May AppleFest (it's early April as this is being written), the anticipated Apple IIGS Plus may be the Apple II's last gasp. In response, Apple II software engineers at Apple are reportedly fighting back by stressing that the Apple IIGS could become the low-cost Mac that the company needs. If cuts are made to the Finder's boot time and a jump is made in the speed of the machine's microprocessor, the IIGS could evolve into a powerful, Macintosh-like computer for the home and classroom, these engineers are arguing.

That idea has some merit, considering the strength of recent IIGS software releases such as *AppleWorks GS* and the power of new IIGS and IIE hardware peripherals like the Apple Video Overlay card. With some prodding, albeit major prodding, the IIGS could transform into the color, inexpensive Macintosh Apple's always dreamed about.

On the other hand, Apple may already have made up its mind to let the II line languish. Unfortunately, Apple II owners may be the last ones let in on the secret.

Words for Only \$10

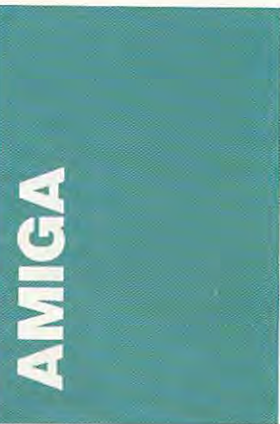
COMPUTE! Publications is offering its popular *Apple SpeedScript* word processor for only \$9.95. Two versions of this ultrafast program—a 40-column and an 80-column version—come on one disk, making the package perfect for the home. Kids can use the 40-column *SpeedScript* for easy legibility, while Mom and Dad can put the 80-column *SpeedScript 80* to work on letters, reports, and other documents.

Easily customized, *Apple SpeedScript* is simple to learn and just as simple to use.

Because of its low cost, *Apple SpeedScript* is great for the classroom and for school-wide word processing labs. The program works on all Apple II computers equipped with a 5¼-inch disk drive.

Complete documentation is included on the disk, so you can get started right away. To order *Apple SpeedScript*, send \$9.95 plus \$2.00 shipping and handling (and appropriate sales tax if you live in New York, Pennsylvania, or North Carolina) to COMPUTE!'s *Apple SpeedScript Disk*, P.O. Box 5188, Greensboro, North Carolina 27403. (No phone or credit-card orders can be accepted.)

—Gregg Keizer



It's always a special event when Commodore decides to advertise the Amiga. It's even more special when Commodore devises an effective ad, since those have been rare indeed in the Amiga's last three years. Commodore Business Machines, which recently switched advertising agencies, has finally figured out that the Amiga's natural market is among creative types (and gamers, of course, but Commodore Business Machines is reluctant to promote the Amiga as a game machine). The company has devised a new tag for the machine—the *computer for the creative mind*.

The new, more attractive print ads feature the Amiga

2500 and are aimed at "precisely 3,617,960" professionals who should be buying Amigas—animators, artists, musicians, videographers, designers, art directors, and (a bit of a long shot here) chief executive officers. Other fictitious figures refer to the number of professionals in each category. The numbers are ridiculously high, but Commodore can't be blamed for hoping that there are, for example, "683,521 art directors" out there who absolutely must have an A2500.

It wouldn't be bad if there were that many potential buyers because the Amiga still hovers under the 1-million-unit sales mark, worldwide. Maybe Commodore's new marketing team, executive leadership, expanding dealer base, and rejuvenated ad campaign will do the trick. The offer of a free VCR with every Amiga 500 purchase has been successful (although Commodore doesn't provide any way to use them together).

Oddly, though, Commodore Business Machines has yet to put together a decent TV ad for the Amiga—truly puzzling to all Amiga observers, since this is the machine that desktop video was born on.

Goofball Golf

Everything old is new again. When I was a kid, my family went to the shore each summer, and the highlight of the trip was the nightly round of miniature golf at a course right off the beach. What could be more satisfying than watching your ball roll down Moby Dick's throat and land with a plop right in the cup, or hearing your dad invent wonderful new curses on his seventh try through the whirling windmill blades?

Nowadays, miniature golf is back in vogue as a safe place to take your first date. In case you don't want to face the long wait to tee off, Electronic Arts (1820 Gateway Drive, San Mateo, California 94404; 415-571-7171) has captured much of the fun in its new release, *Zany Golf* (\$39.95).

Zany Golf offers as many as four players a chance at nine

holes that increase in difficulty and, well, zaniness. The course includes the requisite windmill hole, a hole with a bouncing hamburger, a pinball hole, a tricky magic carpet hole, a castle hole, and more. The play concept couldn't be simpler: You spot an X on your ball, aim, and draw back a dotted line with the mouse as though you were swinging back a putter and then let go. The ball snaps forward, hopefully toward the cup. The trick is to complete each hole in the least number of strokes and pick up any bonus strokes offered for difficult feats, such as hitting a fairy that pops up or beating the clock when it appears. If you complete the hole in fewer strokes than the maximum allowed, the remaining strokes are carried over to the next hole. Make or come in under par, and there's a special reward. Some of the pars are absurdly low, so that won't be easy.

The graphics are good, especially the introductory screens. You can tell the hole graphics do double-duty for the IBM version, but they're more than adequate anyway. The animation is only a little less smooth than that of Electronic Arts' *Marble Madness*, which *Zany Golf* resembles, but play is much more leisurely. The music is suitably corny.

What's really good about this game is the multiplayer option and the fact that the holes are not too difficult for younger players (adults may have some trouble, though). In fact, *Zany Golf* is one of the better family games I've seen for the Amiga. My kids love it—especially when Dad takes all seven strokes to get into the windmill.

Space Action

If miniature golf is just too sedate for your battle-hardened reflexes, try *Space Harrier*, another successful translation from Sega's video-arcade arsenal (distributed by Mindscape, 3444 Dundee Road, Northbrook, Illinois 60062; 312-480-7667). *Space Harrier* is a fast and furious game indeed. The premise is as simple as that for

any shoot-'em-up: Blast the weird aliens across multiple difficulty levels to save your world from invasion. What sets *Space Harrier* apart is its superlative 3-D graphics and its unique point of view—you fly the hero from the back, more or less by the seat of his pants.

This is one game that gives you a real sense of flight over a fast-moving landscape. Your targets are some of the best-looking critters I've seen in a game: Chinese dragons, Olmec stone heads, drone troikas, one-eyed mastodons, and other aliens. All of them come at you mighty fast in their own individual 3-D attack patterns. When they hit you, or when you smack into one of the land-based obstacles (and that will happen often), you land on your backside with a hard grunt—a more *personal* punishment than the standard explosion or crash experienced in other games.

Mouse control is truly responsive, but you may prefer a joystick because you can fire your blaster faster with less digit fatigue. And finger-eye coordination is all you'll need, since there's no call on the higher brain functions in this game. Nonetheless, I found *Space Harrier* highly addictive—one of the best pure-action games yet released for the Amiga.

The Real World

On the other hand, you may be tired of simpleminded fun and games and want to relax by experiencing a high level of international anxiety. There's always the new *Balance of Power: The 1990 Edition* (\$49.95), the update of Chris Crawford's classic strategy game of superpower brinkmanship. It's also distributed by Mindscape.

For those of you who haven't played it before, *Balance of Power* is really a master course in global realpolitik (practical, not idealistic, politics) masquerading as a computer game. The main screen is a map of the world giving facts and figures on 80 countries, increased from 62 in the

previous edition. Color codes give the state of relations between each country and the superpowers. One or two players take the role of the United States or the Union of Soviet Socialist Republics and engage in all kinds of political, diplomatic, military, and economic meddling to enhance their country's influence and prestige. The game spans eight years, from 1989 to 1997; if you manage to survive without igniting nuclear war, the winner is the side with the highest prestige score. Nuclear war ends the game. *Balance* is the operative word here—the program does not reward White House-basement-style zealotry.

What's always been impressive about *Balance of Power* is the sheer mass of information packed into the game. If you want statistics about the number of television *per capita* in Mauritania, it's there. You really feel as though you can make informed diplomatic decisions, even though the game deliberately ignores many significant international factors such as trade conflicts. A battery of artificially intelligent advisers lets you know if you're going to succeed or be reamed on any major decision. Play is sufficiently complex that you must read the manual to get going (it's the only software manual I've seen with a bibliography and suggested reading list), and it wouldn't hurt to browse through *Foreign Affairs* and *Foreign Policy* each month, either.

New for this edition is an expanded database of facts and an advanced multipolar level. In the multipolar level, the smaller countries can take independent actions of their own—send troops and fight wars—and you, as a superpower, must exert your influence to keep things under control. This level is more like the real world but is much harder to manage. While the multipolar option goes far in addressing the superpower bias in the previous edition, it would be nice to see the next version of *Balance of Power* deemphasize military conflict in favor of other factors coming to the fore in the 1990s—global economic and environmental

conflicts, for example.

The game is still pretty slow, mostly because each move requires that the game's database be recalculated, and the graphics are nothing to get excited about. But *Balance of Power* remains the most advanced game simulation of any kind, and anyone interested in the state of the world should give it a look.

Send It to Me

Write to me with information of interest to the Amiga community care of Amiga Specific, *COMPUTE!*, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408.

— Steven Anzovin

MAC

Olduvai, a company that's produced several fine software packages, recently introduced *MultiClip* (\$69). The program replaces the standard Macintosh Clipboard and Scrapbook with its own multiple clipboards. You cut or copy items to *MultiClip* through a command-key sequence: Command-Option-X, for example, cuts selected items to *MultiClip*, an alternative to the Command-X command which cuts selected items to the normal Clipboard. It improves on the Apple Scrapbook by streamlining the cut-and-paste procedure and by allowing you to edit the contents of each clipboard.

Although the package is a good idea, it has one unfortunate weakness. Because some of the most popular Macintosh word processors don't use the Apple standard Clipboard, *MultiClip* faces some compatibility problems. For example, the program doesn't work with *WriteNow* 2.0.

Many of these problems may be solved with new versions of the word processors, but people at Olduvai say they can't account for incompatibilities in forthcoming programs. Most other programs—graphics, spreadsheets, databases, and desktop publishing—work smoothly with *MultiClip* (macros may not, though; in *Wingz*, the script didn't understand Command-Option-X as a cut to *MultiClip*'s clipboards). The company will release a maintenance version of *MultiClip*, bringing *WriteNow* 2.0 into the compatibility club. *Microsoft Word* 4.0 corrects the problems that its previous version had with *MultiClip*.

If you can beat the compatibility problems and you want access to more than one clipboard, try *MultiClip*. Contact Olduvai at 7520 Red Road, Suite A, South Miami, Florida 33143; (305) 665-4665.

Thunder II

Sometimes it's hard to understand why people still buy spelling checkers now that most word processors have them. *Thunder II* may give you a good reason.

Thunder II is a good, solid package. It has all the features you find in built-in spelling checkers, plus many more advanced options. And the dictionary is smart enough to catch double words and some punctuation errors.

Besides checking spelling in word processors, *Thunder II* also works interactively in spreadsheets, graphics packages, and databases. You may need more than one megabyte of memory for *Thunder II* to work with big packages. When I used it with *Wingz*, for example, a dialog box announced that there wasn't enough memory to load the dictionaries. Misspell all the

words you want—*Thunder II* isn't going to beep without its dictionaries.

Correct spelling isn't all you get from *Thunder II*. To analyze your writing, you can ask for a Flesch index and a Gunning Fog index, which indicate your prose's readability and grade levels. The program also counts words, syllables, and characters.

If you constantly type the same word or phrase over and over again, *Thunder II* will let you assign an abbreviation to the phrase. You type the short version, and the program replaces it with the long version (a lot like the glossaries in *Microsoft Word*, but *Thunder II* doesn't store formatting instructions with the glossary entry). Another useful feature automates search-and-replace operations. You create a list of words and their replacements, and *Thunder II* performs all the search-and-change tasks on one command, much like a batch command.

The program is easy to install, and since it's a cdev, you can easily link it to applications via the Control Panel. Once linked, *Thunder II* runs automatically from those applications. It doesn't seem to slow down any normal activities, and so far there haven't been any clashes in compatibility. The program includes some Compatibility Modules that patch *Thunder II* with *WriteNow* and *Microsoft Word*.

Thunder II costs \$79.95, and you can get information about it from Electronic Arts, 1820 Gateway Drive, San Mateo, California 94404; (415) 571-7171.

