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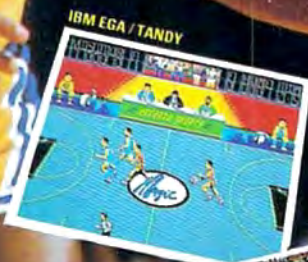


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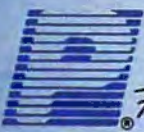


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COMPUTE!

JUNE
1989

VOLUME 11

NUMBER 6

ISSUE 109

The Leading Magazine
of Home, Educational, and
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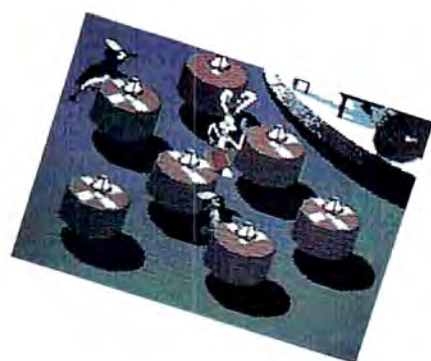
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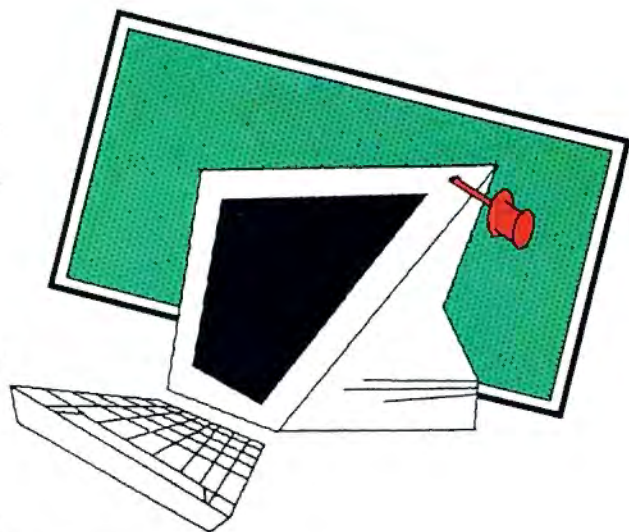
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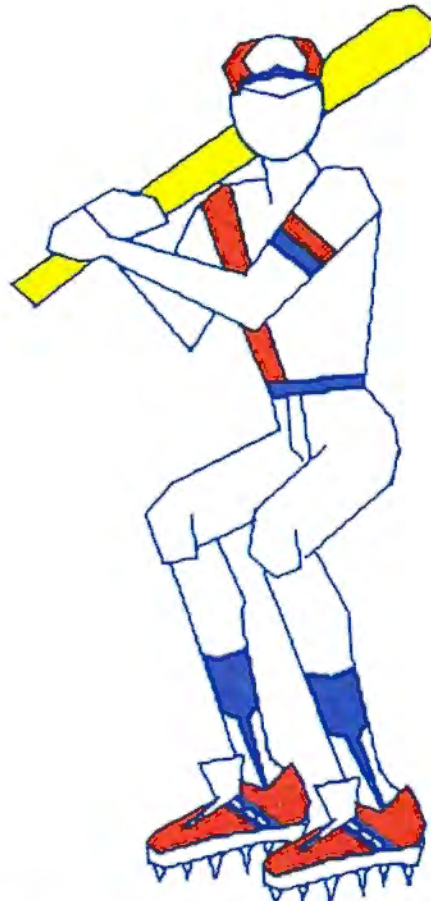
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**Science Fact,
Science
Fiction. I Love
Both, I Hate
Both. It Just
Depends on
Whether
There's a
Computer in
the Room.**

editorial license

GREGG KEIZER

Science fact, science fiction. That's what this issue is about. One I love deeply, the other I could do without.

I was the kid in science class who turned on the Bunsen burner and pointed the flame *across* the lab table. Charred notebook pages and some singed hair were the usual results. I refused to take biology in high school—not because of some open-mouthed respect for the rights of frogs, but because I thought lectures about the lymphatic system would be boring. Instead, I took chemistry my last year; a handful of seniors lorded it over a class composed of juniors who were science geeks from the get-go. Sometime in there we stuck an unfortunate junior under the emergency fire-dousing shower and pulled the chain: 30 gallons of water spilled over him and the classroom floor.

In college I made the mistake of taking an Honors class in something called *Practical Biology*. I should have read the course description a bit more carefully. I ended up in a class full of pre-med majors, people who were born with knives in their hands. And the class! We operated on dogs at an animal-research facility—simple operations at first, then more involved procedures. Everyone had to take turns playing head surgeon, or assistant surgeon, or nurse. There I was with a scalpel poised above a slowly breathing mongrel when I should have been in front of a typewriter in the journalism department. I was cured of science for good.

Science fiction, on the other hand, was something I took to like dark to the night. I went through every SF novel in my hometown library, then convinced my mother to let me use her card so that I could check out books from the adult section upstairs. Andre Norton, Robert Heinlein, Robert Silverberg, Isaac Asimov, Arthur C. Clarke, and hundreds of other writers filled my head with tales of strange worlds, strange ships, and even stranger beings. It was everything science wasn't—fresh, inviting, imaginative, creative, and most of all, lots and lots of fun.

So when I decided I wanted to write fiction, I knew it had to be science fiction. I wrote bad stuff, not-so-bad stuff, and, finally, good stuff that someone wanted to publish. Now I write strange stories about people who can't die, prisoners in an alien war, Hitler coming back from the dead. Stuff my mother takes a rain check on. (You must be doing something right when your mom can't fathom your stories.)

But there's no science in my science fic-

tion. A dash here, a splash there—just enough to get me by. Not the nuts-and-bolts kind of science fiction that writers like Gregory Benford or Larry Niven put out.

Yet when I look at the computer software for science and science fiction, I get the strangest feeling. I may have made a mistake somewhere. Science on a computer is cool. Cooler by far than science fiction.

As David Stanton points out in this issue's "Science!," science software lets you manipulate the universe. Pretend to experiment with chemicals too dangerous for any teenager to handle. Track a grizzly bear through the wilds. Peer into the body of a human or a frog. All these windows on the world are only possible because of the personal computer. The future of science-oriented simulations alone is staggering. Imagine splitting the atom, splicing genes, delving into the guts of a tornado—all from the safe side of a computer screen. Science software makes science come alive in ways I never dreamed of when I was mixing strange concoctions in an empty drawer during Chem class. If there had been personal computers and science software when I was growing up, I might be sitting in a lab now instead of pounding keys like this.

Science-fiction computer games, on the other hand, can't match the real thing. Orson Scott Card, in "Light-Years and Lasers," takes a look at 11 topnotch games and draws the same conclusion: SF games are often not good science fiction. There's no contest between a well-written, contemporary SF novel (*Great Sky River*, for instance, by Greg Benford) and a science-fiction computer game when it comes to plot, characterization, even originality. Rather, SF computer games work because, as Card says, they "do an excellent job of what only computer games can do." That means letting you participate in the science fiction, letting you in on the adventure to new worlds, new times. Yet for all its charm, science-fiction computer entertainment dulls me; the anticipation of the game is almost always better than the game itself. It's like the feeling I get watching reruns of "Mister Ed"—the show isn't nearly as funny as I remembered it from my eight-years-old days. If there had been personal computers and science-fiction software when I was a kid, I might be writing stories that my mother, heaven forbid, would actually read.

Science fiction. Science fact. I love both, I hate both. It just depends on whether there's a computer in the room. □

Now Hear This!

Fabulous Ad Lib synthesized sound is now available with your favorite entertainment software!

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The same Ad Lib Music Synthesizer Card that set the home computer music world on its ear just a year ago is now stepping out with some of the hottest entertainment software on PCs anywhere. So you get to experience a whole new dimension of thrills and excitement.

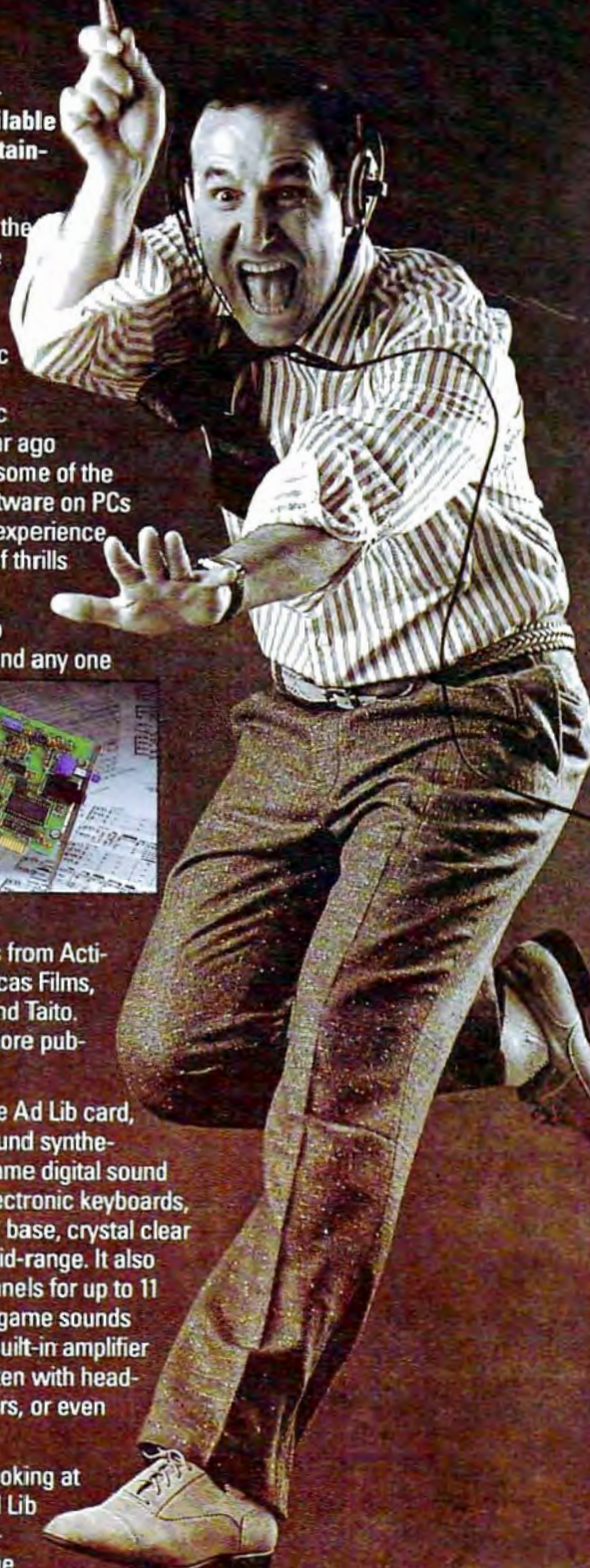
All it takes is the Ad Lib Music Synthesizer Card and any one of the

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Electronic Arts' 688 Attack Sub (top) and Space Quest III from Sierra (bottom).

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news & notes

Hello, Sports Fans!

Play ball! will be the call of Monday-morning quarterbacks and armchair baseball managers when they hook their personal computers into an electronic sports network sponsored by Washington-based Gannett, the publisher of *USA Today*, and Linc Networks of Greensboro, North Carolina.

Susan Bokern, director of sales and marketing at Gannett News Media, said the USA Today Sports Center service grew out of the sports department at *USA Today*, which wanted its own database both for research and for supplying Gannett's 88 other newspapers with sports information. "We saw that this was something we could offer to the public," she said.

Besides scores, stats, schedules, and spreads, sports fans can field Fantasy/Rotisserie-league teams for baseball, basketball, football, and hockey. A chat line and electronic mail keep players in touch with one another, and a special service that crunches your fantasy

team's stats is also available (\$40.00 per season per member, \$60.00 per season per nonmember).

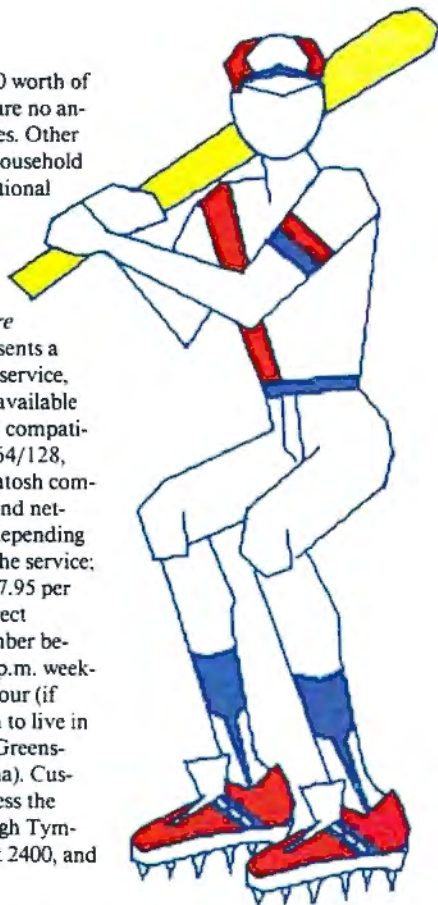
Although the Sports Center started up in mid-February, Gannett and Linc anticipated that the Fantasy/Rotisserie leagues wouldn't be running until April 1. Other services, like shopping, have been scheduled for a late May rollout. Bokern said agreements with vendors had been completed, but that the first priority was signing up new customers.

If team games aren't your style, you can also play chess, backgammon, checkers, even blackjack. High scores for the week are posted, and you can play online against another opponent. For baseball-card aficionados, live online auctions and a trading post for collectibles have been planned to debut in late May. Public forums and communications with the *USA Today* sports department add to the network's offerings.

Cost for an individual membership is \$14.95, which

brings with it \$15.00 worth of online time. There are no annual or monthly dues. Other people within one household can join for an additional \$4.95 each (no free time); club and team rates are also available.

Optional *SportsWare* software, which presents a graphics face to the service, costs \$24.95 and is available for the IBM PC and compatibles, Commodore 64/128, Apple II, and Macintosh computer lines. Phone and network charges vary depending on how you access the service; costs range from \$17.95 per hour (for dialing direct through an 800 number between 6 a.m. and 7 p.m. weekdays) to \$2.95 per hour (if you're lucky enough to live in the calling area for Greensboro, North Carolina). Customers can also access the Sports Center through Tymnet, Telenet, Telenet 2400, and ConnNet.



— Peter Scisco

Computerized College Come-On

College recruiting may never be the same. The Illinois Institute of Technology, a high-tech university in Chicago, really wants the attention of high-school seniors. To get it, IIT has taken note of its own curriculum and put together a computerized come-on aimed at kids with PCs.

Instead of a flashy four-color brochure, IIT has been sending prospective students a single 5¼-inch disk. When they pop the disk into an MS-DOS machine, high-schoolers are treated to an animated pre-

sentation that hypes the school, its strengths in high technology, and its location. A menu system navigated with single-character keypresses lets the college-bound explore such areas as financial aid, student/faculty ratios, key majors, on-campus sports, and job placement.

Running on any PC with CGA graphics or better, the *Why Should You Consider IIT* disk was created by The Learning Curve, a Chicago-based company that specializes in adding animation and graphics to training packages. The

graphics, though lacking the polish (and in CGA, the color) of much commercial software, are enough to keep people pressing keys.

Has the unique recruitment tool been a success? According to Bill Black, IIT's director of admissions, "A high percentage of the inquiries are from top students—just the sort of prospect that is suited to our programs."

For more information about IIT and its disk, contact the Institute's public relations office at (312) 567-3104.

— Gregg Keizer



Mean Mister Mustard vs. Macintosh

The next time you buy an Apple product, it may be a Peach. In February, Apple Corps filed suit in Great Britain's High Court against Apple Computer. Apple Corps is owned by the three surviving members of the Beatles and the estate of John Lennon.

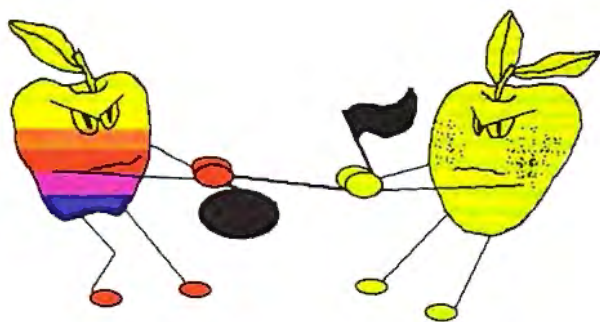
Apple Corps claims that Apple Computer broke a 1981 agreement in which the computer company promised not to use the Apple logo on any products designed to produce music. These products include the MIDI interface, the Macintosh line of computers, the Apple IIGs, and the Apple IIe.

"We believe the case has

no merit," said Carleen LeVasseur, spokesperson for Apple Computer. "And we do not believe that we are in violation of any agreement with Apple Corps."

The Beatles' company has asked the court to force Apple Computer to change its name, to sell the music products under a different name, or to change the computers by removing the sound chips. Apple Corps lawyer Paul V. LiCalsi said a remedy might also require Apple Computer to pay a licensing fee for the products that have already used the logo.

"The whole realm of the



music business was preserved for the Beatles' company by this contract," LiCalsi said. "Technology being what it is, these lines get blurred, and that's what we were protecting ourselves against."

In 1986, Apple Computer and Apple Corps negotiated another agreement to expand the use of the Apple logo to a wider range of products. Dur-

ing those ill-fated negotiations, LiCalsi said, Apple Corps realized that Apple Computer had already broken the 1981 contract.

Apple Computer will file a response with the British court. Until then, the company won't affirm or deny any of Apple Corps' claims.

— Heidi E. H. Aycock

On the Road Again

It's back and it's hot. The gang that brought *Test Drive* screeching onto your computer screen is on the road again with *The Duel: Test Drive II*. New cars, new road, computer competition, and enhancement disks are sure to give white-line fever to more computer users than ever.

Taking its lead from flight simulator programs, Accolade is also offering *Test Drive* addicts scenery and car disks. So far, one scenery disk (*California Challenge*) and one car disk (*The Supercars*) are avail-

able. Although Accolade hasn't set a release date for future enhancement disks, a company spokeswoman said there would probably be another disk available by the end of the year. She said the release of scenery and car disks was in response to letters received from *Test Drive* players.

Additional disks will probably be designed by Distinctive Software, the same team that developed *The Duel* and the original *Test Drive*. Car game enthusiasts may one day be able to race from the

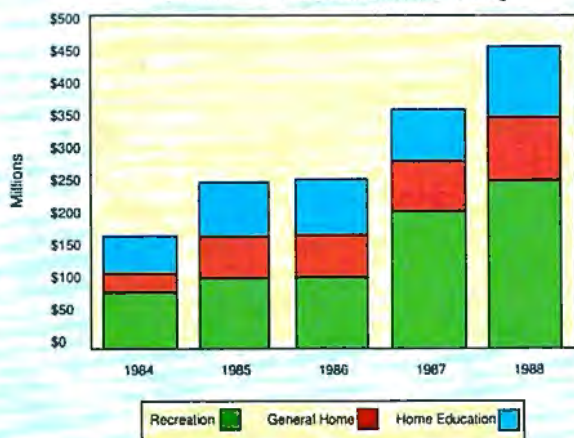


Big Apple to Big Sur in the car of their dreams. So if shifting gears and burning rubber is

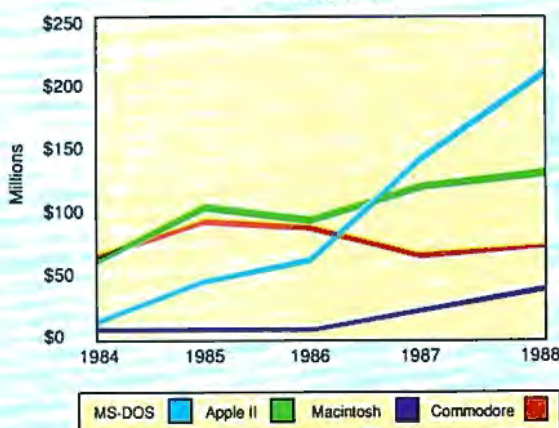
your idea of fun, buckle yourself in to *Test Drive II* and run with the best.

— Peter Scisco

Consumer Software Sales Hit the Ceiling



MS-DOS Takes Over



That Old Ball and Chain

It used to be that a person could get in real trouble slipping a file into a jail cell. But if you're a member of the Prisoner's User Group (PUG) in the Washington State Reformatory of Monroe, Washington, you're encouraged to bring files into the Big House—computer files, that is.

Sponsored by Edmonds Community College, also of Monroe, the group consists of about 20 Commodore 64/128 users. The group corresponds by way of its PUG newsletter subtitled "The Computing Be-

hind Bars Publication." In addition to prison news and hints on computer use, the newsletter carries such items as "From the Soapbox," a general forum for discussing a variety of problems particular to using computers in prison.

In the latest issue, for instance, the editor blasts the Midnight Gamerster, the computer user who disturbs other prisoners with the sounds of game playing deep into the night. "This is the same lack of consideration for others that landed the Midnight Gamerster



in prison in the first place," writes editor and group president Ed Mead. He also criticizes computer users who run their printers after 10:00 p.m. in defiance of prison rules.

Besides playing games and producing newsletters, the users at the prison can take part in community college

classes, including Introduction to DOS, math (up to calculus), computer programming, and computer literacy.

Anyone interested in communicating with the PUG can write to Mead at P.O. Box 777, Monroe, Washington 98272.

— Peter Scisco



What the Future Has in Store

New York City has long been the center of finance and fashion for the United States. But software? If Software, Etc. gets its way, the Big Apple will soon be toasting another cultural focal point—the software store of the future.

Opened March 13 on famous Fifth Avenue, the 4323-square-foot store features an electronic chair connected to a 16-screen *Media Wall* for multimedia demonstrations of software programs. Called the *Power Desk* and adapted from the bucket seat of a Premiere car, the chair is equipped with

two personal computers and is wired for sound. From the chair, salespeople and developers can demonstrate software packages on the Media Wall, which dominates the back of the store. "This incredibly futuristic New York store reflects our predictions for where software is heading and how it will be merchandised in the years to come," said Jordan Levy, vice president and director of marketing.

The huge outlet will support the major personal computer platforms: IBM PC and compatibles, Apple II, Macintosh, Commodore, and Amiga. In addition to software, visitors will find more than 1000 different books and magazines

as well as supplies and accessories.

The store also boasts a special desktop publishing area, complete with a Macintosh II computer, laser printers, and scanners. Elsewhere in the outlet are eight personal computers, stationed on a carousel, that can be used for demonstrations. Theatrical lighting and vaulted ceilings complete the store's look.

Opening ceremonies were attended by The Amazing Kreskin (who attempted to read a computer's "mind"), film designer Syd Mead (*Blade Runner*), financial guru Andrew Tobias, and major league baseball manager Earl Weaver.

— Peter Scisco

Cheat Right

Slogging through complicated simulations and adventure games may be fun for folks with lots of time on their hands, but for those of us with lives to lead, every minute lost looking for the Magic Scroll is another minute lost to family, friends, and other hobbies.

Enter the hint book, an invaluable aid to players who want to play detailed games but just don't have the time. Epyx, a noted publisher of entertainment software, has just released an attractively packaged booklet that includes tips

and hints on four of its popular games: *The Legend of Blacksilver*, *Space Station Oblivion*, *L.A. Crackdown*, and *Sub Battle Simulator*.

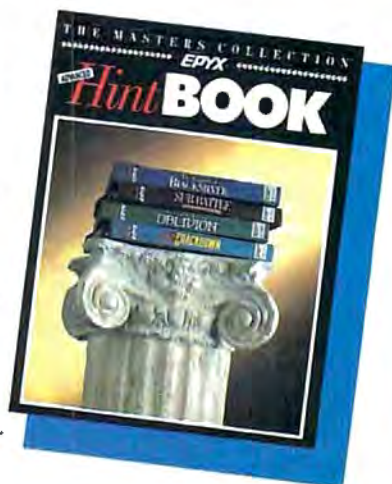
The Master Collection Hint Book contains general suggestions as well as hints to help you move past a particularly troublesome spot in the game. A variety of detailed maps aid in game navigation; the maps for *The Legend of Blacksilver* are particularly helpful. Tips for the one non-adventure game in the quartet, *Sub Battle Simulator*, are more

tactical in nature but still valuable.

Other tip books may use clever techniques to keep you from discovering *too* much, but Epyx's booklet can get quite specific. That may disturb some who want just a bit of aid, but for those of us pressed for time, it's more a benefit than anything else.

For a copy of *The Master Collection Hint Book*, contact Epyx at 600 Galveston Drive, Redwood City, California 94063; (415) 366-0606; \$9.95.

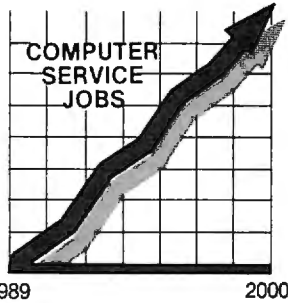
— Gregg Keizer



5 sure steps to a fast start as a high-paid computer service technician

1. Choose training that's right for today's good jobs

Jobs for computer service technicians will almost double in the next 10 years, according to the latest Department of Labor projections. For you, that means unlimited opportunities for advancement, a new career, or even a computer service business of your own.



But to succeed in computer service today, you need training—complete, practical training that gives you the confidence to service any brand of computer. You need NRI training.

Only NRI—the leader in career-building, at-home electronics training for 75 years—gives you practical knowledge, hands-on skill, and real-world experience with a powerful XT-compatible computer you keep. Only NRI starts you with the basics, then builds your knowledge step by step until you have everything you need for a fast start as a high-paid computer service technician.



2. Go beyond "book learning" to get true hands-on experience

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Collected Works

For years, computers have promised to make things simple, to keep track of the detritus of our lives. Organization is supposed to be their forte; tireless cataloging, their domain.

But have you ever tried to create a database? One that holds just the right information for your record collection, your photograph file, your baseball-card boxes? With a database program, the chore isn't tough. But it may be more than you bargained for (especially if you don't already own a database and so have to go out and buy one) or take more time than you can

devote.

Call up Steve Hudgik, owner of HomeCraft Computer Products. Hudgik has developed a whole series of customized databases for IBM PC and compatible computers—databases specifically set up to track records, books, videos, baseball cards, jazz albums, comic books, and classical recordings.

Each *Organize Your Collection* database is complete and ready to run and has a variety of fields already set. For instance, the *For Record Collectors* database has three levels, each of which provides progressively greater detail of

information that can be stored for a song. The simplest level offers only six fields: Catalog Number, Song Title, Artist, Year Released, Note, and Value. The most advanced level includes another 15 categories, ranging from Writer to Date Last Played.

Hudgik's databases are simple to use: All you have to do is enter the information. Data can easily be edited, and, of course, searched for and printed. It's a quick task to search for all the songs in your collection that were recorded by Neil Young, for example—a printout takes just a moment longer.

Even more interesting for some, however, is Hudgik's offer to create a custom database for any collection. If HomeCraft doesn't already offer a database for whatever you collect and Hudgik believes he can sell at least 6–10 copies, he'll do the programming and come up with a specialized database just right for you. The price is the standard \$59.95 that HomeCraft charges for all its specialty databases.

For more information on HomeCraft's products, contact the company at P.O. Box 974, Tualatin, Oregon 97062; (503) 692-3732.

—Gregg Keizer

CD-ROM Surge

More than 2,000 people gathered in Anaheim for Microsoft's Fourth Annual CD-ROM (Compact Disc-Read Only Memory) Conference. The March conference addressed both the current state of CD-ROM and its potential for continued growth.

CD-ROM is thriving in both areas. Software revenues last year approached half a billion dollars, and 1989 promises to be even larger. Because CD-ROM offer enormous amounts of storage, the tech-

nology is seen by many as crucial to the elevation of the PC from data-crunching workhorse to true multimedia appliance. Several conference announcements showed that such an appliance may be in our future.

Philips, Microsoft, and Sony jointly announced CD-ROM XA (eXtended Architecture), a standard that adds compressed audio capabilities to CD-ROM discs. IBM and Intel announced advances in DVI (Digital Video Interactive), which further extends

CD technology by the addition of full-motion video. Other product announcements included CD-based telephone directories, Bibles, entertainment and education packages, authoring systems, and mastering processes that allow CDs to run on both MS-DOS and Macintosh machines.

Perhaps the heaviest traffic in the exhibit hall flowed toward two products unavailable here—Fujitsu's fmTOWNS, a 386-based PC

with a CD-ROM drive; and NEC's phenomenally successful PC Engine, a dedicated game platform that's sold more than a million units in Japan. In December, the company introduced a CD-ROM drive for the Engine and proceeded to sell 100,000 drives in three months—despite limited software.

Neither NEC nor Fujitsu announced plans to release their products in the West.

—Keith Ferrell

The Gospel According to Bubeck

If you've been looking for an electronic bulletin board that caters to an unusual interest, lay your hands on the *1989 BBS Bible*, released by Bubeck Publishing. First of its kind, the *1989 BBS Bible* lists nearly 5000 public computer bulletin board systems in the United States.

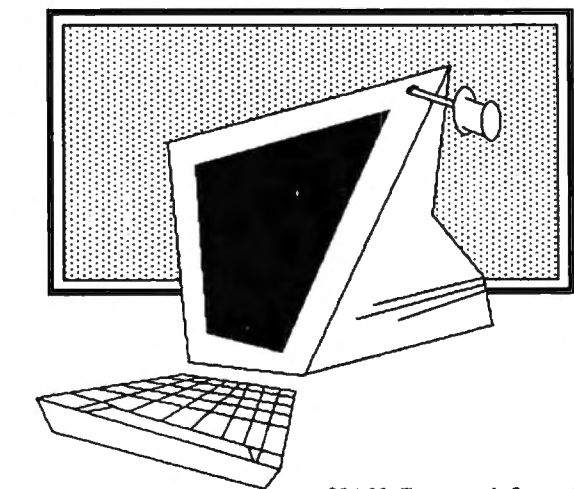
The *BBS Bible* was compiled by Thomas W. Bubeck, a freelance writer who has edited magazines and annual directories, because he found a scarcity of useful, up-to-date information about BBSs.

Using your computer and

a modem, you can connect to a BBS for fun and conversation. Some BBSs offer electronic mail or live chat sessions; others offer games, special-interest groups, or computer-specific information.

The *1989 BBS Bible* lists BBSs by area code and by more than 130 special interests, including machine-specific categories. Noncomputer interests include genealogy, religion, science, and music.

Besides the directory, Bubeck has compiled several articles helpful to people using BBSs. For example, you can read about low-cost long-distance services and about beating viruses before they attack.



Bubeck plans for the *BBS Bible* to be an annual affair with the 1990 edition due out in the fourth quarter of 1989. The current edition costs

\$24.99. For more information, contact Bubeck Publishing at P.O. Box 104, Collegeville, Pennsylvania 19426; (215) 287-6356.

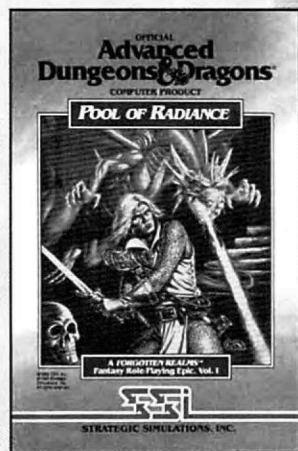
—Heidi E. H. Aycock □

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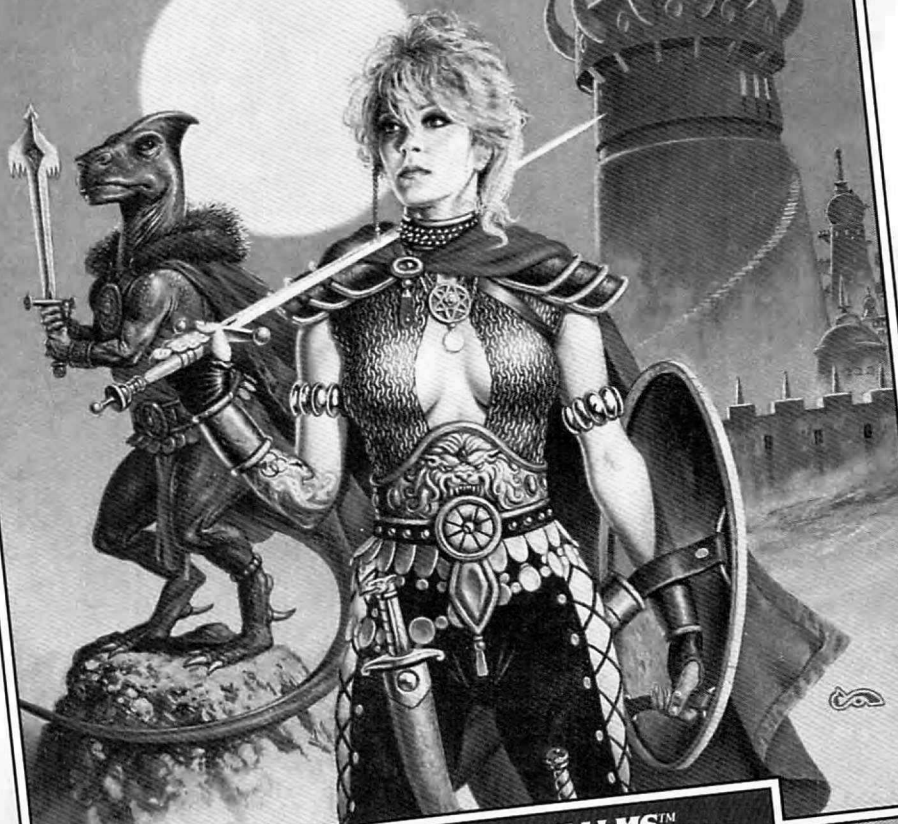
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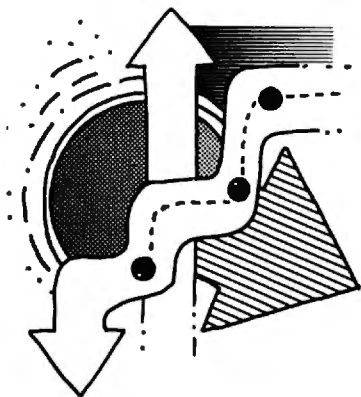


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gameplay

ORSON SCOTT CARD

Judge Computer Games as Art, Respect Game Designers as Artists

The other day I was reading a book of literary biographies—you know, the kind of book where some star-struck academic tells us common people how it was that genius writers got to be so wonderful in spite of the fact that they were horrible, selfish people who ruined the lives of everybody around them and wrote stuff that nobody would ever read if they weren't required to by English teachers.

You know—the kind of book I want somebody to write about *me* someday.

At one point the author of this book, referring to a very popular writer of the early twentieth century, wrote, "His work showed some talent, but it was hardly literature."

