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COMPUTER

MAY
1988

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Cover illustration: Lee Noel, Jr.



editorial license

GREGG KEIZER

**We Changed
Because We
Saw You
Changing. It's
That Simple.**

We've changed. When you flip through the pages of this issue, the first thing you'll notice is a new, clean layout and design. Thanks to the expert guidance of our art director, Janice Fary, the magazine is easier to read, easier to use, easier to digest. *COMPUTE!*'s contemporary look reflects, we think, our philosophy of providing the most up-to-date information about computers and how to put that information to use.

Which brings us to an even more fundamental difference. Over the last decade, *COMPUTE!* has published the highest quality software available in print form. With this issue, however, *COMPUTE!* magazine begins a new era, one that doesn't include type-in programs.

As computers and software have grown more powerful, we've realized it's not possible to offer top quality type-in programs for *all* machines. And we also realize that *you're* less inclined to type in those programs. You're more interested in hands-on features, dependable and forthright product reviews, and insightful columns. We've changed because we saw you changing. It's that simple. After all, our job is to give you the kind of information *you* want.

We believe that the new *COMPUTE!* will make the time you spend on your computer more interesting, more worthwhile, and more productive. And we think that the package we've put together does that better than any other consumer computer magazine.

COMPUTE! will include more feature articles, written by authors old and new to the magazine—practical features that demonstrate the power of personal computers, that show you how you can use the machine to educate, entertain, produce, and process. Well-written articles show *you* how to use your computer, not how one person far removed from your experience may use it. This issue, we're showing you a bit of everything—a preview of what to expect from *COMPUTE!* features. Hardware guru Arlan Levitan looks at laptops; educational computing expert Fred D'Ignazio shows how summertime can be fun with a computer; and our games-crazed staff picks its 20 favorite computer diversions.

There will be a complete buyer's guide in each issue to help you find, and then buy, the right software for your computer. This month, for instance, we offer a comprehensive listing of personal finance packages. Next month, flight simulators. The month after that sports games. And so on.

We're doubling the number of our product reviews, adding hardware evaluations on a regular basis, and changing the focus of those reviews to give you solid information about the software that you want to buy, not the software we want to hype. We'll review programs like *Quattro* because many of you work in the home, *Ticket to London* because you and your children want to learn with the computer, and *GeeBee Air Rally* because everyone likes to have fun.

COMPUTE! has always been known for its recognized columnists, and we're not going to change that. "Gameplay," our new entertainment column, is written by Orson Scott Card, an award-winning science-fiction writer who has a keen eye for what makes or breaks a game. We're also debuting "Discoveries," David Stanton's educational computing column and "Levitations," our free-form column that reports on almost anything connected with personal computers and their users. And though we've changed the name of his column, we're keeping David Thornburg's refreshing look into both the near and the distant future of computers.

Even though we no longer carry type-in software specific to each kind of computer, we do give you computer-specific information in the new *COMPUTE!* Specific department. If you own an Amiga, Apple II, Atari ST, Commodore 64 or 128, IBM PC or compatible, or Macintosh personal computer, you'll find this new section an invaluable fount of product information, news, and application hints and tips. Here you'll read about everything from an IBM PC virus to Commodore 64 emulators for the Amiga.

Rounding out the magazine are such things as "News & Notes," full of industry news—the serious and the humorous—that appeals to anyone who owns a computer; letters to the editor; technical and programming hints and tips; and a stronger new products listing.

We like what we're offering, and we hope you do, too. If you like using your personal computer, want to know more about computers and how to put them to work (and play!), then you've got the right magazine in your hands. Stay with us, and stay on this unique road of discovery as we see what lies ahead.

Editor

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news & notes

No Crash in Computers

Even though the stock market took the big dive last October 19, even though many analysts are calling for a slowdown in the economy (or worse, a possible recession, or for the real doom-sayers, a depression), personal computer hardware and software sales are expected to remain strong and grow stronger.

Almost everyone is expecting 1988 to be a good year. Microsoft, the number one software publisher, predicts that sales of personal computers will rise 26 percent in their current fiscal year (July 1987 to June 1988). Since Microsoft is the supplier of MS-DOS, the operating system for IBM PCs and compatibles, it should have a good idea of sales strength.

Apple Computer also sees a year of growth. John Sculley, Apple's chairman and CEO, recently told a group of analysts that his company foresees an increase of 30 percent in personal computer sales dollars this year. Obviously, Apple hopes a big part of that increase is spent on Macintosh computers.

Fourth-quarter sales for both Apple and personal computer powerhouse IBM showed that lots of people and businesses paid little attention to the market's crash. IBM's final quarter was 6.3 percent better than last year's, while Apple's was a whopping 57 percent higher.

At the consumer end of things, retail giant Sears, Roebuck, & Co. projects a 10-percent growth in its computer sales. That's double the increase in 1987. And home computer hardware and soft-

ware sales, says the Electronic Industries Association, will be better this year than last. Home computer sales will be up 12½ percent, while software sales should jump 25 percent, says the Association.

But it's difficult to explain why businesses and consumers are still going after big-ticket items like computers. One reason may be that several computer companies—Apple and IBM in particular—are coming off a year in which they introduced new and more powerful models that have caught everyone's eyes. Price cutting is another possible contributor, especially in the IBM-compatible market, where clone manufacturers continue to offer more machine for less and less money. Home computer sales may be up because many people will have a bit more money this year, since the tax cuts take effect. And some businesses may see additional personal computers as a way to make their operations more productive, an important consideration if there is a down turn in the economy.

— Gregg Keizer



Game of Glasnost, Comrade?

The first entertainment software designed in the Soviet Union is now available in the U.S. for IBM and Commodore 64 computers. Called *Tetris*, the game is a cross between arcade-style action and strategy. *Tetris* was designed by 30-year-old Alexi Paszhitnov, a

screen toward the bottom. The player rotates and flips the pieces as they descend in order to form complete horizontal rows where they land—with no blank spaces.

Tetris reached the West after the head of Academy Soft sent a copy of the program to a Hungarian programming company, Novotrade, which has produced software for British and American publishers for the past five years. Spectrum HoloByte is making it a cornerstone of the company's new International Series of entertainment software.

For the American version of *Tetris*, a Spectrum HoloByte development team rewrote the program, incorporating colorful background scenes representing Gorky Park, Red Square, and other Soviet views.

The IBM version of the game has a suggested retail price of \$34.95, while the Commodore 64 version is priced at \$24.95.

— Selby Bateman



Tetris begins the U.S.S.R.'s quest for software dominance.

researcher at the U.S.S.R. Academy of Scientists (Academy Soft); it was programmed by 18-year-old Vagim Gerasimov, a student of computer informatics at Moscow University.

The premise of the game is deceptively simple: Four squares, in various configurations, drop from the top of the

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**AIR
FORCE**

Computer Games Go VCR; Teenage Boys Hit the Couch

It's a first. The popular *California Games* from Epyx has been transformed into a VCR game by the company's new Consumer Electronics Division. *VCR California Games* is one of three new VCR game ventures being tried by Epyx, a company best known for its entertainment computer software.

Marrying elements of video and board gameplay, *VCR California Games* begins with players who are out of money but are in a race to reach San Diego from San Francisco. To make enough money for gas and car repairs, contestants take to the surfboard, skateboard, sailboard, and other totally Californian devices, hoping for big prize money and instant fame. At various



California Games is one of three VCR games that Epyx is hoping will keep you in front of the tube, not the computer.

places on the board game, players turn on the VCR and watch the action as surfers wipe out, skateboarders skate or die, and BMX bikers fly through the air.

Patterned after the hit computer game of the same name, *VCR California Games* obviously hopes to tap into the

huge VCR audience, which includes far more households than the home computer marketplace. Other games planned for release are *VCR Golf* and *Play Action VCR Football*. A second line of games uses audio tapes for play-by-play highlights.

Epyx may be basing its

VCR expectations on the results of a survey the company recently conducted which said that the majority of boys between 12 and 18—typically the group most taken with computer action entertainment software—would rather watch TV than play sports.

The survey of 1,000 teenage boys may not be an accurate depiction of American teen behavior, but it makes interesting reading nonetheless. Slanted toward electronic entertainment (75 percent said they bought computer games, while less than 20 percent of American households own a computer), the survey reported a stunning 35 percent relaxed by watching TV. Playing sports was a distant second at 18 percent, while using a computer came in third at 13 percent.

—Gregg Keizer

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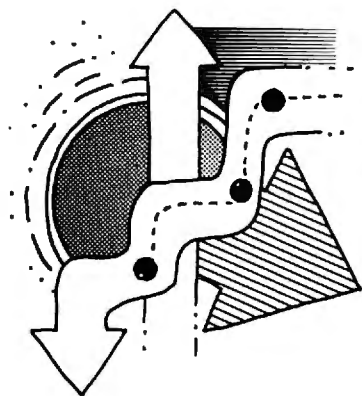


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gameplay

ORSON SCOTT CARD

Do You Want to Change the World? Two Games Let You Try.

History is the toughest game to create on the computer. By comparison, football is pretty easy to get right. Eleven guys per team, four downs to get ten yards.

But history—the rules keep changing.

The problem with history is it only happens once. We can never go back and run it over again to see what would happen with a few changes. What if Nixon had won in 1960, or Humphrey in 1968? What if Jerry Brown had been the Democratic nominee in 1976, or Gary Hart in 1984?

Nor can we ever know how close to World War III we really were in 1952 or 1962. Did Truman save us from a hideous war with China, or needlessly surrender half of Korea to a totalitarian state? Did our safety really depend on Kennedy staring down the Russians over Cuban missiles in 1962?

Impossible to know. And yet two recent computer games, *President Elect* (Strategic Simulations; 1988 edition) and *Balance of Power* (Mindscape), dare to take on exactly those questions.

President Elect lets you replay every election since 1960. You may choose from all the candidates in each of those elections. Playing against the computer or a human opponent, you can try to outwit history.

See if you can manage Humphrey's campaign in 1968 better than he did. Or try a fantasy election: Robert Kennedy against Richard Nixon in 1968, for instance, or something really strange, like John Glenn against Ronald Reagan in 1972, with Jesse Jackson running a third-party campaign.

The toughest test of all? Out-guess the future. The 1988 edition of *President Elect* offers all of this year's candidates—along with a few who played coy too long or backed out early. By evaluating candidates' personal strengths and weaknesses, and their positions on various issues, the gamewrights let you hold your own test elections.

How would Gore do against Bush, if the economy is soft and public morale is down? What about Gephardt against Dole? Cuomo against Kirkpatrick? You can play them all.

And, in one sense, the simulation works. I found myself following the game's poll results with the same kind of interest I feel about the real thing. Election day, with the returns trickling in, was almost as tense as the real thing.

But what really impressed me about *President Elect* was its faithfulness to the way presidential politics really seem to

work. The strongest forces are completely out of the players' control.

Is the national morale high or low? Is the economy booming or collapsing? Candidates ultimately can't overcome such powerful forces.

But that's the way it works in the real world. The game is only a contest of skill and judgment when you set it up to be pretty even—a middling economy, no incumbent, two moderates.

I found few false notes in *President Elect*—and their guesses about 1988 have held up pretty well so far.

I only wish they had spent as much effort on the design of the game. The worst annoyances? The game won't let you change your mind about anything once a choice is made; the map that shows how different states are leaning isn't on the screen when you have to make campaign decisions.

Compare *President Elect* with a beautifully designed game like *Balance of Power*, though, and you begin to realize that while bad design can be annoying, bad history makes a game unplayable.

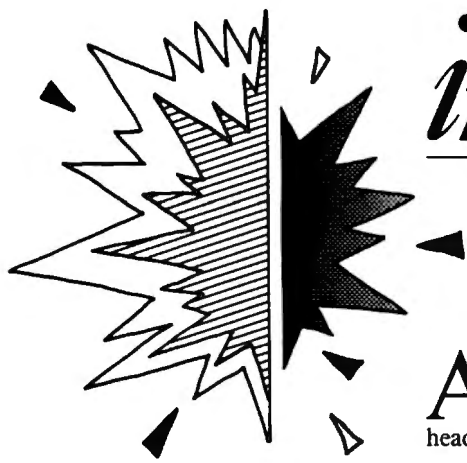
Balance of Power is a *Risk*-like game about the contest between the U.S. and the Soviet Union for world domination. You give aid here, send a few troops there—always with the possibility of nuclear war looming over you like a shadow.

Unfortunately, you very quickly realize that the shadow is really Chris Crawford, leaning over your shoulder and bullying you into playing the game his way. He has a sweet delusion that as long as the United States is very nice and doesn't do anything to offend them, the Russians will all go home. And if you don't play that way, why, he'll stop the game with a nasty remark about how the world was just destroyed by nuclear war.

The trouble is, since we've never had a nuclear war, there's no way Crawford can possibly know what would cause one. And there are a lot of experts who claim that the Soviets seem to behave a lot nicer when we stand up to them than when we disarm.

Maybe Crawford is right. But then, maybe he isn't. And in the meantime, he's so sure he's right that *Balance of Power* isn't a game, it's propaganda. Imagine what *President Elect* would be like if Republicans always won, and you'll know why *Balance of Power* fails.

Too bad, because Crawford is the best designer of simulation games I've seen. But when it comes to history, you just can't design a good game by grinding an ax. □



impact

DAVID D. THORNBURG

Only Software That Creates New Metaphors Can Change the Way We Use Computers

According to legend, the Roman god Janus opened the door to each new year. He is represented with two heads because every door looks both ways.

I was thinking about Janus the other day when I realized that there are two aspects to our use of personal computers. We use computers both to look backward to our past way of doing things, and to look forward to new ways of working, learning, and playing. Each time we use a computer, we look through time's door in one direction or the other.

My major personal computer application is word processing. When I use a word processor I'm looking backward, using the computer to accomplish tasks that are performed by older technologies—typewriters, typesetting equipment, and so on. Of course the computer has advantages over these, or I wouldn't use it. As writing tools, computers do the job much better than these older tools. What the computer lacks in novelty, it more than makes up for in efficiency.

Other backward-looking applications are abundant: Graphics programs, accounting packages, and music-transcription software are all examples of ways computers can be used to look back through time's door to perform tasks that we can relate to in numerous concrete ways.

The concrete connection between some computer applications and the types of tasks we used to perform without computers makes this technology easy to justify and apply. When we're told about a new word processor, it's easy to generate a set of criteria by which to judge the program before we even take it out of the box.

When computers are being used to perform tasks that are new to us, we have no frame of reference. How would you establish the criteria for judging the world's first interactive adventure game, for example, or a mouse-driven musical instrument?

Computer applications that look forward are exciting, but they provide special challenges to users and software developers alike.

The major problem from the developer's point of view is marketing. How can you convey the usefulness of a program that does something no one has seen before? The most common approach is to express the program's function with a metaphor. Sometimes this works and sometimes it doesn't.

I remember sitting in a meeting during the late 1970s discussing a forthcoming product called *VisiCalc*. No one had any idea of how to describe the product, the first electronic spreadsheet, to potential custom-

ers. Someone called it an electronic blackboard; someone else suggested calculator array. There was no clearly understandable metaphor that captured the essence of this product until someone noted that the spreadsheet, known to accountants, was close enough to convey at least one of the program's applications.

Another example of a new computer application came in 1984 with the introduction of *Filevision* for the Macintosh. This program was the first commercial hypertext database—although this term was unknown to most computer owners at the time. I remember watching a computer salesman try in vain to explain what *Filevision* did. He called it a combination of a graphics program (old metaphor) with a database (old metaphor). Now that Apple has released *HyperCard*, the public's awareness of hypermedia is high enough to support products of this type.

It takes a brave soul to be among the first to adopt a new technology, even though pioneers often end up at a tremendous advantage over their more conservative peers. I've often started working with a new class of software only to find applications for it that were not foreseen by the original developers. The problem with being innovative is that new applications rarely sell well enough to become commercial successes in their first year. Many small, innovative companies don't have the resources to wait until the world understands their new product.

We'll always use computers to perform old tasks, but it's important to realize that the advantages of using computers in this way are incremental. We may not like living without a word processor, but most of us could use a typewriter again if we had to.

Completely new applications for computers, however, have the capacity to allow major modifications in how we work, learn, and play. It's through the creation of new computational metaphors (almost all of which are created by small companies) that computer technology will influence our lives in the coming years.

Computers are like Janus—they look forward and backward in time. If you expect the computer to be a power tool in your life, be sure that some of your programs look forward, not backward. □

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Letters

Computer Drama

I believe that the computer software and hardware industries should address two things: a flexible word processing program which permits easy and quick formatting of scripts and plays, and a full 60-column screen so we will be able to see an entire page without incessant scrolling.

Considering how much software and hardware comes out of California, I am surprised that nobody has done just this for TV and movie script writing.

Clement G. Scerback
Seminole, Florida

More on CD-ROM

I was horrified to read Phil Nelson's comment in the February *COMPUTE!* that "in the meantime, there are exactly two CD-ROM applications for micros—the *American Heritage* encyclopedia and Microsoft *Bookshelf*—both for the IBM PC."

First, there are more than two applications. The August 1987 issue of *CD-ROM Review* listed 100 titles. Some may be vaporware, and some are not yet available, but there are certainly more than two available. As an example, for librarians there are *Books in Print*, *Ulrich's International Periodicals Directory*, and *Reader's Guide to Periodical Literature*. In addition, one user's group has a disc that contains more than 600 floppies worth of public domain software, and last spring I played with *ERIC* (an index to educational material) and a medical index.

Second, I believe that Nelson meant the Grolier *Americana Encyclopedia*. Both may be available, but I've only seen the Grolier one.

Third, of course they are only available for the IBM PC. Most of the material is business-oriented. This isn't surprising, considering the cost of the CD-ROM players.

Ken Bullock
Medicine Hat, Alberta, Canada

Computing for the Handicapped

I am currently working with severe and profound mentally and physically handicapped adults. I am using a Commodore 64 and a Commodore 128. The computer is used to teach skills such as attending and matching concepts.

I would be interested in sharing ideas, problems, concerns, and programs with others who have written programs, or are using computers as a teaching aid, for mentally handicapped individuals.

Robert D. Gunn
1837 Carlyle
Beatrice, NE 68310

The British Invasion

I read your magazine often, though sometimes I can't get it. I am a British reader who lives abroad.

This letter concerns the U.S. game market. The first thing I would like to say is that the games are appalling there. In my opinion, the U.S. has only five good game producers: Epyx, Access, Accolade, SSI, and MicroProse.

This brings me to my next point. Your reviewers are missing something. It seems that the best games that U.S. companies are selling are from the U.K. I've had many of the "new games" that are being advertised now for six months. Your reviewers hardly ever mention this fact.

Great Britain is also way ahead in arcade conversions. I'm sure that many people have heard of *Run, Crygor*, and *The Last Mission*. These games are already being converted to home computer games.

In summary, I'll say that if you want good games, go to the U.K.

A. Blake Davies
Dubai, United Arab Emirates



The best burger in town. The best plumber around. Everyone likes to make "Best of" lists. The editors at COMPUTE! are no exception. Here's our first Best list—20 computer games no one should be without.

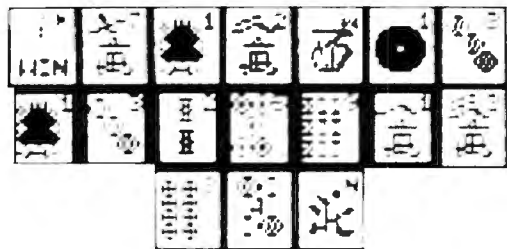
Think back to the first program you bought for your computer. Chances are it was a game. Maybe it was a rock-'n'-rollin' arcade game that nearly tore your joystick apart. Or perhaps it was a thought-provoking simulation that included a manual three inches thick and three pounds heavy. Whatever its form, it was strictly entertainment.

Personal computers may be terrific number crunchers, word processors, drawing tools, and file organizers, but they're also premiere game players and presenters. Thousands of games can only be played with a computer. Without computers, for instance, there would have been no *Pong*, no *Pac-Man*, no *Space Invaders*. Simply put, there would have been less fun in the world.

Computers are fun. We can't forget that. If we do, we run the risk of forfeiting our machines to the dry, the dull, and the dreary.

Our Favorites, Maybe Yours

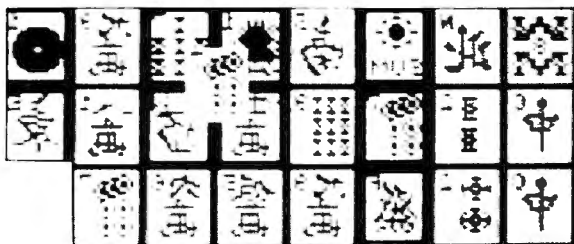
With some discussion, some debate, and some shouting, we picked 20 great computer games, games that are a step above superior. Almost everyone around here is a computer game player (sometimes to the detriment of work). Most of us play games on a wide variety of computers. We play games on everything from the venerable Commodore 64 and Apple IIe to the state-of-the-art Amiga, Macintosh, Atari ST, and 386 PC. We play on IBM PCs, PC-compatibles, and clones. Name a personal computer that has had entertainment software and we've played on it.



Our criterion for selecting these 20 games was simple—if it's listed, we think it's a great game. But what makes a game great? Lots of things, really, but they include playability (how well does it play?), depth of play (how long can you play before you get bored?), graphics and animation (how good does it look?), game concept (is it unusual, out of the ordinary?), and popularity (if tens of thousands play the game, it *must* be good). Answer *yes* to these questions, and you've got yourself a game worth playing.

All these games, with one exception, are available. Look for them in local software stores or from mail order companies, or contact the publisher directly. You may be able to find the out-of-print game by scanning user group newsletter classified ads, talking to other computer users, or going to small computer fairs and shows.

We hope our picks confirm your suspicions, that you agree with our 20 choices. And if you discover a new game here, so much the better. It means we've done our job.



It's possible, of course, that we've left out a few of *your* favorites. Let us know if we have. Tell us which games *you* think should be in the Top 20. Write us—Favorite Games, *COMPUTE!* Magazine, 324 W. Wendover Avenue, Greensboro, North Carolina 27408—and tell us we're on target or way off base. It's your chance to make the next "Best of" list.

Balance of Power

Go eyeball to eyeball with the Soviets (or with the Americans) and see who blinks first. Mindscape's *Balance of Power*, the game that made Chris Crawford famous, is an impressive recreation of the world's geopolitical landscape as viewed from one of the two superpowers. You desperately try to avoid nuclear conflagration as you advance your own ideology. With tools like money, guns, troops, treaties, diplomatic pressure, and dirty tricks, you coax third world nations to your side. All the while you're putting the pressure on the Soviets and their clients. Crisis management is the key to winning. Back down at the wrong time and you'll lose the game. Call one too many bluffs and you'll see the chilling message *You have ignited a nuclear war*.

—Gregg Keizer

Beach-Head

Travel by land and sea, battling the opposition in a quest to locate and conquer the enemy fortress of Kuhn-Lin. *Beach-Head*, a popular Access release of old, was a pioneer for computer combat action games. It was one of the first to combine multiple screens of arcade-style battle with the rudiments of strategic planning. In the fast-action scenes, you find yourself in the heat of battle, facing ships, aircraft, and tanks head-on. To locate the fortress, you must advance through three screens, employing a variety of tactics in each. Good graphics and sound contribute to the game's play. *Beach-Head* spawned many imitators, as well as a popular sequel. Few, however, ever matched the excitement generated by this classic original.

—David Hensley, Jr.

California Games

Surf's up! And so is the level of excitement in *California Games*, the best of Epyx's Games series. This time, instead of competing for Olympic gold and glory, players are challenged to tackle a variety of classic West Coast sports: surfing, flying disc toss, skateboarding, BMX bicycles, footbag, and roller skating. Each event is beautifully rendered, with terrific animation and some of the smoothest joystick control seen. Game play is easy at first, yet satisfyingly difficult to master. Repeat playability is high.

Perhaps more important is the game's sheer exuberance. It's nice to know that, via the computer, there's a California where the skies are always blue, the surf perpetually gnarly, and the competition totally tubular.

—Keith Ferrell

Chessmaster 2000

Chessmaster 2000 provides a challenging chess opponent for owners of almost every personal computer. Opening up a whole new genre of chess programs, *Chessmaster 2000* offers realistic graphics and optional sound, which on the Amiga and Atari ST even includes speech. View the board in two or three dimensions as you challenge its 12 levels of play and three different play styles: Coffeehouse, somewhat random in its strategy; Normal, providing good, solid moves; and the aptly named Best Move. To augment its playing abilities, *Chessmaster 2000* contains 7100 openings and a library of 100 classic games. With some serious concentration and a strong end game, maybe you can force *Chessmaster* to say, *I am checkmated, you win*.

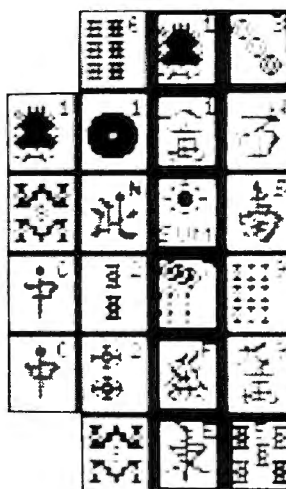
—Randy Thompson

F-15 Strike Eagle

Vicarious thrills are a big part of computer games, and *F-15 Strike Eagle* from MicroProse provides plenty to every budding jet jockey. Arcade in its feel, this isn't a touchy simulator where twitching sends you into a spin. Handle the F-15 as roughly as you want, and most times it will

come through. Real-life scenarios give you opponents from Lybia, Syria, and Iran. Use your heat-seeking and radar-ranging missiles, cannons, and electronic jamming gear to successfully out-duel enemy jet fighters. Climb, roll, dive, jink, then hit the afterburners to get back to base. Other flight simulators teach you how to fly or land on a carrier, but only *F-15 Strike Eagle* makes jet fighter combat nerve-wracking and fun at the same time.

—Gregg Keizer



Flight Simulator

The desire to fly seems innate, and that's what attracts thousands of people to try their hands at *Flight Simulator* and its grown-up companion, *Flight Simulator II*. By far the most popular versions, they put you in the pilot's seat of a single-engine aircraft with a very accurate array of controls and instruments. To heighten the realism, you're presented with a simulated 3-D cockpit view in any direction. You can actually fly over real-world scenery—circle the Empire State Building or barnstorm the Golden Gate Bridge. Most important, *Flight Simulator* fuses the action elements of arcade-style games, the exploration aspects of

These Are a Few of THEIR Favorite Games

We asked a handful of software publishers and developers to give us their favorite games—the ones they and their companies weren't connected with. Here are their picks. . . .



Trip Hawkins, president, Electronic Arts

"My first major computer gaming experience was with *Colossal Cave*, the original adventure game. I nearly finished [the game]. I really liked it, but the novelty wore off, and I haven't liked any text adventures since."

What took the place of text games in his life? "I'm addicted to sports games," Hawkins admits. "I programmed a football game back in 1973 and used it to simulate the 1974 Super Bowl. In my simulation, Miami beat Minnesota 23-6; in real life it was 24-7."

His favorites? "An old-time favorite was *Sneakers*, by Mark Turmell. It's one of the few action games I ever mastered. I liked the arcade game, *Battle Zone*, but I wasn't any good at it. I also got pretty hooked on *Marble Madness* and *Gauntlet*; I think the digitized sound effects put them over the top for me."



Sid Meier, vice-president of product design at MicroProse, and developer of *Pirates!* and *F-15 Strike Eagle*

"I like games that are simple," says Meier. "Not games that are trivial, but also not games that require you to invest a week or relearn something. I like games

that you can just pick up, sit down in front of, and get going."

An example? "*The Sentry* from Firebird is one I enjoy. It's a great diversion. You have to use your brain and think. It's not a real joystick-shaking game, and it's not really an action-oriented game, but it's just fun to sit down with and puzzle through for a while. It's a game that kind of takes your mind off whatever you want your mind taken off of. That's why I like it. It's unusual and it's hard to describe."



Ezra Sidran, developer, author of *Universal Military Simulator* (Firebird) and *Designasaurus* (DesignWare/Britannica)

Sidran is unequivocal in his choice of favorites: "Anything written by Sid Meier and Ed Bever. *Crusade in Europe* is a good example, as is *Silent Service* (which Sid did alone)."

What makes their games stand out? "The documentation is exceptional," Sidran says. "Playability is superb, but it's the documentation that gives you a perspective you just don't find in many computer games."



Tom Snyder, head of Tom Snyder Productions, creator of Infocomics

Snyder recalls a season spent playing *Castle Wolfenstein* in concert with a friend.

"I enjoyed the interaction with another player," he says. "One of us worked the arms; the other, legs. We played for weeks

in a row—it was, in many ways, the ultimate social experience.

"*Wolfenstein* was a really elegant game. At first I disliked the violence, but once I got past that, I couldn't stop. At one point we found ourselves whispering to each other so the Germans wouldn't overhear us."



Roberta Williams cofounder of Sierra On-Line, and author of *Mixed-Up Mother Goose* and the *King's Quest* series of animated adventure games

"I like Infocom's games," Williams says. "I write adventure games, so I'm drawn to that genre. *Beyond Zork* is a good one. I started playing the first two (Zorks) but never finished. I just don't ever have time."

Still, she keeps coming back to text adventure games. "I started playing *Trinity* a few months ago. I said, 'For once I'm really going to take some time and get through it'—and I didn't. After a while I said, 'I just don't have the time.'"

Williams enjoyed the time she spent with *Trinity*, noting, "I thought it was rather hard, but only because I didn't really have the time to put into it and think about it. But I thought it was very well done."

—Keith Ferrell

adventure games, and the intellectual challenges of flight and navigation to create an experience that is uniquely educational, nonviolent, and fun.

—Tom R. Halfhill

Gettysburg— The Turning Point

Reliving history is a prime ingredient in all computer war games. The best ones offer an attention to historical detail and the opportunity to make tactical or strategic decisions.

SSI's *Gettysburg—The Turning Point* provides all this and more as the bloody days of America's greatest battle are brought to life on your screen. Assume command of either the Union or Confederate forces as the computer commands the opposition, or play a two-player game with a friend while the computer acts as the referee.

As you wage battle in any of the four included scenarios, the program supplies realistic situations as fatigue and supply problems become factors in the battle. Move units, fire at the enemy, and assault defended positions on the recreated battlefield.

Superior war games like *Gettysburg* let you see what happened, and why, in conflicts that changed the face of America.

—George Miller

Hitchhiker's Guide to the Galaxy

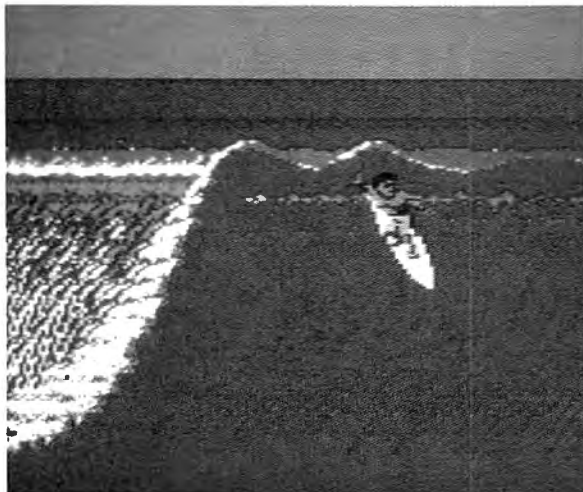
You wake up with a raging headache, so you get out of bed, take an aspirin, and get dressed. But a bulldozer is about to demolish your house. If you survive, you soon discover that the earth is blocking the planned route of an intergalactic bypass and will be destroyed in a matter of minutes. Luckily, you get your hands on "The Hitchhiker's Guide to the Galaxy," a sort of electronic encyclopedia that lets you escape. You're on your way to intergalactic adventures with melancholy robots and aliens who create fatally poor poetry.

What distinguishes *Hitchhiker's Guide* from run-of-the-mill adventure games is its sense of humor. Douglas Adams, author of the original book series, collaborated closely with Infocom's programmers. His keen and literate wit make this game a joy.

—Todd Heimarck

Impossible Mission

Stay awhile, stay forever! Those chilling words send you off in search of an evil scientist in his underground labyrinth. Great speech synthesis and smooth, colorful graphics make Epyx's *Impossible Mission* a fast-paced game with an innovative feel. A banshee's scream erupts every time your character falls down an elevator shaft. In fact,



California Games

one of this game's guilty pleasures is to send your character hurtling repeatedly into the abyss just for the sound effects. Squat robots bar your way at every step, sending electrical charges through your character if you make a misstep.

You can have hours and hours of fun just running amuck within the underground passages, jumping robots, riding the elevators, and solving memory teasers. But you're on a deadline, trying to

prevent a nuclear catastrophe. Your character runs smoothly along, his footfalls echoing nicely in the corridors, while the deranged doctor repeatedly calls out to his robots: *Destroy him, my robots!*

—Selby Bateman

Mean 18

Experience the thrill of playing the world's most famous golf courses while in the comfort of your own home. *Mean 18*, a golf simulation game from Accolade, utilizes superb graphics and digitized sound to create a realistic golfing experience. Nearly every aspect of the game comes into play, from club selection to green breaks. Plenty of practice and perseverance are necessary to master *Mean 18*, a touch of realism that helped send this sports game onto the best-seller charts. Once you're familiar with the courses provided, you can design your own with the feature-packed course architect or buy packaged disks with more actual courses. Chances are, after experiencing *Mean 18*, you may find yourself hooking and slicing your way around the computer links more often than your favorite local course.

—David Hensley, Jr.

M.U.L.E.

Cross a robot and a factory, and you get a stubborn critter called a *MULE*. In this classic game from Electronic Arts, you and three others—under the control of other humans or the computer—play planetary colonists. Land is regularly granted to the colonists, or you may bid for it. You then buy MULEs and outfit them to produce electricity to run the MULEs, food for the colonists, smithore to build more MULEs, or crystite (a precious metal with a wildly fluctuating value). After installing the MULE on the land, you take the product to market. At the same time that you're selflessly helping the colony to thrive, you're also trying to make the biggest profit. Do you specialize in smithore and hope that other players produce electricity and food, or do you diversify to gain self-sufficiency? This game requires a sense of strategy as well as proficiency at joystick maneuvers.

—Todd Heimarck ▶

Pinball Construction Set

Bill Budge's *Pinball Construction Set*, published by Electronic Arts, helped launch an important genre of entertainment software—the construction set. Tired of the pinball machine? Then create your own. Budge put together an elegant pinball machine, full of crazy sounds and flashing colors, a place in which nothing is nailed down—least of all your imagination. You can build virtually any kind of pinball machine, no matter how strange and wonderful, by moving bumpers, switches, bells, balls, and whistles into any configuration. The games are always fun, and the construction set itself is a programming work of art. We've seen plenty of pinball machines on computer screens, but this one's a classic that never seems to grow old.

—Selby Bateman

Raid on Bungeling Bay

The Bungeling war machine is gearing up for a major assault. New war factories are cranking out military hardware at an alarming rate. If they aren't stopped now, they'll never be stopped. That's where you come in. Your mission is to destroy the heart of the machine, the factories. To complete your mission, you command a carrier and five attack helicopters. These choppers aren't as fast as the Bungeling jets, but maneuverability and a good cannon more than make up the difference. Brøderbund's *Raid on Bungeling Bay* is an outstanding arcade game that's both playable and addictive. You may be able to destroy one or two of the factories your first time out, but you'll have to refine your strategy before you'll ever see the Bungeling empire fall.

—Dale McBane

Where to Find Our Favorite Games

Game	Publisher	Computers	Price	Address	Available
Balance of Power	Mindscape	Amiga, Apple, Atari ST, Mac, MS-DOS	\$44.95-\$49.95	3444 Dundee Rd., Northbrook, IL 60062, 312-480-7667	Yes
Beach-Head	Access	Apple, Atari, 64	\$19.95	2561 S. 1560 W., Woods Cross, UT 84087, 801-298-9077	Reissued as part of a three-game Action Pack
California Games	Epyx	Amiga, Apple, 64, MS-DOS	\$39.95	600 Galveston Dr., Redwood City, CA 94063, 415-366-0606	Yes
Chessmaster 2000	Software Toolworks	Amiga, Apple II, Atari, Atari ST, 64, Mac, MS-DOS	\$39.95-\$44.95	1820 Gateway Dr., San Mateo, CA 94404, 415-571-7171	Yes
F-15 Strike Eagle	MicroProse	Apple, Atari, Atari ST, 64, MS-DOS	\$34.95-\$39.95	120 Lakefront Dr., Hunt Valley, MD 21030, 301-771-1151	Yes
Flight Simulator/Flight Simulator II	SubLogic	Amiga, Apple, Atari, Atari ST, 64, Mac, MS-DOS	\$49.95	713 Edgebrook Dr., Champaign, IL 61820, 800-637-4983	Yes (Mac and MS-DOS versions avail. only from Microsoft Corp., 800-426-9400)
Gettysburg: The Turning Point	SSI	Apple, Atari, 64, MS-DOS	\$59.95	1046 N. Rengstorff Ave., Mountain View, CA 94043, 415-964-1353	Yes
Hitchhiker's Guide to the Galaxy	Infocom	Apple, 64, MS-DOS, Mac	\$14.95-\$19.95	3250 Bayshore Pkwy, Mountain View, CA 94033, 415-960-0518	Yes
Impossible Mission	Epyx	Apple, 64	\$39.95	600 Galveston Dr., Redwood City, CA 94063, 415-366-0606	64 version only available from Softmail, Woodside, CA (408) 848-3042 (\$9.95)
Mean 18	Accolade	Amiga, Apple IIas, Atan ST, MS-DOS	\$39.94-\$44.95	20813 Stevens Creek Blvd., Cupertino, CA 95014, 408-446-5757	Yes
M.U.L.E.	Electronic Arts	Atari, 64	\$14.95	1820 Gateway Dr., San Mateo, CA 94404, 415-571-7171	Yes
Pinball Construction Set	Electronic Arts	Apple, Atari, 64, Mac, MS-DOS	\$14.95	1820 Gateway Dr., San Mateo, CA 94404, 415-571-7171	Yes
Raid on Bungeling Bay	Broderbund	64	\$29.95	17 Paul Dr., San Rafael, CA 94903, 415-492-3200	Discontinued (Nintendo game system version available)
Reach for the Stars	SSG	Apple, 64, Mac	\$45.00	1820 Gateway Dr., San Mateo, CA 94404, 415-571-7171	Yes
Shanghai	Activision	Amiga, Apple, 64, MS-DOS, Mac	\$29.95-\$44.95	3250 Bayshore Pkwy, Mountain View, CA 94033, 415-960-0518	Yes
Silent Service	MicroProse	Amiga, Apple, Apple IIas, Atari, Atari ST, 64, MS-DOS	\$34.95-\$39.95	120 Lakefront Dr., Hunt Valley, MD 21030, 301-771-1151	Yes
Starflight	Electronic Arts	MS-DOS	\$49.95	1820 Gateway Dr., San Mateo, CA 94404, 415-571-7171	Yes
Ultima I, III, IV, V	Origin Systems	Amiga (III), Apple (all), 64 (I, III, IV), Atari (III, IV), Atari ST (III, IV), Mac (III), MS-DOS (I, III, IV)	\$39.95-\$59.95	17 Paul Dr., San Rafael, CA 94903, 415-492-3200	Yes. <i>Ultima II</i> discontinued.
Worms?	Electronic Arts	Atari, 64	\$14.95	1820 Gateway Dr., San Mateo, CA 94404, 415-571-7171	Yes
Zork Trilogy	Infocom	Amiga, Apple, Atari ST, 64, MS-DOS, Mac	\$44.95-\$52.95	3250 Bayshore Pkwy., Mountain View, CA 94033, 415-960-0518	Yes



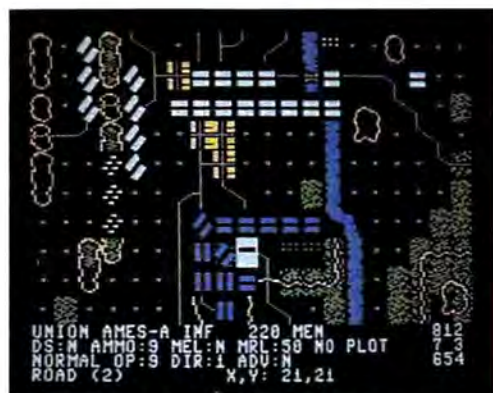
Flight Simulator



Starflight



Ultima IV



Gettysburg: The Turning Point



Mean 18

Reach for the Stars

Modeled after a popular board game, *Reach for the Stars* is a game of galactic supremacy that pits you against up to three opponents in a bid to become emperor of outer space. Expand your empire by colonizing uninhabited worlds and by conquering enemy planets. Get the best of your enemies by executing a brilliant sneak attack or by building a vast economic empire. Limited information on enemy colonies and fleets makes *Reach for the Stars* a realistic strategy game that keeps you guessing. Excellent computer opponents and variable victory conditions provide additional challenges.