Take Off

Spreadsheets are the realm of number crunchers—people who want to show how stock-market prices relate to the number of bananas that spoil in supermarkets. For the home, a simple spreadsheet, such as *Microsoft Works* or *MacCalc*, is sufficient. Nothing fancy—just something that shows the results of a spending binge on the household budget.

For a home office, how-

ever, you may want to consider one of the more powerful programs, like *Excel* or *Full Impact*. Informix's *Wingz* has just joined the close circle of mathematical-function factories. It has a large capacity for numbers, holding 32,768 rows × 32,768 columns of information. If you need to customize the program, you can write scripts with a language that loosely resembles HyperTalk. Attach scripts to buttons (sounding more hyper-oriented all the time, isn't it?) and menus, or use these programs as macros. If you choose the Learn command, *Wingz* will automatically write a script based on your actions.

With no other information, you may think *Wingz* looks an awful lot like *Excel*. So why veer off the proven path cut by Microsoft? Take a new direction if the prospect of terrific graphics tools appeals to you. *Wingz* lets you create graphic enhancements right on your spreadsheet, a good feature for people who plan to develop presentations in connection with calculations. When you create charts, they show up on the spreadsheet, too. These features give *Wingz* an aura of desktop publishing.

And the charting features are the most advanced around. You can choose the traditional pie, bar, and line charts; or you can see those same charts in three dimensions. There are even contour graphs and surface charts. Each chart is explained in the Dictionary Guide to *Wingz*, so you know which ones are best for different kinds of data. Once you've chosen a chart, you can manipulate its display—explode pie charts, place legends, resize the chart, change the fill patterns, and so on.

Wingz isn't as easy to learn as one of the smaller spreadsheet packages, but it isn't any harder to pick up than *Excel*. Some of the graphics tools don't work as well as they do in dedicated graphics packages, but they're still impressive for a spreadsheet.

It's tempting to buy a package like *Wingz*, but its price and complexity will scare off the casual spreadsheet user. Consider this package if you're looking for a real powerhouse. *Wingz* retails for \$395, and

you can get information from Informix Software, 16011 College Boulevard, Lenexa, Kansas 66219; (913) 492-3800.

Hail to El Jefe

In the wake of recent diplomatic snafus and international soap operas, Springboard Software has offered a new political simulation. *Hidden Agenda* offers a spoon-size taste of life in a troubled Central American country.

As the new president of Chimerica, you must settle the uprisings and outcries of all the people. Balance the interests of the landless poor against those of the wealthy cotton growers. Placate the Mothers of the Disappeared without incurring the wrath of the army. And if you can make friends with the likes of Colonel Horacio Ehrlich and "Blowtorch" Padilla, you're a diplomatic wizard.

If other simulations have tested your patience, try *Hidden Agenda*—it's fast-paced and takes only a few hours to play. Decisions take up two weeks of game time, seasons pass after nine moves, and a year comprises three seasons. You control how often you make decisions by choosing to meet with representatives of competing interests. Some decisions are critical; others, merely decorative. At all turning points, you may refer to your appointed cabinet-level advisors. You'll find trusted aides among the cabinet ministers, as you'd expect, but you'll also find that some of the citizens are just as useful and knowledgeable.

If you survive for three years, you win the game. To evaluate your success, the game includes a future encyclopedia entry about your first years as president. Even if you survive, your report may not be as flattering as you would hope.

The beauty of this game is that there are three ideologies, countless influences, and numerous other interests that complicate any action you take. The influences are represented, in part, by newspapers that recount your actions in

COMPUTE! *specific*

their own biased fashions. Without being able to account for the complex myriad of real-life influences in a real-life country, *Hidden Agenda's* designers have put together a simulation that rings true.

You can play this game many times, choosing different political alignments for different outcomes. *Hidden Agenda* is available for \$59.95 from Springboard Software, 7808 Creekridge Circle, Minneapolis, Minnesota 55435; (800) 445-4780.

— Heidi E. H. Aycock

ATARI ST

Welcome to the moon Mitral, a moon that threatens to explode if you don't release the gas trapped beneath its surface. In *Space Station Oblivion*, you must guide a small tank through 18 sectors of Mitral. Through the cockpit window, you see the moon's landscape. You control the tank's movement with your joystick or keyboard and the weapons with your mouse.

Epyx (P.O. Box 8020, Redwood City, California 94063; 415-368-3200) has released this remarkable 3-D adventure. As you maneuver the tank, you can vary the speed, raise the vehicle up in its tracks, and tilt it back and forth. For weapons, the tank is equipped with high-powered lasers and shields.

This game has three objectives. First, you must figure out how to enter each sector. Some are connected by doors, but some are more deviously linked—hidden doors, false walls, switches that must be activated, and other trickery.

Second, you must deal with the sectors' defenses, including laser towers and overhead satellites (tilting back helps). Third, a drill must be placed in each sector to release the trapped gas, and you decide which is the most effective place to put the drill. There are hints as to the proper location, if you know what to look for. To recharge your tank, you must also find some energy crystals. There are other hazards in the sectors, such as deep trenches and mine fields, but for each hazard there is a solution. The simulated, convincing 3-D graphics move smoothly. This game is fun to play, but plan to spend quite a bit of time with it. Fortunately, you can save games to disk and resume them later.

If you just can't handle the complexities of *Space Station Oblivion*, there is help. Epyx has published its first hint book in the Master Collection (\$7.95). It contains complete solutions to four Epyx games: *The Legend of Blacksilver*, *Sub Battle Simulator*, *Space Station Oblivion*, and *LA Crackdown*. The section for *Sub Battle Simulator* consists primarily of hints, but the other sections contain complete information on solving the puzzles. Even maps are included. In the case of *Space Station Oblivion*, there's a cut-out which can be folded into the polyhedral shape of Mitral. The book tells you everything you need to know. For example, the drilling coordinates are supplied in each sector description and in a chart. To some it may feel like cheating; to others, it's just a helping hand.

Pounds of Pictures

One of the standard formats for object-oriented art is the GEM file format. Those who use Migraph's *Easy-Draw* are familiar with object-oriented graphics: You build pictures from simple objects such as squares, lines, and circles. There's a significant advantage to this format: When you distort, shrink, or stretch a picture in packages like *Easy-Draw*, the picture loses none of its de-

tail or resolution.

Migraph (720 South 333rd Street, Suite 201, Federal Way, Washington 98003; 206-838-4677) has introduced *DrawArt Professional* (\$59.95), a collection of GEM-format clip art that can be imported into object-oriented graphics packages. The *DrawArt* collection includes houses, scenery, computer art, and aircraft.

Migraph has released a program for editing image files, too. These pictures defy the limits of screen resolution, but also defy editing. An image file can have any resolution, even 300 dpi for laser printing and higher. *Touch-Up* (\$189.95), a paint package, edits and prints image files no matter what the resolution is.

The program is intuitive in spite of some inconsistencies and some commands that don't work as expected. *Touch-Up* supports several formats, including GEM, IMG, TIF, DEGAS, NEOchrome, and MacPaint.

From your toolbox, you can draw variable-width lines, curves, freehand sketches, and airbrush art, even *splines* (smooth curves that pass through specified points). *Touch-Up* includes such special effects as stretch, rotate, flip, and mirror.

For fine detail, use one of the four zoom modes. Or use a fat-bits feature, which blows up a small section of the screen into a large grid. *Touch-Up* works in three resolutions and imports color pictures but only outputs in black-and-white.

If you want to edit IMG files or convert files from one format to another, this program works very well.

Rumors

It is rumored that Atari is working on two new machines. The first (called ST Plus by those who know about these things) is compatible with the ST but features a 1280 × 960 monochrome screen, as well as two-channel, four-voice-per-channel stereo sound. It will also access 4096 colors (16 at a time in low resolution) rather than the 512 colors currently available.

In fact, the ST has the software to support 4096 colors because there is an extra, unused bit for each color (red, green, and blue). JRI (which produces the Mega Genlock board) has a working prototype of a board called the FT4096C. Plug it into your ST and you have access to 4096 colors, but still only 16 colors at a time (JRI, P.O. Box 5277, Pittsburg, California 94565; 415-458-9577; no price yet).

Atari's other vapor machine is a 68030-based ST (some call it the TT). It isn't clear whether it will be compatible with the ST, although early word says that it will. The TT will also run UNIX, a rather unfriendly but extremely powerful operating system capable of multitasking and networking. Users will be shielded from UNIX by a shell. Prototypes of the 68030 machine are being shown to developers while Atari feverishly tries to finish the operating system. Look for these two machines to be announced soon.

Rumors Revisited

There have been recent rumors about a speed-up board for the ST—one which utilizes the 16-MHz version of the 68000 chip (the ST uses the 8-MHz version). JRI has completed work on and is now selling such a board, the JATO board. To maintain full compatibility, the chip electronically switches to 8 MHz when communicating with other chips and with RAM, but it runs at 16 MHz when performing internal functions. Spreadsheet calculations, some graphics, and Antic's *Cyber* series went considerably faster. The board's name comes from the Jet-Assisted Take-Off modules that were attached to propeller-driven aircraft to help them reach takeoff speed more quickly. If you want to use the JATO board, your ST must be equipped with 120-nanosecond (or faster) RAM chips. This leaves out some of the early Mega ST machines, which came with 150- or 170-nanosecond chips.

— David Plotkin ☐



REVIEWS

/// *fast looks*

**Eyeball an IBM,
Attack in Twos,
Call Timeout, Save
Kennedy, Learn
the Bear Facts,
View Disks, Delve
into Dungeons,
Traverse Verses,
Putt Around, and
Free Your Checks**

Each month, "Fast Looks" offers up snapshots of some of the most interesting, unusual, or important software and hardware for the IBM PC and MS-DOS, Commodore 64/128, Apple II, Amiga, Macintosh, and Atari ST lines of personal computers. Get the last word on what's new—here, fast, first.

ThunderChopper

*Motor RPM at 100 percent now, raise collective pitch, rotor spin increasing, cyclic forward, watch that tail rotor—if those are the kinds of phrases that give you a boost when you sit down to have fun with your computer, then *ThunderChopper* will give you a real lift.*

Don't expect to master this game in an afternoon. The controls are complex enough to keep you in training for some time. When you've mastered the student flight patterns, though, you can go out into the real world to solve some pretty hairy problems—and I don't mean reporting traffic jams.

To help you navigate, you have access to a compass, an Automatic Direction Finder, and Distance Measuring Equipment. Your on-board computer warns of dangers—don't fly too high, this is no F-19—and doubles as a zoom television display. To defend yourself against enemies, you can choose from TOW missiles, Stinger missiles, Zuni rockets, or a Hughes Chain Gun.

If your joystick skills are limited to moving left, right, up, and down and pressing a fire button, this game will give you the dustoff. But if you're a fan of flight simulators and you want a change from jets, props, afterburners, and rollouts, *ThunderChopper* gives

you the real feel in a technically sophisticated (if you don't count the dismal sound effects) package. Rotor up. Tail right. You're outta here.

— PS

Apple II—\$29.95
Commodore 64/128—\$29.95
IBM PC and compatibles—\$39.95
SubLOGIC
501 Kenyon Rd.
Champaign, IL 61820
(217) 359-8482

Flash

Flash isn't based on the speedy DC Comics superhero. It's a cache program that lets your computer read your floppy or hard disk drive faster.

With some programs, *Flash* can speed up disk reads as much as three times. That means you'll have a lot more time to play computer games, back up your files, or spend time with your family.

Flash stores data in a special area of your computer's memory. When your computer needs the same information again, it reads the data from RAM rather than from the disk drive. It works best with programs that access the disk a lot, such as word processing, spreadsheet, and database programs.

You can install *Flash* (either manually or through your AUTOEXEC.BAT file), and specify the amount of memory to be set aside for the buffer. When the buffer is filled, *Flash* replaces the oldest data with newer data. By flagging some of the files in your buffer HI-PRI, you can keep them in memory even when the buffer is full.

Flash can dramatically speed up many programs; it works well with both floppy and hard disk systems and offers a variety of options. Even if you have as little as 256K of RAM in your computer, this could be the most useful utility you'll ever buy.

— DE

IBM PC, PS/2, and compatibles—\$69.95
Software Masters
6352 Guilford Ave.
Indianapolis, IN 46220
(317) 253-8088

The Honeymooners

"Norton, I'm tellin' ya, it's a natural. Computers are *hot*, pal. We're gonna make a fortune!"