That sort of snobbery makes my skin crawl. You hear it all the time, from the sort of people who enjoy despising others' tastes. "I suppose it's all right if you like that sort of thing, but it's hardly art, is it?"

Often that attitude is used to react against anything new. That's how theatrical people referred to the movies—as commercial trash, not art. Now, after 80 years, film is definitely accepted as an art—whose practitioners sneer at television just as theater people sneered at *them*.

Painters did it to photographers when photography was new. Elizabethan poets did it to playwrights.

Computer games are new and subject to this same snobbery. But when I review games, I start from the assumption that gamewrights should be judged, criticized, and respected as *artists*, and that they—and we—should take their work seriously as art.

I don't mean *art* and *artist* the way we might speak of *the art of ditch-digging* or a *pickup artist*. I mean that a gamewright can be an artist the way Shakespeare, Rembrandt, Bach, Chaucer, and Capra are artists. Maybe gamewrights aren't as good yet—but they should aspire to the same sort of ageless greatness in their work.

That's my view, but am I right? After all, computer games are *games*, not art.

Take football. Few would call a football game *art*, even though it has an audience. It's performed by professionals, it's loved for its own sake, and it has traditions, styles, schools of thought, and even critics declaring who is good or bad. There are even aesthetic moments—a beautiful catch, a gorgeous bit of footwork, a perfect punt.

Still, it's a contest, not an art. Most of the events in the game are random. The rules and the playing field are standardized, but during the game itself, as the opposing

coaches constantly try to surprise each other, as players test each other's strength and wit in a series of individual contests, specific outcomes are always unpredictable.

A football game is also not repeatable. You can see a play or movie or painting, read a book, hear a symphony over and over again, and each time can be as powerful and important as the first. However, if you videotape a game and watch it again, the outcome is known. The contest is over. It isn't *real* the second time around.

Most importantly, no single intelligence guides the story that unfolds on the field. The course of the game is not *created*; it merely *happens*.

But videogames aren't like football games. They're more like golf. Here, the real contest is between the player and the designer of the course. The designer's work is defensive; the player's job is to attack. The only contest between the players is to compare their scores—just like a vanity board at the end of a videogame.

In golf, a single intelligence *does* guide the experience of playing. Aesthetics are profoundly involved; beauty and drama are much of the reason for playing at one course rather than another. And the course is repeatable: You can play it again and again, discovering new things about it each time.

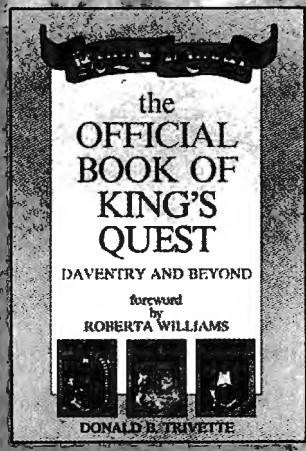
Of course, some golf courses aren't very artlike. You play on them because they're cheap and close and you want to practice. I've played videogames like that, too. But just because some are bad doesn't mean the good ones aren't art.

But I'm still comparing computer games to a game, not to an art. So how about architecture? There are a lot of ugly, uninspired buildings in this world—even uglier than the average municipal golf course. But that doesn't change the fact that some architects create buildings that are undeniably great art, inside and out.

Furthermore, you don't just experience the architect's art from the outside. You can go inside and walk around. You can explore, discover, even *live* inside that art. Just the way you don't simply *look* at a golf course—you play through it.

Computer games are works of art—a new art, one that has yet to earn respect. But it is an art nonetheless, and we the players are the audience, as we control our own passage through the world of the game. We are collaborators with the gamewrights in an open-ended art, created for our pleasure, completed by our choices. □

COMPUTER'S HOT NEW SELECTIONS!



The Official Book of King's Quest: Daventry and Beyond
by Donald B. Trivette
ISBN 0-87455-155-2
Retail: \$10.95, pb, 144 pp

This is the official guide to America's most popular series of 3-D animated adventure games—the bestselling *King's Quest* from Sierra On-Line. The book provides clues to solving the four *King's Quest* games, maps to help navigate the world of Daventry and beyond, and answers to questions like "What is the gnome's name?" It describes the elaborate programming, artwork, and musical composition that goes into the making of a *King's Quest*. Includes eight pages of color photos showing the stunning graphics that have made *King's Quest* the king of 3-D adventure games.



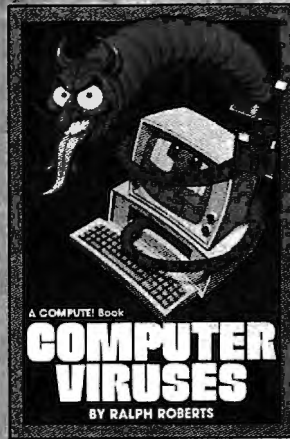
Machine Language Routines for the Commodore 64 and 128
by Todd D. Heimark and Patrick C. Parrish
ISBN 0-87455-085-8
Retail: \$18.95, pb, 585 pp

A must for every Commodore 128 and 64 machine language programmer. Scores of routines that can simply be inserted into your own programs. Included is the assembly language code with easy-to-understand documentation and instructions. A companion disk that includes all the programs in the book is available for \$12.95 (E0858 BDSK).



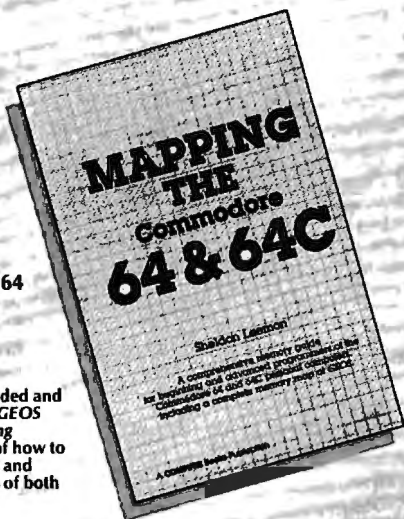
COMPUTE!'s Music System for the Commodore 128 and 64
by Craig Chamberlain
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Sidplayer, the powerful and popular music player and editor program, is now more versatile and more impressive than before. *Enhanced Sidplayer* for the Commodore 128 and 64 includes two new versions—one for the Commodore 128 running in 128 mode and another strictly for the Commodore 64. The accompanying disk contains the Editor and Player programs (including a singalong program), utilities, and sample music that you can enjoy immediately or change. *Book/Disk Only*



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by Ralph Roberts
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The authoritative guide to computer viruses, worms, and Trojan horse programs. Includes important information every computer user needs to protect against possible disaster—the loss or altering of valuable data. Written in a light yet information style, *COMPUTE!'s Computer Viruses* explains how viruses infect computers, how to protect against them, and what to do if a virus attacks. This book also includes informative reviews of the most popular virus-protection software available. Must reading for every computer user.



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by Sheldon Leemon
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Letters

Simpler, Cheaper, Better

I couldn't agree more with the February 1989 "Editorial License"—computers cost way too much. The problem is that manufacturers are trying to give everyone the cutting edge in technology when it really isn't necessary. Look at the successful Nintendo system. Does anyone know what microprocessor or graphics chip it uses? Does anyone care?

How about a nice, solid home computer, one that's simple to operate but doesn't include such consumer-useless features as being able to fine-tune time slicing in a CONFIG file? Yes, outdated technology, but who cares? Forget computers that appeal to everyone from the Department of Defense to fifth graders—leave the high-tech stuff to computer scientists and engineers.

*James Hague
Richardson, TX*

Stop Stealing

Talking to Atari users, we learned many wanted to see our best-selling air combat simulator, *Falcon*, converted to the Atari ST.

Many of our competitors warned us that releasing an ST product would be a money-loser. We were told that within weeks the product would be up on the bulletin boards and sales would fall to 0. We chose to disregard these comments and felt that the piracy problem only existed with a small handful of users.

However, within 30 days of our releasing *Falcon ST*, pirates had put the product up on the bulletin boards—complete with diagrams for the code-wheel protection, keyboard layout, and mission maps of the product.

The real cost of such software piracy is not the lost \$49.95 sale, but rather the lost industry support for the Atari ST.

Many ST owners argue that the ST has no more pirates than the IBM or Mac. Many of us at Spectrum HoloByte believe this to be true. The problem is that the number of installed STs is considerably smaller than that of the IBM or Macintosh, thus increasing the impact of piracy on sales. In addition, ST pirates seem better organized and pira-

cy seems more accepted (or, should I say, tolerated) by ST users.

The cost of developing and publishing a product is quite high, especially on a complex machine like the ST. The Amiga version's sales volume is already double that of the ST, even though Amiga *Falcon* has been on the market for less time. When Macintosh and IBM versions were released, they sold four times the volume of product over the same period of time. Based on the current sales trend, the ST developer will be lucky to break even.

There is no clear-cut solution to the problem of piracy. All we can ask is that if you like a program, buy it. Think of it as an investment. The more invested, the more and better titles you'll see for the ST. It's a shame that a few users can hurt a market as badly as the ST pirates can and deprive thousands of good ST users of the product support that other machines receive.

*Gilman G. Louie
CEO/Chairman
SPHERE, Spectrum HoloByte*

What's the Difference?

Do you produce *COMPUTE!'s PC Magazine*? If so, what is the main difference between it and *COMPUTE!?* I get *COMPUTE!* and don't want to go to the expense of subscribing to a parallel format.

*Maurine E. Phinisee
Washington, DC*

COMPUTE! Publications publishes four magazines: COMPUTE!, COMPUTE!'s PC Magazine, COMPUTE!'s Gazette, and COMPUTE!'s Amiga Resource. COMPUTE!'s PC Magazine differs from COMPUTE! in its focus (MS-DOS only), its content (features, reviews, and between five and eight ready-to-run programs on the accompanying disk), and price (\$12.95 per issue). From our perspective, if you own an IBM PC or compatible computer, you'll find both COMPUTE! and COMPUTE!'s PC Magazine invaluable resources. The former gives you a broad view about home computing in general, while the latter provides a focused perspective and useful software.

Flight notes

8A



Apple vs. Amiga

Recently, while looking through some old issues, I came across the item "Apple Loves the Plus" in the November 1988 "News and Notes" section. It's a wonder to me that anybody pays that kind of money for that kind of system when computers like the Amiga are available for less.

Let's do a quick comparison of the Apple IIc Plus and the Amiga 500 (which is what I own). The Apple IIc Plus comes with 128K of RAM; the Amiga 500 comes with 512K of RAM. The Apple has a very low screen resolution. Correct me if I'm wrong, but I think it has 320 X 200, the same as the C64. The Amiga has a maximum resolution of 640 X 400. The Apple IIc Plus has beeps and tones for sound. The Amiga has four-channel stereo sound. The Apple has 16 colors; the Amiga has 4096 colors. The Apple runs at a maximum speed of 4 MHz; the Amiga runs at a speed of 7.2 MHz. The Apple has a 6502 microprocessor; the Amiga has a Motorola 68000 microprocessor. And the list goes on.

The final thing I would like to point out is that an Amiga 500, equipped with an RGB analog monitor, costs around \$900. The Apple IIc Plus, equipped with a composite monitor, costs \$1,099. As you can see from the above list and the prices, there really is no comparison. How can Apple justify this? It should price this computer down nearer to the price of a comparable Commodore 64 system. Why anyone would pay so much money for so little computer is beyond me.

Layne Adams
Rockwall, TX

XTs for Less

I just read your column on the cost of computers ("Editorial License," February 1989). You said it was possible to buy a color TV, CD player, and so on, for under \$300, but "good luck" trying to find a computer system for that amount. I agree that there probably aren't any serious computer systems around for \$300, but it is possible to put together an IBM PC XT-compatible system (less printer) for about \$365, including monochrome monitor, disk drive, and 128K of RAM.

I don't think you will see an EGA-capable system for \$400-\$500 (with printer) in the near future. The lowest priced EGA monitor I could find costs \$320 all by itself. A more realistic figure

is \$900-\$1,000. I do not believe the \$400-\$500 figure will result even from high volume, direct sales, or mass merchandisers, as the figures I found are the lowest direct-sales prices I could find.

I, too, would like to see lower system prices, but I think we have hit near bottom on PC compatibles based on the 8088 and 80286 microprocessors.

Phil Imber
Glendale, AZ

Mr. Imber included a price list for XT-compatible components that he found in Computer Shopper—a 4.77-/10-MHz motherboard for \$69, a computer case for \$24, a power supply for \$30, and so on. If you're willing to tinker and search for good prices, you can probably build a cheaper system than you can buy.

Diet Search

I'd like to ask for your assistance in locating a program. Several years ago, I purchased a program called the *Scarsdale Medical Diet* for my Apple IIe. I've since sold the Apple and replaced it with an MS-DOS system. I would now like to locate the MS-DOS version of the program, having sold the Apple version with that computer.

Garry G. Stiegman
New York, NY

Bantam Books has discontinued The Complete Scarsdale Diet, but there are other options. Try, for example, Your Personal Weight Loss and Nutrition Center (\$49.95) from Instructional Systems, 14 East Fourth Street, Suite 602, New York, New York 10012; (212) 477-8800.

Neat Niche

I think *COMPUTE!* magazine has definitely created a niche for itself. Several of your columnists are unique in their personal approach; I especially like Orson Scott Card.

Furthermore, few magazines would have the ambition and courage to cover both very inexpensive and very expensive software in the same article as Caroline Hanlon did with word processors in May. Her list may not have been complete, but its diversity is a credit to your multidimensional approach to home computing.

Arleigh Hartkope
East Brunswick, NJ □

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As with other mythical quests, only the proper approach can put you on the right track to finding the hidden jewel. Even if you can determine it's location, the jewel is only visible under a strictly-defined set of conditions. Make a mistake during your final approach and you may get lost so completely that you'll never be able to find your way back!



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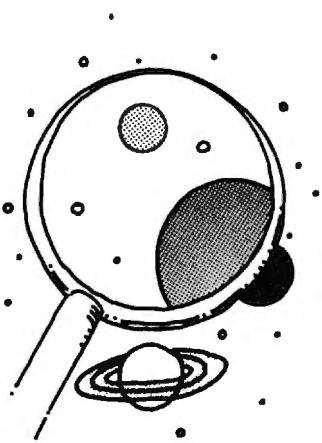
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Computing Gets Easier Every Day

discoveries

DAVID STANTON

“I’ll never understand all those buttons,” a colleague recently admitted, speaking of her VCR. “Playing back a tape is simple enough, but when I want to record something, I just ask my son to set up the machine.”

My nemesis is the telephone system at work: Three outside lines coming into the building serve who knows how many phones. Only those who understand all the lights and buttons can capture a dial tone, and that’s only half the battle. The town of Friendship is just ten miles away—*long distance* in telephone talk. Travel 25 miles in the opposite direction and you’ll reach Olean—“local calling area . . . no charge . . . no need to dial 1,” explains the operator. What about Niagara Falls, three counties and 80 miles away? Same area code. Alfred? Same county as ours but different area code—more numbers to dial.

All this is not to suggest any basic failing of Ma Bell. It simply serves to highlight some of the common complexities we all cope with as part of the cost of modern technology.

Like my friend the VCR-phobe, some of us resent all this unnecessary confusion. Others revel in it. Some have even figured a way to turn it into cash. But for many of us, *high-tech* and *confusion* have become synonymous.

Until recently, microcomputers only served to exacerbate the growing division between techies and technophobes. Limited memory, a lack of programming standards, and hardware incompatibilities conspired to make it so. In the early 1980s, you never knew *computers*; instead, you knew the TI-99/4A or the Atari 400 or the Commodore PET. You didn’t know *word processing*; instead, you knew *PaperMate* or *PaperClip* or *TI Writer*. Computer literacy came slow and hard.

Now, as then, RAM, ROM, CAD, CAI, CMI, WYSIWYG, 80386, 65C816, 6510, CPU, and similar cryptic jargon add to the popular view that computing is a complex skill best left to the few. Knowledge is power, and those who learned the hard way too often oppose moves to simplify computing.

What else could explain the resistance so many experienced computists have toward simpler-to-learn operating systems? Can it really be true that some hard-core types actually prefer MS-DOS’s command structure to the growing number of DOS shells that make things so much easier? What rational user could seriously object to

the desktop metaphor made popular by the Macintosh and now available for virtually all popular microcomputers? Do some really believe that learning to use each new computer brand or program should require hours of tedious study?

No matter. Resist though some will, things are changing, and today’s truth will out: Computing in 1989 need not be complicated! Today’s best computers are not hard to understand. Today’s most powerful software packages need not take hours to learn.

Apple Computer probably deserves a large part of the credit. When the company introduced that first 128K Macintosh, many laughed. “Real computists don’t use mice!” doubters scoffed.

Considered in retrospect, that view was a bit shortsighted. Since then, point-and-click devices have proliferated faster than rabbits. Today it’s almost impossible to find a computer system that doesn’t come with a mouse as standard equipment or, at least, as a strongly recommended option. Similarly, graphics-based operating systems and DOS shells have spread everywhere. Consider GEOS for Commodore 64s and 128s, or GS/OS for the Apple IIgs, or GEM Desktop. Even IBM is making moves in the right direction with its DOS 4.0 operating system.

Although these environments differ in some respects, they look and feel similar enough to ease the pain of moving from one machine to another and from one application to another. Increasingly, software is bridging the gap of hardware incompatibility. As this trend accelerates, hardware will become almost incidental. What does it matter which machine you’re using if it boots to a familiar desktop?

This trend toward uniformity of human interfaces holds great promise for both current and potential computer users. The less time we all spend learning *about* computers, the more time we can spend learning *with* them.

Increasingly, computing is becoming as easy as it should have been all along. If you’ve avoided buying a computer out of some vague insecurity, now is the time to reconsider. If hardware and software require hours to master, place the blame where it belongs—with the manufacturer or publisher. And if you can’t program your VCR or dial your telephone without help, don’t worry. Computing really isn’t tough! □

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

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SCIENCE!

David Stanton

We're born scientists.

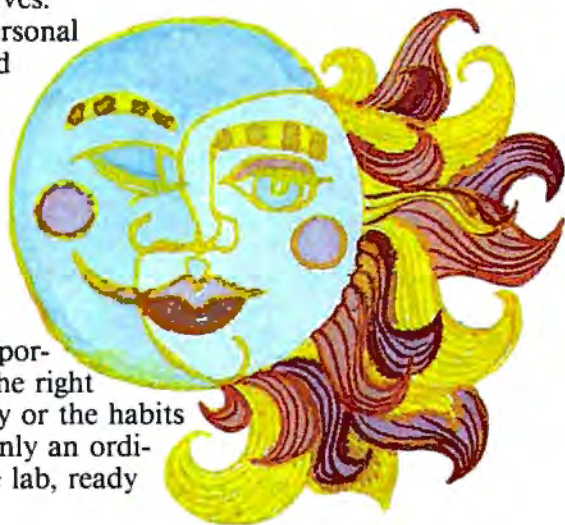
We are, after all, a curious species—always wondering, forever exploring, constantly striving to understand our world. From the moment we search for our own infant fingers and feet, we're hooked. Each new conquest inspires another search. Each question answered evokes unlimited new inquiries.

Where does the sun go at night? How many feet does a snake have? What does electricity look like?

The quickly approaching summer days provide the perfect environment for scientists of all ages. Woods and wildlife, beaches and lakes, blue skies and shooting stars vie for attention and offer unlimited opportunities to expand our knowledge of the universe and ourselves.

But some subjects lie beyond the reach of personal experience. The stars, the seas, history itself guard their secrets with barriers of space and time. The risk of injury limits our ability to directly explore subjects like nuclear energy and human physiology. The abstract nature of electricity, temperature, and the law of acceleration makes them difficult to understand without help.

The solution? A personal computer and good software. Science simulations, lab kits, and tutorials eliminate danger and provide untold opportunities for experimentation and analysis. With the right software, anyone can study astronomy or rocketry or the habits of grizzly bears. Connect a few probes and suddenly an ordinary home computer becomes the perfect science lab, ready to analyze real-life data.



*Unravel the mysteries of the universe
with the kind of science software that
puts the expertise of an Einstein, a Galileo,
an Audubon inside your computer.*

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Hundreds of science programs are currently available, and their subjects cover the full range of scientific discovery. We've selected a few of the most popular science packages to illustrate your opportunities. Some are classics. Others are new. But all invite you to expand your knowledge of the world around and within.

Back to the Past

Dinosaur mania has infected a large part of the population. No longer are the prehistoric creatures content to keep to museums. Now dinosaurs turn up almost anywhere: in libraries, in malls, on television, even inside computers. Whatever their promotional secrets, they have achieved top billing and have developed a strong following.

Among the most popular software packages for aspiring paleontologists is DesignWare's *Designasaurus*. Three separate segments of the program provide something for everyone. With *Build-a-Dinosaur*, budding scientists can study several species, including the tyrannosaur, the brontosaurus, and the stegosaurus. By mixing and matching fossils, kids can build a realistic onscreen dinosaur or create an entirely new species. *Walk-a-Dinosaur* lets children assist their pet as it struggles to survive in a hostile world. *Print-a-Dinosaur*, though, will probably get the most use because it's so much fun. With it, you can print a dinosaur reference book, complete with pictures and explanatory text. Those who prefer wall decorations can print black-and-white posters for coloring and hanging. Best of all, children can produce their own dinosaur T-shirts by using the sheet of heat-transfer paper included with the program.

DesignWare publishes *Designasaurus* for most popular personal computers. Each version fully exploits the unique sound-and-graphics capabilities of its host. When it's time to explore the world as it was millions of years ago, *Designasaurus* is one program that's sure to please.

Dyno-Quest approaches the same subject in a different manner. Designed for children ages 6-14, *Dyno-Quest* uses an adventure-game format in which players must help Donnie and his dog, Doobie, do research on one of 18 dinosaur species.

Secondhand knowledge from stodgy libraries and dusty books will not suffice. Instead, Donnie and Doobie must fly their Kaboom (a spaceship) through time and space in search of their special dinosaurs. During their travels they encounter uninhabited terrain, typical hazards of the era, dinosaurs, and other creatures.

When did dinosaurs live? Which species lived where? What did the earth's continents look like so long ago? What did dinosaurs eat? And what did they do in their spare time, without radios and televisions? These are a few of the

questions children answer as they complete the quest.

Donnie, Doobie, and the traveling Kaboom also encourage players to think clearly and make sound decisions. Those who waste gas or fuel may be stranded in the past. Success comes only from careful planning and solid judgment.

Griz!

Recently, Advanced Ideas released *Audubon Wildlife Adventures: Grizzly Bears*. This program is just one in a series being developed by the National Audubon Society. As you might expect, the program encourages a better understanding and appreciation of grizzlies by providing factual information in an entertaining manner.

Seven grizzly-related activities can be selected from the main menu. A database lets users search for information about bears and other animals that populate the forests. On the Spot with Dr. Pots is a simulation in which players assist Dr. Pots in studying the bears of Bear Country. When a bear attacks a farmer's herd in *Bear Encounters*, the user must play a park ranger's role and decide what to do. Must the bear be killed, or can it be relocated?

From an educational standpoint, *Grizzly Bears* has much to offer. Each activity requires users to read and analyze information and make judgments based upon their new knowledge. The program's design is perfect for independent study and exploration, and a management system maintains a record of each user's success. What better way to spur interest in a summer trip to one of our beautiful national forests!

It's Alive!

How could you forget the day you dissected your first frog? Ah, the smell of formaldehyde, the nervous movements with the scalpel. Some of us were openly squeamish. Others concealed uneasiness behind childish snickers. All of us sensed that we were learning something profound.

Now there's an alternative that will better suit many students and virtually all frogs. It's Scholastic's classic *Operation: Frog*, a science simulation that guides beginning biologists through the dissection and reconstruction of a frog. During the process, you learn to use probes, dissecting scissors, forceps, and a magnifying lens. You can remove organs, magnify portions of them for closer inspection, and even replace them. Animated sequences demonstrate how each organ functions, and appropriate diagrams illustrate the placement of each organ within its own body system.

Although *Operation: Frog* does not show everything quite as it is in the real thing, it does display all major organs and their physical relationship to each other. The body



cavity is organized into three layers. Removing an organ from the top layer reveals additional organs beneath. In this way, the program forces students to progress in an orderly fashion much as they might in an actual dissection.

One advantage over actual dissections is that you can stop at any point and save your progress to disk. In addition, the software provides onscreen help at the touch of a key and maintains a running score to help you judge your progress. More importantly, the kitchen table stays much cleaner when dissections are confined to computer screens.

With *Body Transparent*, another DesignWare package, would-be doctors can study the human skeleton and learn about the placement and function of important organs in the human body. It's the perfect solution for anyone who thinks a patella is for flipping pancakes and a clavicle is a musical instrument. The program consists of three main sections: a tutorial, a quiz-based game, and an editor.

Body Assembly, the tutorial, teaches the names and locations of bones and body organs. You use the keyboard, joystick, or mouse to move each part to its proper place. The computer explains incorrect responses and rewards correct ones. In Easy mode, the bone or organ and its name are presented. In Hard mode, only the picture of the bone or organ is given.

Once young physiologists have mastered tarsals, tibias, lungs, and livers, they can try *Body Facts and Functions*, the game part of the program. Actually, it's essentially a quiz in which you point out body parts described in a series of questions. Additional quiz sets include questions about common diseases, complete body systems (respiratory and circulatory), and the functions of various organs. The faster you respond with correct answers, the higher your score.

One of the program's nicest features is its fact editor. With this, parents, teachers, or students can create their own specialized fact lists for the game. Overall, *Body Transparent* is carefully designed, easy to use, and somewhat addictive. One thing is certain: A few hours spent with this program will definitely improve your sense of humerus.

Chemical Reaction

Many of us grew up with chemistry sets. Their experiments were as much a rite of passage as they were a way to discover how things worked. At the same time, those experiments made our parents prematurely gray as they worried about the explosive results of our unbounded curiosity. Fortunately for modern moms and dads, home computers and chemistry software make potluck potions safe for everyone.

Simon & Schuster's *Chem Lab* illustrates the potential of such software. The program simulates a chemistry lab complete with flasks, Bunsen burners, other paraphernalia, and hundreds of chemicals. Budding chemists dispense ingredients from three special dispensers—one for gases, another for liquids, and a third for solids. Two keyboard-controlled robot arms move and manipulate equipment.

The manual contains 50 experiments of various difficulty. Each experiment provides just enough information to get things rolling. Students must produce the correct target chemical by proper mixing of specified ingredients. A chart of chemicals and their formulas, a glossary of chemistry terms, and the periodic table give students most of the information they'll need. Do things right and everything will work out fine. Do things wrong and . . . KABOOM!

As students attempt to make a synthetic diamond, some laughing gas, or a silicon chip, they'll also be learning about how chemical formulas are named and how chemicals are combined to make new products. Best of all, no one will ever be in danger. Simulated explosions, toxic substances, and caustic chemicals remain safely stored within your home computer—no fuss, no mess, and no gray hairs!

Another chemistry lab simulation is *The Incredible Laboratory*, by Sunburst. You won't find any real chemicals here, though. Instead of teaching chemistry, this program teaches young scientists how to gather and record data, form hypotheses, test those hypotheses, and develop conclusions based upon their research.

In this program, you must manipulate imaginary chemicals to determine what effects they have on the monsters they create. In Novice level, for example, there are five chemicals that affect five body parts. Which chemical causes the head to turn yellow? Which causes amphibian-like feet? Which deforms arms? By careful observation, note taking, and logical thinking, you can match each chemical with its specific effect.

In Challenge mode, two players compete against each other. One mixes chemicals to create a monster. Then both players attempt to select their new monster from a group of three candidates on the screen. The learning comes from losing: "If I'm wrong and she's right," a player might ask, "then what does she know that I don't?"

Players who master the Novice level can move up to Apprentice and eventually to Scientist. Apprentices must cope with a wider variety of chemicals. On the Scientist level, the effects of chemicals change each time the program is used; consequently, students must study the chemicals before each new competition.

Admittedly, a science program involving chemically created monsters may sound a bit bizarre. It is important

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to remember, however, that *The Incredible Laboratory* is not intended as a chemistry tutorial. Instead it hopes to involve children in the process of thinking logically. It is excellent at doing just that.

Probing Questions

Science simulations and tutorials help children learn about the real world while protecting them from its dangerous realities. Keyboard, joystick, or mouse input may control graphics and text, but the programs themselves run inside a world of their own, separated from real life by plastic and glass. Some of the most exciting science software crashes through that artificial barrier between microchips and reality and lures the world inside the machine.

One of the most popular packages of this type is Brøderbund's *Science Toolkit: Master Module*. Along with software and a User's Manual and Experiment Guide, the kit includes a temperature probe, a light probe, and an interface box for connecting these and other devices to a computer's joystick port. Any scientist over age 10 can hook everything up in less than five minutes, and the experiments in the manual are simple enough for any youngster and exciting enough for almost any adult.

What do radiators and elephant ears have in common? One experiment begins with exactly that question. Its answer explores the dissipation of heat. (Don't worry—this experiment *doesn't* require an elephant!) Experimenters take a series of temperature readings on containers filled with warm water. Does the water cool faster when stored in a pie plate or a coffee cup? Why?

Why does it get darker and darker as you move farther and farther away from a light source? What happens when plaster of Paris hardens? How does color affect the reflec-

tion and absorption of light? Experiments outlined in the manual help children discover answers to these and many other questions.

Once you've mastered these experiments, you can expand your scientific horizons by purchasing one of the three add-on kits Brøderbund offers (all kits require the *Master Module*).

Speed and Motion adds a second photocell and a balloon-powered car to your growing lab. Two new measuring instruments—a speedometer and a tachometer—help kids of all ages study jet propulsion, pendulum motion, acceleration, and similar phenomena. *Earthquake Lab*, the weakest of the kits, includes three experiments, an onscreen seismograph, and an assemble-it-yourself seismoscope; the latter is primitive at best. This one is best left for the classroom, where it can be used by many different students or for demonstrations from year to year. The most recent entry is *Body Lab*. In addition to the usual manual and disk, this kit comes with a build-it-yourself spirometer (used to measure and display lung capacity). The spirometer, an onscreen heart-rate timer, and an onscreen response timer encourage experiments about the human body. With the kit's heart-rate timer, for instance, children can study the effects of exercise and caffeine on heart rate. Although the spirometer works only with difficulty, young scientists will still learn much about themselves and their own bodies.



Science Software of the Future

The abundance of science software offers something for everyone, but a vague discontent keeps us constantly searching for more. True computer buffs demand the best and will be satisfied with no less.

Imagine, for example, the perfect tutorial on human physiology. It boots to the expected graphic of a human physique. Maybe parts are labeled and maybe they're not. Either way, the screen image rivals the best color photography imaginable. But having impressive graphics is only the start.

The real power of this perfect tutorial is its ability to deliver unlimited information on any aspect of its subject. Point and click, and a fully labeled eye appears. Click on the retina to enlarge and analyze its structure. Click on any label for explanatory text. Use the menu bar to select information about retinal diseases or current research or treatment procedures. Press the Escape key to continue with a study of the lungs or the human skeletal structure or the brain. Wander as you might from topic to topic—the knowledge you seek is instantly available.

Maybe you'd like to check your heart rate. Just click on the heart, install a simple test device according to onscreen instructions, and select Test from the menu bar. Suddenly, the onscreen heart leaps to life, pounding beat for beat at your own heart's rate. A series of charts display related data.

What does a diseased heart look like? A short mouse walk and a click activate a videodisc sequence complete with doc-

tors, nurses, patients, and operating rooms. Watch and learn. Advance, freeze frame, backtrack at will. No matter what you want, you're always in control of this software.

How about a fully functional weather station? A few realtime probes combined with the right software could be just the thing for turning a home computer into a personal weather forecaster. Or imagine the perfect software-based chemistry lab. Start with a huge database of chemicals, mix a bit of artificial intelligence with just the right algorithms, and scientists could perform serious chemical research without the need for test tubes, Bunsen burners, and the rest.

Does all this sound farfetched? It shouldn't. Today's Macintosh II and IBM VGA graphics look sharp and clear. Current-generation 80386 and 68030 microprocessors have improved operating speeds significantly; next-generation chip research is already in the works. By the time you read this, the NeXT computer should be shipping, complete with its 256-megabyte optical drive as standard equipment. And at least one manufacturer is already working on an optical disk device capable of holding one gigabyte (1 billion bytes) of read/write storage space. Couple all that with the trend toward ever more RAM and higher-capacity memory chips; factor in expected advances in input/output technology; and the potential is mind-boggling.

Any way you look at it, the next few years should be an exciting time for scientific computer watchers.

Another inexpensive package that can turn a computer into a science lab is Sunburst's *Playing with Science: Temperature*. The package includes a disk, three thermistors (temperature probes) that connect to an Apple II's joystick port, and an extensive manual complete with lesson plans and activity sheets. Connecting the hardware takes less than five minutes even if you insist on reading the directions.

Each of the experiments begins with a question. Can water be hot and cold at the same time? How far from a fire can you sit and still feel warm? What makes rocks hot? What kind of cup keeps water hot the longest? Each experiment includes detailed directions for answering its question by gathering data and analyzing it.

Students use three thermistors to gather their data. As temperature readings change, the results are displayed on the computer's screen. Depending upon the parameters chosen in the software's setup menu, data can be represented on bar graphs, line charts, thermometers, or digital readouts. You can also configure the software for maximum and minimum temperatures, maximum time of the experiment (1 minute to 23 hours, 59 minutes), and number of active thermistors. Activity sheets guide you through the process of recording appropriate notes and analyzing results.

Playing with Science: Temperature is easy and fun to use. The best part, though, is that all but the youngest children can use it with a minimum of supervision.

The Space/Time Continuum

Not all science software is designed for free-flowing experimentation and discovery. Brøderbund's *Physics*, for example, is a hard-driving tutorial that's suitable either as a classroom supplement or as a tool for independent study. The two-disk program for the Macintosh covers a full year's material and includes plenty of physics problems.

Teachers' Pets

What do educators look for when evaluating software for their own courses? Which packages do they especially like, and why? We asked a few computer-using teachers.

Before becoming a teacher in Bolivar, New York, Jim Goodwin was a well-site geologist involved in oil and gas exploration. He spent most of his time analyzing core samples and deciding where to drill. Jim likes teaching, but he loves rocks.

Ask him what software he prefers for his Earth Science classes, and the answer comes back quick and sure—*Geologists at Work*, by Sunburst. "It's a perfect simulation of what geologists really do," he insists. Students select a site from which to drill and extract a core sample. Then they analyze the sample to determine its composition at various depths. Based on this information, students can deduce the history of a particular land mass as far back as 10 million years. By taking selected core samples in an area and comparing them, students can identify evidence of such geological processes as folding, faulting, tilting, intrusion, and erosion.

