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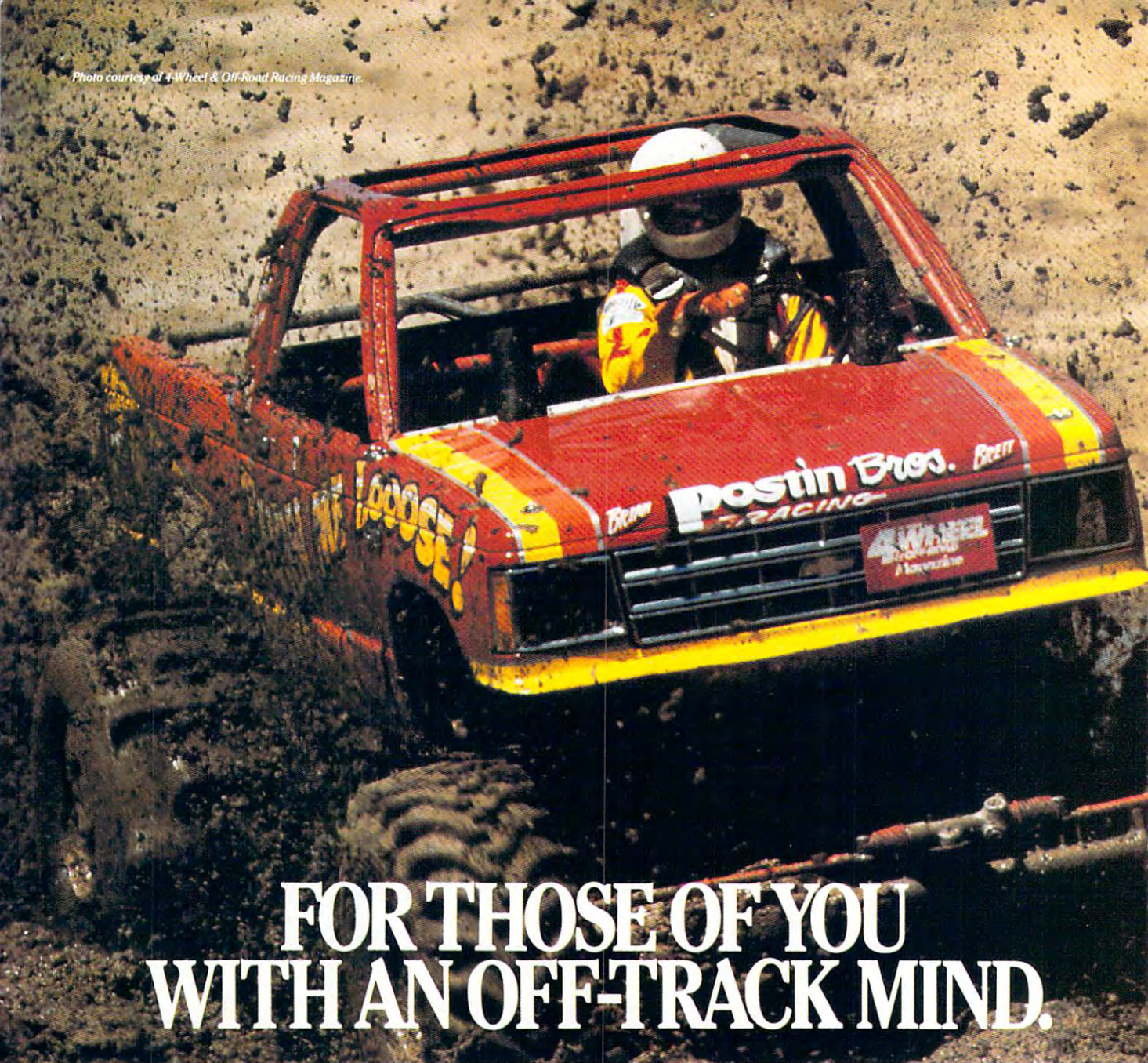
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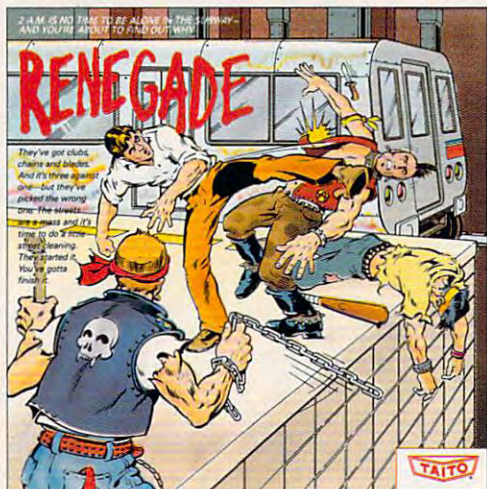
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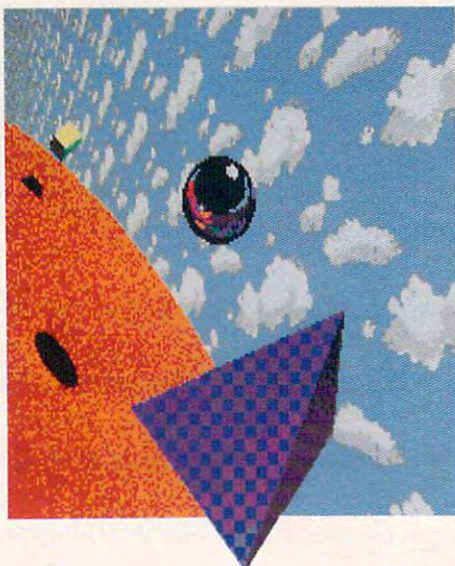
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GREGG KEIZER

If Fun Is Where You Find It, Then Look to the Computer on Your Desk

Fun is where you find it.

And there's plenty to be found on personal computers. Entertainment software may not be the largest sales category (that distinction belongs to wide-ranging productivity software), but it is the fastest growing. There's good reason.

Few recent additions to American homes have done more for entertainment than the personal computer. Consider the entertainment software best sellers—games like *Gunship* and *Starflight*, *California Games* and *Where in the USA is Carmen Sandiego?*. They wouldn't be possible in any other form. The magic of computer sound, animation, speed, and complexity creates entire worlds, worlds that no board or card game can duplicate.

Only the VCR can rival the personal computer as a home electronic entertainer. But though more than half of American households own a video tape recorder (less than a quarter have a personal computer), numbers can't tell the whole story. The VCR offers only *passive* entertainment; it only lets you watch what happens. Play a computer game and enter an *interactive* environment, where your decisions have an impact on the outcome.

Television is trying to reproduce this interactivity with things like Caption Power, a toy used to take aim and fire at targets in a TV program. These efforts are crude compared to computer fun, as crude as the ancient *Pong* videogame appears when compared to present computer arcade games like *Arkanoid* or *Thexder*.

While video tries to play catch-up, computer entertainment runs at the edge of its technology. Older machines like the Commodore 64 and the Apple IIe are still being pushed by software developers beyond the limitations once thought sacrosanct. Massive numbers of MS-DOS computers have enticed developers into making it the game system for millions. Top-flight machines like the Amiga, ST, and IIGS are tailor-made for entertainment. Software keeps pace, with bigger games, better graphics, and brighter ideas.

And as you'll see in this issue, computer entertainment isn't exactly standing still. Computer fun is ready to make the move to compact discs, the ubiquitous digital format storming the audio world. Holding more than 500 megabytes of data, CDs will make possible immense simulations and graphics-intensive games. To produce these huge

works requires a system much like Hollywood's studios, says Trip Hawkins, president of Electronic Arts, one of the software publishers heading into compact discs. His thoughts on the future of computer entertainment appear in Keith Ferrell's cover story, "Quiet on the (Software) Set," and makes fascinating reading. The recent CD-ROM conference in Seattle and the introduction of Apple's CD-ROM drive (both reported in "News & Notes") indicate that the technology is ready to hit the consumer market. The days of Catch-22—when no one wanted to develop applications for CD-ROM because there wasn't an installed base of drives—may finally be ending.

The future is already here, though, as "The New Look in Fun Software" demonstrates. Tom Netsel charts five new ways developers are making the current generation of games more exciting and challenging. Some of these emerging entertainment forms are on the shelf now; the rest you'll see in the months ahead.

Not everything connected with computers has to be a game, of course. "Color Your World" is about one of the most enjoyable, nonentertainment computer application—paint programs. Steve Anzovin, a professional computer graphics designer, shows us some of the best paint software and suggests what to look for when you're paint-program shopping.

As always, we've got a comprehensive buyer's guide, this time on flight simulator software, an entertainment genre that always puts several packages on the best-seller lists. And our review department is loaded with looks at the newest entertainment software.

On a related topic, check out "MS-DOS Takes Charge of Fun Software" in News & Notes. It's a glimpse at the sales figures for game programs in 1987, and it shows how important IBM PC, Tandy, and compatible computers are to the entertainment software market. Games for the MS-DOS universe have been taken to task for their lack of color, graphics, and sound, but with the proliferation of EGA cards, MS-DOS entertainment software is literally looking better. More RAM (most machines now come with either 512K or 640K) means bigger games. And IBM PS/2 machines and top-of-the-line VGA graphics promise to elevate MS-DOS entertainment to the level dominated by games-oriented computers like the Amiga.

Fun is where we find it. In our case, that's inside the computers on our desks. □

news & notes

One Million Sold in One Day

The Japanese love arcade games. Sales of home video arcade games in Japan, for instance, far outstrip those in the United States. In fact, it's estimated that a third of Japanese households own the Nintendo Family Computer.

That may explain the recent and phenomenal success of the Nintendo arcade game *Dragon's Quest III*. On its release, more than one million copies of the game were sold in a single day. Television reports showed unbelievably long lines, and Japanese authorities reported thefts and assaults, as well as nearly 300 arrests for truancy among school kids cutting classes to get their hands on the game.

The \$45 game (not yet available in the U.S.) can take up to 150 hours to complete, which is part of its attraction to arcade players who demand

greater and greater challenges.

— GK

New Clone-Killing PS/2 Prices from IBM

IBM may be dealing clone makers a death blow with a new double-barreled strategy. Insiders report that IBM is lowering prices on its PS/2 line over a period of two years and at the same time requiring its dealers to carry larger quotas of the machines, thus leaving less shelf space for IBM's competitors.

If IBM's discounting strategy is put into effect, by the end of 1988 a 80286-powered machine could cost as little as \$1,000, and 80386 systems could be selling for \$2,500. By the end of 1989, report some sources, a 386-based system could be going for an entry-level price of \$1,350.

According to Doug DeLay, an IBM press spokesman, IBM is not going to reduce the

with more function for their dollar. "You won't see the Model 50's price lowered significantly, for example," says DeLay, "but you'll see a new machine at the current Model 25's price point with a 80286 processor and much of the 50's capability. There is every chance you'll see an 80286-powered PS/2 selling for \$1,350 by Christmas of this year."

The PS/2's major competitors are the multitudes of 286-powered AT clones, the up-and-coming 386 machines (led by Compaq's cutting edge 386/20), and the soon-to-appear PS/2 clones. Will lower PS/2 prices hurt these makers?

At the low end, most 286 and 386 AT compatibles are currently priced well below equivalent PS/2 machines, and the chances are that they will respond to any IBM-announced price cuts with similar slashes. (Dell Computer, makers of PC Limited computers, has already announced a \$1,000 price cut on its 386-powered System 300 machines.)

Lowering prices drastically may be difficult for clone makers, however, because 286 and 386 compatibles have a high component cost. A 80386 CPU, for example, sells for about \$500. IBM, on the other hand, manufactures most of the PS/2 line's components itself and, therefore, has an edge in any price war.

On the high end, Compaq's 386/20, using supposedly obsolete AT architecture, outperforms the top-of-the-line PS/2 Model 80 by a significant margin. Users who want optimum speed may have to look beyond the PS/2s.



The PS/2's current status deserves some scrutiny. Last November, IBM announced that it had sold one million PS/2s. This figure may not be quite what it seems, say some analysts. First, this is the number of machines shipped by IBM, not the number sold to end users. Next, over one-third of these computers were sold in Europe, not the U.S. And last, almost 70 percent of the one million PS/2s sold were the non-OS/2-running Models 25 and 30—essentially XT clones. This all adds up to about 200,000 OS/2-ready PS/2s sold in the U.S. Impressive, but not overpowering.

The success of IBM's PS/2 line may be directly tied to the fate of OS/2, the operating system the line is custom-designed to run. OS/2 is a multitasking system that overcomes many of MS-DOS's limitations. Users who want multitasking, but who need to run existing MS-DOS programs (and are willing to put up with MS-DOS's restrictions—640K of directly addressable memory, for example) may be happier with a 386 compatible, MS-DOS, and either *Windows/386* or *DESQview*, both of which take advantage of the 80386's 8086 virtual mode to run several MS-DOS applications at once.

— CK

Upcoming Flood of GEOS Software

Three new products have changed the market for *GEOS*, the popular Macintosh-like operating system for the Commodore 64 and 128.

Already released are Berkeley Softworks' *GeoProgrammer* and Abacus' *BeckerBASIC*. These software development systems will help both machine language and BASIC programmers produce application and entertainment software for *GEOS*.

GeoProgrammer is a complete system designed for machine language programming in the *GEOS* environment. It consists of an assembler, a linker, and a debugger. It uses *GeoWrite* as a text editor.

BeckerBASIC is a BASIC specially designed for *GEOS*. It's upwardly compatible with BASIC 2.0. A runtime package is included to let programmers

distribute their programs to people who do not own *BeckerBASIC*. Hi-res and sprite graphics commands, sound commands, and menu commands highlight *BeckerBASIC*.

Berkeley's own BASIC programming language is expected soon. With its release, we can expect even more programmers to begin producing *GEOS* software.

— RA

Only 3—and Already So Big!

You can pack hundreds of megabytes of information onto a single compact disc and, as Microsoft proved in early March, you can pack hundreds of compact disc data specialists into a single room.

More than 2000 people gathered in Seattle for Micro-

soft's third annual conference on CD-ROM (Compact Disc Read-Only Memory.) Despite the conference's relative youth, there was a strong sense among the attendees that CD-ROM is both a technology and a market approaching mainstream acceptance in the business and professional arenas. More than that, though, was an almost visionary awareness of the creative and educational opportunities offered by CD-ROM and its cousin, Compact Disc-Interactive (CD-I).

It was business, though, that got this year's conference started, as Microsoft announced the launch of two new CD-ROM based products: *Small Business Consultant* and *Stat Pack*. Priced at \$149, *Consultant* consolidates

continued on page 80



PART 1



"Find Red Square" Contest!

Find Red Square in Moscow and enter to win a real trip for two to Europe. See the SubLOGIC Product Chart at your dealer or write SubLOGIC for complete details and contest rules.



"WESTERN EUROPEAN TOUR"

Scenery Disk is so beautiful to fly, you'll want to make it the centerpiece of your Scenery Disk collection! This is part one of a five-part guided tour from London to Moscow's Red Square.

We start out in London by flying over the Parliament building. Look closely and you can see the faces of Big Ben.

Our next view offers a glimpse of the majestic Tower Bridge and Tower of London at dawn. Other British highlights include Buckingham Palace, Westminster Abbey and Stonehenge.