"Anything you say, Ralphie Boy!"

Kramden and Norton have another scheme. This time it's software, but the results are the same as with their hot dog stand or any other money-making venture they've launched: Close, but not quite in the clover.

That's the way it is with First Row's *Honeymooners*. A lot of love went into this game—a lot of affection and respect for the Great One's greatest creations—but somewhere along the way, the project took a wrong turn.

Instead of reliving the Honeymooners' ambience, we get some pretty rudimentary arcade games and a trivia contest. Kramden's section puts you in charge of a Manhattan bus as you pick up and drop off passengers, racing the clock all the while. Alice and Trixie provide a jigsaw puzzle of Honeymooners scenes. With Ed, you get to repair leaks in the sewers—sort of a Norton utilities.

Gameplay is simple, the graphics even more so. In MS-DOS format, the game supports only CGA; it might have been better if First Row had gone with black-and-white in honor of the TV series.

On the whole, then, a loving tribute to a great series, but a disappointment as software.

This one may be for Honeymooners fans only, but I think they'll understand. Humina, humina, humina. . .

—KF

Commodore 64/128—\$29.95
IBM PC and compatibles—\$29.95

First Row Software
3624 Market St.
Philadelphia, PA 19104
(215) 662-1400

MacWrite II

For many people, *MacWrite* is the Macintosh program. Its latest incarnation lives up to the hype and becomes an important milestone in Macintosh evolution.

MacWrite II is still one of the easiest-to-use word processors available for the Macintosh, but it runs faster and offers more advanced options—mail merge, elementary column layouts, and a spelling checker—than the original version.

Compared to T/Maker's similar release, *WriteNow 2.0*, *MacWrite II* fares well. In speed, special features, and ease of use, the two programs are nearly

even. You won't find yourself tapping your fingers, waiting for your words to be processed. And as long as you're not looking for a hybrid word processor/desktop publisher, you won't find many tools missing from either package.

However, *MacWrite II* distinguishes itself by its what-you-see-is-what-you-get display, which is more precise than *WriteNow 2.0*'s display. Footnotes, headers, and footers not only appear on the page, but they're also accessible for editing in the same way that other text is accessible—just click on the text and start typing. In other packages, you must double-click on a footnote, header, or footer to access separate editing windows.

That kind of simplicity and elegance is what's expected from top-of-the-line Macintosh packages, and *MacWrite II* fulfills expectations easily.

—HA

Macintosh—\$249 (\$50 to upgrade from *MacWrite 5.0*; \$75 to upgrade from earlier versions of *MacWrite*)

Clarix
440 Clyde Ave.
Mountain View, CA 94043
(415) 960-1500

Contributing to "Fast Looks" this month were Heidi E. H. Aycock, David English, Keith Ferrell, and Peter Scisco.



IBM PS/2 Model 30 286

IBM won't admit it, but its PS/2 Model 30 286 is a throwback—a machine that harks back to the days when IBM personal computers were king, when compatibles were scrambling to climb out of the sales cellar, when a PC AT with the blue logo was *it*.

With the introduction of this journeyman computer, IBM has conceded that there's life left in the AT line. Everyone else already knew this—buyers flocked to AT-class compatibles last year—but it took IBM a bit longer to catch on. Perhaps it was the company's stubborn promotion of its Micro Channel Architecture-equipped PS/2 models. Whatever the cause, the company that once stopped making ATs is now back at it.

The Model 30 286 is an entry-level MS-DOS computer running Intel's 80286 microprocessor at 10 MHz. Its small case—with the familiar Model 30 footprint of 16 × 16 × 4 inches—is packed with 512K of RAM, one 1.44-megabyte 3½-inch disk drive, VGA

graphics, a 90-watt power supply, and three full-size slots that accept most XT and AT boards. There's room to add one hard disk drive (though you can't add an internal floppy disk drive); most Model 30 286 machines are sold with a 20-megabyte hard disk drive already installed. The IBM Enhanced Keyboard is bundled with the computer. The Model 30's most significant option is an 80287 math coprocessor.



The PS/2 Model 30 286 runs slowly but displays beautiful graphics.

Setup is simple: Just plug in the power cord and the keyboard and monitor cables. The optional IBM monitor can sit on the system box, but I put the box on its end, beside my desk. As with most computers, the cables just barely reached. Manufacturers should include longer cables with their systems for people who like to keep a clear desk.

This Model 30 is no speed demon. Compared with most AT-class computers, the Model 30 286's 10-MHz microprocessor is barely sufficient (especially if you've spent any time in front of a 12- or 16-MHz machine). Scrolling through a word processing document, even in lightning-fast *XyWrite III Plus*, takes too long. Faster 286 computers, like the Vendex HeadStart III or Northgate's 286, make plain the Model 30 286's faults.

The computer's 20-megabyte hard disk drive is comfortably quick. It's a quiet drive, something to consider if you're using the computer in a home office with little of the typical business background noises. No disk utilities are included with the computer, but software such as *PC Tools Deluxe* can fill the gap nicely (for a price, of course).

One of the highlights of any IBM personal computer is its keyboard. The Model 30 286 doesn't disappoint. Its keys have a firm feel, with an excellent tactile and auditory response. A numerical keypad, cursor keys, and 12 function keys (arranged along the top edge) complete the keyboard. It's an outstanding input device for words and numbers.

Built-in VGA support puts as many as 256 colors on the screen at the same time (or up to 64 shades of gray). Software that takes advantage of VGA is increasingly popular, especially in the entertainment and education areas: The Model 30 286's graphics make the machine a good choice for home users eager to play and learn, and ensure top-line video capabilities into the 90s.

Although a mouse isn't included in the basic package (too bad), there is a mouse port at the back of the system box. Before you buy a mouse, though, make sure it has the mini-DIN-type PS/2 connector. Other ports include serial, parallel, and external floppy disk drive connections.

All this makes the Model 30 286 a solid, though not slick, machine. Its high marks come, first of all, from the name on the front. IBM is, for many people, the only choice. Dependable and easy-to-find service is available, and you can be comforted by the knowledge that the company will be around tomorrow. Such confidence is hard to come by in the volatile PC-compatible market. Even without the IBM logo, though, the Model 30 286 is a steady performer. Keyboard excellence, top-of-the-line graphics, and expansion-slot standards all contribute to the computer's quality.

Down among the low marks, however, is the computer's lackadaisical speed. A 12-MHz chip should really be the entry-level microprocessor today. More important is the Model 30 286's price. Configured with the 20-megabyte hard disk, the system runs \$2,595, without a VGA monitor. Compare that with any number of PC-compatible computers, and you'll find more for your money in a clone: more processing speed, more memory, more disk storage.

Balance the price against the name and you have a dilemma. I found the Model 30 286 a good word processing computer, primarily because of the keyboard. But there are PC compatibles with keyboards just as good, with more to offer. Northgate's 286 computer (16 MHz, 2 megabytes of RAM, a 65-megabyte hard disk, and two floppy disk drives—all for \$2,799) comes immediately to mind.

Unless you can buy the Model 30 286 at a substantial discount—either from a computer dealer or through IBM's educator program—I'd suggest looking elsewhere for that power 286 machine you'll want on your home desktop by the end of the year.

IBM knows the Model 30 286 is a throwback. What it doesn't know is that

you may want to throw it back and reach for something else.

— Gregg Keizer

IBM PS/2 Model 30 286

For ...
\$1,995 (with a 1.44-megabyte floppy drive)
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Double Dragon

Double Dragon is a simple sell in the arcades. The cast of bloodthirsty villains, dynamic animation, impressive graphics, and varied street-fighting moves make it easy for kids to drop quarters into its slot. But its the greatest appeal stems from its cooperative, two-player mode. Visit any local arcade and you'll see pairs of teenage boys staking their immediate futures and scanty fortunes on just one more try at the game.

The measure of success for any personal computer translation of an arcade game is how closely the program comes to duplicating the look and feel of the original. Considering the restrictions placed on it by memory limitations and machine architecture, Arcadia has done a pretty nice job.

Unlike the Nintendo version, the personal computer version of *Double Dragon* lets two players engage the enemy simultaneously. You can split up the task of kicking, punching, and dealing other assorted death blows to your numerous and varied adversaries. But since no foe is a pushover—not the whip-bearing Linda, the thug with the baseball bat, nor the machine-gun-toting Big Boss—sometimes even two good guys can be too few.

Like most arcade games, *Double Dragon* is high on violence and short on plot. A set of twins named Billy and Jimmy seek to rescue Billy's girlfriend Marian, who has been kidnapped by the Black Warriors, a gang of sadistic street hoods. To save Marian, our heroes must travel from street to factory to forest to a final showdown at the gang's hideout. Along the way, they will get their money's worth from all their karate lessons.

To accommodate both one- and two-player modes, Arcadia made some sacrifices. Moving objects (the elevator

and flying crates, for example) found in the stand-up arcade version are missing, as is the ability to climb most ladders. More importantly, the animated figures are unclear, making it difficult to gauge your opponent's moves and to counter them effectively. It's even more difficult to discern which weapon your adversary is carrying.

You can acquire a weapon by defeating an armed assailant, but you might not be able to use it effectively. Close enough to deal a debilitating blow with a whip or bat is quite often too close for comfort. For the same reason, most players will avoid many of the joystick-controlled offensive moves, such as punching, elbowing, and head butting, in favor of the frontal kick, which can be administered from a greater—and safer—distance.



Two players can get a real kick out of battling the bad guys in *Double Dragon*.

Another loss from the arcade version is the option of continuing play from where a former game has ended. As a result, your chances of reaching *Double Dragon*'s final screen on the first few hundred outings are very slim. If you enjoy lengthy load times and re-playing earlier levels, that's fine; if not, then be forewarned—this game can consume some major time.

Arcadia acknowledges that *Double Dragon* is unforgiving to the novice gamer. But the programmers of the Commodore version built in a glitch to help players survive as long as possible: If you move your man to the top of the screen and jump, all attackers will freeze. Unfortunately, they won't stop kicking, clubbing, and punching. And actually, they're more deadly frozen than moving—at least when you hit them on the run you can get out of the way before they retaliate. So much for helpful glitches.

Double Dragon's documentation is barely adequate, and in some places it's inaccurate. For example, the characters as drawn in the manual bear little resemblance to their onscreen counterparts. Scoring methods aren't explained. And

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it would be helpful if descriptions of the obstacles and pathways were included.

While not as responsive as the stand-up arcade controls, the computer's joystick stands up well to the rigors of street karate. Graphically, *Double Dragon* is quite acceptable. The smooth animation and the horizontally scrolling backgrounds are richly detailed and marginally 3-D. They're as close to the real thing as you could expect, considering the hardware limitations. That goes for the music and sound effects as well.

Arcadia deserves high grades for preserving enough of the look and feel of the arcade-hall original to please all but the most demanding critic. The home version of *Double Dragon* doesn't upstage the stand-up version, but it's close enough to be worth its price.

— Len Poggiali

Double Dragon

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TimeOut SpreadTools, MacroTools, and MacroTools II

Apple II users looking to boost the power of their computers with quality, low-cost software have often cast their eyes on Beagle Bros. and its TimeOut series of *AppleWorks* enhancement software. Joining that parade as the latest of the Apple II tweekers are *SpreadTools*, *MacroTools*, and *MacroTools II*. *AppleWorks* users, get ready for liftoff.

All three programs require *AppleWorks* version 2.0 or 2.1 and at least 128K of RAM (more is recommended). In addition, *MacroTools* and *MacroTools II* require *UltraMacros* version 2.3 or higher.

Each TimeOut application comes with a core routine, which lets you access the program from within *AppleWorks*, and the application itself, which can reside on your *AppleWorks* disk or on another disk. To get to the TimeOut menu, press the Apple and Escape keys

simultaneously; then, highlight the application you want to run with the arrow and Return keys, just as you would do in the *AppleWorks* menus.



Three new packages in the TimeOut series boost the power of *AppleWorks*.

SpreadTools brings together seven tools that can boost the functionality of your *AppleWorks* files—especially spreadsheet files. Four of the tools are small in scope. Data Converter quickly and easily converts data from the word processor to a spreadsheet, from a spreadsheet to a database, and from a database to a spreadsheet. Formula to Value converts a block of formulas to all values, which conserves memory (formulas take up more memory than values). With Quick Columns, you can change column widths without using the Apple-Arrows method (you can change the width of as many as 127 columns at once). Finally, Rows-Cols lets you copy any spreadsheet row into a column or any column into a row. Unfortunately, formulas in the row or column are lost when copied.