The program includes simple problems for beginners and more difficult ones for experts. Aspiring scientists especially enjoy the simulation in which they become field geologists in search of oil and gas. Jim strongly recommends *Geologists at Work* for both school and home use.

At first, *Physics* looks a bit like a computer-based textbook. Twelve chapters cover such topics as vectors, thermodynamics, and the properties of light. Each chapter consists of pages of text that can be turned at the click of a mouse. Like most printed physics texts, each chapter ends with a series of problems to test comprehension. If that were the extent of *Physics*, there would be little to recommend the program.

However, *Physics* offers much more than any printed text. When you need a new term clarified, just click on it and you'll get an in-depth explanation. Diagrams that would sit lifeless on a printed page come alive and move in this software. What better way to describe motion or acceleration than to demonstrate it graphically on a computer screen? And when the time comes to solve a few problems, *Physics* provides instantly available hints—or even solutions, if necessary. Students willing to study on their own and those who want a little extra assistance with a high school course will find this package an invaluable aid. (Incidentally, under its Sensei label, Brøderbund also publishes two math tutorials—*Calculus* and *Geometry*; the latter is available for the Apple IIGS as well as for the Mac.)

You Don't Need to Be a Weatherman to Know Which Way the Wind Blows

What's the average temperature in Dallas in January? What percentage of daylight hours are sunny in San Diego? How



Bill Bauza teaches at Amsdell Heights Junior High School (Hamburg, New York), where he also serves as chairman of the science department. He uses many different programs with his seventh-grade students, but a special favorite is Brøderbund's Science Toolkit series. He finds it especially effective for classroom demonstrations, but feels it would be quite suitable for home use as well.

His district has the entire set: the *Master Module* and the three add-on kits. The complete system contains light sensors, temperature probes, a balloon-powered car, a seismograph, and a spirometer. That should be enough equipment to keep any teenager busy experimenting for a long time.

Lance Eggleston, a physics teacher at Hamburg Senior High School (Hamburg, New York), combines *Precision Timer*, from Vernier Software, with photoelectric instruments from PASCO Scientific to demonstrate important principles of physics. He and his students enjoy designing their own experiments and using their equipment to verify the physical laws explained in their textbooks.

Eggleston feels that this combination offers greater flexibility and power than some of the more popular programs. He especially appreciates the fact that *Precision Timer* is written in BASIC and can be easily modified to suit any particular purpose.

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many inches of snow fall during an average December in Albany, New York? Mindscape's *Forecast!* can answer all these questions and many more.

Forecast! helps aspiring meteorologists learn about weather and the factors that affect it. The program consists of several useful and enlightening segments. Weather Forecaster, for example, produces a realistic weather prediction based upon current data—temperature, wind velocity, barometric pressure, and the like. Anyone considering a move to a more habitable climate will enjoy Weather Traveler because it quickly provides accurate data on such things as average rainfall, temperature variations throughout the year, and how often the sun shines. Weather Calculator performs weather-related conversions—Celsius to Fahrenheit, knots to miles per hour, and such.

If someone in your family is intrigued by weather, *Forecast!* could be just the gift you've been looking for. It's educational, entertaining, and, for those of us who accept subzero winter temperatures as a necessary evil, very enlightening.

Blinded by Science

As you can see, science software covers a lot of territory. There really *is* something for everyone. Before you rush out and buy software that may not fit your needs, though, remember that not all educational packages work equally well at school and at home.

Home users will be most satisfied with programs that require only a minimum amount of adult supervision. The best educational software for the home appeals to widely divergent age groups and offers enough activities to assure hours of enjoyable use. The wisest approach to selecting the right program is to find something that might appeal to members of your family and then to try it out at a local software dealership.

All this takes time, of course, but the payoff may be worth far more than the investment. The child you inspire today just might be tomorrow's Nobel prize winner! □

David Stanton, *COMPUTE!*'s "Discoveries" columnist, is the computer coordinator for the Bolivar school district in New York.

Summer Science Software

Audubon Wildlife Adventures: Grizzly Bears

Ages 9 and up
Apple II—\$49.95
Apple IIs—\$59.95
IBM PCs and compatibles with CGA or better—\$49.95
Advanced Ideas
2902 San Pablo Ave.
Berkeley, CA 94702
(415) 526-9100

Body Transparent

Ages 10-17
Apple II—\$39.95
Commodore 64/128—\$29.95
IBM PCs and compatibles—\$39.95

Designasaurus

Ages 7 and up
Amiga—\$49.95
Apple II—\$39.95
Apple IIs with 768K—\$49.95
Commodore 64/128 (requires joystick)—\$29.95
IBM PCs and compatibles—\$39.95
DesignWare by Britannica Software
345 Fourth St.
San Francisco, CA 94107
(415) 546-1866

Chem Lab

Ages 9-14
Apple II—\$19.95
Commodore 64/128—\$19.95
IBM PCs and compatibles—\$19.95
Simon & Schuster
One Gulf + Western Plaza
New York, NY 10023
(800) 624-0023
(800) 624-0024 (in New Jersey)

Dyno-Quest

Ages 8 and up
Apple II—\$49.99
IBM PCs and compatibles—\$49.99
MindPlay
3130 N. Dodge Blvd.
Tucson, AZ 85716
(800) 221-7911

Forecast!

Ages 13-18
Apple II—\$59.95
IBM PCs and compatibles (64K)—\$59.95
Mindscape
3444 Dundee Rd.
Northbrook, IL 60062
(800) 221-9884

Geologists at Work

Ages 14 and up
Apple II—\$65.00

The Incredible Laboratory

Ages 8 and up
Apple II—\$65.00
Commodore 64/128—\$65.00
IBM PCs and compatibles (CGA or better)—\$65.00
IBM PS/2 Model 25—\$65.00
TRS-80 Color Computer—\$65.00

Playing with Science: Temperature

Ages 5-13
Apple II—\$99.00
Sunburst Communications
39 Washington Ave.
Pleasantville, NY 10570-2898
(800) 431-1934
(800) 247-6756 in Canada
(914) 769-5030

Operation: Frog

Ages 9-16
Apple II—\$59.95
Commodore 64—\$59.95
Scholastic
P.O. Box 7502
2931 E. McCarty St.
Jefferson City, MO 65102
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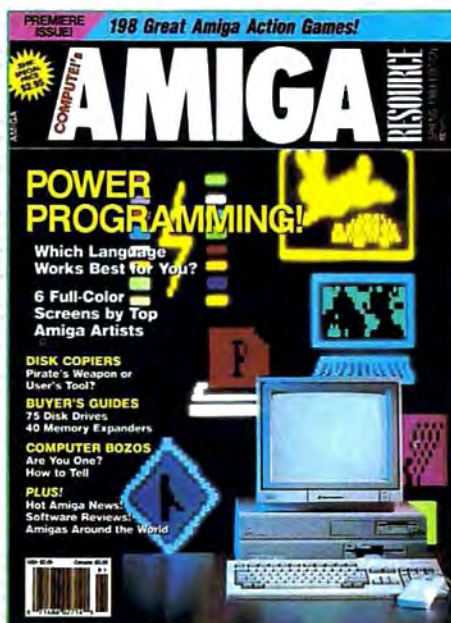
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LIGHT-YEARS AND LASERS

SCIENCE FICTION INSIDE YOUR COMPUTER

Orson Scott Card

What computer game first seduced you? Was it *Asteroids*, as you mastered the technique of flying through space, turning and thrusting?

Was it *Space Invaders*? *Galaxians*? *Star Raiders* on the Atari 800? *Zork*? *Hitchhiker's Guide to the Galaxy*?

What drew you into the games? Was it the strange adventures they let you have? The exotic places they let you visit?

Computers have been tied to science fiction from the start. Back when computers were house-sized behemoths—with fragile vacuum tubes providing a whopping 8K of memory and programs stored on perforated cards—science fiction writers busily invented possibilities for the new technology.

There were stories about computers choosing the president, computers becoming intelligent beings, computers running an intelligent house, computers going crazy, computers that even turned out to be God. Science fiction *loved* computers.



Science fiction games are fun, but are they really science fiction? Award-winning author Orson Scott Card puts 11 games to the SF test.

And computer people loved science fiction. Even though few science fiction writers foresaw the miniaturization that would make *personal* computers possible, the early programmers who first discovered the possibilities of computers had science fiction in their blood.

That's why when some young programmers were playing around with a prototype video display terminal—imagine, a TV screen hooked up to a computer!—one of the first things they invented was a game, and the game was a prototype of *Asteroids*. Science fiction was in their blood.

A lot of these young programming geniuses had cut their teeth on science fiction. Some of them may

have heard about computers for the first time in a science fiction story. Science fiction set them to dreaming, and when they got old enough, they set about making the dreams come true.

Ever since, science fiction has been a strong theme running through the arcades and, later, home computer games.

Games Aren't Books

But are these games *good* science fiction? Yes and no.

I remember 1977, when a friend at work told me about an incredible new movie called *Star Wars*. We all took a long lunch hour (nice boss!) and went to see it. It was wonderful. All the ray guns and blasters and aliens and space battles we had read about in science fiction were up there on the screen. I could finally see it with my own eyes.

None of the hokey cardboard sets and sound-stage planets of "Star Trek," none of the witless writing and talentless actors that had been part of science fiction film and television almost from the start. With *Star Wars*, somebody had finally made a space movie that *felt* real as you were watching it.

We loved it. We raved about it for days afterward.

My friends knew I had sold a few science fiction stories, though none had yet been published. It was almost inevitable that one would say, "Hey, Card, don't you wish you could have written something like *Star Wars*?"

It felt like he'd spit in my face. Write something like *Star Wars*? What a humiliating idea. *Star Wars* was a wonderful *movie*, but it was straight out of 1930s pulp science fiction. *Written* science fiction had outgrown that space-opera stuff decades ago.

That's the way it often is with science fiction games. We love them because they finally give us a chance to act out some of those old science fiction stories. *Asteroids* actually lets us feel how tricky it would be to pilot a ship that moves by rocketry—it can't slow down without turning around. *Star Flight* captures the feeling of exploring where no one has ever gone before.

But compared to good science fiction, they aren't even in the same league. If I can't invent a better alien than those in *Star Flight*, I'm out of business as a storyteller.

The point is, you don't measure games the same way you measure books. They do different things.

A game isn't going to be very good at characterization.



But then, it doesn't have to be, since the hero of the game is the player. The player supplies the character's motivation—game heroes do what they do for the players' reasons.

Nor can you have an intricate, logical plot—not in a *good* game. That's because a game has to give the player options, give the player the power to make choices and carry them out. Games that force you to follow a plot step by step aren't all that much fun the first time, and once you've acted out the story the game designer has forced on you, there's no reason to

go back and play again. So a *good* game has a whole bunch of incidents and adventures, but players discover them in fairly random order. Again, the player supplies the plot.

World Creation

There is an area, though, in which a game can be good science fiction—sometimes better than anything in books or movies. Science fiction writers call it *world creation*.

This doesn't mean simply inventing planets with neat aliens. Look at the movie *Blade Runner*. It takes place in Los Angeles. No aliens at all. But it isn't the L.A. we know. It's set in the near future, and things have changed. Lots of things, moving through the background of the film, give us a powerful sense of being in a strange new place, a place we've never seen before. And yet it feels absolutely real. We believe that the future might be this way, and so we believe in and care about the characters, even though their problems could not even exist in our own time.

Science fiction is the literature of the strange. If the story doesn't differ from the known world in some important way, it isn't science fiction.

The same thing applies to science fiction computer games. They are the opposite of sports games and flight simulators. Instead of letting us act out a real-world activity like playing basketball with Michael Jordan or landing a jet fighter, science fiction games let us do things that can only happen on the computer screen.

Point of View vs. Mapping

Game designers use two strategies to take you through their game worlds. One is *mapping*: You are looking down on the action, watching your player-figure (vehicle or character) move through a flat map of the world. You can see all around your player-figure, to the edges of the screen.

The other strategy is *point of view*: You are seeing the world from ground level in a 3-D display. Far-off things are small; you can't see what's behind a wall until you go around the corner or through a door; and to see what's behind you, you have to turn around.

One strength of mapping is clarity; you know where you are. Also, mapping is very frugal with memory. Maps can be graphically gorgeous (like the planet surfaces in *Sentinel Worlds* or the terrain in *Firezone*), but they do it by repeating certain images over and over again. One symbol always means mountains, while another always means trees.

Point of view, however, attempts to give you movielike immediacy. You're actually seeing things, moving through the world yourself instead of maneuvering a player-figure around on a map. The trouble is that 3-D graphics are slow and they eat up memory in unbelievably large gulps. Each new angle of view

requires a new picture, so you not only have to have a picture of each place, but you also have to have a new picture for every conceivable angle!

The solution is usually to use vector graphics to draw the 3-D display. At a primitive level, this means straight lines to represent the bare walls of rooms, with one view for each of the four cardinal directions. When you turn, you lurch a full 90 degrees at a time.

Space Station Oblivion and *The Colony* both attempt far more ambitious 3-D displays. Instead of having four views of a room, you scroll smoothly through dozens of different angles. The result is very satisfyingly realistic movement. Unfortunately, the cost of this is that you can never get the lush pictorials of mapping, and even on my speed-demon 386 machine, it can be a bit slow.

As long as computers place limits on speed and memory, these tradeoffs are going to be unavoidable. But both strategies have been proven to work well, and some games now move easily back and forth between them—most notably *Sentinel Worlds*, which at one level uses mapping and point of view on top of each other.

And in this area, computer games can be even better than movies and books.

In books, the author can explain to you how this strange new world works, so you understand it; you grasp how and why it's different from present reality. Filmmakers can *show* you strange things—make them seem real because you see and hear them, even if you don't understand. But computer games let you actually *do* things—take part in the strange adventures that take place on the computer screen. That's something that books and movies can never do—and that's why computer games have a valid role within the science fiction tradition. They *can* be good science fiction, not by imitating science fiction books or movies, but by doing an excellent job of what only computer games can do.

What Makes a Game Good Science Fiction?

Strangeness. The game must take us to a place we've never been to before, let us do things we cannot do anywhere else. Not only must the game differ from the real world, but it must also differ from all previous science fiction games. If a game is just a rehash of another, with nothing new to offer, it has no reason to exist.

Experience. There must be lots of detail, lots of things to see and do. The game must transform the act of punching a keyboard or wiggling a joystick or moving a mouse while staring at a screen into a fresh, meaningful, memorable experience.

Depth. The game must give players the sense that the game world goes on forever and that wonderful or terrible things are going on all the time, even in places they never visit.

Rationality. Both people and nature should act in believable ways. Science fiction differs from fantasy in the requirement that natural laws must prevail, that things must make sense. Bizarre things can and should happen, but there should always be some hint that things are happening for a reason.

Options. There should be many possibilities—lots of different things can and will happen. It is important in *all* computer games to give players the feeling that they have choices—that *they* are in control. But it's vital to science fiction games that players never feel that they're being forced into narrow channels without meaningful choices. People love science fiction because it opens up possibilities; it never walls you in.

Playability. A game can't be good science fiction unless it's also a good game, just as print and film science fiction can't be good unless they tell a good story. If it isn't exhilarating to play—or terrifying, or astonishing, or just plain fun—then why should we bother leaving the present world to get there?

When all these things come together in a game, when the game designer allows you to truly be a stranger in a strange land, then the game deserves to take its place as one of the classics of science fiction, along with movies like *Blade Runner* and *Star Wars* and *The Day the Earth Stood Still*, along with books like *The Left Hand of Darkness* and *Dune* and *A Door into Summer*. And just as these books and films are so different from each other that you can hardly recognize them as being from the same genre, so also the best science fiction games will surprise us, will reinvent science fiction even as they fulfill it.

Let's take a look at some of the most recent science fiction games and see how they measure up. To be fair, however, I not only looked at these games myself, but also had my ten-year-old son, Geoffrey, play them all. He isn't loaded down with all this critical philosophy. He doesn't care whether a game measures up to some set of principles. He just wants it to be fun. That makes him sometimes a better critic than I am. So I'll tell you which are his favorites as well as which are mine.

Star Flight

Your crew must discover and explore new worlds to judge their suitability for colonization while you try to solve the mystery of why stars are destabilizing and blowing up—before your home world's star is destroyed.

More than a year old, *Star Flight* deserves its status as the *Star Wars* of science fiction games. Brilliantly designed and programmed, this is the first game to really give you the sense of exploring space. You have tremendous freedom: You don't have to do things in any particular order and you can develop your own style of play.

The depth of creation has always been astonishing. The alien species are different and interesting. Sometimes you have to fight and sometimes you have to run, but usually you can talk your way through encounters. The planets you explore can be dangerous, and no two are alike. It's thrilling to discover the ruins of an ancient civilization, and when you finally find out who the surviving ancients are, I promise it will blow you away—exactly the sort of discovery that can make a science fiction novel unforgettable.

Star Flight remains the standard against which all other space-exploration games must be measured. With superb full-screen graphics and intuitive game controls, it will make you impatient with games that clutter the screen with needless distractions or force you to waste time on tedious repetition. Still, this is not a fast-action game; you have to think, and it takes a long time. It's a mid-list game for Geoffrey—enjoyable, but sometimes discouraging.

Sentinel Worlds I: Future Magic

Sentinel Worlds owes a lot to *Star Flight*—or perhaps Karl Buitter, the game designer, solved similar problems in similar ways. There are fewer worlds to explore, but once you're on a planet, you get to do far more than is possible in *Star Flight*. As you tool around in your all-terrain vehicle (ATV), you run across buildings—so you get out of the ATV and go inside, where an astonishing combination of overhead map and 3-D display lets you explore and meet, converse with, and sometimes fight with other characters.

I have seen no other game, science fiction or otherwise, that matches *Sentinel Worlds* for sheer depth. Buitter has found an almost perfect balance, giving you plenty of choices without bogging you down with complex command structures and tedious repetition. The graphics are colorful and clear at every level; there isn't a moment when the game isn't a pleasure to look at and a pleasure to play. The music is interesting, a genuine movie score—but eventually, *anything* played on the computer's internal tweeter is going to drive me crazy.

Buitter's solutions to programming problems are surprising but exactly right. Game designers are often torn



between the desire to put a lot of information into the game—especially when you're conversing with game characters—and the problem of putting huge amounts of text into memory and onto the tiny screen. Buiuter has put the text into a book of "paragraphs." When you encounter the right character in the game, you are referred to the book to find out what he says.

The paragraphs are believable dialogue, *very* well written (a rarity in games; compare it with the embarrassingly bad writing in the Ultima series, for instance). To keep you from cheating and reading the paragraphs ahead, there are false clues; if you're peeking, you'll end up on wild goose chases that accomplish nothing.

Your sensors immediately peg strangers as hostile or friendly. You can talk to the friendlies and can only fight with or flee from the hostiles. Not too subtle (don't you wish you had a machine like that?), but it's better than just killing anything that moves.

Some of the world creation is medium-dumb: a planet where there are only two seasons—at every latitude? And Buiuter has a rather lackluster sense of naming; he puts lots of unpronounceable letters together to fake alienness instead of developing the sense of a linguistic tradition.

But the game world is big enough to accommodate different experiences, and it doesn't force you into set patterns. You can explore randomly, having the adventures you want to have. I call it the best of the space adventure games, and it placed high on Geoffrey's list as well.

Firezone

This simple futuristic war game has beautiful graphics and simple, intuitive controls. If you've ever played a war game before, you can literally start to play *Firezone* the moment it comes onto the screen. This was obviously one of the game designer's goals: The directions include Quickstart



instructions for those who don't want to bother with thick rule books.

Yet despite its simplicity, *Firezone* is fascinating, with infinite choices in both strategy and tactics. If you play alone, the computer is a tough but fair opponent. If you play head to head with someone else, you can play the same scenario again with vastly different results. And the game includes a construction set, so you can devise more scenarios—though you won't soon tire of the ones that come with the game.

This could have been a World War II simulation; setting it in the future adds little, except that the designer avoids the standard villains. There's none of this us-against-the-Nazis or us-against-the-commies stuff.

As science fiction, the game isn't much, but it's still a fine war game. It is Geoffrey's absolute favorite.

Star Command

This game wants to be *Star Flight* or *Sentinel Worlds*, but it isn't. The setup phase is tedious and too detailed, though there are touches of wit in training crew members.

It isn't just the primitive graphics; the look of the game is certainly adequate, and the screen communicates well. And there's some decent invention in the scenario. The problem is that there's no sense of *experiencing* anything. Mostly you're told about what's going on, and after a short time it seemed to me that it was a text game which consisted of getting assignments from mission control and mechanically going out, doing them, and coming back. I wasn't having fun. Geoffrey did find it playable, though it isn't high on his list.

Wasteland

This game owes a lot to the Ultima series of fantasy games. You move through a map of post-nuclear-holocaust America, entering surface villages and underground dungeons. The world creation is interesting and fun—not just jokes

Creating Characters

Most games that let you assemble a group of characters to take part in your adventures follow the role-playing pattern set years ago by the paper game Dungeons & Dragons. Your characters are different from each other because they have a range of abilities. Some have a great deal of strength but aren't too bright. Some have considerable dexterity and quickness, but they're quite frail and can't withstand much injury.

Strengths in one area mean weaknesses in another—no one character has it all. Thus all the characters in your party are necessary to overcome obstacles and accomplish your goals.

Most of these games follow that basic pattern, but with variations. *Sentinel Worlds*, for instance, lets you choose faces for your characters from a group of pictures. *Star Flight* and *Star Command* require you to put your characters through training before they become reliable in using their skills. *Star Command* amusingly takes you through the ups and downs of your characters' education until they finally get good enough to bring along on your adventure.

Most games use the standard ability groups: strength, dexterity, intelligence, and endurance. *Star Command* adds Esper ability, which serves the role that magical ability serves in fantasy games. *Star Flight* uses categories that apply to specific jobs on your starship: Characters train in areas like medicine,

languages, navigation, engineering, and science.

The benefit of this is that you get the sense that you're playing with well-drawn individual characters. You begin to feel that you know them personally; you're responsible for keeping them from getting killed. The drawback is that spending too much time creating the characters and manipulating them through the game becomes extremely tedious.

This is particularly true in the area of weapons and armor. Maybe some players really enjoy dressing up their characters like dolls. *Star Command* has more weapons options than I ever wanted. But if you're someone who cares about the difference between an LTV Ranger Seeker Missile and an SS-29 Bulldog Missile, go for it.

I prefer the approach of *Firezone*: The game's choices are few, but those choices differ significantly. This is no more limiting than, say, chess, with only a few kinds of pieces that nevertheless allow almost infinite possibilities.

And *Wasteland*, with its full cast of interesting characters, lets you skip character generation altogether. You can use the existing characters and get right into the game, or, if you prefer, you can start from scratch and create your own. I like having that choice.

like mutant bunnies and prairie dogs, but intriguing villages and settlements where you can actually volunteer to help fellow survivors with their work.

It's that real-life element that I liked best. What bothered me was the way you're constantly having to fight the same annoying creatures and pick up treasures in an obvious rehash of generic fantasy adventures. Mutant bunnies can get boring, too, especially when the battles are reported by text instead of happening visually on the screen.

In fact, the science fiction elements are the only virtues of this game: The world is visually and conceptually interesting and I enjoyed exploring it. But the game designer brought nothing new to the actual game itself. This is still a kill-the-monsters-and-get-the-treasure game, without the overarching story that makes each Ultima installment meaningful. Geoffrey and I both enjoyed it at first; both of us got quite bored after a very short time. Devoted fantasy gamers, on the other hand, will probably love this.

Space Station Oblivion

The lame science fiction story here—you have to dig into a lot of places to release "natural gas" to keep a moon from blowing up—is a thinly veiled excuse for what's really a programmer's exercise in 3-D graphics. But once you stop expecting the story to make sense, this is a fun game, as you explore a strange world of geometric shapes. The movement is smooth and believable, and the visual experience of this unnatural world is compelling. There are fascinating puzzles to solve, dangerous enemies, and plenty of wonders to behold, so the game succeeds in some of the goals of science fiction.

It's also full of fast action, which makes it one of Geoffrey's favorites. And it still sticks in my mind as a fascinating experience.

The Colony

David Smith's *The Colony* tries to do the same sort of thing with 3-D graphics that *Space Station Oblivion* attempts, and while the line drawings betray the game's origin on the Macintosh, the graphics are marvelous and I salute the programming achievement.

Too bad it's wasted on a very limited puzzle game that became so annoying and confining for me and Geoffrey that we both gave up in disgust. Your crippled spaceship lands on a planet after a collision with a black hole (scientific nonsense, of course—if you collided with a black hole, you'd never come out). Your job is to figure out how to escape from the ship and get into an underground colony.

You have no options. You must solve puzzles in a certain order—and, to make matters worse, the game designer plays stupid tricks on you. For instance, if you pick up a cigarette from an ashtray, you're told, "Cigarettes are bad for your health," and you die immediately. The lesson? The game will randomly punish you for exploring—yet you have to explore in order to accomplish anything.

There are other annoyances. Anytime you pick up the book to move it somewhere else, when you set it down you have to read the text again. You can move things around on the desk, but if you leave and come back later, everything is back the way it was before. In other words, *you don't make any difference in this world*. You exist in order to do the designer's bidding.

How did this game ever become a "game of the year"?

Only because it originally appeared on the game-poor Mac.

Tower Toppler

In this arcade-style action game, you're a froglike alien, trying to destroy towers by climbing them. There are doors that lead to other doors; you go from level to level using elevators, dodging various opponents. When you reach the top of a tower, it sinks down into the sea. Then you go fishing during a bonus round until you reach a new tower and start over.

The science fiction element is irrelevant, but the game is fun and the graphics are terrific. The smooth animation as you move around the cylindrical tower is delightful, and there's a lot of good animation.

As science fiction, it's fun but shallow. As an action game, it's just plain fun. This was Geoffrey's second favorite.

Captain Blood

Never mind the dumb copy protection (a key disk *and* a once-only hard disk installation). Never mind the incoherent instruction book that keeps referring you from one section to another without ever making sense. *Captain Blood* should have been a triumphant game.

The EGA graphics are gorgeous—though they owe a great debt to H. R. Giger by way of the movie *Alien*. The control panel is fascinating and original. The planet's 3-D surface is craggy and beautiful. Movement is smooth. In other words, the graphics programming is terrific.

And as science fiction, it's pretty good. The story is inventive and intelligent. I especially liked the little fishlike alien that you send down to explore the world for you.

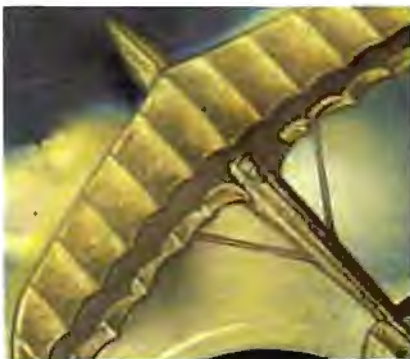
Unfortunately, as a game, this one sucks pond scum. It was almost

impossible even to tell what was going on, what we were supposed to do, and how we were supposed to do it. We couldn't tell what the onscreen signals meant as we tried to land on the planet's surface. We were never told why we crashed. Was it an enemy shooting us down? Did we bump into a rock? And when we did reach our goal, we had no idea what we had done *right*.

Maybe we would have liked later phases of the game. But Geoffrey and I found it so frustrating that we didn't stick around to find out. In fact, Geoffrey blew up the planet—and I removed the game from the hard disk without the uninstall option. We haven't regretted either decision.

Star Saga: One—Beyond the Boundary

This is a game that tries to transcend the limitations of the computer by having much of the action take place on a game board, with the machine serving primarily as game master, doing the housekeeping for a group of human players. The story of the game is wonderfully inventive, and I got far enough into the game to know that it shows great promise. Unfortunately, the game plays best when you have several people playing—and I wasn't able to assemble such a group in time for this article. But *Star Saga* looks like first-rate science fiction and a darn good game. (Later, when I've had a chance to play it with a group, as it's meant to be played, I'll review it at length in my column, "Gameplay.") ▶



Balance of Power: 1990 Edition

This may be the best-designed game ever. It's simple and beautiful, and it uses the Windows environment better than any application I've seen. It is also the most detailed, carefully extrapolated future world I've worked with.

I should love this game. I'm the guy who, in the 1978 short story "Breaking the Game," described a *Risk*-like game in which hundreds of players take part in a deep and perfect computer simulation of recent history. Game designer Chris Crawford has come closer than anyone to making that sort of game a reality.

But when I first played it, it infuriated me. When you push too hard in the wrong situation, nuclear war erupts, and Crawford slaps you with an insulting message about how he isn't going to show you a big mushroom cloud because he doesn't "reward failure." It makes you feel like you're in a college class with a professor who thinks he's God. The fact is, *nobody* knows what will cause a nuclear war because we've never had one, and for Crawford to taunt you because you didn't guess the same way he did is offensive.

Nevertheless, one of the people I respect most picked the game as one of the 20 best games in this magazine [June 1988—Ed.]. I was baffled. So, as I reviewed science fiction games for this article, I resolved to look again.

The game is still brilliant in the way it collects and uses data about the real world—you can practically use it as an almanac. Unfortunately, in simplifying geopolitics, Crawford made some choices that result in absurdities. For instance, if you're playing the part of the President of the United States, you're supposed to sit back and let the Soviets



ets introduce troops into Syria *without protest*. The historical fact is that when the Soviets proposed to do exactly that back in 1973, President Richard Nixon put the U.S. military on alert, and the Russians backed down. In Crawford's world, Syria is vital to the Soviet Union and unimportant to the U.S. In the real world, almost the reverse is true.

Likewise, in the real world, no U.S. President could stay in office if he allowed the introduction of Soviet advisers in Mexico without taking massive countermeasures—and it's

hard to imagine a Mexican government insane enough to try it. But in Crawford's world, resisting such Soviet adventurism often results in nuclear war. Hasn't he heard about the Cuban missile crisis?

When I first reviewed *Balance of Power*, I assumed these absurdities reflected Crawford's political views. Since then, I've come to realize that they probably reflect the limitations of the game program. There are only so many variables that the computer can handle.

So here's my advice. Pretend that *Balance of Power* takes place on an alien planet that through sheer coincidence is divided into nations and continents astonishingly similar to those of Earth, with the same names. So, you must act solely on the basis of what the game tells you about the world. If you do that, you'll find this a deep and powerful game. If you don't, the game will drive you crazy. □

Orson Scott Card is an award-winning science fiction writer, with two Nebula and two Hugo awards to his credit. His novels include *Ender's Game*, *Speaker for the Dead*, and *Prentice Alvin*. His most recent work is a novelization of the movie *Abyss*. His column on computer entertainment, "Gameplay," appears monthly in *COMPUTE!* magazine.

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POWER

HOME COMPUTING

Heidi Aycock, Steven Anzovin, Gregg Keizer, and Peter Scisco

What's it take to be a power user these days? How much can you really pack into your home computer system before the power lines melt? Just when is too much still not enough? Here's how to turn your wimpy home machine into the Bulgarian weightlifter of computers.

Power.

It's the most seductive word in the computing lexicon. Hardware and software makers know this and use the word to tantalize. Apple puts the tag *The power to be your best* at the bottom of each ad; Paperback Software reminds everyone that *Knowledge is Power*.

Home computer users aren't immune to the power plague, either. Just as much as anyone in a corporate tower, we thirst for a machine that sings through spreadsheets, that whips through word processing. We hunger for the most complete, the best-equipped computer system we can afford.

Ah, there's the rub, isn't it? Money. Because we don't have a capital-outlay budget—because it's *our*

money, not someone else's—we have to be careful about how our computer currency is spent. Hard choices are in store for anyone who wants to make a home computer more powerful.

That's what this article is about—hard choices. Deciding that you want a more powerful machine is easy; the tough part is choosing *how* to make that machine a power beast.

We've eliminated some of the guesswork by taking \$1,000 and putting power into three typical home computer systems—an 8088-based MS-DOS computer, a Macintosh Plus (or SE), and a Commodore Amiga 500. And because not everyone uses a home computer for the same tasks, we've shown you more than one route to power computing. More interested in writing than in graphics? Planning on creating the ultimate game system instead of the ultimate database?

Read on. And may the power be with you.

MS-DOS

Five years ago, when you bought your IBM PC or compatible, a *power user* was a gas-station grease monkey with an air wrench. Today, you're still clicking along with 512K of RAM, a monochrome monitor, and two floppy disk drives. But something's wrong.

Every computer magazine you open bristles with the hottest hardware this side of a crooked pawn shop. Face it: You're an 8088 chip in a 386 world, and it's time for a makeover.

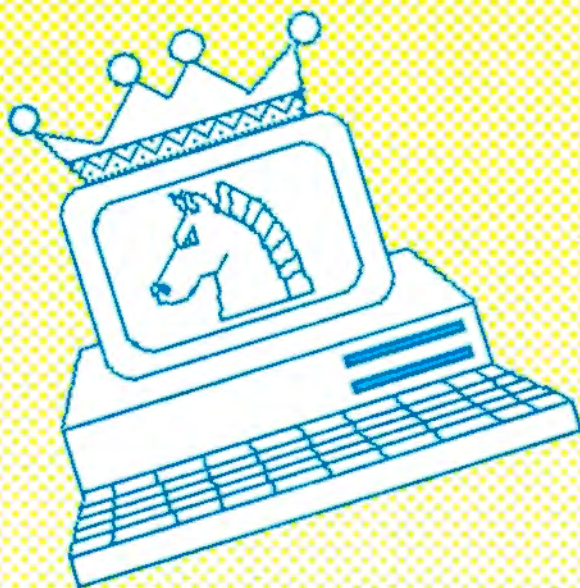
Game Master

If you're a gamer looking to bring your PC compatible up to the level of today's competition, you'll want EGA color, the minimum standard for top-flight gameplay. You'll also want to increase your computer's RAM to 640K and add a game card and a joystick.

The Boca Research EGA by Boca board will give you the colors you need for \$249. The board supports not only EGA, but MDA, CGA, and Hercules standards as well. A scan of mail-order houses reveals no-name EGA cards priced as low as \$145.

Of course your new board is useless without a color monitor. The choices are mind-boggling. Mail-order prices for EGA monitors can be as low as \$325. Mitsubishi's XC1410C monitor lists for \$659, but can be had through the mail for \$375. Samsung's CM4531 display retails for \$349.

That's about \$550 so far. The next step is to boost your PC's memory. For about \$55, you can add two banks of 64K RAM chips (a total of 18) to your computer's motherboard,



Illustrations by Scotty Billings

minimum for today's entertaining memory-munchers. Be sure to buy chips that match the speed of the chips already in your PC. Check the number on your installed chips and use the digits to the right of the dash to determine speed (for example, 4164-15 signifies a 150-nanosecond chip; 41256-08 means it's an 80-nanosecond chip).