Check back with us next month as we fly to Paris, France.



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gameplay

ORSON SCOTT CARD

I Want an Imaginary Game World— Not a Rat's Maze. And I Want Great Graphics. Can I Have Both?

I've got a color screen, a few million bits of memory, and a good graphics computer. I've also got a few hours to play a game. I'm sorry, Infocom, but tonight I want pictures on that screen, and I want to see them move.

I'm not talking about arcade games, though. Those fast-action shoot-'em-, kick-'em-, mash-'em-or-die games have begun to lose their appeal for me.

Partly, it's because I'm getting on toward 40, and it's too demoralizing to watch a ten-year-old get a billion points on a game where I got crushed with a mere ten thou.

Mostly, though, it's because I've grown impatient with games that flood the screen with bad guys to mow me down just so they can hear the swish-clank of another quarter dropping into the slot. Why should I put up with that at home, when I've already paid 240 quarters to buy the game?

At home, I want an imaginary world to explore at my leisure. I want a game that doesn't train me to play it like a rat in a maze. Above all, I want to see the world in living color on the screen.

Which brings me to some of the best games—and best graphics programs—on the market today. The premier animated adventures—the *Ultima* series (I–IV) from Origin Systems, the *King's Quest* series (I–IV) from Sierra, and the *Bard's Tale* series (I–III) from Electronic Arts—have each developed a unique approach to making an adventure game that feels like a movie instead of a book.

Let's look at all three approaches to game graphics as if they were movies. *Bard's Tale I* is "filmed" entirely through "point-of-view" shots, as if you were looking through the characters' eyes. What you see on the screen is only what the characters in the game would see; you don't see the characters themselves.

When you walk down a street in the city of Skara Brae, you see buildings on the right and on the left, receding in the distance. Move forward, and you jump a frame farther down the street. Turn left or right, and you face the door of a building.

At first glance, the pictures look great. But you quickly realize that there are only a half-dozen building images, repeated over and over again through the city.

I know, I know—pictures eat up memory. The *Bard's Tale* authors made a choice—creating only a few pictures, but a very large and interesting city—and, if you

have to choose, that's the choice to make.

Other trade-offs aren't so easy to take, though. For instance, you never actually see any of the battles; all the fights are described to you in a text window. All the building interiors look the same. Nobody ever moves on the screen.

The *Ultima* series, on the other hand, uses an overhead camera most of the time, looking down on events the way you look down at a map. A picture of one man represents your entire party (in *Exodus: Ultima III*, it's a party of four; in *Ultima IV: Quest of the Avatar*, a party of eight). You can see enemies approaching and attempt to run away or, if you're feeling feisty, you can stay and fight.

In towns, dungeon rooms, and combat situations, you again have an overhead shot, this time with a smaller-scale map. However, the map only shows you what your characters can actually see. Anything around the corner of a building or deep within a forest shows up as black on your screen and becomes visible only when you put your character in a position to see it.

The effect is wonderful. You get a sense of moving through the world, of discovering what's around the next bend. In battle, you can individually pick what each character in the party gets to do—moving and choosing targets independently. The world is vast and fascinating, especially in *Ultima IV*; no other adventure game I've seen can compare with it.

The map approach makes sense, both for play and for programming. In play, you can always see what's going on, and the screen is alive with images. To program it, the designers only had to store the graphic image of a whole bunch of tiny reusable objects.

But this approach, successful as it is, remains schematic, not movielike. Only in the corridors of the dungeons do you find yourself looking at the scene from eye-level—and here, bound by the same limitations as *Bard's Tale*, the designers had to face the same tradeoffs. If you compare the dungeon corridors of *Ultima* with the streets and dungeons of *Bard's Tale*, *Bard's Tale* wins that graphics contest hands down.

I've got some good news for you. There's a third approach, used by the game creators at Sierra for *King's Quest*, *The Black Cauldron*, and *Mixed-Up Mother Goose*. This one is the most movielike of all; I promise you, it'll knock your socks off. I'll tell you all about it next time. □



impact

DAVID D. THORNBURG

All Work and No Play Makes Business Computing Dull—and Unprofitable

Like most business people, I spend so much time using the computer for practical things that I almost never take the time to use it for entertainment.

This wasn't always the case. When the microcomputer first appeared, it was seen as a hobbyist's tool and then as an entertainment device—not as a practical tool for business. The emergence of the videogame market helped spur the sales of personal computers and had another effect as well: It placed pressure on computer manufacturers to increase the performance of their products and to improve the sound and graphics of these machines. Today's high-quality graphics and sound capabilities owe their existence to the entertainment market, not the business market.

I have fond memories of the early Atari computers—the Atari 400 and 800. These were the first popular personal computers to take graphics and sound seriously. As a result, the computer games created for these machines were among the best ever designed. It wasn't until Commodore's VIC and 64 models came to market that any serious competition for Atari surfaced.

And yet, during the heyday of Atari sound and graphics, the personal computer market was starting to change. In the search for new markets, computer manufacturers started to emphasize the idea of the computer as a productivity tool, not just as an entertainment device. Atari and Commodore programmers directed their attention to word processors and databases with the same vigor they had shown when creating videogames.

Unfortunately for Atari (and to a lesser extent, Commodore), their computers had done such a good job penetrating the entertainment field that many business customers felt that these machines wouldn't meet their needs. This erroneous image of computer capability was frustrating.

When the IBM PC was introduced, I was astounded at how poorly the computer was designed. Rather than build on the advances required to create a good game machine, IBM chose to use a design that was, to be kind, lackluster. And yet this technological step backward didn't impede the sales of the machine. In fact, the IBM name was used to prove that the personal computer was now ready for business.

Those of us with long memories were amused at this observation since the Apple II had, by that time, established itself quite strongly in the business market through

VisiCalc, the first successful micro-based spreadsheet program.

Perhaps the Apple II's lack of rich color and its mediocre sound kept it from being branded a game machine, thus allowing it to cross over into new markets as they were created. It wasn't until the release of the Apple IIGS, a computer with adequate color and sound capabilities, that Apple could (in my mind) stand in the same technological league with the Atari computers of 1980! This indicates that the pendulum may once again be swinging—not towards entertainment, but towards a balance.

Effective communication is entertaining. We love to be entertained; this is why our recording artists and sports stars make more than the presidents of our great companies. Given the value of entertainment and the ability of personal computers to work in a dual role, it's logical to ask how our business and productivity tools could be made more entertaining.

While the addition of color to word processing may not make much sense for business correspondence, it can be of great value for the creation of overhead charts and other business graphics.

One must be careful in choosing to incorporate fancy features in any business presentation. When a new tool can help communicate an idea with clarity, it should be used. All too often, though, we get so excited with a new tool that we insist on using it even when it's inappropriate. We saw this when the Macintosh was first introduced and many Mac owners felt obligated to mix numerous typefaces and styles on a single page. While this showed off the unique abilities of this computer, it also made documents hard to read. As Macintosh users became more comfortable with the power of their computers, clarity in communication returned.

If you use computers in your business, it might be worthwhile for you to look at some entertainment programs to see how some of their abilities could be used to help you communicate your ideas more clearly.

The next time you entertain a thought, make it entertaining! □

David Thornburg has written several Apple II programs designed to enhance creativity in computer users of all ages. These programs are available to *COMPUTE!*'s readers at no cost and can be obtained by sending a blank, formatted ProDOS disk, along with a stamped, self-addressed mailer, to David Thornburg, Innovision, Dept. C, P.O. Box 1317, Los Altos, California 94023.

letters

Amigas and MS-DOS

I was exceedingly surprised to read in the January 1988 issue of *COMPUTE!* that my Amiga 500 can't run IBM software. In fact, most of the software I run on my Amiga 500 is MS-DOS software because that is the software I get from publishers that send me their software for review. No Amiga software publisher has sent me any, and I am "computer poor."

This is the third time in the past month that I've heard such a statement. One source was a user's group newsletter in which the editor had filled some space with a discussion of Commodore matters by a Commodore technical employee! I have ceased to be surprised by the peculiarities of that company. I do expect better from you.

May I point out that on page 101 of that issue, there is an advertisement for the 1020 drive "with Transformer." Transformer is an Amiga program which readies the Amiga to accept the MS-DOS system disk. The version I have turns the Amiga into a monochrome IBM. Of course, I cannot run my favorite CGA programs, but I have no trouble with the great majority of PC programs.

Rumor has it that there is a newer version of the Transformer which runs CGA software. I cannot say that it actually exists, but I hope it does and that it is released soon.

Macey B. Taylor
Vice President/Editor
Catalina Commodore Computer Club
Tucson, Arizona

Transformer is a software emulator sold by Commodore to allow the Amiga 1000 to run MS-DOS applications. Since it is designed to be used with Version 1.1 of Kickstart, and the 500 and 2000 come with Version 1.2 in ROM, we do not recommend that owners of the new Amigas buy Commodore's 5 1/4-inch drive just to get the Transformer.

We also have heard rumors of an upgraded Transformer, but since the Transformer runs much slower than a genuine MS-DOS computer, we still think that the only reasonable way to run MS-DOS programs on an Amiga is to buy an Amiga 2000 with a Bridgeboard.

The Expanded 64

I recently purchased the Commodore 1764 RAM Expansion cartridge for my 64. When used as a ramdisk, it significantly speeds up programs which access the disk often, like *GEOS*. Unfortunately, I haven't been able to use it with any games.

I hope that we will soon see programs that take advantage of the RAM Expander if it is present.

William L. Moore
Deltona, Florida

Don't Count Jr. Out

Many discouraging words have been said about the IBM PCjr, so I would like to give my view.

As fire chief of a medium-sized suburban fire department, I have used my 640K expanded IBM PCjr for all of my administrative and training tasks. This includes running *dBase II*, *WordStar 2000+*, and many other programs for the department's preplanning and personnel records. We're even waiting for a new simulator program to train fire officers.

So don't count old Junior out by any means. The installation of the jr.Hotshot expansion memory has made this machine valuable to me for a long time to come.

Ray Ott
Cheektowaga, New York

Overseas Computing

Last year *COMPUTE!* discussed foreign computing in "Readers' Feedback" (January 1987). I would like to point out that any Commodore 64 purchased in the United States must have many changes made to it other than the power supply if it is to be used in a foreign country. Other components must be changed, as only the most basic functions of the computer will operate without all the proper changes.

Joel H. Kornreich
Kasara Microsystems
Spring Valley, New York

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The Leading Magazine Of Home, Educational, And Recreational Computing

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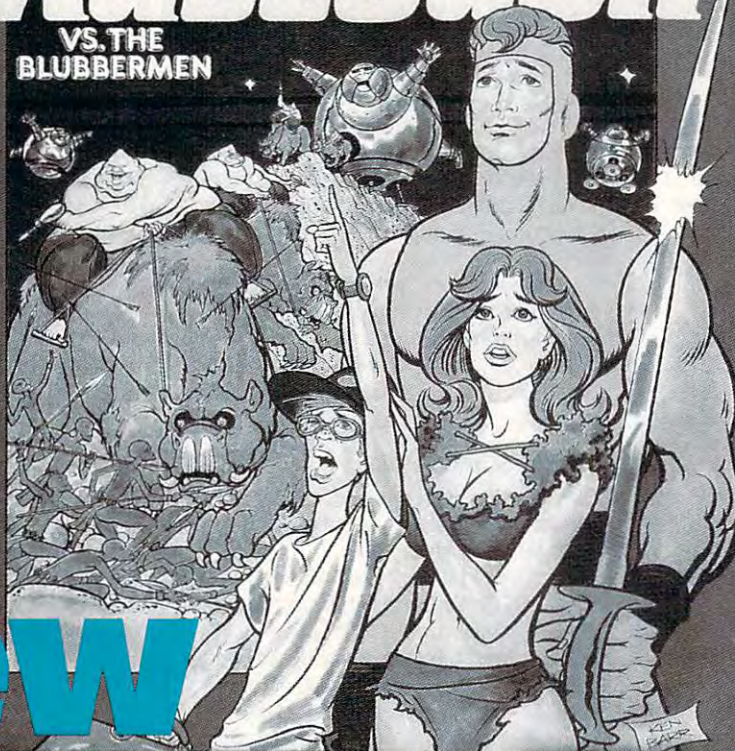
Infocom and Tom Snyder Productions Present **INFOCOMICS™**

\$12

Lane Mastodon™

VS. THE
BLUBBERMEN

NO. 1



new

diversions

Tom Netsel

These five trends will change the way you play: computer comic books, telecommunication games, high-level simulations, and Compact Disc-Interactive entertainment.

The Golden Age of entertainment software is now!

Leisure-time software is reaching new levels of sophistication as designers push machines to new limits—as the games get bigger, better, and brighter. Here are five new diversions coming soon to a computer screen near you.

Computer Comics

America loves comic books. More than 20 million of them are sold each month. Now this colorful world of superheroes and dastardly fiends is coming to life on personal computers, enhanced with sound and dramatic cinematic effects such as

www.commodore.ca

new diversions

zooms, pans, and dissolves.

Infocomics are comic books that you read on your computer. They are not games. There are no complicated puzzles to unravel, no treasures to locate, no arcade aliens to blast in the name of interstellar peace. Instead, you get an intricate web of intertwining plots and story lines.

The idea came to Tom Snyder,

Snyder's team developed a technology that allows artists to create 2,000 to 3,000 expressive drawings using minimal storage techniques. As a result, it takes four to five hours to read a single Infocomic disk.

Infocom's first venture into outside publishing may appear to be a radical departure from its text-only products, but company president Joel

ownership among comic book readers is three times the national average.

The premier Infocomics titles, now on the market for most personal computers, include *Lane Mastodon vs. the Blubbermen*, a comic spoof of 1930s pulp fiction, written by Steve Meretzky; *Gamma Force in a Pit of a Thousand Screams*, Amy Briggs' action-packed superhero tale featuring a trio of brave aliens; and *Zorkquest: Assault on Egrevth Castle*, by Elizabeth Langosy, a fantasy adventure about

a caravan of travelers manipulated by an evil magician.

The initial titles are aimed at the comic book set, but plans are underway for an adult psychological thriller which requires several points of view to determine who is crazy and who is not. An Infocomic for young children will

She thinks the guy's a chump.

chief executive officer of Tom Snyder Productions, as he looked at some of the best adventure games, graphic adventures, and role-playing games. Snyder felt that they all suffered from artificial plots. "There's no sex, love, greed, sadness, jealousy, and passion—all the stuff that Shakespeare wrote about and all the stuff that *Hill Street Blues* was about," he points out.

Snyder wanted a graphic product that had a story line rich in human experience, one that relied less on magic spells, monsters, and hardware to sustain interest.

He wanted interactivity, but he didn't want the player to change the plot. Instead, Snyder experimented with letting the user change the story's point of view. His original model was a Raymond Chandler-style detective story, set in a seedy office in the 1930s. The radiator hisses; there is steam on the windows. We see the story from the detective's point of view. A beautiful but obviously distraught woman enters. As she explains her problem, the detective tries to impress her with his revolver. He thinks he's playing it cool.

Switch to the woman's point of view, though, and you see that she's not at all impressed by the gun. She thinks the guy is a chump. When she leaves, you can go with her and meet her family. If you hop to her husband's perspective, you find out he's really in cahoots with the detective.