Spend your credits on scouts, transports, warships, social concerns, planetary environment, local defense, or technology. Decide where to attack your enemies, and when. The choices are many, but so are the rewards. Domination of the universe doesn't come cheap.

—William Chin

Shanghai

Lose yourself in the mysteries of the ancient Orient with *Shanghai*, Activision's computer version of the popular and addictive game of mah-jongg. Attention to detail is what sets this game above the rest. The screen is beautifully drawn—right down to the shadows that the game tiles cast. In *Shanghai*, your goal is to remove pairs of tiles from the playing field until none are left. The trick is that you can only remove tiles on the left or right edge of a group. The game is similar to solitaire, though much deeper. Although the standard game is usually played at a leisurely pace, the two-player timed game is an exciting change. As a bonus, there's a wonderful surprise waiting for you when you finally remove all the tiles.

—Rhett Anderson

Silent Service

Submarine simulations fulfill a strange desire—to be someplace where you really wouldn't want to ever be. *Silent Service* is the best-selling submarine simulator for a good reason: It combines a relatively faithful feel of submarine warfare with excellent graphics, good sound, and

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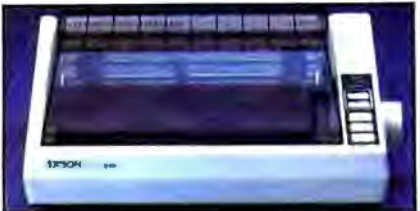
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Silent Service

palm-twitching action. You captain a U.S. sub in the Pacific during World War II, searching out Japanese convoys, sinking enemy merchant ships, and avoiding charging destroyers.

From a central menu, you access several screens to run the sub and fire its weapons. Dive, surface, raise the periscope, fire torpedoes or the deck gun, use your radar, and quietly slip away when the depth charges drop. *Silent Service* rewards both patience and aggressiveness, qualities a good sub captain has to have. For its playability, realism, graphics, and durability, *Silent Service* makes our favorites list.

—Gregg Keizer

Starflight

In a market crammed with science fiction games, *Starflight* stands out. No simple shoot-em-up,

this game turns on trading, mining, collecting artifacts, interacting with aliens, and solving mysteries.

Starflight simulates an entire universe. Hundreds of solar systems with planets, lifeforms, and exploitable minerals are scattered through a cosmos riddled with wormholes through which your starship emerges . . . elsewhere. Behind everything is a gradually unfolding mystery whose dimensions span time and space, and on whose solution the fate of the universe rests. Finally, *Starflight* captures the feel of a certain type of science fiction, as you assemble a crew, set out to explore and acquire, and are drawn into a narrative whose conclusion you control. The game can take hundreds of hours to play fully, yet those hours are anything but boring.

—Keith Ferrell

Ultima

Enter the world of fantasy with any of the *Ultima* series of adventure games. Attract a party of like-minded adventurers, explore Britannia, and endure perils as you complete a quest.

As with most *Dungeons and Dragons*-style role-playing games, magic plays an integral part in your quest. Often, magic spells are the only means to defeat a monster. Movement through the available worlds is controlled on a hex-squared map which encompasses several screens. Battles with monsters or brigands dedicated to your destruction are resolved on a separate animated screen.

where each member of your party is controlled individually in sequence.

Whichever *Ultima* you choose, you'll enjoy a rich plot and dynamic game as you explore the cities, castles, and dungeons of Britannia.

—George Miller

Worms?

Worms? is still in a class all by itself, more than four years after its introduction. The folks at Electronic Arts knew a good thing when they saw it, even if no one could quite describe just what *Worms?* was all about.

It's just as difficult to explain today, but it is a simple, unadulterated joy to play—without doubt a unique entertainment package. Up to four people can watch their worms—

trails of light that seem to have minds of their own—zip around one another as they apparently fight for space. Or maybe they're dancing to the always-changing music. No one's quite sure, but the effect is a game that's as engrossing as it is delightful. *Worms?* has never failed to draw a crowd of people around the office when we boot it up, and continues to hold its charm after all these years.

—Selby Bateman

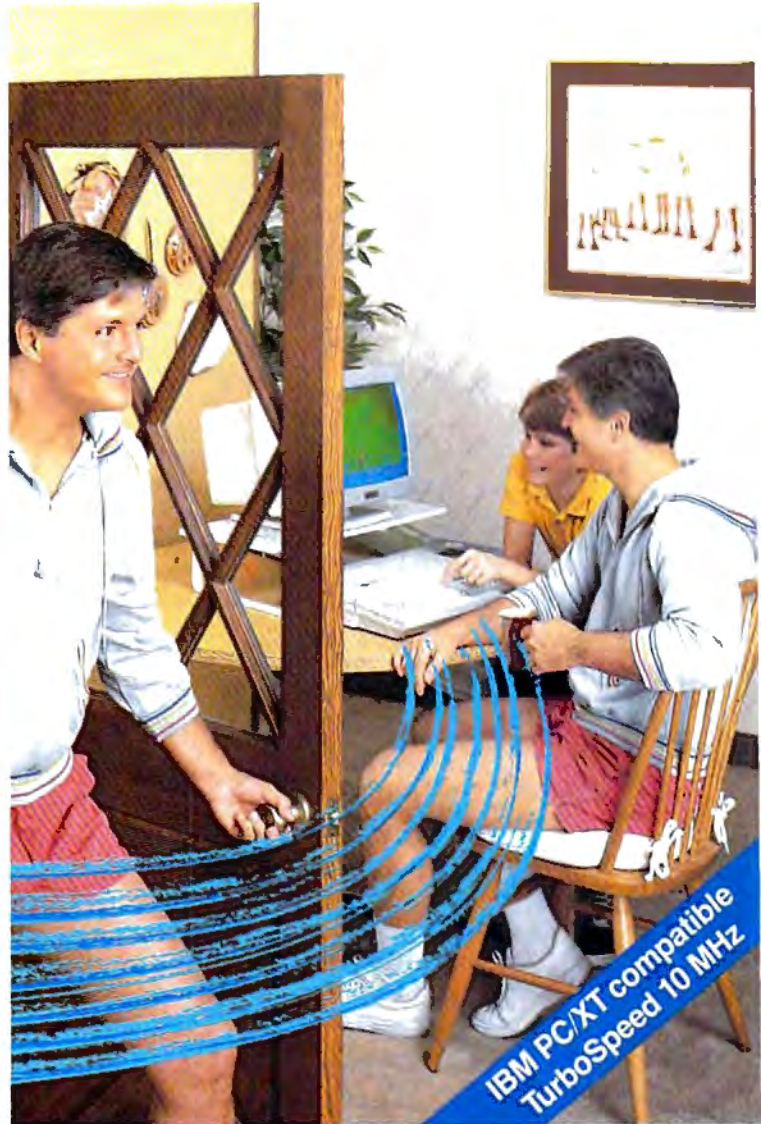
Zork

Traverse The Great Underground Empire, confront The Wizard of Frobozz, and explore the Dungeon Master's ominous domain. Based on a classic mainframe adventure program, the *Zork* series opens up a new world inside computers. *Zork I* challenges you with dangerous foes and perplexing puzzles as you attempt to find 20 valuable treasures in an ancient underground empire. *Zork II* introduces you to the absent-minded Wizard of Frobozz. *Zork III* takes you even deeper into the Zorkian realm.

You communicate with *Zork* in plain English, using commands such as *Go north and walk around the house*. And although *Zork* lacks the complex sound effects and dazzling graphics found in most of today's games, the series' detailed descriptions and amazingly coherent responses create images in your mind—images that no computer could begin to rival. With text-only adventures becoming less and less commonplace, *Zork* continues to stand the test of time.

—Randy Thompson □





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The Laser Compact XT has a built-in disk drive, serial, parallel, joystick, mouse and modem interfaces to hook up all your peripherals. The Compact XT gives you the choice of working with either a monochrome

or color monitor (CGA and Hercules*), and the XTE model is EGA compatible.

The Laser Compact XT combines performance and speed with a price that's easy to handle at under \$600. For more information on the Laser Compact XT and the name of your nearest dealer, contact Video Technology Computers, Inc., 400 Anthony Trail, Northbrook, IL 60062, or call (312) 272-6760. In Canada, call (604) 273-2828.



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Kids, Computers, and Summer Vacation

Fred D'Ignazio

*Get ready for
your kids'
summer vacation
with this idea-
packed article.*

It may be April now, with the snow still on the ground or the cold rain still falling, but before you can say "School's out!" it will be. That means summer vacation, which means free time for most kids. To kids out of school, every day is Saturday.

Depending on your viewpoint, that can be a blessing or a curse. Lots of free time is great, but if you can't fill your children's summer days with interesting activities, you're going to be in for one long, hot season. Parents know the syndrome well. The first two weeks of vacation see children playing, reading, or working hard. Things slow down a bit the third week. The fourth week arrives, and with it, terminal boredom.

"There's nothing to do" millions of children exclaim, seemingly simultaneously across the country.

Since you have a computer in the house, put it to use; it can keep kids entertained and even help them learn a

few things during the summer. This article offers dozens of ideas for summer activities that involve your children and your computer, both around the house and when you're on the road. There's even some computer tips for parents on vacation and information on computer camps for kids.

Get ready for the summer now. Make sure your computer is plugged in, and you've got a supply of good, entertaining software next to it.

Summertime Software

Keeping your children busy with the family's computer is easy. Just turn them loose in the local computer store with your credit card.

Not a feasible solution, is it? Your computer software budget is limited, and you're not going to be content with

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Canoes, Campfires, and Computers

Not too long ago, when kids went to summer camp they rode horses, paddled canoes, and tried to avoid poison ivy. Today's campers still enjoy the traditional programs, but many camps have added computers to their activity list. In addition to swimming and archery, campers are now programming in Pascal, studying artificial intelligence, and mastering advanced spreadsheet techniques.

According to the American Camping Association, there are about 150 camps in the United States classified either as computer camps or as camps that offer some sort of computer instruction. The quality of their programs varies tremendously. If you're thinking of sending your child to a computer-intensive camp, investigate its curriculum before you start sewing on name tags. Determine your child's computer needs and then decide whether the camp can meet those requirements.

Some camps offer general courses in computer literacy, while others, such as the Midwest Computer Camp in Indianapolis, Indiana, let students choose their own intensive course of supervised study. In addition to programming and telecommunications, Midwest offers special classes in robotics, lasers, and music synthesizers, plus a full range of traditional camp activities.

Be certain to ask about the camper/staff ratio. You'll also want to know the qualifications and teaching experience of the computer personnel. Some instructors may be experts with computers, but make certain they also have experience teaching children.

It's a good idea to find out what kind of computers are available. Most camps have a variety of machines, but if you have an Apple at home, make sure your child can use an Apple at camp.

Hands-on experience is invaluable in computer education, so ask about the

camper/computer ratio. Some camps restrict enrollment to ensure a 1:1 ratio. Be wary if the ratio is higher than two campers per computer.

Michael Zabinski, director of National Computer Camps, insists that a 2:1 ratio is best. "Some camps have one child per computer, and the parent thinks that's a good deal," he observes. "That's terrible. You want two kids per computer. Not three, not one, but two. They interact. Whenever one kid gets stuck, the other pitches in."

Zabinski says many parents are concerned that their children spend so much time alone at home with their computers. At his camps, children have a minimum of five hours a day at a computer with another boy or girl their age.

"This is an opportunity to go out, meet other kids, and work with other kids," Zabinski says. "They work together; they share."

Camps such as National Computer—which has facilities at colleges and prep schools in Atlanta, Georgia; Hartford, Connecticut; and Cleveland, Ohio—have a minimum of five hours of formal computer instruction per day. They also offer up to another five hours, if the child wants it. Midwest provides six hours of structured learning time, with the option of several additional hours. Camps that include computing as just another activity in their traditional curriculum may

offer only an hour at a computer per day. It's up to the parent and child to decide how much computing time they want and then select a camp that fulfills that requirement.

Parents should also inquire about medical facilities, living quarters, and other activities. While costs vary from camp to camp, ask if the general tuition covers all fees. Write for brochures and look them over carefully. When you've narrowed the selection, prepare a list of questions and call the camp director. A phone call and a chat with the director can be very helpful, especially if you can't visit the camp in person.

The American Camping Association publishes an annual guide to camps. It's not a specific list of computer camps, but many of the camps offer computer training. Other camps can be located by checking advertisements in publications such as the *New York Times Sunday Magazine* and *Sunset Magazine*.

For further information, consult the *Parents' Guide to Accredited Camps* (\$9.95), American Camping Association Publications, 5000 State Road, 67 North, Martinsville, Indiana 46151. Or you can call 800-428-CAMP (in Indiana, call 317-342-8456).

—Tom Netsel

your kids playing games—whether fantasy role-playing or shoot-'em-up arcades—all summer long.

What you need is software that's not too expensive and software which takes care of two things at once—software that entertains (so it keeps your child happy) while it teaches (so your child learns something in the process). Summertime can be, to use Stephen King's phrase, "a dead zone," a time when your children's minds shut down and go into suspended animation. But summertime can also be an opportunity for your children to improve important skills, like reading and math. Or it can offer the time to begin learning a new skill, like typing, speaking a foreign language, or playing a musical keyboard.

These 30 programs fit the bill. You'll probably need a couple of them within a few weeks after school lets out. Put a couple of others away for a rainy summer afternoon, that day when your children come to you with the pathetic, bored expression you know so well. (For prices, computer versions, and publishers' addresses and phone numbers, look to the "Summer Software" grid included with this article.)

- **Rocky's Boots, Reader Rabbit, Writer Rabbit, and Math Rabbit** (The Learning Company). The Rabbit family of programs let children practice their reading, writing, and arithmetic skills while they play entertaining games. (The IGS version of *Reader Rabbit* even talks!)

Rocky's Boots, another award-winner, challenges children to build colorful logic gates which resemble Rube Goldberg contraptions.

- **Math Blaster, Math and Me, Alge-Blaster, and Grammar Gremlins** (Davidson) • **Piece of Cake Math** (Springboard). These popular programs help your kids keep their arithmetic, math, and language skills sharp while playing arcade-style games. *Math and Me* is unusual because it caters to preschoolers, playfully drilling them in arithmetic.

- **Playing with Science: Temperature** (Sunburst) • **Science Toolkit** (Broderbund). Sunburst's program is a combined temperature probe, cable, and



Summer Software

Program	Grade/Age	Computers	Price	Publisher
Adventure Creator	Grades 5 & up	Apple II, 64	\$6.95-\$9.95	Spinnaker
Alge-Blaster	Grades 7-12	Apple II, 64, MS-DOS	\$49.95	Davidson
A+ Series	Grades 7 & up	Apple, Atari, 64, MS-DOS	\$19.95	American Educational
Barron's ACT	Grades 9-12	Apple II, MS-DOS	\$79.95	Barron's
Create a Calendar	Grades 4 & up	Apple II, 64, MS-DOS	\$29.95	Epyx
Grammar Gremlins	Grades 3-6	Apple II, MS-DOS	\$49.95	Davidson
Jeopardy	Grades 4 & up	Apple II, 64, MS-DOS	\$12.99	Sharedata
Lovejoy's SAT	Grades 9-12	Apple II, 64, Mac, MS-DOS	\$39.95-\$59.95	Simon & Schuster
Math and Me	Ages 3-6	Apple II	\$39.95	Davidson
Math Blaster	Grades 1-6	Apple II, Atari, 64, Mac, MS-DOS	\$49.95	Davidson
Math Rabbit	Ages 4-7	Apple II, MS-DOS	\$39.95	Learning Company
Music Construction Set	Grades K & up	Apple II, Apple IIcs, Atari, Atari ST, 64, MS-DOS	\$14.95-\$49.95	Electronic Arts
The Newsroom	Grades 4 & up	Apple II, 64, MS-DOS	\$49.95-\$59.95	Springboard
The Oregon Trail	Grades 5 & up	Apple II	\$55.00	MECC
The Perfect Score	Grades 9-12	Amiga, Apple II, 64, Mac, MS-DOS	\$69.95-\$79.95	Mindscape
Piece of Cake Math	Ages 7-13	Apple II, 64, MS-DOS	\$34.95	Springboard
Playing with Science: Temperature	Grades 1-6	Apple II	\$85.00	Sunburst
Postcards	Grades 4 & up	Apple II, Apple IIcs, 64, Mac, MS-DOS	\$24.95-\$29.95	Activision
Print Shop	Grades K & up	Apple II, Apple IIcs, Atari, 64, Mac, MS-DOS	\$44.95-\$59.95	Broderbund
Reader Rabbit	Ages 4-7	Apple II, Apple IIcs, 64, MS-DOS	\$39.95-\$59.95	Learning Company
Rocky's Boots	Ages 9 & up	Apple II, 64, MS-DOS	\$34.95-\$49.95	Learning Company
SAT Complete	Grades 9-12	Apple II, 64, Mac, MS-DOS	\$39.95-\$99.95	Spinnaker
Science Toolkit	Grades 5 & up	Apple II	\$39.95 each	Broderbund
Seven Cities of Gold	Grades 6 & up	Amiga, Apple II, Atari, 64, Mac, MS-DOS	\$14.95-\$19.95	Electronic Arts
Summer Games	Grades 4 & up	Apple II, Atari, 64	\$19.95	Epyx
Think Quick	Ages 7-14	Apple II, MS-DOS	\$49.95	Learning Company
Typing Tutor IV	Grades 5 & up	Apple II, 64, MS-DOS	\$49.95-\$59.95	Simon & Schuster
Wheel of Fortune	Grades 4 & up	Apple II, 64, MS-DOS	\$12.99	Sharedata
Where in the USA (World, Europe) is Carmen Sandiego?	Grades 4 & up	Apple II, 64, MS-DOS	\$34.95-\$44.95	Broderbund
Writer Rabbit	Ages 7-10	Apple II, MS-DOS	\$49.95	Learning Company

Activision
P.O. Box 7286
Mountain View, CA 94039
(415) 960-0410

American Educational Computer
7506 N. Broadway Ext.
Suite 505
Oklahoma City, OK 73116
(405) 840-6031

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Hauppauge, NY 11788
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San Mateo, CA 94404
(415) 571-7171

Epyx
600 Galveston Dr.
P.O. Box 8020
Redwood City, CA 94063
(415) 366-0606

Learning Company
P.O. Box 2168
Menlo Park, CA 94026-2168
(800) 852-2255

MECC
3490 Lexington Ave. N.
St. Paul, MN 55126
(612) 481-3500

Mindscape
3444 Dundee Rd.
Northbrook, IL 60062
(312) 480-7667

Sharedata
7400 W. Detroit St.
Suite C-170
Chandler, AZ 85226
(602) 961-7519

Simon & Schuster
1 Gulf & Western Plaza
New York, NY 10023
(212) 373-8882

Spinnaker
One Kendall Square
Cambridge, MA 02139
(617) 494-1200

Springboard
7808 Creekridge Cir.
Minneapolis, MN 55435
(612) 944-3915

Sunburst Communications
39 Washington Ave.
Pleasantville, NY 10570-2898
(914) 769-5030

software package which lets your kids run their own experiments on the effects of temperature. It teaches scientific thinking, applied math, and data analysis. Apple II owners should also take a look at Brøderbund's *Science Toolkit* series. Three modules, each \$39.95, are available: *Speed and Motion*, *Earthquake Lab*, and *Body Lab*.

• *Create a Calendar* (Epyx) • *Postcards* (Activision) • *Print Shop* (Brøderbund) • *The Newsroom* (Springboard). These programs might be called "Summer Utility Programs." Your children can help plan your family's summer activities with *Create a Calendar*. Even if you never get out of town this summer, your kids will enjoy sending postcards made with Activision's *Postcards*. Brøderbund's *Print Shop* creates invitations to summer parties, banners and signs for kids' lemonade stands, and personalized letterheads for kids' letters to pen pals, cereal prize offers, and distant relatives. And Springboard's *The Newsroom* lets your children create travel diaries and travel scrapbooks which look like professional newsletters.

• *The Perfect Score* (Mindscape) • *Barron's ACT* (Barron's) • *Hayden's SAT* (Spinnaker) • *Lovejoy's SAT* (Simon & Schuster). Summer is a good time for older children to prepare for college entrance exams. You can set up a regular schedule so that they practice a few minutes each day throughout the summer. Mindscape's package is notable because it contains a disk called *The Perfect College* which helps you and your child decide on the best college.

• *Typing Tutor IV* (Simon & Schuster) • *German, French, and Spanish* (American Educational Computer) • *Music Construction Set* (Electronic Arts). With all that time on their hands, summer is the perfect opportunity for your kids to learn a new skill or polish old ones. *Typing Tutor IV* is a tried-and-true program which refines anyone's typing abilities. American Educational Computer has a line of reasonably priced language-drill programs for kids trying to improve grades in foreign language class, or for anyone thinking of a trip abroad. *Music Construction Set* offers children a chance to hone music theory, composition, and listening skills while their music lessons are suspended during the summer.

• *Summer Games* (Epyx) • *Jeopardy*, *Wheel of Fortune* (Sharedata). *Summer Games* is a holdover from the 1984 Summer Olympic Games, but

it should be a popular game this year with the Olympic Games in Seoul. *Jeopardy* and *Wheel of Fortune* give you a chance to compete on your favorite TV program and maybe even wake a few brain cells in the process.

• *Adventure Creator* (Spinnaker) • *Think Quick!* (The Learning Company) • *The Oregon Trail* (MECC) • *Seven Cities of Gold* (Electronic Arts) • *Where in the World (or USA or Europe) is Carmen Sandiego?* (Brøderbund). No list would be complete without adventure games—especially during the summer. The five games listed are special because they offer something beyond pure, mindless escape. *Adventure Creator* lets your children create adventure games of their own with up to 100 rooms, mazes, boo-



by-traps, creatures, and, of course, treasure. *Think Quick!*, *Carmen Sandiego*, and *The Oregon Trail* sharpen children's critical-thinking skills, including problem-solving, spatial and visualization skills, observation and analysis, and common sense. *Oregon Trail* and *Seven Cities of Gold* are historical simulations which make social studies come alive and let children experience firsthand some of the problems confronting early settlers and explorers. *Carmen Sandiego*—in all her forms—teaches students geography and strengthens their reference and research skills while they track down a thief in the midst of a crime spree.

No Computer Couch Potatoes Allowed!

These 30 summer fun programs will keep your children busy, entertained, and mentally active. But what happens—and it's likely—if the programs are *too* successful? What if all your kids want to do is spend endless hours indoors by themselves, slumped over the computer keyboard, blasting numbers, blazing trails across Oregon, and

practicing the Olympic high jump?

Why is your child spending so much time at the computer? A big part of it is certainly because computers are fascinating tools and toys. But if your child is there all the time, it may be because they have nothing better to do. Or at least they *think* they have nothing better to do.

There's no single answer to children's boredom, but there *is* a single strategy. Organization. Children are notoriously "underorganized." As long as their time is structured and their day mapped out, they're usually fine. It's good to organize children's time, but it's even better to help children learn how to plan and organize on their own.

This is where the computer comes in.

Make a Calendar

The first warning sign of kids' summertime blahs is when the novelty of being out of school wears off. This happens when summer vacation ceases to be a glorious liberation from school and suddenly becomes an endless succession of gray, fuzzy days with nothing to do and nothing to look forward to.

Now's the time to sit down with your children and talk about the family's plans for the summer. Get out a calendar and mark the days that the family will be traveling, going to special summer events, and doing family activities.

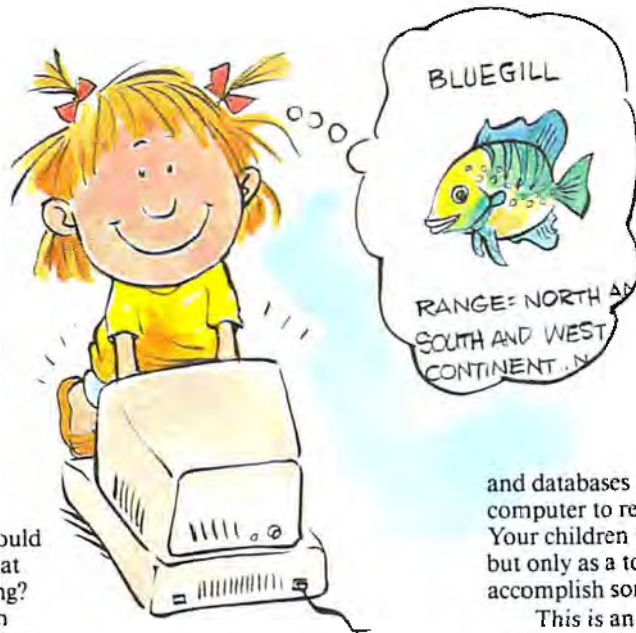
You can turn your children loose on a program like Epyx's *Create a Calendar* or Brøderbund's *Print Shop* (with the Graphics Expander). Let your children create a personalized calendar which maps out the family's summer plans. Your kids might start by creating a calendar for June and then make up new ones at the beginning of July and August. It's easy to illustrate the calendars with special graphics and even color them with markers, paints, or crayons after the calendar is printed.

The trick here is to share your family's plans with your children so they're aware of the fun things that lie ahead and so they see themselves playing an active part in planning the family's summer activities.

Lists and Ideas

One summer I decided to take a break from writing, so I grabbed my two children and drove them around the Olympic Peninsula in Washington State and then north to Alaska. We went backpacking, hiking, and camping. We had a ball.

Before we left, I went to the store and bought each child a spiral-



bound notebook. I asked them to use the notebook to plan out the details of our trip. Where should we go? What should we see? What camping supplies should we bring? What clothes should each person pack? What reading material? What stuffed animals?

Both of my children spent hours thinking through details of the trip, visiting the drug store, the grocery store, the camping store, and imagining things that we would need and activities we could do. Later, when we actually made the trip, we used many of their ideas. Their advance planning helped. Talking over their ideas, too, whetted everyone's appetite for the trip and built up excitement long before we left home.

Your children can do something similar with your computer. They could use your word processor, spreadsheet, and database programs to help you plan your major summer excursions.

On Their Own

What happens when your kids get tired of list making and planning? That's the time to get them thinking about summer activities and projects they might do by themselves.

If you want to keep your sanity, it will come to this. Most families can spend only a small fraction of the summer traveling and doing fun and exciting things. There's still going to be that vast block of time when the kids are left to fend for themselves around the house. Boredom quickly sets in, and the culprit is monotony—one day flowing endlessly into the next.

Before your children become terminally bored, encourage them to sit down at the computer and draw up a list of personal projects they'd like to do during the summer. Now that they've helped plan the family's activities for the summer, they'll be familiar with the overall schedule.

They'll be much more realistic in making plans for their own activities.

The key is for them to think up projects which they can do each day of the summer which help them structure their time—and give them something fun to look forward to each day.

Start with your children's current interests. Do they like cars, horses, clothes, astronomy, science, stamp collecting, building things? Sit down with your children and explore the nooks and crannies of their minds. What things fascinate them? What activities do they naturally do on their own? What are their grand dreams now that school is out?

Summer Computer Projects

Earlier, I listed 30 programs which help children do something specific with the computer. But the best programs are ones which you already have—word processors, spreadsheets, and databases. These are general-purpose organizing tools and can be used for almost any activity you and your children think up. These programs probably won't cost you anything because you already have them. (And if you don't, you should seriously consider buying one of each; they're indispensable tools for all kinds of computer chores.) Another plus is that your children can gain valuable practice with their spelling, writing, and math skills during the months when most kids' skills are getting rusty.

General-purpose applications like word processors, spreadsheets,

and databases also help connect the computer to real-world activities. Your children will use the computer, but only as a tool to help them accomplish something else.

This is an important criterion parents should look for: Can your children combine the computer activity with other noncomputer activities in their lives, or does the activity isolate the children and pull them away from other people and other activities?

Here are some examples of traditional summertime activities which can be enhanced using a computer.

Baseball Card Collection

You can help your children set up a baseball database. They can enter all their new cards on the database. The database can print out reports of all players by team, by batting average, by value of the card, and so on. The database is a perfect tool for keeping track of a player's personal statistics.

With a word processor and your local reference librarian, your children can write fan letters to their major league heroes. And with a program like Brøderbund's *Print Shop*, your children can print out banners and flyers for their own fan club or create a personalized baseball-style letterhead.

Weather Station

Weather is great. Unless you live in Key West or Death Valley, the weather is different every day. Your children can use the computer to track the weather and even make predictions. Your local hobby store should have a weather kit for sale, but you can start out simpler by sending your child outdoors as a weather observer, armed with an empty can (to measure rainfall), a thermometer, and a book on clouds. They can keep a weather journal on the

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Finally. The day for your family's vacation has arrived. You've packed up the suitcases, watered the plants, and put the dog in the kennel. You think you're ready to go. But haven't you forgotten something?

You forgot to pack the computer. This may sound like the last thing you want to take with you, but there are compelling reasons to bring the computer along. Here are a few.

Motel Nights. Nothing can be more painful than being stuck in a tiny motel room with hyperactive children, a sullen spouse, and an illegal pet. This, unfortunately, is the fate of many summer travelers. The computer can rescue you and your family from this. Since you're stuck together anyway, this is a good time for working on computer projects together. Maybe you've been wanting to teach your daughter how to use the word processor or your son how to program in BASIC. Now's as good a time as any.

Travel Diary. Another thing you can do each night on a trip is keep a travel diary using your family's word processor. Your kids can each have their own computer disk to store their diary files. They can make a diary entry every evening after the day's activities. Who knows? The diaries may be useful for those what-I-did-this-summer compositions once school begins in the fall.

Squeeze in Some Work. You're on vacation and trying to put as many miles between you and your office as possible.

But, face it, you probably brought along some work that needed doing, and you're hoping to squeeze it in while you're on your trip.

With your computer, you can do that work at odd moments, maybe early in the morning before your family gets up or in the evenings after things have settled down. It's also a great distraction on those afternoons when you've gotten too much morning sun and you'd do better to stay indoors.

If you have a modem, even better. Now you can wire your memos, reports, and analyses into the office computer via the telephone.

Tracking Trip Costs. In the movie *European Vacation*, Chevy Chase and his family ran out of money in the middle of their sightseeing tour across the Continent. That's easy to do.

A computer can be very handy here. If you regularly enter your major expenses, you can keep close tabs on things and budget better each day. Maybe you'll even get home with a few dollars in your pocket.

Vacation Videos. After you get back from vacation, you and your chil-



dren can edit your vacation videotapes and add colorful titles and credits using the graphics programs on your computer. To create a video title, just draw it on the computer screen and then disconnect the cable from the back of your monitor and plug it into the VIDEO IN jack on the back of your VCR. When you press Record on the VCR, you're capturing the image from the computer screen onto your videotape.

If you're not a video buff, use the computer to dress up your scrapbook snapshots. Using a popular print program like *Print Shop*, your children can create titles which they can cut out and paste to the pages of your scrapbook.

word processor, build a weather database, and create charts and graphs from weather statistics entered into a spreadsheet. If this gets them excited, just have them consult the local newspaper for weather conditions around the nation. If you're lucky, they'll soon be tracking weather in such far-away locales as Falls Church, Grand Junction, and Baton Rouge.

Wild Bug Safaris

If your family has a camera or a video camera, you can send your children off on wild bug safaris around the neighborhood. Most of the new video cameras have macro lenses which act as a video magnifying glass for intrepid young explorers who like to look at wildlife really close up. The advantage of using a camera is that your children are encouraged to leave the creatures outside (where they belong). When your kids track down a new bug, their job is to identify it using the family encyclopedia or reference books at the local library. They can use the word processor

to keep a journal of their explorations and a database program to record and organize their important discoveries. When they've inventoried the local insect population, you might encourage them to branch out to other forms of wildlife, including birds, squirrels, or even neighborhood pets.

Junior Sales Club

Kids need money during the summertime, so they're always thinking up good business propositions. A computer makes a perfect tool for your budding businessperson. My son Eric recently sold 35 boxes of popcorn to raise money for his local Cub Scout pack here in Lansing, Michigan. Eric's only eight, but in a single afternoon, I taught him how to use a simple spreadsheet program and how to "keep his books" on the computer. For a week, Eric sat down at the computer every day after school and tallied his popcorn sales, checked the accounts with his shoe box full of money, and tracked the customers who still hadn't paid.

Clubhouse Decorations

Almost every kid creates a clubhouse sometime. The clubhouse might be a bunch of boards in a tree, a bedroom rigged up with ropes and overturned chairs, or a maze of boxes in the basement. Kids love to decorate their clubhouses. This is a good time to suggest using the computer to create signs and banners for their clubhouse and membership cards for the club's members.

The key to success with all these activities is simple: Build from your child's current interests, wait until the time is ripe, and use software you already have around the house. This saves you time (you're already familiar with your software) and money (you don't have to buy a new program). And your child gets to do what he or she already wanted to do—only better! □

Fred D'Ignazio is the author of numerous books and a popular speaker on educational computing issues. He has two children, lots of summer software, and a dread of unfilled summer days.

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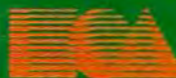
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Taking It



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on the Road

Arlan Levitan

Compute in planes,
trains, and
automobiles—and a
thousand other
places—when you
have a portable
personal computer.

If the user can't come to the computer, the computer must come to the user. Such is the credo of the laptop computer community, a varied collection of workaholics, regular travelers, computer hobbyists, and students. While Adam Osborne and the 28-pound Osborne I portable are generally acknowledged to be the founders of the faith, things have changed radically since the introduction of the first transportable computers.

Advances in technology have dramatically shrunk the size and weight of portables, while increasing the memory and disk storage capabilities to rival that of powerful desktop systems. The development of specialized chips with extremely low power requirements and liquid crystal display (LCD) technology have substantially freed the portable from its power umbilical cord.

If the thought of a fully functional computer system—in a package about the size and weight of a telephone book—intrigues you, you're a good candidate for a laptop computer.

Three years ago, most industry experts claimed that the laptop market had been saturated by the Tandy Model 100. The limited success of various portables introduced in 1985 and 1986 seemed to bear those predictions out. In retrospect, the market for laptops wasn't dying, it was approaching critical mass. The introduction of the IBM Convertible laptop legitimized the genre in the minds of many computer users and manufacturers. The past year has seen over two dozen new lightweight machines for computing on the hoof, and X-ray machine operators at airports now yawn instead of reaching for their guns when the electronic innards of a carry-on computer pop up on their screen. Here's a brief look at six of today's best battery-powered machines.

Laptop Lingo

Computers carry extra baggage—jargon that's difficult to understand for the uninitiated. And laptops, a particular sub-culture of computers, has its own lingo. Here are enough explanations of computer- and laptop-specific terms to at least get you through this article, maybe enough to get you past the laptop salesperson.

Backlit. Since LCD screens depend on reflective light, adding a small built-in light makes text and graphics much easier to see in low-light conditions.

BPS. Bits per second is the speed at which information is transferred from one computer to another, usually when connected via modem. Divide the bps rate by 10, and you have a rough character per second (cps) transfer rate. At 300 bps, for instance, approximately 30 characters are transmitted every second.

K. Stands for Kilobyte, which is 1024 bytes of data. (A single text character, for instance, takes up one byte in a computer file.) It is used in this article to show how much memory (RAM) a particular computer may have.

Laptop. Computers which weigh less than 20 pounds, have a flat-screen display, and include internal batteries (whether rechargeable or not) fall into the laptop category. Within this definition are numerous variations, as this article attests.

LCD. Liquid Crystal Display, the dominant display in laptops, uses electrically charged crystals to form characters and graphics. Attractive to laptop computer manufacturers because of their low power consumption, LCD screens are also used in such consumer products as digital watches.

Microfloppy. The hard-shelled 3½-inch disks which are used in virtually all disk-equipped laptops. The other standard drive size, commonly used in desktop computers, is the 5¼-inch floppy.

Microprocessor. The brain of a computer, this single chip processes the information it receives from programs in RAM and ROM. ▸



Tandy 102

The Tandy 102 is a rugged, compact machine that gets top marks for its portability. The system weighs only three pounds, is about the size of a magazine, and is an inch-and-a-half thick, making it easy to stow in a backpack or briefcase.

The screen is a fixed LCD panel that shows 40 characters on each of its 8 lines. While the display is not a *supertwist* or a *backlit* LCD [portable and computer jargon have been italicized for easy reference—see the sidebar “Laptop Lingo”], the large size of the characters and the ability to adjust the screen contrast yields very good legibility.

The 56 full-size keys of the keyboard are laid out in standard typewriter format. There are also programmable function keys, an imbedded numeric keypad, and separate cursor movement controls. The keys are adequately spaced and have a good feel, but rapid typing on the 102 produces a noticeable clatter.

Unlike most other laptops, an internal 300 bps modem is a standard feature of the Model 102. Connection ports for a printer, bar-code reader, and serial devices are also provided.

The Model 102's maximum memory of 32K of RAM may seem small in comparison to the 640K MS-DOS laptops, but the five programs built into the system squeeze a lot of utility into a small package. The ROM-based text editor, BASIC programming language, address book, appointment scheduler, and *telecommunications* programs are enough for many users.

While on the go, files are normally stored in the 102's memory and may be moved to an optional external disk, to a cassette drive, or to another computer via the 102's *modem* or serial port. Four AA-size alkaline batteries provide power for up to 20 hours of operation, and an internal nicad battery preserves the contents of memory for up to 30 days. An AC adapter (\$5.95) is also available.

The Model 102 is completely compatible with its popular forebear, the Tandy Model 100. An extremely wide selection of hardware accessories and public domain and commercial programs are available.

Although it is not MS-DOS compatible, the 102 is an affordable, lightweight system capable of doing a yeoman's service. Good third-party support and convenient service through local Radio Shack stores continues to make the Tandy 102 (and Model 100) a familiar sight in press boxes and college classrooms. ▸

Datavue Spark

The Datavue Spark is an intelligently designed IBM PC-compatible laptop. One of the most desirable aspects of the Spark is that the variety of system configurations offered by Datavue effectively lets you “roll your own” laptop.

The Spark's numeric processing power is a little over twice as fast as the original IBM PC. A \$995 stripped down Spark comes equipped with one 3½-inch microfloppy disk drive and 384K of memory. When fitted with an optional rechargeable battery, a one-drive system weighs a shade over ten pounds and will run for over three hours on a charge.

The standard supertwist LCD display is very good, with unusually high contrast. At extra cost, you can get an excellent backlit LCD screen second only to the much admired screen of Zenith's latest laptops.

All Sparks come equipped with parallel and serial *ports* as well as ports for an external RGB or composite monitor, and an optional external 5¼-inch disk drive. System memory may be expanded to a full 640K by opting for a 256K expansion card. Room is also provided for a second disk drive and an internal 300/1200 bps modem.

The 77-key keyboard features an embedded numeric keypad and ten function keys spread across the top. The Spark's keyboard feels good, but it's set a little too far back from the front edge of the system.

The Spark has a number of convenient features not found on other machines. Built-in ROM-based utilities let you toggle the *microprocessor* speed, set the backlit display to shut off after a specified time, and do a wide variety of other things.



But unlike most other laptops, there are no spring-loaded dust flaps shielding the disk drive slots when they're empty. Although the built-in handle is convenient, it feels less than secure. And while the Spark's overall construction is sturdy enough, its appearance and fit are not up to the standards of competing systems.