To round out your game system, you'll want to pick up a game card with two ports and a decent pair of joysticks (for head-to-head competition). All told, these will set you back about 70 bucks: \$20 for the card and \$50 for the joysticks. With the \$225 you have left, you can buy several of the new games you've been lusting after; or, better yet, you can look for a deal on the **Ad Lib Music Synthesizer Card** (list price, \$195) to replace the wretched warble of your PC.

Your revamped PC will make you the envy of every gamer on your block. Play on.

Pumped-Up Productivity

Time is money, and to make your PC work faster, you need to boost it to AT status with a 286 accelerator board. Either AST's **Hot Shot/286** (list price, \$545; street price, \$355) or Orchid's **TinyTurbo** (discount price, \$279) will replace your computer's 8088 processor with an 80286. Both accelerator boards are fairly simple to install—much, much easier than replacing your PC's motherboard.

To create an even more impressive productivity machine, expand your computer's memory to 640K and then start looking at storage options. You'll want at least a 20-megabyte hard disk (a **Seagate drive and controller** will set you back about \$270 if you

buy mail order), but for only a little more money you can have 50-percent more storage (street prices of 30-megabyte drives are around \$290).

If you have an older PC, it may not have the power to handle the extra storage capacity. Replacing your power supply isn't too difficult, and 150-watt units are available for about \$150 from mail-order dealers. You may also have to upgrade your computer's BIOS

chip, but this, too, is a fairly simple affair; expect to pay around \$50.

Assuming that your power supply and BIOS chip are adequate, you have about \$300 left. For about \$215, you can add two banks of 256K chips to your accelerator board to bring your computer up to one megabyte of RAM. Another \$80 gets you **Deskview**, software to help you manage the extra memory (DOS can deal with only 640K).

But if you've spent the extra \$200 for a power supply and BIOS upgrade, you might consider spending your last \$100 on a modem. You can buy a Hayes-compatible 1200-bps internal modem from a mail-order dealer and still have money left—enough to take your spouse to lunch so you can explain how you just spent \$1,000 on your old computer. Another option is a new keyboard, like the **OmniKey/102**, from Northgate Computer Systems (retail price, \$99), or the **ZEOS/RS** space-saving model, from ZEOS International (\$89.95, retail).

The Artist Inside

Whether composing a symphony, painting the new wave, or launching the next Random House, creative types can benefit from technology that was once the property of hackers and number crunchers. You have several

PC Purchases

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(800) 722-6335

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(714) 863-1333

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Samsung Electronics America

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Voyetra

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Pelham, NY 10803
(914) 738-4500

ZEOS International

530 5th Ave. NW
St. Paul, MN 55112
(612) 633-4591

upgrade options, depending on your artistic bent. Your first step: Boost your system's memory to 640K.

If it's music you're after, you'll want to add a sound board like the Ad Lib or, even better, the Roland MT-32 Multi-Timbre Sound Module, from Sierra. The Roland will set you back \$550 if you buy it at full retail price. That leaves you about \$400 for a MIDI interface like *Midiator*, from Key Electronics (interface, sequencer, and software for about \$130), or *PC/Musicpak*, from Voyetra (retail price, \$249). The rest of the money you can sock away for a sampling keyboard.

If computer art is your passion, then you'll need the cream of display-adaptor technology: VGA. The Video Seven Vega (\$499, retail; \$259, mail order) or another VGA card will get you started. Back your choice with the Amdek Monitor/632 (\$595, retail) or the NEC MultiSynch II (\$949, retail; \$570, mail order). Keep in mind when matching cards with monitors that the display quality is tied to the highest resolution common to both products.

For example, a board that supports a color resolution of 640 × 350 pixels won't drive an 800 × 600 pixel monitor to its full potential. You can save money by matching a lower-resolution board to a comparable monitor. Use your last \$100 for a *Microsoft Mouse* (\$99 from some mail-order houses, including a copy of *PC Paintbrush*).

To make your PC a publishing system worthy of any potential Alfred Knopf, you'll want to add a 20-megabyte hard disk to hold a desktop publishing program and a collection of fonts and art. A mouse will help you design the next Pulitzer winner. You won't be able to afford a full-page display with the \$575 you have left, but you can upgrade your monitor to VGA status if you stick with a crisp, paper-white phosphor display like Samsung's ML4571 (14-inch screen; \$249, retail). After you've paid for a VGA card, you'll still have enough cash left over for a multifunction card that will equip your PC with a serial port (just in case you can spring for a laser printer next year).

— Peter Scisco

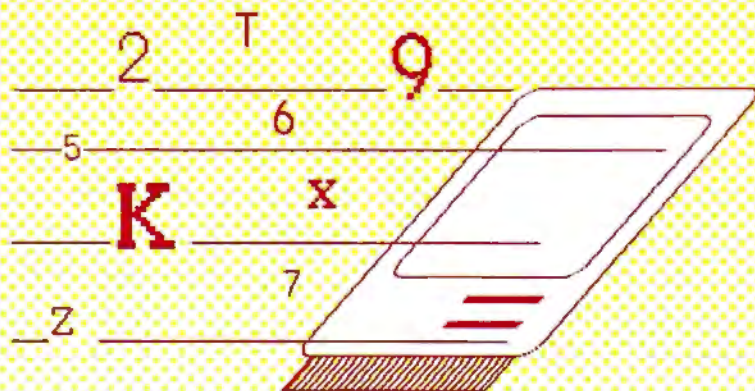
bytes (the most efficient path) will run \$899 from your local Apple dealer, but you can do better by going to a third-party source. *Levco's One-Plus-One*, which turns a Mac Plus into a 2-megabyte machine, costs just under \$400. Taking an SE to 2.5 megabytes costs around \$470 when you use third-party RAM; one source among many is the *Hardware House*, of Philadelphia.

You can also use some of the added RAM to run print spoolers and ram caches. Print spoolers let you keep working with your computer while you print by writing the file to disk or to memory. As you work, the printer retrieves the file, bit by bit, during the tiny increments of time when your computer isn't busy. Some recommended spoolers are *Mainstay's MacSpool* (\$79.95) and *SuperMac's SuperSpool* (\$99.95). Both work with the *ImageWriter*, but *SuperSpool* also works with *LaserWriter* printers. Disk caches store frequently used parts of a program in RAM, which the computer can access more quickly than it can access a disk drive. A disk cache is available via your Mac's Control Panel; if you have more memory, you can simply set aside more RAM for the cache.

Once your Macintosh's memory needs are satiated, you can head for higher-quality printing. You won't find a laser printer for your \$1,000, and the difference between your *ImageWriter* and a 24-pin printer is probably not enough to justify the expense. But you have other options. One printer to consider is the *Hewlett-Packard DeskJet*, an ink-jet printer that retails for \$999 (\$680, mail order). Add a *Grappler LQ* interface (\$149, retail; \$98, mail order), from Orange Micro, and the *DeskJet* prints pages that rival a *LaserWriter* in quality if not in speed. Another ink-jet printer is the made-for-the-Mac *WriteMove* printer, from GCC Technologies. A small-sized printer, *WriteMove* retails for \$699 but requires special paper—something the *DeskJet* can do without.

If topnotch printing isn't a priority, you'll want to spend the rest of your \$1,000 for a hard disk drive. Not only does a hard disk drive hold more than an 800K floppy disk can, but it also can load and save files far, far faster. Just as important is the fact that today's high-octane word processors take up three or more floppy disks, leaving you with some disk swapping to do unless you have a hard disk. Moving up to a hard disk is one of the smartest things you can do to power up your system.

Hard disks come in different capacities; the 20-megabyte size is the most common. A 20-megabyte hard disk holds the equivalent of about 25



Macintosh

You probably thought your Macintosh was powerful enough to last a lifetime. Although it's a highly sophisticated computer—one that includes a state-of-the-art interface and sports more RAM than most MS-DOS machines—it's not, as the saying goes, everything it wants to be. You'll have to make some tradeoffs as you plan your system expansion (don't expect to turn your Mac Plus into a Mac IIx), but with around \$1,000, you can dramatically transform your machine.

Writer's Wonder

Your Macintosh may be a premier writer's tool and a robust word proces-

sor, but it can be even more help to anyone who puts words on the screen if you punch up its power.

Speed, print quality, and more storage are three of the most important things writers demand from a computer. Speed, because time is really money. Print quality, because editors have a nasty habit of not reading illegible print. And more storage, because a good writer is a prolific writer.

The easiest way to boost the speed of your word processor is to put as much of your document as possible into RAM, where it's instantly accessible. Your first step to power writing, then, is to add memory to your Mac. Bumping up your Mac to 2.5 mega-

floppies and costs around \$550. Companies like **Crate** and **Jasmine** sell hard drives at competitive prices.

Spend \$1,000 on RAM and a printer or on memory and a hard disk and you'll ensure your place in the halls of powerful writers.

Superior Spreadsheets, Dynamic Databases

Spreadsheets and databases run best from a hard disk, so that should be the first system enhancement to consider if you're into numbers and lists for your home business. Spreadsheets and databases eat up even more storage space than do text documents, though, so you should consider a larger-capacity drive. A 42-megabyte **LaCie Cirrus** hard drive, for instance, will cost you \$650 direct from the company.

If you want to see more of your spreadsheet or database form at one time, you'll find that a large-sized screen can be of immeasurable help. It's tough to find a name-brand large-screen monitor for your \$1,000, but it's not impossible. The best advice is to scout the mail-order ads and hope for the best. One source is **Icon Review**, which recently advertised a **Cornerstone SinglePage Display** for \$899.

A recently announced alternative to a Macintosh-specific full-sized screen is the **Mobius card** (\$479), from **Mobius Technologies**. Installed in your Mac SE, the **Mobius card** lets you connect hi-res IBM-compatible monochrome monitors to your computer. The benefit, of course, is the drastically reduced cost of such monitors. A 14-inch **NEC Multisync GS** monitor, for instance, runs only \$279 at full retail; \$190, mail order. For less than \$700, then, a **Mobius card/Multisync GS** combination can display about 75 percent more than the standard Macintosh can. That means 75 percent more of your spreadsheet or database is on the screen.

If you're a serious number cruncher and you already have a hard disk, you may be the perfect candidate for an accelerator board with a math coprocessor. Such boards either have a 68000 microprocessor running at a faster speed than the original, or a next-generation 68020 microprocessor, an even faster chip. A 68881 math coprocessor chip speeds up numerical manipulations, making things like spreadsheet recalculations really swift. As with the large-screen monitor upgrade, though, you can afford only this one improvement on your \$1,000 budget. Even then, you'll have to look hard. One possible buy is the **SiClone**

Turbo SE accelerator, a board based on a 16-MHz 68000 microprocessor. The accelerator itself costs \$398, while the 68881 math coprocessor chip runs \$298.

Cheaper tactics, such as ramdisks and disk caches, can help. Follow the guidelines in the previous section if you want to up your Mac's RAM. Even trashing the Finder and switching interfaces can be a boon. Take a look at **CE Software's DiskTop** (\$50, retail; \$27, mail order) or **Fifth Generation's Power Station** (\$60, retail; \$32, mail order); they can free up memory for your applications.

Picture Perfect

Macintosh artists need as much computer speed as anyone does, but they also need high-quality printing, top-notch displays, and a lot of storage space. Trying to decide between increasing the quality of your printing or bumping up your storage capacity is tough. If you work with digitized pictures, you're saddled with enormous files. And most high-powered graphics packages, such as **PageMaker** and

Freehand, require a hard drive. Consider a 40-megabyte (or larger) hard disk if you're active in desktop publishing or computer graphics.

But if you must produce camera-ready artwork, you'll have to find a way to get clear, sharp printouts. Again, \$1,000 is not enough to put a laser printer next to your Mac. Some photocopy shops and typesetting firms can print your Macintosh files on a **LaserWriter** or even on a **Linotronic** typesetter for top-quality output. If you have access to such a service, your best option is to buy a hard drive and more memory. Spending the entire \$1,000 will be easy (\$650-\$700 for a 40-megabyte hard disk and \$400 or so for additional RAM), but you'll have a more powerful graphics station at your beck and call.

For clear, sharp printing *without* going to an outside printer, you can turn to the **Grappler/DeskJet** combination or even the **WriteMove** option. The output rivals that of laser printing, and the cost is much lower.

— *Gregg Keizer and
Heidi E. H. Aycock* ▶

Macintosh Merchandise

Apple Computer

20525 Mariani Ave.
Cupertino, CA 95014
(408) 252-2775

CE Software

1854 Fuller Rd.
P.O. Box 65580
West Des Moines, IA 50265
(515) 224-1995

Crate Technology

6850 Vineland Ave.
Building M
North Hollywood, CA 91605
(818) 766-4001

Fifth Generation Systems

11200 Industriplex Blvd.
Baton Rouge, LA 70809
(504) 291-7221

GCC Technologies

580 Winter St.
Waltham, MA 02154
(617) 890-0880

Hardware House

3440 Market St.
Philadelphia, PA 19104
(800) 356-2892
(215) 386-2208

Hewlett-Packard

18110 SE 34th St.
Camas, WA 98607
(206) 254-8110

Icon Review

101 Reighard Ave.
Williamsport, PA 17701
(800) 228-8910

Jasmine

1740 Army St.
San Francisco, CA 94124
(800) 347-3228
(415) 282-1111

LaCie

16285 SW 85th
No. 306
Tigard, OR 97224
(800) 999-0143
(503) 684-0143

Levco

6181 Cornerstone Court E
Suite 101
San Diego, CA 92121
(619) 457-2011

Mainstay

5311-B Derry Ave.
Agoura Hills, CA 91301
(818) 991-6540

Mobius Technologies

6020 Adeline St.
Oakland, CA 94608
(415) 654-0556

NEC Home Electronics

1255 Michael Dr.
Wood Dale, IL 60191
(312) 860-9500

Orange Micro

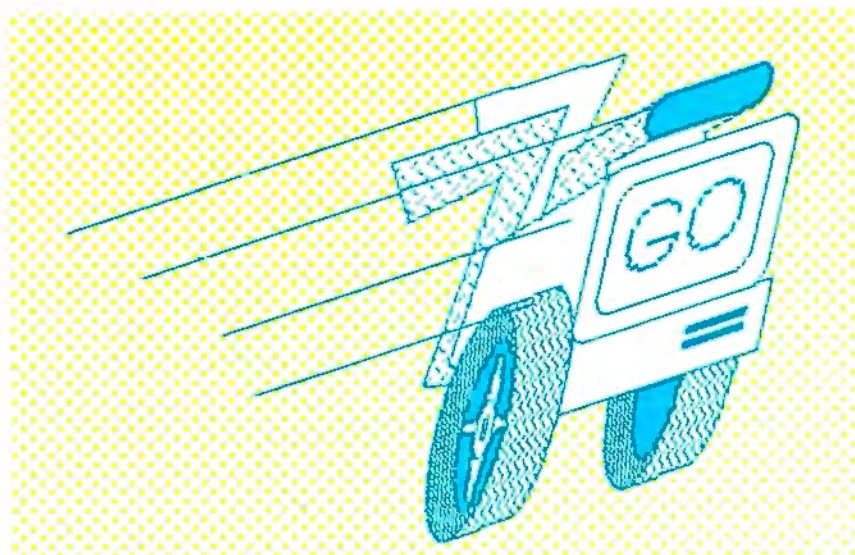
1400 N. Lakeview Ave.
Anaheim, CA 92807
(714) 779-2772

SiClone

1169 Borregas Ave.
Sunnyvale, CA 94089
(408) 734-9151

SuperMac Technologies

485 Potrero Ave.
Sunnyvale, CA 94086
(408) 245-2202



Amiga

The recent explosive growth in the Amiga hardware market has made taking a basic Amiga 500 system—512K computer, single 3½-inch disk drive, and Amiga RGB monitor—to the hardware max a lot easier. For a mere \$1,000, you can build a graphics computer Max Headroom would be proud of. Or put together a home-productivity machine that will give you far-reaching number-crunching and database-sorting capabilities. Of course, there are other possible \$1,000 Amiga additions to cover such uses as music creation, computer-aided design, and even gaming.

Animated Workstation

There are almost 100 many exciting hardware tools for Amiga graphics: Deciding on the add-ons best suited for you can be daunting. Just keep in mind the capabilities you need for *your art*, though, and assembling a system should be simplified.

Before you add any exotic graphics hardware, you'll want to turbocharge your Amiga 500 with additional memory by buying the **A501 512K RAM expansion**, from Commodore (\$199).

You'll also want to add more disk storage with an external floppy disk drive; a good example is the **Master 3A disk drive**, from Oceanic America, widely available for \$160. The extra memory and storage space will make it possible to create super-sized graphics and compile animations without a lot of irritating disk swapping.

Two simple devices can really expand your Amiga's usefulness as a graphics workstation. The **Digi-View Gold video digitizer**, from NewTek (\$200), complete with the **Panasonic WV-1410 monochrome CCTV camera** (\$280; also available from NewTek), lets you capture any external image for later manipulation with a paint or an animation program. Digi-View produces accurate, full-color reproductions of anything you can focus a video camera on. The system is simple and easy to use, and gives far better results than you'd get from any other digitizer on the market. For desktop video applications, nothing beats a genlock, a device for mixing live video and Amiga graphics for taping on a VCR. The basic Amiga genlock of choice is the **Amigen**, from Mimetics (\$179). This small unit is the only low-cost genlock on the market that works with any Amiga. With it,

you can easily put titles and animations on your videos for professional-looking effects.

The total cost of your newfound graphics power is \$1,018. Watch out, Walt Disney!

Amortized Amiga

You may not think of the Amiga 500 as a business dynamo, but it can pack the same productivity wallop you'd get from an AT clone or a Macintosh SE. What the basic Amiga 500 lacks, though, are the hard drives and faster processor speeds that give those machines the clout to eat through big spreadsheets and massive databases.

At the moment, the most efficient way to add mass storage to your Amiga 500 is with the **Impact 20HD/RAM hard drive**, from Great Valley Products (\$795). This external SCSI drive allows up to six more SCSI peripherals to be connected to the computer. With the optional **Autoboot EPROM** (an additional \$100; also from Great Valley), you can start your Amiga 500 directly from the hard disk under version 1.3 of the Amiga operating system. The Impact drive also has room to accept two megabytes of RAM, which you can purchase when and if the price of memory chips descends from its current stratospheric level. (Commodore has promised, and even shown, a combination 20-megabyte hard disk/RAM-expansion unit. Called the A590, it may appear sometime in 1989; its price is undetermined.)

If the 7.16-MHz 68000 microprocessor in your Amiga 500 seems a little poky when you compare it to the 10- and 12-MHz 80286 chips in current ATs, or even to the not-exactly-maxed-out 8-MHz 68000 in a Macintosh SE, how about giving your Amiga a caffeine jolt with a faster processor? Creative Microsystems offers a **68000 microprocessor** (\$200) that runs at 14.32 MHz, double the standard speed. Simply pop out your current 68000 and pop in the faster version for speed increases of up to a theoretical 200 percent. (Opening the Amiga 500 case voids your warranty, but the speed increase is worth it.)

Pumping up your 500 to give it productivity prowess doesn't come cheap, but it shouldn't exceed \$1,100—well worth the numbers when you're crunching numbers.

— Steven Anzovin ☐

Amiga Add-Ons

Commodore Business Machines

1200 Wilson Dr.
West Chester, PA 19380
(215) 431-9100

Creative Microsystems

10110 SW Nimbus
Suite B1
Portland, OR 97223
(503) 620-3821

Great Valley Products

Plank Ave.
Paoli, PA 19301
(215) 889-9411

Mimetics

P.O. Box 1560
Cupertino, CA 95015
(408) 741-0117

NewTek

115 W. Crane St.
Topeka, KS 66603
(800) 843-8934

Oceanic America

P.O. Box 587
Eugene, OR
(503) 741-1222

Heidi E. H. Aycock and Peter Scisco are the assistant editors, and Gregg Keizer is the editor, of *COMPUTE!*. Steven Anzovin writes the Amiga column for the "COMPUTE! Specific" department. All of them want more than \$1,000 to spend on their computers.

buyer's guide

Historical Games



Wish you could be a legendary leader? Want to change the course of history? Can you think of a better way to run the world or win the war? Whether it's hobnobbing with Genghis Khan, rubbing shoulders with Napoleon, or shooting the breeze with MacArthur, there's a historical game in this buyer's guide that's as good as any time machine.

Mickey McLean

The Ancient Art of War

Broderbund
IBM PC and compatibles, Macintosh
Color graphics card required for IBM
\$44.95

Players challenge eight of the greatest military leaders in history—Genghis Khan, Alexander the Great, Sun Tzu, and others. Players choose armies, weapons, battle formations, and strategies. The game features 11 historical and fictitious battles, and new battles can be created. Joystick is optional.

The Ancient Art of War at Sea

Broderbund
Apple II, IBM PC and compatibles, Macintosh
Graphics adapter card required for IBM
\$44.95

In this war-strategy game, enemies include Blackbeard, John Paul Jones, and Admiral Lord Nelson. Players can choose from 11 sea battles or create their own. Battles are fought in realtime. Three levels of zoom bring players right down to the ship decks, and an illustrated guide explains the enemy's strategies and tactics.



In the race against nuclear war, players use diplomatic savvy and military finesse to preserve the safest *Balance of Power*.

Ancient Battles

Scorpion Software
IBM PC and compatibles
CGA required
\$44.95

Ancient Battles is a strategy war game, with several battle scenarios, to be played by two players or one player against the computer. There is also a construction set for creating new scenarios.

The Annals of Rome

Datasoft
Distributed by Electronic Arts
Amiga, Atari ST, Commodore 64, IBM PC and compatibles
\$24.95 (Commodore)
\$34.95 (Amiga, Atari ST, IBM)

As leader of the Senate's ruling party in Rome in 273 B.C., the player controls Roman armies at home and on foreign soil. The play

er must reckon with 13 foreign powers and command 21 Roman officers who vary in their abilities and degree of loyalty.

Balance of Power

Mindscape
Amiga, Apple II, Atari ST, IBM PC and compatibles, Macintosh
\$39.95 (Amiga, Atari ST, Macintosh)
\$44.95 (Apple)
\$49.95 (IBM)

As U.S. President or General Secretary of the Soviet Union, the player has eight years to manage overt and covert actions, insurrections, political deceptions, divisions of troops, and diplomatic relations. During the game, each nation's prestige will rise or fall.

Balance of Power: The 1990 Edition

Mindscape
Amiga, Apple IIs, Atari ST, IBM PC and compatibles, Macintosh
640K required for IBM
\$49.95

This updated version of *Balance of Power* includes more countries, a multipolar orientation, and an updated database. As U.S. President or Soviet General Secretary, the player tries to complete eight years in office. The goal is to avoid nuclear war and to earn prestige. ▶





Battlefront

Strategic Studies Group
Distributed by Electronic Arts
Apple II, Commodore 64
\$39.95

Scenarios for Saipan, Bastogne, Crete, and Stalingrad recreate major land battles of World War II in this game. The player can command either the Allied or the Axis forces. Each side has as many as 60 battalions divided into three divisions. Units include infantry, armor, and antitank units. New games can be created with the game-design kit.

Battlegroup

Strategic Simulations
Apple II, Commodore 64
\$59.95

In this World War II game, the U.S. and British forces meet Hitler's army on the Western Front. The game features most of the weapons from 1943 to 1945, including mortars, tanks, troop carriers, antitank guns, flamethrowers, and bazookas. The computer calculates the hit probabilities for each soldier and weapon.

Battle of Antietam

Strategic Simulations
Apple II, Atari, Commodore 64, IBM PC and compatibles
Color graphics card required for IBM
\$49.95

Robert E. Lee's army meets General George McClellan's forces at Antietam Creek in this Civil War simulation. The basic game has simple rules and options, and it moves quickly. The advanced and intermediate versions require more strategy and use factors such as hidden units and chain of command. Each turn represents 30 minutes of actual battle time.

Battles in Normandy

Strategic Studies Group
Distributed by Electronic Arts
Apple II, Commodore 64
\$39.95

This sequel to *Battlefront* features eight scenarios from the World War II Allied invasion of Normandy and the two months afterward. A map of the Normandy Peninsula and a historical article for each scenario—Omaha, Utah, Sword, Cherbourg, Carentan, Villers Bocage, Goodwood, Epsom—are included. Each scenario may be edited, and new games can be created.

Battles of Napoleon

Strategic Simulations
Distributed by Electronic Arts
Apple II, Commodore 64
\$49.95

Players can simulate almost any Napoleonic engagement on a detailed tactical level. The construction set recreates battles, and player-generated maps and armies can also be used. Scenarios include Waterloo, Quatre Bras, Auerstaedt, and Borodino.

Black Monday

Keypunch Software
IBM PC and compatibles
Color graphics card required
\$9.99

Players can relive the stock market crash of Monday, October 19, 1987. As many as six people can borrow and invest up to \$5 million in 20 different stocks. Investors can compile personal daily reports, speculate on market trends, and identify market patterns.

Blitzkrieg at the Ardennes, 1MB version

Command Simulations
Amiga
1 megabyte required
\$59.95

This enhanced version of *Blitzkrieg at the Ardennes* depicts the World War II Battle of the Bulge. New features include hidden unit movement, a more flexible attack rule, and aerial reconnaissance. New sound and graphics have been added. An upgrade from the 512K version is available for \$10.00. The 512K version sells for \$52.95.

Blue Powder Grey Smoke

Gardé
Apple II, Commodore 64, IBM PC and compatibles, Macintosh
\$49.95

Players fight in the Civil War battles of Gettysburg, Antietam, and Chickamauga. Players must reckon with 11 types of terrain and seasonal changes. Players can choose to view any part of the battlefield in either a close-up or a broad overview.

Carriers at War 1941-1945

Strategic Studies Group
Distributed by Electronic Arts
Apple II, Commodore 64
\$49.95

As task commander, the player locates and sinks enemy vessels in this simulation of World War II Pacific Ocean warfare. There are 31 carriers, 215 other ships in 63 classes, and more than 4000 aircraft in 126 squadrons. Six scenarios are included—Pearl Harbor, Coral Sea, Midway, Eastern Solomons, Santa Cruz, and Philippine Sea. Using a game-design kit, the player can create new battles.

Conflict in Vietnam

MicroProse
Apple II, Commodore 64, IBM PC and compatibles
CGA or EGA card required for IBM
\$19.95

Full-color graphics recreate five battle scenarios of the Vietnam War. The player controls the troop movements, counterattacks, and artillery bombardments. The battles can be replayed as they really happened, or different strategies can be used to try to alter the outcome.

Crusade in Europe

MicroProse
Apple II, Commodore 64, IBM PC and compatibles
CGA or EGA card required for IBM
\$19.95

This war game recreates some of the major land battles of World War II, beginning with the Normandy invasion on D-Day. Players monitor troop movements across maps of France and Germany and wage battles against opposing generals. Battles can be played as they actually occurred, or new strategies can be attempted.

Decision on the Desert

MicroProse
Apple II, Commodore 64, IBM PC and compatibles
CGA or EGA card required for IBM
\$19.95

The player can command either the Allied or the Axis forces in the desert warfare of World War II. As commander, the player controls air strikes, armored battalions, and infantry movement in North Africa from 1940 to 1942. The game features accelerated realtime, graphics, and variable skill levels.

Decisive Battles of the American Civil War, Volumes I, II, and III

Strategic Studies Group
Distributed by Electronic Arts
Apple II, Commodore 64
\$39.95 each

Volume I, *Bull Run to Chancellorsville*, covers six major battles of the American Civil War—First Bull Run, Shiloh, Second Bull Run, Antietam, Fredericksburg, and Chancellorsville. Volume 2 of this historical-war-game series covers five Civil War battles—Gaines Mill, Stones River, Gettysburg, Chickamauga, and Chattanooga. The third game in the American Civil War trilogy features Spotsylvania, The Wilderness, Franklin, Nashville, Atlanta, and Cold Harbor. A graphics editor and war-game construction kit are included in all three packages.

Desert Rats

Scorpion Software
IBM PC and compatibles
CGA required
\$39.95

Desert Rats, a collection of six battle simulations, is set in the North African campaign from 1941 to 1942. The fight begins with Rommel's invasion of Tripoli and ends with the Battle of El Alamein. Maps and historical notes are included with this one- or two-player game. ▶



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2400	\$129.95

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PRINTERS

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SP 1200AS	
RS232	\$189.95
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HR60	\$699.95
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Citizen

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Premiere 35	\$489.95
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Epson

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NX-2400

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\$299⁹⁵



KX-P 1180

The 1180 by Panasonic offers you more than what you might expect in a low cost printer. With multiple paper paths, versatile paper handling, and front panel programmability through the EZ Set Operator panel, the 1180 is an excellent value. The 1180 also features 2 excellent print qualities: Near Letter Quality and Draft, with speeds up to 192 cps in Draft and 38 cps in Near Letter Quality plus crisp, clear graphics.

\$175⁹⁵



Citizen 120 D

If you are seeking world renowned printer performance for your home, look no further than the 120 D. Your data processing needs are handled quickly at a print speed of 120 cps (draft) or 25 cps (NLO). The 120 D features 9 pin dot matrix print quality, standard parallel centronics interface and a 4K text buffer.



\$137⁹⁵

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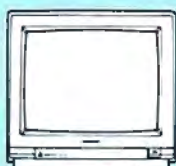
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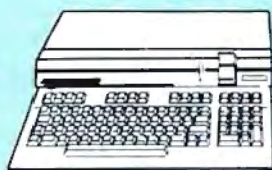
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LASER**Turbo XT Model II**

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CITIZEN**Mate/12 AT**

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

\$1349⁹⁵

Monitor Optional
FCC Class B Approved

**VENDEX[®]****VTI-55-AT**

- IBM AT Compatible with Award Bios
- Small Footprint
- 80286-12 Turbo Processor with 8 MHz or 12 MHz Software Switchable
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- RS232 Serial Port
- Clock Calendar with Battery Backup on Board
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- EGA Graphics Adaptor
- 5 total Empty Slots
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**\$1,199⁹⁵**

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Europe Ablaze

Strategic Studies Group
Distributed by Electronic Arts
Apple II, Commodore 64
\$49.95

The player can be either a British commander during the Battle of Britain or a member of the U.S. Eighth Air Force during the bombing of Germany, planning bombing missions and air defense. A weather system provides variables such as wind strength and cloud cover. There are 37 types of aircraft and 255 squadrons operating from 127 airbases. Three scenarios are included.

Genghis Khan

Koei
IBM PC and compatibles
EGA or VGA required
\$59.95

One to four players build empires in this military, economic, and diplomatic simulation. Features include characters with distinct personalities and two scenarios with five levels of difficulty. Players assume the role of Genghis Khan, Richard the Lion-Hearted, Emperor Alexius III, or Shogun Minamoto of Japan. Once the empire has been built, players must keep the population happy, the treasury full, subordinates loyal, and the enemies down.

Gettysburg: The Turning Point

Strategic Simulations
Distributed by Electronic Arts
Amiga, Apple II, Atari, Commodore 64, IBM PC and compatibles
\$59.95

This war game reenacts the three days of fighting at Gettysburg in 1863. The game features a command-control system to show the effects of the commanders, ammunition points, fatigue rules, and variable reinforcement. Three versions—basic to advanced—are available. The computer can play either side. One or two people can play.

Gold Rush!

Sierra On-Line
IBM PC and compatibles
\$39.95

Players encounter problems as they travel from New York to California, searching for a fortune in gold. Players can choose to sail around the tip of South America, cut through Central American jungles, or ride across the North American landscape. A book detailing the story of the California Gold Rush is included with the package.

Guardians of Infinity

Paragon Software
Distributed by Medalist International
IBM PC and compatibles
512K; EGA or CGA required
\$44.95

In this role-playing text game, scientist Adam Cooper travels back in time to November 1963 and interviews 125 historical characters to prevent President Kennedy's assassination. The game is compatible with Aicom's Accent speech board.

Halls of Montezuma

Strategic Studies Group
Distributed by Electronic Arts
Apple II, Commodore 64, IBM PC and compatibles
\$39.95 (Apple, Commodore)
\$44.95 (IBM)

Letting players join the Marines, this game simulates such battles as Belleau Wood, Iwo Jima, Okinawa, and Inchon. The program features night-capable units, brittle units, reports, AI routines, historical articles, players' notes, and two programs for designing original games.



In *Gold Rush*, treacherous landscape and rough waters mark all routes west in the feverish search for precious gold.

Kampfgruppe

Strategic Simulations
Distributed by Electronic Arts
Amiga, Apple II, Commodore 64, IBM PC and compatibles
Color graphics card required for IBM
\$59.95

In this World War II, Eastern Front simulation, players command German or Russian forces and their respective arsenals of tanks, tank destroyers, self-propelled artillery, assault guns, mortars, and flamethrowers. There are four historical scenarios, and new scenarios can be created. One or two people can play.

Lords of the Rising Sun

Cinemaware
Apple IIs, Atari ST, Commodore 64, IBM PC and compatibles
EGA required for IBM
\$34.95 (Commodore)
\$49.95 (Apple IIs, Atari ST, IBM)

A civil war has begun in twelfth-century Japan. The Taira clan has killed your character's father and subverted the emperor. Players command armies of samurai warriors, defend against ninja assassins, negotiate alliances with other clans, and confront enemies in personal combat. The ultimate object of the game is to become shogun.

MacArthur's War

Strategic Studies Group
Distributed by Electronic Arts
Apple II, Commodore 64
\$39.95

Set during the Korean War, *MacArthur's War* recreates the top battles of the conflict. Players command United Nations or Communist forces against human or computer opponents. Program features include historical articles covering the entire campaign, with battle notes for each scenario; a war-game construction kit; and an icon editor for game customization.

Nam

Thunder Mountain
Distributed by Mindscape
Apple II, Commodore 64
Joystick required
\$14.95

In this tactical war game of U.S. and Allied forces in Vietnam, introductory- and intermediate-level players test their command abilities in six historical scenarios, including the Tet Offensive. Units are rated for strength and effectiveness and are armed with rifles, machine guns, mortars, and rocket launchers. Play lasts from one to four hours for one player.

Napoleon in Russia— Borodino 1812

Datsoft
Distributed by Electronic Arts
Atari, Commodore 64, IBM PC and compatibles
\$24.95 (Atari, Commodore)
\$34.95 (IBM)

Napoleon in Russia recreates the battle of 1812 that changed the course of Napoleon's advance across Russia and eventually led to his overthrow. Players can let the Russians escape, as Napoleon did, or defeat the Russians and see how the war might have changed. Action takes place on scrolling maps recreated from Russian military cartography.