"You are not changing the story," Snyder says. "You're just seeing it from every character's point of view. A well-written story in this style doesn't make sense until you've seen it from most people's points of view."

For scripts, Snyder approached Infocom, the Activision-owned software firm noted for interactive text adventures. Snyder's concept makes extensive use of graphics, an approach Infocom had previously avoided.

Berez sees it as an extension of what Infocom does best.

"We really see ourselves as being in the storytelling business," he says. "What we've done in the case of Infocomics is take the technology that was developed by Tom Snyder and marry it with the story writers that we have here."

Infocom's research indicated that people's initial reaction to the graphic product reminded them of comic books. Researchers also discovered that computer



Illustrations by Harry Blair.

new diversions

feature a farmer, a wolf, and a fox.

Snyder says he hopes to sell the product to people who do not usually buy computer software. In his view, there are millions of people out there (including his mother) who really don't enjoy playing computer games. To lure new buyers, each Infocomics title carries a suggested retail price of \$12, which may be discounted as low as \$9.

As the technology grows, Snyder and Berez expect Infocomics to expand and add additional features. "The next thing we plan to do is add voice and more storage," Snyder says. "Right now it is compressed within an inch of its life. If you have 2000 pictures on an Apple disk, you've got to be doing some magic."

Phone Games

Reach out and play someone.

Instead of playing solitaire games with the computer, or even playing against the computer, gamers are increasingly able to play sophisticated games by modem. Using telecommunications, you can connect two computers and play computer chess, backgammon, or checkers with a human opponent. If you're looking for more militant action, you can climb aboard a helicopter simulator and try to blast a friend to smithereens.

Sierra On-Line's *3D Helicopter Simulator* is a good example. "It's an amazing feeling the first time you try it," says Ken Williams, cofounder and president of Sierra. "You can actually hover over another craft and look straight down at it. It's got real rotating blades."

Other sophisticated flight simulators turn your computer into a Cessna or an F-16 jet fighter. Sierra's aeronautical entry is based on McDonnell Douglas's Apache helicopter. An important feature of *3D Helicopter* lets you fly

in two-pilot flying. You can also go sightseeing. "Getting him right alongside of you and doing precision flying is just a blast," Williams says. "It's pretty exciting flying under bridges and trying to land two helicopters on top of a small building."

Sierra has plans to add extensions to the product, letting more than two helicopters be online at once. Williams has already contacted one of the major time-sharing services to make it available, with plans in the works for as many as 20 people flying at one time.

True Stories

Simulations give everyone the chance to see what it feels like to pilot anything from a Sopwith Camel to an Apollo moon rocket, or drive a railroad locomotive or a 200-mph dragster.

Most simulations have an arcade quality, and use speed, action, and

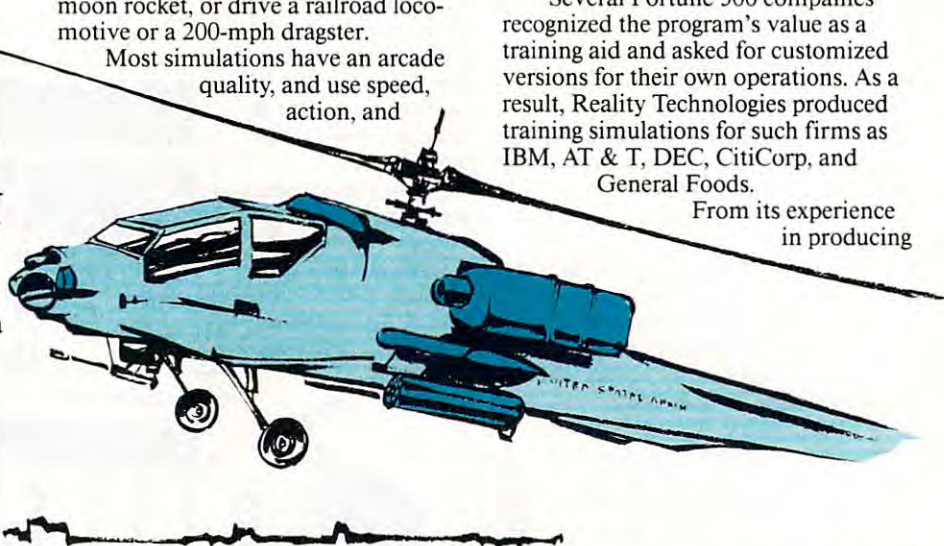
thought this type of computer simulation should be put to more uses outside the classroom.

After graduation and a stint with Apple Computers, Goldstein and a fellow Wharton graduate decided to develop their own PC-based business simulations. "We came out with products that gave executives and would-be executives the thrills and agonies of running a business," he says.

Their first product was *Venture Magazine's Business Simulator*. The program was basically a PC version of the business school program that ran on a DEC 10. "This time it was more fun," Goldstein says. "We took advantage of the PC and the ability to use it as an individual, one-on-one training tool."

Several Fortune 500 companies recognized the program's value as a training aid and asked for customized versions for their own operations. As a result, Reality Technologies produced training simulations for such firms as IBM, AT & T, DEC, CitiCorp, and General Foods.

From its experience in producing



thrills to attract players. Lately, another type of simulation is appearing. It's more a thinking man's simulation, one that combines education and entertainment. Mark Goldstein calls it *edutainment* software.

Goldstein is president of Reality

Technologies. His software gives IBM and Macintosh users the opportunity to run some of America's top corporations via simulations.

Computer simulations are a core component of many business schools. Students run a fictitious company, making such decisions as how much to charge for a product, how much to set aside for research and development, and how much to spend on advertising. "Frankly, it was the only course we enjoyed," Goldstein says, recalling his days at Wharton Business School. He

customized business simulations, Reality Technologies teamed up with McGraw-Hill and introduced *Business Week's Business Advantage*. The new package is a series of programs based on feature articles from *Business Week* magazine. "We put real data downloaded from databases into a model, and create company- and industry-specific case studies," Goldstein says. "Instead of running a mythical company as in our first simulation, in *Business Advantage* you could call the shots at Chrysler." The simulation puts you in the role of Lee Iacocca, the chairman of Chrysler. You're faced with a realistic business scenario. General Motors and Ford have just revamped their product lines, Asian cars are flooding the market, and the Japanese are targeting the mid-range and luxury-car markets, where U.S. firms are traditionally strongest. Despite flat demand and a sluggish economy, your job is to build Chrysler's strength.

Users manage the company over a

3D Helicopter Simulator.

against a human opponent who doesn't have to be seated at your computer. He or she can be at another computer connected by a modem and a telephone line.

"It's a different feeling playing against another human being," Williams says. "You can tell the difference in a dogfight when you're playing a computer; the computers aren't intelligent enough. You can't talk back and forth, and the computer won't hide. You can fly behind a building and, hopefully, your opponent won't see you."

Competition is not the only thrill

Technologies. His software gives IBM and Macintosh users the opportunity to run some of America's top corporations via simulations.

Computer simulations are a core component of many business schools. Students run a fictitious company, making such decisions as how much to charge for a product, how much to set aside for research and development, and how much to spend on advertising.

"Frankly, it was the only course we enjoyed," Goldstein says, recalling his days at Wharton Business School. He

EVERYTHING NEW IS OLD AGAIN

The five trends and technologies that Tom Netsel has discovered in entertainment software aren't sounding any death knell for fun software as we know it, thank you.

They say that nothing is really new, and entertainment software publishers run up against that limitation just like everyone else. Cinema-style software products are crude reproductions of movies, just as early films were often crude reproductions of plays staged outdoors. Telecommuting games aren't much different, in principle, from playing chess through the mail. They're faster, certainly, but the concept behind them doesn't change—two people far removed playing a game together.

The old forms of entertainment software will be around long after these five new formats hit our computers. Witness that:

Interactive text games are getting more sophisticated. An all-text game like *Border Zone* (Infocom), for instance, offers players multiple points of view. The game's three chapters give the player three different roles within the same story.

Solitaire games show no sign of losing their popularity. For all the talk of networking and work groups in business, most computer use is still a solitary occupation. The same goes for entertainment. One of the greatest boons to game playing has been the computer opponent. *Balance of Power* (Mindscape) is much

less challenging when played with another person; the computer doesn't back down, doesn't blink when a crisis reaches its climax.

Strategy games, where graphics and speed are less important, continue to comprise one of the best-selling entertainment software categories. A game along the lines of *Decisive Battles of the American Civil War* (SSG) won't play any better because the graphics are more detailed or because there's more information online. The key to such games is the thinking that goes into developing successful plans and carrying them out. As players of monster board games know, there comes a point where too much complexity gets in the way of playability.

Arcade games are making a dramatic comeback, rising fast in both sales and

consumer popularity. Games such as *Arkanoid* (Discovery) don't really need more than what they already have in a game system such as the Commodore Amiga. And since the most sought-after computer arcade games are often translations from video arcade machines—equipment that in some cases is less sophisticated than many personal computers—beefing up the technology won't necessarily mean a better-designed action game.

This isn't to say that progress in entertainment software—from electronic comic books to CD-I—shouldn't be encouraged and anticipated. We're just as excited as anyone else about the new look in fun software.

But we're also thrilled with what we have now.

—Gregg Keizer

five-year period. The computer makes all competitor decisions. At the end of each simulated year, the financial status and competitive position of each company are presented.

In this type of simulation the computer's microprocessor does not have to compute changing scenery, aerial maneuvers, or artillery trajectories. Instead, *BWBA* uses a number-crunching routine on a 400-rule expert system and the equivalent of 400 pages of spreadsheet equations to process each management decision. The simulation considers a broad range of external elements that can affect a company's bottom line, such as actions by competitors, interest rates, and consumer spending.

"These invaluable lessons about effective management in highly competitive business situations can be immediately applied to anyone's business," Goldstein says. "We're bridging the education simulation genre and creating valid tools and models. This envi-

ronment can very effectively teach people what their business problem is and how they might address it."

As far as creating more realistic models and simulations is concerned, Goldstein says he has primarily been restricted by hardware, but that problem is being resolved. "If you look to a 286-plus [microprocessor] environment, it's pretty limitless," he says. "We're doing some simulations on DEC and Sun workstations. It looks like you're dealing with real people (in the simulations) who even have expressions on their faces. It's a whole new dimension."

Interactive Stooges

Robert Jacob wanted to come up with something different in entertainment software. He set out to develop a product that looked as much like a movie as possible.

"We wanted to do games that had tremendous graphics, state-of-the-art sound, easy user interfaces, nonlinear

story line for replayability, and enough eye/hand coordination to keep your pulse rate up a little, but not so much as to drive you crazy," Jacob says.

That didn't seem to be too tall a request for his creative team at CinemaWare. They came up with the concept of interactive cinema. It's not an adventure game, it's not an arcade game, and it's not a role-playing game, but it has elements of all three combined with animation, Jacob says.

Titles released this spring include *Rocket Ranger* and *The Three Stooges*.

In *Rocket Ranger*, you are a young American scientist at your desk in 1940, when a rocket suit and ray gun suddenly materialize. A note explains that these items were sent by a group of scientists in the twenty-first century. They want you to change the course of history, because in their world, the Nazis won World War II.

It seems the Nazis have set up a base on the moon and are mining a se-

cret mineral. To make matters worse, the fiends are kidnapping American women—including your girlfriend—and turning them into zombies to work in the mines. "As part of the game you have to build a rocket ship and go up and save her," Jacob says. "There are a lot of campy elements in it that make it fun."

In *The Three Stooges*, the zany trio comes to the aid of a widow and her three beautiful daughters, who are facing foreclosure on the orphanage they run. With your help, Curly, Larry, and Moe have 30 days to raise enough money to save the women from the clutches of an evil banker. You guide the Stooges through a series of odd jobs that include prizefighting, pie throwing, and medical misadventures.

"All the arcade elements of the game are taken right from their movies," Jacob says, "as are the 160 uses of digitized sound, which include their voices and other sound effects."

"To the best of my knowledge, no one has ever really done a computer comedy before," Jacob says. "We wanted to do a game that would make you laugh when you sat down and played."

Jacobs feels this technology is just taking off as machines improve and programmers learn to use the machines better. He feels the next step in the evolution of interactive entertainment will include the use of true video images rather than graphics. Cinemaware already has developed a prototype that includes video images of actors.

To take full advantage of these emerging entertainment techniques requires hardware that is not too far advanced from what is available today, but a heavy reliance on digitized images and sound requires a much larger storage capacity.

"A megabyte of RAM should be sufficient to handle most of the requirements in the next few years," Jacob predicts. "It's really a question of disk space and disk access. I feel very strongly that Compact Disc-Interactive (CD-I) is going to be the focal point for the entertainment of the 1990s."



The Three Stooges.

The Ultimate Entertainer

Combine the tremendous storage of compact discs with the interactivity of entertainment software and you get Compact Disc-Interactive entertainment. CD-I is an evolution of the compact disc audio standard developed by the Netherlands-based Philips corporation. CD-I is a joint venture of Philips and Sony aimed at standardizing the format and specifications for this emerging technology.

The first CD-I players, which will connect to your stereo and television, will be marketed by such consumer electronic firms as Sony, Panasonic, and Hitachi. The players will contain a powerful microprocessor, play as many as 16 channels of stereo, store as many as 7000 broadcast-quality pictures, support computer animation, offer full-motion video in a portion of the screen, and play conventional audio compact discs.

American Interactive Media (AIM), a subsidiary of Philips and PolyGram records, is a CD-I software publisher that expects to have approximately 50 CD-I titles available when the first players hit the market early next year. Cinemaware has already signed an agreement with AIM to develop *Rocket Ranger* in CD-I.

Spinnaker Software is another firm working with AIM. Its first venture into the field is a CD-I version of *Sargon IV*, Spinnaker's popular chess game. By the time this article appears, *Sargon IV* should be on the market for the Macintosh, says Steve Yelick, Spinnaker's manager of engineering. The 68000 code for the 3-D chessboard will be the

CD-I prototype.

"The Macintosh version will have different chess sets as resources," Yelick says, "and we will expand that concept in CD-I all the way to possibly having animated chess pieces, like the original *Star Wars* movie, with little guys jumping around and chewing on each other." The CD-I version will have many more games and include full audio that will announce your moves.

In a parallel move, Yelick is working on a science fiction adventure for an IBM PS/2 computer and CD-I. He expects *Star Lords* to be out by Christmas.

"In *Star Lords*, we're trying to exploit everything we know about gaming, interactive fiction, and CD-I technology," Yelick says. "It's a multimode game system that includes strategic star maps and 3-D space views that will permit arcade-style chasing and fighting."