SpreadTools' real power lies in its three major tools. Analyzer scans for errors in six different ways: Scan for Errors searches for unreferenced values, for references to blank or label (text-filled) cells, for references to cells containing a formula that is calculated after the formula that's referencing it, for circular references, for @NA cells, and for cells with formulas that evaluate to an @ERROR. If any of these errors occur in a spreadsheet, the program displays a list on the screen; you can print the list with the standard Open Apple-P command.

Analyzer's Cell Cross Reference generates a list of cells that are referenced by any formula and the cells containing the formula. Bird's-Eye View displays 76 columns of a spreadsheet; each cell appears as a single character that indicates whether the cell is blank or holds a formula, value, label, or repeated label. Adjust Column Widths automatically modifies the width of all spreadsheet columns, Track References

lets you see the location of each cell referenced by a formula in another cell, and Show Cell Values generates a list of all nonblank cells along with the cell type, layout specification, and current value.

SpreadTools' second tool, Block Copy, lets you copy blocks of information within a spreadsheet as well as to and from the Clipboard. It's much more powerful than the *AppleWorks* copy command. Copying to the Clipboard presents Add Values and Subtract Values options, which means that any formulas in the cells, either on the Clipboard or in the section of the spreadsheet about to be copied to, are converted to values, and then the cells on the Clipboard are either added to or subtracted from the existing spreadsheet cells.

The third major tool in *SpreadTools* is CellLink, which lets you copy up to 175 values from a spreadsheet stored on disk or on the Desktop. If the spreadsheet is on the Desktop or stored on a ramdisk, this feature works lightning quick. You can even chain spreadsheets so that the results of one spreadsheet are copied to a second, the results of the second spreadsheet are copied to a third, and so on.

All the tools are easy to install and to use. The *SpreadTools* manual, while thin, is complete and well-written. In addition, the spreadsheet example and practice sessions make learning the program a breeze.

SpreadTools is a broad-based application that helps you ride herd on your *AppleWorks* spreadsheets. *MacroTools* and *MacroTools II*, however, are narrower in scope—yet there is no loss of quality. Both applications include sample macros and applications written in and requiring TimeOut *UltraMacros*, a macro programming language for *AppleWorks*.

MacroTools includes four applications: Debug, which makes it easier to write *UltraMacros* macros; File Status, which gives you the current desktop file number, size, type, and file status, and which allows you to change the file status; MenuMaker, for creating *AppleWorks* menus for your macros (developers can license MenuMaker for a one-time \$50 fee); and Task Launcher, which permits rapid changing of active macros. The program also includes 36 sample macros and two database files of useful information for those who write their own macros.

MacroTools II applications include File Lister, which provides a list of files from which users can choose; Ultra Lock, which locks a macro set so that it

can't be listed using the macro compiler; Ultra Publisher, for converting word processing files into two- or three-column documents; and Mail Merge, which allows you to enter mail-merge fields without first moving the information to the Clipboard. This program boasts 33 sample macros.

Known more as an educational computer than as a high-powered business machine, the Apple II gains needed muscle from all three of these programs at a minimum price. For the serious *AppleWorks* user, *SpreadTools*, *MacroTools*, and *MacroTools II* are a must. They work gracefully with *AppleWorks*, not against it.

— Vincent D. O'Connor

TimeOut Tools

For...

Apple II with *AppleWorks* 2.0 or 2.1—
\$59.95 (*SpreadTools*); \$25.00 (*MacroTools*); \$25.00 (*MacroTools II*)

From...

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And...

MacroTools and *MacroTools II* require
TimeOut UltraMacros 2.3 or later.

Guardians of Infinity: To Save Kennedy

It's January 2087, and a pterodactyl just flew into Times Square. For months now, out-of-time anomalies have occurred. What began as a harmless flash or two from the past has become more frequent and more dangerous. The chronological crisis is getting desperate, as bigger and more frightening objects from the random past are ripping into the current time continuum. Time's very fabric is unraveling by the hour.

The cause of the time rupture can be traced to November 22, 1963, when something happened that never should have: the assassination of President John F. Kennedy. The integrity of the time continuum can be restored only by going back to 1963 and making sure Kennedy never rides in his fatal Dallas motorcade. And the only way back is through Paragon's *Guardians of Infinity: To Save Kennedy*.

In this interactive text game, you play the role of temporal physicist Adam Cooper. An expert on time, Cooper has

invented a time-travel machine called the Time Sphere. He is the only man on earth in a position to save Kennedy.

But this is no solo job. As Cooper, you assemble a five-agent team, the Guardians of Infinity. Each member an expert in a particular field, the team consists of a professor of American history (Kennedy's great-grandson), a temporal researcher, a diplomat and language specialist, a freelance mercenary, and your own daughter.

More than 100 different historical figures key to the President's administration and the Kennedy family also play a part in the game, from Lyndon Johnson and Jackie Kennedy to Dean Rusk and William O. Douglas. There are senators, staff members, Secret Service agents, and assorted others, including Peter Lawford and, of course, Lee Harvey Oswald.

The game's mission manual contains biographies of each of these figures to help jog your memory and to help you decide which of them your agents should approach. If you direct your agents successfully and they can convince the right people that Kennedy's life is in danger, then a personal meeting will be arranged between you and the president. At that time it will be up to you to convince Kennedy to cancel the motorcade.

The game begins as you and your crew enter the Time Sphere and are transported to Friday, November 15, 1963—one week before Kennedy's assassination. On the screen appear six conversation windows, one for each of your agents and one for you.

There is also a window for computer information; across the top of the screen is a date, time, and ship-status window to help you keep tabs on the energy level of the time machine and on how much time you have left before the assassination. A News & Headlines window informs you of current news stories, and along the bottom of the screen is the important Kennedy window, which constantly monitors and displays J.F.K.'s current location.

As you comb the extensive listings of historical figures, you must decide which of your agents to send to see whom. If you instruct an agent to go see Robert Kennedy, for instance, you will need to say where and when, and what that agent must say to convince him that his brother is in danger. After agents have left the Time Sphere, their dialogue windows indicate their current locations.

You can improve your chances of successful interviews by matching the talents and personalities of your agents

to those of the historical figures. You'll have plenty of obstacles. How do you get enough 1963 currency to fly your agents around the country? How do you manage to talk to Robert Kennedy, even if you are a time traveler?



Save the life of a president and restore the fabric of time in *Guardians of Infinity: To Save Kennedy*.

When your agents do get to see someone important, be prepared for some sensitive questions and tough decisions: How do your agents know the president's life is in danger? Should your agents tell people they are from the future? If so, what can your agent say to convince people that's true?

If you're lucky, clever, persistent, and convincing, you'll get a private meeting with Kennedy. Based on what you say to him, President Kennedy might cancel the motorcade, saving time from continued decay.

For players who remember the thousand days of Camelot, there's a lot to relearn. For those to whom the sixties and the Kennedy mystique are little more than an asterisk in a history book, the interplay among the historical figures offers a unique glimpse into a dynamic chapter of American history.

To save Kennedy: As a game, the idea is challenging and nostalgic. *Guardians of Infinity* combines sophisticated text programming with an off-beat idea about a fascinating and emotional time.

— Ed Ferrell

Guardians of Infinity: To Save Kennedy

For...

IBM PC and compatibles—\$44.95

From...

Paragon Software
Distributed by MicroProse
180 Lakefront Dr.
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(301) 771-1151

And...

Macintosh version planned for a 1989 release.



Wildlife Adventures: Grizzly Bears

From the moment I loaded *Wildlife Adventures: Grizzly Bears*, it really got its claws into me. A wildlife adventure that focuses attention on an important environmental problem, this impressive debut from the National Audubon Society integrates the power and attraction of personal computers with a fascinating study of nature.

Grizzly Bears follows a choose-your-own-adventure motif, with an environmental and educational twist. By linking aspects of environmentalism and detective work, it presents a comprehensive and attractive package.

You'll find four sets of grizzly-bear adventures within the program. Each adventure contains a number of simulations in which you, a trainee in the field, team up with a computer-provided expert to solve grizzly-bear cases. These cases might include handling a bear that has become aggressive toward campers, determining where developers can build with the least disturbance to the grizzlies' habitat, and even solving the mystery of a bear that has been shot.

Informative text is integrated with captivating graphics, and excellent maps add a feeling of reality to the simulation. The program's reading level is challenging, and onscreen prompts make it readily accessible.

In addition to the adventures, *Grizzly Bears* includes a database of information about the grizzly's foods, eating patterns, and habitat. There's also information on particular grizzlies, whose characteristics you'll learn as you progress through the stories. As in real life, you won't get to know these bears personally. They aren't even friendly. You're involved with them simply as part of your job. Yet, because you are responsible for their welfare, you'll end up caring about them—your decisions count.

The program keeps excellent records of your progress. Each case you solve is saved to the program disk; you can check your records at any time. And, as long as you enter your name the same way each time you boot the program, you won't repeat a story. The excellent manual and a compelling guide offer follow-up activities designed for you and your family, schoolmates, or friends. The program is appropriate for a large age range, for families who want to work together on the stories, and for teachers who might include the topic in their curriculum.

Grizzly's mouse support is excellent (none for IBM, unfortunately) allowing easy movement among its menus and its graphics screens. Even if you haven't used a computer before, you should have no trouble moving through the stories. In fact, one of the program's attractions is the way it encourages people to use computers as tools. Concepts such as databases and telecommunications are explained and used at many points in the stories.



Venture into the forest in search of bears with *Wildlife Adventures: Grizzly Bears*.

A few weaknesses do detract from this otherwise excellent program. For example, it wasn't clear what was expected of me in several instances when I was trying to move around a map of the area. Also, conflicting evidence on one of the mysteries proved frustrating.

Spelling errors hurt the program's educational credibility. In one major snafu, the program became confused about which screen I was in—graphics or text. I had to reload the story, losing the progress I had made up to that point. I hope subsequent versions correct this and also the problem where several of the mysteries contain the same scenario (although the victims and culprits vary).

Particularly troublesome was the fact that there was no escape from some of the graphics screens except to quit the story. Repeated returns to headquarters can make for a long session, especially with stories that demand so much concentration from young children.

Despite these annoyances, the program meets its objectives. You can't help but learn about the subject and about some of the problems confronting environmentalists. And, perhaps most importantly, you can't help but have fun. With its delightful premise, *Wildlife Adventures: Grizzly Bears* delivers an interesting and educational look at an animal that most of us will never see. The Audubon Society's computerized grizzlies have put the environmental bite on me, enough so that I

can't wait to see what's next in the menagerie.

—Kristen Sternberg

Wildlife Adventures: Grizzly Bears

For...

Apple II—\$49.95
IBM PC—\$49.95
Apple IIGs—\$59.95

From...

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Berkeley, CA 94702
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And...

A classroom edition (including backup disks, binder, background information, reusable worksheets, and activity suggestions) is available for \$79.95 (Apple II or IBM) and \$89.95 (Apple IIGs); the Apple II and IBM versions are available on 3 1/2- and 5 1/4-inch disks.



ViewLink

In the innocent days of microcomputing, a simple word processor and some files fit on one 5 1/4-inch floppy disk. The perfect file-management system consisted of a dependable felt-tip pen, some color-coded labels, and a disk case. But things have changed. We often work with several programs, and we generate hundreds of files.



ViewLink organizes files and applications in logical, easy-access groups.

Keeping track of the trappings of modern computing has become a time-consuming, frustrating chore, but Traveling Software's *ViewLink* is one solution worth considering. It's called the first associative access manager for MS-DOS—clear enough once you see the program in action.

It's a combination DOS shell, text-search utility, and hard disk organizer. As a multitasking program, *ViewLink* breaks the barriers imposed by MS-DOS's rigid directory/subdirectory

REVIEWS

structure. It helps you organize your applications and files in unlimited new ways. Regardless of your hard disk's size, *ViewLink* can impose logic and order on your library of data.