Nobunaga's Ambition

Koei
IBM PC and compatibles
EGA or CGA required
\$59.95

Set in sixteenth-century Japan, *Nobunaga's Ambition* combines aspects of a war game with a role-playing adventure. Players assume the role of Nobunaga Oda, who tried but failed to take over the nation. Nobunaga must successfully rule during war and peace. From one to eight players may play either of two scenarios at five different levels of difficulty. >



The Oregon Trail

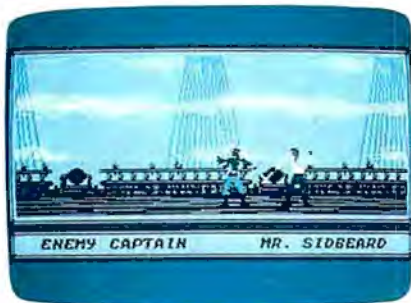
MECC
Apple II, IBM PC and compatibles
CGA required for IBM
\$39.95

The Oregon Trail reenacts the journey of settlers traveling from Independence, Missouri, to Oregon in the nineteenth century. Players cross rivers, fend off grizzly bears, ration supplies, and repair covered wagons. The program is designed to help players practice and sharpen problem-solving skills.

Overlord

Scorpion Software
Atari ST
Color monitor required
\$39.95

Overlord is based on the Max Hastings book of the same name. Players can control six different countries in this recreation of the invasion of Normandy on June 6, 1944.



In *Pirates!*, players learn the essentials of a successful seafaring life—fencing, sailing, cannon firing, and courtship.

Patton vs. Rommel

Electronic Arts
Commodore 64, IBM PC and compatibles,
Macintosh
\$14.95 (Commodore, IBM)
\$19.95 (Macintosh)

Players assume the role of either General George Patton or Field Marshal Erwin Rommel as these two World War II military leaders meet in battle on D-Day in Normandy. There are 20 kinds of tactical orders, and each division can handle up to 32 different orders at a time. After orders have been issued, players watch the battle progress. The generals may even appear on the screen to evaluate the players' strategies.



Pirates!

MicroProse
Apple II, Apple IIgs, Commodore 64, IBM PC and compatibles, Macintosh
\$44.95 (Apple, Apple IIgs, Commodore, IBM)
\$59.95 (Macintosh)

In the role of captain of a seventeenth-century pirate ship, players search the Caribbean for treasures, Spanish ships, and cities to plunder. They develop skills in sailing, sword fighting, battle tactics, trading, and navigation. More than 70 graphics scenes and pictures include a map of the Caribbean. Difficulty levels vary.

President Elect—1988 Edition

Strategic Simulations
Apple II, Atari ST, Commodore 64, IBM PC and compatibles
Color graphics card required for IBM
\$14.95

Three players simulate any presidential election from 1960 to 1988, using a roster of 71 candidates and statistics. Candidates are rated on social, economic, and foreign policy as well as public image. Players alter the election's outcome by varying economic and political factors. Fictional candidates may also be created. For grade 5 through college level.

Ram

Avalon Hill
IBM PC and compatibles
Color graphics board
\$30.00

One player can recreate the naval battles in the Mediterranean Sea during the Peloponnesian War. The player commands the ancient Athenian navy against the Corinthians and Spartans. Five scenarios can be played in realtime.

Rebel Charge at Chickamauga

Strategic Simulations
Distributed by Electronic Arts
Amiga, Apple II, Commodore 64, IBM PC and compatibles
Color graphics card required for IBM
\$49.95 (Apple, Commodore, IBM)
\$59.95 (Amiga)

Players can test their strategies by recreating the battle at Chickamauga Creek. The battle takes place on a 64 x 54 square-grid map, and players can switch between strategic and tactical displays. The conflict is played in 13 turns, with each turn representing two hours of realtime. Introductory, intermediate, and advanced game levels are included.

Road to Moscow

Game Designers' Workshop
Commodore 64
\$40.00

Players relive World War II in Russia through five strategy games, including the invasion of and fight for Poland. The object is to take and hold key Russian cities before the computer or an opponent can accumulate reinforcements. Ten levels of difficulty and random events ensure that no two games play alike.

Romance of the Three Kingdoms

Koei
IBM PC and compatibles
CGA or EGA required
\$69.95

Romance of the Three Kingdoms is a military, economic, and diplomatic simulation set in second-century China. The program merges a war game with a role-playing adventure. This game for one to eight players features 255 distinct characters and five scenarios detailing the struggle for control of China.



As many as eight players can join in the struggle for control of second-century-China in *Romance of the Three Kingdoms*.

Rommel Battles for North Africa

Strategic Studies Group
Distributed by Electronic Arts
Apple II, Commodore 64
\$39.95

This war and strategy game allows players to recreate eight of the major World War II battles between General Erwin Rommel and the Allied forces in North Africa, including Syria, Cauldron, and Tebourga Gap. A construction kit can be used to create new scenarios. This game is the fourth sequel in the Battlefront series.

Russia: The Great War in the East, 1941-1945

Strategic Studies Group
Distributed by Electronic Arts
Apple II, Commodore 64
\$39.95

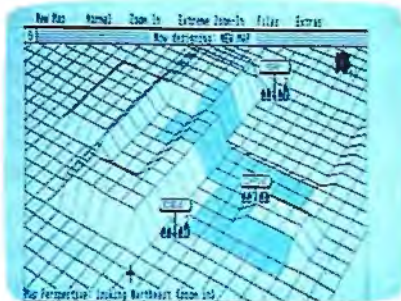
Players command the Russian Red Army or the German Wehrmacht in this simulation of the World War II conflicts on the Eastern Front. Each army has up to seven divisions and three theaters. An economic system provides replacements, reinforcements, rail repair, and Western Front forces. Three shorter scenarios—Leningrad, Stalingrad, and Kursk—are also included.



The Seven Cities of Gold

Electronic Arts
Apple II, Atari, Commodore 64, IBM PC and compatibles, Macintosh
\$14.95 (Apple, Atari, Commodore, IBM)
\$19.95 (Macintosh)

Players assume the role of a Spanish explorer from 1492 through 1540, seeking out the Aztec and Inca cities. Over 2800 screens represent the different worlds to explore. Players can generate computer-drawn maps as they explore sixteenth-century North, South, and Central America.



Players can fight in five historic battles and design new 3-D battle grids when they play *The Universal Military Simulator*.

Shiloh: Grant's Trial in the West

Strategic Simulations
Distributed by Electronic Arts
Apple II, Commodore 64, IBM PC and compatibles
\$39.95

In 15 turns, this game recreates the Confederate Army's surprise attack on General Grant's Union forces. The terrain of Shiloh is displayed on a 30 x 30 square-grid battlefield, and all the brigades and artillery are included. Play can be switched between strategic and tactical display. The program has three levels of play.

Sons of Liberty

Strategic Simulations
Distributed by Electronic Arts
Apple II, Commodore 64, IBM PC and compatibles
Color monitor required
\$34.95 (Commodore)
\$39.95 (Apple, IBM)

Three major battles of the Revolutionary War are recreated in this simulation: the Battle of Bunker Hill (the easiest of the three), the Battle of Saratoga (a turning point in the war), and the Battle of Monmouth (the battle that proved George Washington's abilities). In Solitaire mode, the computer can direct one side or both sides. Each game has three levels of difficulty.

Tsushima

Avalon Hill
Apple II, Commodore 64
\$30.00

Set in the Russo-Japanese War of 1905, *Tsushima* recreates ship battles on both strategic and tactical levels. The strategy game involves sightings and battles, with ship-to-ship maneuvers and combat. In the tactical game, each side selects a fleet drawn from the 29 ships available. One or two people can play.

Under Fire

Avalon Hill
Apple II, Commodore 64, IBM PC and compatibles
Hercules or color graphics card required for IBM
\$59.95 (Apple II)
\$34.95 (Commodore, IBM)

This World War II simulation contains three maps of Europe, nine scenarios, and a map-maker disk. The computer can control the U.S., German, or Russian armies, and it allows simultaneous movement. The armies are divided into ten-person squads, which are rated by weapons and quality of training.

The Universal Military Simulator

Rainbird
Amiga, Apple IIs, Atari ST, IBM PC and compatibles, Macintosh
\$49.95

This game reenacts five historical battles—Gettysburg, Arbela, Hastings, Marston Moor, and Waterloo. Players can use the built-in

editor to design new maps, the order of battles, objectives, and what-if scenarios. Battles take place on a 3-D grid system so the player can view the field from any angle or zoom in on an area. Digitized sound accompanies the play. Two additional scenario disks, *The American Civil War: Scenario Disk One* and *Vietnam: Scenario Disk Two*, are also available for \$19.95 each.

Vulcan

Scorpion Software
IBM PC and compatibles
CGA required
\$39.95

Vulcan is a simulation of the Tunisian campaign from 1942 through 1943. Features include five different scenarios and a special hidden-movement option. Players control five different armies—three Allied and two Axis.

Wooden Ships & Iron Men

Avalon Hill
Commodore 64
\$35.00

Wooden Ships & Iron Men recreates the tactical actions of the era of the Napoleonic Wars and the American Revolution. The battles include the *Bonhomme Richard* versus the *Serapis* and *The Constitution* versus the *Guerrière*. Players can also recreate 20-ship skirmishes such as the Nile, Chesapeake, and Trafalgar battles. One or two people can play.

Publishers of Historical Games

For more information about the historical games listed in this buyer's guide, contact the publishers listed below.

Avalon Hill
4517 Harford Rd.
Baltimore, MD 21214

Broderbund
17 Paul Dr.
San Rafael, CA 94903

Cinemaware
4165 Thousand Oaks Blvd.
Westlake Village, CA 91362

Command Simulations
297 N St.
Bldg. #3
Hyannis, MA 02601

Datasoft
Distributed by Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404

Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404

Game Designers' Workshop
P.O. Box 1646
Bloomington, IL 61702-1646

Gardé
8 Bishop Ln.
Madison, CT 06443

Keypunch Software
1221 Pioneer Bldg.
St. Paul, MN 55101

Koei
20000 Marine Ave.
Suite 100
Torrance, CA 90503

MECC
3490 Lexington Ave. N
St. Paul, MN 55126-8097

MicroProse
180 Lakefront Dr.
Hunt Valley, MD 21030

Mindscape
3444 Dundee Rd.
Northbrook, IL 60062

Paragon Software
Distributed by Medalist International
A division of MicroProse
180 Lakefront Dr.
Hunt Valley, MD 21030

Rainbird
3885 Bohannon Dr.
Menlo Park, CA 94025

Scorpion Software
19 Harbor Dr.
Lake Hopatcong, NJ 07849

Sierra On-Line
P.O. Box 485
Coarsegold, CA 93614

Strategic Simulations
1046 N. Rengstorff Ave.
Mountain View, CA 94043

Strategic Studies Group
Distributed by Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404

Thunder Mountain
Distributed by Mindscape
3444 Dundee Rd.
Northbrook, IL 60062

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MS-DOS

Choosing a PC mouse used to be simple: You bought Microsoft's mouse or Logitech's. But the increasing popularity of the mouse with PC users has created a hotbed of competition. After Microsoft introduced its new, streamlined mouse last year, everyone seemed to be releasing new mice, many emulating Microsoft's Dove bar look.

Logitech, which made the three-button mouse popular, has just introduced a three-button, high-resolution mouse with a sleek new look (Logitech, 6505 Kaiser Drive, Fremont, California 94555; 800-231-7717; \$139). Besides its new look, the Logitech mouse shares two important features with Microsoft's newest offering: It has a short button travel and its trackball has been moved from under the palm to near the front.

The curvaceous shape of the new Logitech mouse may take some getting used to, especially if you're familiar with the traditional, wedge-shaped Logitech mouse. The new mouse doesn't support your hand with ridges on the buttons and grooves on the side the way Logitech's previous C7 did. And the new Logitech isn't happy with just any mouse pad—in fact, the only pad it works well with is a hard-surfaced pad such as the MouseTrak L/F (930 Dow

Dell Lane, Saint Helena, California 94574; 707-963-8179; \$11.95). But on the right surface, this mouse is fast and surefooted.

Perhaps the biggest threat to the dominance of Microsoft and Logitech in the mouse market is Key Tronic. Famous for its high-quality keyboards, Key Tronic recently introduced a new 200-dpi, high-quality two-button mouse (P.O. Box 14687, Spokane, Washington 99214; 509-928-8000; \$119). The Key Tronic mouse is shaped something like Microsoft's, but it's larger and will probably fit a large hand better. Key Tronic shows a conservative bent when it comes to trackball location: It places the trackball directly under the palm. Another interesting feature is the raised nubs on the left mouse button. The left button gets the most use, and these nubs make a good nonslip surface for your index finger.

The Key Tronic mouse has a solid feel, with just the right weight and resistance. And it glides effortlessly across almost any surface. The button travel is a little longer than Logitech's (which many people may prefer), and it has just the right amount of resistance.

If you're interested in buying a mouse, it's best to try a variety of the devices and decide which is best for you. But if you don't have an opportunity to go comparison-shopping and you want a two-button mouse, you can't go far wrong with Key Tronic.

SideTalk

Background telecommunications can certainly take the sting out of uploading and downloading. While your computer burns up the phone lines transferring files in the background, you can work undisturbed in another applica-

tion in the foreground.

Invisible Link (see this column in the February 1989 issue) is a good, basic package that uses less than 30K, but it does have some limitations. It has no script language, it supports only XMODEM Checksum and CRC error-checking protocols, and it doesn't get along very well with other memory-resident programs.

At the other end of the spectrum from *Invisible Link* are high-powered, industrial-strength programs such as *Relay Gold*, *Mirror III*, and *BackComm*. Unfortunately, the power of these heavyweights comes at a price: Each uses about 200K of RAM when operating in its memory-resident, background mode.

Between *Invisible Link* and the big guns is *SideTalk* (Lattice, P.O. Box 3072, Glen Ellyn, Illinois 60138; 800-533-3577; \$119.95). In its default configuration, *SideTalk* uses about 75K, supports an array of communications parameters, offers speeds ranging from 300 to 9600 bps, and sports a powerful BASIC-like script language that can handle complex communications. *SideTalk* supports not only XMODEM Checksum and XMODEM CRC protocols, but also the staples of the BBS world, YMODEM and YMODEM BATCH. And the program has ANSI emulation (though unfortunately, it doesn't support ANSI color).

In its background mode (the program can also be used as a one-time command), *SideTalk* performs flawlessly: It doesn't crash your system, it works well with other memory-resident programs, and it completes transfers without muss or fuss. I tested *SideTalk* with a variety of foreground and memory-resident programs, including Borland's *SideKick*, and experienced no problems. In fact, I even loaded and unloaded *SideKick* from memory while *SideTalk* was downloading in the background—*Side-*

Talk didn't miss a byte.

Background communications is only half the *SideTalk* story. *SideTalk*'s powerful script language is an excellent partner for the program's background ability. The language is so complete that you can even write games in it. More to the point is the fact that you can write your own simple, single-user BBS in less than 20 lines of code. An example that's easy to customize is included with the package.

There's very little to complain about with *SideTalk*. The manual contains a lot of useful information, but it also contains some errors, and, though the number for the Lattice BBS (which offers technical support and files for downloading) is included in the autodial directory, the number is incorrect. These minor reservations aside, *SideTalk* is a winner. If you're interested in communicating in the background, don't overlook it. It may be as close as we're going to get to an ideal background telecommunications program.

Still the King

Peter Norton built his reputation on *The Norton Utilities*, but he has never been content to rest on his laurels. Each new release of *The Norton Utilities* has introduced new programs and new features. If you trace the changes in the *Utilities*, you can see the evolution of the average PC user.

When *The Norton Utilities* was introduced, the rank-and-file PC user was technically oriented and probably had some programming skill. The first edition of *The Norton Utilities* was intended for a techie group. As the PC market matured, more and more non-technical people started using the machines. There was a need for software that would perform critical disk chores but be easy to use. Each new version of *The Norton Utilities* has addressed more of these users.

The Norton Utilities, version 4.5 (Peter Norton Computing, 100 Wilshire Boule-

vard, 9th Floor, Santa Monica, California 90401-1104; 213-319-2000; Standard Edition—\$100, upgrade—\$25; Advanced Edition—\$150, upgrade—\$39), is the easiest of the *Utilities* to use yet. Almost every program in the package has had at least a minor facelift, and several new programs have been added.

The Norton Utilities Advanced Edition's new offerings include File Date and Time, Norton Control Center, Safe Format, Norton Disk Doctor, and a book, Norton Trouble Shooter. And all the utilities now work with DOS 4.0 and DOS 3.3's extended partitions.

In the flurry of new features, it's easy to miss 4.5's big news, which is NDD—the Norton Disk Doctor. This is an automated disk-test-and-repair program that performs more than 100 tests on your disk's logical and physical structure.

Norton Disk Doctor can be operated in two modes: quick and complete. In quick mode, NDD is like a super-version of CHKDSK. It analyzes your disk's logical structures: the boot record, the FAT (File Allocation Table), and the directories. This series of tests is quick enough to run every day.

If you specify the complete switch, in addition to performing the logical tests, NDD tests every sector on your disk for data integrity. If bad sectors are found, the program moves the data to a safe location and marks the sectors as bad. This test is similar to but more thorough than Disk Test (familiar from previous editions of *The Norton Utilities*). NDD takes quite a while to run a complete test.

You can run NDD either interactively or as a command line option. Peter Norton's technical support suggests that you run NDD with the quick switch every day to catch logical problems before they become critical and that you run either NDD with the complete switch or Disk Test every week to insure the physical integrity of your disk. If you're thinking of upgrading to *The Norton Utilities* 4.5, NDD alone is worth the price.

— Clifton Karnes

64 & 128

A few columns ago I took SSG's Ian Trout to task for an announcement he made in *Run 5* (SSG's house magazine). He said that the 64 was in a state of demise and that SSG would probably stop supporting it.

Well, Trout leads off the latest *Run 5* editorial with an apology for what he wrote, reassuring his readers that all of SSG's new games, including the Napoleonic system and the new World War II command-level system, will indeed be released for the 64. This is excellent news, because SSG's games grow stronger all the time. If you haven't tried an SSG war game, start off with one of the Decisive Battles of the American Civil War volumes (\$39.95), with the superb *Reach for the Stars*, third edition (\$39.95), or with *Halls of Montezuma* (\$39.95).

Contact SSG at 1820 Gateway Drive, San Mateo, California 94404; (415) 571-7171.

Fun Fare

New games have been released on several fronts.

From Mindscape (3444 Dundee Road, Northbrook, Illinois 60062; 312-480-7667) comes *Willow* (\$29.95), the game based on the unsuccessful movie. Excellent graphics and good gameplay (as well as support for fast-load cartridges) can't hide the fact that the movie was flawed, but as a game it's pretty good. Mindscape has also released the

long-awaited *Uninvited* (\$34.95). This program uses the same game mechanics found in *Deja Vu*, and its plot is every bit as absorbing. With *Deja Vu 2* around the corner, you'll probably want to get through *Uninvited* as quickly as possible. But take your time; it's worth it.

Sega (of videogame fame) is now releasing games in Commodore 64/128 format. *Alien Syndrome* (\$29.95), available now, is an arcade shoot-'em-up with well-executed graphics and good game speed. Sega games for home computers are distributed by Mindscape.

Mastertronic (a division of Virgin Mastertronic International (711 West 17th Street, Unit G9, Costa Mesa, California 92627; 714-631-1001) has released a computer rendition of *Shogun* (\$9.99), the epic novel by James Clavell. Your goal is to become the military ruler of Japan. Although Mastertronic calls the package an interactive novel, it's mostly just good, fast arcade action. *Trilogy* (\$14.99), another Mastertronic release, offers a trio of graphics-and-text adventures—Venom, Kobayashi Naru, and Shard of Inovar. In an interesting twist, the games come on floppy disks—one side for the 64 and the other for MS-DOS.

Melbourne House (a division of Virgin Mastertronic International (711 West 17th Street, Unit G9, Costa Mesa, California 92627; 714-631-1001) has converted *Barbarian* (\$29.99) to the 64/128 format. A graphics masterpiece in the Amiga and Atari ST formats, this Psygnosis release takes full advantage of the 64's capabilities. As a barbarian warrior seeking to destroy the evil Neron, you move through the underground world of Durgan. You'll find this game addictive. The monsters are interesting and the interface works well.

In contrast to the worlds of fantasy and the worlds of the past, consider the world of hockey. Electronic Arts (1820 Gateway Drive, San Mateo, California 94404; 415-571-7171) has released *Powerplay Hockey* (\$24.95), which pits the United States against the Soviet Union. A fast-moving

arcade game, *Powerplay* combines solid graphics with reasonably accurate gameplay to produce a contest that's especially fun between two players. The problem is that hockey is one of the most difficult team sports to simulate properly, but EA has managed to capture a good part of the feeling of a game always on the verge of chaos.

128 Only

Here's some good news for Commodore 128 owners. If you bought your 128 under the impression that 128-specific software would be plentiful and quick to arrive, you've probably been quite disappointed. One of the 128's major selling points is its total compatibility with the 64, a point that's worked more against the 128 than for it: Because the 128 is also a 64, there is very little reason for publishers to develop software tailored specifically for the 128.

Berkeley Softworks (2150 Shattuck Avenue, Berkeley, California 94704; 415-644-0883) is one of the publishers that has made its packages available for the 128. GEOS 128, *geoCalc 128*, *geoFile 128*—all have been released for the machine, with considerable appreciation by 128 users. Each program costs \$69.95. Timeworks (444 Lake Cook Road, Deerfield, Illinois 60015; 312-948-9200) is another publisher with a strong line of 128-specific products, offering *Word Writer 128* (\$49.95), *Sylvia Porter's 128 Personal Financial Planner* (\$49.95), and several other packages available in different versions for the 64 and 128. For many companies, though, the 128 is given only lip—or, in this case, boot—service. A few games autoboot on the 128, but otherwise they are no different from the 64 versions.

Some new packages add to the 128-specific category, though. Free Spirit Software (58 Noble Street, Kutztown, Pennsylvania 19530; 215-683-5699) has recently released three titles, all exclusively designed for the 128. In fact,

these packages go so far as to require not just a Commodore 128, but a 128 with a mouse, the 64K video RAM chips, and an RGB monitor. In other words, you need a top-of-the-line 128 or, better still, a 128D. The 128D already has the video chips in place, and many of these computers are sold with the 1084 monitor. All three programs support the 1750 RAM expansion unit and the 1581 3½-inch disk drive.

Spectrum 128 (\$39.95) is a paint program complete with an interlace option for those who own multisync monitors or high-persistence monitors. The package lets you draw and color several classes of shapes—boxes, circles, polygons of various kinds, spheres, donuts, cylinders, and spools. You can adjust shading and lighting, and you can work with individual pixels. You can access 16 colors in high resolution and 128 colors in low resolution.

Sketchpad 128 (\$29.95) is a drawing program that uses the 128's video capabilities to let you draw smoothly curved objects. Rays, boxes, circles, arcs, and lines are available, and you can load *Print Shop* graphics directly. The Lock command is a strong feature that saves your picture to memory while you experiment with it and then lets you bring it back intact if you wish.

News Maker 128 (\$29.95) is an easy-to-use desktop publishing package designed for newsletters, signs, posters, and the like. The package includes almost 50 fonts and five preset page formats with different column layouts. Using pictures from *Basic 8.0* or *The Print Shop*, along with text created on a notepad, you can pour words into columns and wrap them around graphics.

Because the company supports the 128's superior capabilities and because its programs aren't copy-protected, Free Spirit deserves commendation.

But Berkeley Softworks isn't left out of this 128-specific discussion. Following close on the heels of version 2.0 of GEOS for the 64 comes version 2.0 of GEOS 128. The same improvements found in the Commodore 64 upgrade have made their way to the 128 version. *geoWrite 2.1* and

geoPaint are more powerful packages, with more impressive features. GEOS now includes *geoSpell* for accuracy, *geoMerge* for mail-merging, *geoLaser* for printing on an Apple LaserWriter, and *Paint Drivers* for converting non-graphics files into *geoPaint* format.

In other words, Berkeley has answered the criticisms made by the host of GEOS users. Given the 128's 80-column mode and its larger memory, GEOS becomes a superior product. The program's added support of the 1750 RAM expansion unit and the 1581 disk drive make GEOS 128 a serious productivity program. Even the problem of system lockup, which some users have complained about with the original GEOS, seems to have largely disappeared.

— Neil Randall

APPLE II

School kids know this criminal. She's been followed by more children than the Pied Piper. Carmen Sandiego, infamous star of *Where in the World Is Carmen Sandiego?* (as well as two sequels, *Where in the U.S.A. . . .* and *Where in Europe . . .*), has been eluding students for years, all the while teaching them about geography, history, and cultures. But now Brøderbund's popular educational series puts on a finer set of clothes for the Apple IIgs. A IIgs-specific *Where in the World Is Carmen Sandiego?* works like the original but looks so much better that

it's a crime if you have to play the old version.

The plot remains the same: Track down one of Carmen's minions (or Carmen herself) by using clues scattered around the globe. You search for evidence, decide where to investigate next, and jet from city to city in your pursuit of these pilferers of national treasures.

Carmen's success has always depended on tricking children into thinking that they're having fun when actually they're learning about geography, culture, flags, and more as they practice using a reference book (*Where in the World . . .* puts the 1989 *World Almanac* in the box). The IIgs version of *Where in the World Is Carmen Sandiego?* retains this trait and adds terrific graphics, mouse support, and pull-down menus to make learning even more fun.

Although the graphics are a peripheral part of gameplay (they simply illustrate your present location), their quality ups the ante in Apple educational software. More important to the pursuit of Carmen and her gang, however, are the dossiers on disk and the program's mouse support. The mouse makes menu selection simpler, and with the gang's files on disk, kids hardly need to crack open the documentation to pinpoint the guilty party.

Where in the World Is Carmen Sandiego? retails for \$44.95. For more information, contact Brøderbund at 17 Paul Drive, San Rafael, California 94903; (415) 492-3200.

Dinosaurs in Town

Kids and dinosaurs are nearly inseparable. Take a quick peek into most kids' rooms and you'll find at least one dinosaur. Classrooms aren't immune, either; posters and stickers of the terrible lizards are everywhere. Computer software publishers haven't let this fascination of the little for the large go untapped. From *Designasaurus to Dinosaurs Are Forever*, educational software packages have made

stegosaurus, brontosaurus, and tyrannosaurus rexes major monitor stars.

A new entry in the electronic dinosaur category is an entertaining and educational program called *Return of the Dinosaurs* (American Educational Computer, 7506 North Broadway Extension, Suite 505, Oklahoma City, Oklahoma 73116; 800-222-2811; \$39.95).

Your friend, Professor T. Rex, has invented a time transporter, but the machine has malfunctioned. To save your hometown, you must identify and collect the dinosaur that's slipped through a crack in time. In a process that's reminiscent of the Carmen Sandiego series, you track down clues by going from place to place and by talking with the townspeople who have seen the beast. You move through four separate screens, combing Main Street, the Museum Park, the Museum itself, and the nearby countryside as you hunt for your next informant. With \$60 in your pocket, you head out to converse with Sergeant Prime Evil in the police station; talk to Dinah, the rural mail carrier; and even gab with Auntie Sedit. The clock is ticking, though, and you've got to find the dinosaur and zip it back in time by the end of the week. You can walk from place to place or, to save time, spend money and take a taxi or bus.

Press Control-N to call up your notebook; then enter the clues you've uncovered. How large is the dinosaur? What does it eat? Does it walk on four legs or two? When you've gathered a few clues, you can use the Dinofile, a database of 70 dinosaurs, to determine the dinosaur's exact name, the period in which it belongs (so you can return it), and where it lived. The Dinofile is the heart of the package, for it's there that children learn how to access a computerized database and extract information from it.

Return of the Dinosaurs offers passable graphics and meager sound so that it can run on the lowest-common-denominator Apple II system—a 128K IIe or IIc (and an Apple IIgs in IIe mode). Sound and graphics are good

enough to hold a kid's interest, though. One plus is that the package contains both 5¼-inch and 3½-inch disks.

Using dinosaurs as its bait, *Return of the Dinosaurs* makes kids think through a problem; by showing children how to use a database, the program helps them find the facts to solve that problem. *Return of the Dinosaurs* doesn't have a computer publishing juggernaut's advertising budget behind it, but it deserves a look by teachers and parents.

Up and Down

Although Apple II sales during the 1988 Christmas season—typically the time of year when Apple pushes computers hardest at consumers—were off nearly 50 percent from 1987, software sales last winter were up significantly.

Figures released by the Software Publishers Association, a collection of 440 leading software publishers, show that Apple II software sales were up nearly 20 percent during the last three months of 1988 when compared to the same period in 1987. Leading the increase were sales in the desktop publishing category, up almost 130 percent. *Print It!*, from Timeworks; *Springboard Publisher*, from Springboard Publishing; and *geo-Publish*, from Berkeley Software, are the front runners in the category.

Not far behind was the integrated software category, which increased by 102 percent. The release of Claris's *AppleWorks GS* during the quarter undoubtedly played a major role in the sales jump, since the category only grew by 5 percent for all of 1988. *AppleWorks GS*'s release may also have affected word processor sales, which dropped by 9 percent—*AppleWorks GS*'s word processing module is arguably its strongest feature.

Educational software went up 17 percent, while game programs crept up only 4 percent. The big losers were graphics packages; that category dove 25 percent.

For all of 1988, however, Apple II software sales were

flat, crawling up only 4 percent (in fact, when inflation is taken into account, Apple II software sales probably declined slightly). Yet Apple II owners can take comfort in the fact that things are worse for someone else: Commodore 64 software sales grew by only 0.8 percent during the year.

Micro Fun

Home computer users are always on the lookout for good software at bargain prices. When you're spending your own money on Apple II software, you want the most for your dollar.

One source of inexpensive but still worthwhile educational software is Scholastic Software, the publisher of a unique series of disks called *Microzine* and *Microzine Jr.* Long a staple in many classrooms, *Microzine* and *Microzine Jr.* make the transition to the home with ease. If you have kids and an Apple II computer in your house, check these out.

Microzine is aimed at kids ages 9 and up, while the newer *Microzine Jr.*'s audience is children ages 6 to 9. Each issue of *Microzine* and *Microzine Jr.* includes four programs, either on two 5¼-inch disks or on one 3½-inch disk. A booklet offers instructions and tips as well as program-related activities teachers and parents can do with their kids.

One recent issue of *Microzine*, for instance, included a certificate creator, a delightful (and fast-paced) math game based on percentages, a visual-discrimination program much like those what's-wrong-with-this-picture pages in children's magazines, and a graphics adventure story in the Twistaplot series. A sample *Microzine Jr.* issue offered a mask maker, a Twistaplot adventure where kids take on the identity of various African animals, a robot simulation that mimics the game twenty questions, and a graphics screen where children locate inappropriate objects.

Both *Microzine* and *Microzine Jr.* use a menu system to select programs and the issue's other features, which

range from Letters to the Editor to disk-formatting selections. The menu, while helpful, isn't the slickest around. For instance, you have to use the arrow keys to move the pointer, even if you have a mouse.

The proof is in the programs, though, and, on that count, *Microzine* and *Microzine Jr.* are definitely a parent's good buy.

Home versions of *Microzine* and *Microzine Jr.* run \$32.95 an issue (five issues are produced in a school year). To find out the current price of a year's subscription, contact Scholastic at 2931 East McCarty, P.O. Box 7502, Jefferson City, Missouri 65102; (800) 541-5513.

— Gregg Keizer

AMIGA

Who would have thought that Commodore Business Machines would ever become the darling of Wall Street? Well, that's what's happening, as analysts scramble to explain the company's recent financial success. Earnings for 1988 were up 74 percent over 1987, sending the price of Commodore stock to a four-year high that even beat Apple's current stock price. Sales of Amigas and Amiga peripherals accounted for about 40 percent of the profits, and Commodore's PC-compatible line brought in about 20 percent of the bacon. The rest was mainly from the Commodore 64 and 128, which, despite their aging technology, show no sign of imminent demise because of

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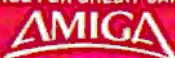
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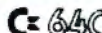
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their immense software base. The company has broadened its dealer base to 1500, about twice as many dealers as last year. And a new president, Mehdi Ali, has taken the reins, although Irving Gould remains chairman and undoubtedly still wields the real power.

While a number of market analysts have been recommending Commodore stock as underpriced, many others are still struggling to catch up with the new Commodore image. Three years ago Commodore was nearly in receivership, with its creditors operating the company by proxy. Some ill-informed Wall Streeters apparently have Commodore pegged as a toy manufacturer, probably confusing it with Coleco. As a reader of this column, you have a definite advantage over these market pros, since you know Commodore for what it really is. If you like to play the stock market, now might be a good time to give Commodore a hard look.

So what is Commodore going to do with its newfound wealth? Among the things I'd like to see is a complete overhaul of AmigaDOS, Intuition, and the Workbench look and feel. It's not enough to have the only multitasking operating system—the Amiga operating system should be internally consistent, carefully detailed, easy to access and program, attractive to look at, and above all, bulletproof. Operating-system redesign, more than new hardware or new marketing efforts, will convince corporate buyers that the Amiga is a serious computer. Better quality control on Commodore products and a responsive customer-service operation would go far in that direction also.

Register your own opinion by contacting Commodore Business Machines, 1200 Wilson Drive, West Chester, Pennsylvania 19380; (215) 431-9100.

Dateline: AmiEXPO

The New York AmiEXPO show (March 3–5) looked like the biggest Amiga-only show

ever held in the United States. Attendance was larger than expected, the hubbub was deafening, and the place was so crowded that it was hard to squeeze from one aisle to the next.

And this was without any visible support from Commodore or many of the other major players in the Amiga market—Commodore didn't even have a booth. Gale Wellington, Commodore's General Manager for Worldwide Software and Product Support, said in her keynote address that this was because there were too many conflicting shows before and after AmiEXPO. But the rumor is that Commodore has an unspecified grudge against the AmiEXPO organizers.

Video professionals were hobnobbing with artificial-intelligence mavens, performance artists with regional sales reps, while roving gangs of teens—hapless dads in tow—were blitzing every game on display, especially *Space Harrier*. Excitement over the Amiga's creative capabilities was palpable everywhere. Crowds gathered around the latest killer demos, such as Chris Williamson's Walker Demo II, NewTek's science-fiction demo reel, and Glen Graham's glistening *Sculpt-Animate 4D dragon*.

Amiga hard drives, scarcely to be seen at last year's New York AmiEXPO, were in evidence all over the floor. Great Valley Products (225 Plank Road, Paoli, Pennsylvania 19301; 215-889-9411) showed a complete line of external and internal drives, including a 44-megabyte SCSI removable media drive (\$1,299 for drive, and \$139 for the storage media), a first for the Amiga. Interactive Video Systems (15201 Santa Gertrude Avenue, Y102, La Mirada, California 90638; 714-994-4443) also displayed a range of fast, autobooting controllers and hardcards for the A2000/A2500. The IVS cards looked especially sturdy and cleanly designed.