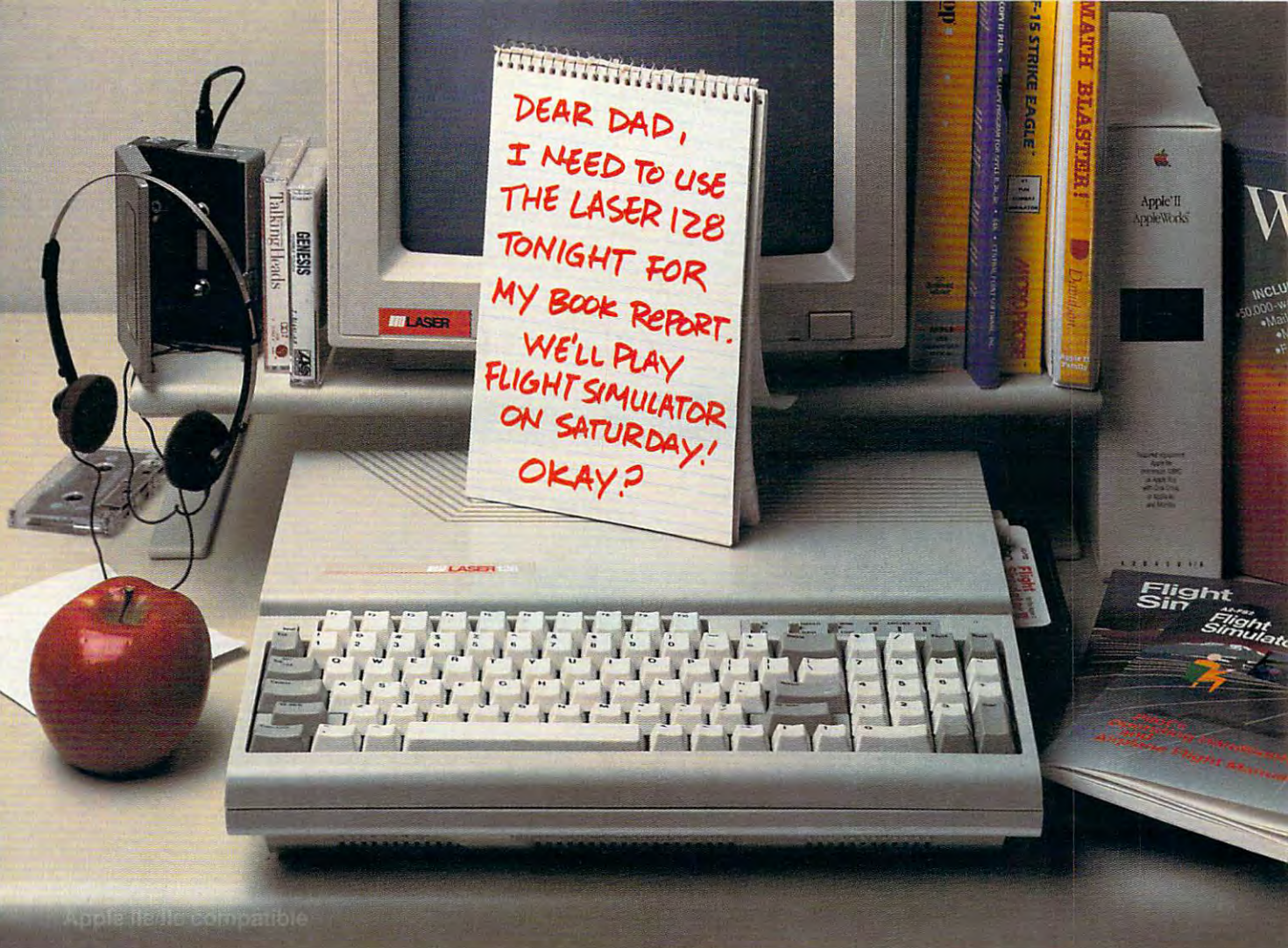
With more than 600 megabytes of storage space, CD-I offers programmers a great opportunity to use memory-hungry graphics to create a degree of realism not available on today's machines. *Star Lords*' screens will combine art and digitized images, Yelick says. "We'll build models of space vehicles and photograph them. That's where CD-I's digitized imagery will really shine."

What excites Yelick most about CD-I is not technical. "Its most interesting aspect is standardization. There are going to be multiple vendors with hardware, multiple vendors with software, and cross compatibility. That's what makes CD-I exciting, trying to avoid the lack of standardization that plagues the computer industry. The consumer won't put up with it."

Cinemaware's Bob Jacob is waiting for the day when CD-I interfaces with computers and peripherals. He doesn't expect it to be too long in coming.

"Imagine a computer," he says, "with one megabyte of RAM with a 68000 processor. It'll play back CD audio discs, CD-I discs; have ports for joysticks, keyboards, and floppy disk drives; and sell for under \$1,000!"

Now that'll be a game machine! ☐



Now your kids can afford to do their homework

More and more students are learning with computers. However most parents haven't been able to work a computer into their budget. The Laser 128 Apple-compatible computer will let you do all those things that you and your family want to or have to do – homework, write reports, even play games for a fraction of the cost of an Apple. With a Laser you can work out your budget on a computer, instead of breaking it with one. The Laser lets you take advantage of the largest software library available, so your child can learn more at home with the same programs they learn on in school. And, you can do your work at home on the Laser, too.

The Laser 128 with all its features: built-in disk drive; 128K RAM (expandable to 1 megabyte); serial, parallel, modem and mouse interfaces; 80 column text mode; numeric keypad; and an expansion slot; makes for a pretty educated buy. When you do your homework on which computer to buy, you'll find the Laser 128 at the head of the class with value. For more information on the Laser 128 and the name of your nearest dealer, contact Video Technology Computers, Inc., 550 Main Street, Lake Zurich, IL 60047, or call (312) 540-8911. In Canada, call (604) 273-2828.



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In 1885, the French painter Georges Seurat scandalized the Paris art world by painting with little colored dots on canvas. A century later, thousands of artists are painting with little colored dots, but not on canvas. They are using paint programs, one of the newest and most popular categories of personal computer software. A paint program gives you the ability to create any image on the computer screen, from fine art to the most casual scribbles.

All paint programs work the same way. The display of your computer is made up of a field of tiny rectangular dots, called *picture elements*, or *pixels*

for short. A paint program does nothing more than allow you to change the color of any pixel at will. What distinguishes one paint program from another is the design and range of tools provided to help you in that basic task. In this article, we'll be looking at the features of modern paint software and comparing six of the most popular programs: *SuperPaint* on the Apple Macintosh; *PC Paint Plus* for the IBM-PC, Tandy, and compatibles; *Deluxe Paint II* for the Commodore Amiga; *The Advanced OCP Art Studio* for the Commodore 64/128; *PaintWorks Gold* for the Apple IIGS; and *Degas Elite* for the Atari ST.

Paint Appeal

Why are paint programs popular? It's simple: They are fun, rewarding, and easy to learn, something that can't be said about the typical spreadsheet. The pure, glowing colors on the screen and the simplicity of most paint program operations are highly appealing. And computer art is a perfect antidote to "art anxiety," the fear of drawing and painting that many people feel. Beginners who would freeze in front of a sheet of expensive art paper or a stretched canvas will happily experiment on the computer screen once they learn that paint programs let them instantly erase and easily undo any mistake.



Color Your World

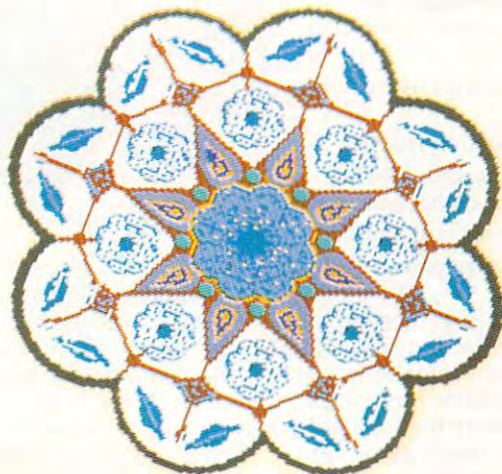
Picking a Paint Program



Steven Anzovin

*Monet you may not be, but
the new paint software now
making waves goes a long
way in turning pixels into
pictures.*

Professional artists appreciate the speed with which they can work up a design on the computer before creating the final product in expensive media like photography or video. In business, paint programs are used to supply illustrations for desktop publishing, to enhance charts and graphs created with spreadsheet programs, to create animations for desktop video, and to develop impressive presentation materials on slides and overhead transparencies. And a growing number of professional and amateur painters show their work only on disk, distributing it through information services, bulletin boards, and user groups.



Kids Paint on Computers

When you turn your hand to computer art for the first time, you may feel some initial uncertainty, but your children almost certainly will not. Kids are fascinated by the glowing images they can create on the computer screen, and they pick up the basics of paint programs intuitively. In fact, most "adult" paint programs are so easy to learn that even children too young to read can have fun with them. My daughter, age 3, is an accomplished mouse master and will happily scribble away on the screen (with careful supervision) and then ask her father to "print it" so that her masterpiece can be posted on the refrigerator. Her brother, age 6, uses *Deluxe Paint II* to create dinosaur books and birthday cards; he taught himself to read words such as *load* and *brush* out of the pull-down menus.

Publishers of educational software have picked up on the popularity of paint programs among children and are incorporating artmaking features into some new kid paint packages. Two recent releases are *The Sesame Street Crayon* series from Polarware and *ColorMe: The Computer Coloring Kit* from Mindscape,



The Sesame Street Crayon

both for the IBM PC, Tandy, and compatibles with color graphics capabilities.

The *Sesame Street Crayon* programs are basically electronic coloring books. They let kids use a "crayon" tool to fill in and print out 26 readymade pictures of the familiar Sesame Street characters. Each package in the series contains pictures on one theme—letters, numbers, or opposites.

ColorMe is more slickly packaged. The software itself is a scaled-down paint program that offers a selection of brushes, a fill tool, undo, clear page, a text tool with four fonts, cut and paste, and magnify. Included in the package are disks with pictures of the cartoon character Rainbow Brite; a box of crayons; blank stickers and buttons; colored printer paper; and a plastic binder to hold your children's pictures together.

My kids tried out both programs with much excited anticipation. The 6-year-old



ColorMe: The Computer Coloring Kit

lost interest in *Sesame Street Crayon* soon after he realized that he couldn't do any drawing himself. However, the 3-year-old liked to flip through the pictures and spent nearly 30 minutes with the program, a very long time for that age. Still, once she had seen all the pictures several times, she also lost interest.

The *ColorMe* package fared somewhat better, but not because of the software. Both children had no trouble using the drawing program to the limits of their abilities, but they were far more interested in the real paper, crayons, stickers, buttons, and other stuff included in the box. When those supplies were used up, so was enthusiasm about *ColorMe*.

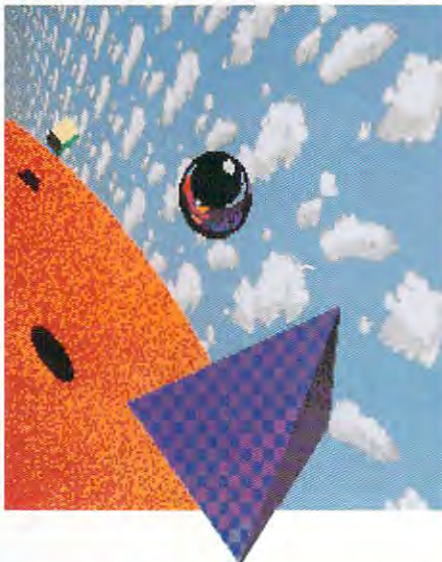
Lesson: If you're thinking of buying a paint program for your children, get one for yourself instead and let them use it. They'll get more out of it, and when their attention is elsewhere, you can have some fun, too.

Tools of the Trade

A good paint program should provide digital counterparts to an artist's traditional tools: pencils, brushes, rulers, a palette for mixing colors, and a canvas or page to work on. These basic functions include:

- a simple pencil or freehand drawing tool for sketching
- an eraser
- a selection of brushes for painting
- shape tools for drawing geometric forms—rectangles, polygons, circles, and curves
- a fill tool for filling areas with colors or patterns
- palettes of colors and/or patterns
- a cut-and-paste feature for moving and copying any area of the picture
- a magnifying glass for closeup work
- a grid to help you align parts of your painting

The majority of paint programs offer these tools in similar arrangements. The most often used tools are normally available as icons running along one side of the screen, where they can easily be selected with the mouse, joystick, tablet, or other pointing device. (You



can't operate any current painting program solely from the keyboard.)

A good paint program should also go beyond tradition to give you new tools that make painting faster, easier, and more successful. The latest generation of paint software does just that, offering the kinds of advanced functions that two or three years ago could be

found only in high-end graphics software costing thousands of dollars.

These advanced features include:

- flip, rotate, distort, and bend options for changing the orientation of selected areas
- dithering and smoothing tools that blend colors to create washes and other painterly effects
- stenciling or masking tools that prevent you from painting over selected colors or areas of the screen
- a perspective feature to make paintings appear to recede into space
- color cycling to create flashing animated sequences
- oversized pages for creating work bigger than the screen

SuperPaint

In the beginning there was *MacPaint* for the Macintosh. This venerable ancestor of all current paint programs helped create the market for computers with better graphics. Silicon Beach's *SuperPaint* is a worthy descendent to *MacPaint*. It takes the black-and-white *MacPaint* look and tool set and adds more tools, more patterns, more menu

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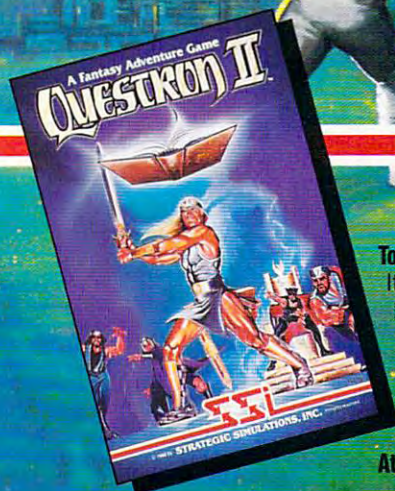
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The Look of Paint

Because of *MacPaint*'s influence, most paint programs today look very much alike. Not necessarily in their resulting artwork, but rather in how they look on the screen and how they present their tools and features.

Take a look at the accompanying figure—it represents *Deluxe Paint II* on the Amiga, but, with some minor changes, it could stand in for almost any paint program on the market.

If you haven't used a paint program before, or you've just dabbled in electronic art, some explanations are probably in order. Here's enough to get you past the art jitters and on to digital art fame and fortune.

Crosshairs.

When you're drawing, or using almost any other tool in a paint program, the pointer changes to another shape. The most common is a crosshairs, which in *Deluxe Paint II*'s case, is used for, among other things, drawing and creating shapes.

Menu. Features are grouped under like categories called *menus*, which are displayed by pointing at the menu bar and

usually clicking the mouse button. Something like this *Deluxe Paint II* Brush menu then falls down from the menu bar.

Menu bar. Since the mouse is the

more than one page so you can make changes on one while keeping the artwork intact on another.

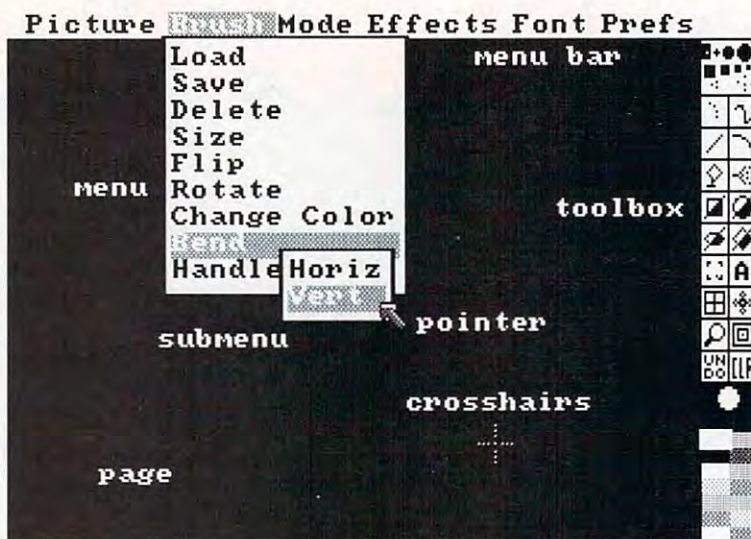
Pointer. Sometimes called the *mouse cursor*, this is typically displayed as an arrow. Place the pointer on a menu selection or tool in the toolbox to call it into play. The pointer moves as you move the mouse across the desk.