First, though, you must install *ViewLink* on your hard drive. (If you don't have a hard disk, this topflight organizer isn't for you.) During installation, *ViewLink* presents a list of 40 popular applications that it directly supports. After you mark the ones you use, the program asks where each is stored and where to look for its associated documents. From that information, *ViewLink* creates a series of *views* and *items*. Programs not listed and those you may purchase later can be added manually.

In the *ViewLink* metaphor, a view is a collection of related items. Views are displayed on the left of your main screen; items, on the right. Clicking on the default view Applications, for example, activates an items list of your programs, like *WordPerfect* and *Lotus 1-2-3*. Click on another view, WP.Files perhaps, and *ViewLink* lists all your *WordPerfect* documents as items. To run an application or load a file, select it from the items list with the highlighted cursor and press Return. Quit an application and *ViewLink* returns, ready to go on to the next file.

On this level, *ViewLink* works much like a DOS shell, shielding you from the infamous C> prompt. However, this program can do much more than launch applications.

Imagine for a moment that one of your major clients is Jeffrey Brown. Your 100-megabyte hard disk contains 25 or 30 documents related to the Brown account. The files were created by several different applications, and they're stored in who-knows-how-many subdirectories. To further compound the problem, you didn't have the foresight to name each file with a JB prefix.

You haven't heard from old J. B. in over a year. In fact, you thought he had moved to Tahiti until a dark-suited legal-type with a pasted smile and a subpoena informs you otherwise. It seems your friend has actually been spending time in a cold cell awaiting trial on charges of feeding wooden nickels into area Donkey Kong machines. You're ordered to deliver all information on the Brown account.

No problem. *ViewLink* builds a view by textual content. In this mode, you can enter *Jeffrey Brown*, and the program will search your entire disk for all files that include those words. The resulting JB view will include an item reference for all relevant files. Furthermore, when you click on any one of those items, *ViewLink* will locate the appropriate application (even though you may not know the right one yourself) and load the file for printing or revision.

You can also build views that include all items with common filenames, dates, or file types (files produced by the same application). *ViewLink* even creates views that include only those items that share combinations of similarities—all *WordPerfect* files that mention Jeffrey Brown and were written on June 1, 1988, for example. You can build views manually, too, by linking or unlinking any number of items with any individual view or set of views.

Confused? Don't worry. A single keystroke triggers context-sensitive help screens anywhere in the program.

What does all this mean? For one thing, it means a document that otherwise would require a duplicate in three different subdirectories—WP.Files, Jeffrey Brown, and Legal Problems—can be easily accessed from related views without wasting valuable disk space. It means you can search for a lost document by any keyword from its text.

Still, *ViewLink* isn't perfect. Grasping its view-item-link metaphor takes awhile. At first the manual is confusing, and by the time you can understand it, you don't need it. This isn't a program for casual users, but then casual

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users have no need for it.

On the other hand, people who are serious about computing at home or at work would do well to consider it. When your hard disk cries out for organization, *ViewLink* can help.

— David Stanton

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Wizardry-V: Heart of the Maelstrom

"Duck!" I yelled at Mondo-9 the Dwarf. He didn't hear me. The bat caught him right between the eyes and finished him off. Another member of my team gone. But the adventure must go on.

Welcome to *Wizardry-V: Heart of the Maelstrom*, a new stand-alone adventure scenario from Sir-Tech. Here you can create and control a party of up to six characters, seeking a balanced team that can traverse mazes, grow rich and strong, and finally win the game. But it's not easy—especially when you're as hard on adventure-game characters as I am.

Your characters spend their time in either a castle or a maze. The castle is important for preparing a party or healing wounds, and the maze is where the actual adventuring is done. My first party entered the maze before I had finished reading the manual—an unfortunate mistake, because they all ended up in a dark room full of ugly stuff they couldn't see. I hope someday to create a party with the sole purpose of finding the remains of Mondo-1 and friends.

Wizardry-V comes with an 86-page manual (it has a glossary and a table of contents, but no index), a pamphlet called *The Myths and Muses of the Maelstrom*, its own Spells Quick Reference Chart and Magic Word List, and three 5 1/4-inch floppy disks. Unfortunately, there's no provision for installing the game on a hard drive.

If you've never played *Wizardry* before, you can expect to spend a few hours just exploring the menus and assembling a party at the castle—all prior to entering the maze. If you're an experienced *Wizardry* player, you can import characters from previous scenarios (except *IV*). Imported characters are stripped of all their items and gold, however.

Part of the fun of *Wizardry-V* is in creating new characters. A character's race can be human, elf, dwarf, gnome, or hobbit. Characters can be good, neutral, or evil. Their statistics in five key areas measure their abilities: Strength affects skill in combat, I.Q. and Piety influence spell-casting ability, Vitality affects durability, and Luck works in mysterious ways. Depending on these statistics, characters fall into different classes, including fighters, mages, priests, thieves, bishops, samurai, lords, and nanges.

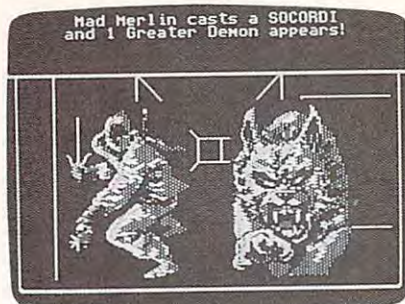
Once you've entered the 3-D video maze (rendered in line drawings), plan on meeting various fascinating folks. You might run into the Toga Llama, the Ruby Warlock, the Laughing Kettle, or some slime monsters. You could spend an evening with the ladies at Manfredi's fun center. Mondo-9 the Dwarf's party wasn't so lucky; it was ambushed by three men in robes during a search for the body of Mondo-8 the Dwarf. Perhaps Mondo-10 will boast a higher I.Q. and a little more luck.

To progress in the game, you'll have to inspect each location thoroughly and draw a good map of the maze. Mistakes sometimes led me to new explorations and discoveries, like the fact that Curly the Stooge can swim and Madge the Mage can find hidden doors by casting spells. I've had so many parties lost in the maze that I'm starting to get a feel for the place... I think.

The IBM PC and compatibles version of *Wizardry-V* is designed for CGA and can be displayed on an RGB or monochrome monitor or on a television monitor. The four-color graphics are adequate, but an EGA or VGA version would be welcome. Except for slow disk access when I was inspecting locations for objects, the game's speed presented no problems on an 8-MHz XT clone.

Wizardry-V has no disk copy protection, but it does make use of a key word found in the package's Magic Word List. After you've entered a maze, you'll be called upon to complete a partial spell with the help of the word list. All in all, it's hassle-free—unless you lose the Magic Word List.

Wizardry-V: Heart of the Mael-



Prepare to meet a variety of odd characters in *Wizardry-V: Heart of the Maelstrom*.

strom is classic adventure gaming in the tradition of the paper game *Dungeons & Dragons*, with ties to the past and to the future. It's a game in which adventurers travel together, as in real life, and share common struggles and teamwork. If you're new to the *Wizardry* series, you'll find that this game stands up well by itself. If you're an old hand at *Wizardry*, you'll welcome the chance to continue your adventures.

— Joey Latimer

Wizardry-V: Heart of the Maelstrom

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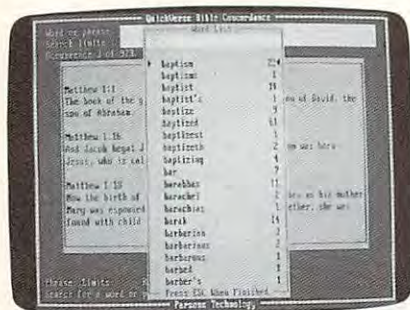
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QuickVerse Bible Concordance

Ironically, one of the greatest obstacles to Bible study is the Bible itself: It's so big. So many pages; so many words—where to begin? One place to start is with *QuickVerse Bible Concordance*, a computerized Bible index and reference program from aptly named Parsons Technology. If you're a computer user who's serious about Bible study, this program will save you valuable hours.

QuickVerse is straightforward and easy to use. The onscreen displays are uncluttered and easy to read. The documentation, while not elaborate, is complete. And the program works well even without a hard drive, although you'll probably tire of swapping disks.

The *QuickVerse* main screen consists of two sections. The verse window, which occupies most of the screen, displays scripture text. To make reading easier, verses are single-spaced on the screen with a double space inserted between them.



Flexible search functions make *QuickVerse Bible Concordance* a valuable aid in Bible study.

Below the verse window are listed the various browsing keys, along with brief descriptions of what they do. You use these keys to move through the Old and New Testaments. Pressing the Home key, for example, takes you to the start of the current book or, if you're already there, to the first verse of the previous book. Pressing the End key takes you to the start of the next book. PgUp and PgDn keys serve similar functions at the chapter level.

Oddly, *QuickVerse* abandons the up/down pattern at the verse level, which takes some getting used to. To move to the previous verse, you press the left-arrow key; the right arrow takes you to the next verse.

Onscreen Bible browsing is fun, but *QuickVerse*'s real power lies in its versatile search mode. As its name suggests, the program is verse-oriented and searches text verse by verse. During the search process, the screen displays either the number of occurrences to be displayed (in the case of unlimited word searches) or the percent of possible matches that have already been scanned (in the case of limited word or phrase searches).

The Search feature lets you locate words or phrases in two different ways: Choose from a pop-up word list (the list includes virtually every word in the Bible, excluding only common words such as *the* and *and*); or, if you already know the word or phrase you're looking for, simply type it in and *QuickVerse* will display every occurrence. All searches stop at verse boundaries. If you try to search for a phrase that crosses verse boundaries, the program won't

find it.

If you want to find related but different words—for example, *baptise* and *baptiseth* and *baptist*—you can use the program's wildcard feature. In this case, you could type *bapti** and the program will find all occurrences of the three examples. The wildcard does not function at the beginning or in the middle of words, however.

QuickVerse ignores capitalization during searches, and it also disregards punctuation—a mixed blessing. Apostrophes, for example, are treated as spaces. Thus, *QuickVerse* considers a word like *Aaron's* as two words: *Aaron* and *s*. Use the wildcard feature to search for the possessive form.

By using the Limits feature on the Search menu, you can narrow the scope of your search to specific books and even to specified groups of verses within a particular book.

QuickVerse also lets you call up particular references. Select Reference from the Search menu; then type in the reference, identifying the book, chapter, and verse that you want to find.

Whether searching or recalling, *QuickVerse* lives up to its name with a fast response time. Running on an IBM PS/2 Model 30, for example, it located *And I saw a new heaven and a new earth* (from Revelation, the last book of the New Testament) in under ten seconds—much faster than I could have found it by paging through a traditional concordance.

If *QuickVerse* did nothing but search and recall, it would be an invaluable aid to Bible study. But it goes even further. The program also provides tremendous versatility in printing verses. You can print the most recently displayed verse, print all verses matching your search criteria, or print lengthy passages. You can even specify that words appearing in the Bible in italics be printed in italics on your printer. You can also save verses in file form for use in your own word processor program.

Overall, the only things missing from *QuickVerse* are luxuries. A note-taking feature would let users add and save comments on various passages. Serious students would appreciate having access to the Apocrypha. And users at all levels might benefit from the inclusion of screen drawings in the documentation—nothing brings a story to life quite like pictures.

But the absence of those features is a small price to pay for a Bible study aid with this kind of grass-roots flexibility. The realm of Bible concordances has gained a valuable ally: a complete,

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— Steve Hudson

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Zany Golf

Forget about *Jack Nicholas' Greatest 18 Holes of Major Championship Golf*.

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But *Zany Golf* has all this and more. This isn't your by-the-book PGA golf game or your standard kick-off-your-shoes Putt-Putt course. This golf game leaves reality behind for a walk on the wild side. It's a game you might dream about after eating one pepperoni pizza too many.

Zany Golf is modeled after miniature golf. From one to four players compete on a nine-hole course of increasing difficulty. Like real golf, players take turns hitting. Unlike real golf, you're eliminated when you run out of strokes, while the other players continue. You're given a certain number of strokes for each hole, and any leftover strokes carry over to the next hole. If you're playing by yourself, you can play as all four players to give yourself a better chance of making it to the ninth hole.

The first hole, the Windmill, features a ramp that leads to a turning windmill and a tunnel that carries the ball to a lower level. If that hole whets your appetite, and if you like junk food, you'll love the second hole, Hamburger. It features a giant bottle of catsup and a giant jumping hamburger that bounces over the hole. You can make the hamburger jump faster and higher—giving

you a clearer shot at the hole—by clicking the mouse button (or the joystick button or keyboard equivalent).