New genlocks were popular, too. The trend is toward pro-quality genlocks that integrate into superformat systems. Communications Specialties (89A Cabot Court,

Hauppauge, New York 11788; 516-273-0404) showed its Gen/One (\$895), a professional genlock/keyer/encoder that's both NTSC and Super-VHS compatible. The Scanlock Model VSL-1 (VidTech International, 2822 NW 79th Avenue, Miami, Florida 33122; 305-477-2228; \$995) is similarly capable, with the addition of front sliders for fade control. It also comes in a PAL version (\$1,095), compatible with European video standards.

There was plenty of new software to be seen and tested. Haitex Resources (208 Carrollton Park, Suite 1207, Carrollton, Texas 75006; 214-241-8030) showed *Adrum* (\$79.95), a nice drum machine capable of loading up to 26 sound samples. Another music program, *M* (Intelligent Music, 116 North Lake Avenue, Albany, New York 12206; 518-434-4110; \$200), is a full-featured, realtime MIDI sequencer with an unusually powerful pattern editor. *M* looks to be one of the hottest Amiga music programs of 1989.

If you looked around, you could also find new business software. *Project Master*, from Brown-Wagh (16795 Lark Avenue, Suite 210, Los Gatos, California 95030; 408-395-3838; \$195), is a well-thought-out and easy-to-use graphical project-planning tool. You define the various tasks and goals of your project, name your resources, and estimate how much money and time each task will take. Then *Project Master* graphs the best way to organize the project and provides complete time, resource, and cost breakdowns at each stage. A program like this can be usefully applied to any complicated job, like writing a large software program, producing a film, or managing a production run on the shop floor.

A Lot of Elan

The best new graphics program at AmiEXPO was *Elan Performer*, from Elan Design (P.O. Box 31725, San Francisco, California 94131; 415-621-8673; \$59). *Elan Performer* is a

utility program that displays all kinds of Amiga graphics, including IFF, HAM, RGB, ANIMs, and RIFF animation files. A program like this really comes in handy when you have many different kinds of images to show, but you don't want to carry around the application programs used to create the graphics. Assign picture or animation files to keys on the keyboard by clicking a simple keyboard diagram; to play the slide show, press the chosen keys. The show also can be automated. ANIMs can be played forward and backward at various speeds by moving the mouse. *Elan Performer* always keeps your memory as full of graphics as possible, so disk access during a show is held to a minimum.

Elan Performer offers basic animation capabilities as well. You can sequence images and use the program to compile them into an ANIM or RIFF animation. *Elan Performer* even tells you which animation file format produces the smallest file, and then it lets you choose the best format. Use the control screen to synchronize your show with music or other events. The screen gives you precise control over timing, duration, and looping of each image. *Elan Performer* is one program that every Amiga artist should own.

— Steven Anzovin

MAC

Next time you're in the grocery store, check the produce section—you may find Macintosh and Apple II computers

nestled among the fruits and vegetables. Apple has joined with grocery chains around the country to offer computers in exchange for cash-register receipts.

By January, the program had attracted 504 grocery stores and about 7000 schools. Students collect as many receipts as possible in a 26-week period and trade them for Apple components. To get an ImageWriter, for instance, schools need \$65,000 worth of receipts. To get a Macintosh Plus, they need \$185,000 worth. Participating supermarket chains are located all over the country, from Michigan to Florida, from Nevada to Virginia.

The giveaway is John Connelly's idea. His company, J. Edward Connelly Associates, develops incentive marketing campaigns. Connelly buys the computers from Apple at a discount and then sells them to the supermarkets. The supermarkets expect boosted business as a result of their participation. Some have reported sales increases of as much as 10 percent.

If you're interested in starting an Apples-for-the-Student movement in your community, join forces with a supermarket chain that serves your area and contact Peter Jarvis or George Pittel at Service Marketing Group, 300 Garden City Plaza, Garden City, New York 11530; (516) 747-7111.

Magic Lessons

Programming may not be the most popular activity among Macintosh owners, but its magic is strangely compelling to thousands. Creating just the right spells and incantations can be difficult, though, so Symantec has released a package for the programmer's apprentice in all of us.

Just Enough Pascal (\$75) is a Pascal programming tutorial that works with *THINK's Lightspeed Pascal*, from Symantec. By showing you how to build a program step by step, *JEP* teaches you about programming logic, Pascal commands, Macintosh-specific

routines, and *Lightspeed-specific* debugging. You may open *JEP* as a novice, but you'll close it knowing enough to write your own applications.

The tutorials are stored in a desk accessory. Choose *JEP Instructions* from the Apple menu and you'll find a hypermedia system with buttons for program assembly instructions. Other buttons take you to explanations of concepts and tinkering sessions for experimenting with the code.

Just Enough Pascal is a terrific teacher. If you have a little programming background, you'll be surprised at how well the lessons explain tough concepts. Each variable type, each function, each program unit is explained carefully with detailed, practical examples. If you have no programming experience, you'll never know how hard it can be to grasp some of the necessary information, because Symantec's program makes it fairly easy.

Although *Just Enough Pascal* is specific to *THINK's Lightspeed Pascal*, that's not a real drawback. *Lightspeed* is a particularly good Pascal compiler with excellent debugging tools.

Nothing makes programming a snap except a perfectly logical mind. For most of us, only practice and experiments will improve our skills. So don't be surprised if the information in *Just Enough Pascal* isn't instantly transparent—that's simply not the nature of programming. If you want to learn the magic of the Mac, though, you can get a good start with Symantec's package.

Contact Symantec at 135 South Road, Bedford, Massachusetts 01730; (617) 274-4800.

Holy Writ

If you don't have *The Macintosh Bible*, get it. The book gathers together a wealth of information about the Mac: tips, ideas, hints, and mini-reviews that help you choose new products and make better use of old ones.

Not a book to be read straight through, *The Macin-*

tosh Bible, Second Edition is best used as a reference when you think there must be a better way to do something. It's organized by topic—Fonts, Page Layout, Utility Programs, and so on. If you're wondering whether there's a way to close all open windows at once, for example, look in the "Tips about Windows" section in the "Basic System Software" chapter. Sure enough, it's there: Just hold down the Option key as you click in the close box of an active window to close all other windows, too.

If you're an old hand at the Macintosh, you may find the book too elementary at first glance. It is, however, one of the few places you can find all this information under one cover. You'd have to search bulletin boards, join user groups, peruse CompuServe, and subscribe to most of the Macintosh magazines to reproduce the work that Arthur Naiman and his crew have done in *The Macintosh Bible*.

The Macintosh Bible (\$28) is published by Goldstein and Blair, Box 7635, Berkeley, California 94707; (415) 524-4000. The price includes two free upgrades to keep you up-to-date with important changes in the Mac world.

Or Not to Upgrade

When is an upgrade not an upgrade? When you don't need it.

Apple has described the latest upgrade to *HyperCard* (version 1.2.2) as a maintenance release, and many of its new features won't apply to home users. Version 1.2.2 offers improved display and printing of Japanese, Arabic, and other characters, for instance, and provides CD-ROM drive support for international users and A/UX compatibility.

Doesn't sound too interesting, but surely some home users could use these new offerings.

HyperCard 1.2.2 does fix some minor bugs from earlier versions, and the new version also has improved sound capabilities. Of particular interest to you may be its improved

operation in low-memory situations. If you have a one-megabyte Mac, *HyperCard* 1.2.2 is a good upgrade for you.

Apple calls this version an optional update, and U.S. customers aren't required to upgrade. If you're interested, the update is available from all registered Apple dealers.

Under the Apple

When they're stored as desk accessories, applications take on a new character. Word processors under the Apple menu become handy scratch pads with text-manipulation capabilities. Databases under the Apple become easy-access fountains of information. Generally, desk accessories aren't as feature-packed as stand-alone programs in the same genre, but they offer enough for people who have only an occasional need for the application.

Preferred Publishers has released two such packages: *DAtabase* and *Vantage*. *DAtabase* is as good an information manager as most of us need. *Vantage*, on the other hand, really can't replace your word processor. (But then, your word processor probably can't replace *Vantage*, either.)

Although its reporting features are limited, *DAtabase* offers many useful functions. Using a *HyperCard*-like interface called *DAtabase Builder*, that's part of the package, you create forms that look like cards. Besides graphics tools, *DAtabase Builder* offers basic text fields, calculated fields, check-box fields, and pop-up menu fields.

Once you've designed the look of your database form, you quit *DAtabase Builder* and start up *DAtabase* from the Apple menu. From there, you can enter, browse, sort, and search for your information. *DAtabase* stores text and graphics, so you can catalog clip art and other pictures as well as phone numbers and addresses.

Too bad *DAtabase Builder* isn't more closely linked

with its parent, *Database*; you'll probably want to adjust the form once you start entering data.

Vantage is a good desk accessory for people who share text files with other computer formats. As a mini-word processor, it can't compete with something like *QuickLetter*, but as a utility for stripping control characters, sorting text lists, adding line numbers, and editing text, it's a good package. Even if you perform these tasks only a few times each year, you still may want a program to do the dirty work. *Vantage* will clean up cheerfully.

Database retails for \$129.95; *Vantage*, for \$99.00. For more information, contact Preferred Publishers at 5100 Poplar Avenue, Suite 706, Memphis, Tennessee 38137; (901) 683-3383.

— Heidi E. H. Aycock

ATARI ST

Wouldn't it be nice if you could switch between two programs at a moment's notice? One way to do this is to use *Juggler 2*, from MichTron (576 South Telegraph, Pontiac, Michigan 48053; 313-334-5700; \$49.95).

The package actually includes two programs. The first is the original program, called *The Juggler*. It displays several programs in separate windows at the same time. To switch between the programs, you just click on the window containing the program you want. While *The Juggler* is handy, it doesn't work with programs that don't follow the rules for

programming under GEM.

Juggler 2, the other program in the package, works with many more programs. Depending on memory, as many as eight partitions can be set aside, each independent of the others. To switch between the partitions, simply press Shift and Alternate simultaneously. The partitions can contain either GEM or TOS programs, and these programs can even be in different resolutions on a color monitor.

The first time you switch to a partition, that partition is booted to the desktop with any programs or accessories that you have in your AUTO folder. By naming boot disk folders AUTO1, AUTO2, AUTO3, and so on, you can customize the partitions and what automatically appears in each. The desktop layout of each partition can also be customized by placing a DESKTOP.INF file in the AUTOX folder.

You may find two small glitches in *Juggler 2*. The JUGGLER2.PRGM file must be the last to run from an AUTO folder; however, even then, JUGGLER2.PRGM doesn't run all the programs ahead of it when booting a partition after it's been added to an existing AUTO folder. The problem is easily solved: Simply delete the AUTO folder and rebuild it by dragging files to it in the exact order that they should run in.

The desk accessory *Universal Item Selector II* (mentioned in this column in the February 1989 issue) caused *Juggler 2* to crash repeatedly. Oddly, though, *UISII* didn't cause this crash when used inside *Multi-Desk*, perhaps because the accessory is loaded after *Juggler 2* in this configuration.

Another switching solution is *Revolver* (Intersect Software, 2828 Clark Road, Suite 10, Sarasota, Florida 34231; 800-826-0130; \$49.95). *Revolver* allows you to separate your ST's memory into partitions of 256K or more. The partitions can be different sizes and offer different resolutions on a color monitor.

Cycling through the different partitions takes just a keystroke. A partition can be rolled out—saved to disk in a compressed format—or rolled in—retrieved from disk. The

first time you access a partition, it's booted from disk. Pressing Reset reboots only the current partition, leaving the others alone. You can even view one partition while in another partition.

The package includes a reset-proof ramdisk, a print spooler, and a disk I/O buffer, all of which will survive a warm boot.

A control-panel button gives you access to a screenful of file functions, such as copy, rename, move, and delete. The control panel also lets you adjust such items as key-click control, key repeat on/off, bell on/off, mouse speed, and time and date settings. A built-in VT52 emulator is also included, along with a timed automatic reminder to roll out a partition. You'll also find a fix for the famous 40-folder bug (this bug crashes the ST after you've accessed 40 folders).

The one problem with *Revolver* is that you can't perform certain operations on the partition you're in, so you must first switch to another partition. The control panel, however, doesn't tell you which partition you're in and will let you choose the active partition or even a nonexistent partition.

Bloody Games

There's nothing delicate about *Technocop*, from Epyx (600 Galveston Drive, Redwood City, California 94063; 415-366-0606; \$39.95). In this graphically violent game, you play a police officer of the future. In the first segment you drive your car down a winding road. If you're feeling nice, you can avoid enemy cars and motorcycles, but if you're feeling belligerent, you can run them off the road or blast them with your guns. The game ends when your vehicle becomes damaged (by running off the road, ramming a tree, and so on).

In the second segment, you arrive at a crime scene. You enter a building and, under a time limit, try to apprehend the criminal. You can duck, jump, use elevators, and defend yourself in the quest for

the miscreant, whose presence is monitored on a wrist-mounted radar.

As you move through the building, various toughs assault you with axes, whips, knives, and other instruments of mayhem. Blasting them with your .88 Magnum reduces them to a quivering pile of bloody bones. You must also avoid blasting innocent bystanders. This game is loaded with gratuitous violence and is not recommended for the squeamish.

Accessorize

The six-desk accessory limit of the ST has become a problem as larger memory configurations become more common. A variety of all-in-one desk accessories have been marketed to address this problem, but they share one drawback: You may not need everything that such packages offer, but you still have to sacrifice the memory required for the whole package even if you only need one or two of the tools offered.

Yet another ST desk accessory limitation is that the accessories are set when you boot up and can't be changed unless you reboot.

Codehead Software (P.O. Box 4336, North Hollywood, California 91607; 213-386-5735) intends to change all that. Its *Multi-Desk* (\$29.95) is a remarkable utility that circumvents the ST's desk accessory problems.

Multi-Desk lets you access as many as 32 desk accessories from a single slot in the Desk menu. (And because *Multi-Desk* can occupy more than one of these slots, the number of desk accessories is virtually unlimited.) Further, *Multi-Desk* lets you load and unload accessories at any time. Configuration options allow you to store accessories in a folder, load a slate of desk accessories at boot-up, and reserve memory. You can even run *Multi-Desk* as a regular program—just change the extension—so you can run desk accessories from the Desktop the same way you run regular programs.

— David Plotkin □

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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.

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GAMES

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GRAPHICS

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



CURSOR MODE SCI PG00 10 1 81

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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.

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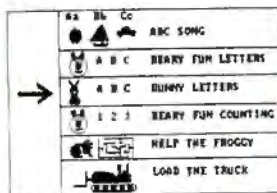
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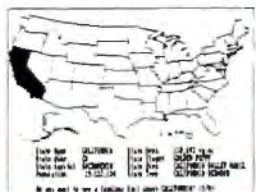
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AMY'S FIRST PRIMER

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////// **fast
looks**

Tool DOS, Tackle Toons, Lounge with Larry, Explore College, Tread Softly, Hit and Stick, Play the Angles, Zone Out, Create Cartoons, Share a Story, Write It Up, Build a Town, and More

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.

Kings of the Beach

Kings of the Beach is volleyball the way volleyball was meant to be, save that you play it on your computer—spikes, sun, and sand from California and Hawaii to the beaches of Australia.

Using some complicated joystick controls, you have a choice of three serves, three offensive plays, and a defensive block. You can also use a mouse or the keyboard to control the game, but the joystick is best. Seldom can you return a ball on the first hit, so you really get a feel for the pass/set/spike strategy used by competitive teams.

The court appears 3-D and is hard to get used to at first. But if you learn to follow the ball's shadow you'll gain an edge. Spiking the ball onscreen is almost as hard to master as it is on the court. It's a matter of timing: Jump at the wrong time and you'll hit the ball out of bounds or miss it entirely.

Luckily, you don't have to face your opponents cold. A visit to the practice courts will hone your skills—and you'll need the drill. This tough game demands that you start out easy. You can always increase the difficulty later.

If you're itching to put your fingers on leather and your feet in the sand, this game's for you. Don't forget the sunscreen.

—HA

IBM PC and compatibles—\$39.95
(\$44.95 for a package with both a 5¼-inch version and a 3½-inch version)

Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404
(415) 571-7171

Apple II Video Overlay Card

Desktop video may be the newest buzzword in the computer business, but the phrase is just phosphor on the screen unless you have the right equipment. Until recently, that left the Apple IIe and IIGS out of the picture. Not any more.

Acting essentially as a genlock card, the new Apple II Video Overlay Card fits inside an Apple IIe or IIGS and accepts video input from a VCR, video-disc, video camera, or television. It then synchronizes these video signals with the Apple II so that you can superimpose Apple II graphics on the video pictures. Immediate uses for such a card might include titling the video you shoot at home or in the classroom or combining computer animation you create with a program like *Cartooners* with a video of the new baby gamboling about the living room.

The Overlay Card dramatically improves the video signal that leaves the Apple II, ensuring that what goes out is just as crisp as what goes in. Special *VideoMix* software makes it a snap to control the mixing of video and computer graphics. And a variety of already-available software is compatible with the Overlay Card, including such first-rate Apple IIe and IIGS packages as *Deluxe Paint II*, *Fantavision*, and *Art & Film Director*.

If you're trying to marry these two technologies—computers and video—a

genlock board is a must. And for the moment, Apple's Video Overlay Card is the only card game in town.

— GK

Apple IIe and IIgs—\$549
Apple Computer
20525 Mariani Ave.
Cupertino, CA 95104
(415) 996-1010

Project Firestart

Since it's been called "a horror movie in space," you can probably guess which film *Project Firestart* took as inspiration. Inexorable, insatiable creatures are loose on a space station. You have to stop them.

You arrive at the station, aware only that something is very wrong. Immediately, you encounter carnage of the most gruesome sort: severed limbs, blood-splashed walls, rooms carpeted with corpses. This is not a game for the squeamish or the very young.

The rest of us can have grim fun exploring the large, multilevel station, unlocking its secrets, walking its long corridors, looking for lurking monsters. Pay attention—your life depends on it.

While you're armed with lasers and can find other weapons, your most important tool is your wits. By accessing computer records, for example, you can uncover the creatures' tolerances and vulnerabilities. If you're quick, you can manipulate station systems to produce deadly traps.

Cutaway scenes enhance the game's cinematic feel. Graphics and animation are well realized, and the soundtrack is excellent. Documentation is slight, but a few minutes with the game should familiarize you with most of its conventions.

This is an entertaining, if unspectacular, program that succeeds at what it sets out to do—put you in a horror movie in space.

— KF

Commodore 64/128—\$29.95
Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404
(415) 571-7171

MenuWorks

This program won't plan nutritious meals or draw up a grocery list. But it will customize your IBM PC or compatible computer so that you can run your favorite programs at the touch of a key—without ever facing the DOS command line.

Upon installation, *MenuWorks* will search your hard disk for executable files (.EXE) and build menus for those applications. For instance, if it finds *WordPerfect* in your computer (WP.EXE), it will construct a menu called Word Processing and make *WordPerfect* an item on that menu. *MenuWorks'* artificial intelligence routines recognize more than 1000 popular software programs, from business applications to games.

If you'd rather design the menus yourself, *MenuWorks* gives you that option as well. The program works with color and monochrome systems, offers mouse support, allows for password protection, and supports an almost unlimited number of menus with as many as 81 choices in each. It also features several useful DOS commands that are tied to function keys—everything from setting the date to copying files.

If you want to move away from the DOS prompt but the thought of creating batch files and arranging the syntax in your AUTOEXEC.BAT file gives you heartburn, this nifty little program sets a fine table.

— PS

IBM PC, PS/2, and compatibles—\$24.95
PC Dynamics
31332 Via Colinas
Suite 102
Westlake Village, CA 91362
(818) 889-1741

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



PC Tools Deluxe, Version 5.0

PC Tools Deluxe is more than a diverse collection of utilities—it's truly a program for everyone. Beginners seeking a single program to help them get started, intermediate users looking to improve their productivity, and power users wanting to wring out the last bit of performance from their PCs will find what they need in this renaissance package.

Beginners will benefit from *PC Tools Deluxe's* PC Shell, which gives MS-DOS a friendlier face, making it easier and faster to use. Managing files with PC Shell's 1-2-3-style menus works well, although some of the key assignments could benefit from a better arrangement.

In the shell, a drive directory tree appears on the left of the screen, a list of

files in the currently highlighted directory on the right. Choose from Copy, Move, Compare, Change, and other commands when working with files; for disk management, you can also select Search, Format, Park Disk, and Get Disk Info. Users can maintain directo-



Move quickly from task to task with the latest version of *PC Tools Deluxe*.

ries, print files, use a simple text editor, run programs, and perform other tasks from the shell.

If desired, you can customize the PC Shell screen colors, size of windows, and other attributes. More importantly, you can also add your favorite programs to the Applications menu and, from there, launch *WordPerfect*, 1-2-3, or other applications with only three keystrokes.

The Applications menu comes packed with utilities: Compress Disk, to improve disk performance; PCBACKUP, with optional fast-backup and size-compression features; MIRROR, which offers great insurance against accidentally formatting a disk; PC Format, which replaces the standard DOS command; and PC Secure, for password protection and file encryption.

If the shell provides comfortable shelter for beginning PC users, then *PC Tools Deluxe's* Desktop furnishes power with an expansive versatility. Open as many as 15 windows at a time. Switch between tasks at will. Besides a notepad, a database (a nonrelational file manager), a calculator, and a calendar, the Desktop includes an outline editor, a telecommunications program, a macro editor, a clipboard, and miscellaneous utilities.

The notepad won't replace a full-featured word processor, but it's great for popping up over another application to create or edit a file quickly. The notepad's autosave and spell-checking features are also a boon to busy computer users, as are the macros that let you produce special printing effects—if you're prepared to spend time and effort learning how. Until you gain that experience, you can port important

documents over to a full-featured word processor for editing and printing.

The Desktop's outliner, while no *MaxThink*, is a solid worker. You can expand the current outline level, expand all levels, show the current level only, collapse the current level, show the main level only, or promote and demote the current item and its subsets.

The database manager is a great way to create, view, and edit *dBase*-compatible database files. Printing data is easy, though you've got to use the notepad to do so. But as easy as printing data is, I would have liked more flexibility in defining the records I want to select.

The program's appointment scheduler outperforms many stand-alone reminder programs. It offers the essential features, like a monthly calendar display, as well as options for defining repeating appointments. The built-in To-Do List works well enough, sorting itself by priority and allowing for future to-do items. You can also assign items a starting and an ending date.

The three desktop calculators are each designed for a different kind of

math. The Algebraic calculator offers a visual scrolling tape, the Financial calculator emulates the Hewlett-Packard 12C calculator, and the Programmer's calculator operates in and converts between hexadecimal, octal, binary, and decimal number systems.

PC Tools Deluxe's telecommunications module includes background communications capabilities, XMODEM-protocol support, and a script language. The program's macro editor lets you re-define keys on the keyboard and assign commands and keystrokes to those keys (subject to some limitations). If you use the macro editor with the appointment scheduler, you can run programs or enter DOS commands automatically at preset times.

With all it has to offer, *PC Tools Deluxe* is a terrific one-shot power boost to any PC or compatible. But there's room for improvement. Help screens could be better, with beginner and expert help files that you can read from the disk. It would also be helpful if the notepad supported more file formats and offered more cursor-control options. Lastly, the program would

benefit from a pop-up 1-2-3-compatible spreadsheet program for editing work sheets.

Those criticisms notwithstanding, the breadth and depth of *PC Tools Deluxe* assure it a place in the world of power computing. Fortunately, its ease of use extends its reach even further, bringing full functionality to both expert and novice at an extremely attractive price. Instead of spending your money on several packages, this one program can do it all. Few programs cover so much ground so well for so little.

— J. Blake Lambert

PC Tools Deluxe, version 5.0
 For . . .
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 From . . .
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 Beaverton, OR 97006
 (503) 690-8090
 And . . .
 Owners of version 4.0 can update for \$15.



Kids are key to America's future. And so are computers. By the year 2010, virtually every job in our nation will require some computing skills. That means preparing all of our youth today to take on technology tomorrow.

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The Computer Learning Foundation is a non-profit organization that's taking the lead in computer literacy efforts nationwide. We're bringing together companies, state departments of education, national non-profits and local groups.

Our Computer Learning Month in October is a focus for thousands of community and classroom programs. We've involved millions in discovering the benefits of computing.



Who Framed Roger Rabbit

Who Framed Roger Rabbit is an action-packed, gag-filled software salute to Hollywood's full-length feature of the same name. Loosely based on scenes from the film, players join Roger Rabbit in three madcap, arcadelike adventures as he tries to save Toontown from the evil Judge Doom. The dastardly villain wants to destroy Toontown by dissolving its Toon inhabitants, who are made of ink and paint, with buckets of Dip.

But first, the story: The year is 1947. Marvin, owner of Toontown and the Gag King genius behind the Gag Factory, supplies novelties and props to the cartoon industry. One night Marvin turns up dead, his will missing. Since he had promised to give Toontown to the Toons, they have only one hope for survival—find the missing will. They call upon Roger, our hare-brained hero, to recover the document and rescue the seductive but lovable Jessica from the menacing manacles of the malevolent

Judge Doom.

Toontown remains on the brink of portentous peril and Jessica languishes at the Gag Factory while you, in the role of Roger, outmaneuver the Judge and his wily weasel henchmen. Your mission is fraught with danger. With every mishap, another bucket of Dip is added to your tally. If you accumulate five buckets, you vanish from computer memory as fast as a Toon dissolves in Dip.

You begin your quest behind the wheel of Benny the Cab, steering your way through the bustling streets of Los Angeles. You must beat Judge Doom to the Ink and Paint Club while avoiding numerous obstacles. Stay away from the weasels in their Toon Patrol wagons, avoid collisions with the Red Cars, and parry the puddles of despicable Dip. But be quick: The sooner you arrive at your destination, the more time you'll have to rescue Jessica.

Benny the Cab's accordionlike suspension lets him rise to the occasion. He leaps out of trouble by hopping onto buildings. You can also maneuver him to help you grab useful items along the

way. Grab a tire for a burst of super-speed, rubber gloves to protect you from the Dip puddles, and diamonds to reduce your Dip tally by one bucket.

Once at the Ink and Paint Club, you must answer a question from the 1947 summer edition of the Gag Factory Catalog, which is included with the game. This method of copy protection gives you three chances—answer incorrectly and the game ends abruptly; answer right and you're inside the club.

Inside, it's a mad rush to find the missing will. You circle the club's seven tables, each set with drinks and papers. One of the papers contains the will, but since Marvin used invisible ink when he penned his final testament and you don't know which of the papers is the real thing, you have to grab them all.

It's not easy. If you accidentally grab a drink, you lose time. As you near your goal, penguin waiters pop up to restock the tables with more drinks and papers. Watch out for Bongo, the gorilla bouncer—a chance encounter with him, and he'll boot you from the club. You're also working against a clock, trying to make your rounds and collect the pa-



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*You Won't Believe
What You'll Achieve!*



pers before the music stops. If time runs out, it's good-bye Ink Club, hello Benny, as you find yourself back on the streets of Los Angeles, racing Judge Doom to the Gag Factory.

At the Factory, weasels galore stop at nothing to pound Roger to a pulp. Your only hope is to grab the gags that lie strewn about and use them to disable your opponents. The more gags you try, the more the weasels laugh. Eventually, they giggle themselves into oblivion.



Who Framed Roger Rabbit sets you off on three madcap adventures.

But watch your step: Some of those stray gags will backfire and there's always a perilous puddle of Dip to avoid. Survive the weasel onslaught and you confront the evil judge himself—just as he's about to send Jessica to that big Toontown in the sky. Defeat Judge Doom, rescue Jessica, and you become Toontown's greatest superhare-o.

Who Framed Roger Rabbit is as entertaining as it is exciting. It's packed with amusing animated high jinks. Colorful graphics, while not as three-dimensional as the Toons in the film, add a flamboyant touch. Add music and sound effects, and you have a rich, if simple, program.

This merry chase through Toontown offers several hours of pleasurable playing—easy to start but hard to finish. It's loads of fun—but when you mix Disney with Spielberg, and then add Buena Vista, it's hard to imagine anything else.

— Carol S. Holzberg

Who Framed Roger Rabbit

For . . .
Amiga—\$44.95
Apple II—\$39.95
Commodore 64/128—\$29.95
IBM PC and compatibles—\$39.95

From . . .
Buena Vista Software
500 S. Buena Vista
Burbank, CA 91521
(818) 972-3300

Leisure Suit Larry II: Looking for Love (In Several Wrong Places)

You know the type—terribly obnoxious but somehow endearing. The kind of guy you'd never hang out with, but you would get a kick out of watching from across the room as he hits on, and is promptly rejected by, every woman he approaches. You know the type—a guy like Larry Laffer.

Larry's special brand of charisma surfaced in *Leisure Suit Larry in the Land of the Lounge Lizards* and returns in the sequel, *Looking for Love (In Several Wrong Places)*. Sierra's latest installment not only lives up to the original, but surpasses it: The graphics and animation are better and the story line is more intricate and sophisticated. One thing that remains unchanged, however, is the humor. *Looking for Love* doesn't focus quite as much on the adult aspects of Larry Laffer's adventures as did *Lounge Lizards*, but it's every bit as funny.

Looking for Love opens with our favorite nerd down and out near Beverly Hills. After he's told in no uncertain terms to hit the road by Eve, the woman he had planned to spend the rest of his life with, Larry sets out in search of romance. Before leaving, however, he finds a dollar in Eve's garage—all he needs to turn his life around. He buys a lottery ticket at the local convenience store, then weasels his way into a nearby television station and onto the set of the Lucky Life lottery show. A spin of the big wheel turns Larry's buck into a million dollars a year for life. What's more, while waiting in the green room at the TV studio, Larry is mistaken for Bachelor Number 2 and ends up as the big winner on the Dating Connection show. His prize: a cruise to the South Pacific aboard the U.S.S. Love Tub.

Before setting sail, Larry gets to spend some major bucks. First stop: Rodeo Drive. (Where else can you break a million-dollar bill?) After he's bought a \$100,000 swimsuit for his cruise and dropped a cool \$100 for a haircut, Larry heads back to the convenience store for a 32-gallon Grottesque Gulp—a soft drink the size of a small trash can that somehow fits into Larry's jacket pocket (along with everything else he collects during his adventure).

Unfortunately for Larry, his luck

soon begins to run out. A case of mistaken identity puts him right in the middle of a bizarre plot of international intrigue involving an evil doctor's plan to take over the world. The cruise ends in disaster, with Larry escaping to a small island in the Pacific, where he is pursued by KGB agents. To survive, Larry must resist the temptation to fall for every pretty face he sees.

Looking for Love is thoroughly entertaining from beginning to end. The story is as interesting as anything you're likely to find on network television, and less predictable to boot. In addition, the way Larry moves around in his 3-D world (you use the keyboard, a mouse, or a joystick) and interacts with other people and objects creates a realistic environment that makes you forget you're sitting in front of a computer.



Join Larry Laffer in his search for everlasting love in *Leisure Suit Larry II: Looking for Love (In Several Wrong Places)*.

Also impressive is the way the game's designers have included effects, such as animated traffic flowing in the distance, and employed adventure "extras": characters who have nothing whatsoever to do with the story but who go about their business oblivious to your, or even Larry's, presence. These features create the illusion that you're peeking into a world that continues to function even when you put the disks away.

A variety of game options let you adjust the overall speed of the animation, control the volume, or toggle the sound on and off. You can adjust a setting in the game to minimize or maximize the adult aspects, and you can insert your own favorite cliché to replace the *Have a nice day* line.

Because of the adult nature of *Looking for Love*, it isn't suited for young players—not because it's overtly offensive, but because a certain amount of sophistication and experience is required to appreciate the puns, double entendres, and innuendos that compose the game's humor. If such risqué ri-

poste appeals to you, this is a terrific sequel to one of the best adventure games ever written.

— Bob Guerra

Looking for Love (In Several Wrong Places)

For . . .
Atari ST—\$49.95
IBM PC and compatibles—\$49.95

From . . .
Sierra
P.O. Box 485
Coarsegold, CA 93614
(209) 683-4468

And . . .
Hard disk recommended; the IBM version supports Roland MT-32, Ad Lib, and IBM music cards and includes 3½- and 5¼-inch disks.

College Explorer

Choosing a college isn't easy. You're faced with stacks of catalogs, piles of brochures, and mounds of applications. Out of all that, how do you cull the school that best fits your goals, your abilities, and your financial situation? It's a laborious process, but one made much easier by *College Explorer*, a software package in a class by itself. Secondary schools, libraries, college-placement services, parents, and students will find this program a nearly indispensable tool during the search process.



Hunting for the right school is made a little easier with *College Explorer*.

College Explorer's two databases include pertinent information on more than 2800 colleges. The program works as a kind of filter, guiding you first through broad criteria like type of degree offered (associate's or bachelor's) and, in the end, allowing you to narrow your choices by means of some 400 features and preferences. The program focuses on fields that can help this narrowing-down process: Location,

size, campus life, fees, competitive sports, and majors offered are among the fields you can explore. And after you've made your choices, *College Explorer* can sort your list by a number of criteria, including location, tuition, and enrollment size.

Because of the breadth of information, plan on spending at least 30 minutes with the program each time you start it. Surprisingly, one of *College Explorer's* strengths leads to one of its weaknesses: Although specification in each field is encouraged, the program gives no warning as to how many explicit choices you can make before you run the risk of eliminating every college. The guidelines for stating necessities and preferences should be clearer. I frequently put down so many preferences that the computer couldn't find a match. But don't worry if that happens to you, because you can easily reenter the program to make more general selections and to continue your explorations.

Immediate entry into the database, an easy-to-use manual, and helpful menus make *College Explorer* a pleasure to use. Its impeccable technical performance—complete and simple menu access to features, effortless loading and operation, quality recordkeeping, and easy saving and printing of your selections—is without flaw. The user's guide is concise, explicit, and informative. No special skills are needed. Even if you haven't had much previous computer experience, you should be able to use the program easily and extract its valuable information smoothly.

College Explorer will help you in your search for a college, but that's just the beginning of the search process. You still must write to each college for catalogs and detailed information. The database descriptions of colleges are extremely dry. In future updates I'd like to see a sampling of courses offered at the colleges, listed according to preferences I indicate; also, a listing of faculty and their respective distinctions would be informative. Any attempt to personalize the directory of colleges would be welcomed.

The listing of degrees offered for each selected college is somewhat confusing, if complete. The list itself is much like that found in standard college guides; the only difference is that a Y or an N appears before each degree to indicate whether it is offered. It would be much clearer if those not offered were struck from the list. This criticism also applies to other fields, like sports and extracurricular activities.