Submenu. Some programs use a hierarchical system of smaller, shorter menus available from within other menus. *Submenus* are normally shown when the pointer is aimed at a feature on a menu.

Toolbox. Depending on the program, this may be on the right side of the screen, on the left, or

even at the top or bottom. *MacPaint*'s influence is strongest here, for it set the pattern of grouping the primary tools in small iconic boxes. Clicking on one of the small boxes gets you ready to use that tool. In the figure, for instance, the small magnifying glass represents *Deluxe Paint II*'s magnify tool.

— Gregg Keizer

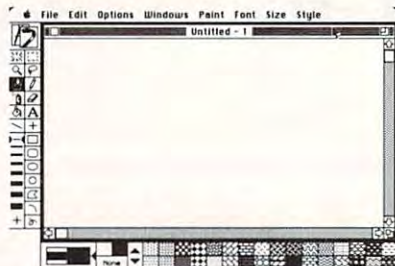


preferred pointing device for a paint program, it only makes sense to use the mouse to select features. This is done from the *menu bar*, which usually runs along the top of the screen.

Page. The drawing "surface" which the program uses. The most common synonym is *screen*. Some programs offer

options, and up to ten pictures onscreen at the same time.

But what sets *SuperPaint* apart from other paint programs, including *MacPaint* (even in its most recent upgrade from Claris), is that it is also a



drafting program. Behind the paint layer there is another layer, called the draw layer, in which you work with objects (as in a computer-aided design, or CAD, program), not pixels (as in the typical paint program). Different techniques are used to work with the paint and draw layers. In the draw layer, you

can easily change the characteristics (pattern or line width, for example) of any object without redrawing it. Objects can be grouped together and moved as a unit, instantly aligned, or stacked up. On the other hand, the usual paint tools don't work in the draw layer—you can't repaint objects pixel by pixel, for instance. Parts from either layer can be merged together as a painting or as a drawing.

PC Paint Plus

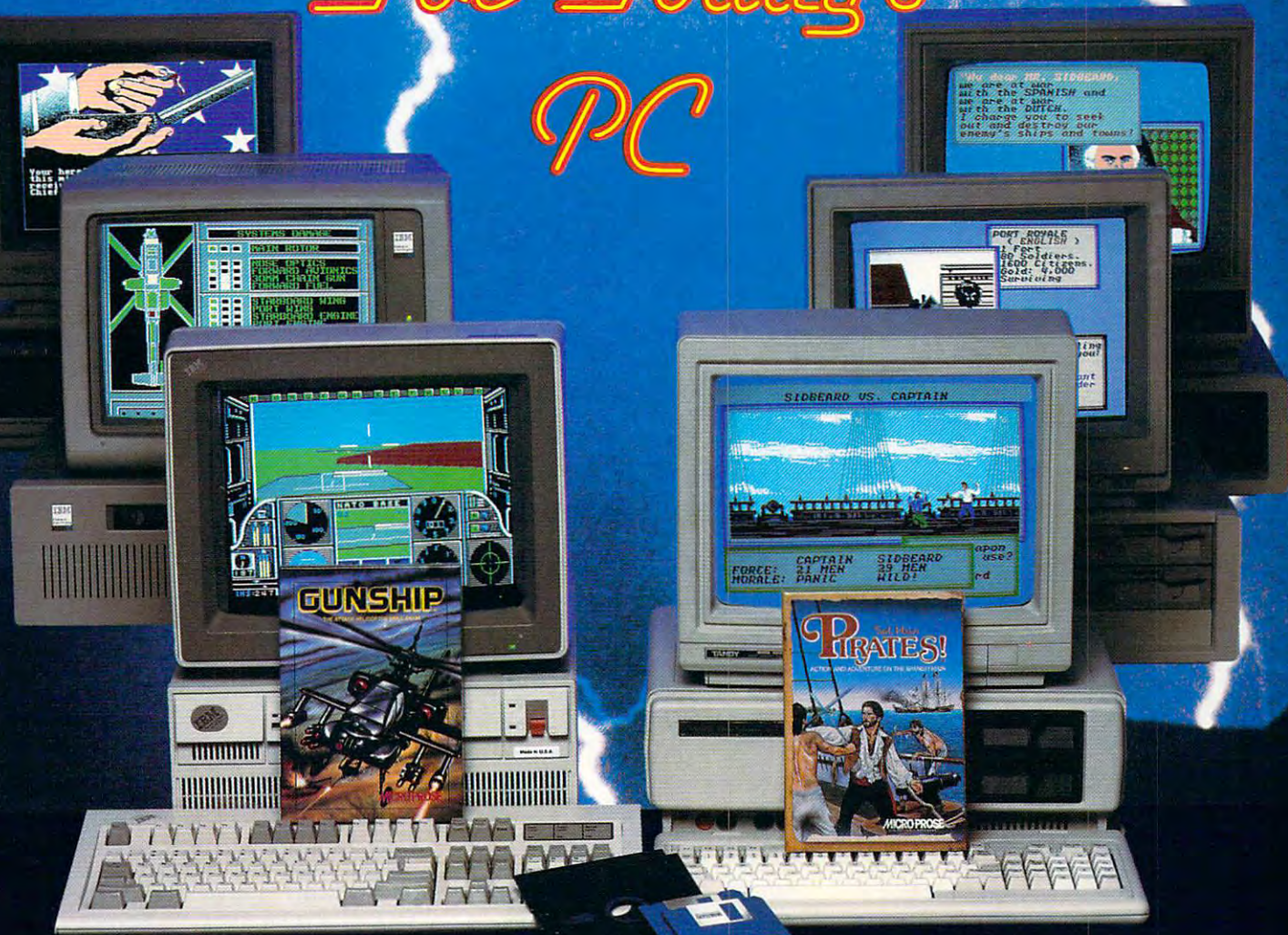
PC Paint Plus from MSC Technologies is a faithful rendition—in color—of the Macintosh/*MacPaint* concept for the world of IBM PCs, Tandys, and compatibles. All the same tools are there, in about the same positions—icons along the left of the screen, drop-down menus above. You even have to use the program with a mouse. Mouse Systems bundles *PC Paint Plus* with its own high-quality optical mouse, but you can also buy the program separately and use

a Microsoft or VisiCorp mouse. The program doesn't offer some features, like custom patterns and fancy rotations and distortions of selected areas, which are standard with other paint software.



Included with *PC Paint Plus* are two programs that greatly increase its usefulness for desktop publishing and presentations. The *CAPTURE* utility saves any screen created by another program, such as a chart created with *Lotus 1-2-3*, so that you can load it into *PC Paint Plus* for artistic embellishment.

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State of the Art

When the first paint programs appeared on the scene in the early 1980s, people were amazed at what they could do. You could cut out an image and move it! Choose colors! Fill shapes!

But in these more sophisticated times, such features have become passé. Artists now demand, and software developers are striving to provide, new wave capabilities that boggle the mind. Forthcoming packages for several computers will feature:

- surface mapping, the ability to make a pattern or picture look as though it was painted on the surface of a sphere or other 3-D shape.
- adjustable light source shading, which can, for example, make circles look like spheres lit from any angle.
- tinting, to lay washes of translucent color over selected areas.
- simulated digital video effects, including automatic multiple images and twisting the picture around any axis.

These are powerful features, and they open new avenues for computer artists. But are they necessary for every



user? And do they make painting any easier?

The fact is, advanced tools don't always make your life easier. A case in point is the perspective option appearing in

several paint programs. This seems like a great boon—remember how you struggled to master perspective in junior high art class? But paint program perspective often gives disappointing results.

Say you've painted a landscape that includes a tree, and you want to put it into perspective. You tilt the painting 45 degrees away from you with the perspective tool. Do you see the tree from another angle as you would in the real world? No—it just looks like a drawing of a tree turned 45 degrees. All you can do with paint program perspective is tilt flat planes—since flat planes are all you can create. This is great for making pictures of boxes, but not very useful for anything else. In the end, it's often easier to take the time to lay out the picture with lines and vanishing points like artists have been doing since the Renaissance.

Of course, no one wants to give up other advanced tools like dithering and stencils—they really do make life easier. Most artists love to see new features, hoping for that perfect program which provides the maximum power in the most elegant form.

Another utility, called *16C*, converts 16- and 4-color pictures to 2-color pictures and feeds graphics to the Polaroid Palette slide-making system.

Deluxe Paint II

Deluxe Paint II (available in nearly identical versions for the Apple IIGS and IBM PC, Tandy, and compatibles as well as for the Amiga) offers many advanced features while keeping the polished feel of the original *Deluxe Paint*, the first paint program to take advantage of the Amiga's exceptional graphics. Despite the program's full complement of tools—it was the first to offer such features as stenciling, smoothing and shading, and perspective—the most powerful aspect of *Deluxe Paint II* is its well-thought-out interface, which makes it one of the easiest paint programs to learn. Another outstanding feature is the custom brush tool. You can select any area of your painting

and use it as a brush, copying it with a click or dragging it across the painting to create a swath of color. And you can use custom brushes in conjunction with every other draw-



ing tool (which most other paint programs cannot do), giving you great flexibility in creating complex, multicolored forms.

Some of *Deluxe Paint II*'s other features are less easy to use. The perspective tool is complex and rather confusing. And *Deluxe Paint II* is a memory hog. You can't use several

memory-intensive features, such as the spare page, the stencil tool, and a large custom brush, at the same time (especially in the Amiga's high-resolution, 640 × 400 pixel mode) without at least one megabyte of memory.

OCP Art Studio

Commodore 64 and 128 users now have available an up-to-date paint program in *The Advanced OCP Art Studio* from Firebird Software (Firebird's products are now distributed by Activision). This program doesn't offer everything that paint software on other systems can, but *OCP Studio* still provides a lot of functionality for its \$39.95 price. Among the program's standard features are lockable colors to create stencils; several levels of magnification; editable patterns; a pattern-mapping option that lays a pattern over the pixels changed by the last painting operation; and a font editor for creating

The Price of Paint

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2350 Bayshore Pkwy.
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(415) 960-0410

Color Me: The Computer Coloring Kit

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Mindscape
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(312) 480-7667

DEGAS Elite

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

Deluxe Paint II

Amiga; IBM PC and compatibles; Apple IIGS
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San Mateo, CA 94404
(415) 571-7171

Paintworks Gold

Apple IIGS
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Activision
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SuperPaint

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Silicon Beach Software
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P.O. Box 261430
San Diego, CA 92126
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custom fonts. *OCP Studio* works in the multicolor (160 × 200 pixel, 16 color) Commodore 64 mode, but it won't access the 128's higher-resolution graphics.

Despite its considerable power, *OCP Studio* is somewhat awkward to use. Since most choices have to be

One *PaintWorks Gold* feature that points to the future is its built-in animator. With options from the Anim menu, you can create a sequence of paintings, compress them, and replay them as an animation at variable speeds. Though animations made in this way can only last a few moments (depending on the amount of memory in your IIGS), you can cycle them over and over to create a longer work.

DEGAS Elite

The premiere paint program for the Atari ST series is *DEGAS Elite* from Batteries Included (now distributed by Electronic Arts). While offering all the standard features that paint program users expect, *DEGAS* takes a somewhat different approach to the user interface. Instead of choosing tools from a series of icons, you

up any screen area on your painting.

Drop shadows are a favorite trick of graphic designers, and *DEGAS Elite* does them on command, creating a shadow a specified distance away from any point or shape you draw. Shadows can be cast in any of eight directions and in any



made from pop-up menus rather than by clicking on icons, you always seem to be waiting for another menu to appear.

PaintWorks Gold

The most striking new feature of Activision's *PaintWorks Gold* for the Apple IIGS (an upgrade of the original *PaintWorks Plus*) is its wide selection of color options—they make the best of the IIGS's 4096 available colors. You can specify background and border colors, define color sets for dithering and color cycling, mask colors so they can't be painted over, create "slippy colors" that can't be picked up by cut-and-paste operations, save 128 16-color palettes and set a palette of 196 preferred colors, and make several colors transparent. You can also mask any area of the screen at any time simply by drawing a selection box around the area.



access tools and dialog boxes from a text-based menu screen. This menu screen is not visible when you work on the painting area, meaning you have to toggle back and forth frequently from painting to menu until you learn the keyboard equivalents to the common tools. On the other hand, the main menu doesn't take



color, making the original object seem to float up off the page.

Before You Buy

Though these are among the most popular paint programs, there are several others for each computer. How to choose between them? Before you buy a paint program, think about what you want to use it for.

Will you just be doodling on Sunday afternoons to relax after a week of creating 10,000-cell spreadsheets at work? If so, you may not need a new-wave program with all the bells and whistles, like perspective and adjustable light-source shading (see the sidebar "State of the Art").

On the other hand, you may be a professional artist or designer, for whom nothing but the latest and most gadget-laden program will do. In any case, before you buy any

paint program, you should try it out on your computer system (or on the one you're thinking of buying) to make sure it has the following indispensable features:

- An easy-to-use set of tools and procedures; the program should not feel awkward or confusing. If you can't figure out basic operations without reading the manual, the program may be too complex.
- Full access to your computer's graphics capabilities. Most comput-

ers have more than one display mode; make sure the program can use each to full advantage.

- File compatibility with other programs. You should be able to swap files with other popular paint programs, as well as business, page layout, and desktop video software for your computer.
- Compatibility with your printer and other peripherals. Check to see if the program has a driver for your printer and that it can be installed

on a hard disk.

Keep these principles in mind, and you should end up with a program that suits your needs. And who knows? You may just decide to rent a garret and throw away that spreadsheet forever. □

Steven Anzovin has been a freelance computer graphics designer for the past four years, and has written several books on the subject, notably *Using Deluxe Paint II* (COMPUTE! Books).

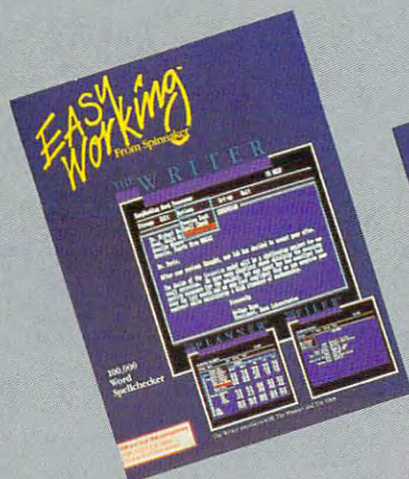
Paint Programs Compared

The table and quick evaluations below show how the six paint programs stack up against each other in basic and advanced features.