Timing is also important on Walls, the third hole, with its three walls that rise and fall. Try to roll over the first two walls and bounce off the third.



Getting your ball past a bouncing burger is a real challenge in *Zany Golf*.

On the fourth hole, Pin Ball, your golf ball becomes the silver ball in a giant pinball machine. Watch out that you don't tilt the machine by repeatedly clicking the mouse. (I may be missing something, but success on this hole seems to be more dependent on chance than on skill.)

Once you have the hang of the fifth hole, Fans, you can usually breeze your way to a hole in one. And breeze is exactly what you do, using a series of fans to push your ball along. By wiggling the mouse, you can increase the air flow from the fans.

On the sixth hole, Magic Carpet, you try to keep your ball on the checkered carpet. As long as the ball is on the carpet and still in motion, you can steer it. You also have to cope with railings that rise and fall—so time your moves carefully.

Castle, the seventh hole, has a steep hill with a castle at the top. You receive a free stroke for entering the castle gate. (Here's a tip: Pull all the way back and shoot directly along the line of the red arrow and red spot.)

You may become a bit antsy at the eighth hole. This is the hole that moves as your ball approaches it. Fortunately, Ant Hill is designed as a steep hill with eight sides—and seven of them have bumpers that can hit the ball back up the hill. Click the mouse button to activate the bumpers. If you're careful as you hit the ball back and forth, you have a good chance of eventually hitting the ball in.

You need a lot of energy and extra strokes for the ninth and final hole, Energy. It looks like a futuristic Dr. Frankenstein laboratory and is by far the most difficult of the nine holes. You're

on the lowest level, and you must somehow reach the hole on the third level. Along the way, you encounter laser beams, transporter devices, and false holes.

Overall, *Zany Golf*'s graphics and sound are excellent (especially on the Amiga and Apple IIGS versions), but the game may be too easy for hard-core game fans. Once you work your way to the ninth hole—which isn't that difficult—you lose much of the incentive to play again. (The documentation does promise a special reward if you finish all nine holes in par or better.)

If you're looking for a moderately challenging game with topnotch graphics and sound, *Zany Golf* may have just the hook (or slice) you're looking for.

—David English

Zany Golf

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CheckFree

Few of us enjoy writing checks, licking stamps, tracking a budget, and balancing our checkbook. So *CheckFree*, a program designed to support Check-Free Technologies' electronic bill-paying service, sounds like the best thing since the automatic teller machine. Finally, the end to drudgery.

Automatic teller machines aside, personal electronic banking is largely unexplored. You have to know exactly what you're doing before you start zipping payments and zapping your bank book. *CheckFree*'s 90-page manual is filled with the what, how, and why of electronic banking, and includes plenty of warning notes to reinforce important program reminders.

The software works smoothly. It's simple and requires few command keys. If you get into a jam, pressing Escape will get you out of it. Use Return to save entries; F1 brings up meaty help screens.

CheckFree's workhorse menu is Schedule Payments; it pays all bills except taxes and court-directed payments. But before you transmit your first

check, you must compile a merchants list. This list includes the payee's name and address, your account number (if applicable), and a description of the bill (fixed amount/recurring or variable amount/recurring). Submenus let you initiate, change, or cancel payments, and add, change, or delete merchants.



Make check writing easier by sending payments over the wire with *CheckFree*.

You'll only need to set up fixed amount/recurring bills once. Unfortunately, the program doesn't display the amount paid for fixed/recurring bills. If you'd like to keep track of your payments yourself, you could define your payments as variable amount/recurring. That way, you're forced to enter the amount each month.

Once you've compiled your merchants list, you're ready to pay some bills. Scroll down the list of merchants, highlight the one you want to pay, and press Return; a check form appears on the screen. Type in the date and the amount, and your check is ready to transmit to the CheckFree processing center. It, in turn, debits your account and credits the merchant's account. If your merchant doesn't accept electronic payments, the CheckFree center prints and mails a paper check.

CheckFree has several controls. If you date the payment less than three days from the payment due date, for example, the program warns you that it needs three business days to pay a bill. (You'll have to change the date to proceed.) Another control lets you cancel a payment without erasing information on the merchants list. The program even verifies zip codes.

You can sort your payments into 24 categories, but you can't break credit-card payments into subcategories; such a feature would be handy for home businesses.

A second menu, Review/Balance Register, tracks payments and deposits. All payments are automatically recorded in *CheckFree*'s register; you can also record handwritten checks. The Review/Balance Register reconciles your com-

puter checkbook with your bank statement and maintains a current bank balance.

The Budget and Reports menu produces five reports detailing your income and expenses. The most descriptive is the Annual Report, which prints a month-by-month listing of payments sorted by category. Such a listing can help at tax time or when you're trying to convince a banker to lend you money.

CheckFree Technologies charges \$9 per month for 20 transactions. If you have more than that, you're billed \$3 for every 10 (or part of 10) over the standard 20. Compared with the cost of postage, envelopes, and your time, that price just about evens out. However, CheckFree does charge \$15 on returns for insufficient funds. Add that to your bank's charges and you can get into some heavy money for bouncing a check. Other charges include \$10 for a stop-payment order; \$3 for paper receipts, records, and statements (per copy); and \$2 for unaccepted payments.

You can cancel your CheckFree service with a written ten-day notice; the company can cancel at any time. Also, CheckFree can assign its responsi-

bilities to independent contractors or other third parties; if security is of paramount concern, you might not like that idea.

Overall, *CheckFree* earns high marks for its ease of use and simplicity of design. The idea of personal electronic banking—though still a new, unexplored prospect for most home computer users—gains ground with the help of this package and the service behind it. The phrase *The check is in the mail* is headed for history.

— Glenda McClure

CheckFree

For . . .
IBM PC and compatibles with MS-DOS 2.1 or later, Hayes-compatible modem, and two floppy disk drives or a hard disk—\$29.95

From . . .
CheckFree Technologies
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(614) 898-6000

And . . .
The CheckFree software package is also available at Radio Shack stores.

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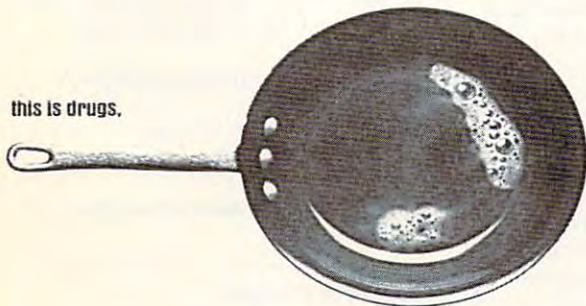
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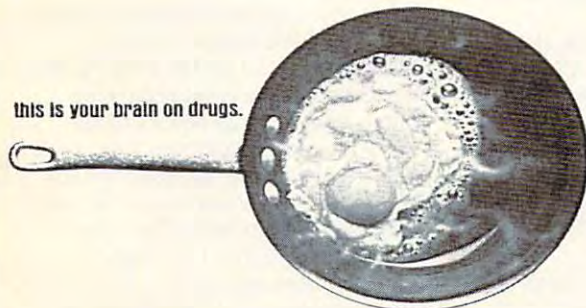
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Antic: "Impressive and amazingly complete. Information packed manual."

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Cardiac Arrest! is almost as fun to use as it is educational. There are varying degrees of difficulty, with over 45 patients—and none is ever the same twice. You can actually go "beyond ACLS" with hypothermia, hypocalcemia, hyperkalemia, and more. Yet the manual is so complete and well-organized that non-medical people use the simulator to "play doctor."

Our other medical teaching software is excellent, and priced within reach of those who need to use it.

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Dandy Tandy

Tandy's 4000 SX personal computer is based on the 16-MHz Intel 386SX microprocessor. The computer supports VGA and features SmartDrive intelligent-device electronics storage technology, which allows users to connect hard drives with integrated AT-type controllers directly into the system.

Users can access 8086- and 80286-based applications as well as 386-based software that takes advantage of 386 architecture. The standard configuration includes one 3½-inch, 1.44-megabyte floppy disk drive and three additional device slots. Other standard features include a socket for an optional 16-MHz 387SX math coprocessor, four 16-bit expansion slots, VGA graphics, 200-watt power supply, 101-key enhanced keyboard with tactile feedback, keylock, asynchronous serial port, and a bidirectional parallel port to support scanning devices in a desktop publishing environment.

One megabyte of RAM is standard. Two memory slots can support up to 16 megabytes of system memory. In addition to the smaller disk size, users can install a 5¼-inch, 1.2-megabyte floppy disk drive. Tandy also offers SCSI devices in capacities from 40 megabytes to 344 megabytes and a 150-megabyte tape drive system.

The suggested retail price of the base system without a hard drive is \$2,599. A 40-megabyte hard drive boosts the price to \$3,248, while the 80-megabyte system retails for \$3,498.

Tandy, 1800 One Tandy Center,
Fort Worth, TX 76102
Circle Reader Service Number 200.

Taito for the PC

Two popular Taito arcade games that have been released for the IBM PC, *Renegade* and *Sky Shark*, support AdLib's 11-voice and Tandy's 3-voice synthesized sound.

Based on the coin-op arcade game, *Renegade* offers players fast-paced kara-



The Tandy 4000 SX supports VGA graphics and uses a 386 chip.

te action set in urban areas such as an inner-city subway platform, old shipping piers, and seedy city streets. In each situation, players must fend off a gang of thugs and defeat the gang's leader to move on to the next level of play. Players can use the keyboard or joystick to control the action.

In *Sky Shark*, players pilot a World War II-era Tiger Shark while trying to rescue prisoners of war held behind enemy lines. Flying over a vertically scrolling landscape, players encounter tanks, fortified artillery bunkers, flying bandits, and battleships. This game is also based on a coin-op arcade hit and can be controlled by keyboard, joystick, or mouse.

Both games require 512K (640K on the Tandy 1000 TX and TL for Tandy 16-color display). *Renegade* and *Sky Shark* also support Hercules monochrome, CGA, EGA, and VGA graphics. Available on 3½- and 5¼-inch disks, each game is priced at \$34.95 for a single-disk format and \$37.95 for a dual pack.

Taito Software, 267 W. Esplanade,
Suite 206, North Vancouver, B.C., Canada V7M 1A5

Circle Reader Service Number 201.

Mickey McLean

Amiga Meets Mac

ReadySoft's A-Max, a hardware/software combination, allows an Amiga to run most Macintosh productivity software. All that users need to supply is a Macintosh 64K or 128K ROM. Once the ROM has been installed, Macintosh software runs at full Mac speed on the Amiga.

The A-Max cartridge plugs into the Amiga's external disk drive port and has connectors for an Apple 800K external drive and additional Amiga drives. If an Apple external drive is not connected, the transfer software included with the package allows users to convert Mac disks to A-Max format which can then be used with standard Amiga drives.

A-Max, compatible with all Amigas, supports the Amiga's keyboard, mouse, disk drives, RAM expanders, and parallel and serial ports. Compatible Macintosh programs include *HyperCard*, *Excel*, *Word*, *MacPaint*, and *MacTerminal*.

The suggested retail price for A-Max is \$199.95.

ReadySoft, 30 Wertheim Ct., Unit 2,
Richmond Hill, Ont., Canada L4B 1B9
Circle Reader Service Number 202.

Fly with Chuck

Take to the skies with Electronic Arts' updated *Chuck Yeager's Advanced Flight Trainer 2.0* for the IBM PC and compatibles. The latest version includes more than 20 new features. You'll also get an audiocassette by Chuck Yeager on which he shares several of his heroic flying experiences and offers personal instructions on how you should attempt your first flight.

Enhancements include new terrain, EGA graphics and a full VGA analog palette, four new planes (including the Space Shuttle and the YF-117A Stealth Fighter), and six new race courses.

The game also features Yeager's Six Day Flight School, with onscreen help that lets you advance from funda-

 www.commodore.ca

mental maneuvers to aerobatic stunts like aileron rolls and hammerhead turns. Yeager himself shows you where to set the yoke, rudder, and throttle.



Fly 18 different aircraft in Chuck Yeager's *Advanced Flight Trainer 2.0*.

Advanced Flight Trainer 2.0 has a suggested retail price of \$49.95. A combination pack with both 5¼- and 3½-inch disks is \$54.95. Upgrades from previous versions cost \$24.00.

Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404

Circle Reader Service Number 203.