These flaws, however, are easy to overlook when weighed against the Spark's overall versatility, cost, and ease of use. By letting you graft a wide variety of options onto a solid base system, Datavue helps you find a laptop that fits both your needs and your pocketbook. ▸

Laptop Etiquette

Powering up a laptop requires a bit more thought than a desktop computer. The problem lies not in how to turn it on, of course, but in how to decide where, and when, it's appropriate to use your laptop. Here are ten places, for instance, when popping the top of your laptop may not be the best idea.

- 1. At the dinner table.** It's hard enough to get the entire family together these days, much less with someone clicking away behind a pile of mash potatoes and meatloaf. Eating and computers don't mix very well anyway. Crumbs, gravy, soup, and wine aren't appreciated by most keyboards and circuits.
- 2. In church.** Tapping toes in rhythm to the current psalm may be trendy, but it doesn't mean keyboard clacking can substitute. Look at it this way: Be thankful there are a few places where you can't take your computer—and your work—with you.
- 3. On the airplane next to someone who's never seen a laptop.** You won't get any work done, honest. Before you see the A> appear, you'll be answering questions like "What's that?" or "Are you sure that won't make the plane crash?" Corollaries include never using a laptop during in-flight movies (you'll lose your eyesight trying to see the screen in the dim light) and never using a laptop next to an in-flight drunk (you don't want a spilled drink—or worse—in your keyboard, do you?).
- 4. While you drive.** Pay no attention to those people who dial cellular phones from their moving automobile. Dialing a phone is child's play compared to typing on your laptop. Whatever

information you're entering or retrieving, let it wait. Ignore this rule when you're stuck in grid-lock or driving across Wyoming.

- 5. At the movies, unless it's a drive-in or it stars Robbie Benson.** Enough said.
- 6. Actually on the beach.** Someone may have told you to buy a laptop so you could write that great novel while on vacation, but they didn't mean to take it down to the water's edge. Sand has a habit of getting in places other than your teeth and bathing suit. And just because the computer's chips are made of sand doesn't mean they yearn for their birthplace.
- 7. In the tub.** Electricity loves water. Really. Makes it go fast and hot. The only time you should take a bath with your laptop is when you pay for it.
- 8. At a Macintosh user group's meeting.** For the present, there are no economical Macintosh laptops. Mac owners, some who think their machine is the best thing since sliced silicon, don't like to be reminded. This rule gets repealed as soon as a Macintosh laptop costs less than \$2,500.
- 9. In a classroom (to play something like Starflight).** Your instructor will know you're not simply taking notes when, after blowing that alien spaceship to smithereens, you jump up and shout "Yee-hahh!"
- 10. On the subway late at night.** There's a better way to do what you're doing. Just put a big sign on your forehead that says, "Yuppie Victim Here."

—Gregg Keizer

Toshiba 1000

Weighing in at a mere 6.2 pounds and able to leap into any standard briefcase with ease, the Toshiba 1000 is the undisputed featherweight champ of MS-DOS laptops. It's also relatively inexpensive (\$1,199), but it lacks some of the muscle of more expensive heavy hitters.

The 1000's non-backlit supertwist LCD screen has adequate contrast, but it's extremely difficult to read under less-than-optimal lighting conditions. With 24 lines stuffed into a three-inch tall screen, the display can sometimes look crowded.

Processing power is exactly the same as a standard IBM PC, which places the 1000 at the low end of the MS-DOS compatible laptop spectrum. The rechargeable battery provides almost three hours of operation between charges. The 82-key keyboard has an extremely low profile but is surprisingly comfortable and well-suited for touch typists.

The 1000 comes equipped with 512K of RAM and a single 3½-inch disk drive. Connectors on the computer's rear panel allow the 1000 to operate an external RGB monitor, parallel printer, and various serial devices. There's no provision for a second internal drive. That limitation is mitigated by MS-DOS being built into the system's ROM and the availability of an expansion card that lets you use the 1000 as a diskless computer.



The optional (\$549) memory expansion card provides an additional 768K of LIM (Lotus/Intel/Microsoft standard) expanded memory. Of the 768K, 128K may be used to fill out the 1000's main memory to 640K, and the balance may be dedicated as a *nonvolatile* ram-disk. An optional 300/1200 bps internal modem is also available.

The Toshiba 1000 floats like a butterfly and stings like a standard IBM PC. It's a wonderful example of clever engineering, and it's the machine of choice for those who demand maximum portability in a PC-compatible laptop and who can live with the inconveniences dictated by that design.

Modem. A device which converts digital signals from a computer to the analog signals the phone system can understand (and vice versa). Necessary for computer telecommunications.

MS-DOS. Microsoft's Disk Operating System (or the variations termed PC-DOS) has been the standard since the IBM PC was introduced. MS-DOS provides the interface between the computer's hardware and its software, allowing you to store information on disks and carry out file and disk maintenance tasks.

Nicad. Nickel-cadium batteries can take repeated recharging and still deliver power. Their relatively heavy weight is one of the factors against ultra-light laptops.

Nonvolatile. Though not permanent, nonvolatile memory retains its information after the main computer power is turned off.

Ports. Connectors, usually on the back of a computer, used to link the machine to such devices as printers, disk drives, monitors, and modems.

RAM. *Random Access Memory* is the part of a computer's memory that's used to temporarily store programs and data files. When the power is turned off, information in RAM vanishes.

Ramdisk. A part of RAM that's designated as a "disk drive." Since the "drive" is completely electronic, with no moving parts, retrieving programs and data (or storing them) is extremely fast.

RGB. Color monitor which mixes red, green, and blue to create a multitude of other colors. It's the standard type of color monitor in the IBM PC and compatible world.

ROM. *Read-Only Memory*, as opposed to RAM, is permanent. Information stored in ROM (usually programs necessary to running the computer system) remains coherent when the power is turned off.

Supertwist. A method, used in manufacturing, of improving the legibility of LCD displays.

Telecommunications. The process of transmitting information, via computer, from one location to another using a modem and the phone lines.

In Your Lap

Portability. For the frequent traveler, less is generally more. As long as the machine meets your needs, the lighter the better. By the end of the day, a couple of pounds can make the difference between being tired and feeling fresh. Machines that will fit in a briefcase allow you to keep one hand free for hailing cabs and beating off Moonies in airports.

Display quality and aspect ratio. The clarity of a laptop's display has a direct relationship to how long you can comfortably use it. If you can't easily see what's on your system's screen, you're likely to develop a mild case of eyestrain or a splitting headache. Backlit LCD or gas plasma displays are easiest on the eyes and are readable under almost any conditions. The best non-backlit LCD displays use special high contrast supertwist technology that works well under medium- to high-light levels but will still leave most users squinting under low light. The ratio of height to width of most laptop displays is lower than that of the displays used with desktop systems. The shorter the screen, the more compressed graphic images will appear.

Battery/power characteristics. The amount of useful operating time between charges may limit the usefulness of a laptop. You can spend half of a coast-to-coast flight twiddling your thumbs if your machine is relatively power hungry or the battery is not fully charged. While they're being used, disk drives and internal modems put an extra load on batteries. Some units' batteries are easily removed, allowing you to carry several fully-charged packs.

Compatibility. If you already own a desktop system, being able to run the same programs on both your laptop and desktop computers can be a definite plus. Most of today's laptops are IBM PC-compatible, but data such as text files can be easily moved between dissimilar systems via modem or serial port.

Storage. One or two 3½-inch microfloppy disk drives will generally be adequate for most laptop users. An internal hard disk drive offers great convenience but typically makes a laptop machine heavier and substantially more expensive.

Epson Equity LT

While the Equity LT is a relative latecomer to the PC-compatible laptop market, the Epson name has long been associated with laptop computers. The firm's prior experience has been put to good use, resulting in a fast, flexible, and feature-laden 12½-pound system.

The LT comes equipped with a full 640K of memory and two 3½-inch disk drives. With nearly 2½ times the computational power of a standard IBM PC, the Equity is one of the fastest battery-powered laptops available.

The Equity has two internal proprietary expansion slots, although the only announced accessory is a 300/1200 bps modem. External serial, parallel, 5¼-inch drive, and RGB monitor ports are standard. An optional 20-megabyte hard drive may be substituted for the second floppy drive.

The standard non-backlit LCD display is yellow, rather than the more commonplace purple/blue. While the display takes some getting used to, Epson claims that the yellow screen is actually easier on the eyes. An LT with the standard display can operate up to seven hours between battery recharges. An extra-cost blue backlit LCD display is also available.

The Equity LT's keyboard is an accountant's dream. The large keyboard includes a separate numeric keypad to the right of the Enter key and ten function keys across the top.

Owners of desktop PCs will appreciate the inclusion of Traveling Software's excellent *Lap-Link* file transfer program with all Equity LT machines.

The Equity LT is a solid laptop offering from a firm with a reputation for reliable and well-designed products. Although the LT is a bit on the heavy side, its high performance, comfortable keyboard, and expandability make it an attractive choice for the first-time laptop purchaser.

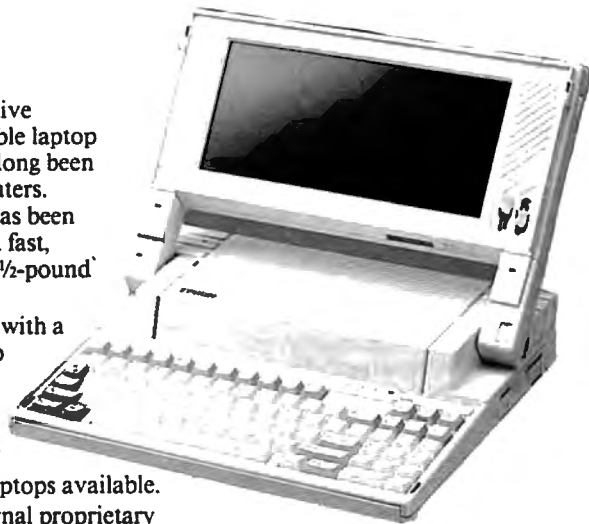
NEC Multispeed

The NEC Multispeed is a fast, versatile, PC compatible laptop with a number of interesting twists.

The Multispeed was the first laptop machine to use a true 16-bit microprocessor. It's more than twice as fast as a standard IBM PC. 640K of memory is standard, and up to 126K of main memory may be set up as a nonvolatile ramdisk.

Five ROM-based applications are standard, including a text editor with spelling checker, an outliner, a simple database, a telephone dialer, and a terminal program. The system's 512K of ROM also contains extensive online help screens that may be called up at the press of a button.

The Multispeed was one of the first laptops to use supertwist LCD technology. The standard display has good contrast but is diffi-



cult to read under low light conditions. An optional backlit screen is also available.

The 85-key keyboard has a solid touch and has the ten function keys on the right hand side, an arrangement users of older PC keyboards will appreciate. A full-size numeric keypad is included, but it's located above the main key group to conserve space.

Two 3½-inch microfloppy drives are included, as well as serial, parallel, and RGB color monitor ports. Internal modems—both 300/1200 and 300/1200/2400 bps models—are available. The standard Multispeed weighs 11.2 pounds and operates for about three and a half hours between charges.

The NEC Multispeed is a solid machine,



with an intelligent design and a healthy dose of speed. When introduced in early 1987, it set new standards for battery-operated laptops and continues to hold its own today. ▶

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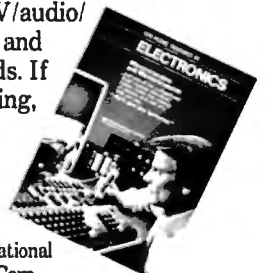
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Norcross, GA 30092
(404) 394-3119

Datavue Spark (1 drive, 384K—
\$995; 2 drive, 640K, backlit—
\$1,450)
Datavue
1 Mecca Way
Norcross, GA 30093
(404) 564-5555

Diconix 150 portable printer
(\$479)
Diconix, A Kodak company
3100 Research Blvd.
P.O. Box 3100
Dayton, OH 45420
(513) 259-3100

Epson Equity LT (dual floppy—
\$1,895, no screen); hard disk/
floppy—\$2,995, no screen)
Epson America
2780 Lomita Blvd.
Torrance, CA 90505
(800) 421-5426

Heath/Zenith 181 and 183,
(Z-181—\$2,399; Z-183—\$3,599),
Zenith Data Systems
1000 Milwaukee Ave.
Glenview, IL 60025
(800) 842-9000

Lap-Link (\$129.95)
Traveling Software
North Creek Corporate
Center, #109
19310 North Creek Pkwy.
Bothell, WA 98011
(206) 483-8088

NEC Multi-Speed EL (\$2,495),
NEC Home Electronics (USA)
1255 Michael Dr.
Wood Dale, IL 60191-1094
(312) 860-9500

Parrot 1200 modem (\$119)
Novation
21345 Lassen St.
Chatsworth, CA 91311
(818) 998-5060

PocketModem (\$259)
Migent
P.O. Box 6062
Incline Village, NV 89402
(800) 633-3444

Tandy Model 102 (\$499)
Tandy/Radio Shack
1800 One Tandy Center
Fort Worth, TX 76102
(817) 390-3011

Toshiba 1000 (\$1,199)
Toshiba America
Information Systems Division
9740 Irvine Blvd.
Irvine, CA 92718
(714) 583-3000

WorldPort 1200 (\$199); **WorldPort**
2400 (\$359)
Touchbase Systems
160 Laurel Ave.
Northport, NY 11768
516-261-0423

The Well-Equipped Laptop

Carrying cases. A carrying case is an essential accessory unless your laptop is small enough to fit in a briefcase or you move it about infrequently. While a shopping bag might do, a case designed for your laptop offers better protection from the elements and often has compartments for AC power supplies, disks, and other odds and ends. Most cases offered by manufacturers won't keep a laptop from being damaged if dropped on a hard surface from a height of more than a couple of feet. If you're rough on your equipment, consider using a hard or soft case intended for protecting photographic equipment instead. Halliburton Zero, Pelikan, and LowePro make top-notch cases that will accommodate most popular laptops. Look for these cases in most photography stores:

Portable printers. Getting it down on paper lets you share your work with others and lets you conveniently reference material without having to boot up your machine. Portable printers used to be AC-only affairs that were often as heavy as to computers to which they were attached. Kodak's Diconix 150 is the most notable of recent offerings. The Diconix (\$499 list) is a nicad battery-powered, ink-jet unit about the size and weight of an average hardcover novel.

Modems. Internal modems offered by laptop manufacturers may be convenient, but they're relatively expensive and use valuable battery power while in use. Inexpensive external modems no larger than a deck of playing cards are less expensive and are easy to pack along. If you're a portable telecomputer on a budget, check out the Novation Parrot 1200, Migent PocketModem, and WorldPort 1200 and 2400.

File Transfer Programs. You can move files between machines (typically between a laptop and a desktop, or vice versa) by using terminal software with file transfer capabilities, but doing so can be a slow, tedious process. Specialized file transfer programs such as White Crane's *Brooklyn Bridge* and Traveling Software's *Lap-Link* for IBM PC compatible systems simplify the process of moving multiple files and do so at speeds 12 times faster than the fastest speed of most terminal software.

Spare. If you rely heavily on your laptop, double up on items that may put you out of service, even though your machine is perfectly functional. A spare AC power supply is insurance against losing the original. An extra rechargeable battery can extend your untethered operating time.

Zenith Z-183

If you think you've never seen a lap computer with a display you can live with, odds are you've never seen a Zenith Z-180 series laptop. Add a hard disk to the equation, and you have a compact machine that makes few compromises.

The Z-183's standard backlit display is visually stunning. Dark blue characters clearly stand against a shocking blue background from almost any viewing angle. Screen brightness and contrast are adjustable across a wide range. The 6 × 8 inch display area yields an image with no trace of aspect distortion. Characters are not crunched vertically, and plotted circles are truly circular.

The Z-183 has 640K of memory. A full megabyte of expanded memory may be added with an optional add-in card. Processing speed of the Z-183 is adequate, clocking in at about 1.4 times faster than a standard IBM PC.

One 3½-inch microfloppy drive and a 10-megabyte hard drive are standard. A 20-megabyte drive is also available. When equipped with the standard rechargeable battery, the system will operate for a little over three hours with heavy use of the hard drive. An optional high-power battery raises extended operation to five hours or more between charges.

The 78-key keyboard has an embedded numeric keypad and 10 function keys. The feel of the keyboard is good, but some touch typists may find the key spacing a hair too tight.

The Z-183 comes with parallel and serial ports and outputs for an external RGB or composite monitor. An internal 300/1200 bps modem is optional, and floating-point arithmetic fans will find an internal socket that accepts an Intel 8087 math coprocessor.



The Z-183 has a sturdy, integrated carrying handle, but it's rather heavy for a laptop, weighing over 15 pounds. This almost classifies the machine as "luggable" rather than portable. Arnold Schwarzenegger may be able to toss the Z-183 around like a toothpick all day, but most users will start wishing for a bionic arm after 15 minutes.

The number-crunching power of the Z-183 may fall short of other laptops, too, but the excellence of its display and the convenience of an internal hard drive will tip the scale for many prospective purchasers. If you don't need a hard drive, consider the Zenith 181, a lighter, dual-microfloppy version of the Z-183.

Arian Levitan, Contributing Editor and author of the monthly column "Levitations," is also the hardware analyst for Consumer Guides' *Computer Buyer's Guides*. □

new products!

Adventures in Atlantis

Electronic Arts has released *Return to Atlantis*, a graphic adventure game for the Amiga 500, 1000, and 2000 that allows players to assume the role of an Agent for "The Foundation" and complete 14 missions.

Each mission takes you on adventures in exotic international locales such as the Baltic, the Caribbean, and the South Pacific. There are over 140,000 locations to explore and hundreds of opportunities for conversation with various characters. Players are aided in their quests by several tools available on the flying ship Viceroy, including a robot named RUF (Remote Underwater Friend) and ART, a shipboard computer. Throughout the game you encounter characters who seek profit or political advantage for themselves.

One interesting feature of *Return to Atlantis* is the player profile you complete at the beginning of each game. This profile is woven into the gameplay, adding a personal touch. You can use either a mouse or joystick, and you have access to onscreen help at any time.

The game requires 512K of memory and has a suggested retail price of \$49.95.

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

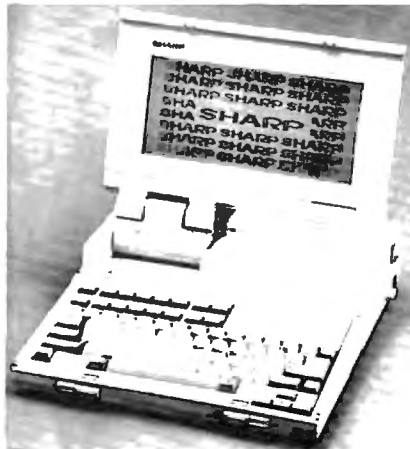
Circle Reader Service Number 200.

Sharp Cuts Laptop Prices

Sharp Electronics has cut the list price of its battery-powered IBM PC-compatible PC-4501 laptop computer by \$300, dropping the retail price to \$995.

The PC-4501 features a supertwist LCD screen, a 3½-inch disk drive, a Centronics parallel printer port, and 256K of memory, which can be expanded to 640K. Users can also add a second disk drive, a 300/1200 baud modem, a CRT adapter, an EPROM card, an extended memory card to boost RAM to 1.6MB, and an external 5¼-inch disk drive.

Other portable computers in the Sharp line include the PC-4502 and the



The Sharp PC-4501 is now available for under \$1,000.

PC-4521. The PC-4502 features two 3½-inch disk drives, 640K RAM, and a backlit screen. It retails for \$1,795. The PC-4521 has a 20MB hard drive and lists for \$2,995.

Sharp Electronics, Sharp Plaza, Mahwah, NJ 07430

Circle Reader Service Number 201.

Buick Disk Drive

Buick Motor Division has released the 1988 version of *Dimension*, a marketing and information program for people interested in Buick automobiles. The program includes two disks with graphics and information about Buick's 1988 models. The disk package is available free of charge for owners of IBM PC, XT, AT, or Macintosh computers with a minimum of 512K.

The program contains basic data on each Buick model, including standard equipment and optional packages, specifications, comparisons to competitive automobiles, and a spreadsheet purchase plan. The graphics portion provides views of the cars' interiors and exteriors, as well as engineering features such as brake systems, suspensions, and engines.

Dimension can also calculate estimated payments based on the manufac-

turer's suggested retail price and on user-specified information about desired down payment and length of contract.

Free disks are available by writing to Buick and specifying the computer on which the disk will be used.

Buick Distribution Center, c/o Adcom, 6845 Dix St., Detroit, MI 48209
Circle Reader Service Number 202.

Computerized Comics

A partnership between Infocom and Tom Snyder Productions has produced INFOCOMICS, comic book adventures on computer software. The story lines allow the user to follow any character's path, so different viewpoints of the story can be told. Viewers can change characters when another character has been encountered.

Only four of the computer's keys are needed to view the story while each page turns automatically. Viewers use the space bar and the arrow keys to fast forward, rewind, or stop the action, and the return/enter key to change character paths.

The initial titles available include *Lane Mastodon vs. The Blubberman*, a spoof of 1930s pulp science fiction; *Gamma Force in Pit of a Thousand Screams*, a superhero tale of three aliens; and *Zorkquest: Assault on Egreth Castle*, a fantasy adventure about a caravan of travelers controlled by an evil magician.

All three titles are available for the Apple II series, the Commodore 64/128, and IBM PCs and compatibles for a suggested retail price of \$12 each.

Infocom, 125 Cambridge Park Dr., Cambridge, MA 02140

Circle Reader Service Number 203.

Fantasy, Survival, and War from SSI

Strategic Simulations has recently released four new game titles including the sequel to *Questron*.

Questron II takes over where the original game left off. The player's char-

acter is in possession of the Evil Book of Magic that was stolen from Mantor the crazed magician. The book cannot be destroyed, so the player must send his character back in time to ensure that the book is never created. The player has encounters with creatures that must be fought off with weapons and spells.

The game is available for the Commodore 64/128 for a suggested retail price of \$39.95. The Apple II and IBM versions retail for \$44.95, while the Atari ST and Amiga versions sell for \$49.95.

Another sequel is also available from SSI. *The Eternal Dagger* is the follow-up to *The Wizard's Crown*. Players must search for magical weapons and then must take a journey while solving puzzles. The object of the game is to find the Eternal Dagger. The game is available for the Apple II series, the Atari 8-bit, and the Commodore 64/128 for a suggested retail price of \$39.95.

In *Roadwar Europe*, the player assumes the role of the leader of a road gang equipped with cars, trucks, and motorcycles in post-doomsday Europe. The player's mission is to locate and disarm five hidden bombs, find the enemy's headquarters, and destroy the terrorist leaders while battling mutants, cannibals, and rival road gangs. The Apple II, 64/128, and IBM versions sell for \$39.95. The Atari ST and Amiga versions retail for \$44.95.

Players can reenact the Civil War Battle of Shiloh in SSI's *Shiloh: Grant's Trial in the West*. There are three levels of combat to choose from, and, during solitaire play, the computer can direct the North, the South, or both sides. The game is available for the Apple II series, the Atari 8-bit, the Commodore 64/128, and the IBM PC and compatibles for a suggested retail price of \$39.95.

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

Circle Reader Service Number 204.

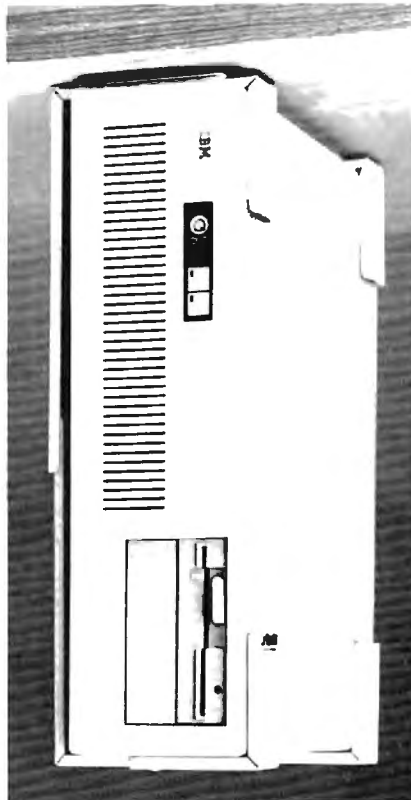
Computer Space Saver

LinTek Computer Accessories has introduced the System Dropkick, a holder that mounts a PC system unit vertically so it can easily fit under a desk or workstation. The System Dropkick adjusts from 3½ to 7 inches in height, and from 16 to 22 inches in width.

The product is designed to free as much desk space as possible while

keeping the disk drives close at hand.

Made of welded steel, the Dropkick has a light beige electrostatic finish.



The System Dropkick mounts the CPU vertically under the workstation.

The suggested retail price is \$89.95.

LinTek Computer Accessories, 426 North Park NE, Grand Rapids, MI 49505

Circle Reader Service Number 205.

Robot Battles

Microdeal has recently released *Slaygon* for the Amiga and the Atari ST. The Slaygon is a sophisticated military robot that cannot be destroyed by conventional means.

Players must help the government destroy the Cybordynamics Laboratory facility where a toxic virus has been developed to control the world. If the robot can disable their computer, the world will be saved. The Slaygon must bypass security robots and move through five miles of hallways and 500 rooms and then advance through five security levels.

The game is made more difficult

by the fact that the robot has a limited energy supply. An information panel allows the player to view the energy level indicator, a directional indicator, a map, and a three-dimensional front view.

The suggested retail price is \$39.95.

Microdeal, 576 S. Telegraph, Pontiac, MI 48053

Circle Reader Service Number 206.

Word Power

Matchups has announced the release of Version 2.1 of *Tyler*, a word game similar to the Scrabble crossword game. Users can customize the game with their choice of board size and layout, and the number and value of pieces. The game features a 200,000 word vocabulary and will help players when needed.

Tyler is available for the IBM PC and compatibles with at least 192K of memory and the Macintosh with 256K. The full vocabulary requires 512K. The IBM version also includes Jotto and Hangman games. A manual and keyboard template also come with the package. The game carries a suggested retail price of \$50.

Matchups, 16D Oak Rd., Medford, MA 02155

Circle Reader Service Number 207.

Making Sales

First Phase has introduced a software program designed to increase productivity for sales professionals and managers. *Daily Routine* helps users make better use of their time by organizing their days.

The program features a daily agenda of follow-up activities, customer history files, call reports, and quotation summary reports on one input screen. Another input screen allows users to enter expense and mileage reports. The program also contains a name and address file that can be integrated with a memo feature. Users can create mailing labels based on city, company, or a user-defined file code.

The menu-driven program features screen help and a 60-page manual. *Daily Routine* uses less than 256K and is available for IBM PCs and compatibles in both the 3½-inch and 5¼-inch formats. Suggested retail price is \$175.

First Phase, P.O. Box 4504, Greensboro, NC 27404

Circle Reader Service Number 208. □

COMPUTE!

specific

OS/2 Blues for the PC World; New Drive—No Faster—for the 64; Hypertext on Apple IIs; Another Amiga Fat Agnes Chip; LaserWriter II Family Debuts at MacExpo; 512 Colors at Once in New ST Paint Program; and Terrific Hints & Tips



PC owners are always trying to squeeze more power from their machines. We install ramdisks, buy speedup boards, add hard disks, and—at least some of us—think of little else in our spare time. Unfortunately, most people overlook an inexpensive, easy-to-install option that supercharges your PC by fundamentally altering the way you interact with it.

The option, if you haven't guessed already, is a mouse. The mouse made a late start with the PC family, but its virtues are becoming universally recognized. More PCs now come bundled with a mouse, and more supporting software is released every day. In fact, the sophisticated new PC graphics environments such as *GEM* and *Windows* are crippled without a mouse.

The difference between using mouse and nonmouse interfaces, in software products which support both, is remarkable. Microsoft's *Word*, for example, is one of the most powerful word processors available in keyboard-driven form. With the mouse, however, it enters a new dimension, allowing you to write and edit at warp speeds.

Before you buy a mouse, there are a few things to consider. First, you'll have to choose between a two- or three-button mouse. The

standard is two buttons, but three buttons can be useful.

Another decision to make is the type of mouse-computer connection you'll need. Mice come in two configurations: serial and bus. The serial mouse connects to one of your PC's free serial ports. Since DOS versions through 3.2 only support two serial ports, finding one free isn't always easy. For those who don't have a free port, there's the bus mouse. This package comes with a card to install in one of the computer's empty slots.

The last consideration is to make sure your mouse's software is Microsoft-compatible. Microsoft was an early advocate of the mouse for PCs and its device driver is the standard. Most mouse software will have a driver that emulates Microsoft's, but check before you buy.

PC Virus

Just about everyone in the PC community has heard of *Trojans*, the seemingly normal utility programs that reformat a hard disk when your back is turned. Now there are rumors of a new kind of destructive program called a *virus*.

Computer viruses came to life in Commodore's Amiga, with the first ones reported several months ago. Viruses are distinguished (if that's the right word) by their incubation period. They insinuate themselves into an operating system, and after a certain interval, do *something*. The something depends on how malicious the author is. The early Amiga viruses were fairly benign organisms. They simply locked themselves into the operating system, and after a certain number of reboots, a message appeared on the screen saying that something wonderful was about to happen.

The PC virus is rumored

to be more destructive. Early reports from Lehigh University say that after incubation, the PC virus reformats everything in sight—hard disks and floppies.

A call to Don Watkins, SYSOP on CompuServe's IBMNET, provided some information and a little perspective. To Don's knowledge, no viruses have appeared on the IBM forums of CompuServe. "Every program is thoroughly tested and analyzed before it's made public," he reports, "and we have an audit trail that links each upload to an individual through his or her MasterCard or Visa account." In more than five years, Don has found only one destructive program uploaded to CompuServe, and that was easily detected during testing.

In addition to his duties at CompuServe, Don runs his own PC BBS, and hasn't experienced any problems to date with Trojans or viruses there, either. "I think the virus scare has been exaggerated in the PC community," he concludes. "Every two years or so, PC users get frightened about something, but we're more likely to damage our systems accidentally ourselves than to encounter a virus or a Trojan."

CGA Emulation

The Hercules Graphics Adapter and its compatibles are probably the most common graphics cards found in the nearly ten million PCs currently on desktops. The card provides crystal-clear text and super-high-resolution 720 × 348 graphics at a low cost. The only problem with the Hercules card is that IBM has never recognized it as a standard. As a result, neither BASICA nor GW-BASIC graphics commands support it. BASIC expects a CGA card for its graphics, as do most games.

If you like the Hercules

COMPUTE! *specific*

card's high-resolution monochrome display, but occasionally need CGA compatibility, Athena Digital has the answer. *Athena BIOS* is a small video card and supporting software package that allows your Hercules Graphics Adapter or compatible to emulate a CGA card's color graphics in black and white. It has the added advantage of speeding up your system's normal video output even when it's not being used for emulation.

Installation takes about ten minutes. You'll need to find a vacant slot for the card. Any short slot will do; the *Athena* even works in the otherwise-useless eighth slot on many XT compatibles. The software portion of *Athena BIOS* is installed as a device driver, so you'll need to add it to your CONFIG.SYS file.

Once in place, *Athena BIOS* is completely transparent. To invoke CGA emulation, you simply type a special command at the DOS prompt and the program springs into action. It also has a soft-boot facility that lets you load and run many copy-protected packages.

No emulator will run everything, but *Athena BIOS* comes close, and it increases the speed of your normal video output in the bargain. *Athena BIOS* is available for \$60 from Athena Digital, 2351 College Station Rd., #567, Athens, Georgia 30605, (404) 354-4522.

OS/2 Blues

It seems that every time you open a computer magazine these days you see pages and pages about IBM's new PS/2 line and its new operating system, OS/2. When the computer and business press isn't singing the praises of OS/2, it's talking about *Windows*, Microsoft's graphic interface. Unfortunately for owners of plain-vanilla PCs, XTs, or compatibles, these exciting new operating systems are out of reach. They require an AT-class machine running an Intel 80286 microprocessor—or do they?

Microsoft has just released *Mach 20*, a \$500 speed-up board—easily installed in your PC—that the company guarantees will run a version

of the new OS/2 when the operating system is finally released. With the installed base of PCs and XTs being more than four times that of 286 machines, Microsoft evidently wants to enlarge its OS/2 market. *Mach 20* may be a link with OS/2 for the rest of us.

As a side note, *Mach 20* is really Personal Computer Support Group's 8MHz 286 Breakthru turbo board with some minor enhancements and a special Microsoft option added. The option? You may have guessed it already—a mouse port. Microsoft's *Mach 20* will unquestionably cure your OS/2 blues, at least for the time being. It's available from Microsoft Corporation, 16011 NE 36th Way, Box 97017, Redmond, Washington 98073, (800) 426-9400.

— Clifton Karnes



Aside from its styling, the old 1541 disk drive has never really been upgraded. Nor has it been successfully emulated, either. Finally, though, it's about to be replaced.

The Commodore 1541-2, due to ship soon, is styled along the lines of the Commodore 128's 1571 drive, but beyond the cosmetics, it contains several significant features. First, unlike most drives that have tried to emulate the 1541, it's fully compatible with the 1541. Secondly, the 1541's infamous bugs, particularly the save-with-replace bug, have been fixed. Finally, its external power supply will keep the unit cooler.

Unfortunately, nothing has been done to speed things up. The 1541-2, like the 1541, plods along its merry way, depending on software-driven turbo drivers to make its speed palatable. Fortunately, turbo drivers are showing up on most commercial software now, and there are various cartridges and magazine programs available to improve the drive's speed as well.

Meanwhile, sales of the 128D are outstripping those of the 128. Schools, in particular, like the 128D's enclosed design. Other buyers include those tired of seeing the wires that connect components together.

When Amiga's 64

With all the enhancements offered to the 64 by both Commodore and third-party developers, upgrading from the 64 to a more powerful computer is less attractive now than it was two years ago.

For those who do decide to upgrade, however, there's the problem of what to do with the older machine. Selling it is a possibility, of course, but the 64's software base (which probably cost a small fortune) goes with it. Keeping it is another option, but most people have limited space. The third possibility may be the most attractive—emulation.

The problem is, emulation is difficult. The Amiga will perform like an MS-DOS machine, but only with expensive hardware additions (Sidecar for the 1000, the Bridge card for the 2000). A few years ago, a Vancouver company sold an Apple II hardware emulator for the 64, but it cost too much to be completely saleable.

Software emulation is worse. Amiga owners have already seen one software emulator, the *Transformer*, fall on its face. Now, though there are a series of products that turn the Amiga into a Commodore 64, the Amiga community is naturally skeptical.

The best Commodore 64 emulator is a Commodore 64. Anything else will probably be second-best, but for the record, here's what's available:

• *Go-64!*, Software Insight Sys-

tems, 16E International Drive, East Granby, Connecticut 06026; (203) 653-4589; \$69.95—a full emulation package.

• *The 64 Emulator*, ReadySoft, P.O. Box 1222, Lewiston, New York 14092; (416) 731-4175; \$59.95 with complete interface—a full emulation package.

• *Access-64*, Dynamic Software Technologies, 9420 Reseda Blvd., Suite 410, Northridge, California 91324; (818) 360-2995; \$79.95—makes use of 1541 or 1571 drives to transfer files from 64/128 to Amiga text programs; allows 1541/1572 to be used as an Amiga storage drive (only).

• *Disk-2-Disk*, Central Coast Software, 268 Bowie Drive, Los Osos, California 93402; (805) 528-4906; \$49.95—allows transfer of text files from 64/128 programs to Amiga programs; converts PET ASCII to Amiga ASCII and vice versa.

• *C-View*, C Ltd., 723 East Skinner, Wichita, Kansas 67211; (316) 267-6321; \$49.95—a cable that lets an Amiga use a 1702 monitor (eliminates the need to buy an Amiga monitor).

RTC Multi-Link

RTC Multi-Link (RTC Multi-Link Inc., 110 Riviera Drive, Unit 10, Unionville, Ontario, Canada L3R 5M1) is a combined hardware/software networking system for Commodore 64 and 128 computers. Designed for educational use, it allows as many as 40 machines to be linked through a hard disk drive that's included in the package. The price tag is high, about \$3,000 for a ten-station system, but it includes a 20-megabyte hard drive, individual station modules, the Central Control Board, and the software. Its usefulness in the classroom should substantially offset the cost.

The idea is that the teacher will run the control unit, a 64 or 128 with the controlling software. Each additional computer can run either as a terminal or as a stand-alone unit, a selection made by the control software. Terminal mode al-

COMPUTE! *specific*

lows students and teacher to communicate with each other, again subject to the desires of the teacher/controller. The Control Board can restrict access between any two individual terminals, or it can open things up to a fully interactive environment.

For schools with a number of 64 or 128 machines already on hand, *Multi-Link* should provide a fruitful learning environment.

And Infocom has taken *Zork* out of the realm of the pure text adventure. *Beyond Zork* gives your character a number of role-playing style statistics, and it provides an on-screen map as well. A long-awaited graphics improvement to an already successful series of products, *Beyond Zork* should introduce Infocom's brand of interactive fiction to an entirely new group of players. It's available for the 128 only.

— Neil Randall

GEOS Contest

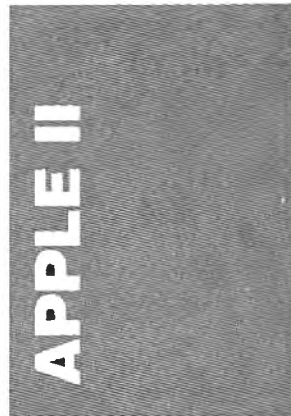
Berkeley Softworks, *COMPUTE!'s Gazette*, and Quantum Computer Services are sponsoring a *GEOS* programming contest with cash and prizes valued at over \$25,000. Prizes will be awarded for the best desk accessories and applications in categories of entertainment, education, productivity, and open programming.

For more information, see the March issue of *COMPUTE!'s Gazette* or call Berkeley Softworks at (415) 644-0883.

New Games

The 64's huge installed base continues to attract developers of game, creativity, and entertainment software. Electronic Arts has translated *Instant Music* to the 64/128 from the Amiga and Apple IIGS, a must for would-be composers who have no time to learn music notation. Electronic Arts' *Bard's Tale III* should be released by the time you read this, yet another improvement in this extremely popular fantasy role-playing series. *Skate or Die* revs up violent skateboarding, while *Strike Fleet* (from Lucasfilm Games) gives you control over 20 types of modern ships.

Meanwhile, Accolade has released *Test Drive*, which puts you on a mountain road behind the wheel of a Porsche, a Ferrari, a Lamborghini, a Lotus, or (for the miserly) a Corvette. *Fourth and Inches* is a menu-driven (à la *HardBall!*), graphics-based football simulation, while *Mini-Putt* is surely the first computerized miniature golf simulation.



HyperCard, Apple's hypertext program for the Macintosh, has been getting enough press and attention to make even presidential candidates jealous. Hypertext is the computer buzzword of the year.

And all this hasn't made Apple II computer owners happy. They want a hypertext application, too, so they can create the same kind of software that's being generated by the megabytes for the Macintosh. Unfortunately, Apple has been playing dumb when it comes to hypertext on the II. If anything appears, it would undoubtedly find a home only on the Apple IIGS, the company's darling of the line.

Though a IIGS version of *HyperCard* may one day surface, Apple II owners don't really have to wait. There's already a hypertext program for all 128K Apple computers that serves up many of *HyperCard*'s vaunted features.

Tutor-Tech is its name. Developed and published by Techware, a small company in

Florida, *Tutor-Tech* is an authoring system designed primarily for teachers. The program's Teacher/Student package, with one disk for the teacher, another for students (the latter can be copied up to 50 times), costs \$195.

Tutor-Tech users can create sequences of screens, which are then linked through buttons. Paint program-like tools make it easy to draw simple shapes and lines, fill with one of 16 patterns, 16 colors, and place four kinds of buttons. Graphics can be imported from *MousePaint* or *Print Shop*, a boon to art phobics.

You may be tempted to match *Tutor-Tech* against *HyperCard*, but the comparison doesn't always work. *Tutor-Tech*, for instance, does not offer a programming language (like *HyperCard*'s HyperTalk), a failing that's apparent when you find out that clicking on buttons can only change pages (as the screens are called).