Given the amount of time and money many of our college-bound stu-

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dents spend requesting catalogs, preparing essays, visiting colleges, and thinking about the many choices before them, an investment in *College Explorer* is minimal and can pay handsome dividends. Deciding which college to attend is up to you. *College Explorer* doesn't rob you of that responsibility, but it does assist you in the more tedious operations. And that will make your hunt for the right school a pleasure.

— Kristen Sternberg

College Explorer

For . . .
Apple II (128K RAM and extended 80-column card needed for IIe)—\$49.95
IBM PC, PS/2, and compatibles in either 5¼- or 3½-inch disks—\$49.95

From . . .
The College Board
College Board Publications
Box 886, Dept. PO8
New York, NY 10101-0886
(212) 713-8165

Abrams Battle Tank

There's a firestorm every minute in the land of rolling thunder, Western Europe, where the Warsaw Pact has broken through NATO defenses to begin World War III. You're in command of an M1A1 Abrams tank, history's most sophisticated armored fighting vehicle. If Patton had ridden in this tank, Berlin would have made him mayor.

Abrams Battle Tank gives you a taste of what it's like inside one of these 60-ton iron maidens. Whether guiding your crew through a single mission or holding your own in a World War III invasion scenario, be prepared for firing action from every angle—east, west, north, south, and even from above.

From the main menu, you select from four options: Scenario, Campaign, M1-Info, and Exit. M1-Info gives you a rundown of your weapon systems, using illustrations and appropriate military jargon. Select Scenario to choose a single battle from among eight missions; choose Campaign to move through all eight missions in an order randomly selected by the computer.

Before you head to war with the Russkies, you'll report to the fuel depot. That's where you choose your armament mix, balancing Sabot (very effective against tanks and other armored vehicles), HEAT (very effective against infantry and constructions like enemy

headquarters), and AX (an experimental wire-guided weapon that can vaporize enemy helicopters) rounds. It's enough to make *weapons procurement* part of your everyday vocabulary.

Out on the battlefield, you play three roles: commander, gunner, and driver. Each position offers a unique view of the outside world and is accessed by a specific function key (F1 to move to the gunner's position, for instance).

In the heat of battle, moving from one station to the other can cost you time—and your life. Therefore, you'll almost always stick with the commander and gunner stations. The driver's station is more an afterthought than a necessity: You can get speedometer readings from the commander's station and receive warnings if you're working the motor too hard. I would gladly trade the driver's perspective for a good pair of binoculars: Spotting the enemy at a distance is imperative to survival.

Guiding the tank is your first challenge. You'll have to learn to distinguish between heading (the direction in which the body of the tank is pointing) and bearing (the direction the turret—and therefore the main gun—is facing). To turn the tank or the turret, press the left- or right-arrow key or move your joystick to the right or left. The A key aligns the turret and the tank; the C key switches control between the tank and the turret.

For example, suppose you're in the commander's station and your heading is 270 degrees (there are no compass directions in this game—just degrees). You take a hit bearing 2 degrees. You can swing the entire tank toward the right (0 degrees is due north), or you can switch control to the turret and change your bearing to point your cannon at the enemy. Getting a moving, southbound enemy into your sights when you're rolling west at 40 kilometers an hour is a skill that takes hours to develop.

Your main defenses are speed, natural cover, and smoke canisters that blind the enemy for about 20 seconds. To see through the smoke or to see at night, you can switch on your thermal imaging system (press the T key). If your tank is too heavily damaged to continue the fight, you can return to base for repairs.

When you contact enemy forces, use your target acquisition and designation system (press the Enter key while in the gunner's station) to identify the target—don't shoot friendly forces, or headquarters will have your head. Press the L key to lock onto the target and hit

the space bar to fire. If your hit takes out the enemy, your commander appears onscreen to acknowledge the kill.

My few objections to *Abrams Battle Tank* center on its operation. The game ran well on an AT clone, but the tank was slow to respond on my Tandy 1000 EX. To compensate, I had to anticipate my movements—another level of confusion to an already-complex game. Also, the skill levels—Novice, Moderate, and Expert—function only in the Scenario mode; if you choose Campaign, you must play on the Expert level. Fighting on that level, while much more realistic than fighting on the other two (no tank can survive hit after hit without serving up its crew like so much fondue), is frustrating for beginners eager to fight an entire campaign. My tours usually ended with a snap, crackle, and pop—and I'm not talking Rice Krispies.



Hit your enemies on the run if you want to survive in *Abrams Battle Tank*.

Abrams Battle Tank provides hours of rapid-fire warfare simulation without much emphasis on real NATO defensive strategies. (No one expects a single tank to rescue a stranded convoy—that's a job for a helicopter gunship—or to take on single-handedly several enemy battalions.) But if you put those questions aside and accept the game as a graphically excellent, tactically complex simulation, you'll get a lot of bang for your buck.

— Peter Scisco

Abrams Battle Tank

For . . .
IBM PC and compatibles—\$39.95

From . . .
Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404
(415) 571-7171

And . . .
A combination pack for the IBM that includes 5¼- and 3½-inch disks sells for \$44.95; an Amiga version is planned for an August release, but no price has been set.



TV Sports Football

Red dog 23! Hut! Hut! Hut! Thud! Ooof! Crash! Uunh! Arrgh!

Once you've heard Cinemaware's *TV Sports Football*, you'll know this program is, as the package says, "so real . . . it sweats!" Its bone-crushing, in-the-trenches action propels this gridiron simulation to the top of the computer-football heap.

As in real football, there are strategic and tactical levels to the game. You can play with either the 28-franchise Cinemaware Football League (CWLFL), modeled on the NFL, or use the program's editing features to build your own players, teams, and leagues. The computer can run any or all of the franchises, or you and up to 55 (!) of your friends (one each as offensive and defensive captains of each franchise) can play against each other. This game encourages team play, an aspect lost in many other sports games. You have to play an entire season, but if you can't devote that much time to the turf, the computer can play most of the games for you.

The CWLFL franchises have offensive and defensive strengths and weaknesses modeled after the actual records of NFL teams; you can even play a franchise against itself, which can settle those nagging postseason disputes about the relative merits of one team's offensive and defensive squads. The program saves league stats on a separate disk, which must remain in a second drive while you play.

You perfect your tactics by watching exhibition games and then trying practice plays. Learn how to hand off, pitch out, rush, kick, and pass with the joystick. It takes practice to learn how to drop into a pocket, spot a receiver, avoid the rush, fire the ball, and then make a diving catch. Don't rush into a season before you're prepared.

You select your plays from the Playcalling screen, which also shows play diagrams, the score, the down, yards to go for a first down, and the game clock. Choose a play by selecting the appropriate icon in the lower part of the Playcalling screen, or let the computer call the play for you. Over time, *TV Sports Football* learns the kind of plays you are likely to call in any situation and will call those plays if you're temporarily away from the game raiding the fridge.

Once you have selected a play, you switch to the playing-field screen to run it. With the joystick you can control key players, such as the quarterback, receivers, and defensive backs; or, you can let the computer handle them. If you want to veg out in front of the screen as you do during a real TV game, the computer will run the entire game.

Calling and running plays is exciting, but *TV Sports Football* also scores in the visceral-impact department. The look and feel of the game are amazingly authentic. The design, pacing, and graphics accurately mimic a televised game, with commentators, pregame and postgame shows, commercials, and a halftime extravaganza. The colorful screens, detailed players, and smooth animation are what you'd expect from a Cinemaware game, especially on the Amiga; you won't be disappointed.

Added to the stunning visual effects is the game's realistic sound. With the digitized samples you'll hear the explosive grunts of colliding linebackers, the roar of the crowd, and the calls of the refs. The ball does make a funny arcade-type noise as it flies through the air, but that helps you read its flight and position your receiver. Even the program's musical score sounds like the kind of

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hyped-up fanfare that opens and closes every NFL game. I do have one quibble: The announcers are silent. Instead of reading text, I would have liked to hear John Madden's ravings. Maybe Cinemaware couldn't fit him on the disk.

Another gripe I have, at least with the Amiga version, is that you can't run it from one disk drive, install it on a hard disk, or multitask it with other programs. Cinemaware has bypassed the Amiga operating system entirely in its new games, resulting in software that loads faster from disk but behaves badly by Amiga standards. That won't bother the typical fan, however.



The onscreen action rivals the real thing in *TV Sports Football*.

By making a game that mirrors the good and bad points of televised sports, Cinemaware has achieved something new, something more than the standard run-of-the-mill computer football game.

If you're turned off by the video hoopla and blather of professional football, you'll want to pass up *TV Sports Football*. But no gridiron addict should be without it; it's simply the most realistic football simulation ever created. The only problem fans face is whether to watch the game on TV or play it themselves.

— Steven Anzovin

TV Sports Football

For...
Amiga with external disk drive and joystick—\$49.95

From...
Cinemaware
4165 Thousand Oaks Blvd.
Westlake Village, CA 91362
(805) 495-6515

And...
Release of a version for the IBM PC and compatibles is imminent. Apple IIgs, Atari ST, and Commodore 64/128 versions are under development.

Geometry

Almost all students will, from time to time, need some extra coaching when confronting their studies. Unfortunately, teachers and parents are sometimes unavailable or unprepared to offer help. Enter the electronic tutor.

Geometry, newly released for the Apple IIgs and long available for the Macintosh, follows a standard high-school textbook approach. It offers ten chapters on a variety of topics: points, lines, planes, angles, triangles, congruence, parallel lines, parallelograms, and more. Each chapter contains about a dozen subtopics for further exploration.

For example, some of the subjects covered in Points, Lines, and Planes include geometric figures, the distance postulate, the angle-measure postulate, and theorems about complementary, supplementary, and vertical angles. A student interested in similarity can examine ratios, proportions, the properties of proportion, and more.

Geometry retains its book metaphor throughout; students can "turn" pages with a mouse or brush up on a particular concept by looking it up in the program's online index—an alphabetized list of terms arranged on tabbed indexlike cards.

To use the index (located under the Subject menu), students click on the tab where the term is likely to be listed. For example, to find out more about *hypotenuse*, the student would select the tab labeled *F-I*. Then, he or she could select *hypotenuse* directly with a double click. The student can use the scroll bar to examine all the index listings on a particular card in searching for a specific subject.

Throughout the program, students advance at their own pace. They can work on more than 350 problems, or they can stick to the tutorials, reviewing each chapter's concepts. The graphics capabilities of the IIgs and Macintosh—and both computers' intuitive interface (icons, dialog boxes, point-and-click mouse control, and pull-down menus)—enhance the program's operation. Keyboard commands also assist with cursor control.

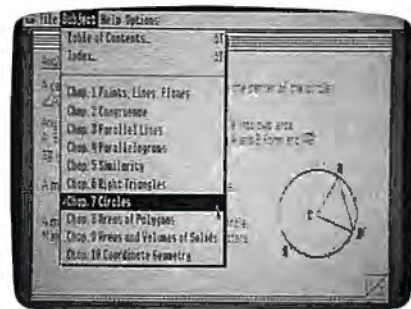
One advantage to selecting subjects on a chapter-by-chapter basis is the animated graphics that appear at the start of each lesson, illustrating the concepts under discussion. For example, the chapter on congruence opens with two animated triangles. As the triangles rotate, they change shape. At some points in their movement, the triangles are congruent, while at others they are not,

providing a clear sense of what *congruence* means.

Among *Geometry*'s several convenient features is the Save Place command, which lets you place a "bookmark" in the program and automatically return to that point the next time you run *Geometry*. To find your place, click on the BookMark icon from the Finder or the Restore Place command in the File menu. If you're running *Geometry* from a hard disk, the Save Place and Restore Place commands are fully functional, but you won't be able to take advantage of the BookMark file directly from the Finder.

Other useful features include the Help menu options, which provide background information on the current page or problem, clues to solve the current problem, and even the solution to problems.

The program does suffer from an initial lack of grace. Because *Geometry* comes on three 800K floppy disks, it demands multiple disk swaps to launch, even if you have two 3½-inch disk drives.



Use *Geometry* to get the right angle on your math studies.

A hard disk will reduce the time it takes to boot and reboot, but not all users are prepared to make that purchase. Likewise, not all users are prepared to increase their computer's memory. While *Geometry* runs on a IIgs with 512K, you'll encounter problems if you print pages that include animation, because such printing eats a lot of memory. Printing such pages with the Print Page command means rebooting when printing is done. Apple IIgs programs are notorious for their long launch time, so the last thing you want to do is reboot on a regular basis. *Geometry* doesn't take advantage of GS/OS, which could have sped up program loading. And the program supports AppleTalk only if your system is equipped with at least 768K.

Geometry's user's guide provides a thorough explanation of program operation, but it's an inadequate reference

tool. Concept definitions and references are available only on disk. Students should bring their geometry text home from school or use the program index, from which they can print the information they need.

Despite the demands it places on your hardware, *Geometry* successfully underscores the computer's role as an instructional aid. Its interactive learning abilities and animated geometric figures that rotate through several planes bring abstract theorems and classical postulates to life. This may be the angle teachers and parents need to get kids to enjoy their geometry lessons.

— Carol S. Holzberg

Geometry

For . . .
Apple IIgs—\$79.95
Macintosh—\$99.95

From . . .
Broderbund Software
17 Paul Dr.
San Rafael, CA 94903-2101
(415) 492-3200

And . . .
A school edition, with supplemental teaching aids, retails for \$109.95 (Macintosh) and \$89.95 (Apple IIgs); a lab pack, with five copies of the program and supplemental teaching aids, retails for \$219.95 (Macintosh) and \$199.95 (Apple IIgs).

Twilight Zone: Crossroads of Imagination

Consider for your approval: You're an average person in a routine situation going through the everyday motions we all find so comforting. But take a wrong turn at a strange intersection or a walk down an unfamiliar road, and suddenly you find that you've crossed over into a new dimension—a world of imagination, a strange place to which others remain oblivious.

You have just returned to the Twilight Zone, but not to the late-fifties-to-early-sixties television series. Instead, the popular science-fiction show lives on in *The Twilight Zone: Crossroads of Imagination*, the first in a series of role-playing adventures from First Row Software Publishing based on Rod Serling's classic show.

Twilight Zone begins with a normal setting. It's a typical 1980's unkempt bachelor's bedroom, complete with blaring television set. Bleary-eyed and unshaven, the hero awakens and

glances around his room. He has no idea of the problems that lie ahead—perhaps a meeting with the Grim Reaper himself. Suddenly, a very ordinary day takes a very nasty turn.

Once you enter the sixth dimension, there's no going back. You must conquer all obstacles or face a horrible fate. Before it's all over, you'll save a young girl from a fiery death, perform valiantly in an important race, and serve honorably a grateful king. You'll wander city streets, bury the wounded in distant jungles, and solve baffling riddles. And when it's all over, then . . . well, only then will you discover how it all ends.

Of course, you understand that I'm sworn to secrecy. But—what the heck—a few brief hints won't give anything away. Just don't tell anyone where you heard them. If A. J. Foyt calls, remember to request a few pointers; a consultation with a member of the local volunteer fire department wouldn't hurt; and if your memory isn't as sharp as it once was, you might consider re-reading the legend of Excalibur. Take these suggestions for what they may (or may not) be worth. From here on my lips are sealed.

This game is a classic text adventure. You interact by reading text and then reacting to it with typed commands. The program responds predictably to the usual direction commands (North, South, and so on), as well as Inventory, Load, Save, and Quit. In addition, it recognizes an unusually large vocabulary of verbs and objects.

One of *Crossroads of Imagination's* most noteworthy attributes is an especially good parser. The manual credits artificial-intelligence routines for taking the game far beyond the common verb-object syntax of many text adventures. The command *Take book and read it*, for example, works fine. In some instances, the program even requires qualified commands like *Tie hunter with rope*.

The game's numerous graphics aren't necessary to the adventure, serving only to help players imagine the described settings. That doesn't mean the artwork looks bad. But players who run the text-only version will suffer no disadvantage and, in fact, will gain speed by deactivating the pictures.

Similarly, sound also plays an unimportant role. On occasion, your computer speaker will emit a few notes from the television show's theme song, but mostly you're left alone to think and type. Although some players might prefer interactive graphics and more sound, an engaging plot with carefully

constructed responses ensures the game's success.



Cross the threshold into danger in *Twilight Zone: The Crossroads of Imagination*.

Unfortunately, the well-planned responses are marred by many misspellings and grammatical errors. It's not unreasonable to expect professional software to deliver a higher measure of technical excellence.

Twilight Zone rates high marks for plot construction and player involvement. It's easy enough for beginners yet challenging enough for more advanced players. With a bit more polishing, it could be outstanding, sparking renewed interest in that world of space and time, the world of imagination.

Too tee too doo too tee too doo. . .

— David Stanton

Twilight Zone: The Crossroads of Imagination

For . . .
Amiga—\$39.95
Apple II—\$39.95
Commodore 64/128—\$29.95
IBM PC and compatibles—\$39.95

From . . .
First Row Software Publishing
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King of Prussia, PA 19406-9773
(215) 337-1500

Cartooners

You wake up Saturday morning. You hear nothing. The TV is silent. Where are the kids? Surely not sleeping—no kid sleeps late on Saturday. After all, it's the day of the marathon cartoon.

The answer is in the computer room. Your kids are creating their own cartoons. They squeal with laughter as they program a rabbit to jump high in the air, turn around, and land next to a

weasel. They giggle uncontrollably as a pig does the moonwalk in a cornfield. If it's unusual for your kids to use brainpower on Saturday morning, wait until you boot up a copy of Electronic Arts' *Cartooners*. The Flintstones were never like this.

Cartooners uses the excellent graphics and sound capabilities of the IIGS to full advantage. Background scenes take on a 3-D effect. Clouds, for example, look multilayered in the sky behind the windmill. And the only way to improve the lively and complex music would be to hook your Apple IIGS into your stereo.



Write your own gags and be a comic genius with *Cartooners*.

These fantastic features extract their price. You'll need at least one megabyte of memory and, though the program will run on one drive, you should have a second disk drive. *Cartooners* comes with a program disk and an art disk; another drive makes the program easier for young children to use. If you've been waiting to add memory to your computer, this program gives you a pretty good excuse for opening your wallet.

Making animation with *Cartooners* is a blast. The instructions are easy to follow, and the menu-driven program is easy to use. The menu bar across the top of the screen allows for every scene, actor, action, and text needed for creating a cartoon. While the program disk carries some of the information, the art disk has most of the selections.

The program includes plenty of background scenes, ranging from a cornfield to a park to a graveyard on a dark night. Choose one and you're on the way to producing your first cartoon. The next step is to select the actors, which can be animal characters or objects such as clouds, shrubs, weasels, and butterflies. Each actor can be programmed to move independently of the other actors in the scene. The rabbit can walk, hop, turn around, or freeze. The

butterfly can fly forward, backward, up, or down. You can also program the timing and speed of the action, but you'll need practice to get everything coordinated. You can have one actor walk in front of or behind another. Five copies of an actor can be placed on the scene at once; for example, you could have a group of squirrels dancing around a campfire and a raccoon doing the shimmy nearby.

The cartoon's action is controlled by the number of frames it takes to complete a move. The menu bar at the bottom of the screen provides the options for movement. To set the frames, click on the forward button and advance it as far as needed. To go back, click on the rewind button. When the play button is clicked, the cartoon starts from the beginning. The frame counter indicates which frame the cartoon is showing and changes according to the action on the screen.

Actors speak through the use of speech balloons, which you can fill with as much or as little text as needed. An invisible balloon programmed to move upward and off the screen can give the effect of a scrolling caption. Speech balloons are controlled the same way the actors are; a pause feature lets you hold a frame, giving you time to read the text.

After you've created and saved your cartoon, you can string it with others to run as a show. You can also record your cartoons on videotape, freeing you from the computer when you want to put on a show.

Cartooners does import graphics from *Deluxe Paint II*; however, the color palette may be a little different, so be watchful. Music can be composed and imported as well, using *Instant Music*.

If you get up really early next Saturday morning, maybe you'll beat the kids to the computer and get to try *Cartooners* for yourself. But since most kids think they can operate a computer better than any adult can, don't be surprised if they find you funnier than the cartoon you create.

— Nancy Rentschler

Flodd, the Bad Guy

In a kingdom far, far away, kindly young King Alex rules, and everyone lives happily and without a care in the world. Alex and his canine cohort, Ollie, have great times together. Life is so terrific, in fact, the young monarch has never had to use his magic lamp with its genie and three wishes.

This peaceful scene is the setting for *Flodd, the Bad Guy*, an electronic lapware adventure from the Reading Magic Library of Tom Snyder Productions. The program builds reading, problem-solving, and decision-making skills in youngsters ages 2 through 6 while giving kids and adults the opportunity to share a computer. It's known as lapware because kids can sit in a grownup's lap while reading the story and playing at the computer.

In the story, Flodd, the bad guy, sneaks into town one summer night. He pulls the plug from the water tower, leaving Alex's subjects high and dry. Alex summons the genie and uses wish number 1—rain to fill up the tower. When Flodd threatens to pull the plug again, Alex rubs the lamp once more for wish number 2—the water tower plug to stick forever.



Share a tale of genies, magic, princes, and villains in *Flodd, the Bad Guy*.

In a fit, Flodd kidnaps Ollie, Alex's trusty companion. In desperation, Alex summons the genie for wish number 3, his last. Much to everyone's surprise, however, Alex doesn't plead for Ollie's return. Instead, he asks the genie to make Flodd happy. The story ends on a heartwarming note when Flodd returns, carrying Ollie in his arms, and the boy king and his dog are reunited.

The story of *Flodd, the Bad Guy* is simple. The accompanying graphics are colorful, but not exceptional. The animation is dynamic, yet uncomplicated. Nevertheless, the program is a success. Prereaders will find its highly interactive quality very appealing. ▸

Cartooners

For . . .
Apple IIGS—\$59.95

From . . .
Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404
(415) 571-7171

As a parent or other adult reads the story aloud, the child gets to "turn" the pages by pressing any key on the keyboard. Children may turn pages forward or use the left-arrow key to go back to previous pages. Once a page is turned, the built-in timer waits for a full second before the child can advance the story any further. This keeps the child from skipping ahead before the pages can be read.

At numerous points in the narrative, youngsters must make decisions about what happens next. Should Alex ask people where Flodd lives, or should he follow Ollie's nose? Should he and Ollie enter the dark passage or the lit one? Is it better to follow Flodd to the aquarium or take the shortcut?

Children decide how to proceed by pressing the first letter of the choice word. To ASK, for example, a child would press A; to take a SHORTCUT, the child would press S. Each choice word appears onscreen in colorful capital letters, with its first letter standing out from all the rest. Every choice word is accompanied by an expressive graphic clue—kids use it to figure out the corresponding letter. Next, they locate the letter on the keyboard and press the key. The story continues when the correct letter is pressed. There's no negative feedback if the youngster presses an incorrect key; however, once a decision is made, it can't be reversed.

The story's numerous turning points are highlighted by flashing animated graphics with positive-sounding audio reinforcement. Some kids will want to hear the story again and again in order to try out all the possible plot variations. Others will feel more comfortable making the same choices every time. Either way, this tale provides a wonderful opportunity for prereaders to polish their early reading skills in a nonthreatening electronic setting.

Besides promoting reading skills, *Flodd, the Bad Guy* introduces young children to the computer keyboard and promotes shared computer time between adults and kids. This successfully interactive storybook strengthens letter and word recognition as it gives children a sense of power over their computing environment. The package comes with a copy-protected program disk, an instruction booklet, and a color poster. You may purchase a backup for \$10 or swap the 5¼-inch floppy for a 3½-inch version (or vice versa) for \$2 plus the original disk.

The next time you turn on your computer, think about *Flodd, the Bad Guy* (or any of the other stories in the Reading Magic Library) and share your

lap and some time with a small person. If you sit still and don't misbehave, your child may even let you make some of the program's important decisions.

— Carol S. Holzberg

Flodd, the Bad Guy

For . . .

Apple II—\$34.95
IBM PC and compatibles with CGA—
\$34.95

From . . .

Tom Snyder Productions
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Cambridge, MA 02140
(800) 342-0236 or (617) 876-4433

And . . .

Also in the Reading Magic Library line,
Jack and the Beanstalk for Apple II and
PC—\$34.95; EGA and Tandy 16-color ver-
sions scheduled for February release.



Publish-It! Lite!

Just because you're on a budget doesn't mean you want your documents to look like Brand X. *Publish-It! Lite!* can help. Despite its silly name (I guess they couldn't call it *Publish-It! Less!*), it's the best of the very-low-end IBM PC and compatible desktop publishing packages.

This program differs significantly from competitors like *First Publisher*, *The Newsroom*, and *Pages*. Using *Lite*—the baby sibling of Timeworks' *Publish-It!*, a medium-price desktop publishing program that has earned rave reviews for its ease of use and power—is like driving the base model of a luxury car. Not all the features are there, but the quality still is. Like its older sibling, *Lite* is fast and easy to use and has well-designed fonts and good print quality.

On the screen, *Lite* looks similar to *Ventura Publisher*. It uses the familiar GEM interface with drop-down menus, scroll bars, and a sidebar that contains the mode selector and a list of files or attributes. You can view a page as actual size or double size, and in full-page mode.

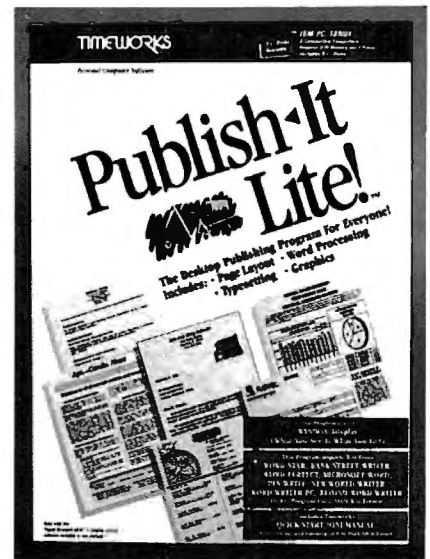
With *Lite*, you create up to six column guides to help you design pages. These guides don't print, but appear on the screen as dotted lines. The guides also have a snap-to feature that aligns your frames within the column guides.

Use your frame to place text or graphics on the page. You create a frame by clicking on the frame icon and then clicking and dragging the mouse. If you don't already have a frame select-

ed, *Lite* presumes you want to create one. You can then create four styles of lines around the frame box: thin, thick, thicker, and double.

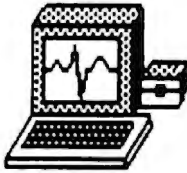
To load text, click on the frame and then on Import Text, which displays a list of file formats. *Publish-It! Lite!* reads files from *WordWriter* and *Quintet* but doesn't directly read files from *WordPerfect*, *WordStar*, or *Microsoft Word*. To import text from those programs and others, you'll have to save your work in ASCII. This limitation means *Lite* can't import bold, underline, or italic attributes from your word processor. However, it does convert normal typewriter quotation marks into real typographic quotation marks—a small victory.

If all your text won't fit in one frame, you can create another. *Lite* automatically redirects text so that it wraps around a new frame placed on top of a frame already filled with text. This feature helps you create more attractive and professional-looking pages because text will continue to wrap around the frame no matter how often you move it, making it easier for you to experiment with design. Besides importing text from a word processor, you can also type directly onto the page. *Lite* automatically scrolls the screen and offers a handy search-and-replace function—even *Ventura Publisher* lacks these features.



Publish-It! Lite! offers low-cost entry into the world of desktop publishing.

You place graphics on the page as you place text—by creating a frame and importing the graphic. *Lite* will read only *PC Paintbrush* and *GEM Paint* files; while this is somewhat limiting, these are the two most popular bit-



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mapped formats. You can use the program's graphics editor to edit bit-mapped graphics and object-oriented graphics (for drawing lines, boxes, and circles). And unlike *Pages*, which takes forever to display pictures, *Publish-It! Lite!* quickly handles that task. That means you can use the program efficiently on a PC or XT—no need to upgrade to an AT-class computer.

Publish-It! Lite! really shines when it prints. While the font quality of some low-end publishing programs is suited only for children's play, *Lite's* printing is a cut above. That quality, however, is limited to Epson-compatible 9- or 24-pin dot-matrix printers.

Lite comes with three typefaces: Dutch (Times Roman), Swiss (Helvetica), and Bullets. You can print any of these fonts in sizes ranging from 7 to 36 points.

The program's excellent manual is easy to follow and includes a complete tutorial. The onscreen help is limited—enough to jog your memory, but not complete enough to replace the documentation.

As good as it is, however, *Publish-It! Lite!* has some significant limitations. More experienced users will find the program lacking in advanced features. It can't, for example, create documents longer than four pages, and it hogs memory when producing graphics.

Also, there are no automatic headers, footers, or page numbers. Hyphenation is completely manual, a blow to justified text. You can't move frames from page to page, and you can't turn off the nonprinting page and frame guides, so your screen display, while accurate, isn't what-you-see-is-what-you-get quality. Most inconvenient, you can't set a default type style for imported text: You must manually select the text and then select a type style.

Publish-It! Lite! is also missing manual control for leading (the space between lines). This limitation can be a benefit to the beginner, who is ensured that text is always set with enough leading (no complicated settings to master). More limiting, however, is *Lite's* inability to print landscape (sideways) pages.

Despite these limitations, *Publish-It! Lite!* operates on a more professional level than its low-priced competitors. Its greatest edge is its upgrade path. An inexpensive Laser Accessory Pack lets you print to a laser printer. And, if you outgrow *Publish-It! Lite!* (and you will if you're a frequent desktop publisher), you can graduate to the standard *Publish-It!*, a full-featured program with all the bells and whistles *Publish-It! Lite!* lacks.

Publish-It! Lite! offers a stable, affordable entry into desktop publishing. Though limited, it offers beginners an easy-to-use framework within which they can hone their page-design skills. It's a good place to start.

— Daniel Will-Harris

Publish-It! Lite!

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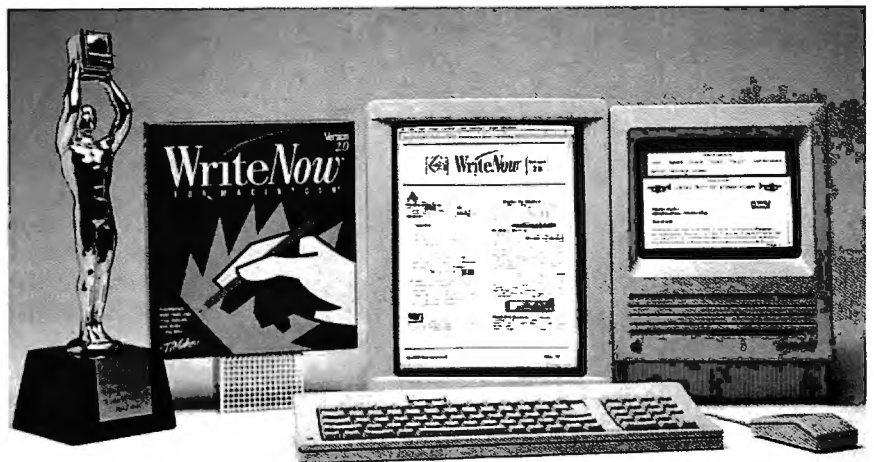
WriteNow 2.0

There's nothing wrong with a word processor that doesn't jump through hoops blindfolded, as long as it's designed to handle pure text processing with grace and common sense. In this regard,

\$400 word processor that eats up more than a megabyte of RAM. But if you want a shallow learning curve, the endurance of a marathon runner, and just the right features to produce basic documents, buy *WriteNow*. You only have to feed it 512K of RAM.

As with most Macintosh word processors, you format paragraphs in *WriteNow 2.0* by changing settings on a ruler at the top of the screen. Icons control various tabs, margins, first-line indents, line spacing, and text alignment. If you've been using a more powerful word processor, you may miss features that automate paragraph formatting, like the style sheets in Microsoft *Word*. *WriteNow* has similar features, but they're not as elegant. To transfer formats, you must copy and paste rulers throughout your document. You can change all paragraphs controlled by identical ruler settings, though, by selecting them and holding the Shift key when you change ruler settings for one of the paragraphs: the others will change accordingly. A similar control works on fonts, type styles, and type sizes. For example, select several lines of text, starting with a boldface entry; then hold the Command key as you select Underline from the Styles menu, and all selected, boldface entries will change to underline.

The program's spelling checker is speedier than some because it skips text



Write Now 2.0 is a high-performance word processor in an entry-level package.

T/Maker's *WriteNow 2.0* holds its own.

WriteNow is a good example of what an entry-level word processor should offer: ease of use, sufficient speed, and economy. If you want a complicated program that runs like an Olympic sprinter and offers a long list of obscure features, go out and buy a

previously checked until those sections are revised. Several buttons control the spell-checking procedure. One suggests intelligent alternatives to misspelled words—it's even smart enough to suggest transposed spellings. Another button ignores spellings that are unique to a particular file. Other buttons add and

REVIEWS

subtract words. The 100,000-word dictionary is so well stocked that it recognizes contractions and some possessives.

WriteNow 2.0 includes several little details that affect ease of use and the general appearance of your document. You can, for example, set typographic-style quotation marks and apostrophes by choosing Smart Quotes in the Page Setup dialog box when you start a document. (It won't change any punctuation you've already typed, though.) The Window menu is another nice feature; it lets you move from one open file to another. Center, right, and decimal tabs increase your options for designing tables and charts; flexible line spacing makes room for graphics that are too big for the line of type they inhabit. Headers, footers, and automatically numbered footnotes give your document a professional or scholarly appearance. Tab leaders add a little zip to your tables of contents. All in all, these little features are as welcome as the more significant ones. They don't slow down the program, and they improve the look of your pages.

Features like mail merge were once the territory of more expensive word processors. *WriteNow's* mail merge lets you use conditional statements and merge more than one document into your template. A stationery feature stores default formats as well as text and graphics that will appear on each new document you open. You can suppress this feature by holding down Option when you launch *WriteNow*.

Many people who have been using *Microsoft Word* would be pleased with *WriteNow*, so *T/Maker* has included a system of filters for converting *Word* files into *WriteNow* format. The process, however, is relatively clumsy, for you must first save the *Word* file in RTF format. There's also a filter for converting *MacWrite* files directly into *WriteNow's* format. Filters for other word processors will be available soon. Text-only files, of course, are easily imported to *WriteNow*.

WriteNow 2.0 answers your demands and more. Some of its features work very well; however, others can't compete with similar features in full-featured packages like *Microsoft Word* or *WordPerfect*. The multicolumn option is impressive, but the format you choose controls the whole document. You can't even run a headline across several columns without a pair of scissors and a bottle of glue. Background printing is another impressive offering, but it's sluggish and slows down any other computer work you do while you wait for your printing to finish.