Super Young Authors

Students in grades 6–12 can use Scholastic's *Super Story Tree* to author their own interactive stories. The program helps students write stories that start at one point and branch out to different plot lines while incorporating graphics, sound, and special effects.

The program comes with a library of sounds, a collection of clip art and graphics, a selection of fonts, drawing tools for creating original art, and special-effects transitions such as dissolves and wipes.

Features include a word processor and the ability to run story disks on a compatible computer without the program disk. A scan feature enables handicapped students to operate the program by pressing the space bar or clicking the mouse when the desired option is highlighted.

Available in 5¼- or 3½-inch disks, *Super Story Tree* runs on all Apple II computers, including the Apple IIGs. A school edition package includes a program disk with backup, a second disk with graphics, backgrounds, and clip art, and a Teaching Guide. Educators can purchase the package for \$79.95. Lab Packs and an AppleTalk version

will be available this fall.

The home edition, with program, graphics, background, and clip-art disks and a User's Guide, also lists for \$79.95. A version for the IBM PC and compatibles is scheduled for release during the winter of 1990.

Scholastic, P.O. Box 7501, 2931 E. McCarty St., Jefferson City, MO 65102
Circle Reader Service Number 204.

Don't Get Burned

Miles Computing has released *The Magic Candle* (\$39.95), a medieval fantasy role-playing game designed and published by Mindcraft and distributed by Electronic Arts.

Your goal is to save the land of Deruvia from the wrath of the archdemon Dreax, who has been imprisoned within the flame of the magic candle for many years. You must stop the candle from melting before Dreax escapes and wreaks havoc on the peaceful land of Deruvia. During your adventure in Deruvia, you'll encounter elves, dwarves, goblins, wizards, and any one of 26 types of monsters. To defend yourself, you have special skills such as sword swinging, fireball throwing, and spell casting. There are 54 levels of dungeons, six towns, six villages, and two castles to explore. To assist you on your quest, you can assemble a team of 25 characters.

The Magic Candle is available for the Apple II series and the IBM PC and compatibles at a suggested retail price of \$49.95. The Commodore 64 version sells for \$39.95.

Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404

Circle Reader Service Number 205.

Print to Go

Toshiba America's portable ExpressWriter301 provides 24-dot, letter-quality printing and weighs only four pounds. The printer uses a thermal-transfer process on plain paper.

The ExpressWriter301 has five resident fonts and prints at 60 characters per second (cps) in high-speed mode and 42 cps in normal mode. Included with the unit are built-in rechargeable ni-cad batteries and a separate 12-volt AC adapter for recharging. The batteries are good for up to one hour of continuous printing. A low-battery indicator light is positioned on the control panel. The printer accepts paper sizes

from 4 to 8½ inches wide. It uses a black, snap-in ribbon. Paper guides are built in.

Toshiba/Qume and Epson LQ Series emulations are standard, making the printer compatible with almost all software packages. The ExpressWriter301 has a suggested retail price of \$489.

Toshiba America, Information Systems Division, 9740 Irvine Blvd., Irvine, CA 92718

Circle Reader Service Number 206.



The Toshiba ExpressWriter301 portable printer weighs only four pounds.

Bank Street Data

Sunburst Communications recently released *Our Town Databases* for *Bank Street School Filer* and has announced plans for a new database disk-exchange program for students.

Our Town contains starter databases that focus on the theme of community. Students can research and explore their town's history, buildings, plant and animal life, and important people, places, and events; then they can fill in database records with their findings.

Designed for students in grades 4–12, the databases allow students to analyze such issues as the impact of the environment on plants and animals in their town and the steps that make up the local food chain—from point of origin to the grocery store. A complete six-unit curriculum is included in the Teacher's Guide.

After students have finished entering data about their own town, they can take part in the *Our Town Database Exchange*, which allows students to compare and contrast their own com-

munities with other towns and cities in the United States and Canada.

Our Town Databases is available for the Apple II and the Commodore 64/128 and has a suggested retail price of \$59.

Sunburst Communications, 39 Washington Ave., Pleasantville, NY 10570

Circle Reader Service Number 207.

Ahoy, Ye ST Mates

Pirates!, the role-playing adventure game from MicroProse, comes to the Atari ST.

Sail over the Spanish Main in the seventeenth century, filling the role of novice seaman with one ship and a small crew. You can increase your wealth and status through bartering and shrewd moves that lead to more ships and more men. During gameplay, players can raid peaceful sailing vessels, search for buried treasure, and battle various swashbucklers and ship captains. Visit more than 50 islands and nations; try your hand at nine different sailing vessels. If you like, you can lead historically documented expeditions like those of Sir Francis Drake and Henry Morgan.

The Atari ST version of *Pirates!* makes use of the machine's two-button mouse and supports the MIDI board. It requires 512K of RAM and a color monitor. At press time, MicroProse had set the suggested retail price tentatively at \$44.95.

MicroProse, 180 Lakefront Dr., Hunt Valley, MD 21030

Circle Reader Service Number 208.

ZIP It, ZIP It Good

A new computer ZIP code database with related programs has been released by Melissa Data for IBM PCs and compatibles. *PC-ZIP* lets users access up-to-date Post Office-approved ZIP codes and city, state, and county names for all ZIP code zones currently in use in the United States. In addition, it provides the time zone, telephone area code, and latitude and longitude for each ZIP code.

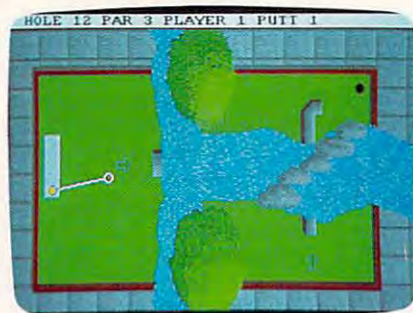
PC-ZIP comes with three associated programs that perform several data-retrieval tasks. *EZIP*, a name-and-address entry program, allows users to verify ZIP codes. For localized mailings, *RZIP* can find all ZIP codes with-

in a radius of 1-999 miles from a specified point. The third program, *QZIP*, is a memory-resident program that allows users to find the area code, time zone, and county name for a ZIP or find the ZIP code of any city or town nationwide.

The main database contains over 90,000 ZIP code records. It is in *dBase III* format and can be used with custom applications. The database is updated twice a year. The suggested retail price for *PC-ZIP* is \$99.

Melissa Data, 32118-8A Paseo Adelanto, San Juan Capistrano, CA 92675

Circle Reader Service Number 209.



Choose from five wacky courses in the bizarre *Hole-in-One Miniature Golf*.

Financial Manager

Brøderbund Software's personal finance program *On Balance* has been released for IBM PC and compatible computers. The program had been available previously for the Apple II series only.

The program's information screen is designed to look and work like a checkbook register. Up to 200 different accounts can be created including checking, savings, credit cards, auto loans, and mortgages. Tax-related expenditures can be flagged for recall and reporting at tax time. Each month, users can enter up to 800 different transactions. The program can reconcile any type of account, allowing users to track their overall financial position. In addition to recordkeeping and bill paying, *On Balance* acts as a financial-planning tool, allowing users to set goals and budgets. With each entry, the program shows how close users are to meeting their goals and displays year-to-date totals and averages for each budget created.

The program also reports net worth and net income; reminds users of recurring transactions such as car payments; creates amortization tables for loans, savings accounts, and annuities; and can print checks.

On Balance for the IBM PC is compatible with *Lotus 1-2-3*, providing spreadsheet capabilities. The suggested retail price is \$59.95.

Brøderbund Software, 17 Paul Dr., San Rafael, CA 94903-2101

Circle Reader Service Number 210.

PC Putter

DigiTek Software has released *Hole-in-One Miniature Golf* for the IBM PC and compatibles and the IBM PS/2. The game features courses that range from traditional miniature golf holes to bizarre tests of putting skills.

One to four players can compete on any of five courses. Holes include the classic windmill and even the interior of a pinball machine.

The game supports mouse, joystick, and keyboard controls. The package comes with either five 5¼- or two 3½-inch disks. *Hole-in-One Miniature Golf* supports EGA, CGA, VGA/MCGA, Tandy 16-color, and Hercules graphic modes. The suggested retail price is \$34.95.

DigiTek Software, 8910 N. Dale Mabry Executive Center, Suite #37, Tampa, FL 33614

Circle Reader Service Number 211.

Indoor/Outdoor Soccer

Commodore 64 owners can bring the World Cup Tournament home or turn the rec room into an indoor soccer arena with Medalist International's *Keith Van Eron's Pro Soccer*. The game was produced in cooperation with Keith Van Eron, famous indoor and outdoor goalkeeper.

Players follow the action from an overhead point of view with vertical and horizontal scrolling that ensures that the ball and players never leave the screen. A slow-motion instant replay appears after a goal is scored.

The indoor soccer mode lets players play an entire Major Indoor Soccer League (MISL) schedule. The outdoor mode lets players set up their own World Cup Tournament. Up to 16 people can participate in the World Cup

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scenario, each controlling a different team from a different country in games that are subject to all kinds of weather.

Pro Soccer retails for \$34.95 and is being marketed under Medalist International's MicroPlay Software label. Medalist International is distributed by MicroProse.

Medalist International/Micro-Prose, 180 Lakefront Dr., Hunt Valley, MD 21030

Circle Reader Service Number 212.

Novel Approach

Infocom has released *James Clavell's Shogun* for the Macintosh and Amiga. The player assumes the role of John Blackthorne, the lead character in Clavell's novel, who as a sea pilot from sixteenth century England embarks upon an uncharted route to Japan.

Upon reaching his destination, he finds himself in the midst of a power struggle between two Japanese regents who aspire to be Shogun. During the

conflict, Blackthorne befriends one of the regents, Toranaga, and falls in love with Mariko, the court translator. To succeed, the player must think and make decisions as Blackthorne would have done.

The Macintosh and Amiga versions each have a suggested retail price of \$59.95. Versions for the Apple II and the IBM PC and compatibles will be released later this year.

Infocom, 125 CambridgePark Dr., Cambridge, MA 02140

Circle Reader Service Number 213.

Sound Advice

Electronic Arts has released *Instant Synthesizer*, a combination four-voice polysynthesizer, sound digitizer, and sound editor for the Apple IIGS. Musicians can use the program to create music and experiment with new instruments as well as expand the number of instruments in programs such as *Instant Music*.

Computer musicians can adjust the vibrato depth, speed, and attack rate or graphically edit the attack, sustain, and release envelope of any instrument. *Instant Synthesizer* includes preprogrammed sounds that can be used right away.

Sound sampling cards such as Future Sound and MDIdeas are supported by the program. Live sounds can be captured and users can graphically edit the waveform. Users can also adjust the attenuation, cut parts of the wave, loop segments, and find loop points automatically.

The computer's keyboard can be used to play sounds or users can add a MIDI connector to work with any MIDI device. Sounds can also be created with the program and be played on an external keyboard.

Instant Synthesizer has a suggested retail price of \$79.95.

Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404

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continued from page 80

Toby Labs has verified that any machine capable of sustaining three and a half minutes of the hokey pokey administered with hard-soled Buster Browns is suitable for supporting the weight of virtually any multiple-page display on the market.

2. Forget about keyboards with capacitive rubber-dome technology. Toby Labs has determined that it only takes an average of eight hammer blows from a Gravis or Wico joystick to put one out of commission. Contrary to commonly held wisdom, grape Kool-Aid makes an excellent solvent for quieting noisy key-action. Fun Fruits make an excellent short-term insulating adhesive.

3. Another area that has yielded surprising results is our tests of storage-media effectiveness. Toby Labs has painstakingly documented the fact that the actual capacity of popular data storage devices cannot be discerned by the manufacturer's specifications or raw formatted or unformatted capacity. Toby Labs' tests have revealed that full-height 5¼-inch floppy disk drives can be stuffed with almost five times as many of my business cards as so-called "high-density" 3½-inch drives.

[Interesting side note: The U.S. Air Force has made discreet inquiries into the research that Toby Labs has conducted on the aerodynamics and radar profiles of floppy disks traveling at low angles of attack. Preliminary data indicates that stealth fighter and bomber aircraft constructed of the same black polycarbonate as that used for disk sheathing would be virtually undetectable by adult Homo sapiens.]