But *Tutor-Tech* can link one card to any other card or to other lessons (a term used for collections of pages) on the disk. Both qualities are shared with *HyperCard*. In fact, many of the things *HyperCard* can do, *Tutor-Tech* can duplicate on an Apple IIe, IIc, or IIGS.

For more information about *Tutor-Tech*, contact TechWare at P.O. Box 1085, Altamone Springs, Florida 32715, 305-834-3431 (after April 16: 407-695-9000).

What's GEOS?

Berkeley Softworks, best known for its prominent position in the Commodore 64 community and now looking for new worlds to conquer, is bringing its *GEOS* operating system and applications to the Apple II.

A disk operating system for the 64 officially sanctioned by Commodore, *GEOS* presents a Macintosh-like graphics interface, complete with icons, pull-down menus, windows, and mouse control. Berkeley's *GEOS* applications include a word processor, a paint program, a desktop publishing package, and various utilities, all of which helped extend the Commodore 64's life

long past anyone's expectations.

All this is scheduled to come to the Apple II. *GEOS*, *geoWrite*, *geoPaint*, *geoSpell*, utilities, and desk accessories are included in the first package, which retails for \$129. With a mouse, Apple *GEOS* users can point and click their way through computer applications just like Macintosh owners.

Other desktop-style interfaces have been tried on the Apple II, notably *Catalyst* and *MouseDesk*, though none have caught on. Apple *GEOS*, however, will have an almost instant library of applications available, since translating the Commodore versions takes only weeks, not months.

Berkeley plans on marketing *GEOS* to the established base of more than 4 million Apple IIe and IIc owners. Apple IIGS users have the icon-based *Finder*, a color version of the Macintosh graphic interface, and so would find little use for *GEOS*. According to Brian Dougherty, president of Berkeley, *GEOS* will find its first market in education, where Apples dominate. Berkeley's *geoNet*, a network linking Commodore 64s and Apples to an IBM PC acting as a file server, should be a strong argument for bringing *GEOS* and its applications into the classroom. Educators may see the advantage in having every student—no matter what computer they're working with—using similar-looking word processors, for instance.

The Bottom Line

Apple Computer's bottom line keeps getting blacker and blacker.

In late January, Apple reported its first-ever billion dollar quarter. Net sales for the first quarter of the 1988 fiscal year (October 1 to December 31, 1987) were \$1.042 billion. That's 57 percent more than the numbers for the same quarter the previous year.

The company's net income (from all sources, not just sales) was even better, a record \$121 billion, up 108 percent over last year's first quarter.

According to a statement

continued on page 51

The Automatic Shoebox

A Conversation with Andrew Tobias

Andrew Tobias has built a career—and a reputation—by writing clearly, and often wittily, about money. His books and articles fall roughly into two categories: those such as *Fire and Ice* (about Revlon head Charles Revson) and *The Invisible Bankers* (about the insurance industry), which deal, often investigatively, with industries and issues; and those such as the well-known *The Only Investment Guide You'll Ever Need* and its recently published cousin, *The Only OTHER Investment Guide You'll Ever Need*, which offer financial advice.

Recently Tobias has gathered nearly as much fame for software as for prose. *Managing Your Money* by Andrew Tobias, published by MECA (see the following Buyer's Guide for further details), is numbered among the more successful personal financial management packages on the software market.

We asked Andrew Tobias to talk generally about the elements that make financial management software worthwhile for the average consumer.



Andrew Tobias, financial writer and adviser, and guiding force behind *Managing Your Money*.

COMPUTE! *Is there a single overriding question that determines whether or not a financial management package will be effective for a consumer?*

Tobias: Number one is: *Will it be practical?*

A program that just balances your checkbook is fine, but you really don't need it. It's not practical, any more than it has turned out to be practical to have a computer in your kitchen to help you figure out amounts and recipes. It's a clever idea, but it's probably not worthwhile.

In order for a financial management program to be practical, it probably ought to be integrated. If you go to the trouble of entering your various transactions, will you get other benefits than just being able to balance your checkbook?

COMPUTE! *What other benefits are important?*

Tobias: You ought to be able to get reports for doing your taxes. In fact, you ought to be able to keep track of how you stand for your budget, your tax estimation, and so on.

Automatically, once you've entered the data, it should have an impact on your taxes—it should have an impact on some sort of net worth or balance sheet statement so that, in essence, you can press a key and print out some kind of balance sheet for your banker. It should have an impact on cash forecast-

ing, so you can spot months ahead when you may be running short of cash based on your current budget.

COMPUTE! *Are there other elements consumers should consider when looking at the various financial management software packages on the market?*

Tobias: The software should be reasonably friendly, so it's not too hard to learn. More important for this kind of software is the ease of data entry. If you're using the software every day or every week, for years, all the little conveniences that may seem like bells and whistles at first really become the sort of everyday bread and butter that determine whether or not the program is efficient or whether it's a real drag. And you really don't find this out until you've used the program for a while.

COMPUTE! *Let's talk about that a while. How long does it last? There's a school of thought that argues that computerizing your finances really doesn't save any time.*

Tobias: Look: You have to pay your bills, and you have to do your taxes, or prepare materials so your accountant can do the work. This already takes a long time.

Although it does take time to learn to use a financial management package, once you've learned it, at the very least, it takes no longer to pay your bills by

typing the amounts into the keyboard. But if you don't pay your bills by computer, you can certainly save time at the end of the year in organizing your shoebox, in essence.

Given the time it takes to learn a program, let's assume that on balance you don't save any time at all when managing your finances. It already takes a fair amount of time to pay your bills. With a computer there should be, at the very least, no net increase in the amount of time it takes.

COMPUTE! *How do you personally go about managing your finances?*

Tobias: I have two pieces of equipment: my expensive computer and next to it my 15-cent manilla folder. When I receive bills, confirmation slips from my broker, insurance policies, receipts, and all that stuff, I throw them in the folder. Every so often I power up the computer and clean out the folder. I find it satisfying, so I do it quite often.

COMPUTE! *But you don't have to.*

Tobias: No. Really, you could probably do it twice a month.

COMPUTE! *You think that, ultimately, the computer, even if used only as a sort of automatic shoebox, does save the home user some time when managing the budget?*

Tobias: I think so. Not the first month or two. But once they really get going, I think they will save time.

And even if they don't, there are advantages.

COMPUTE! *Such as?*

Tobias: First, it happens to be a little more fun. Second, far more important, you're in control of your finances. At any given time you can see where you stand. The computer and software give you a reason and a structure for making a budget and a plan. [Financial writer] Venita Van Caspel has said, "Most people retire with nothing, not because they plan to fail, but because they fail to plan."

Having a structure like this makes it fun and gives you a reason to look at your net worth every so often and see how you're doing, and it gives you a look at your budget. It puts you in control of your finances and gives you a much better chance of being able to spot problems and organize your life so it doesn't just happen to you. It lets you have some say in what kind of future you have.

—Keith Ferrell □

buyer's guide

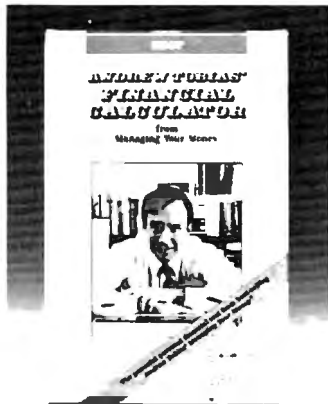
Personal Finance Software

Where's the money gone? A common question for most of us, one that sometimes doesn't have an answer. If you have a personal computer, though, you can get answers to your financial-management questions and get a handle on your money. No matter what your financial situation—from pauper to prince—you can find a software package listed in this buyer's guide that's just right for you.

Andrew Tobias' Financial Calculator

MECA
IBM PC and compatibles
\$44.95

Based on the financial planner *Managing Your Money*, this program can be used to make decisions regarding home finances. Categories include tax planning, retirement planning, college planning, rental-property analysis, investment analysis, cash-flow analysis, mortgage refinancing, buy/rent/lease decisions, inflator/deflator, internal rate of return, IRA/Keogh plans, present and future values, loans and annuities, bond yields, and compound interest. The new tax laws for 1987 and 1988 are incorporated into the program. An online calculator and a depreciation calculator are available.



Andrew Tobias' Financial Calculator, taken from the popular program Managing Your Money, offers help in making home finance decisions.

BankMate

Practical Software
IBM PC or PS/2 compatible
256K
\$29.95

Checks, deposits, and credit card purchases can be entered into this program through screens designed to look like checks and deposit slips. It can handle up to three bank accounts, and repetitive checks and deposits can be defined for faster entry. This personal finance program supports up to 100 categories for transactions; 50 of the categories are predefined or can be customized. *BankMate* can be used to balance the checkbook, prepare tax returns, or create graphs of expenditures for a 12-month period. The program includes a pop-up calculator and 30 days of free telephone support.

BDL.Estate

BDL Homework
IBM PC
\$69.95

Finances as well as important papers can be tracked with this program. *BDL.Estate* is designed to help organize assets, debts, papers, job data, bequests, final requests, and other important notes in case of death. Reports include a net-worth worksheet.

Bottom Line

The Midwest Software
Apple II, Commodore 64/128, IBM PC
\$35.00

With this ledger program, users can define up to 99 account titles for their budget. A journal disk can hold up to 2000 entries, and 40 disks can be linked together. Home, school, or business users can credit or debit any account and track the flow of money by day, week, month, quarter, or year. Messages may

be added to the bottom of the reports, and reports for individual accounts or the whole ledger can be printed.

Business Systems

Timeworks
Commodore 64
\$49.95 each

For small and medium-sized businesses, these menu-driven programs can be used to create and print accounting reports. Each program can be interfaced with other programs in the series for an integrated accounting reports package. All include password protection for security. Available programs are *Inventory Management*, *Sales Analysis Management*, *Accounts Receivable Management and Invoicing*, *Accounts Payable Management and Checkwriting*, *Payroll Management*, and *General Ledger*.

Check Tracker

Chipmunk
Commodore 64/128
\$24.95

This program helps home and small-business users keep track of activity in their bank accounts—checks, deposits, savings, electronic transfers, and transactions through automatic teller machines. The program can support double-entry records, justify the accounts at the end of the month, print hard copies, and store each month's activity on disk.

CheckMaster II

Info-Napse Micro Services
IBM PC and compatibles
\$42.35

CheckMaster II is a check-printing system for home users. It allows users to create their own check formats and print from one to 200 checks at a time. Handwritten checks, automatic teller machine withdrawals, fees, and direct deposits can also be entered into the system.

Caroline D. Hanlon

Clan Practical Accountant

Sir-Tech Software
Apple II, IBM PC
\$79.95

The *Clan Practical Accountant* can be used by people with little or no accounting experience to provide a complete picture of their financial status. The program helps develop a financial statement for each month and can be used to trace tax deductions and income. Nine charts of accounts are included, or the accounts can be customized. The program can handle up to 128 accounts, and all account balances can be carried forward to the next year. Reports can be formatted for individual needs and displayed on 40- or 80-column screens or printed out. The Apple II version supports up to 2400 transactions per disk, while the IBM version handles over 4000 transactions. Up to 20 liquid assets can be stored on one data disk. A password option is provided to protect the records. Four guidebooks are included, and a telephone support hotline is available five days a week.

College Financial Planner

Randle, Coray, & Associates
IBM PC
\$95.00

A college-financing plan can be constructed for each child by using this program. Data for each child is stored on a disk so it may be updated each year as inflation, costs, and other circumstances change. Costs such as tuition, room, board, books, and transportation can be itemized, and the program automatically adjusts the costs for inflation. The program provides three plans for saving the needed capital. A manual and forms for gathering data are included in the package.

Dac-Easy Light

Dac Software
IBM PC or compatible
DOS 2.0 or later, 80-column printer, 256K
\$69.95

Designed for both home and office use, this accounting package can be used to keep track of credits and debits, create financial statements, and print checks. It offers a chart of accounts for the home or office for entering deposits, withdrawals, customers, and vendors. The program can be used to generate up-to-the-minute financial statements and monthly balance sheets. Checks, invoices, or mailing labels can be printed with the program. A calculator automatically computes all the totals.

DivorceTax

Research Press
IBM PC and compatibles
Lotus 1-2-3 or compatible spreadsheet
\$65.00

This template is designed to help structure a divorce settlement so both parties can save on taxes. It takes into account issues such as alimony, child support, property settlements, dependents, and child care. The program must be used with a spreadsheet.

Dollars and Sense

Monogram
Apple II, IBM PC and compatibles, Macintosh
128K (Apple), 256K and DOS 2.1 (IBM)
\$119.95 (Apple), \$149.95 (Mac), \$179.95 (IBM)

Home users can create budgets with up to 120 accounts, print checks, pay bills, perform automatic

transactions, and view their overall financial condition with this software package. Five what-if scenarios allow the user to experiment with different liability options, and the outcome can be displayed in graph form—in color if the monitor supports color graphics. A portfolio manager helps keep track of stocks, and using Monogram's *Moneylink/Moneyline* software, the investor can access online services. With *Forecast* (included in the IBM version only), the user can estimate federal income taxes and plan tax strategies for up to five years. The program contains two sets of predefined starting accounts and has unlimited account capability. Double-entry accounting functions are computed automatically. Reports can be displayed on the screen or printed. In the IBM version, data can be exported to *Lotus 1-2-3*. Onscreen help is provided.

	1987				1988			
	Payor	Payee	Joint	Joint	Payor	Payee	Joint	Joint
	Spouse	Spouse	Income	Income	Spouse	Spouse	Income	Income
With Spouse:								
Filing Status	4	1	2	4	1	2	4	2
Tax	3	1	4	3	1	4	3	4
Number of Dependents								
((CHILDCARE EXPENSES))								
Alimony	0	0	0	1000	-1000	0	0	0
Child support	1000	-1000	0	0	0	0	0	0
Property settlement								
Cash & property								
Annual installments	0	0	0	0	0	0	0	0
((CHILD CARE EXPENSES))								
Child care expenses	2141			2141			2141	
Number of children	2			2			2	

DivorceTax is a Lotus 1-2-3 template specifically for tax planning prior to a divorce settlement.

Ea\$y Loan\$

PAR Software
Amiga
256K
\$39.95

Small-business and home users can keep track of loan payments and create amortization schedules with this program. Amortization schedules can be customized with partial payments, balloon payments, negative amortizations, and variable interest rates and payments. The program can calculate missing variables such as principal, length of time, or interest rate. The schedules and loan tables can be viewed on the screen or printed out.

EasyForm W-4

Valley Management Consultants
IBM PC or compatible
Lotus 1-2-3, 256K
\$49.00

This *Lotus 1-2-3* template consists of four separate programs. *W4* and *W4A* help users complete the new forms for withholding allowances. *Update* calculates the minimum amount of withholding and adjusts the allowances to equal the amount to be withheld. *Estimate* helps users estimate their income taxes for the next year. Annual updates are available for \$19.

EasyTax

Valley Management Consultants
IBM PC
Lotus 1-2-3, 384K
\$89.00

EasyTax is a template that can be used to prepare Federal income tax forms 1040 and 1040-ES and schedules A, B, C, D, E, G, R, SE, W, 2106, 2119, 2210, 2441, 3903, 4562, and 6251. Online instructions and help notes provide assistance in filling out the forms displayed on the screen and then printing them out. Calculations are performed by the program, and the results are automatically transferred to the appropriate forms. Tax tables and rate schedules are built in, and the analyst feature compares an individual's deductions and credits to the government guidelines. A three-year planner is included. Updates are available each year for \$30.

Economic Investor

ECON Investment Software
IBM PC
\$399.00

Economic Investor uses econometrics to forecast stock prices. The user inputs recent values for seven economic variables, and the program can calculate the returns on 1200 different stocks plus the probabilities of those returns actually occurring. (Another version of the program computes the returns for 500 stocks; it costs \$249.)

Equalizer 1.5

The Charles Schwab & Co.
IBM PC and compatibles
Modem
\$199.00

Investors can use their modem and this program to keep track of activity in their investment portfolios. The program can be used to access Schwab's central computers, Standard & Poor's Marketscope, and the Dow Jones News/Retrieval database. From the Schwab computers, the investor can check on commissions, gains and losses, dividend receipts, and updates to the portfolio. Investors can also use the program to initiate buy or sell orders, review securities prices, and keep up-to-date on investing information. Telescan's *Analyzer* software is included with Version 1.5.

Everything You Need to Do Your Taxes with Lotus 1-2-3

Woodbury Software
IBM PC
Lotus 1-2-3
\$39.95

With this tax-planning and preparation package, users can compare 1-6 alternate tax strategies or evaluate taxes for 1-6 years. The program helps determine the tax effects of financial decisions and aids in sorting tax records. Major IRS forms such as the 1040 and Schedules A, B, C, D, G, SE, and W can be completed. Help screens appear throughout the menu-driven program.

EZTax-Plan, Personal Edition

EZ Ware
IBM PC, PCjr, and compatibles; Macintosh
Commercial spreadsheet
\$95.00

This tax-preparation package is designed to be used with *Lotus 1-2-3*, *Multiplan*, *Excel*, or *Symphony*. It

buyer's guide

helps individuals project future taxes, compare different tax strategies, plan for retirement, and complete tax form 1040 and schedules A, D, R, and SE. The audit-alert feature also signals if planned deductions may lead to an IRS audit. *EZTax-Plan* takes into account charitable contributions, self-employment taxes, credits, itemized deductions, and assets such as bonds, stocks, and real estate. Updates incorporate any changes in tax laws that may occur. The package includes a coupon for one free update. This program can be used with *EZTax-Prep 1040*, also from EZ Ware.

EZTax-Prep 1040

EZ Ware
Apple II; IBM PC, PCjr, and compatibles; Macintosh
Commercial spreadsheet. Printer optional.
\$99.95

EZTax-Prep 1040 includes templates for completing 26 IRS forms and schedules: 1040, 1040ES, 2106, 2119, 2210, 2441, 3800, 3903, 4952, 4562, 4684, 4797, 4972, 6251, 6252, 8582, 8598, 8615, and Schedules A-F, R, and SE. Computations are performed by the program and the results are automatically applied to the appropriate form. Forms can be printed in an IRS-approved format on 1040 stock or transparent overlays using standard or laser printers. The program can also be used to create what-if scenarios and plan future tax strategies. The audit-alert feature points out deductions that could possibly trigger an IRS audit, and data can be exported to EZ Ware's *EZTax-Plan* for more in-depth tax planning. *EXTax-Prep 1040* is designed to be used with *Lotus 1-2-3*, *Multiplan*, *Excel*, or *Symphony 1.2*. Annual updates which include all tax law changes are available for a fee (Macintosh—\$99.95; other systems—\$129.95).

Federal Tax Forms

Sky Computer Resources
Apple II, Apple III
128K, *Appleworks. III-EZ-Pieces* for Apple III
\$39.95

A template for use with *Appleworks*, this program helps users complete IRS forms 1040, 2106, 2441, 3903, 4562, and Schedules A-F and SE. The program consists of three sections (instructions, a transfer area, and the tax form); two calculator templates for computing depreciation, amortization, and taxes; and a manual. Information can be entered into cells, and the calculations are performed automatically. The forms and schedules can be printed in IRS-approved format; the 1040 data must be printed onto an actual 1040 form. Additional forms and schedules are available for \$5 each.

Financial Decisions Planner

TaxCalc Software
IBM PC and compatibles
Spreadsheet program
\$100.00

A template for use with *Lotus 1-2-3*, *Symphony*, and other spreadsheet programs, the *Financial Decisions Planner* can help users calculate and evaluate various situations before making a financial decision. It contains 15 functions, including future value of an investment, minimum investment for withdrawal, nominal interest rate, adjusted-rate mortgage payments, future value of regular deposits, continuous interest, term of a loan, last payment on a loan, principal on a loan, and others.

Financial Navigator

MoneyCare
IBM PC and compatibles
192K
\$99.00

A double-entry bookkeeping system for personal and small business use, this program can handle up to 250 accounts and 1,000 payers. The report function can generate up to 40 reports such as balance sheets and personal income statements. The program can be used as a checkbook manager and to print checks. Totals are automatically calculated. Data from the personal version can be transferred to the professional version.

Forecast

Monogram
Apple II, Macintosh
\$59.95 (Apple), \$69.95 (Mac)

Users can create five different scenarios to compare tax strategies or evaluate what-if situations. This tax planning software incorporates the new tax law changes, but retains tax formulas from previous years. It can be used to view tax projections for four years and to keep track of deductibles through 1991. A worksheet can display the user's tax status, including estimated taxes. Reports can be printed, and files can be transferred to programs that read SYLK files. Upgrades are available.

Fundwatch 4.0

Hamilton Software
IBM PC
128K, DOS 2.0, graphics card
\$29.95

Designed for the home investor, this program can compute the current and periodic yields, project annual total returns, evaluate trends over a specified period, and calculate the total returns on a portfolio. It can print out the results in text or graph format to the screen or printer. The program does not require a modem or access to an online service.

Future-Tax

Taxaid Software
Commodore 64, Plus/4
\$39.95

The new tax laws of the Tax Reform Act are incorporated into this program to help users calculate income taxes for 1988 and 1989 and plan future tax strategies. The menu-driven program includes the new tax rates and automatically figures standard deductions, exemptions, limitations on IRAs, surtax, deductions for the elderly, and itemized-deduction limitations. Data can also be output to the screen or printer.

Home Accountant

Arrays
Apple II, Atari, Atari ST, Commodore 64, IBM PC and compatibles, Macintosh
\$39.95 (Apple, Atari, 64), \$49.95 (ST), \$59.95 (Mac), \$69.95 (IBM PC)

Up to 200 budget categories can be defined with this program for home financial managers. The program can keep track of multiple bank accounts and credit cards, print checks and reports, record automatic transactions, and flag items for use in tax preparation. The IBM PC and Apple II versions can be used with *Tax Advantage*, also from Arrays.

Home Finance Manager

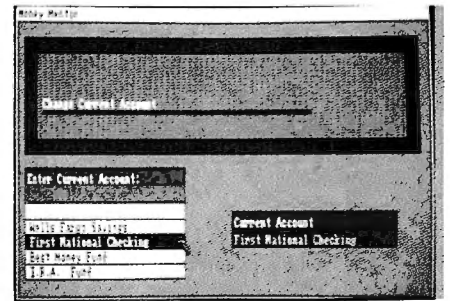
CASC
64
\$49.95

This home financial-management program can store over 200 transactions per month in 60 financial-management items. Data can be displayed in graph form or printed out in reports such as the annual report.

Home Management II

MVP Software
IBM PC or compatible
256K
\$59.95

An enhanced version of the original *Home Management I*, this program contains five modules for home financial planning and management. Personal Budget Planning (PBP) can help users plan their household budgets while Budget helps users keep track of income and check writing. Stock Broker is for analyzing possible investments, and Quik Loan is a loan amortization program. Typewriter, the word processor, can be used for small applications such as addressing envelopes and filling out forms.



Money Mentor for the Amiga provides up to 200 budget categories for any 12-month period.

HomeWorks

Keep It Simple Software
IBM PC
\$40.00

Home buyers can use this program to calculate loan amortization schedules or determine if a loan is affordable. Loan amount, interest rate, payments per year, payoff term, first payment date, and balloon date can be specified with the loan calculator. Income and expense information are used to decide if a loan would be too large. The autopilot option takes into account FNMA requirements for down payments and mortgage insurance.

In-House Accountant

Migent
Macintosh
512K
\$199.00

Small-business or home users can keep track of budgets, payables, and receivables with this accounting program designed for the Macintosh. Transactions are all performed in one window, and related items are immediately updated when a transaction occurs. The data can be searched, edited, displayed in graph form, or printed out in reports such as customer statements, aging, invoices, balance sheets,

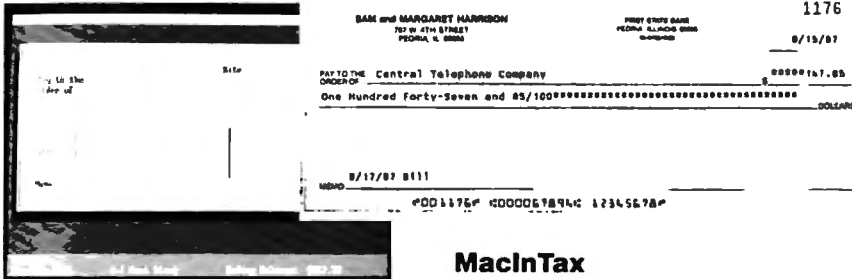
buyer's guide

and income statements. A page preview can be used to show the report exactly as it will print, and the program offers a selection of type styles and sizes. There are 18 financial formulas to calculate data. Data can be transferred to spreadsheets and other applications. The program is not copy-protected.

Investograph Plus, Basic

Liberty Research
IBM PC or compatible
\$99.00

The basic version of this investment tracking program can be used to chart price fluctuations and moving averages, analyze cycles and momentum, and provide daily or weekly portfolio values. A what-if option allows the user to experiment with various portfolio mixes. The program is available on 3½-inch or 5¼-inch disks.



Quicken, a check-writing and record-keeping program, uses screens that look and work like a checkbook.

Isgur Portfolio System

Batteries Included
Atari ST, IBM PC and compatibles, Macintosh
512K (ST, Mac), DOS 2.0 (IBM PC), modem
\$199.95 (ST, Mac), \$245.95 (IBM PC)

Lee Isgur designed this portfolio manager to help investors keep track of securities information and manage their investments—from stocks and bonds to commodities and margins. Current status of each holding in a portfolio can be displayed in graph form or printed out. The telecommunications program can be used with a modem to provide up-to-date stock prices and information. Each sale is recorded and can be printed out for tax purposes. Functions can be defined and stored, and the program has macro capabilities. The built-in calendar helps keep track of long- and short-term investments. Amount of data maintained is limited only by the amount of disk storage capacity. The program accepts either keyboard or mouse input.

J. K. Lasser's Your Income Tax 1988

Simon and Schuster
IBM PC and compatibles
256K, DOS 2.1, color or monochrome monitor
\$69.95

Software is combined with the J. K. Lasser Tax Institute's tax guide to help users complete their tax returns based on the new tax laws. The interview feature helps users select the correct forms, and the questions can be modified for individual needs. There is an onscreen calculator to use with either the worksheets or actual forms, and data can be transferred

among the forms. Various tax strategies can be entered to compare liabilities. Help screens contain excerpts from the book. Individuals and professional tax preparers can use the program, and the results can be printed in IRS-approved format or on original IRS forms. Owners of the 1987 edition can buy the 1988 edition for \$39.95 with proof of purchase.

Loan Ranger

Pride Software Development
IBM PC and compatibles
\$99.95

Menu screens help users enter their data in this amortization program. The accompanying manual helps explain many loan terms and practices such as balloon loans, actuarial method vs. U.S. Rules method, Truth in Lending Law, and The Rule of 78s.

MacInTax

Softview
Macintosh
512K
\$119

IRS forms are displayed on the screen for the user to fill in the appropriate lines. The program automatically performs the calculations and transfers data among the forms. There are 13 worksheets to aid in computing taxes, and itemization windows help break down any amount into a detailed listing. Instructions for each line in the forms can be displayed on the screen, and the IRS instruction book is included. Completed forms can be printed using a dot-matrix or laser printer. *MacInTax* includes forms 1040, 1040A, 1040EZ, 1040ES, 2106, 2119, 2210, 2441, 3903, 4562, 4562A, 4684, 4797, 4868, 4952, 6251, 6252, 8283, 8582, 8598, 8615, and schedules 1, A-F, R, and SE. The program operates with *Multi-Finder*. Annual updates are available for \$55. State tax programs to supplement *MacInTax* are available for California and New York for \$65 each; state updates cost \$35.

Managing Your Money 4.0

MECA
IBM PC and compatibles
256K, DOS 2.0 or later
\$219.98

Version 4.0 of *Managing Your Money* is a financial planning package made up of nine integrated programs covering major aspects of home financial planning such as checkbook management, budgets, tax planning, insurance and retirement planning, and portfolio management. It incorporates the new tax-law changes and contains a full-featured word processor with mail-merge capabilities. The program can be used to set up budgets, track net worth, plan finances for up to five years, keep records of insurance and investments, and print checks, invoices, mailing labels, reports, graphs, and tax forms. Memos can

be stored on the electronic calendar, and financial data can be exported to *Lotus 1-2-3*.

Money Counts 4.0

Parsons Technology
IBM PC or compatible
Hard disk or two floppy disk drives, DOS 2.0, 192K
\$16.00

Up to 999 accounts and 24,000 transactions per year can be handled by this money management software. This program can be used to monitor cash, credit cards, and checking and saving accounts, plus it can help balance a checkbook. A financial calculator can determine interest rates, loan payments, and amortization schedules while the pop-up calculator can be used for onscreen computations. Four financial statements and three inquiry reports can be generated and printed, and data can be displayed in graph format. The program is menu-driven and not copy-protected. Onscreen help is provided.

Money Mentor

Sedona Software
Amiga
\$95.95

Home financiers create, edit, or delete up to 200 budget categories—100 income labels, and 100 expense labels—for any 12-month period with this money-management program. In the transaction system, users can manage up to 30 accounts including checking, cash, savings, and credit cards. Transfers within accounts and transactions split between categories can be tracked. The reporting system provides graphic reports that illustrate actual vs. budgeted amounts. Users can project their financial picture using the more than 50 reports available.

MoneyMate

Practical Software
IBM PC or PS/2 compatible
256K
\$99.95

A system for organizing personal finances, *MoneyMate* allows up to 200 transaction categories; 100 of the categories are predefined or can be modified. This financial-management program can handle up to ten bank accounts and 25 credit cards. Checks, deposits, credit-card charges, returns, and cash purchases can be entered. The program can be used to project cash flow, compare expenses to budgets, balance a checkbook or charge-card statement, track unpaid bills, calculate loan payments, and print checks, a net-worth report, and information for tax returns. Help is provided through onscreen messages and 90 days of free telephone support. The program also contains a pop-up calculator and notepad.

MoneyMate

RealWorld
IBM PS/2
\$169.99

MoneyMate can be used to help organize an individual's or family's finances. The program can keep track of up to ten bank accounts, 25 credit cards, and unpaid bills. Loan repayment schedules, cash-flow projections, and budgets can also be calculated. Categories of financial activity are predefined and can be modified. Information can be sorted out for tax preparation or displayed in graphs. Pop-up windows and graphic user-prompts provide onscreen help. Output can be sent to some spreadsheets such as *Lotus 1-2-3*.

Moneyworks

University Software
Apple II
64K, ProDOS
\$39.95

Four subsystems make up this personal-finance package. Budget helps users develop a budget and print out monthly and yearly balance sheets and statements. Filer is a database for organizing checking, savings, money market, IRA, and credit-card accounts as well as investment and stock transactions; the telephone and address list can be used to print mailing labels. The user can examine the effects of interest rates, investments, and inflation with the Financial subsystem. This feature can also be used to print loan-amortization schedules, balance the checkbook, or flag taxable items. The memo writer can be used instead of switching to a word processor. General rather than accounting terms are used, and help is provided on the screen.

Multi-Program Disk #6

Cardinal Software
Commodore 64
\$19.95

This disk contains five financial and statistical programs. *Financial Calculator* calculates interest rates, principal on a loan, payments, future values, and mortgage amortizations. *Statistics* helps determine mean, variance, deviation, and distributions. Linear, *n*th-order, geometric, and exponential regressions can be calculated with *Regression Analysis*. *Linear Programming* uses the Simplex method to solve linear programming problems, and the *Odds Calculator* uses combinations or permutations to determine odds.

Nimbus

Oxxi
Amiga
\$149.00

Small business owners can use this program to manage their cash flow. Customer and vendor accounts are tracked by name rather than number so payment status, outstanding balances, and P/L statements can be quickly accessed. When information is entered into accounts payable or receivable, it is automatically updated to the general ledger. The program uses the single entry method and offers predefined reports and invoices and an editable chart of accounts. Pop-up mini-menus help the user through the program, and business terms rather than accounting terms are used. *Nimbus* can also be used to compile reports for taxes.

PC/TaxCut

Best Programs
IBM PC and compatibles
\$75

A QuickTax feature is included in this program to automatically recalculate tax owed, refund due, current tax bracket, and taxable income each time a number changes in the program. This helps users see how variations will affect the tax return. *PC/TaxCut* offers context-sensitive, onscreen help for whatever topic or calculation the user may be preparing. Forms can be displayed on the screen before printing, and the 1040 can be printed on plain paper with an IBM or Epson dot-matrix printer. A telephone tax advisory service is available for registered owners of *PC/TaxCut* for \$1 per minute with a minimum of 15 minutes. There is no charge for questions concerning

program operation. Updates for previous owners of *PC/TaxCut* cost \$45.

Personal Accountant

Softsync
Apple II, Atari, Commodore 64/128, IBM PC, Macintosh
48K (Apple, Atari), 128K (IBM PC, Mac)
\$34.95 (Atari, 64/128), \$49.95 (Apple, IBM, Mac)

This double-entry bookkeeping system is designed for small businesses and individuals. Data can be entered into five accounts—income, expense, deposit, loan, and equity—and reports can be printed out. The information can also be used to help prepare tax returns. Amortization tables can be used to calculate loan costs and future value of deposits such as an IRA. Names and addresses for each account can be stored in a database and used to generate mailing labels and lists.

Filing: Mr. and Mrs. Sample		Flow 1988	Rate Form	Page 6 of 12
10	AGI (Line 7) 24,000	21	Char. Contrib. Deduction	29,211
11	AGI (Line 7) 24,000	22	No. of dep. & blind claimants	0
12	AGI (Line 7) 24,000	23	Special AGI or AGI allow.	0
13	AGI (Line 7) 24,000	24	Standard Deduction (Chk 8)	0
14	AGI (Line 7) 24,000	25	Standard Deduction	3,700
15	AGI (Line 7) 24,000	26	Adjusted Gross Income	20,511
16	AGI (Line 7) 24,000	27	State Income Tax	0
17	AGI (Line 7) 24,000	28	Tax from Form 977	0
18	AGI (Line 7) 24,000	29	Additional Tax	2,501
19	AGI (Line 7) 24,000	30	Total Tax	2,501

Tax Preparer is a full-featured tax preparation program for the Apple II and IBM PC personal computers.

Personal Portfolio Manager

Abacus
Commodore 64, 128
Modem
\$39.95 (64), \$59.95 (128)

Personal Portfolio Manager is a portfolio management and analysis system that investors can use to manage stock portfolios, obtain quotes and news, and analyze securities. The program can record dividends and interest, reconcile brokerage accounts, and store up to 1,000 transactions on a disk. The auto-run feature can automatically log on, update quotes, and log off using the Warner Computer System. A variety of reports can be printed using the report generator. A modem is required for accessing online data. Compatible modems include the Commodore 1600, 1650, or 1660; Westridge; and Telelearning and compatible modems.

Planner's Choice

Activision
Apple II, Commodore 64, IBM PC and compatibles
\$34.95 (64), \$39.95 (Apple, IBM)

This spreadsheet program can be used to develop and organize home budgets, tax strategies, investment options, financial reviews, and statistical reports. The program features windowing, three built-in functions, adjustable column widths, 255 rows, and a quick-reference guide. The IBM PC and Apple versions support up to 64 columns, while the Commodore 64 version uses 255 columns.

Quicken

Intuit
Apple II
\$49.95

A financial-management program for homes and small businesses, *Quicken* helps Apple owners keep track of paid bills, tax records, and other financial transactions. It can automatically write and print checks and update financial statements.

Quicken 2.0

Intuit
IBM PC and PS/2
256K, DOS 2.0 or later
\$49.95

Version 2 of *Quicken* contains the same check-writing and financial-management features as the original, plus has some new capabilities. A bill-minder feature reminds the user when it is time to pay a bill, and the program can automatically write recurring checks. Financial records can be updated whenever a transaction occurs. Reports such as income and payroll tax records, budgets, and income and expense can be generated and printed out. Version 2 also allows an unlimited number of bank accounts and transactions. The package includes a quick-start-and-tips card, manual, sample checks, sample envelopes, and a check and envelope order form. Disks are available in 3½- or 5¼-inch format. Free telephone support is provided.

Real Estate Analyzer

HowardSoft
Apple II, IBM PC and compatibles
64K (Apple), 128K (IBM). IBM compatibles require MS-DOS, GW-BASIC, and 192K
\$295.00 (Apple), \$350.00 (IBM)

Real estate investors can use this program to calculate the projected cash flow and overall return on property. It incorporates many tax laws, including ACRS tables and recapture rules, and it uses several measures of profitability, such as the financial management rate of return (FMRR). The program can automatically determine multiple loan payments, depreciation schedules, itemized income and expenses, after-tax cash flow, and the final return on investment. Information can be displayed on the screen or printed out. Investment models include trust deeds, depreciation schedules, expense items, and income schedules. Telephone support is provided.

Rory Tycoon Portfolio Analyst

Coherent Software Systems
IBM PC or compatible
512K
\$150.00

An investment-management program, *Rory Tycoon Portfolio Analyst* can be used for managing investment portfolios, historical and realtime charting, and retrieving quotes. It can handle up to 2,500 investments and can perform the calculations to determine net worth, market value, costs, profit/loss, dividend income, and yield. A summary of each investment can be generated, including commission costs, margin value, imputed interest, and annual income projections. Historical charts of prices and movement can be shown on the screen or as high-resolution printouts. The package contains interfaces to Dow Jones News/Retrieval, CompuServe, and Lotus Signal.

Securities Analyst-128

Free Spirit
Commodore 128
\$49.95

Stock data can be entered into the program, saved to disk, and printed to a dot-matrix printer. Text information can be displayed on the 80-column monitor while charts and graphs are displayed at the same time on the 40-column monitor. Stock analysis includes P/E ratios, co-efficient of variability, beta factor, and percentage gains. Available charts include weekly performance, moving average, and accumulation and distribution. Data on the performance of 16 stocks is on the disk, and there is a mini word processor for keeping notes. The disk is not copy-protected.

Smart Checkbook

Softquest
IBM PC, PCjr, PS/2
128K
\$100.00

Smart Checkbook offers a variety of features to help home users manage their personal finances. Checks, deposits, automatic withdrawals, and other transactions can be entered into the checking account section, which accepts an unlimited number of accounts and can be used to reconcile bank statements. The checkbook manager allows the user to backup the files and modify any of the categories or accounts. Up to 200 categories are available in the budget feature, and each item can be distributed to up to 15 different accounts. Dates, names, amounts, and other fields can be searched in individual accounts, or the accounts can be combined. Budgets, tax information, personal balance sheets, net worth statements, and other reports can be printed; checks can be printed by specifying the form number.

Smart Money

Sierra On-line
IBM PC and compatibles
\$79.95

Smart Money can be used to control day-to-day expenditures and to plan for the financial future. The program can help set up a budget, track bills, remind the user of payment dates, and reconcile credit-card and checking-account statements. When transactions are entered, they are automatically updated to the proper accounts. This program can also be used to save for major purchases, to decide when to borrow money, and to plan investments in stocks and IRAs. Reports such as profit and loss and investment analyses can be printed for tax records and to show how the user is doing financially.

Strategist

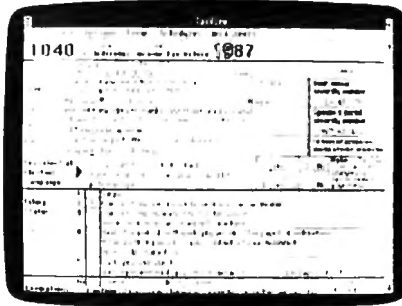
Strategy Software
Commodore 128
\$29.95

A market-timing program, this software uses a historical quote file and a strategy chosen by the user to simulate trades and determine the best trade strategy. It uses persistence checks and an exponential moving average of quotes to test which strategy will produce the greatest payoff; the operator could then use this same strategy in actual market trading. The package includes the main program, a program to create the historical files, a program which tracks current price activity, and several utility programs.

Swiftax

Timeworks
Commodore 64/128
\$49.95

Individuals can use this program to help prepare their yearly tax returns. *Swiftax* handles tax forms 1040, 1040A, 2441, and 1040EZ, and schedules A-D, G, W, and SE. It automatically calculates tax alternatives such as income averages to show the lowest tax to pay. Changes can be made to the tax return at a later date using the taxpayer file. Information can be printed directly on tax forms or onto blank paper. Update disks with new tax law information and tables can be obtained each year at an extra cost. The 64 version operates in 40-column mode; the 128 version, in 80-column mode.