	SuperPaint (Mac)	PC Paint + (IBM)	DPaintII (Amiga)	OCP Studio (64/128)	PWorks Gold (IIGs)	DEGAS Elite (Atari)
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Cut-and-Paste	■	■	■	■	■	■
Text	■	■	■	■	■	■
Font Editor				■		■
Color Palette	■	■	■	■	■	■
Color Fill		■	■	■	■	■
Color cycling			■		■	■
Transparent color(s)	■	■	■	■	■	■
Color remap			■			■
Pattern Palette	■	■		■	■	■
Pattern Fill	■	■	■	■	■	■
Custom Patterns	■		■	■	■	■
Grid	■	■	■		■	■
Magnifier	■	■	■	■	■	■
Flip area	■	■	■	■	■	
Mirror			■		■	■
Shadowing						■
90° Rotate area	■	■	■	■	■	
Free Rotate area	■		■			■
Distort area	■		■	■		■
Resize area			■		■	■
Dithering			■		■	■
Dither Fill			■			
Smoothing			■		■	
Stencil			■	■	■	
Perspective	■		■		■	
Perspective Fill			■			
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Oversize pics	■	■	■		■	
Object-oriented drawing layer	■					
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QUIET!

on the (Software) Set

A Conversation with Trip Hawkins

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for the
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Already the next generation of entertainment software is starting to strut its stuff. Digitized sound and images, sophisticated story lines and settings, an emphasis on user friendliness, a willingness to embrace new technologies—all of these elements are coming together to lay the foundation for the next great entertainment industry.

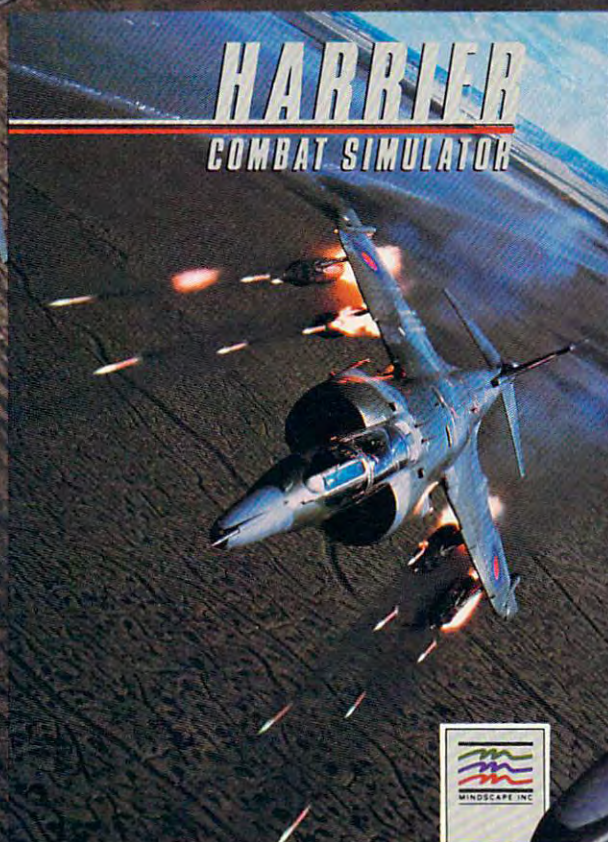
One of the key players in that industry is five-year-old Electronic Arts. Begun in 1982—at the peak of the videogame market—EA was the 136th entertainment software company to enter the business. Since then, the company's growth has been dynamic. Its 1987 revenues topped the \$30 million mark, making the company the seventh largest personal computer software publisher in the world. More than 30 of EA's programs have surpassed the \$1 million sales mark. Under its own label, and through its growing family of affiliated labels, Electronic Arts publishes more than 100 programs a year.

Presiding over the growth is EA founder and president Trip Hawkins. Committed to publishing quality entertainment and productivity software in virtually every category, Hawkins has also guided EA into the global market. Wholly owned subsidiaries have been formed in Europe and Japan. Hawkins perceives a worldwide market taking shape, and is determined to make EA a force in that market.

He's also aware that it's a market not quite like any in existence. On a recent visit to *COMPUTE!*'s offices, he talked at length about the challenges and opportunities facing the New Hollywood. ▶

Keith Ferrell

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QUIET!

COMPUTE! *Entertainment software has grown up quite a bit over the past six years. Where do you see the medium headed?*

Hawkins: The merger of television and computer technology is going to bring together different kinds of technology and the people who know how to work with them. The process of making software is going to be more and more like the process of making television shows and films.

“Technology is really going to help blow the lid off human creativity.”

COMPUTE! *Involving producers and directors? Set designers and studios? You're talking about a New Hollywood.*

Hawkins: Right. All the different aspects. First of all, Hollywood is a geographical area. We think that will happen in software as well. The Bay Area here in San Francisco is where many of the leading home software companies are located. Because of that there are a lot of facilities and capital available in the area. There are a lot of people who have located here because they can get work—people who do graphic art, or programming, or sound.

COMPUTE! *Will San Francisco's central-city continue?*

Hawkins: As time passes, more and more people will congregate in this area because there's so much work available, so many projects going on. Having the companies in one area—having all of the money and the money decisions in one area, all of the facilities, equipment, and technology—is helpful as the industry takes shape.

COMPUTE! *As the New Hollywood takes shape, you and Electronic Arts are in an advantageous position. How does it feel to be one of the hot studios for this new entertainment medium?*

Hawkins: We're really excited about that. We feel like we've been shaping that for the last five years. That's why we've made the big investment in what we call the artist's workstation. We've been able to build up a lot of software development tools that enable the artist to work much more productively, and to handle sound,

graphics, and program debugging at a higher level. That's one aspect of what we consider the studio approach.

The other aspect is the talent pool that's available. We have a lot of people in the company now who have expertise in different areas such as sound and music, and people who are quite experienced with video applications. It's great to have a group of people together like this—it does have a kind of “film studio” feel, where there are a lot of different resources for people to draw on.

COMPUTE! *Will we see entertainment software designed by people who come from outside of programming? Are writers and artists from other media going to be shaping future software releases?*

Hawkins: The center of these projects will continue to be someone who really understands interactive entertainment. Right now, most of those people are the leading designers and programmers. It's going to take a while before there are a lot of writers, for example, who understand how to create a story that's truly interactive in an interesting way. Writers are accustomed to a linear story line, with the reader as an observer.

If you want a screenwriter to design an interactive story, the writer has to think about what it's going to feel like from the perspective of a human character who's figuring out what's going on.

COMPUTE! *Isn't it analogous to the early days of silent films, when movies were essentially filmed stage plays? Then the innovators came along and began to create and exploit true cinematic techniques.*

Hawkins: Right. There are all these new possibilities, so it will take a while for people to really stretch the medium as far as it can go.

COMPUTE! *And it's not just writers who'll do the stretching.*

Hawkins: Another area that's really hot right now is graphic artists and cartoon animators. Look at a series like *The Bard's Tale*. What makes that a distinctive role-playing game, I think, is the high-quality animated artwork that comes with it. The artist who did that is

a former cartoon animator with Hanna-Barbera.

COMPUTE! *Other elements?*

Hawkins: There's also the whole area of sound. You can divide that into two areas: sound effects and music. We now have a huge compact disc library of sound effects. People are doing digital sound, which requires a lot of memory and a lot of processing and good sound output, so it's not something for every machine. We also have some software development tools for people to capture their own sounds and put them into programs.

COMPUTE! *Music is also vital to entertainment software.*

Hawkins: Of course. Rob Hubbard, for example, who is probably the best music composer for the Commodore 64 in the world, worked for us as a contractor on the score for *Skate or Die!* You listen to that and you wonder how he did it.

In England, for example, one magazine has a top ten listing for software music. At one point, Rob Hubbard had something like seven out of the top ten.

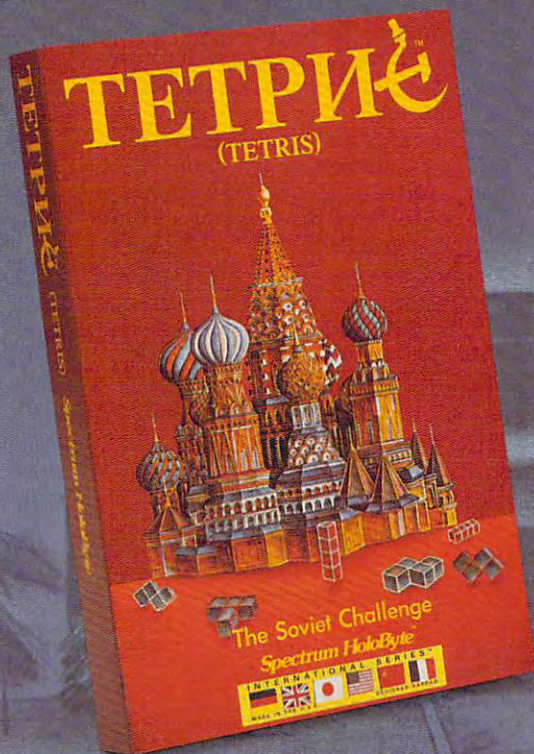
COMPUTE! *All of these elements, of course, have to come together in the service of story. One of the key ingredients to any story is its context, the setting in which the story takes place. Starflight's a good example—hundreds of worlds, quite a few alien cultures, and only after you've knocked around a little do you figure out what's going on. Celebrity games—Chuck Yeager's Advanced Flight Trainer, Earl Weaver Baseball, and so on—give a context of their own, a sense of being a famous person, or having that person's expertise available to you. Context seems to be an area in which software is making some terrific strides.*

Hawkins: I think that it is in many ways more important than the characters. It's obviously important that there be interesting characters, except that in an interactive story, the human being that's playing is a key character, if not the key character.

So what's probably more important is the world that you're in. How fascinating is that world? With a game like *Starflight*, you get an interesting universe in itself, and the more you fly around that universe, the more the story line hooks you.

COMPUTE! *EA recently published Lucasfilm's Strike Fleet, which gives another type of context. Very contemporary, very realistic, very political.*

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QUIET!



“It’s going to take a while
before a lot of writers understand
how to create a story
that’s truly interactive.”

Hawkins: That’s another whole dimension. With a lot of programs, whether story or simulation, you try to capture realism, whether from the actual world or the world of someone’s imagination. Having experts who understand military scenarios and the capabilities of the vessels involved goes a long way to putting you in a real world.

A product like *Yeager*, or *Dr. J and Larry Bird Go One-on-One*, takes celebrities that people already care about and makes them characters in the story. It’s not really an interactive story, but the celebrity becomes like the star in his own film. That makes it more relevant, more interesting to people. If you go to Boston, people will tell you that Larry Bird is a better player and always wins the game; in Philadelphia, they’ll say Dr. J always wins.

People get more emotionally involved with products like this.

COMPUTE! Let’s talk about newer technologies, specifically Compact Disc--Interactive (CD-I), which delivers mammoth storage capabilities to both computers and televisions. What’s the timetable for CD-I reaching the consumer?

Hawkins: We now have an emulator for CD-I, and have actually built a prototype game to learn about the system and illustrate some of its capabilities. We expect to be receiving hardware prototypes in another three or four months [early summer, 1988].

COMPUTE! Are the hardware challenges being solved? Has a CD-I standard been established?

Hawkins: Once somebody says, “Here’s a specification for something I want to build,” you can at least imagine how it’s supposed to perform in theory. But then what you want to do is build a prototype that has all the right characteristics of what the final product is supposed to be. Then you’ll start actually using it, and verifying that it works according to theory.

Once the prototypes come out, software companies will be able to use those to go ahead and commit to developing specific projects. After the hardware prototypes, there’ll be another 9 to 12 months before you see software products coming out. That gives the hardware companies time to go from the prototype stage to the production stage.

COMPUTE! So we don’t have too long to wait before there’s an actual consumer impact from CD-I?

Hawkins: At the June Consumer Electronics Show (CES) [June 4–7], I imagine a couple of the CD-I companies will be showing the machines privately to key customers. Probably by the January CES [1989], you’ll have a lot of CD-I players on the floor of the show, doing things. They’ll start to ship them around the middle of 1989.

It’ll really start to have an impact around Christmas, 1989. So it’s about a year and a half away, basically.

COMPUTE! Obviously, this dramatic increase in storage offers entertainment-software developers a lot of opportunities. What forms will CD-I software take? Are we going to be seeing traditional software games enhanced with megastorage ca-

capacity? Will CD-I combine traditional software forms with new approaches? Or will we see something entirely different in computer entertainment?

Hawkins: All of the above.

Take something like *Starflight*, for example, and let’s imagine what a CD-I version would look like. You can take the program logic and the basic structure of the game, and then decide to bring all of the aliens to life.

COMPUTE! How?

Hawkins: You could actually do it just like a real movie. You could hire a costume designer from the movie business, and create special effects costumes for the aliens. Then you’d videotape scenes with the aliens, and have somebody do a soundtrack for the voices and for the text that they speak in the game.

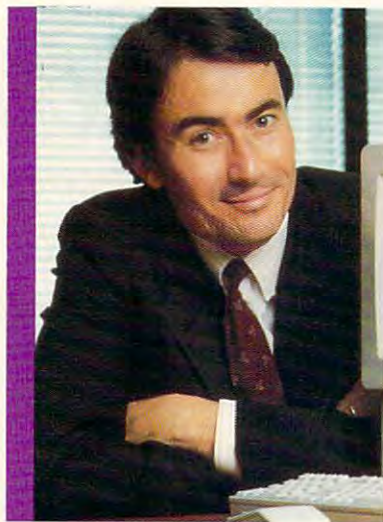
Then you’d digitize all of that. You could fill up all the space on the disk with animated aliens, and interesting sounds. You would also have a universe that’s a lot more interesting to look at. You might have an out-of-the-cockpit view, like *Star Trek*, with planets that look like planets—rotating, with detailed zooms, and that sort of thing.

You’d really amp up the picture and sound quality while keeping the story line and program logic.

COMPUTE! And if you wanted to do it differently?

Hawkins: An alternative would be to take the PC version as a prototype and then reinvent the whole thing with a different user interface. You could do something that felt even more like a film.

FIVE YEARS OLD



William (Trip) Hawkins, 34, is founder and president of Electronic Arts. He holds a bachelor's degree in strategy and applied game theory from Harvard, and an MBA from Stanford. Before beginning EA, Hawkins worked at Apple Computer Inc. in both the Apple II and Lisa divisions, holding the position of director of marketing with the latter.

Electronic Arts, formed in 1982, patterned its software development and publishing methods after the movie industry's producer system. EA currently employs 20 producers, who select graphic artists, programmers, writers, musicians, and others. The producers then bring all these people together and coordinate their work as they create a piece of software. Producers are supported by production teams usually made up of a technical director, an assistant producer, a staff writer, and a product-marketing manager.

The bottom line, however, is that producers manage what EA calls its *software artists*. These independent programmers are monitored by the producers, who have a big hand in the design of the program. Unlike some of the other major entertainment software publishers, EA does not employ a large number of staff programmers, preferring instead to deal with the more than 100 freelance programmers in their stable. These programmers are paid much like book authors; they're given an advance against future royalties, then paid throughout the development process when certain goals are met.