Toby's job performance in the hardware arena has been so exemplary that I've expanded his responsibilities to include acting as my liaison with public relations flacks who provide the equipment we're evaluating. When one calls, I hand the phone to him; he listens to their gibberish with rapt attention, responds with some staccato gobbledegook of his own, cheerily screams "BYE BYE," and hangs up. He must be doing a great job—his lunch schedule is booked solid for a month.

And now for something completely different. . . .

I normally don't quote chapter and verse, but since the Byrds got away with

quoting Ecclesiastes back in the early sixties, I suppose I can, too. Namely: *To everything there is a season and a time for every purpose under heaven.* The seasons around us ebb and flow; operating systems, computer manufacturers, and computer columns come and go. This is the last installment of "Levitations."

I'd like to thank the *COMPUTE!* readers who took the time to write to me over the years, on paper and via E-mail. If I think about it long enough, I might even get wistful about some of the more rabid letters from Atari ST owners, who by now should be so used to being picked on that their sense of humor has returned. Special recognition is due the entire editorial staff of *COMPUTE!* for their unflagging support and patience, even when this column was

***Tests reveal that full-height
5¼-inch floppy disk drives
can be stuffed with almost
five times as many business
cards as so-called "high-
density" 3½-inch drives.***

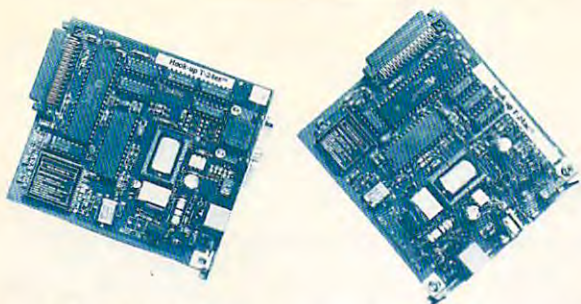
consistently more overdue than release 3.0 of Lotus 1-2-3. Mega-kudos go to editor Gregg Keizer for the free license he granted me to track mud across many a sacred cow's new white carpeting. Gregg has spent untold hours on the phone with me, coaxing, cajoling, and pleading for late copy.

Under occasionally adult supervision, we managed to light a few matches here. Just remember that there are some covers that should never be closed before striking.

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PeopleLink: ARLANL
CompuServe: 70675.463
Genie: XMG15546
DELPHI: ARLANL
Prodigy: KTND12A



new products!



The Hook-Up T-24ac and T-24es modems come with communications software and work with Toshiba laptops.

Calling All Toshiba Laptops

Computer Peripherals has extended its line of Hook-Up telecommunications packages with the introduction of two new modems designed to be used in Toshiba laptop computers.

The Hook-Up T-24ac and Hook-Up T-24es internal modems offer 1200- and 2400-bits-per-second communications speeds and Hayes command-set compatibility for the Toshiba Laptop models T-1100+, T-1200, T-3100, and T-5100. Features include an added eight-pin connector for acoustic-coupler operation on the Hook-Up T-24ac, and an extra serial port on the Hook-Up T-24es.

Telecommunications software comes bundled with the modems. The T-24ac retails for \$349, while the T-24es sells for \$399.

Computer Peripherals, 667 Rancho Conejo Blvd., Newbury Park, CA 91320

Circle Reader Service Number 215.

Mac Music Librarian

Audio Cassette Labeler from Baudville provides music enthusiasts with a way to organize their cassette tape library on their Macintosh.

The program allows the user to enter the artist, title, company, recording year, and as many as 12 songs per cassette side. The source and type of noise-reduction information can also be included. The print preview allows users to see the entire output before printing.

Several databases can be maintained, allowing recordings to be filed by music type and recalled by artist or title.

The suggested retail price of *Audio Cassette Labeler* is \$49.95.

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New Amiga Courses

Access has released *Famous Courses of the World, Volume 1* to be used with the Amiga version of the golf simulation *World Class Leaderboard*.

The supplemental disk contains four new golf courses and an improved course architect, which includes a greater variety of tree selections and improved design features.

The new courses include Harbour Town in Hilton Head, South Carolina; Sunningdale in England; Dorado Beach in Puerto Rico; and Pine Ridge, a fictional course designed by Access.

Famous Courses of the World features a scorecard print-out, top view, and the ability to save the game at any point during a round. The disk retails for \$19.95 and must be played with the original *World Class Leaderboard*.

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ARLAN LEVITAN

We're all familiar with the extensive test reports of computer equipment that appear in magazines. Most of you doubtless have visions of pristine laboratories with endless rows of tidy test benches where the latest computer hardware from scores of manufacturers are carefully put through their paces. Bespectacled technicians garbed in starched white lab coats walk the aisles in a carefully preprogrammed waltz, occasionally glancing at the face of digital oscilloscopes and checking off the results on their clipboards.

The fate of many a computer lies in the balance. A negative review from a prominent publication can send a manufacturer's entire inventory tumbling into the blowout bins of discount liquidators. The results of such testing provide information that may be valuable for those who plan on doing their computing in a sterile lab environment, but it often consistently ignores the special needs of the home user.

Over the past few years I've done a lot of computer hardware testing and reviews for a popular consumer-oriented publication. While I do some of the analysis in an office environment, there are valuable insights to be gained from conducting the inquisition at home.

How many fledgling in-home desktop publishers have happily wheeled home Macintoshes and powered up their new system, only to discover that running their new Apple LaserWriter and air conditioner at the same time trips every circuit breaker in the house? Are you one of those who innocently purchased a computer certified as FCC Class A (business-office environment) for home use? No doubt your neighbors are grateful for the educational content your equipment has added (at no charge to them) to their regular television viewing. I've received several reports that in such cases Vanna White's dental work makes a perfect backdrop for viewing spreadsheets.

Unfortunately, home testing tends to put a cramp in my personal computing style. Even the most pleasant Federal Express delivery person, accustomed to handling nice lightweight envelopes, starts to grumble and mutter after a month of hauling 50-pound computers to and from my office and home. My 10 x 12 foot computing hovel (call it a home office and I'll gag you with an IC extractor) is normally cramped enough, what with the three systems that inhabit it. During the crunch period, like when I'm trying to wrap up a computer buying

guide, things get way out of hand. Throw in another three or four computer systems, add a liberal dose of expansion boards and other accessories, and things get so tight that even my optical mice have round . . . uh, feet. Yeah, round feet.

Most of my writing and hardware experiments take place in the dead of night, and up until recently my kids' sleep patterns and my work habits have meshed well. My daughter, Mira, has never been a problem. Aside from the occasional OS/2 nightmare (Daddy, will we *really* have to use the Presentation Manager someday?), she's normally out for the count once she hits the sack. I have no doubt that she's one of the few persons in the world who could sleep through a Steve Jobs product rollout.

My son, Toby, is another matter altogether. For two and a half years, he lulled me into thinking he would be just like his sister. But back in late March, Toby woke up around midnight and was delighted to find that Daddy was still up and "playing" in the computer room. Almost every night since then, Toby's internal alarm clock kicks him out of bed, full of energy and ready to play untold hours of *Reader Rabbit*. I stood firm in my resolve that the only option was "back to bed" until it dawned on me that I was spending more time trying to get Toby to go to sleep than I was writing. Two hours of hand-to-hand combat with a two-year-old leaves one in no mood to knock off a couple of test reports.

After a month of fighting the good fight, I found myself at a juncture familiar to many experienced computer *Adventure* players: at Witt's End, facing an angry little dwarf brandishing a sharp dagger (OK, so it's only some Lego blocks, but it looks dangerous under the poor lighting in my squalid closet). In a moment of inspired derangement, it occurred to me that Toby's excessive energy and special talents could be incorporated into my computer hardware test suite. Moral: If you can't beat 'em, hire 'em as consultants.

Toby's unique hardware evaluation methods and efforts have produced remarkable results which would otherwise go completely unreported. Following are just a few of the trailblazing findings of the intrepid Toby Labs tester.

1. The increasing popularity of heavy, large-screen monitors has made the structural integrity of a computer system's case much more important than in years past.

continued on page 78

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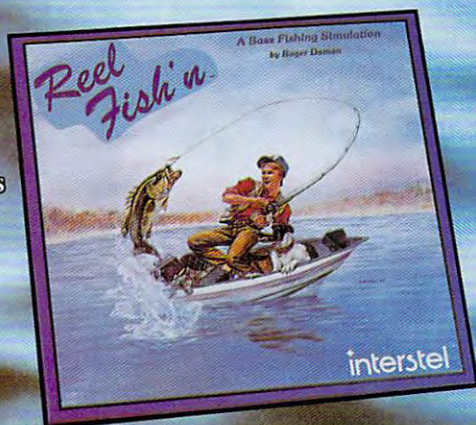
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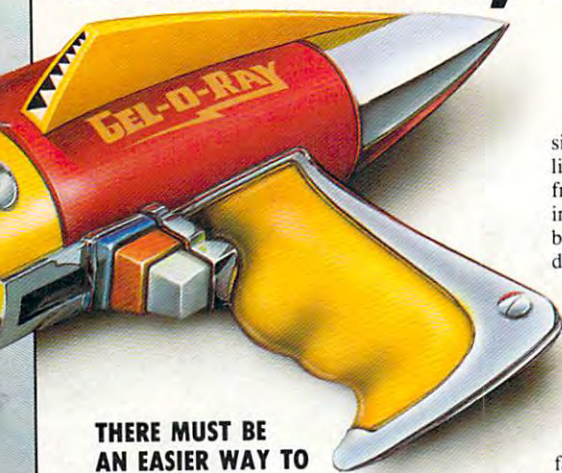
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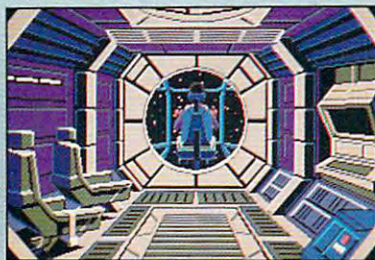
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LIFE'S NOT EASY FOR HEROES

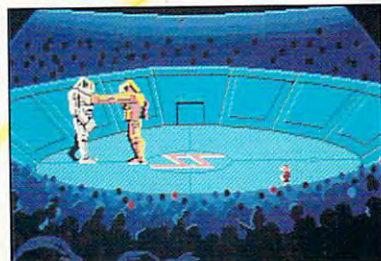
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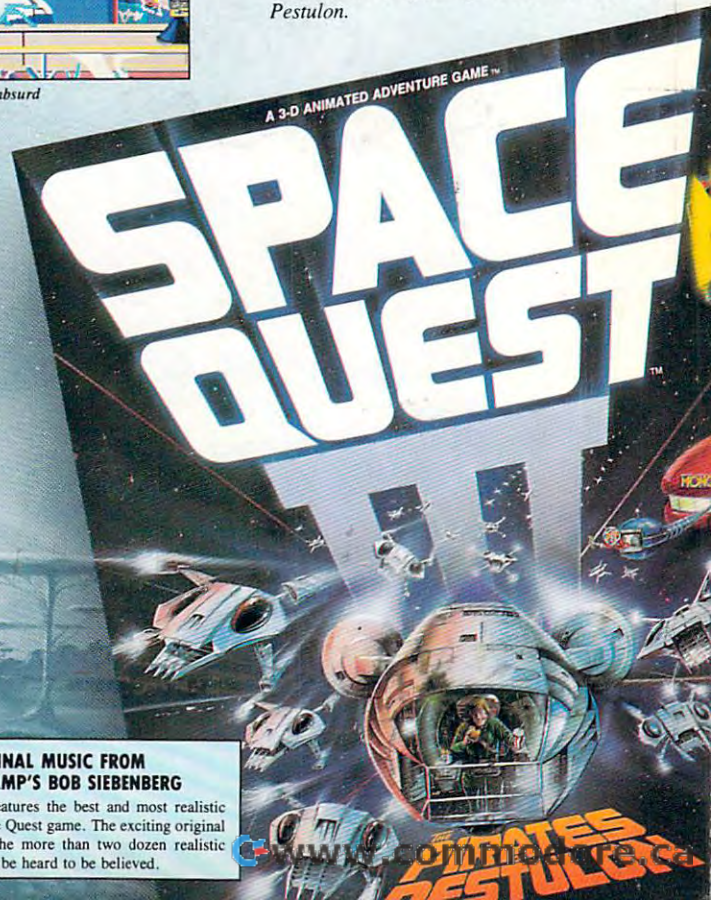
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