TaxView, the IBM PC version of the popular and acclaimed *MacInTax*, is a what-you-see-is-what-you-get tax prep package that shows actual forms on the screen.

Tax Advantage

Arrays
Apple II, IBM PC
\$69.95

A tax preparation program for Forms 1040, 2106, 2441, 4562, and 6251, and Schedules A-E, G, SE, and W, *Tax Advantage* automatically computes the totals, displays the forms, and prints out the data. It can handle income averaging, calculate brackets and liabilities, and provide year-round tax planning. This program works with *Home Accountant*, also from Arrays.

Tax Advantage

Double Eagle Software
Apple II, Atari, Atan ST, Commodore 64/128, IBM PC and compatibles
\$59.95

This federal tax preparation program incorporates the tax-law changes for the 1987 tax year and prints out IRS-acceptable forms and supporting statements. IRS-supported forms include Forms 1040, 2106, 2441, 4562, and 6251, and schedules A-F and SE. The program can also be used for tax planning. Owners of *The Tax Advantage Early Bird Edition*, which includes all changes through August 1, 1987, can purchase the final edition for \$15.95. The two editions are fully compatible; the final edition includes all tax-law changes through November 1987.

Tax Command Professional

Practical Programs
Apple II, Commodore 64/128, IBM PC
128K (Apple), 128K and DOS 2.0 or higher (IBM)
\$49.95

In this program, IRS forms appear on the screen as a series of menus into which the user enters dollar amounts. A calculator and current tax tables are incorporated into the program to automatically calculate the totals. The program can complete Forms 1040, 1040-ES, 2106, 2119, 2441, 3903, and 8615 and Schedules A-F, R, and SE. (The Commodore 64 and 128 versions do not include Form 1040-ES or Schedule F.) It compares itemized to standard deductions and provides line-by-line tax information entry. A summary of the information can be printed for personal records, or the data can be printed directly onto IRS forms. Annual updates are available to registered users at half price.

Tax Master

Master Software
Commodore 64
\$30

Individuals can use this program to prepare their federal tax forms 1040 and 4562 and schedules A-F. The program includes the tax tables and a calculator function to automatically compute the amounts. Results can be transferred from one form to another, and more than one schedule can be completed for each user. This menu-driven program can store data for more than one taxpayer, and the information can be printed to the screen or a printer. The package includes an instruction manual and a coupon for a discount on the 1988 version.

Tax Preparer

HowardSoft
Apple II, IBM PC and compatibles
64K (Apple), 128K (IBM), GW-BASIC with 192K (PC compatibles)
\$250.00 (Apple), \$295.00 (IBM)

Tax Preparer includes all the tax law changes through 1990 based on the Tax Reform Act and enables users to forecast their tax liabilities beyond 1987. The user enters the data, and the program automatically performs all calculations relative to the tax year entered. The data is then transferred to over 20 IRS forms and schedules. Results are checked against the tax code to make sure limits have not been exceeded, and the forms, schedules, and worksheets can be printed in IRS-approved formats. Users can also create what-if? scenarios to plan future tax strategies. Onscreen instructions are provided along with a handbook and telephone support.

Tax ZipFiles

Petit Design
Apple II
Appleworks
\$19.95

Tax ZipFiles is an *AppleWorks* template to use in completing IRS Form 1040 and Schedules A, C, D, and E. The tax ledger feature can sort tax deductible expenses, and the speedmaps and speedpaging features aid in using the program.

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TAXAID

Taxaid Software
Commodore 64/128, Plus/4
\$44.95

An income tax preparation program written by tax accountants and designed for home use, the latest edition includes all the current changes in the tax laws for the tax year 1987. **TAXAID** helps prepare IRS Form 1040, Schedules A-E, and Form 2441 (child care). The menu-driven program calculates automatically with all tax tables built in. An editing feature allows users to make changes and revisions at any time. Printout is in IRS-approved format.

TaxEase

Park Technologies
IBM PC and compatibles
Spreadsheet program such as *Lotus 1-2-3* and at least 256K memory
\$69.95

TaxEase helps users complete both federal and state tax forms, automatically computing the taxes and printing the results on IRS-approved forms. Values can then be transferred among the forms. Versions are available for 18 states—AZ, CA, CO, GA, IL, IN, MD, MA, MI, MN, MS, NC, NJ, NY, OH, OK, PA, VA, and WI—and Washington D.C. and the Virgin Islands. A version containing only the federal tax forms is also available. Updates are available for \$34.95.

Taxmaster

Island Computer Services
Apple II, IBM PC, Macintosh
Appleworks, *Lotus 1-2-3*, *Excel*, or *Works*
\$50.00

A template for use with *Appleworks*, *Lotus 1-2-3*, *Excel*, and *Works*, this program can help users complete IRS form 1040 and schedules A-E, R, SE, 2106, 2991, 2441, 3903, 4562, 6251, 8582, 8606, and 8615. Data is entered directly into the spreadsheet cells. The program performs the calculations and can print the forms in an IRS-approved format. The tax planner can be used to estimate 1988 taxes and plan financial investments; it includes the tax law changes for 1988. **Taxmaster** also contains a template for the new W-4 form.

Taxpertise Preparer

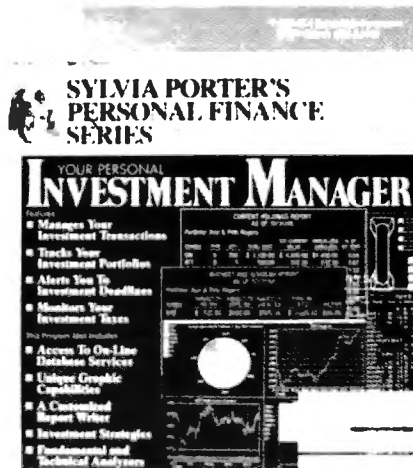
Marnoble Software
MS-DOS or PC-DOS machines
Lotus 1-2-3 or *Symphony*
\$49.95

Taxpertise uses a fill-in-the-blanks format so the screens look like the actual tax form. Completed forms can be printed onto a tax form, on blank paper for use with transparencies, or in an IRS-approved format. This program helps users complete the following tax forms: 1040, 1040A, 1040EX, 1040ES, 1040X, 1116, 2106, 2119, 2210, 2210F, 2441, 3468, 3800, 3903, 3903F, 4562, 4684, 4797, 4868, 5695, 6251, 8598, 8606, and 8615, and Schedules A-F, R, and SE. State forms can also be purchased for \$20.00 for these states: CA, GA, IL, MD, NJ, NY, OH, PA, and VA. It's also available for Washington D.C. Disks are available in 5¼- or 3½-inch formats.

TaxView Planner

SoftView
Macintosh, IBM PC and compatibles
Requires *MacInTax* or *TaxView* from SoftView
\$79.00

This tax planning program includes tax tables for 1987-91 and worksheets to calculate taxes, tax bracket, child care credit, itemized deductions, capital loss limitations, taxable social security benefits, and the maximum IRA deduction. Users can compare up to five alternate tax strategies against the yearly taxes. The program can compute withholding allowances throughout the year and print W-4 and 1040ES forms.



Your Personal Investment Manager tracks, analyzes, and manages investment transactions, portfolios, taxes, and retirement investments.

TaxView

SoftView
Apple IIes, IBM PC and compatibles
\$119

TaxView helps users complete their tax forms or create *What if?* scenarios to determine the best tax plan. Replicas of 27 major IRS tax forms and schedules appear on the screen, and, when completed, they can be printed on a dot-matrix or laser printer. Forms and schedules can be linked together, and data can be imported from text files. The program checks for errors and any violation of an IRS rule. Instructions for each line in a form can be called at any time, and there are 13 worksheets to help in calculations. Versions are also available for some states, including California and New York, for \$65. Annual updates to the federal tax package are \$55, and state updates are \$35. The IBM version operates under Microsoft *Windows*; a runtime version of that system is included on the disk.

Technical Analysis System

Abacus
Commodore 64, 128
Modem
\$39.95 (64), \$59.95 (128)

TAS is a charting and analysis package that stock market investors can use to automatically update a portfolio through Dow Jones News/Retrieval Service or Warner Computer Service and then draw a variety of charts and graphs showing the market trends. The

program can track seven moving averages, five volume indicators, least squares, trading band, and comparison and relative charts. Data can also be entered or edited manually. Up to ten stocks can be tracked for 300 trading days on one disk. A modem is required to capture online data. Compatible modems include the Commodore 1600, 1650, or 1660, Westridge; and Telelearning and compatible modems. The 128 version features macros, an automatic log-on, and quick-draw charts using one to four windows.

Touch 'n Go

Quantic Corporation
IBM PC and compatibles
\$99.00

Business travelers can use this program to help keep track of their expenses for reimbursement, billing, and tax deductions. Each expense spreadsheet contains 30 expense lines and covers a seven-day period. Notes can be added to individual expenses, including credit card or payment numbers. A checkbook-like register helps keep track of advances and payments. The expense notes are printed onto special envelopes in which the receipts are kept. The program also prints two expense reports—one for reimbursement purposes and a personal report for use in preparing tax returns. A year-end summary of expenses can also be printed. An onscreen, three-month calendar and a four-function calculator aid the user in entering the data. The integrated word processor can be used for memos, trip reports, letters, and more.

TurboTax 1988 5.0

ChipSoft
IBM PC
256K
\$75.00

TurboTax is a tax preparation, planning, and record-keeping package. With this program, users can complete over 35 IRS forms plus supporting schedules and worksheets. Online instructions, including a 30-second manual at the beginning of the program, help answer questions about the forms, and customer support is provided by telephone or through the ChipSoft bulletin board. A data examiner option can point out anything left out of a return, and the tax window feature displays the current tax status throughout the program. Most of the math calculations are performed automatically, but a pop-up calculator and notepad are also available. The next year's tax laws are built into the planning mode of the program to facilitate tax record-keeping and planning. The data can be printed onto supplied 1040 forms, or the forms can be printed on IBM- or Epson-compatible dot-matrix printers. There are 26 integrated state-tax packages available for \$40.00 each. A version for professional tax planners is also available for \$295.00.

Your Financial Future

MichTron
Atari ST
TOS in RAM or ROM
\$39.95

This program can be used to estimate future assets, taking into consideration average yields on investments, annual savings, and inflation. It can compare costs involved in leasing and buying and calculate the balance needed to maintain a retirement income. Investments and loans can be tracked and the data stored in a mini-database. A library contains a variety of reports on IRAs. Reports such as net worth can be printed. ▶

Publishers of Personal Financial Software

For more information about the personal financial management software listed in the Buyer's Guide, contact the publishers listed below.

Arrays
6711 Valjean Ave.
Van Nuys, CA 91406

Batteries Included
c/o Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404

BDL Homework
2509 N. Campbell Ave., #328
Tucson, AZ 85719

Best Programs
2700 S Quincey St
Arlington, VA 22206

Charles Schwab & Co.
101 Montgomery St.
San Francisco, CA 94105

ChipSoft
5045 Shoreham Pl.
Suite 100
San Diego, CA 92122

Coherent Software Systems
771 Anthony Rd
Portsmouth, RI 02871

DAC Software
4801 Spring Valley Rd.
Building 110B
Dallas, TX 75244

Double Eagle Software
2210 Wishire Blvd.
Suite 875
Santa Monica, CA 90403

ECON
One World Trade Center
Suite 7967
New York, NY 10048

EZ Ware
P.O. Box 620
29 Bala Ave., Suite 206
Bala Cynwyd, PA 19004

Hamilton Software
3575 Ruffin Rd.
Suite 103
San Diego, CA 92123

HowardSoft
1224 Prospect St.
Suite 150
La Jolla, CA 92037

Info-Napse Micro Services
2801 Moorgate Rd.
Baltimore, MD 21222

Intuit
540 University Ave.
Palo Alto, CA 94301

Island Computer Services
3501 E. Yacht Dr.
Long Beach, NC 28461

Keep It Simple Software
580 Fifth Ave.
New York, NY 10036

Liberty Research
1701 Directors Blvd., Suite 550
Austin, TX 78744

Marnoble Software
3730 Kirby Dr., 12th Floor
Houston, TX 77098

Master Software
6 Hillery Court
Randallstown, MD 21133

MECA
285 Riverside Ave.
Westport, CT 06880

MichTron
576 S. Telegraph
Pontiac, MI 48053

Migent
865 Tahoe Blvd.
P.O. 6062
Incline Village, NV 89450

MoneyCare
253 Martens Ave.
Mountain View, CA 94040

Monogram
8295 S. La Cienega Blvd.
Inglewood, CA 90301

MVP Software
1035 Dallas SE
Grand Rapids, MI 49507

Ontek Development
#3206, 24 Mabelle Ave.
Toronto, Ontario
Canada M9A 4X8

Park Technologies
Box 1317
Clifton Park, NY 12065

Parsons Technology
6925 Surrey Dr. NE
Cedar Rapids, IA 52402

Petr Design
2650 S. Shore Dr.
Milwaukee, WI 53207

Practical Programs
P.O. Box 93104
Milwaukee, WI 53203

Practical Software
131 N. Garden Ave.
Clearwater, FL 34615

Pride Software
8221 Glades Rd.
Suite 202
Boca Raton, FL 33434

Quantic
44 Friendly Dr
Smithtown, NY 11787

Randle, Coray & Associates
Box 1228
Utah State University Post
Office
Logan, UT 84322

RealWorld
282 Loudon Rd.
P.O. Box 2051
Concord, NH 03302-2051

Research Press
4500 West 72nd Terrace
Prairie Village, KS 66208

Sedona Software
11844 Rancho Bernardo Rd.
Suite 20
San Diego, CA 92128

Simon and Schuster Software
One Gulf & Western Plaza
New York, NY 10023

Sir-Tech Software
P.O. Box 245
Charlestown Ogdensburg Mall
Ogdensburg, NY 13669

Sky Computer Resources
P.O. Box 204
Portland, OR 97207

Softquest
P.O. Box 3456
McLean, VA 22103

Softsync
162 Madison Ave.
New York, NY 10016

SoftView
4820 Adohr Ln.
Suite F
Camarillo, CA 93010

Strategy Software
909 Carol Lane
Fairbanks, AK 99712

Taxaid Software
606 Second Ave.
Two Harbors, MN 55616

TaxCalc Software
4210 W. Vickery
Ft. Worth, TX 76107

Timeworks
444 Lake Cook Rd.
Deerfield, IL 60015

University Software
6019 Ogden Forest Dr.
Houston, TX 77088

Valley Management Consultants
3939 Bradford Rd.
Huntingdon Valley, PA 19006

Woodbury Software
127 White Oak Ln.
CN 1001
Old Bridge, NJ 08857

Your Personal Financial Planner

Timeworks
Commodore 64, 128
\$49.95 (64), \$69.95 (128)

Part of the Sylvia Porter's Personal Finance Series, this program provides onscreen instructions and an illustrated manual for both home and individual financial planning. A financial plan is established by answering a series of questions on career, children, savings, and financial objectives. The electronic checkbook and check-writing features can print checks, maintain balances for five checking accounts and ten credit cards, and perform monthly checkbook reconciliations. A budget can be created with up to 140 separate items. The program can also monitor personal financial holdings, aid in tax preparation, and generate financial statements. A report writer can prepare and print a variety of reports, and data can be shown on screen in graphics. The 128 version operates in 80-column mode.

Your Personal Investment Manager

Timeworks
Apple II, IBM PC and compatibles
Modem
\$149.95

The second volume in the Sylvia Porter Personal Finance Series, this program can help users track, analyze, and manage investment transactions, portfolios, taxes, and retirement investments. It can be used to let investors know about upcoming deadlines or to help investors plan their strategies. The package includes access to online services and offers one hour of prime time on Dow Jones News/Retrieval Service. The IBM version can be interfaced with Lotus 1-2-3 and other major integrated systems.

Your Personal Manager 128

Timeworks
Commodore 128
\$69.95

Up to 15 individual investment portfolios can be organized, analyzed, and managed with this program, part of the Sylvia Porter's Personal Finance Series. An investment portfolio can be tracked and updated, all transactions can be recorded, and over 35 types of statistical data and financial profiles of individual companies can be displayed. The program can notify the user of upcoming investment deadlines and monitor investment taxes, dividend income, and capital gains. A telecommunications feature allows the user to get online with electronic databases. The program also explains different investment strategies. *Investment Manager* can be used with other Sylvia Porter Personal Finance programs. For the 128 in 80-column mode.

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from John Sculley, Apple's chairman and chief executive officer, the company's new products were primarily responsible for these sales gains. The Apple IIGs was singled out as the best contributor from the Apple II line, while the Macintosh SE was that computer's best sales performer.

MIDI, Finally

Creating music is one of the most publicized uses of personal computers, and one of the best ways to sell machines. The Apple IIGs has a sophisticated Ensoniq sound chip, capable of producing up to 15 separate voices simultaneously, and holds the musical high ground in the Apple II line. Yet amateur and professional musicians have spurned the Apple IIGs because it doesn't offer built-in MIDI (Musical Instrument Digital Interface) capabilities, preferring computers like the Atari ST instead.

That's likely to change with Apple's introduction of a MIDI interface for the IIGs. For \$99, you get a three-inch by two-inch box which offers one MIDI in-plug and one MIDI out-plug. MIDI is the music industry's standard for communicating musical information digitally and electronically. That means when you connect the IIGs and a MIDI-equipped instrument, such as a synthesizer or digital guitar, to Apple's MIDI interface, the computer can capture each and every note. With the right MIDI-compatible software—such as the soon-to-be-released *Music Studio 2.0* from Activision—musicians can edit and manipulate the music using the IIGs.

Apple is aiming the Macintosh at the professional music market (the MIDI interface works with the Mac as well) and the IIGs at the home and classroom arena. Since the IIGs offers color, however, it wouldn't be surprising if musicians turn to that computer instead of the Macintosh, especially as IIGs music software becomes more sophisticated and such extras as laser printing of scores come to the machine.

Hot Lead

Desktop publishing may be the biggest thing to hit the Apple II market this year. Five packages have been announced by various software publishers, and two have already made it to market.

First to arrive was Softsync's *Personal Newsletter*, a well-rounded desktop publishing program that works on Apple IIe, IIc, and IIGs machines (128K required). The basic features are there, as well as the ability to import art from such popular software as *Newsroom*, *Print Shop*, and *Dazzle Draw*.

Timeworks made it in at second with its *Publish It!*, a larger program with more features. It includes a built-in word processor, a graphics toolbox, and a Macintosh-style interface. Macros and optional laser printing (not immediately available, however) are among the package's highlights.

Three other programs haven't made it out yet. They include Springboard Software's *Springboard Publisher*, Millikin's *Melody*, and Berkeley Softworks' *geoPublish*.

Springboard Publisher is still the most anticipated (and the longest delayed) desktop publishing program for the Apple II. Long promised and full of features, much of its reputation rests on Springboard's solid performer, *The Newsroom*.

Melody is distinctive simply because it's the only one of the five which requires an Apple IIGs. It's also the most expensive, scheduled to retail at \$195, significantly above the \$59-\$139 prices of the others. *Melody* will include a spelling checker and a thesaurus, as well as built-in laser printing support.

The last to announce was Berkeley (see "What's GEOS?"), which has said its *geoPublish*, already out for the Commodore 64, would be the first application to be translated to the Apple II. It's expected to offer such features as master page styles, multiple-page designs, multiple columns, automatic text flow, graphic scaling, page preview, and *PostScript* printing to the Apple LaserWriter.

—Gregg Keizer



Fat Agnes is a video chip in the Amiga. Ever since the Amiga 500 appeared, we've heard rumors of replacement chips that would give the computer even better graphics. Lately, the rumors have surpassed the point of credibility. Some claim that the new graphics chip will do all of the following: directly support one megabyte of RAM, display an impressive array of 256 colors, and eliminate the annoying jitter in the interlace modes.

So what will the upcoming Fat Agnes replacement really have? The one-megabyte chip RAM rumor is most likely to come true. The current Fat Agnes (used in the 500 and 2000) and the regular Agnes (used in the 1000) can directly access only 512K of RAM. This means that all graphics images must be located in the first 512K of memory in order to be displayed or operated on by the blitter chip. One megabyte of "chip RAM" would allow for faster slide shows and animations. Of course, users with 512K or less of RAM won't benefit from such a change, but expansion memory is becoming more popular. In fact, many of the latest graphics programs work best with (or even demand) at least one megabyte.

The 256-color rumor is less likely to bear fruit. It's true that the Amiga's system software can support the eight bit-planes necessary for 256 colors, but the time required to access the data might be prohibitive. Still, it may come eventually—if not in the current batch of Amigas, then the next.

As for the rumor that Fat Agnes will cure the interlace-

jitter blues, that's probably just a misunderstanding. The jitter will be cured, but not by a new Fat Agnes. Commodore's likely remedy is a deinterlacing board that plugs into the video slot of the Amiga 2000. Amiga and 1000 owners needn't despair, though, since Commodore is also said to be working on a new version of the Denise chip to solve the problem.

Where does the new Fat Agnes leave 1000 owners? Probably out in the cold—the Fat Agnes is not pin-compatible with the original Agnes chip. Graphics-crazy Amiga 500 and 2000 owners, though, will likely keep their ears to the ground until the chip shows up—probably in late summer.

Paint Wars

Not long ago, Electronic Arts' *Deluxe Paint II* was the undisputed Amiga paint program. Today, a wave of new contenders has made paint choices less clear. The first challenger was *Digi-Paint*, Newtek's 4096-color paint program—the first easy-to-use Hold-And-Modify mode paint program. Next into the battle was *Express Paint*, the first 64-color Extra-Half-Brite mode paint program.

While these two programs both had strong points, neither had the rich set of brush tools that made *Deluxe Paint II* so exciting and useful.

Now, three new paint programs are about to appear on the market, each with a powerful set of tools. All three will operate in every Amiga graphics mode, including Hold-And-Modify (HAM) and Extra-Half-Brite (EHB). By using the new paint programs, artists (and the rest of us) can produce results that look more realistic.

Paint Point, from Microillusions, will be available soon. This is a very impressive program, with nearly all of *Deluxe Paint's* tools, as well as several very impressive new ones (like mapping an image onto a sphere, cone, or arbitrary shape.)

Electronic Arts isn't sitting still. Look for the new *Deluxe Photo Lab*, which also operates in all of the Amiga's video modes. Although it is a full-featured paint program,

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Electronic Arts will probably pitch it as a tool for modifying and enhancing digitized or pre-drawn images to keep the product from competing with *Deluxe Paint II*.

Digi-Paint II is coming from NewTek, the undisputed king of Amiga graphics products. New-Tek says that they'll introduce eight video products this year. *Digi-Paint II* will mesh nicely with the rest. For instance, you'll be able to use the *Digi-View* interface to digitize pictures from within *Digi-Paint II*.

To 2002 and Back

For almost two years, if you had an Amiga and you wanted a Commodore monitor, the choice was easy—you bought the Commodore Amiga 1080 monitor. But if you've checked the mail orders ads lately, you may have noticed that the 1080 is a dying breed. The replacement? The Commodore 2002 monitor.

Well, believe it or not, after only a few months the 2002 is also disappearing. The replacement for the 2002? The 1084, of course.

It all started when Commodore realized that they could save a lot of trouble (not to mention manufacturing costs) if they could sell the same monitor with their Amiga, 128, and PC compatible computers. This led to the repackaging of the 1080 as the new 2002.

There was one small hitch, though. The cables that connect a 2002 to a 128 or PC are different than the cables needed to connect the monitor to an Amiga. So Commodore sold two different packages with different cables. You may have guessed why the 2002 was doomed. Too many people came home with the wrong cables.

Commendably, Commodore acted quickly and introduced yet another monitor—the 1084. Unlike the 2002, this one includes all the cables you need, no matter what Commodore computer you buy. What will you do with the extra cable? Perhaps sell it to someone who got the wrong cable with their 2002.

New Virus

A newsletter from the ICPUG user's group in Europe notes a new Amiga virus that actually erases any disks that are installed in your system when an apocalyptic message appears. Previous viruses were comparatively inert.

There are several ways to protect yourself from Amiga viruses. Perhaps the best is to use the CLI Install command on a backup copy of any new disks you get. Then store the original in a safe place. This solution works only if the disk is a normal DOS disk. For commercial software and other software with custom boot tracks, the solution is even easier—turn the computer off when you take out the disk.

GFA BASIC

Michtron is said to be working on the Amiga version of their respected *GFA BASIC* interpreter and compiler. *GFA BASIC* has become perhaps the most popular of all programming environments on the ST. Supposedly, the Amiga version would be in some measure compatible with the ST version, facilitating the transfer of software.

Because the BASIC shipped with the ST was so poorly designed and bug-infested, Michtron had little need to promote their BASIC. But the Amiga market may be more difficult to crack.

GFA BASIC won't be the first third-party Amiga Basic. *True BASIC* (the price of which has recently been reduced), *SAM BASIC* (from the creator of *Simon's BASIC* for the 64), and the Absoft's *Amiga Basic Compiler* (reviewed in this issue's Fast Looks) round out the competition.

Demo Reel 1

There may be a lot of talk about the new word processors, spreadsheets, and desktop publishing programs for the Amiga, but it's still the demos that sell the machine. Realiz-

ing this, NewTek, the makers of *Digi-Paint*, *Digi-View*, and the upcoming *Digi-F/X*, has come up with a brilliant marketing ploy to sell their products (and probably some Amigas, as well)—*Demo Reel 1*.

Demo Reel 1 is two disks. Insert one into DF0: and the other into DF1:, turn on your one-megabyte Amiga, and get ready to be stunned. NewTek has gone out of their way to show off the Amiga's great sound and graphics. On Amiga 500s and 2000s, it even turns off the high-pass audio filter for better sound (your power light will dim).

Demo Reel 1 features animated HAM (Hold-And-Modify) graphics, digitized speech and pictures, and a superb musical track. Dealers will probably let this thing run all day. If you want to take a copy home, no problem, NewTek's packaging makes it clear to your dealer that customers are free to copy the demo.

Demo Reel 1 is available from dealers only.

Seeing Stars

Do you know where your local planetarium is? If so, you'll probably love *Galileo 2.0*, a program from Infinity that puts the sky on your Amiga. When you load *Galileo 2.0*, it reads your Amiga's clock and puts the sky right up on your screen. You can then zoom in on any area, identify stars, see the traditional constellations, and label the planets. (The original version of *Galileo* was reviewed in the January 1988 issue of *COMPUTE!*.) Version 2.0 features more stars, faster scrolling and refresh, better accuracy, and much more. You can even save the screen to disk for use in paint programs. Infinity also sent us *Yale Bright Star Data Disk*—a disk that works in conjunction with *Galileo 2.0*. It contains even more stars and celestial objects. This disk should more than please the serious amateur astronomer.

Galileo 2.0 and *Yale Bright Star Data Disk* are available from Infinity Software, 1144 65th Street Suite C, Emeryville, California 94608; (415) 420-1551.

Products, Prices

If you want to know all about the latest games, the newest joysticks, lightpens, and drawing tablets, and the best video and audio products, check out the *Amiga Buyer's Guide* from COMPUTE! Publications. Scheduled to appear on the stands March 25, this volume will be a standard reference guide in your Amiga library.

— Rhett Anderson

MAC

Let's start this column with some ironic news from IBM: Officials recently announced that OS/2 will cut down on training costs because programs will conform to its consistent user interface. The irony is what Michael Maples, director of software strategy, offered as proof for the claim: "The Mac is evidence to support this theory."

A New System

Well, as other computers get easier to use, the Macintosh is getting a little more complex. Larger (and open) machines, mega-memories, a variety of screens and keyboards, and ultra-sophisticated software can intimidate a new user even on a Macintosh. It can get pretty intimidating even for a seasoned user.

To go along with all the hardware advancements, Apple keeps updating the System and Finder. This has been a problem since the first update:

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The System and Finder have their own version numbers (let's see, is it System 3.2 and Finder 4.1 that have to be used together?), and although they were distributed free through dealers and electronic information services, users seldom knew what all the changes were, or when they were released.

The situation is improving. Apple intends to release system updates every six months, with full documentation. Of course, you'll have to pay for the package if you want it that way. You can still get free updates if you don't want to shell out the \$50.

Apple's also trying to straighten out the numbering system. As of this writing, the current versions are referred to together as *System Tools 5.0*. A step in the right direction, but not far enough: The individual version numbers in 5.0 are 4.2 (System) and 6.0 (Finder). We'll see what happens in the next release, due out in late spring or early summer. (To check your Finder version number, use the About the Finder command in the Apple menu when you're on the Desktop; the latest Finder also reports your System version number.)

This current System (and future ones) contains the Multi-Finder "operating system." If you have at least two megabytes of memory, you'll be able to use it. Basically, Multi-Finder keeps the Desktop around all the time, and your applications' windows appear on top of it. You can have as many applications open as memory allows, and then just juggle around the windows.

Bugs and Noise

Apple has also announced two hardware updates in the last few months: one for the Mac II and one for the SE.

When National Semiconductor released its memory expansion board for the Mac II, it exposed a bug in the Mac's ROM, one that kept it from accessing all the memory on NuBus cards. Apple fixed the ROMs and has been using them since February. If you have an old one and run into memory-addressing problems

with it, your dealer should be able to arrange a free upgrade for you.

Complaints about the SE's noisy fan were finally heeded a few months ago, and Apple has been shipping SEs with new, quieter fans. You can arrange a fan swap with your Apple dealer for about \$90.

New LaserWriters

Apple didn't surprise anyone with its announcement of three new LaserWriters, but it is nice to have all the details.

At the bottom of the line is the LaserWriter SC. Its name hints at its defining feature: an SCSI port. This is a one-computer printer—a personal printer not meant for a network. It's a QuickDraw-based system, and does not handle *PostScript*. When General Computer released its non-*PostScript* printer last year, my advice to those who asked was to avoid it; it wouldn't be long before they found they needed *PostScript* output. My reservations don't necessarily apply to Apple's SC, because it's upgradable. At \$2,799, it's a reasonable entry into quality printing if you're not using programs that speak *PostScript*, such as *Illustrator* and *PageMaker*.

The LaserWriter NT (for NeTwork) is priced at \$4,500. It is comparable to the discontinued LaserWriter Plus, with one megabyte each of ROM and RAM and 35 built-in fonts.

The top of the line, the NTX (eXpandable), is the NT with more memory and more potential: ROM expandable to 2 megabytes, and RAM expandable to 12 megabytes. It also has a port for its own hard drive, where you can store more fonts. The price is \$6,599.

All three LaserWriters use a new Canon engine that outputs blacker blacks (large black areas have always been a problem), and all three print at about eight pages a minute. The bodies of the printers are the same; you just swap the brains. The price of the upgrades is roughly the price difference among the models.

Note, though, that Apple is going to support the LaserWriter Plus for five years. It

was going at the show for \$2,999. If there are any left by the time you read this, they may be priced at \$2,500 or less, and could be a wise purchase.

Claris Arrives

The San Francisco MacWorld Expo in January saw the release of many new or upgraded products, and the announcements of even more. There were many noteworthy releases.

First, Claris (the chip off the old Apple) released *MacPaint 2.0* and *MacWrite 5.0*. Seeing the new *MacPaint* is like meeting an old friend who's had a makeover by a fashion magazine: new surface stuff, but the same old friend underneath. *MacPaint* incorporates *HyperCard*'s tear-off menus and has a 'Magic Eraser' that erases down to what you previously had in that portion of the document. It has multiple, resizable windows (finally), and a few new drawing tools. In all, though, it's a disappointment. Macintosh graphic programs have grown so sophisticated since the original *MacPaint* that this version needs more to really cut it in this software category. Upgrading from the last *MacPaint* is \$25; new, the program is \$125. It still can't touch *SuperPaint*, but with the new *SuperPaint* jumping to the \$200 price range, there will be users who can't touch the new *SuperPaint*.

The new *MacWrite* is significantly enhanced with a spell checker and multiple on-screen, editable columns. You still have to insert a ruler for every paragraph that has a format change. The problem with this method has always been that you have to insert a ruler after every changed paragraph, too, or the changes continue through the document. *MacWrite* also has an upgrade fee of \$25 and is \$125 to new users. But, with Microsoft's *Write* priced at \$175 and a simple and generous upgrade path to *Word* available in case you get power-hungry, *MacWrite* is not necessarily a bargain.

Write is an elegant subset of *Microsoft Word*, and is highly recommended as the word processor for beginners

(unless you also need a little spreadsheeting and database capability; then, start with Microsoft's *Works*). The upgrade fee to *Word* is only the price difference between the two products. How can you lose? It's like using *Write* for free.

In the Wings

Other new software which wasn't shipping at the show, but is worth waiting for:

- *PageMaker 3.0* addresses the three major flaws of the previous versions. It has automatic text flow throughout the document, automatic text wrap around graphics, and, best of all, style sheets. With style sheets, first brought to the Macintosh by *Microsoft Word*, you define a combination of paragraph and character attributes as a specific style. Defining any section of a document as a certain style applies the style's attributes to that section. Change the definition of a style, and all the sections of the document that belong to that style change accordingly.

- *SuperPaint 2.0* has multiple object layers, new tools, and, most interesting of all, an expandable tool palette. Silicon Beach, and any interested third parties, can create tools that you can then put into the palette. Its sophisticated tracing function can turn bit-mapped items into objects with Bezier curves. There's no doubt *SuperPaint 2.0* will be worth its new price (\$199), but there's also little doubt that it will lose fans because of the increased price and complexity. The upgrade price for registered owners is \$50.

- Neither *WordPerfect* nor *FullWrite Professional* (*WordPerfect* and *Aston-Tate*, respectively) was ready for release, though each word processor did a brisk business selling in prerelease form.

HyperCard Tip

HyperCard automatically opens the Home Card, which lets you navigate to other stacks. But the Home Card is really just another stack. ▶

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If you'd rather that *HyperCard* open one of your other stacks automatically, just rename that stack Home.

One last tip: If you want to circumvent the Apple menu's "slot" limit of 15, or want to keep your System down in size, get *Suitcase*, from Software Supply. *Suitcase* lets you get at desk accessories and fonts even when they're not in your System file (*Suitcase*, \$59.95, Software Supply, 599 N. Matilda Ave., Sunnyvale, CA 94086; 408-749-9311).

— Sharon Zardetto Aker

ATARI ST

The pictures produced by the color digitizers for the ST seem to pale in comparison with those produced on the Amiga. The primary difference seems to be the number of colors. The maximum number of colors the ST can produce on the low-resolution color screen is 16 from a palette of 512. The Amiga can produce 32 colors in its normal mode, and a staggering 4096 in Hold and Modify mode. The human eye perceives a much higher resolution than is actually present when there are a large number of colors.

Fortunately, someone forgot to tell Boris Tsikanovsky about the ST's limitations. Tsikanovsky is the author of a new paint package called *Spectrum 512*. *Spectrum* includes all the normal drawing tools you'd expect plus some extras. Primary among the extras is the ability to use the entire 512-color palette *at once*. Pictures done in *Spectrum* look spectacular and have an appar-

ent resolution far greater than 320 × 200. Digitized Amiga HAM pictures, translated to Atari format, look very good. Suddenly, the world of color is wide open to ST enthusiasts.

Trio Engineering recently announced *Digispec*, software which allows the popular ComputerEyes digitizer to capture 512-color images. These images can then be modified with *Spectrum 512*. Artists will no doubt enjoy using *Spectrum* to draw on the digitized backgrounds produced with the *Digispec* software.

Spectrum 512 (\$69.95), The Catalog, 544 Second St., San Francisco, CA 94107; (800) 234-7001

Digispec (\$39.85), Trio Engineering, P.O. Box 332, Swampscott, MA 01907

For Programmers

Programming languages available for the ST get better and better. *Personal Pascal* from OSS is available in version 2, with a GEM-based editor that's even faster than the original. Bill Wilkinson of OSS is understandably smug about this. According to Mr. Wilkinson, the method is clever but not too complicated. Commercial developers would do well to make their products scroll as fast.

Tackle Box, a monumental companion product to *Personal Pascal*, consists of 900 pages of documentation on how to use *Personal Pascal* with GEMDOS, BIOS, XBIOS, AES, and VDI. The libraries included let you use simulated C calls with Pascal, and they provide a host of custom routines to aid you in your programming.

Fast BASIC is now available on disk. The bugs have been cleaned up, and technical support is available at a U.S. phone number. Support is from Eidersoft, and they seem to be taking this outstanding product very seriously. The language is structured and the command set is the largest on any language I've seen. There are commands for virtually every VDI and AES function. The editor is icon based and easy to use, plus it allows you

to edit ten files at once.

Michtron has released *GFA Companion* for its well-received *GFA BASIC*. The primary purpose of *GFA Companion* is to allow the nonprogrammer to generate pseudo-dialog boxes for obtaining input and presenting output. The product's packaging claims that it does Dialog Boxes, but it doesn't. Also, since you aren't allowed to give any program-containing code generated by the product to people who don't own the *GFA Companion* (it's copy-protected), the code is of limited use.

Michtron has also released a book for intermediate programmers using *GFA BASIC*. *The GFA BASIC Book* was written by Frank Ostrowski, the designer of *GFA BASIC*. This book contains a lot of useful information, although it tends to be highly technical in spots and repeats a lot of the GEM information in the latest *GFA* manual.

True BASIC was released for the ST as well. This language shows its mainframe roots in its ability to include external libraries (some very powerful ones are available from True Basic) and its ability to become a really huge language if you use all the extensions. There's also a GEM programmer's toolkit so you can use menus, windows, alert boxes, and dialog boxes in your programs. *True BASIC* external subroutine calls are used to generate the GEM functions, effectively insulating the user from the nuts and bolts of programming in GEM.

Personal Pascal (\$74.95), Optimized Systems Software, 1221-B Kentwood Ave., San Jose, CA 95129; (408) 446-3451

Tackle Box (\$79.95), SRM Enterprises, P.O. Box 40, U.S.A.S.A. Colorado 80840; (415) 894-6183

Fast BASIC (\$89.95), Eidersoft U.S.A., P.O. Box 288, Burgettstown, PA 15021; (412) 947-3739

GFA Companion (\$49.95), Michtron, 576 Telegraph, Pontiac, Michigan 48053; (313) 334-5700

True BASIC (\$99.95), True BASIC, 39 South Main St., Hanover, NH 03755; (603) 643-3882

Speaking 1-2-3

If you did your taxes by hand this year, you might want to automate the process next year with a *Lotus 1-2-3* template. There are two ST spreadsheets that can read 1-2-3 files, although one of them, *VIP Professional*, can only read version 1A files. Though 1-2-3 version 1A has been off the market for several years, there is still no upgrade that will let *VIP* read 1-2-3 version-2 files. *Logistix*, from Progressive Peripherals, does read version 2 files, but it isn't as easy to use as *VIP*.

There are quite a few programs and desk accessories that don't run properly with *VIP*. For example, it locks up if you load it after booting with GDOS. Since GDOS is necessary if you want to use the growing number of programs that feature high-quality printed output, you may find that you must frequently reboot your system to use *VIP*.

VIP Professional (\$249.95), ISD Marketing, 2651 John St., Unit 3, Markham Industrial Park, Markham, Ontario, Canada L3R 6G4; (416) 479-1880

Logistix (\$149.98), Progressive Peripherals, 464 Kalamath St., Denver, CO 80204; (303) 825-4144

If you aren't locked into 1-2-3 compatibility (such as it is), there are some very easy-to-use and inexpensive spreadsheets out there: *EZCALC* version 1.33 from Royal Software and *A-CALC Prime* from The Catalog. Both of these feature full GEM interfaces and scroll much faster than the sluggish *VIP*. *EZCALC* even allows you to attach notes to any cell, so you can actually document expenses/income and state your assumptions. It certainly can't hurt to be more organized and able to document everything.

A-Calc Prime (\$59.95), The Catalog

EZ-CALC (\$69.95), Royal Software, 1748 W. 18th Suite D, Eugene, OR, 97402; (503) 683-5361

— David Plotkin □

hints & tips

Orphan Computers

I have a very perplexing problem. Is there such a thing as a conversion table or program to change Commodore 64 programs so that I can use them on my Plus/4? I love my computer, but it's frustrating trying to convert programs myself. I tried to type in one program by leaving out the POKEs. Ha! No way. So what's a Plus/4 owner to do?