Programmers who develop for EA are equipped with an Artist Workstation, an IBM AT or compatible computer with 2½ megabytes of RAM and a proprietary cable that connects the AT with the devel-

oper's "target" computer. The Workstation runs EA's internally created development tools such as music editors, sound editors, and graphics editors. Using a symbolic debugger (also provided by EA), the programmer can write the program on the Workstation and watch it execute on the target computer.

The result of all this has been an enviable string of software successes. According to the company, 32 of its titles have each generated more than \$1 million in profit. Though its financial health is difficult to determine (EA is not traded publicly), it certainly is one of the largest consumer-entertainment software publishers.

Some of the titles EA has developed, published, and sold over the years read like a Who's Who of fun software. Celebrity games such as *Dr. J. and Larry Bird Go One-on-One*, ground-breaking simulation games such as *Seven Cities of Gold*, trendy entertainment such as *Skate or Die*, graphic adventures such as the *Bard's Tale* series, art software such as *Deluxe Paint II*, and extended games such as *Starflight* have won awards for EA and filled its coffers.

It's a mark of the youth of the computer industry that a company like Electronic Arts—which recently celebrated its fifth anniversary—could make such an impact on the market in such a short time.

COMPUTE! Which type of CD-I entertainment are we most likely to see?

Hawkins: I think it makes sense to take the first approach first. Initially, you'll want to try to do some things with the machine, but not to reinvent the wheel. It's going to take people a while to try to figure out all the new capabilities.

There will also be new projects, started from scratch. People will be sitting with a blank piece of paper, wanting to approach CD-I completely fresh and use it in a way that's never been done before.

COMPUTE! Will the production of CD-I software require larger investments of capital and time?

Hawkins: Initially, the development costs for a CD-I project don't have to be any more than for a good PC program. In a sense, we already have the New Hollywood; it's just that with an optical disc, you have more space for pictures and sound. But it isn't going to dramatically increase costs.

Now, if I wanted to spend more, I could. I just don't have to.

COMPUTE! But if you bring in costume designers, and set designers, and other

Hollywood trappings, that is going to cost more.

Hawkins: Yes. And I think what's going to happen initially is what's going on already. There are a lot of people who can't get work in the TV and movie industries, and who are really fascinated with what's going on with computers. Conversely, there are others who could not care less.

We don't have to work with every screenwriter immediately. There are lots of different fish in the sea. You try to find the ones who understand what a small industry we have at the moment. It's pioneering work, and you want people who are interested in it for that reason, who aren't looking at it as something that's so huge that they can make a gigantic killing at it right away.

COMPUTE! Long term, though, CD-I stands a chance of broadening the consumer base in a way that traditional keyboard computers won't. Are we looking at an audience numbering in the millions?

Hawkins: Right now, if you make a hit PC program, you're going to sell a couple of hundred thousand copies. I'd say it will be 1990, 1991 before the level of a hit

gets up to the half-a-million unit level.

That's when you'll have people spending more on development. You'll see development investment going up in relation to sales potential. It'll just gradually slide up there.

COMPUTE! The other side of the New Hollywood is the delivery of Hollywood tools to consumers. Tell us about that.

Hawkins: We're really excited about desktop video. For one thing, we feel that working with that technology will help us make better entertainment products. Second, we think that it's a terrific market in its own right. There are a lot of exciting things we can do in the desktop video market. Third, in the long run there are a lot of consumers who want to make their own movies, have fun with music and images and so on. As the technology gets more sophisticated and less expensive, it's going to be much more accessible to the average consumer.

COMPUTE! In addition to delivering products that reflect their designers' creativity, you'll be delivering tools that let consumers unleash their own creativity in ways that we haven't seen before.

Hawkins: That's right. It's interesting—a

QUIET!

lot of people don't think of themselves as being creative. That's too bad. People don't really use all of the capabilities that they have.

Technology is going to help unlock a lot of potential for people. Look at the musical instrument business. A huge percentage of teenagers take music lessons. That indicates that there are some culturally traditional creative media—and yet, how many people have taken

ing to conform and fit in with everybody else.

COMPUTE! *And the New Hollywood will help change this?*

Hawkins: I think technology is really going to help blow the lid off human creativity. It's going to remind people that it's okay to be playful, it's okay to be creative. People will get a lot more self-confidence about their creative abilities.

story that's going to be of interest to a much broader audience. As that happens, you'll start to see more and more games designed where there can be multiple characters doing different things.

Another problem is that some games right now are almost *too* interactive. You have to do a lot of mapping and calculations, analyzing every little move. Sometimes the work that you're doing detracts from the enjoyment of

“Many games come from designers who are young men interested in science fiction and epic heroism. They're designing products for themselves.”

music lessons and then given up on it? They give up because it's too difficult; it requires too much of an investment of time before they can enjoy any level of competence.

That's where computer technology is really exciting. You can approach it at any level you want. With a package like *Instant Music*, a lot of people will be drawn into music, and enjoy interacting with music and creating their own music. It'll arouse their curiosity, and then they'll have the motivation to learn more about how music really works. And maybe have the motivation to learn how to play an instrument.

COMPUTE! *What about pictures to go with the music?*

Hawkins: Everyone is really fascinated with putting images on the screen, particularly images of themselves. A lot of kids are going to turn into budding Steven Spielbergs when the technology gets to be easy enough to work with.

That's exciting. I think there's a problem with the way modern society works. Kids are really creative, really playful. Then what happens is we all get socialized—we're taught to put on a tie and a coat and go to the office every day at the same time. People lose touch with their creativity because they're try-

COMPUTE! *And it's participatory in a way that other media, such as TV, are not.*

Hawkins: Absolutely. That's really the big target. A huge percentage of leisure time is spent watching television. All of this stuff—whether entertainment or creative applications—we're talking about getting people to use that TV screen for something that's a heck of a lot more interesting and is a lot better for them because it's interactive.

COMPUTE! *Interactive or not, though, it seems that much computer entertainment is basically a solitaire proposition—the user and the computer alone. As computers and CD-I move closer to the TV in the family room, will we see more group activities for the computer, pastimes in which family and friends can participate?*

Hawkins: I don't think you're going to see that transition instantly. You have to look at where software comes from. Many games come from designers who are young men who are interested in science fiction and epic heroism. To a large degree they are designing products for themselves.

Over time, we're going to get more people who are like screenwriters, people who know how to write a good, dramatic

the story line. As we get better writers involved in creating the stories, they'll create interactive products that aren't as interactive. There will be more emphasis on the richness of the story, where people don't have to huddle over the keyboard.

COMPUTE! *As the New Hollywood takes shape, comparisons are bound to be made with the "old" Hollywood. You've been called "the Walt Disney of software." How does that feel?*

Hawkins: I don't really think of myself that way. But without any question, Walt Disney is one of my heroes.

What I really admire about him is that he had a creative vision that he was committed to for 50 years. A lot of people do something for a few years, make some money, then go do something else.

In that sense, I'm like Disney. I think I programmed my first computer game about 15 years ago. This is what I really like doing.

This industry has a lot of potential beyond just software. We have a long-term interest in taking what we believe about the values of interactive entertainment, and the fact that it's good for people, into other areas. It could be coin-operated games, it could be theme parks, it could be lots of different things. □

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If You Don't Have a Clue

Origin Systems has recently released a cluebook to help frustrated adventure-game players. *Quest for Clues* contains solutions to 50 of the most popular text-adventure and fantasy role-playing games, including *Autoduel*; *Ultima IV*; *Bard's Tale*; *King's Quest III*; *The Pawn*; *Phantasie I, II, and III*; and *Moebius*.

The book has over 80 detailed maps for those lost in a fantasy world. Origin Systems has encoded all of the major clues to solve the games so readers can obtain only the clues they need. An overview of each game is also included.

The suggested retail price for *Quest for Clues* is \$24.99, and it's distributed by Brøderbund Software.

Origin Systems, 136 Harvey Rd., Bldg. B, Londonderry, NH 03053
Circle Reader Service Number 200.

See the U.S.A. on Your Amiga

Designing Minds has introduced *Great States II* for the Amiga. Players learn facts about the United States in this game designed for ages from nine to adult.

The game includes information about each state's nickname, entry into the Union, capital, flag, flower, bird, tree, song, and motto. Players can discover how each state received its name and where the state is located in relation to surrounding states.

The program features maps of each state displaying average rainfall, population densities, topography, vegetation, and land formations.

Players have the option to play against another player or the computer, or they can watch the computer play itself.

Suggested retail price for *Great States II* is \$39.95. Owners of *Great States U.S.A.* distributed by The Other Guys Software can receive an update for \$10 if the disk is sent directly to Designing Minds.

Designing Minds, 3006 N. Main, Logan, UT 84321

Circle Reader Service Number 201.

Trackball Input

Fulcrum Computer Products has released the Fulcrum Trackball Plus, a stationary input device that can emulate any of ten different pointing devices, including a Microsoft Mouse, the Mouse Systems Mouse, and the Summagraphics Bit Pad One. The device can also emulate arrow-key functions for programs that are not mouse-driven.

The Trackball supports drag functions and is available in OEM versions. Features include six user switches for flexibility with menu-driven software and an alternate cursor function.

The device is designed to conserve desk space and to provide fingertip control without collecting surface dirt.

Suggested retail price is \$95.
Fulcrum Computer Products, 451 Allan Ct., Healdsburg, CA 95448
Circle Reader Service Number 202.



The Fulcrum Trackball Plus acts as a stationary input device.

PC Joystick Card

CH Products has released Gamecard III Plus for IBM PC, XT, AT, PS/2 (Model 25 and 30) and compatibles with clock speeds up to 16 MHz. The card adjusts for different joystick resistances and different computer speeds.

A three-position switch accommodates different joystick values, and speed selection jumpers allow a speed change to improve performance with

higher speed computers. An optional Y cable is available that allows the connection of two joysticks.

The suggested retail price of Gamecard III Plus is \$59.95. The card retails for \$69.95 with the optional Y cable.

CH Products, 1225 Stone Dr., San Marcos, CA 92069

Circle Reader Service Number 203.

North Atlantic War Zone

Three Sixty has introduced *Harpoon*, a war simulation game based on the board game of the same name. The game features weaponry that is in use today, and it has a library of high-resolution digitized pictures of the weapons scaled to size.

The player assumes the role of the commander of the major NATO naval task force in the North Atlantic, who must lead his forces against the Soviet Northern Fleet. Players can choose the level of difficulty and choose either a small, medium, or large task force. At the beginning of each game, the computer scrambles the parameters to make sure that action sequences are not repeated.

The game will soon be available for the IBM PC and for the Macintosh later this summer. Suggested retail price will be \$49.95.

Three Sixty, 2105 S. Bascom Ave., Suite 290, Campbell, CA 95008
Circle Reader Service Number 204.

Amiga Command Center

Ketek has designed a color-coordinated enclosure for Amiga 500 computers. The Amiga 500 Command Center is designed to save space and to make the computer work more efficiently.

Users can place two 3½-inch external disk drives or one 3½-inch drive and a 20MB or 30MB hard drive above and behind the keyboard. The Command Center features a built-in cooling fan, surge suppression, EMI noise filter, a five-outlet power strip, and a bank of remote switches for control of individual system components.

GO AHEAD AND DRAW YOUR OWN CONCLUSIONS.



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*This is from Print Magic's graphics library.
Note the extreme detail.*



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To make a long advertisement short, no other software of its type gives you as many choices or as much power of expression as *Print Magic*.

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Print Magic offer is available for Apple IIe/c/gs and IBM and compatibles. Allow 4-6 weeks for delivery. When ordering, specify computer type and send your check or money order plus the front cover of your *Print Shop* manual to: Epyx, Inc., 2995 Woodside Road, Dept. 004, Suite 400-383, Woodside, CA 94062.

PRINT MAGIC

BY Epyx



Print Magic is a trademark of Epyx, Inc. *The Print Shop* is a trademark of Broderbund Software, Inc. The graphics were printed using an Apple IIc and ImageWriter® printer.

Options include a 20MB or 30MB hard disk drive, a 1MB or 2MB internal RAM upgrade, a replacement power supply, joystick extension cables, a dust cover for the entire system, and a tilt/swivel monitor stand.

The Command Center is priced at \$179.95 and up, depending on desired options. The standard cabinet without electrical components sells for \$99.95.

Ketek, P.O. Box 203, Oakdale, IA 52319

Circle Reader Service Number 205.



The Amiga 500 Command Center places disk drives above and behind the keyboard.

Printers for Home or Office

Citizen America has introduced two new nine-wire dot-matrix printers for under \$300. The printers will be available through mass-merchandising outlets.

The Citizen 5200 prints 120 characters per second (cps) and is designed for either family or small home-business applications. The 5200 can also be switched to 25 cps for a NLQ (near-letter-quality) mode.

For larger home businesses and small-business offices, Citizen is offering the 5800, which can print at a rate of 180 cps. It also offers front-panel speed control with additional selections of 150 cps/10-pitch data processing, 31 cps/12-pitch high-speed NLQ, and 29 cps/10-pitch NLQ.

Both printers feature switch-selectable IBM and Epson compatibility, standard 4K buffer, standard parallel interface, and optional serial interface. Each one is equipped with a variable-width push tractor and bottom and rear paper feed. Other features include graphics capability, bidirectional text printing, and built-in pica and elite fonts.

The suggested retail price for the 5200 is \$269; the 5800 retails for \$299.

Citizen America, 2401 Colorado Ave., Suite 190, Santa Monica, CA 90404

Circle Reader Service Number 206.

Take a Monumental Trip

Blue Lion Software has released the latest in its line of software travelogues: *Ticket to Washington DC*.

Users can visit more than 45 different places in the capital including Capitol Hill, Georgetown, Arlington, and Mount Vernon. The program's graphics depict notable landmarks and famous exhibits in museums.

In addition to sightseeing, users must discover the identity of a famous American by receiving clues obtained from leads found at various locations throughout the D.C. area. The program features more than 14 different mysteries. Seven three-dimensional maps and onscreen information are available for assistance.

Ticket to Washington DC is available for the IBM PC, AT, and compatibles with at least 128K of memory and a CGA/EGA or Hercules card. The suggested retail price is \$44.95.

Blue Lion Software, 90 Sherman St., Cambridge, MA 02140

Circle Reader Service Number 207.

New from Weekly Reader

Optimum Resource has introduced two new Weekly Reader Software programs for Apple and IBM formats.

Vocabulary Development is designed for children age 8 and up to help them increase their vocabularies and strengthen their reading skills. The program concentrates on synonyms, antonyms, homophones, multiple meanings, prefixes, suffixes, and context clues. Students must match words to meanings through a series of multiple-choice questions.

Reading Comprehension, appropriate for students age 9 and up, is designed to help children learn reading skills such as recognizing main ideas, predicting outcomes, or recognizing cause and effect. The program contains 29 high-interest story and question sets.

Both programs are open-ended and can be customized. Teachers can enter their own exercises, and practice sheets and test masters can be printed.

Each program is available for the

Apple II series and for the IBM PC/XT/AT, PS/2, Tandy 1000 (and 1000TX, HX, SX, EX), 3000, 3000HL, 4000, and compatibles. The suggested retail price for each program is \$39.95.

Optimum Resource, Station Place, Norfolk, CT 06058

Circle Reader Service Number 208.

Take an Apple to Dondra

Spectrum HoloByte has released an Apple II version of *Dondra—A New Beginning*, the first program in the Questmaster Series.