Compared with the entry-level word processors that used to dominate the Macintosh market, *WriteNow 2.0* is a slick, sophisticated writing tool. But it has limits. Use it to produce plain documents—letters, reports, great novels—and you'll be pleased with its performance.

— Heidi E. H. Aycock

WriteNow 2.0
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 Mountain View, CA 94041
 (415) 962-0195

Hometown, U.S.A.

If you've ever wanted to design the exterior of a house or build a small village, then you'll want to visit *Hometown, U.S.A.* Publishing International's program is just the thing for budding architects and closet city planners.

Designed for adults and children, *Hometown, U.S.A.* includes templates of 13 large structures and several smaller ones. Also included are patterns for doors, windows, signs, and other items you can use to "dress up" the buildings you design.

The program's Ideas Book contains hints for getting the most out of the program and suggestions for cutting and assembling the buildings. A second manual contains loading instructions, shots of the parts of each structure, and miscellaneous items. Also included are predesigned buildings that will give you an idea of how your buildings could be placed and decorated.

The first step to designing a building is picking the basic structure. Since there are so many choices, you'll have no problem locating a pattern you like. It gets trickier when you must decide which doors, windows, balconies, fencing, and other additions to use. If you're building a store, for example, you'll have to pick a sign, which you can alter further with the program's paint/graphics capabilities.

The paint/graphics feature is also handy for adding shingles and bricks to your building—just select Patterns from the menu bar. Flood Fill lets you instantly create a roof. (You'll have to add color by hand. Crayons will do, but

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Build the house of your dreams with *Hometown, U.S.A.*

children work as partners, creating a place they can call home.
— Nancy Rentschler

markers or watercolors give a more finished look.)

After you've finished designing your building, you can print it out on a dot-matrix or laser printer (Macintosh version only). For best results, you'll want to use heavy bond or textured paper. Several pieces of the structure appear on each page, and it may take two or three pages to print all the parts your building requires.

The next step is to put your creation together. The program's manual offers excellent suggestions about how to cut, paste, and assemble your building. There are step-by-step directions for putting together each structure. Numbers printed on the tabs of the parts identify the section and indicate to which part it is to be glued. To make your structures even sturdier, glue the parts to cardboard or cardstock before you start. Use sharp scissors or an X-ACTO knife to get more finely cut edges.

The buildings differ in size, but are close to the HO scale familiar to model-train users. (To give you an idea of the basic size, a cassette tape fits nicely inside the hotel.) If you want to make your buildings larger or smaller, you

can enlarge or reduce the printed templates with a photocopier before cutting.

There's no wanting for ideas on using your model buildings around the house. The tiny homes could be turned into containers for cookies or candies given as holiday gifts. Reduce the size of the buildings and they make clever Christmas tree ornaments or, placed on a table, form a Christmas village. Construct a town for your child's (or your own) electric train. Stuff some potpourri in a schoolhouse for a great gift for your child's teacher. You'll find lots of clever ways to use your buildings.

Hometown, U.S.A. also has many classroom applications. For example, a social studies project might have children design the neighborhood where they live. The step-by-step design process, followed by the construction of the buildings, bolsters logical thinking skills. Vocabulary and cooperative-learning skills are practiced as groups of children work together to create their own community.

Parents eager to share in their child's learning experience will benefit from the teamwork that a program like *Hometown, U.S.A.* fosters. Adults and

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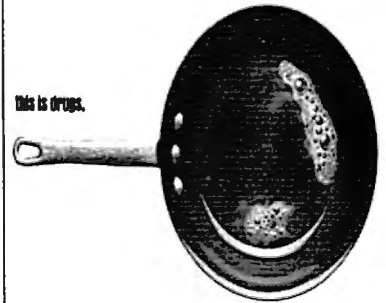
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Print drivers for laser printers are being developed for the IBM version.

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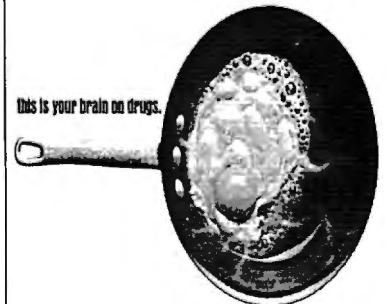
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HFS-III Upgraded

Jay Gold Software has updated its *Home Finance System-III* for the IBM PC and compatibles to version 3.2. The financial management program tracks income and expenses, balances checkbooks, writes reports, and prints checks.

With this version, users can view a report onscreen, send the report to disk, or send it right to the printer. A Find feature allows access to selected transactions for viewing or editing, while Smart menus follow keystrokes to the desired menu entries. A Quick Questions card refers to the Main Menu and answers other common user questions. The program supports laser printers for checks, and an onscreen check-design option lets you purchase business-size checks from any vendor. The suggested retail price for *HFS-III* is \$49.95.

Jay Gold Software, P.O. Box 2024,
Des Moines, IA 50310
Circle Reader Service Number 200.

Powerful Lightweight

Weighing in at 11.6 pounds, the T1600 80C286 laptop is the lightest and most powerful of Toshiba's battery-powered portable PC line. The system boasts a 12-MHz clock speed and comes equipped with 1 megabyte of RAM (expandable to 5 megabytes), a 20-megabyte hard disk with 27-millisecond access time, and a high-capacity 1.44-megabyte 3½-inch IBM PS/2-compatible disk drive.

A detachable backlit supertwist EGA liquid-crystal display is standard; an external monitor can be connected through the system's EGA port. Other system ports include a parallel, two serial, one for an external 5¼-inch external disk drive, and one for a numeric keypad. The dedicated modem slot accommodates Toshiba's optional 2400 bits-per-second Hayes-compatible modem. A general-purpose expansion slot is also available.

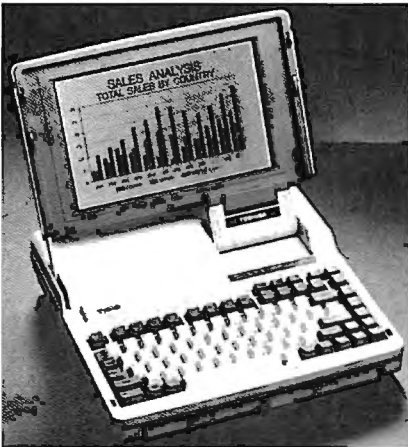
The computer comes with one 15-ounce battery pack but can support two. A Sleep Mode for the microprocessor and power-down features for the

hard disk drive and backlit display conserve battery power. An AutoResume feature allows for instant reentry into an application without rebooting or re-loading application software.

The T1600 comes with MS-DOS 3.3, *PC-Kwik Power Pak* disk-cache utility software, a hypertext disk-resident DOS, and user documentation. The suggested retail price is \$4,999.

Toshiba America, Information Systems Division, 9740 Irvine Blvd., Irvine, CA 92718

Circle Reader Service Number 201.



The Toshiba T1600 portable PC weighs 11.6 pounds.

Copter Rescue and Attack

ThunderChopper, SubLOGIC's helicopter flight simulator, requires players to execute rescue and combat missions. But before facing the enemy, players must complete a set of training missions.

In the first combat mission, Armed Escort, players must guide ground troops to safety through enemy territory, protecting them from guerrilla fighters. Rescue at Sea asks players to locate and rescue the survivors of a major naval engagement. Players must search the floating wreckage while staying on

alert for enemy ships.

An on-board flight computer provides mission instructions and performance feedback. Flight instrumentation includes Forward-Looking Infrared, CO2 laser radar, and zoom television. The helicopter's armament includes TOW and Stinger missiles, Zuni rockets, and a Hughes Chain Gun.

ThunderChopper requires an IBM PC or compatible with a CGA, EGA, or VGA graphics card and a color or monochrome graphics monitor. The suggested retail price is \$39.95.

SubLOGIC, 501 Kenyon Rd.,
Champaign, IL 61820
Circle Reader Service Number 202.

Goofy Golfing ST Style

Electronic Arts' *Zany Golf* has come to the Atari ST. On this unusual miniature golf course, as many as four players compete for best score over nine holes, each of which provides a different challenge and experience.

For example, players must maneuver a golf ball through flashing lights while on the Pinball hole; putts must clear a bouncing burger on the Hamburger hole; and the Energy hole features dart laser beams, particle rays, and transporter pads. Other holes have moving walls, magic carpets, a castle, and, of course, the classic windmill. One hole seems to have a mind of its own, while another remains a secret.

The suggested retail price for the Atari ST version of *Zany Golf* is \$39.95. The game was previously released for the Apple IIGS and the IBM PC and compatibles at the same price.

Electronic Arts, 1820 Gateway Dr.,
San Mateo, CA 94404
Circle Reader Service Number 203.

That's Some Display

Boca Research's Dual Graphics Adapter enables IBM PC and compatibles users to enhance monochrome-monitor resolution and upgrade to a CGA monitor with one adapter. The board combines the functions of CGA, MDA, and

Mickey McLean

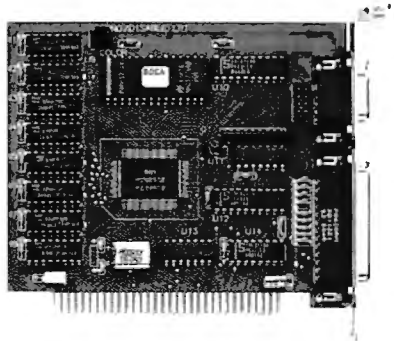
the Hercules graphics card.

Display enhancements on TTL monochrome monitors include standard 80 × 25 line text and 720 × 348 Hercules graphics. On CGA, EGA, or other RGB monitors, the adapter delivers 80 × 25 sixteen-color text, 320 × 200 four-color graphics, or 640 × 200 two-color graphics.

Other features include automatic mode switching and a 25-pin parallel port. The installation procedure consists of the board's insertion into any 8- or 16-bit PC-style bus and setting its jumper; no software is required.

The Dual Graphics Adapter carries a suggested retail price of \$99.

Boca Research, 6401 Congress Ave., Boca Raton, FL 33487
Circle Reader Service Number 204.



Boca Research's Dual Graphics Adapter enhances both monochrome and CGA monitors.

New and Improved GEOS 128

A new and enhanced GEOS 128 has been released by Berkeley Softworks. The new version includes *geoWrite 2.1*, a full-featured word processor; *geoSpell 128*, an 80-column spelling checker; and *geoPaint*, a high-resolution graphics workshop.

Also included with the package is an enhanced deskTop program that supports two disk drives and a RAM expansion unit, offers multiple file selection, and displays the date and time. Other features include *geoMerge*, which creates customized form letters and labels; *Text Grabber*, which imports text from any Commodore word processor; and the *Desk Accessories*, which include a calculator, a notepad, an alarm clock, a screen preference manager, and both photo and text managers and albums.

GEOS 128 (version 2.0) supports

numeric keypad, keyboard, and other input device options, as well as more than 70 printers. The system is compatible with the entire family of GEOS application products. The suggested retail price is \$69.95. Upgrades are available for \$35.00 plus shipping and handling.

Berkeley Softworks, 2150 Shattuck Ave., Berkeley, CA 94704
Circle Reader Service Number 205.

Circle Gets the Square

For those tired of waiting for an invitation to a game show, GameTek offers home computer versions of "Hollywood Squares," "Super Password," and "Double Dare!"

Hollywood Squares asks players to second-guess computer celebrities in the popular game of tic-tac-toe. The game comes complete with the show's theme music and wisecrack comments and answers. Two computer contestants can compete head to head or one can play Gametek's expert player, Microkid.

In *Super Password*, one or two players are paired with computer celebrities to give and receive word clues. Players go through the same rounds that their television counterparts do, including the \$10,000 speed round, in which the champion must correctly guess ten words in 90 seconds.

Double Dare, based on the syndicated game show produced by MTV, combines questions with physical challenges, including launching contestants off a teeter totter and onto a trampoline. Players control their onscreen character's ability to jump over, throw, or toss objects.

The three games are available for the IBM PC and compatibles, the Commodore 64/128, and the Apple II for \$14.95 each.

GameTek/Navarre, 6750 W. Broadway, Brooklyn Park, MN 55428
Circle Reader Service Number 206.

Crime Solver

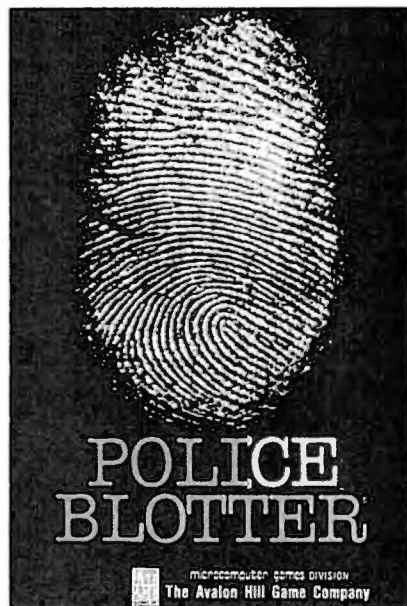
Avalon Hill has released a detective mystery game that challenges your crime-solving abilities. *Police Blotter* places you in the role of a rookie detective of the 13th Precinct of the Queensport Police Department. You must interview witnesses, decipher police reports, and gather clues.

The game features seven mysteries involving blackmail, kidnapping, theft, and murder. Each of the seven cases is

programmed for three levels of complexity. False clues, red herrings, and dead ends tend to make finding a solution difficult. An onscreen case clock tracks the time it takes you to apprehend a suspect.

The game is currently available for the Apple II and has a suggested retail price of \$29.95. Versions for the Macintosh and the IBM PC and compatibles are planned.

The Avalon Hill Game Company, Microcomputer Games Division, 4517 Harford Rd., Baltimore, MD 21214
Circle Reader Service Number 207.



One to four players can attempt to solve mysteries in *Police Blotter*.

Roll With It

Test your joystick skills as you maneuver a ball through a multidimensional puzzle on ten different planes in *Mind-Roll*, from Epyx. Each successive plane increases in difficulty, but players can rearrange the planes in any order for play or practice.

Players must walk a plank, hunt for hidden amulets, fill the screen with tiled squares, and roll over puzzle squares in a predetermined sequence. All onscreen activities must be completed before time expires. Plane 7 features time boosters that give you extra seconds to negotiate obstacle courses, roll down a racetrack, or complete a maze.

After each plane, any remaining time units are converted into points. ▶

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Players also have the opportunity to improve their score with bonus rounds following each completed plane.

Mind-Roll is available for the Commodore 64/128, the Amiga, and the IBM PC and compatibles. The suggested retail price is \$29.95.

Epyx, 600 Galveston Dr., P.O. Box 8020, Redwood City, CA 94063
Circle Reader Service Number 208.

Keyball or Trackboard?

Octave Systems has combined a keyboard and a trackball in KeyTrak, which was designed to save desk space and increase the efficiency of computer users.

The trackball is compatible with both Microsoft and Mouse Systems serial mouse drivers. It has a serial port and a Y-shaped cable that plugs into the keyboard port; plus, it can switch between XT- and AT-class computers. Three mouse buttons are located above the trackball, and the primary button is duplicated on the left-hand side of the keyboard.

KeyTrak has a suggested retail price of \$189.

Octave Systems, 1715 Dell Ave., Campbell, CA 95008
Circle Reader Service Number 209.



KeyTrak combines a trackball with a keyboard.

Start Off Right

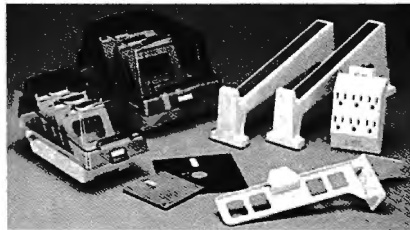
Curtis Manufacturing has introduced The Computer Starter Kit, five computer accessories designed to protect computers, save valuable desktop space, and provide greater user comfort. The kit contains a disk file, a Curtis Clip copy holder, universal printer legs, a computer-cleaning kit, and a surge protector.

The kit can contain either a 3½- or a 5¼-inch cleaning kit that rids disk drives of dust and debris and a disk file that holds up to fifty 5¼- or forty 3½-inch disks. The Curtis Clip attaches directly to the monitor and swings out of

the way when not in use. Any desktop printer can be elevated with the kit's printer legs, and the Safe-Bloc Surge Protector, with hot-to-neutral protection, features six multipurpose outlets and mounts directly into any duplex wall outlet.

The Computer Starter Kit carries a suggested retail price of \$59.95.

Curtis Manufacturing, 30 Fitzgerald Dr., Jaffrey, NH 03452
Circle Reader Service Number 210.



The Computer Starter Kit combines five computer accessories into one package.

In Stereo

Give your Commodore 64 or 128 six-voice stereo music capabilities with the SID Symphony Stereo Cartridge from Dr. Evil Laboratories. The cartridge lets you play Sidplayer songs, both standard and enhanced, including ones available in the public domain, such as Mark A. Dickenson's *Stereo Player* version 10.0. You can also create your own stereo Sidplayer songs with *COMPUTE!'s Music System for the Commodore 128 and 64: The Enhanced Sidplayer*, written by Craig Chamberlain and available from *COMPUTE!* Books.

The SID Symphony Stereo Cartridge requires no assembly; however, you will need two RCA male-to-male cables to connect the outputs of the computer and cartridge to a stereo system. The cartridge is powered by a replaceable 9-volt alkaline battery.

The suggested retail price for the SID Symphony Cartridge is \$34.95.

Dr. Evil Laboratories, P.O. Box 190, St. Paul, IN 47272
Circle Reader Service Number 211.

Portable Fax and Data

Touchbase Systems has released the WorldPort 2496 Portable Fax/Data Modem. The small battery-powered modem combines a 9600-bits-per-second (bps) Group III facsimile modem with a full-featured 2400-bps data modem. Designed for use with IBM

PC-compatible portable and laptop computers, the external unit can also be used with desktop computers.

Features include two standard RJ11 telephone jacks and an interface for acoustic-coupler operation, which allows the unit to be used in phone booths, hotel rooms, and with non-U.S. phone jacks.

The unit can automatically detect and route an incoming fax or data call. Proprietary PC software allows unattended background operation for sending or receiving fax transmissions and sending group broadcasts; it integrates full data-communications features for the data-modem section.

Data-modem features include AT command-set compatibility, autodial/auto-answer/auto-rate select, Bell and CCITT compatibility, a speaker, and LED indicators.

The WorldPort 2496 has a suggested retail price of \$699.

Touchbase Systems, 160 Laurel Ave., Northport, NY 11768
Circle Reader Service Number 212.



The WorldPort 2496 Portable Fax/Data Modem combines fax and data.

Label It

A program for creating and customizing mailing labels for the IBM PC and compatibles is now available from POP Computer Products. *Labels!* can store as many as 4000 names and addresses and features a Lookup Engine that allows for quick recall if the user remembers only a few characters such as part of a name or street address.

Users can type labels in any format, with or without fields. Up to ten different address and label formats can be kept in memory. The program can also import and export ASCII text files.

The Grabber feature lets you enter an address once and then have the data available later for printing an envelope. The address is stored until it's time to print, but the feature isn't a traditional memory-resident program: The Grab-

ber is only memory-resident while the user writes a document.

Labels! supports most printers. It carries a suggested retail price of \$29.95.

POP Computer Products, P.O. Box 1833, Evergreen, CO 80439
Circle Reader Service Number 213.



Users can create and customize labels with *Labels!*.

C-128 Wall Decorator

Free Spirit Software has released *Poster Maker 128* for the Commodore 128 running in 128 mode. The program allows users to create posters as large as five feet by five feet.

You can print the posters or save them to disk as picture files. A graphics utility lets you import *Basic 8*, *Sketchpad 128*, or *Spectrum 128* graphics files. These files can also be enlarged on both the *x*- and the *y*-axes. A utility that reduces the size of graphics screens to create clip art is also included.

Poster Maker 128, which operates in 128 mode with an 80-column display, runs on the Commodore 128D or the Commodore 128 with 64K video-RAM upgrade. Resolution is 640 × 200 pixels. A 1351 or compatible mouse and a 1571 disk drive are required. Optional support is provided for a 1571 or 1581 disk drive as a second drive. The suggested retail price is \$29.95.

Free Spirit Software, P.O. Box 128, 58 Noble St., Kutztown, PA 19530
Circle Reader Service Number 214.

From Across a Crowded Room

Salespeople, educators, and others responsible for presentations and demonstrations will find Forté Communications' remote-control device handy for working with an IBM PC or compatible computer from a distance. With Remote Keyboard, users can run and manipulate programs from as far as 50 feet away.

Remote Keyboard transmits infrared signals to a receiver that plugs into the computer's serial port. Users point the device at the computer's display and then press a button to control the PC. Built into the product's disk-based software is a pointer that can be used to call attention to specific displays during presentations.

The hand-held device weighs less than ten ounces, including batteries. The suggested retail price is \$395.

Forté Communications, 680 W. Maude Ave., Sunnyvale, CA 94068
Circle Reader Service Number 215.



Users can control their PC from as far as 50 feet away with Remote Keyboard.

Convoy Escort Service

Command a Destroyer Escort ship in the North Atlantic during World War II in *Destroyer Escort*, from Medalist International's MicroPlay Software line.

The safety of a World War II supply convoy is your responsibility. There are six convoy routes to choose from, each with three difficulty levels. Players can pick a route that provides the type of challenge they seek, such as one that is prone to submarine attacks.

The escort ship's weapons include torpedoes, a five-inch gun, depth charges, and an anti-aircraft gun you can use against submarines, aircraft, and surface ships. Seven different battle screens provide control over your ship.

Destroyer Escort, a one-player game, is initially available for the Commodore 64/128 and has a suggested re-

tail price of \$39.95. Medalist International is a division of MicroProse Software.

Medalist International, 180 Lakefront Dr., Hunt Valley, MD 21030
Circle Reader Service Number 216.



Escort a convoy of World War II supply ships in *Destroyer Escort*.

Attack Copter

The Sega arcade hit *Thunder Blade* has been released by Mindscape for the Commodore 64/128, the IBM PC and compatibles, the Amiga, and the Atari ST.

As a helicopter pilot, you must defeat the enemy while flying over skyscrapers, mountains, deserts, and ocean.

The game offers two different visual perspectives: top-down and from behind the helicopter. The top-down view lets you see the surrounding area in 3-D, while the rear view lets you see forward through the approaching landscape.

The Commodore 64/128 version of *Thunder Blade* has a suggested retail price of \$34.95. The IBM PC and compatibles version sells for \$39.95; the Amiga and Atari ST editions retail for \$49.95.

Mindscape, 3444 Dundee Rd., Northbrook, IL 60062
Circle Reader Service Number 217.

Young Storytellers

Compu-Teach has released a sequel to *Once Upon a Time . . .* Like the original, the program allows children ages 6-12 to write, design, and publish their own illustrated books.

The new version, *Once Upon a Time . . . II*, features subjects associated with the forest, dinosaurs, and underwater. Hundreds of graphic images are

new products!

available to encourage children to use their imagination to create stories and illustrations. Vocabulary, reading, and spelling skills are combined with concepts that teach story creation and illustration techniques, including those associated with perspective and other spatial relationships.

Available for the IBM PC and compatibles and the Apple II, the program retails for \$39.95. A classroom pack with five sets of disks and instruction booklets sells for \$79.95 in 5¼-inch format and \$99.95 in 3½-inch format.

Compu-Teach, 78 Olive St., New Haven, CT 06511
Circle Reader Service Number 218.

Free Game Offer

Consumers who purchase any two Cinemaware products can receive a third product free, while supplies last.

Buyers can select from such packages as *Lord of the Rising Sun*, *TV Sports Football*, *Rocket Ranger*, and *The Three Stooges*, as well as Spotlight titles like *Deathbringer*, *Federation*, *Dark Side*, and *Speedball*. Other titles will become available through June 1989.

To receive their free software, consumers must send in the original dated sales receipts and completed registration cards from two qualifying packages, a coupon found in specially marked packages or available at many software retailers, and \$3 for shipping and handling. Consumers can choose their free program from among *Defender of the Crown*, *S.D.I.*, *Sinbad and the Throne of the Falcon*, or *The King of Chicago*.

Cinemaware, 4165 Thousand Oaks Blvd., Westlake Village, CA 91362
Circle Reader Service Number 219.

Amiga Gunship

MicroProse's helicopter simulation, *Gunship*, will soon be available for the Amiga. The game puts you behind the controls of a U.S. Army AH-64A Apache attack helicopter armed with Hellfire and Sidewinder missiles, folding-fin aerial rockets, and a 30mm cannon capable of firing 625 rounds per minute.

A variety of skill and reality levels, mission types, and specific mission objectives are available for players who can earn commendations, medals, and promotions during gameplay.

Gunship pilots must fly missions in Southeast Asia, Central America, the Middle East, and Western Europe. A training scenario conducted in the U.S. gets players used to the helicopter in a less hostile environment.

The Amiga version runs on the Amiga 500, may be installed on a hard disk, uses the key-disk copy-protection routine, and can be controlled by joystick. The suggested retail price is \$54.95. *Gunship* is already available for the Commodore 64/128, the IBM PC and compatibles, and the Atari ST.

MicroProse, 180 Lakefront Dr., Hunt Valley, MD 21030
Circle Reader Service Number 220.



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Cocaine can make you blind.

Cocaine fools your brain.

When you first use it, you may feel more alert, more confident, more sociable, more in control of your life.

In reality, of course, nothing has changed. But to your brain, the feeling seems real.

From euphoria...

You want to experience it again. So you do some more coke.

Once more, you like the effects. It's a very clean high. It doesn't really feel like you're drugged. Only this time, you notice you don't feel so good when you come down. You're confused, edgy, anxious, even depressed.

Fortunately, that's easy to fix. At least for the next 20 minutes or so. All it takes is another few lines, or a few more hits on the pipe.

You're discovering one of the things that makes cocaine so dangerous.

It compels you to keep on using it. (Given unlimited access, laboratory monkeys take cocaine until they have seizures and die.)

If you keep experimenting with cocaine, quite soon you may feel you need it just to

function well. To perform better at work, to cope with stress, to escape depression, just to have a good time at a party or a concert.

Like speed, cocaine makes you talk a lot and sleep a little. You can't sit still. You have difficulty concentrating and remembering. You feel aggressive and suspicious towards people. You don't want to eat very much. You become uninterested in sex.

To paranoia...

Compulsion is now definitely addiction. And there's worse to come.

You stop caring how you look or how you feel. You become paranoid. You may feel people are persecuting you, and you may have an intense fear that the police are waiting to arrest you. (Not surprising, since cocaine is illegal.)

You may have hallucinations. Because coke heightens your senses, they may seem terrifyingly real.

As one woman overdosed, she heard laughter nearby and a voice that said, "I've got you now." So many people have been totally convinced that

bugs were crawling on or out of their skin, that the hallucination has a nickname: the coke bugs.

Especially if you've been smoking cocaine, you may become violent, or feel suicidal.

When coke gets you really strung out, you may turn to other drugs to slow down. Particularly downers like alcohol, tranquilizers, marijuana and heroin. (A speedball—heroin and cocaine—is what killed John Belushi.)

If you saw your doctor now and he didn't know you were using coke, he'd probably diagnose you as a manic-depressive.

To psychosis...

Literally, you're crazy.

But you know what's truly frightening? Despite everything that's happening to you, even now, you may still feel totally in control.

That's the drug talking. Cocaine really does make you blind to reality. And with what's known about it today, you probably have to be something else to start using coke in the first place.

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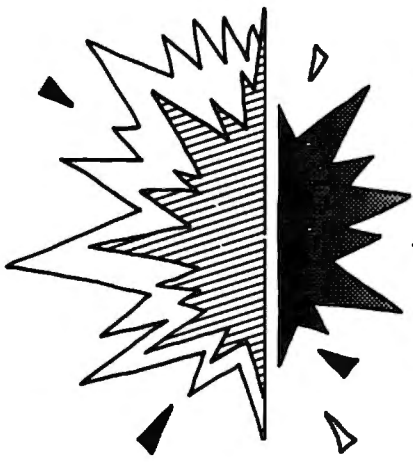
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DAVID D. THORNBURG

Turn On Your Computer and Throw Open a Window onto the Wonders of Science

The popular cartoon image of science depicts bespectacled men in white lab coats standing around a blackboard filled with equations and carries a caption like *Here's the problem: It's x before y except after z*. The reality of science is quite different. During my ten years as a scientist, many of my colleagues were women, most of us didn't wear glasses, and we rarely stood in front of blackboards—we sat in front of computers.

It's hard to imagine what scientific research would be like if the computer had never been invented. Computers are used in all aspects of scientific research, from the acquisition of data to the development of abstract theories.

Any experimental scientist will tell you that the most tedious part of the job is collecting data. Typically, one measures a variety of parameters (resistance or blood pressure, for example) under varying conditions (different voltage or sound levels, for instance) and then generates tables or graphs that depict the relationship (if any) between the stimulus and the response. It's not uncommon for a single experiment to generate thousands of data points.

When data is taken by hand, the opportunity for writing numbers incorrectly is always present. And even if the numbers are recorded properly, that data usually goes into a computer program for analysis: more chances for error. Only by using a computer to capture data over long periods of time can errors be decreased.

Inexpensive products for the personal computer, like Brøderbund's *Science Toolkit* and Sunburst Communications' *Exploring Science*, allow home computer users to conduct scientific experiments using automated data acquisition.

Today's high school students, armed with personal computers, are exploring scientific ideas that were beyond the reach of the best nineteenth-century scientists. Much of the excitement in scientific circles today revolves around exotic subjects like *chaos*—a branch of science with simple principles, but whose results remained obscure prior to the spread of computers. But now many of these fascinating theories can be explored outside the laboratory—by individuals using their personal computers.

Historically, physicists and other scientists developed theories laden with simplifying assumptions in order to make the resulting equations simpler to compute by hand. The result was a collection of theories filled with various "fudge" factors designed

to compensate for these simplifying assumptions. Scientists could often adjust these factors to allow a theory to fit any set of data that was handy—hardly the basis for a rigorous proof. Now that computers allow scientists to deal with the complexity and non-linearity of the real world, theories of greater accuracy can be proposed and tested.

Besides theoretical explorations, another application for computers in the sciences, and one with a tremendous future, is simulation. Computers allow us to construct microworlds based on certain assumptions. By monitoring the behavior of these microworlds over time, we can see what the long-term consequences of these assumptions might be. For example, simulations that show collisions of two galaxies over millions of years can be presented, in animated form, on a display screen in a few minutes. The popularity of simulation programs (often offered as games) reflects some of the power that can come from these microworlds. In any software store, one can find simulations of nuclear reactors, war, and aircraft flight—and recently even a simulation of an entire city.

The growth of the home video market has opened even more doors for simulation and scientific exploration. Genlock cards allow images from videodisc or videotape to be blended or overlaid with computer graphics. An animated computer model of a skeletal structure can be superimposed on a video image of a walking person, for example, to show how various bones move in relation to each other. Or, a teacher might use a videodisc to illustrate cell division to a class. During the presentation, the teacher can freeze the image and then label its parts with a drawing program.

The impact of computers on science is tremendous, but another aspect of scientific computing is even greater. Personal computers have made science accessible to people who had felt intimidated by the field's apparent abstractions. By allowing people to "mess around" with ideas and to play with those ideas until they make sense, the personal computer has greatly increased people's awareness of scientific issues.

The personal computer helps to make abstract theoretical ideas tangible and concrete. It demystifies science without taking away any of its wonder, informing all of us with the miracle of our world. At a time when science and technology are playing an increasing role in private life, the need for an informed public has never been greater.

□

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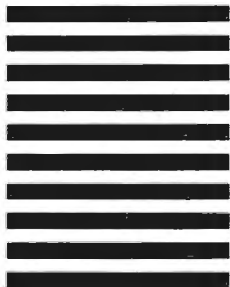
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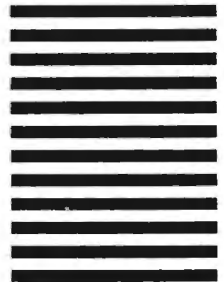


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THERE MUST BE AN EASIER WAY TO MAKE A LIVING

There's never a moment's rest for galactic heroes, and when you're Roger Wilco, space-age swashbuckler and all-around nice guy, the thrills just keep on coming. It seems there's always some kind of dangerous mess to clean up.

This time it's those Two Guys from Andromeda, bestselling designers of Space Quest and Space Quest II, who have gone and gotten themselves foully abducted by the pesky pirates of Pestulon, those poaching parasites, those perverse perpetrators of petty mischief and putrid software.

If Roger can't rescue the two guys from the bowels of the Scumsoft Software stronghold, his days as a popular adventure game character are definitely numbered.

So it's simple, right? Just set course for Pestulon and storm the gates of Scumsoft.



Pilot your ship through the farthest reaches of space, using onboard computer to navigate between planets and defend yourself from enemy fighters.

NOT SO FAST, SPACEWIPE!

But the Two Guys don't write games for sissies. If you can't stomach being picked up like so much trash by a wandering garbage freighter, stalked by giant rubbish rats, ground into hamburger in the belly of the Mog, zapped by a scorpazoid in the deserts of Phleebhut, or deep-fried like a chimichanga on the planet Ortega, you'd better play one of those 'nice' games. In Space Quest III, *The Pirates of Pestulon*, you're not likely to be shown any mercy.

LIFE'S NOT EASY FOR HEROES

Real heroes thrive on danger, and space-faring broomjockey and freelance good-guy Roger Wilco is no exception. Is he afraid of being fried by lightning in a megathunderstorm? Is he afraid of landing in the trash shredder in the depths of the intergalactic garbage truck? Is he afraid of finishing the Belcher Combo plate at Monolith Burger? You bet your sweet asteroid!



Check out all the crazy and absurd junk, er, uh, treasures at Fester Blatt's wacky World of Wonders.

TRASH HEAPS OF PRAISE FOR OUR TWO GUYS

Game reviewers throughout the galaxy love Space Quest games: "...humorous and challenging...", "...laugh-out-loud funny...", "...genuinely entertaining...", "...A three dimensional graphic wonder..."



Battle for your life in the arena with the Nuke 'em- Duke 'em robots. He's down! He's up! This crowd is out for blood, and it might as well be yours.

HAVE YOU GOT WHAT IT TAKES? NOW'S YOUR CHANCE TO FIND OUT

But don't take *their* word for it -- blast off for adventure, challenge, and laughs with Roger Wilco and the Two Guys from Andromeda in Space Quest III, *The Pirates of Pestulon*.



ORIGINAL MUSIC FROM SUPERTRAMP'S BOB SIEBERG

Space Quest III features the best and most realistic sound of any Space Quest game. The exciting original music score and the more than two dozen realistic sound effects *must* be heard to be believed.