Doug R. Lewis

While the Plus/4 had a few interesting features (excellent color control and an advanced BASIC), it was not the runaway success that Commodore had hoped for. One reason it failed is that it lacked the powerful sprite hardware of the 64's VIC-II chip and the great sound of the SID chip. Also, the productivity software included in the machine was less powerful than packages already available for the 64.

The differences in the hardware of the two machines make it difficult to convert programs written for the 64 to run on the Plus/4. Games, and other software that make use of graphics and sound, are especially difficult to transfer.

Your problem hints at the problems that plague all owners of orphans: the difficulty of finding software for your computer, the difficulty of finding friends that can help you with your computer, and the difficulty of finding books, peripherals, and expansion for your computer.

Many orphan computers were born in the explosive period that occurred before the industrywide shakeup in 1983. The Mattel Aquarius, the MSX computers, the Commodore Plus/4 and 16, the Texas Instruments TI-99/4, the Coleco Adam, and the Timex Sinclair are among the dozens of computers that are now called orphans.

Many people enjoy their orphans. Some buy a full orphan system, with plenty of software, as their first system. Needless to say, it's cheaper to buy a used Coleco Adam than a used IBM AT. You can learn a lot by using one of these computers for a while. And if you write your own programs, you may never need another computer.

You may love your Plus/4 now, but someday you may decide that you'd like to buy a new computer. If you do, you may want to ask yourself these questions:

- What software do I want to run? (For example, if you run Lotus 1-2-3 at work, and you want to run it at home, you'll want an IBM-compatible.)
- Do I care about graphics, sound, and games? (If you do, find out how much it will cost to add a joystick to the various computers. Can you add two joysticks? How much will the appropriate monitor cost? Will you need to buy a special graphics board?)
- Do any of my friends have the computer I want? (It can be fun to be a trailblazer, but sometimes it's more practical to be part of the crowd.)
- Do I see peripherals, books, and software for the computer I want advertised in magazines and journals? (If not, your next computer may already be a dying breed.)

Before you buy a computer, read all about it. There are many excellent computer magazines available. For instance, COMPUTE! Publications publishes a magazine devoted exclusively to each of the following computers: the Apple II line, the Atari ST, the IBM PC and compatibles, and the Commodore 64 and 128.

Another Language

I am currently learning 6502 machine language and would also like to learn to program in 68000 machine language. Could you tell me some of the differences between these two languages?

Craig Bloom

The 6502 and the 68000 are close cousins. The 6502 is about two inches long and half an inch wide. It has 40 pins. The 68000 is about four inches long and one inch wide. It has 64 pins. The size difference gives a hint as to the power difference between the 68000 and the 6502.

There are similarities among all microprocessors, and most people find it relatively easy to learn a new assembly language once they know another. Some advantages that the 68000 has over the 6502 are

- More and more useful registers
- More addressing modes
- Multiplication and division commands

Overall, the 68000 is a much more powerful chip, and it is relatively easy to program.

Invisible Drawing

I have been programming in BASIC on my 1040ST for almost a year. In every game and utility I own, pictures are displayed on the screen immediately without being drawn. I am wondering if this is possible in ST BASIC.

John Nanney

It may be a good time for you to move on to a new language.

While virtually every other language on the ST allows you to do this, ST BASIC does not. Among the languages that make it easy are GFA BASIC, C, Modula-2, and Personal Pascal.

To be able to display screens instantly, you need to take advantage of a feature called screen flipping (also known as double buffering on some other computers). When you're using screen flipping, you draw on one screen while you're displaying another. When you've finished drawing, you flip screens. Then you draw the next screen and flip again. Screens can be flipped very quickly. This is how flicker-free animation is achieved on the ST.

There are many ways to draw images on the screen for screen flipping. One is to use the standard VDI or line-A calls. Another is to copy images from another area of memory directly onto the screen. Yet another is to load DEGAS or NEOchrome images onto the screen from disk.

To be able to screen flip, you need two screens. These need to be allocated with the system call Malloc(). Note that, on the ST, screen memory must start on a 256-byte boundary. You also need to use two system pointers: one that sets the physical base of the screen, and one that sets the logical base of the screen. The physical screen is what you actually see on the monitor. The logical screen is the area in which you draw. A call to the SetScreen() function will set these pointers—just pass the pointer to the logical screen, the pointer to the physical screen, and the resolution (0 for low, 1 for medium, and 2 for high) to the function.

Q Both Sides Now

I just bought a Commodore 128 computer and a 1571 disk drive. I'd like to know how I can write on both sides of my disks.

I have tried everything, but I can use only one side of each disk. Please let me know if it is possible to write on both sides of a formatted double-sided, double-density disk.

Dave King

If you're using a 128 and 1571, all you need to do to be able to use both sides of a disk is to format it as double-sided, using the HEADER command. After you've done this, DOS will allocate both sides of the disk for use.

Another common way to use both sides of a disk is to flip the disk over and write on the second side, in effect treating the disk as two single-sided disks. In order to do this, you'll need a device, available in most computer stores, called a notcher. Disks used in this way are called flippies.

We should caution you about using flippies, however. With normal disks, the disk only spins in one direction during its lifetime. Dust and contaminants tend to get caught in the disk's protective lining and stay there. Since flipping a disk causes it to spin in two directions, depending on which side is being used, these harmful particles can be continually dislodged and spread over the disk's surface. If you're going to be using a disk often, stay on the safe side and don't make it a floppy.

Q CGA on Hercules

In the January 1988 COMPUTE!, the article "Computer Monitors: Making the Right Choice" mentioned a program called SIMCGA by Chuck Guzis that emulates CGA graphics with a Hercules card.

I am very interested in this program, but I've been un-

able to locate any information on it. Can you help?

C. Mattingly

After reading the January issue of COMPUTE!, I was very pleased with the article "Computer Monitors: Making the Right Choices." Your article came at the right time for me because I intend to purchase a color monitor soon, and I was not very informed about monitors. The article also contained some very useful information on graphics cards.

In the article, a program by Chuck Guzis called SIMCGA, which allows a Hercules card to emulate a CGA card, is mentioned. Where can I obtain more information on CGA emulators and about this program in particular?

B. Caffaro

I read with great interest the article in January's issue, "Computer Monitors: Making the Right Choice." Since I do mostly word processing on my unit, I feel that staying with a monochrome monitor is the best choice for me.

The problem I am having is that when I want to use my system for other things like recreation, my Hercules card isn't compatible with the programs that use IBM's BASIC graphics. I haven't been able to find Chuck Guzis's program SIMCGA.

Ray Lahna

Evidently, there is more interest in this topic than we suspected. We've had dozens of requests for information on CGA emulators and on SIMCGA in particular.

A Hercules CGA emulator is software (sometimes accompanied by hardware) that produces black-and-white CGA graphics using a Hercules card. The emulator convinces programs that a CGA card is present in the system and translates the CGA's graphics into the Hercules card's graphics. The translation takes time, and for this reason an emulator's screen output is often slower than CGA output. With

many applications, however, this isn't a problem.

We know of three CGA emulators for the Hercules card. The first is SIMCGA, which is available in both public domain and commercial versions. The public domain SIMCGA can be obtained from any PC public domain source: a bulletin board, a user's group, or a for-profit distributor of public domain software.

The commercial version of SIMCGA is much more powerful than the public domain one, but it's been difficult to obtain until recently. Now you can get the commercial version of SIMCGA from Excelsior Software (RD #4 Box 265, Sussex, New Jersey 07461, 914-343-5155 or 717-343-6632) for \$39.95.

The newest commercial version of SIMCGA, 4.2, has a remarkable update policy: If you find any software that SIMCGA fails to work with, Chuck Guzis, SIMCGA's author, will custom-code a special patch for you at no extra charge. This means that SIMCGA can potentially run anything.

Another emulator, Mode-MGA, is available from T.B.S.P. Software (2265 Westwood Blvd., #793, Los Angeles, California 90064, 213-312-0154) for \$79.95. This emulator was originally developed to allow Hercules users to create CGA graphics with QuickBASIC, but the software works with many other programs that require a CGA card.

The last emulator on our list is Athena BIOS, available for \$60 from Athena Digital (2351 College Station Rd., #567, Athens, Georgia 30605, 404-354-4522). Unlike SIMCGA and Mode-MGA, Athena BIOS is hardware as well as software. For more information on Athena BIOS, see the MS-DOS section in this issue's "COMPUTE! Specific" department.

Q In the Numbers

I recently purchased a copy of Learning C from COMPUTE! Books. I would like to use my Amiga to solve complex mathematical equations. Precision is very important to me, and I'm becoming concerned about the results I am getting in Amiga Basic. Most floating point numbers are rounded off to six decimal places. Is there a way to get higher precision numbers out of my Amiga?

R. Allen Mansell

Amiga Basic uses two formats to store floating point numbers—single-precision floating point, and double-precision floating point. By default (if you don't specify which format to use), Amiga Basic will use the single-precision format. Calculations with single-precision numbers are much faster than those using double-precision numbers, but less precise. As an example, try running the following short program:

```
Single = SQR(2): Double# =
SQR(2): REM the '#' indicates
double precision PRINT Single
: PRINT Double#
```

As you can see, the number stored in the double-precision floating point format is far more accurate. A single-precision number will have up to 7 digits of precision, while a double-precision number may have up to 15 digits of precision. There are a number of built-in libraries in the Amiga which are designed for performing numeric operations. These libraries can be accessed from assembly language or high-level languages such as C or Modula-2. These libraries include the mathfp.library, which gives you access to Motorola Fast Floating point operations, and the mathieee-doubbas.library, which performs IEEE double-precision math. In addition to these, some compilers support Motorola 68881 IEEE double-precision math. See the ROM Kernel Reference Manual for more information. □

////// fast looks

**Go to Europe, Be
a Spy, See the
128D, Talk to
Mr. Spock, Build
Robots, Sneak
Behind Enemy
Lines, Battle
Dreams, Print
Anything, Fly
Fast, and Crunch
Numbers with
This Month's
Review Picks**

Mini-Putt

How can something look incredibly easy, yet be so hard? If you've played miniature golf, this question may sound familiar. After playing *Mini-Putt*, a new miniature golf game from Accolade, you'll probably be asking it again.

Mini-Putt leaves little to the imagination. Up to four players can compete. Before beginning the game, you stop at the Pro Shop and enter your name on the scorecard. Four courses with different themes and varying degrees of difficulty are provided.

You control an emotional little character named "Mini-Putt Pete." The game screen is divided into four sections: the playing area, the power and accuracy window, the overview map, and the scoreboard. The top portion of the screen is the playing area, offering a bird's-eye view of part of the green. With the joystick, you can scroll the screen to explore the rest of the green as you plan your shot. Arrows indicate the direction of slope, with colors showing the severity of the breaks. Beware of animated hazards that await you throughout your round—especially the windmill's ball-disappearing trick. Correctly maneuvering through or avoiding the hazards is the key to low scores.

Mini-Putt Pete's place is in the power window. He's framed by a gauge that displays the power and accuracy meter, reflecting your aim and the amount of force you use. Aim by positioning the cursor. Three precisely timed firebutton presses are all that are needed to begin the ball's journey for the hole. How can something that looks so simple be so hard?

Documentation is minimal, but it does cover the basics of game play. After awhile you may tire of playing the provided courses. Neither the manual nor the game offers a clue to whether more courses will be available in the future, although they would be appreciated.

— DH

Commodore 64/128—\$29.95

IBM PC—\$34.95

Apple IIGs—\$44.95

Accolade

20813 Stevens Creek Blvd.

Cupertino, CA 95014

(408) 446-5757

Paintworks Gold

It's not surprising that there are two excellent paint programs already available for the Apple IIGs. The computer, after all, can display 4,096 colors in high-resolution modes that rival such competitors as the Commodore Amiga, Atari ST, and IBM PS/2 computers.

What's surprising, however, is another IIGs paint program introduction. Activision's *Paintworks Gold*, scheduled for release in March, and seen in a prepublication form for this Fast Look, is not simply an upgrade of *Paintworks Plus*, but more of a completely new program.

Similar in look and feel to most point-and-click-style paint programs (ranging from *PC Paint Plus* on the IBM to the Macintosh's *MacPaint*), *Paintworks Gold* brings some new features to Apple art software. One of the most useful is masking capabilities, where colors may be set as masked, and thus be immune to any changes. Masking is perfect for making minor adjustments to delicate artwork. Another innovation is something called "slippy colors," which lets you lasso objects and individual colors, then move them, all without disturbing the surrounding art. The program also matches some of *Deluxe Paint II's* features. Perspectives, sophisticated brushes, and gradient blending of colors, for instance, are now available in *Gold*. Like many IIGs graphics-intensive programs, however, *Paintworks Gold* is often slow, particularly when such things as large brushes

REVIEWS

are used or complicated perspectives are attempted.

Paintworks Gold is a step up in Apple IIGS paint programs, especially when features are compared and counted.

— GK

Apple IIGS—\$99.95

(*Paintworks Plus* owners may upgrade to *Paintworks Gold* for \$20 until 5/31/88, for \$40 after that.)

Activision
2350 Bayshore Pkwy.
Mountain View, CA 94043
(415) 960-0410

MemoryMate

Have you ever been in the middle of an important project and suddenly needed someone's phone number, or thought of an item to add to your shopping list, or needed to reschedule an appointment? *MemoryMate* from Broderbund does all of this without forcing you to put away your work.

MemoryMate is a RAM-resident information retrieval program which can be based either in your root directory or in a subdirectory; it can also operate as a stand-alone program. A single keystroke calls up the program inside any other application.

The program's command list is displayed across the top of the screen at all times. A help screen is also available to explain commands, including copying or moving data from record to record as well as importing or exporting data to or from ASCII files.

Data is entered free-form into records which are limited to 60 lines consisting of 80 characters each. The program can store up to two megabytes of data on a hard disk system.

Specific records can be located by searching for any word, phrase, or date they may contain. When the necessary record or records have been found, users may exit to the exact spot where they paused in their application.

The program's memory residency works well with most other software, but I did experience access problems when several large files in my database were opened. Most questions are answered in the accompanying documentation, but the information is sometimes difficult to locate. Users must sometimes flip back and forth between the main text and the appendix.

The program has helped to organize my cluttered desk and my cluttered

mind. It has also reminded me of important deadlines and when my phone bill is due. I now turn to *MemoryMate* instead of reaching for a note pad or my calendar.

— MM

IBM PC and compatible computers with at least

256K RAM—\$69.95

Broderbund Software
17 Paul Dr.
San Rafael, CA 94903-2101

Fire Power

Computer tank games are nearly as old as the videogame industry. So it may be surprising that *Fire Power*, a tank game from Microillusions, has become so popular. What makes *Fire Power* a crowd pleaser?

It's easy to play, and it's fun.

You can play with one player or two, but it's the two-player option that will keep you coming back. Just as in Atari's ancient *Tank Pong* game for the VCS 2600, this game's success comes from its real, human, head-to-head competition. If you can get your hands on two Amigas and two modems, you and your enemy can play from different rooms, different houses, or even different states.

Unfortunately, *Fire Power* is as gruesome as it is fun. It's truly horrifying to see men being run over by tanks—nothing's left but mangled bodies and pools of blood, scenes that are all too realistic on the Amiga. Some may want to pass this game by on humanitarian grounds.

— RA

Amiga—\$24.95

Microillusions
17408 Chatsworth St.
Granada Hills, CA 91344
(800) 522-2041

Street Sports: Baseball

Street Sports: Baseball takes baseball out of the little leagues, exchanging sparkling uniforms, up-to-date equipment, and the standard playing field for the game that you remember playing as a kid.

Ball diamonds are makeshift. Field locations include a vacant lot and a parking lot. Bases may be improvised

from jackets, trash can lids, or old tires. Players are chosen from a roster of 16 neighborhood kids. It's your job to read their playing specs (they vary in hitting, fielding, and throwing skills), and put together a winning team.

First, you must choose your playing field. Then choose to play either against another person or against the computer. You can play with old teams (on disk), or you can play with new teams, in which case you get to select each player on your squad. If you make up a new team, you name it, select its players, and set the lineup and field positions.

Joystick commands are simple and sensible. The game makes visual sense as well. A "split screen" format shows you both the playing field from behind the home plate and an aerial view of the entire field. The close-up shows the pitcher's throw to the batter and the batter's swing. The overview gives you each player's position in relation to the ball and the bases.

When the game is being played, the top quarter of the screen serves as the scoreboard, which displays everything you'd expect to find on the scoreboard at a major league park.

Street Sports: Baseball is fun to play. Epyx has put together a program with lots of options. Playing nine innings against the computer or a friend will offer you challenges and thrills as you watch your outfielder catch that pop fly or the third baseman tag a runner.

— CSH

Apple II—\$39.95

Commodore 64/128—\$39.95

IBM PC and compatibles—\$39.95

Epyx
600 Galveston Dr.
Redwood City, CA 94063
(415) 366-0606

AC/BASIC Compiler

In general, the BASIC languages available for most computers are compatible with each other. An IF-THEN statement looks the same, no matter what computer you're using.

In real life, things aren't so easy. The best programs rely heavily on the special features of the computer and the particular strain of BASIC. AC/BASIC lets you write programs that run almost unchanged on the Amiga, Apple IIGS,

and Macintosh.

What do these computers have in common? Several things: a window-based mouse interface, high-resolution bitmapped graphics, great sound, and high-level event trapping. AC/BASIC lets you take advantage of these features.

There are three different versions of AC/BASIC, one for each of the supported computers. On the Amiga and Macintosh, you program with the Microsoft BASIC interpreter for your computer, then use the AC/BASIC compiler to make your programs run several times faster.

On the Apple IIGs, you use AC/BASIC as a compiled language—it is never run in interpreted mode. What makes AC/BASIC exciting on the IIGs is that it's the easiest way to make fast applications that use the IIGs's special features.

You'll need to be programming in BASIC at the intermediate level (at least) to use AC/BASIC—nearly every program we tried to compile needed to be modified slightly.

— R.A.

Amiga with at least 512K—\$195
Apple IIGs with at least 512K—\$125

Absoft (Amiga, Apple II)
2781 Bond St.
Auburn Hills, MI 48057
(313) 853-0050

Microsoft BASIC Compiler (Macintosh)
Macintosh with at least 512K—\$195

Microsoft Corporation
16011 NE 36th Way
Box 97017
Redmond, WA 98073-9717
(206) 882-8089

Contributing to *Fast Looks* this month were Rhett Anderson; David Hensley, Jr.; Carol S. Holzberg; Gregg Keizer; and Mickey McLean.

Ticket to London

You look like you could use a vacation. Ten days in London sound good? Don't worry about expensive tickets and pricey accommodations. About thirty dollars will get you a very special package tour: Blue Lion's *Ticket to London*.

Just don't expect some stuffy group excursion—this trip is an adventure!

The adventure starts at once. Following a title screen, a snatch of music, and entry of your name, you find yourself at Victoria Station. With a colorful graphic of the station serving as backdrop, you are met by a British travel

agent. He's wearing a distinctive English Bowler. He has your return airplane ticket, but being a roguish sort, he decides to play a game with you, and test your knowledge of things and people British.



The Tower is just one of the sights you'll see in *Ticket to London*.

You won't get your return ticket until you guess the mystery Briton he has in mind. To add a little spice to your adventure, clues are scattered around the city. If you don't solve the mystery within ten days, you'll be stuck in London for good.

A quick check of the screen's status board assures you that the situation is far from hopeless. It's ten in the morning on your first day, and you have \$300 as well as £50 (that's 50 British pounds). The game's status board is simple and unobtrusive; you can check your financial well-being at any time. If you don't take care of yourself, a line advises you to rest or eat. Another line lets you know how much time remains before you're stranded.

When you're ready to leave the station, a map of London is displayed. The map shows more than 20 different points of interest, including museums, shops, hotels, restaurants, Trafalgar Square, and other important sights. Each location is represented by a distinctive and easy-to-recognize graphic.

Your current location flashes on the map. A single keystroke sets your course to any of the other places of interest dotting the winding Thames. Some sightseeing is in order, so you choose a mode of transportation and decide to visit the Tower of London first.

The Underground is available, or you can walk, but this time you decide to treat yourself to a taxi. The friendly cabby starts a conversation. He asks a question of British interest and you cycle through several potential answers.

His questions range from history to geography, culture and entertainment. You're as likely to be asked,

"Who was the mother of Queen Elizabeth I?" as "What do you get when you mix beer with lemonade?"

Questions appear in balloons on the left of the screen. Cycle through potential answers in the balloon on the right. Press Enter or Return to make your selection. Choose carefully—you only get two chances.

A correct answer is rewarded with a *Good Show!* message; a tally line appears and tracks your correct answers. Answer enough questions correctly, and you receive a message that guides you to clues. Pay the cabby when you reach the Tower. Make a mental note to stop at a bank and exchange some more dollars for pounds.

The aged Tower is impressively pictured with its familiar walls and turrets, and you can almost see the ravens. After a bite to eat in a cozy, traditional British inn, it's time for more sightseeing.

This time you take the tubes. Heading to the British Museum, you meet another friendly and inquisitive gent. Thanks to your knowledge, and a little bit of luck, you answer enough questions to receive a message along the lines of, *Buy something old, shiny, and round or See Marlowe's play.*

Clues! The antiques shops on Portobello Road might have something old and shiny, and there may be tickets at the Barbican for a Marlowe play.

The clues are simple. *Try some game in jelly* would be a good reason to go to Simpson's for an elegant pheasant in aspic. A message advising you to *See the American Painter* should nudge you in the direction of a museum. Will you know which one?

Follow a message correctly and a bowler hat appears, bearing a clue to the mystery person's identity. Clues are relatively straightforward: *He was one of eight children or She was the childhood playmate of her husband's brothers.* There are ten clues for each mystery person. The more clues you possess, the more helpful are subsequent clues. Messages can be reviewed with the doorman at your hotel. The travel agent at Victoria Station keeps track of the clues.

I won't spoil the fun by giving away any mystery identities. The individuals, though, are well-known personalities from the realm of British fact and fiction.

Play the game at your own pace. You can rush around London, responding to messages immediately, or you can take a leisurely tour of the old city. From Buckingham Palace to Covent Garden, each place of interest has its own screen. Representations are faith-

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ful, colorful renditions that capture the feeling of Londontown.

Stop by Nelson's Column, enjoy a very high-class tea at Fortnum and Mason, or poke around in a dusty old bookshop filled with Dickens and Shakespeare. Don't be afraid to live it up, but watch your money. Think your routes through, as well. Cabs are fast, but expensive. The Underground is cheap, but a delay could cause you to miss the curtain at an opera. Walking saves money, but takes more time. Besides, on foot you may find yourself in the middle of a serious British down-pour. Get too wet, and the manual suggests that you'll be forced to spend precious time recuperating at your hotel. (Judicious purchases, though, such as an umbrella and boots, afford some protection from the elements.)

This is an enjoyable program. So much so that you may find yourself wistful when you win. Your tour then ends.

Fortunately, Blue Lion has included enough mysteries and questions to ensure high replay potential. The game is suitable for travellers who have been to London as well as Anglophiles anticipating their first trip. It's also a lot of fun for armchair travellers who may never make the trip for real. In fact, *Ticket to London* may be as close to London as you can come without going.

Cheerio!

— Ed Ferrell

Ticket to London

For . . .

Apple IIc/e/IIas, with 128K—\$39.95
Commodore 64/128—\$29.95
IBM PC, XT, AT, Tandy 1000, and PCjr,
with 128K and CGA or Hercules graph-
ics—\$39.95

From . . .

Blue Lion Software
90 Sherman St.
Cambridge, MA 02140
(617) 876-2500

And . . .

Also in the series, *Ticket to Paris*, *Ticket to Spain*, and *Ticket to Washington, D.C.*



Border Zone

Border Zone, a new interactive text game, brings the intrigue of international espionage to your computer and keyboard. As the main character, you are involved in an assassination plot in the mythical Eastern Bloc nation of Fro-

bnia. Danger is around every corner, deception is practiced by everyone.

Tongue in cheek, Infocom includes several nondisk materials with the program, aimed at helping you get into the story as well as providing information for your quest. These items include a



Play three different characters in Infocom's new all-text adventure of intrigue and assassination.

Frobnia Tourist Guide and Phrasebook, a business card, a matchbook, and a map of the Frobnia/Litzenburg border.

Ironically, these materials combine with the detail and richness of the dialogue and story to create a colorful picture of a drab and stoic country.

The game itself is all text. Frankly, I have found it hard to play text-only games since the advent of games such as *The Pawn* from Firebird, which mixes graphics with text. I like the added element of visual stimulation that occasional graphics provide. But Infocom has stuck with its philosophy of exercising your mind, not your senses.

Border Zone, though, breaks new ground for the company in several respects. To begin with, the program is divided into three self-contained chapters. Each chapter permits you to play a different character in the story's central, assassination-oriented plot.

Chapter One places you in the shoes of an easygoing American businessman returning from a trip behind the Iron curtain. Your quiet train trip is interrupted by a wounded, on-the-run American spy. You find yourself involved in an assassination plot, confronted by a dangerous KGB officer. In Chapter Two, your character is the wounded American agent whose assignment is to stop the assassination. Chapter Three gives you the role of the KGB officer.

This three-scenario approach is both interesting and satisfying. I have often wondered what a particular text game would be like from another perspective. *Border Zone* gives the opportunity to see a story from more than

one point of view.

Perhaps more important, the game takes place in realtime, adding to the suspense of the story. Time is constantly ticking away in the upper right corner of the screen. Unlike other text adventures that progress only as you give responses, *Border Zone's* story moves along without your help. Unless you invoke the PAUSE command, things happen in the story, and to you. Time is of the essence during all three of the scenarios, and realtime progression of the story is guaranteed to produce sweaty palms.

Another new technique for Infocom is *Border Zone's* online hints. Every adventure gamer has at one time or another been tempted to buy a hint book. Not this time: *Border Zone's* hints are provided as part of the program. A simple command takes you to a menu where you retrieve hints for various points in the story. Once you select the topic, you're given increasingly revealing clues.

Border Zone has a smart parser, the vocabulary-driven interface that lets you communicate with the program. The game has an 800-word vocabulary, and it recognizes multiple objects with certain verbs. You can include several sentences on one line. If a command is unclear, the program either makes an assumption or questions you to resolve the ambiguity. With the special OOPS command, you can save yourself from retyping an entire sentence because of one mistake. For example, if your command was PUT THE BOK ON THE TABLE, you could correct it by typing OOPS BOOK.

Border Zone is a well done, interesting, and challenging text adventure. It is an intelligent program with an advanced parser. The realtime game progression and the opportunity to portray different characters in the plot set *Border Zone* apart from other text adventures and make it an attractive entertainment for either advanced text gamers or entertainment novices.

— Scott Thomas

Border Zone

For . . .

Apple II—\$39.95
Commodore 64/128—\$34.95
IBM PC and compatibles—\$39.95
Macintosh—\$39.95

From . . .

Infocom
125 Cambridge Park Drive
Cambridge, MA 02140
(617) 492-6000

The Commodore 128D

The Commodore 128D, introduced in Europe over two years ago, has finally made its way to the U.S., replacing the 128 as Commodore's premier eight-bit machine. The new 128D is everything an upgrade should be. It's an enhancement of the 128 that's completely compatible with all existing software and peripherals.

The most obvious change in the 128D is its new exterior, which strongly resembles Commodore's Amiga 1000. Features include a detachable keyboard and a sleek metal case that houses the system hardware, the power supply, and an upgraded 1571 drive. Not only is the 128D's new look more polished and professional than the 128's, the new design has some practical advantages, too.

The 128D's detachable keyboard uses the same layout as the 128's, but has a lighter action, making lightning-fast touch typing easy. The keyboard's cord is shorter than it should be, but it's long enough to let you reap most of the benefits of detachability.

The slim metal case that houses the system hardware protects the computer's delicate circuitry from coffee spills and also acts as an excellent RF shield. Like the Amiga 1000, the system unit can be used as a convenient monitor stand, with a 128D ensemble taking up much less desk space than a 128 system with an external disk drive and monitor.

Commodore did more than just wrap the 128 in an attractive new package. There are several internal improvements worth noting, the biggest being a dramatic increase in 80-column video RAM. The 128's 8563 chip had 16K of dedicated RAM, but the 128D has a massive 64K. This new RAM makes exciting multicolor, hi-res 640 x 200 graphics possible on the 128D.

There are more hardware improvements to the 1571. Recently, Commodore updated its stand-alone 1571 disk drive by releasing new ROMs, which corrected some bugs in previous editions and increased the drive's speed. The new 128D's internal 1571 sports these upgraded ROMs.

The CP/M 3.0 operating system that comes bundled with the 128D is also enhanced. It now fully supports Commodore's new 1581 3½-inch disk drive and includes several utilities not found in the initial releases of the 128's CP/M.

As far as the user is concerned, the 128D functions just like the 128. It has three modes: 64 mode (with 40-column

composite color video and BASIC 2.0), 128 mode (with 40-column composite color video, 80-column color RGB video, and BASIC 7.0), and CP/M mode (using the 128's inboard Z80A microprocessor). And it runs both *GEOS* and *GEOS128* operating systems.

All the familiar input/output ports on the old 128 are represented on the 128D, but some are in different locations. They include two ports for joysticks or a mouse, a serial port for disk drives and printers, a port for a RAM expansion module, a cassette port, and a user port for a modem or RS-232 interface. Just like the 128, the 128D boasts a handy reset switch.



The Commodore 128D features a detachable keyboard and an internal 1571 5¼-inch disk drive.

The 128D appears to be completely compatible with the 128. We've tested it with a wide range of software and peripherals in 64 mode and 128 mode, with CP/M, and with *GEOS* and *GEOS128*. All software and hardware performed without problems.

There isn't much to criticize about the 128D. In fact, my only reservations center around the internal 1571 drive. Although an internal drive can have many benefits, it also has some drawbacks. First, there's the matter of repair. If the drive needs to go to the shop, the whole system must go. Also, the 128D's internal 1571 doesn't have the external DIP switches that make reassigning device numbers so easy on the stand-alone versions. Commodore must assume that you'll always want the internal drive to be configured as device 8, but users with a 128D and a 1581 drive may not see things that way. The last problem with the internal 1571 is that it makes the 128D more expensive than a 128. With the latter machine, a 64 owner could upgrade to a 128 and use his or her 1541 disk drive. With the 128D, the drive comes with the system, so you don't have any choice about purchasing it. But these are minor points.

The 128D is a winner. It's well designed, compatible with the 128, and has some important enhancements.

— Clifton Karnes

Commodore 128D

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Star Trek: The Rebel Universe

There are so many good things about this game that it's impossible not to wish the developers had carried their ideas a bit further. The attempt to capture the feel of the original *Star Trek* series and the more recent *Star Trek* movies is admirable, and the game's player interface is truly noteworthy.

Despite these excellences, though, *Star Trek: The Rebel Universe* suffers in the end from an unexpected tediousness of play, and a realization that one of the popular series' most attractive attributes has not been included.

Too bad, because in many ways *Star Trek: The Rebel Universe* is more than superb.

The game casts the crew of the Enterprise into a sealed-off section of space called the Quarantine Zone. Within that zone, a host of Federation starships have turned traitor, owing of course to a Klingon plot, and Kirk and the folks must find a way to stop the rebellion from spreading. This demands visiting star system after star system, trying to keep the Enterprise alive while searching for the solution to the problem.

The game screen includes one large primary display, with seven surrounding secondary displays. In fact, there are more than eight screens, since many of the individual displays have subdisplays, but only eight are shown at one time. Accessing any display means simply pointing at it and clicking with the mouse.

Seven of the screens show familiar *Star Trek* characters (the graphics here are very good), and each character has a specific function or functions. The Kirk screen, for instance, shows the time (the Captain's Log), and allows access to the Transporter Room and to the Stores (the stuff you've brought on board from

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your adventures). Click on Spock, as ever the Science Officer, and you find out the Enterprise's condition, as well as details about star systems and their allegiances (friend or foe). When you reach a solar system, it's Spock who tells you what types of planets are there. Uhura's screen shows incoming messages, Scotty's displays the energy and dilithium crystal levels, Chekov's allows weapons selection, McCoy's shows the health of each officer, and Sulu's gives access to navigation.



The crew of the Enterprise must solve the mysteries of the Rebel Universe.

Sulu's screen, in fact, is the most commonly used. His secondary displays include a map of the Quarantine Zone and, as they become applicable, maps of the solar systems the Enterprise enters. To select a system to travel to, you click on the appropriate system shown on Sulu's large, rotating star-map. Fire up the Warp drives, and, in a few seconds, depending on the distance, you're there.

Once inside a solar system, clicking on individual planets reveals their type. There are a wealth of planet types in the game, ranging from Archive Complexes (which give clues to solving the game), to Contamination Zones, Dilithium Mining Complexes, Energy Refineries, Leeching Piles, Life-Supporting planets, Mesonic Rings, Orbital Discontinua, Siren Devices, Psionic Cores, and even Planetary Superminds. The manual explains each thoroughly, and each has a unique effect on the progress of Kirk's mission. The primary goal is to find Life-Supporting planets, because on these you find weapons, items, and artifacts.

Naturally, the Enterprise will frequently be under attack. When the Klingons strike, clicking on Chekov's screen lets you select your response: either phasers or photon torpedoes. A secondary display allows you to lock onto a target and fire the weapons. Phasers deplete quickly, and since you have only 50 tor-

pedoes, choosing weapons and waiting for good targets is essential. You can replenish weapons at a Federation-owned Weapons Dump planet.

Sound effects play an important part in the game. Accompanying the opening screen is Kirk's voice, digitized from the series, invoking, "Space, the Final Frontier," while throughout the game you hear Chekov's digitized voice shouting, "Got him!" and Sulu's proclaiming, "Now in standard orbit, sir." If you fail, Spock's face appears; he raises an eyebrow and exclaims, "I never will understand humans." And in various places Scotty will utter one of several warnings.

Other sounds used to good effect include the transporter, the message display, and the red alert, all audibly faithful to the original series.

The game is extremely easy to play. Clicking on the proper screen is the major requirement, while keeping track of where you've been is important as well. Beyond that, though, all that's needed is to keep the mission goal in mind, visit many, many star systems, and stay alive.

And here is one of two major problems. There are many systems to visit, and many enemies to fight, but, after awhile, exploring and fighting grows tedious. Before long you find yourself not wanting to bother with a nearby solar system, while fighting battles quickly loses its initial interest. Even though there's a lot to do, much of it is repetitious.

The second problem is more serious. What made the *Star Trek* series, and all but the first movie, so fascinating was not the travelling, the combat, and the discovery of devices and weapons, but rather the interaction of the Enterprise crew with alien cultures. In the series, Kirk and the others beamed down to a planet to explore it, to find and examine cultures, and to solve morally-charged problems.

During *The Rebel Universe*, though, beaming down becomes an almost incidental part of the game. There are no alien cultures to find. In other words, the Enterprise's five-year mission—to explore new worlds, to seek out new civilizations—has been largely ignored.

Star Trek: The Rebel Universe is a good game. It has a clever interface, attractive graphics, and, to those familiar with *Star Trek*, an instantly familiar feel. If the game carried the sense of exploration further, though, it would be much more memorable. Despite its flaws, however, I recommend it as a solid, playable, well-constructed game.

The great *Star Trek* simulation, however, is still to be done.

— Neil Randall

Star Trek: The Rebel Universe

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Commodore 64/128—\$29.95

IBM PCs and compatibles (requires 256K and CGA)—\$39.95

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Robotic Workshop

This package managed the neat feat of putting me—not the world's most skilled or experienced electronic hobbyist—in control of robots that I built myself. Likewise for a ten-year-old boy and his own robots. *Robotic Workshop* is a combination hardware/software/mechanical components package that teaches a variety of lessons about electronics and mechanics, provides software for controlling the devices you build, and accomplishes both purposes simply enough to make the system appropriate for children in upper elementary school and beyond.

While children will, I think, enjoy working with *Robotic Workshop* and will learn a great deal from it, this is not a toy. Even the simplest projects involve assembling mechanical devices, loading software, and controlling the experiment via an interface that plugs into the computer. At the same time, there are no soldering irons to warm up, few wires to shave. Explanations are in fairly simple English, and the frequent diagrams, although small, are easily followed even for complex constructions.

Best of all for younger users—not to mention their parents and teachers—the motors and components all snap together easily. Access has built its *Robotic Workshop* around the Capsela system of mechanical hobby parts. A Capsela motor, for example, is a reversible electric motor encased in a transparent plastic sphere. Capsela spheres are studded with coupling ports by which the motor, say, can be connected to a Capsela transmission, and thence to a gear system. The components snap together

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easily, and it's quite a thrill to be able to watch gears turn and motors spin under your control.

Robotic Workshop comes with two motors, two speed reduction modules, two worm gears, a transmission, and plenty of couplers and connectors. You also get a propeller, a wheel, and a tire, all of which are used in some of the experiments. All of the parts worked as promised, and are sturdy enough to stand up to repeated use. Other Capsela elements are listed in a catalog included with the package.

Connecting power to the motors is as simple as assembling the machines. A ribbon cable that comes with *Robotic Workshop* has leads which are inserted into sockets on the Capsela units. No twisting of wires and tightening of screws.

The power itself comes from batteries in *Robotic Workshop's* B100 interface. The interface must be disassembled to install the batteries. Once batteries are in place, the interface plugs into the user port on the 64 or 128, although 128 owners will have to remove the RGB connector, a fact oddly overlooked in Access's documentation. On Apple II-series machines, the B100 plugs into a slot (and thus the system will not work with the Apple IIc).

Once installed, the B100 and the Robotics Operating System (R. O. S.) software that comes with the package are your passport to whole worlds of electronics and mechanics. R. O. S. is itself one of the most impressive aspects of *Robotic Workshop*. The software has a variety of BASIC commands by which you control motor speed and direction, program multiple motors, and meter various operations. Some complete motor control programs are included to get you started, but it doesn't take long to begin putting together your own routines.

Hardware, software, and mechanical components can be assembled and configured in a variety of ways. *Robotic Workshop's* 50 projects are intelligently arranged, moving from the introductory to the advanced at a sensible pace that maintains interest without skipping important details. The first project, for example, "Motors & Electricity," provides a brief but solid discussion of electricity and circuits and then puts the lesson immediately to work. Within minutes of opening the manual, installing the B100, and booting R. O. S., you can be controlling motor speed and direction from the keyboard.

By the time you get started on the second project, you're already assembling

small machines. The first one is a simple fan, whose speed and direction, again, can be controlled from the keyboard.

Advanced experiments take advantage of the base to which Capsela machines can be mounted; if you're working with children, I'd recommend using the base from the beginning. Its stability is necessary.



This strange flying machine is just one of the robotic projects you can put together.

The deeper you press into the projects provided with *Robotic Workshop*, the more sophisticated the projects become. The first dozen projects deal with motors and gears, including lessons on hoists and cranes, gears and torque, multiple motors, gyroscopes, and even metering the efficiency of the engine. Subsequent groups of projects focus on generators, digital electronics (including programming the joystick to provide robot control), light and color (which includes uses for Benham's disk, as well as examples of strobe effects.) There are projects that use infrared sensors for counting and measurement of speed and rpm. *Robotic Workshop* can interface with audio devices, making possible experiments with digitized speech. The B100 has a voltmeter built in, letting you test batteries. You can build a burglar alarm or a radar-like tracking unit. Capsela components can be put together to make a mobile vehicle or plotting device. At the end of the manual are suggestions for other projects, although, by the time you reach the end, you will doubtless be generating ideas of your own.

While the package contains a good selection of components, which can be used over and over, it's likely that the more robots you build, the more you'll want to build. Some of your plans may call for more parts than those included with the kit. I was not familiar with the Capsela system before *Robotic Workshop*, nor could I find them at nearby hobby stores; order forms and catalogs are included with the package, however. *Robotic Workshop's* box contains a sty-

foam container with snug recesses for the Capsela elements; for the smaller parts a ZipLock bag makes a good storage container.

Robotic Workshop impressed me, as it did the children to whom I showed it. Its lessons are both practical—what is electricity, how do motors work, and so on—and informative. With *Robotic Workshop*, you get a glimpse of the nature of programmable machinery and the promise that robotics holds. The lessons learned with the snap-together Capsela components would seem to me easily translated to larger motors, to more advanced study of the subjects *Robotic Workshop* introduces so well.

— Keith Ferrell

Robotic Workshop

For . . .

Commodore 64/128—\$149.95

Apple II (excluding the Apple IIc)—\$169.95

From . . .

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Airborne Ranger

What do you get when you combine the brains behind MicroProse's strategic games with first-rate arcade-style action, animation, and graphics? An arcade game that makes you think.

Airborne Ranger puts you at the cutting edge of combat. As a ranger, you might be asked to serve in the desert, in the arctic, or in a temperate zone. Your weapons vary according to the mission you choose and may include a carbine, hand grenades, rockets, or a knife.

Before the game begins, you select whether to play as a practice or veteran ranger. You can't be a veteran unless you are a veteran: The game lets you save, on formatted disks, a roster of veterans who've proven themselves. When a veteran doesn't make it back from a mission, his death is reflected on the roster. My advice is to stick with the practice ranger until you begin to complete missions consistently.

The next step is to select a mission. It's difficult to advise you on mission se-

REVIEWS

lection, since they're all difficult. The mission's difficulty level may also be selected. The lower levels affect the types of weapons available to your adversaries.

You're given your orders, which may involve destroying an ammo dump, creating a diversion, kidnapping an enemy officer, or completing any of nine other assignments. The level of violence varies widely among the available missions.

A fatigue test requires the game's manual as a reference, ensuring that your copy is legitimate. If you fail the test, you are told you are too tired to continue. You take R & R, which means rebooting the disk.

The mission begins. You fly at a low level over the target area, steering the fast, quiet V-22 Osprey and maneuvering it for the most effective position. Study the terrain. The aerial view of the mission arena is colorful and scrolls smoothly, revealing the details of the arena where your mission will take place.

The mission area is rectangular and surrounded by land labeled *unsafe terrain*. You can't leave the mission area. While you're flying over it, take the time to notice its major features. Rough-looking land represents a mine field. Ravines crisscross the landscape. Machine-gun nests and bunkers are easily recognized. Your objective and recovery zone can be found at the top of the mission area; your drop zone is at the bottom.

During your approach, you may drop up to three supply pods containing medicine and ordnance. Try to land them in strategic locations. Their contents can resupply you in the middle of a mission.

As you near the lower perimeter of the mission area, a buzzer sounds. You jump and then pilot your parafoil toward ground where you can land without being noticed. Once you reach the ground, you're on your own.

Groundside, the main play screen shows the immediate terrain surrounding you. An X floats before you to assist you in aiming your rifle. The X also aims other weapons, locates the landing point of your grenades, and the path of your rockets.

A keystroke gets an alternate map screen, revealing the entire mission area. Use this screen to get your bearings, locate your supply pods, and plan your route through the bunkers and the machine gun emplacements that lie between you and your objective. You can earn additional points by destroying these emplacements, but such derring-do is not recommended. Although it's satisfying to see a high score, it's worth-



Behind enemy lines, the ranger has only his weapons and his wits.

less if you don't survive.

On the play screen, you can move your ranger either on foot—walking or running—or prone. Secrecy is vital, yet crawling takes time. And no matter how careful you are, sooner or later you will be faced with enemy troops. At that point, you have a decision to make—do you avoid the enemy, hide from them, or fight them?

Fortunately, you know when soldiers are coming, even when they are offscreen. It seems the enemy has thoughtfully equipped all troops with tap shoes. Your own progress, on the other hand, is absolutely silent.

In operations with a low difficulty level, you might be able to avoid detection simply by lying still in a ravine or behind a wall. In other scenarios, enemy soldiers approach from every direction.

When moving forward, I like to stick to the ravines. These are the largest identifiable details on the landscape. They often cross each other, and they are usually laid out on the map at regular intervals. So, in addition to offering a measure of cover, the ravines serve as excellent guideposts as you proceed to your objective.

It's tough to maintain absolute secrecy. Sometimes you have to fight. A knife is helpful at close range, but more often you'll use your carbine. Sound effects let you know when you've hit the enemy. When enemy soldiers die, they change color and shortly disappear. For larger emplacements, you may be forced to use grenades or rockets. Don't get too close. When objects are destroyed by rockets or grenades, they scatter shrapnel that could wound you as well as destroy any nearby soldiers.

Weapons selection is controlled from the keyboard, as is first aid, and standing/crawling. Key assignment is sensible and minimal, but the game nonetheless comes equipped with one of those reprehensible cutouts to fit

over the computer keyboard.

Airborne Rangers is an excellent game from beginning to end. My only hesitation in recommending it wholeheartedly has to do with the attributes some game players will find most attractive: the realism and the violence.

The authors of this game have done some thinking in this regard, and they have included a disclaimer of sorts (along with a brief history of the Rangers) in the manual. I suppose no one picking up a game called *Airborne Rangers* expects to find sugar plums and daffodils inside. Be aware, however, that the violence and action are graphic and highly realistic.

— Robert Bixby

Airborne Ranger

For...
Commodore 64/128—\$34.95

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Hunt Valley, MD 21030
(301) 771-1151

And...
The game will also be available in 1988 for IBM PC and PC compatibles.



Dream Zone

Baudville, best known for its excellent graphics programs (*Blazing Paddles* and *816/Paint*) has released its first entertainment package, which, if nothing else, is sure to be controversial. The game, a beautifully rendered graphics adventure, is entitled *Dream Zone* and it is bizarre . . . but that's meant in the nicest way.

The premise is simple: Troubled by recurring nightmares, none of which you can remember the next morning, you seek help from Dr. Sigmund Fraud. His method of treatment places you inside your dreams so that you can seek out and destroy the monster haunting your nights. Your dream world becomes reality: If you fail to complete your quest and escape from the land of the subconscious, you'll perish.

Simple, you say. But you'll never use that word again in connection with *Dream Zone*. From the minute the game leaves reality (which is depicted in stunning black-and-white digitized pictures) and enters the world of dreams, play becomes as confusing, illogically logical, and frustrating

continued on page 70



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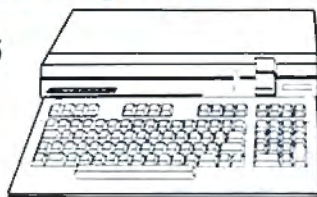
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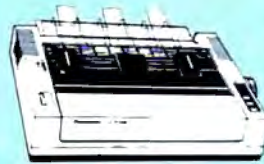
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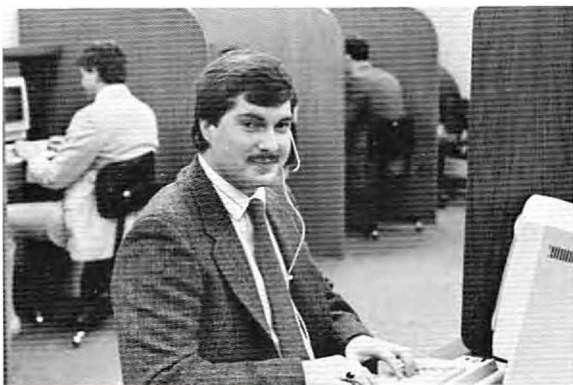
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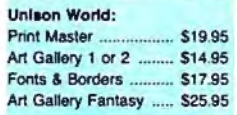
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as . . . well, as a foggy nightmare.

The game truly conveys a dream-like feeling. Perhaps it's the Orwellian overtones which derive from the many animal characters who people the Zone and with whom you must converse and interact. Or maybe it's the frustrations of being placed in somewhat familiar situations that should be easily solvable, only to find that typical solutions aren't the answer in a dream. You must literally learn to think differently and be willing to try bizarre things to solve the maddening puzzles of the *Dream Zone*.

While *Dream Zone's* puzzles are convoluted and complex, the mechanics of the game are straightforward and simple. Thanks to the use of the mouse and a segment of the display titled the Icon Bar, 80-90 percent of *Dream Zone* can be played without touching the keyboard, a real boon to hunt-and-peck typists.

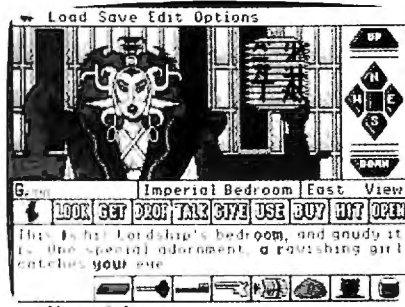
The Icon Bar contains the inventory icon and a list of the most frequently used action words. Clicking on the word DROP, then on one of the icons in your inventory drops that item, for example. Likewise, clicking on the action word TALK inserts *Talk to . . .* in the Command Line; clicking on a character displayed in the Picture Area inserts the name of the character after the words. A final click in the Command Line area activates the instructions. This technique can be used in almost every situation during game play. The Icon Bar is further enhanced by the ability to double-click on a word and thereby change its meaning: A double-click on the word HIT, for instance, changes it to KILL.

Movement about the strange world of *Dream Zone* is just as easily accomplished. To the right of the large graphic Picture Area is the Control Pad. The Pad is made up of directional arrows surrounding a center button. Clicking on an arrow moves you in the corresponding direction: clicking on the center button results in an ENTER command, while double-clicking on the center button results in an EXIT command. Finally, up and down bars are located above and below the Pad itself.

Touch typists can take heart, however, because all commands can be entered into the Command line via the keyboard. Likewise, all commands that can be accessed via the top of the screen pull-down menus (Save, Load, Edit, and so on) have keyboard equivalents for those players who don't care for mice.

Dream Zone is a difficult game. While this isn't necessarily bad, it should be considered a fair warning to

those easily frustrated by seemingly unsolvable puzzles. There are clues within the game itself to the majority of the stumblers found in *Dream Zone*, but the clues are subtle at best. Many of them are discernible only after having found the solution from a hint book (which can be purchased separately) or a telephone call to Baudville.



Dreams come true, and nightmares become reality in your quest.

Also, and not to be moralistic, it should be noted that you will, at times, be forced to steal and kill to accomplish your task. The problem here is that, unlike killing a monster who is intent upon dismembering you, in *Dream Zone* you kill just to get something that won't be given to you freely or for money. Of course, it is just in a "dream," your gun is a water pistol, and the victim is (literally) a Bureaucratic Pig.

Dream Zone is a unique product filled with biting satire, outstanding graphics, a streamlined playing system, and challenging situations. It's hard to believe that the program was written by two high school juniors. The game comes on two copy-protected 3½-inch disks. Up to ten games can be saved on the game disk, an option which should be used.

Dream Zone will be either praised or damned, depending upon an individual's taste. Aesthetically, no one will deny the delight provided by *Dream Zone's* music or pictures, both of which push the IIGS to its limits.

— James V. Trunzo

Dream Zone

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The program employs a Macintosh-type user interface that is responsive, easy to learn, and intuitive. Pull-down menus provide access to many functions. Dialog boxes handle file loading and saving. Scroll boxes and scroll bars make file viewing and loading an easy task, especially since filenames are always displayed in alphabetical order. A clipboard facilitates transfer of graphics between documents.

Icons are used sparingly and appropriately to represent editing and drawing tools. Close boxes return you to the previous screen. A wristwatch icon reminds you that the current action will take time to complete. *Print Magic* also handles mouse input well.

Because it handles the file formats of other software of its genre, *Print Magic* allows you to capitalize on your existing collection of *Print Shop* graphics and *Newsroom* clip art without having to use several different programs to accomplish what you want.

The package's accompanying graphics are sensational, though limited in number. Finely crafted and highly detailed, they can be resized up to the limit of a standard letter-sized sheet. Even in the larger sizes they don't have a chunky appearance.

Text handling is equally impressive. Plenty of dramatic and detailed typefaces are available in two sizes, and the several styles provided should satisfy the most demanding document designer.

continued on page 78

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By Drew Kaplan

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HEAD OF THE CLASS

Spelling is the simplest thing Word Finder can do for you.

Touch Synonym and your speaking and writing will explode with incredible new power. You'll have 4½ megabytes of \$5 \$10 and \$25 words to let you express your ideas with exquisite precision.

It may not always be fair, but it's often how you say something, rather than what you say, that lets you get ahead. And, with Word Finder, you'll have incredibly creative word power at your fingertips.

4½ megabytes is equivalent to about 12½ 5" floppy disks on an IBM® PC.



Yet, there's no programming. Just type in a word and away you go.

You'll always have the right word at the right time. And, if you're not absolutely sure of a word's meaning, just check a few of its synonyms.

EASY TO USE

Just type in a word and touch Spell or Synonym. There's nothing to learn. It's great at work, at home or at school.

If you'll supply the facts, Word Finder will supply the most powerful, vivid words to convey your concepts. And, unlike dictionaries and thesauruses, it's easy to use and totally hassle free.

To use the Thesaurus, touch Synonym. When you push the down arrow, you will see main concept words. Touch the right arrow and you'll see more words with the 'same intent'. So, the thesaurus is logically arranged for ease of use.

Plus, at any time, just re-touch Synonym and you'll start reviewing synonyms of the 'synonym' that was already displayed on the large, oversized 20 character LCD screen. So, there's literally no end to the words you can explore. It's fabulous for creative writing.

BOTTOM LINE

While 100,000 dictionary words and 220,000 synonyms may sound impressive, other computer based thesaurus companies count words such as create, creates, and creating as 3 entries.

Using this method, Word Finder would have 660,000 synonyms. Why is Word Finder conservative? Well, when you get your spelling and thesaurus list from Xerox Corp and Microlytics, Inc., you can afford to be understated.

SelecTronics, working with Microlytics and Xerox's Palo Alto Research Center (PARC), has developed this product's incredible word compression technology.

It's just 3" X 4" X ¾". It weighs just 6

oz including 4 AAA batteries (included). It's great for business (thanks to Xerox) because it has First Names, Surnames, Corporate Names and Cities.

You'll love it when you play Jumble (available in most daily papers), crossword puzzles, Scrabble® and hangman.

But, most of all, you'll love it for what it will do for your vocabulary. It's made and backed by SelecTronics' limited warranty.

IMPROVE YOUR WORD POWER RISK FREE

People look down at spelling errors. People look up to the rare individual with a rich and varied vocabulary.

If you aren't 100% thrilled with the ease of spelling or the wide range of dramatic words you'll have at your command, return it in its original box within 30 days to DAK for a courteous refund.

To order your SelecTronics' Word Finder 100,000 Word Spelling Dictionary with 220,000 (660,000) Synonym Thesaurus to effortlessly let you locate and spell the right word for the right time correctly, call toll free or send your check for DAK's breakthrough price of just \$99⁹⁰ (\$4 P&H). Order No. 6304.CA res add tax.

Infuse your ideas with powerfully graphic words. You don't have to sound like a college scholar to add punch and panache to your speaking and writing.

You and your children will be amazed at how a few well sculptured words can increase the respect people have for what you're already saying.



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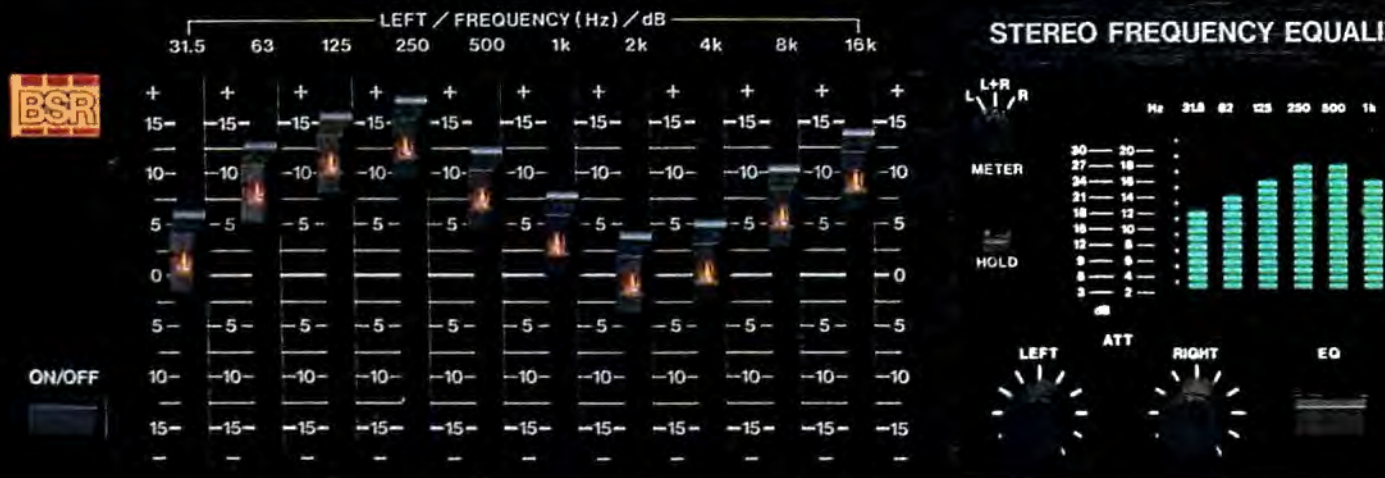
For Toll Free Information, Call 6AM-5PM Monday-Friday PST

Technical Information. . . . 1-800-272-3200

Any Other Inquiries. . . . 1-800-423-2866

8200 Remmet Ave., Canoga Park, CA 91304

FLASH We've been lucky enough to get another production run of this incredible equalizer at the same \$149 close-out price!



model E

Smart Sound Detonator

Obliterate the wall between you and the individual instruments in your music. Infuse your own stereo system's sound with a breathtakingly vibrant 30 to 50% improvement in sound quality that you can measure with this superb BSR Equalizer/Spectrum Analyzer limited \$149 close-out.

By Drew Kaplan

Close your eyes. Touch a button. And you'll hear your stereo system literally explode with life.

You'll hear the gentle brushes on a snare drum, the startling bone-jarring realism of a thunder clap, or the excitement of a full cymbal crash.

You'll hear string basses and other deep low instruments emerge from bass (that will sound murky by comparison), with such clarity and such definition that you'll feel you can almost touch each instrument.

This astoundingly distinct yet powerful bass adds such a full bodied warm feeling to your music, you'll feel as if you've been lovingly wrapped in a warm soft blanket on a cold winter's night.

But don't take my word for the sound quality improvement. With the Pink Noise Generator, Calibrated Electret Condenser Mike and the 220 Element Spectrum Analyzer, you can instantly measure each and every improvement you make.

Plus, there's more. A subsonic filter effectively adds the equivalent of many watts onto the power of your amplifier.

Plus, with its provision for two separate tape decks including two way dubbing, you'll have much more than just greatly improved sound.

You can count on great sound from this top of the line Equalizer/Analyzer. It has a frequency response from 5hz to 100,000hz \pm 1db. And, it has an incredible 100db signal to noise ratio.

BSR, the ADC equalizer people, make this super Equalizer/Analyzer and back it with a 2 year standard limited warranty. Our \$149 close-out price is just a fraction of its true \$379 retail value.

FIRST THE EQUALIZER

YOUR STEREO'S HIDDEN SOUNDS
Your stereo can sound incredibly bet-

ter. Just a 5db roll-off at the high end, up around 14,000hz to 16,000hz, can just decimate the harmonics that give you the open feeling you'd experience at a live concert. A similar roll-off at 60hz, causes the fundamental bass notes to just fade away into the 'murk'.

An equalizer isn't some magical device that manufactures sounds that don't exist. Most of the frequencies that will make your music really vibrant, are actually already recorded in your music.

You'll be able to prove this with a few simple tests we'll try when we discuss the Spectrum Analyzer.

You see, certain frequencies are simply not reproduced with as much volume as are the mid-range frequencies which stretch from about 800hz to 2,000hz.

An equalizer simply lets you establish accurate control of all frequencies to fit your equipment, your recordings, your taste, and your listening environment.

TOTAL MUSICAL CONTROL

And, what a job it can do. It's totally unlike bass and treble controls which simply boost everything from the mid-range down for bass, or everything up for treble. You can boost the low-bass at 31.5hz, 63hz and/or 125hz to animate specific areas or instruments.

And, when you boost the part of the bass you like, you don't disturb the mid-range frequencies and make your favorite singer sound like he has a sore throat.

The high frequencies really determine the clarity and brilliance of your music. The problem is that highs are very directional. Wherever you move in your listening room, you'll find a big difference in high end response, as you'll see when we test the Analyzer.

No recording engineer or equipment manufacturer can even begin to control your listening environment.

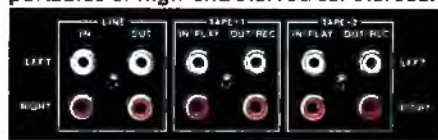
You can control the highs at 4,000hz, 8,000hz and/or 16,000hz, to bring crashing cymbals to life at 16,000hz while at the same time you can cut tape hiss or annoying record scratches at 8,000hz.

But there's more. Don't leave out the mid-range. You can boost trumpets at 300 to 500hz or a clarinet at 1000hz. You can boost or cut any part of the frequency spectrum a full \pm 15db.

TAPE DECK HEAVEN

You can push a button and transfer all the equalization power to the inputs of two tape decks. Now you can pre-equalize your cassettes as you record them and get all the dramatically enhanced sound recorded right on your cassettes.

This is an especially great feature when you play your cassettes on bass-starved portables or high-end starved car stereos.



SIMPLY PLUG IT IN

Use your tape monitor circuit, but don't lose it. Now your one tape monitor circuit lets you connect two tape decks.

Just plug the equalizer into the tape 'in' and 'out' jacks on your receiver or preamp. We even supply the cables.

As you listen to your records, FM or any 'Aux', any time you push the tape monitor switch on your receiver you'll hear your music jump to life.

The output from your receiver is always fed directly to your tape deck(s) for recording, and with the touch of a button, you can choose to send equalized or non-equalized signal to your deck(s).

When you want to listen to a tape deck, just select which tape deck you want, turn the switch on the equalizer,

\$149 CLOSE-OUT

EQUALIZER / SPECTRUM ANALYZER



-3000

and your tape deck will work exactly as it did before. Except, now you can listen with or without equalization.

Look at this. You can dub tapes from deck 1 to deck 2, or from deck 2 to deck 1 with or without equalization.

THE SUBSONIC FILTER

Much of the power drawn from your amplifier is used to drive your woofers. When you drive the amplifier too hard, it clips and you end up with distortion.

A subsonic filter removes a lot of non-musical material you can't hear that exists below 20hz. So, it relieves your amplifier of a lot of work. It doesn't actually create more watts (Please, no letters from my 'technical' friends) for your amplifier.

But, it's like turning off the air conditioning in your car. It saves you using about 7hp of what you have. And therefore, you'll have more watts for clean powerful sounding music.

THE SPECTRUM ANALYZER

Now you can scientifically analyze your stereo listening room and test your equipment by using BSR's Real Time Frequency Spectrum Analyzer.

Plus, you'll see your music not as a single level on a VU meter, but as a kaleidoscopic parade of 10 individual 20 element VU meters.

Each is tuned to a specific octave of the sound spectrum. An eleventh 20 element meter averages all levels.

The effect is awesome. You can visually isolate a string bass or cymbal, and actually see each individual instrument almost as a wave moving across the 220 individual fluorescent elements.

THE MOUTH AND EARS

It talks. The Analyzer speaks with a voice of pure calibrated Pink Noise. Pink Noise is the standard composite 'sound' of all frequencies used for testing in labs around the world. All frequencies from 20hz to 20,000hz are generated at the exact same level at the exact same time.

It listens too. If you are testing a cassette or a component in your system, use the 'Line Button'. If you're testing your whole system with speakers, use the matched calibrated electret condenser

microphone (included). Either way, you'll have a quick, easy and accurate way to evaluate the total sound of your system.

HOW TO TEST

SPEAKERS, EQUIPMENT AND TAPE

Testing your speakers in your listening room is the really crucial test. Simply place the calibrated microphone where you normally sit to listen to your stereo.



At the end of an 18 foot cord is the ear of the system. Just clip the mike wherever you sit and test your room.

Turn on the Pink Noise. You can switch to Left Channel, Right Channel or both. There's a meter range button, a sensitivity control, and even a switch that lets you freeze the meter.

Just sit down at the equalizer. Start with one channel. You'll see all 10 octave bands on the meter. Just slide the corresponding controls to increase or decrease any area that needs help.

You have now set up your system to its maximum capability. But as you'll see, location is very important. Move the microphone 5 feet to the left or right.

Then turn on the Pink Noise and check the Spectrum Analyzer. Now you can see why the specifications that come with your system are only a starting point.

Here's a way to test your tape deck and tape. First record Pink Noise for 3 minutes at -20VU. Then play it back and note the readings on the meters.

Now, record the Pink Noise again at 0VU or +3. Wait till you see how much the high end falls off. Now you'll see why all specifications are listed at -20VU.

With the Equalizer/Analyzer you can enjoy the finest stereo sound from your system and be a test lab too.

WHY SO CHEAP

BSR now only sells equalizers under their ADC name. Well, as Detroit comes out with new cars each year, ADC comes out with new equalizers. We got them to supply us with just 30,000 of last year's

ADC model before they shut it down.

They had already paid for all the tooling, all the research and design, so we were able to buy these for less than half the normal price, for cold hard cash.

THE FINAL FACTS

There are 20 slide controls, each with a bright LED to clearly show its position. Each control will add or subtract up to 15db. (That's a 30db range!)

There are separate sound detonation slide controls for each channel at 31.5hz, 63hz, 125hz, 250hz, 500hz, 1,000hz, 2,000hz, 4,000hz, 8,000hz, and 16,000hz.

BSR backs this top of the line Graphic Equalizer/Spectrum Analyzer with a 2 year standard limited warranty. It is 17 1/2" wide, 3 1/2" tall and 8 3/4" deep.

MAKE YOUR MUSIC EXPLODE RISK FREE

It's startling. Music so vibrant with life you'll swear it's 3 dimensional. Sculpture your music any way you want it. If you're not 100% satisfied for any reason, simply return it to DAK within 30 days in its original box for a courteous refund.

To order your BSR EQ3000 Smart Sound Detonator 10 Band Graphic Equalizer with Real Time Spectrum Analyzer and Calibrated Mike, with Subsonic Filter and Two Way Tape Dubbing risk free with your credit card, call toll free, or send your check, not for the \$379 retail value. Don't even send the \$227.97 dealer cost. Send just \$149 plus \$8 for postage and handling. Order No. 4100. CA res add sales tax.

The sound of your stereo will explode with life as you detonate each frequency band with new musical life. And, you can see and measure exactly what you've done.



DAK

INDUSTRIES INCORPORATED

TOLL-FREE ORDER LINE

For credit card orders call 24 hours a day 7 days a week
CALL TOLL-FREE. . . 1-800-325-0800
8200 Remmet Ave., Canoga Park, CA 91304

... Geneva Continued
gram and all the things it can do for you.
It comes with a great tutorial.

Plus, there's a scheduler program for setting up appointments with day by day calendar screens that you can print out.

Of course, there's a vast reservoir of programs you can buy or download **FOR FREE** from electronic bulletin boards by using the included modems.

IT GOES WHERE YOU GO

During the day, you can use it at your desk, in the warehouse or in the field for work. It's simply great for writing, inventory taking or sales forecasting.

At night, take it home to finish a project. Then using its internal modem, you can study your stock portfolio or log onto bulletin boards to check the latest price of gold, the status of your stocks, play games or download new programs.

And look at this bonus. I've included a \$39 value (we sold it for \$24) CompuServe Membership Package, with \$25 worth of free on-line time. Most bulletin boards are free, but CompuServe has some great things for Genevas.

HOT LINK

You can directly connect this Epson computer to any IBM PC or Clone or virtually any other computer with a serial interface and any standard communication program, simply by using its cable.

You can download (receive) a file from your desk PC to the Epson to take with you, or upload (send) a file from the Epson to your desk PC for your secretary.

In fact, this system is an incredible replacement for a secretary's typewriter. Portable WordStar will let you edit, correct and move paragraphs or sentences.

If you use another program, don't despair. You can still send the file. You'll just have to use it under the commands of your program.

ALL THE THINGS YOU'LL GET

Epson's 64K Geneva Computer has a suggested retail of \$995. It is just 1.87" high, 11.58" wide and 8.42" deep. It has 3 CPUs. It has 72 keys. Plus 'Number Lock', lets you have a standard 10 key pad for fast entry of numerical data.

You'll have up to 10-20 uninterrupted hours of computing from its internal nicad batteries. Then it will automatically shut down. Even after battery-low shutdown, your memory will be protected by the internal backup battery.

Of course, the AC adaptor/charger is included. So, you can operate from AC or DC to suit your needs.



This \$995 Computer comes complete with 4 powerful software programs plus a group of Utility Programs. The programs are stored on ROM Chips (see below) that simply slip into either of 2 sockets on the back of the computer.

Again, like a hard disk, these ROM chips are fast and load automatically. You get Portable WordStar, Portable

Calc and Portable Scheduler. Plus, you get a powerful form of Basic. This system can run virtually any CP/M programs.

There are two ports on the back of the Geneva. One is a serial port for the optional disk drive(s). The other is a fully programmable RS232 serial port for the superb printer we have included. Or, you can use it to communicate with other computers and external modems.

THE EXTRA 64K FLYING WEDGE

Epson makes a \$360 accessory (I've included) called a Multi-Unit, which gives you an added 64K RAM disk.

It's a small wedge that attaches to the bottom of the computer and doesn't increase its footprint on your desk at all.

And there's more. Inside the Multi-Unit Wedge is the 300 baud auto-answer, auto-dial, Tone & Pulse Modem. It comes with a modular phone cable that you plug into any standard phone jack.

You'll also get Epson's \$129 acoustic coupler modem (included). It fits on pay phone and hotel room handsets.

PRINTER HEAVEN

We've acquired a superb \$299 List Price NLQ (Near Letter Quality) printer from Seikosa, Epson's sister company. It can take single sheet plain paper or letterhead or fan fold computer paper.

And its printing is so good that I think Near Letter Quality doesn't do it justice.

It's fast, quiet and easy to use. It's AC powered. It features Bold, Underline, Condensed and Expanded Type capabilities.



THE BEST FREE PART OF ALL

We've written an easy to understand, step by step instruction book that really gets you going with this computer.

WHY SO CHEAP?

It's a terrific \$1,968 system. And, that's just the problem. Epson designed and built very sophisticated equipment. But they relied on salespeople to explain what was needed to consumers.

Many salespeople don't understand why you need each component.

Enter DAK. Epson was stuck with 6714 computers. We made them a ridiculously low offer for everything. Well, 6714 computers isn't very much to a company the size of Epson, so they accepted.

Every Epson Component is backed by Epson's standard one year limited warranty. And, the printer is backed by Seikosa's 2 year limited warranty.

THE COMPLETE COMPUTER SYSTEM RISK FREE

Just imagine working at your desk, on the patio or in a hotel room. I actually wrote an ad on a flight from Atlanta to Boston. I'm 100% sold on this computer.

If you're not 100% satisfied with its typing or computing or communications capabilities, simply return it in its original boxes within 30 days to DAK for a refund.

To order your Epson Geneva 64K portable computer complete with Portable

WordStar, Calc, Scheduler, Basic and CP/M Utilities, On-Board Direct Access Microcassette Deck, Built-In Ni-Cad Batteries, AC/Charger Adaptor, Extra 64K RAM Disk Wedge with 300 Baud Modem, External 300 Baud Acoustic Modem, Communication Software, NLQ Sheet and Fanfold Printer, plus Cable and Connectors, forget the suggested retail price of \$1,968. Call toll free or send your check for just \$499 plus \$18 for P&H. Order Number 4610. CA res add tax.

OPTION

If you don't need a modem and you're into writing long novels, we have the complete system less the modem and CompuServe package, but with a Wedge that gives you a 120K RAM Disk (Wow that's 120,000 characters without saving to cassette or disk!) for just \$599 (\$18 P&H). Order No. 4612.

Note: You can still use an external modem.

For the many people who already own basic Genevas, you can purchase the \$460 retail, 120K RAM disk for just \$200 (\$5 P&H). Order No. 4613.



OPTIONS FOR EVERYONE

For massive storage we have Epson's state of the art 3 1/2" floppy disk drive. It's rated at 320K. It has internal Ni-Cad Batteries and an AC Adaptor/Charger. Epson's retail is \$599, plus \$19 for the Cable and \$17 for the Utility Disk for the drive. It plugs directly into the Geneva's serial port and boots automatically. This \$635 value is yours for just \$229 (\$5 P&H). Order No. 4614.

A box of 10 Double Sided Double Density 320K Floppy Disks is just \$34 (\$1 P&H). Order No. 4615.

High Grade 30 Minute Microcassettes are just \$2⁹⁹ (\$0.50 P&H). Order No. 4616. 60 Minute Microcassettes are just \$3⁹⁹ (\$0.50 P&H). Ord. No. 4617.

The Seikosa printer comes with a unique long life ribbon (up to 2 1/2 million characters). Extra ribbons are just \$7 (\$1 P&H). Order No. 4618.

You'll receive a list of software that DAK stocks for the Geneva, including Ashton-Tate's dBase II, and the step by step instructions with your computer.

For your desk, your home or for the great outdoors, now you'll be able to write, forecast, and compute with mammoth power and in real style.

FINAL CLOSE-OUT NEW BONUS & OPTIONS

We've gotten a \$139 retail value set of 3 programs on 3 ROMs. Now you can keep track of your appointments, your time and your expenses, included FREE.

EXTRA SPECIAL: If you don't need the printer, you can order the system for just \$369 (\$14 P&H). Order No. 4952. The System with the 120K RAM disk without the printer is just \$469 (\$14 P&H). Order No. 4953. Wow!

\$3 Rip-Offs Exposed?

Who says people can't make money with their computers? There are people downloading games, utilities and word processing programs for FREE from public bulletin boards, and then selling them to you for \$3 to \$6. Well, now you can get thousands of programs for your IBM PC, clone or other computer, mostly for FREE, plus help the American Cancer Society!

By Drew Kaplan

Get free programs yourself! If you own a computer, this may be the most important article you ever read.

Imagine printing 10 foot long banners, playing dozens of arcade style action and adventure video games (no joysticks required), using spreadsheet programs, typing labels automatically, speeding up the use of your computer and doing everything, from listing out text files to making DOS easy.

Well, there are over 2,000 numbers you can dial right now, and on many of them you will find hundreds of disks full of exciting 'Public Domain' software.

These are hobbyist boards. Most of the System Operators, or SysOps as they are called, operate these electronic bulletin boards for fun.

You can leave messages, people sell things (not businesses), and there's a wealth of Public Domain software. Why is there Public Domain Software?

THE AMERICAN DREAM

Many computer engineers find that they have special needs and so they write sophisticated programs.

Since they aren't in business, they place these programs on bulletin boards for everyone to use. That way their name gets known and everyone benefits.

In other cases, programs are developed at universities or under government grants where sale is prohibited.

Another class of programs called Freeware is released to the public for limited use. Along with the program is a request for contributions if you like the program.

It's totally up to you, but if you like the program and some guy spent 5 months writing it, usually sending him \$10-\$25

will get you an expanded version, some new documentation and his undying love and gratitude. But it's up to you.

Imagine programs that let you track your stocks, generate forms, play solitaire, golf or sail, make your computer into a piano (wow!), diagnose the speed and accuracy of your computer, rename and re-sort directories and much more.

BUT PEOPLE ARE MAKING MONEY

It's OK to copy these programs for yourself and you are actually encouraged to make copies for friends. This way the software really gets spread around.

But, there's a loophole that allows you to make and distribute copies and to 'recover distribution costs'.

Well, now there are companies making money (by downloading free programs and selling them to you for \$3 to \$6) on the backs of these generous programmers who have actually done the work.

So, if you pay \$3-\$6, is it a rip-off, or is it still a good deal because the software is obviously worth many times the price? It's up to you to decide.

ENTER DAK

OK Martha, here's the catch. No, there's no catch. You don't have to buy 10 tapes or disks. You don't even have to buy a modem from DAK.

Of course, you'll need a modem, but you can even borrow a friend's and both benefit from the great software.

I started DAK as a hobby 22 years ago when I was a student at UCLA. And, I've tried to keep it a hobby ever since.

So here's what I'm going to do. I want you to have all the productivity, and yes fun, you can with your computer. So I've put together two packages so you can vastly broaden your computer's use.

Computer Floodgates ON SALE

You'll be deluged with free programs, information and incredible entertainment when you connect these Hayes Compatible 1200 baud auto-answer/auto-dial modems to your computer, at DAK's smashing new \$79⁹⁹ and \$69⁹⁹ prices.

By Drew Kaplan

Get ready. If you're just using your computer for word processing or spread sheets, boy, have I got a surprise for you!

With a modem, you can dial any of the thousands of electronic bulletin boards across the country and download (I'll explain in a minute) programs that will literally knock your socks off.

And forget expensive long distance calls. With thousands of electronic bulletin boards, there are likely to be several right in your own area.

FREE FREE FREE FREE

I just printed out a 10' banner for my son's birthday. The program prints on any printer, daisy wheel, dot matrix or ink jet. Wow, and it was free.

I'm really enjoying three action video games (without joysticks). In Striker, a helicopter game, I have to pass through enemy territory to recover my spies, get supplies and more. I haven't won yet. In Beasts, I keep getting eaten, and in Pango, well, it's arcade action at its best.

I've designed forms using a form pro-

gram. I've compared my Visual Computer's speed to a true PC (100%), and an AT Clone came in over 600% faster.

If you're like me, whenever you type a DOS command and make a mistake you get frustrated.

Well, there's a program that not only remembers your last few entries, it lets you use the up arrow to retrieve them and you can edit them without retyping the entire line. Great!

What you're reading about is the wonderful world of Public Domain Software. From File Utilities to Diagnostic and Debugging to Multi-Tasking, you'll find thousands of programs to experiment with.

And, you won't be alone. Enclosed with your modem will be step by step instructions on how to use the bulletin boards.

So, don't be shy. Get your feet wet. Once you're on-line, everyone is friendly and glad to help.

PHONE LINE BLUES

So, you don't have a spare phone line? Don't worry. You can use your regular phone line. You won't hurt it at all.

I have a list of 2,000+ electronic bulletin boards. AND, I've packed a ton of the great programs from the bulletin boards for IBMs and clones onto two (2) disks, to show you a little of what you'll find.

AMERICAN CANCER SOCIETY

Unfortunately I can't afford to give you everything for free, but look at this. I'll send you the list of 2,000 electronic bulletin boards for \$2 (\$1 P&H). Order No. 4888. And/Or two (2) disks full of programs for \$3 (\$1 P&H) for both disks. Order No. 4889. Ca add tax.

DAK will donate to the American Cancer Society all proceeds from the sale of the List and Disks beyond the cost of producing and distributing them.

And what's more, the cost of this 'ad' will NOT be included in my costs. So, the disks, the duplication, the printing, the typing, packing and postage etc., will be subtracted and the rest will be donated.



You're the greatest. Here's the first check you made possible for DAK to donate to the American Cancer Society. And, it only represents your efforts through December. Everyone wins. Thousands of you are on-line. The Cancer Society is thrilled and I feel great.

URGENT, DON'T CALL DAK

I've set up a special P.O. BOX for this service. Send your order with checks only (no cash or credit cards) with the words 'LIST' and/or 'DISKS' to DAK, P.O. BOX 3045, Canoga Park, CA 91306.

Please, no phone orders or phone inquiries. All information must be handled through the P.O. BOX. Even if you order anything else from DAK, these items still **MUST** be ordered separately.

HAVE I LOST YOU YET?

First, I may have hit you with some 'Jargon' that isn't familiar. Well have no fear. Everything will be explained with your modem, but look at this.

An Electronic Bulletin board is nothing more than a computer, just like yours, hooked to an auto-answer modem.

Instead of word processing software, it runs a bulletin board program and has lots of storage capacity. Simple?

I mentioned downloading. Well, it's simply like bringing up a program from your own floppy or hard disk.

All you do is use your modem to connect you to the bulletin board and then when you download, you're bringing a file from the bulletin board's hard disk to your own computer. The distance may be great, but the principal is identical.

INFORMATION FOR EVERYONE

For stamps, coins, soccer, football, American Indians, chocolate, coffee, mortgages, banking, ulcers, steel production and more, the information is

...Next Page Please

... Computer Floodgates Continued instantly available and often free.

PAY PAY PAY PAY

No, it's not all free. There's lots of information that you can buy. It's like an electronic bookstore. And, it's great.

When I buy stocks, I want to know about the company. Now I can get the inside information instantly by using my modem. I can get the Company profile, SEC filings, officers' names and salaries.

So, now I can check out companies that I do business with or that compete with me. With a modem, you can instantly read or download complete information on over 9,000 public companies.

SO MUCH MORE

If you write, you can send your copy by modem directly to typesetters. Want a date? There are matchmaking bulletin boards. What fun. Most of these boards seem to be free. But, some are X rated.

INTERNAL OR EXTERNAL MODEMS

There are two types of modems. Internal modems can be plugged into the slots of your IBM PC or clone.

External modems can be connected through the serial port of any computer.

The internal (plugged in) modem is less expensive because it doesn't require a separate power supply. The choice is yours. Operationally they are identical.

MODEM PHYSIOLOGY 1A

I call these modems 1200 Baud Smart Ducks. Because, IF they walk like a duck, sound like a duck, and look like a duck, they darn well better act like a duck. And, these Hayes Compatible 1200 baud auto-answer/auto-dial, tone/pulse modems are great ducks.

Hats off to Hayes. They've just about written the book on specs and protocol for the 1200 baud modem market.

Every professional modem bills itself as 'Hayes Compatible'. But the big question is, how much does it really cost to make a top-of-the-line 1200 baud modem? Or, who's getting rich?

For DAK's new breakthrough prices of \$79⁹⁰ and \$69⁹⁰, you'll not only be getting ducks that quack properly to Hayes modems, but sing like nightingales.

DUCK SOUP

I owned a Hayes 1200 baud modem for about 4 years. I just unplugged it and plugged in BSR's to operate my Hewlett-Packard terminal which I use at home to monitor DAK's computer.

The only differences I noted were improved monitor sound, more screen displays and a help menu. And, oh yes, one last extra. I use a few local data bases whose phone lines are always busy.

Well, BSR's intelligent modems in combination with our bonus modem programs recognize busy signals, hang up and keep re-trying the number.

1200 BAUD POWER

These modems will communicate at 1200 baud (about 120 characters per second) or 300 baud (about 30 characters per second) automatically.

They come with modular phone cords that simply connect to any standard mod-

ular jack. And, they use standard Bell 103 and 212A protocols. (Don't worry.) They operate in half or full duplex.

Built-in microprocessors let you automatically answer incoming (auto-answer) calls and act on all Hayes commands.

WHY SO CHEAP?

BSR's made modems under both the ADC and BSR name in the Capetronic factory. Using three names wasn't very clever



marketing. And, they are now stuck with small quantities of each brand.

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HOOKING IT UP MADE EASY

The internal modem is IBM compatible. The external modem can be used with any computer with a serial port.

If you own an IBM PC or a Clone and if you choose the external modem, you'll probably find an RS232 serial port built-in. All you need is our cable and the modem program on disk, which we've packaged together for just \$19⁹⁰ (\$3 P&H). But, before you order a cable, you may need a short sex education course.



Sex Education 1A. You need to determine whether your computer's RS232 connector is male or female.

If you look at the picture above, you'll



note that BSR's RS232 Modem connector has holes going in. It's a female. If it had copper pins sticking out, it would be a male. Now wasn't that simple?

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cable Order No. 4353. If you have male pins sticking out, order our female cable, Order No. 4354. With either cable you'll get a great free modem software bonus.

For your Apple IIC, your serial interface is built-in. All you need is our cable and modem program on disk. They are just \$19⁹⁰ (\$3 P&H). Order No. 4356.

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REVIEWS

continued from page 70

My favorite *Print Magic* feature is its complete flexibility for placement of graphics and text. It is difficult, however, to obtain pixel-level positioning of text on the page. At this level, positioning becomes a trial-and-error proposition at best, since the entire page is nearly always displayed during text entry.

You should read at least the first six pages of the documentation. They cover *Print Magic's* usage of certain icons found in other software but used in a particular manner by this program. Some terms are defined in rather specific ways, but the rest of the program should be intuitive to all but the computer novice. Some users prefer to plunge into a program and come back to the manual for assistance. If that's the way you like to operate, then *Print Magic's* manual was designed with you in mind.

A 30-minute tutorial leads you through the production of a one-page Christmas party announcement which contains one of *Print Magic's* best graphics. Other developers take note: A simple tutorial is worth many pages of detailed documentation.

Print Magic provides solutions to nearly every drawback you've encountered with other printing programs, while maintaining communication with them. With its ease of use, intuitive interface, exquisite graphics and text, and superior documentation, *Print Magic* delivers a fine performance.

— Duncan Teague

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Gee Bee Air Rally

It's no wonder flight simulations are among the most popular of all computer games. There's something irresistible about flying. For most of us, though, a home computer is as close we'll get to the real thing.

Gee Bee Air Rally drops you into a 1930's barnstorming stunt plane—the Gee Bee. With stubby wings, powerful engine, and huge fuel tanks, the Gee Bee was built for speed. In *Gee Bee Air Rally*, you don't fly from one airport to another, you race several other Gee Bees for fame and glory.



Are you pilot enough for the Gee Bee?

In format, *Gee Bee Air Rally* is similar to *Pole Position*, the archetypal arcade racing game. Just as in that game, you dodge your opponents as you pass them. But *Gee Bee* improves on the racing game form by adding a new physical dimension—not only can you pass your opponents on the left or the right, but you also can pass from above or below.

The game offers three levels of play, each divided into separate events. Normally, you try to fly between the markers that delineate the course. At the end of each level, however, are Special Events in which you pop balloons or slalom around markers.

All planes (yours and those of your competitors) bank realistically around turns. As a matter of fact, the game is so realistic that you'll feel like you're on a roller coaster. When you dive, you speed up; when you climb, you slow down.

Gee Bee's joystick controls are easy to learn and master. Control of the plane is responsive and accurate. People who normally dislike computer games might have fun playing this one, while arcade pros will be satisfied with the maneuvering subtleties needed to play the game at the highest level.

There are three levels of difficulty, but the two highest levels are too easy. After just a few games, I was able to play well past my boredom threshold (currently about 45 minutes). I'd like to see a second level like the current third level, and a third level that's significantly more difficult.

Sound is an important element in this game. In fact, the only obvious way to hear whether you're in low gear or

high gear is to listen to the engine.

On some computers, *Gee Bee's* sound is even more impressive. If you haven't yet hooked your Amiga to your stereo, you'll want to hook it up for *Gee Bee Air Rally*. Every sound effect is available in stereo. When a plane roars by on your right, you'll hear the sound from the right speaker. Not only does this make the game more fun, it actually makes it play better—you can hear from which side a plane is approaching before you see it. *Gee Bee Air Rally* also has perhaps the best theme music of any game yet developed for the Amiga—another reason to connect your computer to a stereo.

Although not as spectacular as the sound, the graphics are also wonderful. The planes, mountains, and scenery are nicely drawn. Each airplane casts a shadow on the ground. The farther away a plane is, the smaller it is. In short, this game has all the visual cues needed to make it seem real.

There are also, however, graphics that are annoyingly intrusive. For instance, every time you crash and bail out of your plane, you're punished by a screen showing where you landed. While these scenes are nicely drawn, they tend to get tedious. Even worse, these screens aren't in memory, they're on disk. I'd like the option of switching these screens off.

Compounding the problem is the Amiga *Gee Bee's* copy-protection (which makes a particularly frightening grinding sound). This protection keeps you from copying the program onto a hard drive or the ramdisk. If you have expansion memory and a disk cache program like *Face II*, you can set aside enough buffers so that each scene only has to load once.

While the sound, music, and graphics are truly impressive, those qualities don't make a game, they only enhance it. For any game, the game play is what keeps you away or keeps you coming back.

Gee Bee Air Rally is worthy of repeated play.

— Rhett Anderson

Gee Bee Air Rally

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Quattro

For half the price of Lotus's *1-2-3*, Borland International's *Quattro* delivers more spreadsheet power, flexibility, and ease of use.

Quattro has its own unique set of commands for performing basic spreadsheet manipulations. However, the package includes an add-in program called Menu Builder which makes it simple to rewrite or rearrange the menus. These menu definitions may be loaded from disk. The program's *1-2-3* compatibility, therefore, comes from loading a special menu tree.

Quattro allows two menu trees—a main and an alternate—to be loaded into memory at once. These menus may be set as defaults which are automatically invoked, so it's not necessary to specify which menu tree you want each time you run the program. *Quattro* contains everything a *1-2-3* user (or beginner) needs to use a full Release 2-compatible spreadsheet, but provides much more for the user who is willing to investigate and experiment.

The program is full of nice touches. It uses, for example, "smart" recalculation to reduce delays. (This means that, rather than recalculate the entire spreadsheet when one formula needs to be recomputed, *Quattro* updates only the relevant formulas.)

Quattro also includes several helpful file-handling features, including the file-compression utility *SQZ! Plus*. Rather than calling the compression routine, you simply supply the correct filename extension and *SQZ!* compresses the file in the proper format.

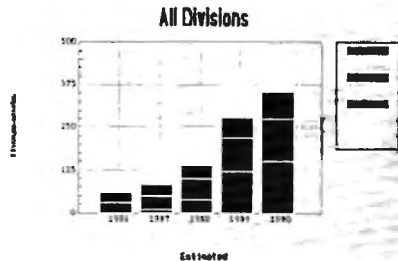
Of course, *Quattro* can handle *dBASE* and *Reflex* file formats, but even more interesting is its ability to handle *Paradox* files. Borland is clearly making its move on the *dBASE/1-2-3* market, and providing a database and spreadsheet combination as powerful and usable as *Paradox* and *Quattro* could make Borland an even bigger force in PC-compatible software.

Another of *Quattro's* common-sense features solves the problem of bringing word processor documents in as spreadsheet data. Many people use word processors to keep simple databases before they even have access to a spreadsheet or database program. Eventually, that simple list of names and numbers can get unruly. When *Quattro* imports a text file, each line is interpreted as a long label, even though it may, for example, contain a name, address, phone number, and salary. *Quattro's*

FileParse menu provides an easy way to separate the elements of each line into individual cells. Simply create a format line that indicates where breaks should occur and what data types are expected. After you've defined input and output ranges and executed the command, *Quattro* transfers the text data to the output range in its proper form.

One nasty *WordPerfect* file (which was extremely wide and had been printed to a DOS text file) contained lines which were too long for *1-2-3* to import. *Quattro* was able to import the file, and the parsing command made it easy to place the individual data elements in the proper fields. Even in an office where *1-2-3* is firmly entrenched, this trick is worth the price of *Quattro*.

PRODUCT SALES



Quattro's integrated graphing abilities let you forgo stand-alone print graph software.

Those who have ping-ponged between *1-2-3* and *PrintGraph* will instantly appreciate *Quattro's* integrated graphing facility. Not only is the graphing feature easier to use, but it offers much more control over the look of the final product, even though it still falls short of providing total control and flexibility.

Quattro supports numerous printers and plotters, produces crisp graphs on laser printers—including *PostScript* devices—and will save graphs to disk in Lotus PIC file format or as Encapsulated *PostScript*. *Quattro* supports many graphics standards, including Hercules, CGA, EGA, and VGA.

Macro jockeys will be glad to lose some of their chains, since with *Quattro* the 27-macro limit is not in effect.

Quattro makes creating macros easier by providing a built-in macro-recording feature that is easy to use and effective. To assist with macro testing and editing, *Quattro* provides a macro-debugging environment.

1-2-3 macros run in *Quattro* as long as the proper menu is in use. It is possible, for example, to use the *Quattro* main menu, then switch to the 123.ALT menu to run *1-2-3* macros, re-

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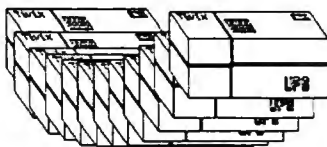
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950: *Our doubts are traitors.
And make us lose the good
we oft might win,
By fearing to attempt.*
Shakespeare

REVIEWS

continued from page 79

turning when finished.

In addition to having the macro-recording feature, you can use the Transcript add-in for regular updating of a log file as you work. If a power failure occurs, most of your work can still be recovered.

For most users, installation will be extremely easy. *Quattro* automatically detects most graphics devices, so installation consists mostly of copying the files to the appropriate disks. Since *Quattro* is not copy-protected, the process is safe and simple for hard disk users, with no need to worry about uninstalling before performing certain hard disk operations.

While the box containing *Quattro* is flimsy and lightweight, the program's documentation is not. The three manuals are clear and competent. A *Getting Started with Quattro* manual addresses the separate needs of the beginner; the *Reference Guide* covers major topics in separate sections, with subtopics arranged alphabetically; and the *User's Guide* discusses a full range of topics in detail, providing a thorough introduction to every aspect of *Quattro*.

Perhaps the best feature of *Quattro* is its highly personal feel. Virtually every aspect of the program is customizable to your preferences. In a head-to-head contest, *Quattro* wins because of its flexibility, power, and ease of use.

Of course, *1-2-3* currently has the edge in terms of support products, but *Quattro* add-ins should arrive on the market before long. Many spreadsheet users will stay with *1-2-3* because of *HAL*, *Write-In*, *See-More*, or other *1-2-3* companion programs. Others will find that even if they have *1-2-3*, *Quattro* offers enough productivity-increasing features to justify having both programs in the spreadsheet toolbox. However, those who have yet to purchase either package and would like to use the *1-2-3* command set should simply look in the mail-order software advertisements under Q.

— J. Blake Lambert

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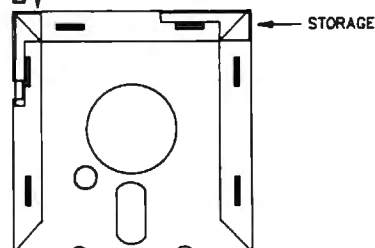
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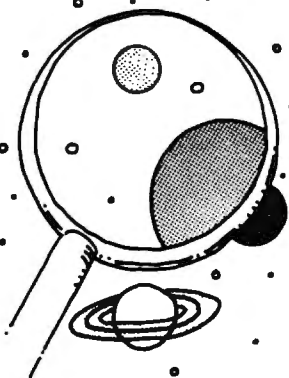
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DAVID STANTON



Computers in Schools Are Living Up to the Promises Made Years Ago, So Don't Despair or Give Up the Faith Yet

In the late 1970s, they told us that computers at school would revolutionize education. We bought a 16K PET here, an Apple II there, and awaited the revolution.

We expected miracles in those innocent days. We got *PacMan* and *Parsec* instead. Not that arcade-style games are devoid of educational value. Conquering each new screen requires imagination, analysis, problem-solving skills, and manual dexterity. But no researcher has yet proven a correlation between *Donkey Kong* scores and educational achievement.

In those days, supporters of computer education needed tough skins. We taught BASIC without knowing exactly why, and we argued for *computer literacy* without understanding what it meant. Still, we shared a vague sense that somehow computers were or would become important educational tools.

Skeptics tolerated us much as we all live with an occasional head cold. If micros established a foothold, teachers and parents who found them intimidating would be forced to master them. Under such conditions, who could blame those who desperately wished the things would just go away?

"Where's the evidence that computers had even a minimal effect on educational performance?" they challenged. We mumbled something about too few machines, too little time to assimilate the technology, and ineffective software.

Accepting our arguments, education agencies began supporting the computer movement with generous (if not lavish) infusions of funds for software, equipment, and training. They called our bluff.

Fortunately for all concerned, the results have been dramatic. Increasing numbers of teachers are now computer literate (whatever that means), and software companies currently offer some very well-designed educational packages for home and school. An in-school ratio of roughly 20 students per microcomputer leaves room for significant improvement, but it represents millions of dollars—no small commitment.

Clearly, the time has come for educational computing to prove its worth both in schools and at home, and there's every reason to believe that the results will be dramatic.

Already students are discovering the benefits of word-processing software and are learning to enjoy the writing process. Progressive parents and teachers are employing specialized hardware and software to provide educational assistance for the handi-

capped. Carefully selected drill-and-practice and tutorial programs are helping some catch up while allowing others to move ahead.

Increasingly, yesterday's promises are becoming today's realities. Currently, computers and quality software are helping us learn more, understand better, progress faster, and explore new ideas.

Even with all this, though, we've only seen the beginning. The outlook for the future looks even more promising. To overestimate the potential benefits of computers in education is virtually impossible. Yet we must remember that the technology itself offers no magic solutions. As with other tools, we can use computers effectively only when we fully understand what they can and cannot do.

Computers alone cannot motivate, but in the right hands they can make learning so much fun that even the least motivated students will seek out opportunities to learn. Computers cannot actually teach, but when teamed with carefully selected software they can—and do—offer unlimited opportunities for learning.

How can we motivate our children to use their computers? Which software belongs at home and which at school? How can a home computer improve a child's success in class? What do computers do well, and what is best handled by more traditional approaches? What is your local school doing right (or wrong) with its computers?

Every month, this column will grapple with these and similar questions. I expect to prod (perhaps even provoke) you with a mix of fact and opinion about the scope and direction of educational computing. I promise to strive to keep you up-to-date on the newest and best ideas and products in the field. I can't promise to be right always, but I can promise to read the mail.

What can you do? Insist on reading specific, practical suggestions here every month. Implement those recommendations that offer the greatest reward for you and your family. Be patient, but expect to see real and meaningful benefits.

So whether you're just thinking about buying a home computer or you use one every day, stick around. If your micro sits gathering dust in the closet (having failed to live up to your expectations), dig it out and hook it up. □

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

continued from page 7

It's All in the Game

They're back . . .

Dedicated videogame machines, and the cartridge-based software they support, celebrated a stunning return to form—and profit—in 1987.

According to industry sources, the videogame hardware market alone grew from approximately \$100 million in 1986 to over \$700 million last year. Such figures may even be conservative: Nintendo, by far the industry leader, claims 1987 sales in excess of \$650 million. The Christmas season alone saw sales of 3 million Nintendo game units.

In some ways, it's easy to understand the soaring sales figures. For one thing, videogame systems are less expensive than computers. For another, Nintendo advertises. *Hard*. Taking advantage of celebrity endorsers, and appealing to the 8- to 12-year-old market, the company has peppered TV with spots citing outstanding arcade action and edge-of-the-seat excitement.

Computer advertisements, on the other hand, aim almost exclusively at adults, pushing productivity, profits, and performance. Hardly the stuff to make Junior lobby mom and dad for a PC under the tree.

Last winter, though, Commodore returned to TV with a series of ads for the 64 that touted superior playability, while also noting the variety of

alternatives that a computer makes possible. Other computer manufacturers are also beginning to cite entertainment as a benefit of owning a computer.

Software publishers are also responding to the Nintendo/Sega challenge. For one thing, 1988 will see more, and more dynamic, arcade-style games released for microcomputers than in any recent year. Some of these games are directly imported from the coin-op and cartridge worlds; others are wholly original.

The publishers are also picking up some extra profits by licensing computer games for translation to arcade machines.

Looming over all of the interplay are memories of the videogame collapse of the early 1980s. At the time, Atari was in the driver's seat: The

crash nearly brought Atari down, and didn't work wonders for its then-parent Warner Communications, either. There was, to be sure, a simultaneous crash in the computer and software market, but observers have noted that the software crash was neither so severe nor so long-lasting as the collapse of the game cartridge.

The feeling now is that game cartridges are probably a cyclical market, one that will come and go every few years as new crops of children age into and then out of the Nintendo/Sega/Atari spell.

Computers, on the other hand, tend to grow with their users, as does entertainment software. Once a child outgrows videogames, the game machines tend to find their way into closets. Outgrowing arcade software, though, opens the other areas of computer entertainment. And when entertainment pales, there's education, productivity, creativity. . . which is why computer software publishers, while not un-mindful of the game machines' renewed growth, are not terrified of it, either.

— Keith Ferrell

The Medium and the Message

Ford Motor Company and *Time Magazine* are among a growing number of companies mixing their media to get their message across: Computer disks that complement their products can also serve as marketing tools.

Time's NewsQuest is a weekly quiz-on-a-disk based on the current issue of the news magazine. Educators who take part in the Time Education Program, a magazine educational service for schools, can use the disk as a supplement to reading, history, political science, and related curricula. Offered in Apple II and IBM formats, the *NewsQuest* disk contains a current events quiz based on the articles in that week's issue of *Time*, as well as ten levels of other test materials. *Time* is even sponsoring a national competition for \$10,000 in scholarships for the school with the highest cumulative scores throughout the year.

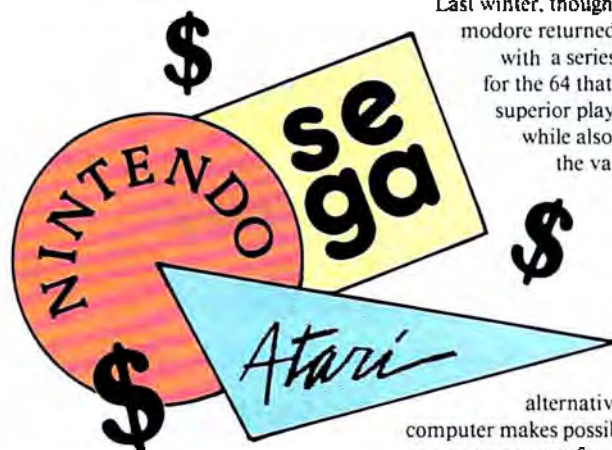
A minimum 30-week subscription to the 5¼-inch disk format is \$89 plus \$16 postage and handling. In 3½-inch format, the price is \$109 plus the same postage and handling fee. The disks arrive weekly by first-class mail. For more information, call 1-800-523-8727. (In Pennsylvania, call 1-800-637-8509.)

Ford Motor Company puts you in the driver's seat with the *Ford Simulator*, a \$4.95 software package that contains information about the company's products as well as a colorful racing simulation game with drag strip, slalom, and Grand Prix courses. It's available for any IBM PC or compatible with 256K of memory and color graphics capability.

The simulator features animated screens that show off everything from how air bags inflate and how cars cut through the wind to the way an engine runs. A buyer's guide section on the disk has information on five different Ford vehicles. You can configure each car with various options, calculate the sticker price and installment payments, and even compute financing costs. The test track portion of the disk features three racing games.

Ford Simulator is available by check or money order for \$4.95 from The Ford Simulator, 14310 Hamilton Avenue, Highland Park, Michigan 48203. Or, you can call toll-free and order the disk with VISA or MasterCard at 1-800-521-3350, extension 300 (Monday-Friday 8:30 a.m.-8:00 p.m. EST). In Michigan, call 1-800-482-5507, extension 300.

— Selby Bateman



Sharing the spotlight with Nintendo—or peeping out from under that giant's shadow—are Sega, now a division of Tonka, and old familiar Atari, which claims more than 2 million XE game systems sold in 1987.

Nor are the registers through ringing when the unit is sold. The cartridge market is estimated now at over ¼ billion dollars annually, and still growing.

Naturally, such sales surges are attracting some attention within the entertainment software industry. Those Nintendos, Segas, and Ataris may not all represent lost computer sales, but it's a sure bet that some of them do. This is despite the deeper and more sophisticated gameplay offered by microcomputers.

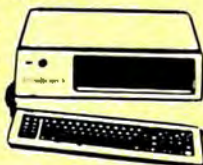
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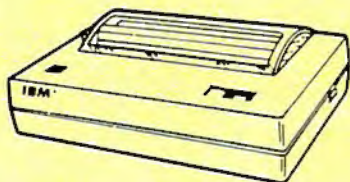
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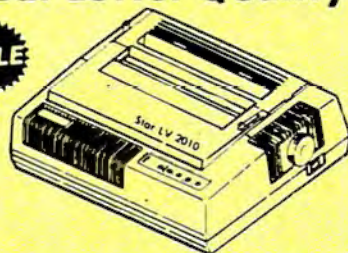
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Softsoap Software

Tandy Corporation, maker of Tandy and Radio Shack computers, has signed an agreement with Amway Corporation, seller of household items, wherein registered Amway distributors are given discounts on Tandy computers. Amway product distributors will need the machines to run *Amware*, special Amway software intended to help the 1 million distributors of Amway products with paperwork and organization.

According to Bob Vis, *Amware* Project Manager, the software, which Amway sells for \$199, contains several modules, including accounting and telecommunications, the latter allowing Amway agents to automate their ordering process by having their PCs communicate directly with Amway's computer. With Amway's computer. With Amway now selling over 300

products, including its name-making soap as well as such unlikely items as MCI long-distance telephone service and home security devices. *Amware* may also ease the burden of inventory tracking for its distributors.

Amware is being licensed by Amway from Internomics, a small California firm that spent over four years developing the software, which is specially geared to managing a multilevel selling agent's business.

By offering them discounts of 5 to 15 percent on computers, Tandy dealers are no doubt eager to get as many of Amway's independent distributors through its doors as possible. Amway, which scored over \$1.5 billion in retail sales last year, also gets a percentage of each computer sold.

— Clifton Karnes

RAM Through the Roof

February saw RAM prices nearly triple in less than three weeks. Prices for a megabyte of 256K-bit chips had been around \$100, but a combination of the weak U.S. dollar and speculation by Eastern businessmen caused prices to skyrocket to \$300 and above.

"The supply of RAM has been dwindling for about a year," says Jack Coakley, of RAM Explosion, a Fairfax, Virginia company specializing in memory expansion hardware, "and prices have been rising slightly, but January and February were unbelievable." RAM supplies have been lowered simply because suppliers can't seem to keep pace with the personal computer industry's ever-increasing demand for more memory.

In Japanese markets, chips aren't being sold at a fixed

price; they're being auctioned to the highest bidder. "If you're a gambler," concludes Coakley, "sell your pork bellies and invest in dynamic RAM."

In a related story, Lotus, Intel, and Microsoft have announced a new Expanded Memory Specification (EMS 4.0) that allows owners of IBM PCs, XTs, and compatibles to access up to 32 megabytes of expanded memory. Makers of expanded memory boards, such as AST, Bocaram, and Quadram, are working to create the EMS 4.0 software drivers for their expansion units. The first of these should be appearing by the time you read this.

The question is, will PC users be able to afford the extra memory the new EMS makes it possible to use?

— Clifton Karnes

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MacBiomorphs Are Coming!

Creating life in the lab is nothing startling these days. Whether it's cellular cloning or test-tube babies, scientists are exploring a wide range of alternative lifestyles. Add to their ranks now a growing number of evolutionary biologists, biochemists, and zoologists, all who are beginning to use the computer to mimic evolution by creating artificial life.

Thanks to renowned biologist Dr. Richard Dawkins of Oxford University, Macintosh owners can take part in such evolutionary experiments without leaving their own era. Dawkins' critically acclaimed 1986 book, *The Blind Watchmaker: Why the Evidence of Evolution Reveals a Universe Without Design*, is now a \$7.95 paperback available with an optional Macintosh disk from W. W. Norton & Company. With the software, purchased separately from W. W.

Norton, you can breed endless successions of *biomorphs*. Dawkins' computer creations that can look vaguely like trees, animals, objects, and whatever else they evolve into over many generations.

There's even a \$1,000 prize for anyone who can find the genetic key to create a particular Holy Grail-like biomorph whose formula was lost after it evolved. The book, which has been hailed as one of the most important science books of this century, is fascinating, exceptionally well written, and highly recommended. The Macintosh disk was created by Dawkins himself after he received many requests for such a program from readers of the hardback edition. The program requires a minimum of 512K to run and costs \$9.95 plus \$1.00 postage and handling. Details on ordering the disk are in the paperback edition of the book, available at most bookstores.

— Selby Bateman

PCs Linked in Telemarketing Scandal

If it sounds too good to be true, maybe it is.

Atlanta, Georgia entrepreneur James Ray Houston is connected with two companies being investigated for operating a nationwide trivia game involving PC users. Trivia Masters Productions of Atlanta and Mutual Telecommunications Network of Tampa have recently been linked to scandal in these companies' home towns, as well as cities in Louisiana, Wisconsin, Iowa, Ohio, Maine, and Washington. Both the Associated Press and the computer press have filed reports indicating that these companies may be taking advantage of both the local PC operators they hire and the general public.



The telemarketing plan works like this: Mutual Telecommunications places ads in local newspapers and computer magazines, offering up to \$300 a week to PC owners who are willing to let their computers be used for 12 hours a day, 7 days a week. In order to be used for telemarketing, the computers need some special hardware and software (both provided by Mutual), for which the owners are required to pay a \$600 deposit.

When the system is set up, each PC owner, called a *SYOP* by Mutual, spends about two hours a day doing house-keeping on his or her system so it can tirelessly make local calls.

When someone answers a call from the computer, they're asked several prerecorded trivia questions. Consumers answer these questions by pressing buttons on their telephones. If they answer correctly, they're told they must pay to play at the next higher level to get a chance at the ultimate grand prize—\$100,000. Consumer groups, local Better Business Bureaus, and at least one state attorney general's office are investigating this operation.

According to the Atlanta Better Business Bureau, the president of Trivia Masters Productions, James Ray Houston, has been involved in three other businesses that are no longer in operation, two of which had legal problems. They are advising consumers to exercise "normal economic precautions" when dealing with Trivia Masters.

COMPUTE! contacted Mr. Houston to clarify these

charges; we discovered that he started both businesses: Mutual Telecommunications, which contracts local PC users to make calls, and Trivia Masters, which uses Mutual's network to contact consumers and get them to pay to play the trivia game.

"Our problem was that we started this thing by calling people randomly," said Houston. "We wanted to contact as many people as possible, and this was what upset everyone. People didn't understand that they had to pay to play, and they got mad."

According to Houston, Trivia Masters will no longer call people at random. Instead, the company plans to contact probable players in a mailing—players will be told they must pay to play and that they must send in their money before they can play. Long-range plans include having a cable television station display the computer/player interaction on games that reach high-stakes levels.

But since Trivia Masters has suspended operations, and local PC SYOPs are not being paid for their efforts, the future of this telemarketing scheme seems uncertain. Mr. Houston is optimistic, however, saying, "We may have started out in the wrong way, but we're on the right track now."

— Clifton Karnes □



Reproduce this Holy Grail biomorph and win \$1,000 in The Blind Watchmaker contest.



levitations

continued from page 94

to primaries and pioneered the early frontiers of "nerdness." Programming became akin to mathematical break dancing, and as far as we were concerned, an elegant piece of code was as much a thing of beauty as any of the iambic pentameter that was being dished out in English Lit.

Although we never quite moved into the two-pocket shirt with dual plastic pocket-protector mode, most students, including our old buddies, began to avoid us. The briefcase, cheerleader, and bookworm cliques kept their distance from us in the school cafeteria, preferring instead to sit at tables whose occupants concentrated on dipping the ends of straws into gravy and then shooting the wrappers up to stick on the ceiling. The few who were curious about the strange hieroglyphic flowcharts we scribed into our table's surface were recruited into our ranks.

The hook was set at the end of the semester by a visit to Wayne State University's computer center where we came face-to-teletype with the beast that had occupied most of our free time for some five months. It was an IBM 1400 series with an astounding 64K of memory, and watching it actually read punched cards and spew out our printouts made as deep an impression on us as a pilgrimage to Mecca.

After that, it was on to Michigan State University, which had just purchased a multimillion dollar mainframe with a whopping 512K of memory. Since the Engineering department owned the computer, anyone who wanted to take computer courses was an Engineering Sciences major. Computer Science, as a distinct discipline, did not exist. Electronic calculators that did simple arithmetic cost hundreds of dollars.

The electrical and structural engineers wore massive Keufel & Esser slide rules on their belts. The real heavies looked like gunslingers from "Gunsmoke," their weapons housed in polished leather holsters worn low on their hips, secured by a leather thong tied just above the knee to allow unencumbered quick draws in case they were confronted by hostile algorithms when rounding blind corners.

Politics led me to stray from the engineering fold. It was the late Sixties, and the unfolding of "flower power" and its attendant political consciousness ran headlong into the apolitical stance of most of my Engineering school associates. I eventually found refuge in Philosophy, where I could gain computer access in the department's advanced logic courses, and where mixing ethics with your work was expected rather than discouraged.

I spent 15 years after school paying my data processing dues. I've looked at computers through the eyes of a user, operator, programmer, and systems analyst. I've worked for large corporations, small businesses, public utilities, and the government. I've watched my buddies boot up their IMSAIs, KIMs, and SOLs as well as PCs, STs, Macs, and Amigas. Through it all, the one thing that has helped make the most sense out of this crazy business is a sense of humor.

"Levitations" is about people. There's nothing inherently wonderful about computers themselves. The folks who have created them and work with them are far more interesting than any electronic component or program. The designers, executives, PR flacks, and media folks whose collective actions comprise what we glibly call the "computer industry" are the grist for this column's mill.

"Levitations" doesn't have a fixed format. Sometimes it will report and inform. Other times it will attempt to educate or editorialize. We'll uncover the darkest mysteries of computing: Did you know that disk sleeves have the ability to teleport across space and time? How else can one explain the fact there are always either too few or too many of them lying around computer desks? We'll find proof positive that strange patterns on the plains of Peru were created by extraterrestrial draw programs, and that most of today's computer salespersons are the demon spawn of ancient alien programmers and used chariot dealers.

We're all Bozos on this data bus, folks, yours truly included. Take off your digital wingtips, lean back, and enjoy the ride. In the months to come, we'll be stopping at various computer trade shows across the country for late-breaking faux pas and in-depth analysis of press conference cuisine. We'll attend Microsoft's upcoming CD ROM conference, including a live report on how far you can frisbee a CD ROM from the top of the Seattle Space Needle. The Computer Dealers Exposition and Consumer Electronics Shows will take us to the Billy Goat Tavern on Lower Wacker in Chicago and the neon wasteland of Las Vegas, punctuated with live satellite reports from the trenches of computer-war battle zones. As my editor has long suspected, I usually don't know what a column will be about until the day after deadline. If there are any stops you would like added to our tour itinerary, feel free to contact me via U.S. Snail, care of *COMPUTE!*, or via electronic mail on one of these services:

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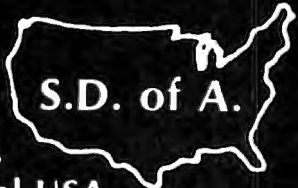
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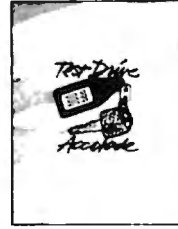
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levitations

ARLAN LEVITAN

In Which Our Resident Free-Form Columnist Reports on the Funny, the Odd, and the Outrageous

Welcome to "Levitations"! Although I'm new to the back of the bus, those who have been regular readers of *COMPUTE!* may have stumbled over my musings before (see *Hitchhikers Guide to COMPUTE!*—"Telecomputing Today," 1984-1988). There are a lot of advantages to being on the back page. It's a lot easier to remove without damaging the rest of the magazine, which makes it a snap to use my stuff for wrapping fish or blotting up messy kitchen spills.

Since this is the first "Levitations," my editor suggested that I take a little time introducing myself. Since he signs the checks, I've decided to go along with the request, although I'll try to make him regret it.

I'm a mild-mannered senior systems engineer for a major metropolitan main-frame manufacturer, dedicated to fighting a never-ending battle for truth, justice, and the right to giggle hysterically at ourselves.

In the early 1980's, I was crazy enough to buy a 48K Atari 800 with disk drive for a little over two thousand bucks, and I helped start up the MACE Atari user group, which at last report is still alive and well. Anyone who has edited a user group newsletter inevitably ends up writing a lot of material to fill the empty spaces. I suppose I got fairly good at it, since people I had never met from strange and exotic places such as Peterboro, New Hampshire, and Greensboro, North Carolina started actually paying me money to do it.

My wife, Gretchen, is a MacManiac and works on microcomputer-based, speaker-independent voice-recognition systems for a public utility. My four-year-old daughter, Mira, likes to play with the Atari 800 she inherited from me but still prefers the tactile feedback of a genuine crayola on paper to a light pen on screen. Tobias, our one-and-a-half-year-old, hasn't professed any preferences for a specific computer. He seems equally adept at drooling into the keyboard of any of our five machines and seems intent on figuring out how to get my CD-ROM player to load and read Lego blocks.

Although our environs are relatively seclude, they're far from quiet. We live just north of the Detroit Zoo. Late nights are occasionally punctuated with lion roars, elephant blasts, and raucous bands of roving penguins, which serve to remind the neighborhood that, after all, it is a jungle out there.

I'm essentially binary in my mode of dress. Unlike other computer columnists, I

don't wear white linen suits or paramilitary garb to business or social functions. My formal uniform consists of a number of nearly identical dark pinstripe suits and the morning excitement consists of deciding whether the white shirt I'll wear will have a regular or button-down collar.

When less formal corporate functions require "business casual" (sport shirt from an acceptable golf or country club, and slacks), I'm a dead man. My definition of casual is T-shirt and jeans, with an occasional flannel or Hawaiian shirt thrown in for special occasions. I'm still trying to live down the 1972 wedding of a friend at which I ushered in a black tuxedo with tails tastefully accented by a pair of red, white, and blue platform tennies with lightning bolts on the sides.

At the over-the-hill-age of 38, I've been mucking about with computers for about 22 years. It all started innocently enough in high school. After a few minor explosions that destroyed a couple hundred dollars worth of lab equipment in chemistry, some counselor decided that the school would be a heck of a lot safer if I were placed in an experimental program. While the chemistry department had definite opinions on what they would like the experiment to be, it instead turned out to be the first computer class offered in a high school in Michigan.

The instructor selected for Computer Programming 101 was Kate Pankin, a chain-smoking mathematics teacher who the Marines had used for breaking in drill instructors on Parris Island.

There was no middle ground when it came to Ms. Pankin. You might hate or fear her, but you had to respect her intensity. In the world according to Pankin, books were sacrosanct, and were not to be defiled by pen or pencil. If Kate Pankin caught you underlining or doodling in the margins of a book during class, the offending writing implement was whisked out of your hand, snapped in two in front of the class, followed by a stream of erudite vitriol that laid the decline of Western civilization directly at your feet. I'm not sure where Ms. Pankin is now, although there were rumors floating around at my 20-year high school reunion that she had suffered a debilitating stroke when the invention of high-lighter magic markers was announced.

Although most of the miscreants in CP-101 had been tossed out of every French, Spanish, and German class in school, we took to learning FORTRAN like politicians

continued on page 92

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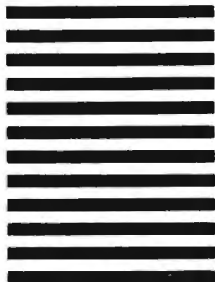
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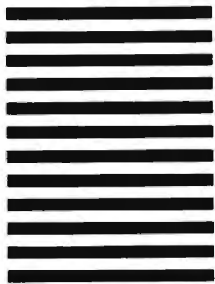
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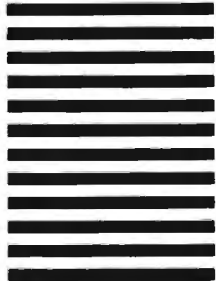
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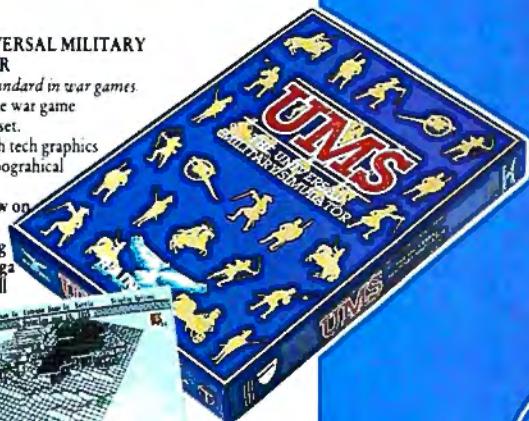
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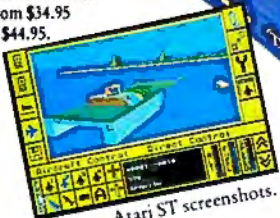
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