The player assumes the role of Terna, the last of the Tellasian race. Terna must find the Crystal Prism of Heheutotol, which is needed to defeat the evil Colnar.

The game features over 100 pictures and more than 30 animated sequences. The quicker the character can obtain objects and complete the quest, the more experience points he or she will receive. These experience points can be transported into future Questmaster modules.

The parser accepts full sentences, multiple commands, and multiple movement executions; joystick input is also supported.

The suggested retail price for the Apple II version is \$39.95 and requires 48K of memory. Spectrum HoloByte plans to release an Apple IIGS-specific version this year with a suggested retail price of \$49.95. Commodore 64 and other versions will follow.

Spectrum HoloByte, 2061 Challenger Dr., Alameda, CA 94501

Circle Reader Service Number 209.

High Sea Adventure

Aegis has recently released *Ports of Call* for the Amiga, a game in which players must deliver goods to ports around the world while taking the least dangerous route across the Pacific, avoiding icebergs, military confrontations, and bad weather. Should the ship become damaged, the player must find a safe port to repair the vessel. The object of the game is to successfully deliver the cargo while acquiring a high price for the goods.

Suggested retail price \$49.95.

Aegis Development, 2210 Wilshire Blvd., Suite #277, Santa Monica, CA 90403

Circle Reader Service Number 210. □

COMPUTE! *specific*

**Speed Demon
PC for \$10;
PaperClip for
the 64 Grows
Up; Claris Gives
AppleWorks
Support; Help
for a Sick
AmigaDOS;
Vaccine Meets
Virus on the
Mac; ST Means
Mega Business;
and Insightful
Hints & Tips**

MS-DOS

It's finally here, the integrated package so many PC users have been waiting for—*Microsoft Works*. With applications that include a word processor, a spelling checker, a spreadsheet, a database, a communications program, and a keyboard macro processor, *Works* may be all the software many home users and small businesses will ever need.

The quality of *Works*' individual applications is outstanding. Even the weakest module, communications, is so easy to use that its lack of advanced features can be forgiven. Although most of the programs could stand on their own as respectable applications, when used in concert, the *Works* whole is definitely greater than the sum of its parts.

What makes *Works*' integration so useful is that the programs can share data with each other. All the applications share a common interface, which simplifies learning *Works*.

To get you started with *Works*, the package includes both computer-based instruction and a large manual which contains an introduction and reference section for each application. The online instruction is good, especially for first-time users, but because *Works* is so intuitive, if you've

used a computer before, you may not need the electronic tutorial.

Works' word processor, reminiscent of *Word*, Microsoft's big-league text cruncher, will probably be the most-used module in the package. In keeping with its simplicity, it has only one text window and one file buffer. Commands include all the usual cursor-movement controls, block operations, text enhancements, and so on, with one startling exception: There's no overtype mode. Although most users stay in insert mode 98 percent of their time, when you need overtype mode, it's very handy to have.

Works' word processor includes an excellent 100,000-word spelling checker (Microsoft's *Word FINDER* thesaurus is available from Microsoft as an extra) and mail merge capability. The printer support is extensive, rivaling that of expensive dedicated word processors.

The spreadsheet and database modules are intuitive and easy to use, with built-in graphing functions that make professional-looking reports both easy to generate and easy to incorporate in word processing documents.

The communications module offers one error-checking protocol only—XMODEM—but it includes an exceptionally easy-to-use script-file generator. To create an autologon file, simply tell the program you want to record and then logon to a BBS or service. The program records both the input from the telephone and your responses, and it stores the dialog in a file you can use on all subsequent connections.

One nice extra in the *Works* package is the keyboard macro processor, *MS-Key* written by RoseSoft, creators of *ProKey*. None of the individual modules offer keystroke

macros, so *MS-Key* helps round out the features of other applications.

Works is a set of tools that beginners will find easy to learn and use, and is one that advanced users will find surprisingly powerful. *Works* is available from Microsoft, 16011 NE 36th Way, Redmond, WA 98073-9717, (206) 882-8080, for \$195.

In the Fast Lane

If you're tired of waiting for files to load from your hard disk or floppies, there's Mark Williams' *Fast Forward* (Mark Williams Company, 1430 W. Wrightwood, Chicago, IL 60614, (312) 472-6659, \$69.95), a disk-caching program that can boost your disks' performance dramatically and thus increase your system's overall speed.

How does a disk cache boost performance? A cache is a TSR (Terminate-but-Stay-Resident) program that takes a portion of your PC's RAM to hold information that is most often requested from your disk. When a program needs to read something, there's a good chance it'll be in the cache. Using this arrangement, a sizable percentage of your disk reads can actually be made from super-fast RAM, rather than a slower hard disk or much slower floppies.

How much of a speed improvement will *Fast Forward* make? The answer depends on the type of software you're using, but informal benchmarks show an average speed increase of between 200 and 300 percent. These figures mean that *Fast Forward* can turn a 65-millisecond XT-class hard disk into a 25-millisecond sprinter.

Installing *Fast Forward* is easy. You simply type the pro-

COMPUTE! *specific*

gram name at the DOS prompt, or put the command in your AUTOEXEC.BAT file. The program is highly configurable, so you can custom design just the right caching philosophy for your needs.

As you might expect, the more RAM you can allocate to the cache, the more speed you'll achieve. *Fast Forward* lets you specify almost any size cache; the default is 128K. The latest version of *Fast Forward* also supports RLL-controlled hard disks and AT extended memory.

Shareware Top 10

Since the first PC shareware products appeared several years ago, this grass-roots method of product distribution has caught on with a vengeance. There are shareware products to rival the quality of their commercially distributed counterparts in almost every software category. And shareware, by eliminating the middleman, is usually much less expensive than dealer-purchased products.

What are the best shareware products? This is difficult to determine with accuracy, since different suppliers offer different titles, but Nelson Ford, president of The Public (Software) Library, a copy service specializing in PC shareware, suggests the following top ten.

"The top four are easy to choose," says Nelson. "*PC-File* is undoubtedly number 1. Close behind that are *PC-Write*, the word processor, and *ProComm*, the telecommunications program. Number 4 is *Automenu*, an outstanding DOS menu program. After that there's more room for disagreement. I'd put *PC Key Draw* on my list as number 5, and *A86/D86*, the amazingly fast assembler and disassembler by Eric Isaacson, as number 6. Next come *EZ-Forms*, a form generator, and *As-Easy-As*, an excellent 1-2-3-like spreadsheet. Finishing my list are *PC-GL/AR/PR/AP*, an accounting system, and *Family History System*, a genealogy program."

Shareware is available from many sources: user's groups, bulletin boards, the authors themselves, and copy-for-profit services like Public (Software) Library. It should be noted that when you purchase a program from a for-profit copier, you're not buying the software itself, but rather paying for the media—the disk—and the copying service. If you use the program, the shareware's author will still expect you to register the product with him or her and pay the registration fee.

You can contact The Public (Software) Library at P.O. Box 35705, Houston, TX 77235-5705, (713) 721-5205.

The \$10 Speedup

PC owners are deluged with ads for hardware that takes the garden-variety PC or XT and turns it into a speed demon. Unfortunately, most of these products cost hundreds, even thousands, of dollars. If you'd like to improve the performance of your 8088- or 8088-2-powered PC for a modest investment, however, NEC offers two chips that replace your CPU and boost speed up to 40 percent and beyond.

The NEC chips are the V20, which replaces the 8088, and the V20-8, which replaces the 8 MHz 8088-2. These chips are completely compatible with the Intel originals, but since they're more efficient, they're faster. In addition to the speed increase, the V20 chips are compatible with the 8080 instruction set, so they can be used to emulate CP/M software with good results.

Installing a new microprocessor is straightforward. All you need to do is remove your old CPU and insert the new V20 in its place. (This surgery isn't difficult, but if you're uncomfortable with the idea, get a knowledgeable friend to perform the operation for you.)

NEC says their chip improves CPU performance by 40 percent, but informal benchmarks show a best-case improvement of nearly 60 per-

cent. A new V20 won't decrease disk access times by much, but if you use a disk cache, like *Fast Forward*, discussed above, you can expect a considerable performance boost.

You can get the V20 from several sources (and pay over \$40 for it), but one supplier with a reasonable price is Jameco Electronics. You can order the chip from them at 1355 Shoreway Rd., Belmont, CA 94002, (415) 592-8097. The V20 sells for \$8.75; the V20-2 costs \$10.75.

—Clifton Karnes

64 & 128

GEOS continues to grow. It's included with the new 64C, and everyday more and more packages are being released that are compatible with it. But if it's to succeed at becoming the de facto operating system for the 64/128, it must become the system with which third-party developers and home programmers actually create software.

GeoProgrammer (Berkeley Softworks, 2150 Shattuck Ave., Berkeley, California 94704, (800) 443-0100; \$69.95), a somewhat scaled-down version of the UNIX-based development system that Berkeley itself uses to produce *GEOS* software, is here to help assembly language programmers develop *GEOS* software using the *GEOS* environment. *GeoProgrammer* provides all the tools for assembling, linking, and debugging *GEOS* applications. In fact, *geoProgrammer* consists

of three separate but integrated programs—*geoAssembler*, *geoLinker*, and *geoDebugger*. Using the package requires only *GEOS* and a knowledge of machine language programming.

The package lets you create three types of applications: sequential, VLIR (Variable Length Indexed Record), and desk accessories. You write the source code with *geoWrite* and create graphics with *geoPaint*. *GeoLinker* takes it from there, linking the files into a runnable *GEOS* application. *GeoDebugger*, as its name suggests, eases the pain of tracking down errors in your program.

Unlike most *GEOS* products, which emphasize ease of use, *geoProgrammer* has only the programmer in mind. If you're considering buying it, start by reading the back of the box. Then, if the description "extensive macro facility with nested invocation and multiple arguments" has you in a state of uncontrolled euphoria, this is probably the product for you. If you can't understand the box at all, you should probably come back to *geoProgrammer* later.

Exotic Games

Spectrum HoloByte has initiated an exciting International Series of recreational games. Spectrum looks for exciting games by foreign programmers, puts some finishing touches on them, and releases them here.

There are currently four titles available for the 64: *Tetris*, a challenging moving-puzzle game from the Soviet Union; *Soko-Ban*, a game of strategy from Japan; *Intrigue*, an interactive mystery from America, with Washington, D.C. as the locale; and *Zig-Zag*, a English-made space adventure.

According to Spectrum's president, Phillip Adam, other titles will be added soon. If future games are anything like *Tetris*, they'll be worth waiting for.

Spectrum HoloByte can be reached at 2061 Challenger Drive, Alameda, California 94501; (415) 522-3584. ▶

COMPUTE! *specific*

A Better PaperClip

Even in its original incarnation, *PaperClip* was a superb word processing package. Arriving fairly early in the 64's career, it instantly set the standard by which all 64 word processors were judged. Some word processors had better individual components (such as spelling checkers), while others looked prettier on the screen, but none had the features or the sheer reliability of Batteries Included's groundbreaking product.

PaperClip II added a number of features, but soon after its release, the Batteries Included line was picked up by Electronic Arts. The much-awaited *PaperClip Elite* (for the Amiga and the Atari ST) disappeared from production, and *PaperClip* itself seemed to have seen its last upgrade. Happily, though, Electronic Arts saw fit to improve an already fine product, and *PaperClip III* brings one of the 64's most important products back onto the market.

PaperClip III comes with a 190-page manual and two disks. One disk contains the 64 version of *PaperClip III*; the other disk holds the 128 edition. This means that 64 users who have upgraded to the 128, and who have kept the 64 sitting around, actually receive two separate products.

The 128 version makes use of that machine's capabilities, allowing text entry in 80 columns and previews of 50 lines per screen, an easier and faster interface, and several additional features. It also supports the 1750 RAM expansion, especially useful with the spelling checker. It even provides a feature, in Telecommunications mode, that eliminates the Return markers from the end of lines of text received over a modem.

For the most part, though, the 64 and 128 versions are the same, allowing you to move from one to the other easily. *PaperClip* now has a series of menus, accessible with the function keys, which allow you to control such things as modes, printer drivers, screen colors, modem settings and protocols, and page formats. Formatting commands, disk

commands, and so on can still be controlled directly from the keyboard, though, and experienced *PaperClip* users will rarely use the menus at all. For beginners, however, the menus are a big help.

Very little is missing from *PaperClip III*. The program still needs a bit more cursor flexibility, indexing and footnoting features would be extremely useful, and the telecommunications subprogram could use different terminal emulations. Apart from these, there's not much to complain about. *PaperClip III* follows nicely in its predecessors' footsteps.

Paperclip III is available from Electronic Arts, P.O. Box 7530, San Mateo, California 94403 for \$49.95. Owners of previous *Paperclip* versions can upgrade to *Paperclip III* for \$15.

The New 128D

The 128, like the 64, has always had one problem: Despite its relatively small size, it takes up too much desk space. This problem isn't really the fault of the computer itself; instead, it's the fault of its peripherals. The monitor and the disk drive seem to fly out in all directions, connected to the system unit by a maze of wires that look sloppy and always seem to get in the way.

Enter the Commodore 128D, the newest addition to the 64/128 line. It combines the 128 with a 1571 drive inside an attractive box on which the monitor can rest. This frees the keyboard, which attaches to the side of the unit and can be moved around easily. It also eliminates the need for a monitor stand, and it relegates most of the wires to the back of the unit. In other words, it's more like an Amiga 1000 or an IBM-PC.

Commodore has taken the opportunity of the 128D's release to enhance a few things. Specifically, the internal 1571 drive has eliminated the earlier 1571's bugs, and the video memory has been expanded to allow more impressive graphics. Add to this the new support

of the 3½-inch 1581 drive in CP/M mode, and you have some significant changes. The necessary ports line the box, with only the 1571's external dip switches missing.

But the biggest improvement is in the computer's ergonomics. Not only does it take up less space than the earlier versions, it also "feels" better. The keyboard can now sit on your lap as you type (an absolute must for many people), and it seems much crisper than the earlier 128's keyboard. There's no longer a need to clear the disk drive's slot of papers and packages in order to insert or eject a disk, and there's also no temptation to pile things on top of the drive. Finally, the 128 looks like a serious computer.

The 128 has always been an impressive, if somewhat overlooked, machine. With the coming of the 128D, it's even more impressive, and it's demanding to be taken seriously. This can only point to a strong future.

GeoCompatibility

There seems to be some confusion about the compatibility between *GEOS128* and *GEOS*. According to Berkeley Softworks, *GEOS128* will run most *GEOS* applications that were originally released for the 64. *GeoFile* and *GeoCalc* won't run, but *Deskpack*, *geoWrite Workshop*, and the new *geoPublish* will. *GeoProgrammer* had some initial problems running under *GEOS128*, but these apparently have been corrected.

What this means is that you can upgrade to a 128 or 128D and use *GEOS128* without losing access to your *GEOS* library, except for *geoFile* and *geoCalc*, which you must upgrade to the 128 versions.

Two *GEOS* products due to be released soon are *geoNet* (a LAN, or Local Area Network, that links 64s and IBM PCs) and *geoBASIC*. Whether *geoBASIC* will be compatible between the 64 and 128 is an interesting question that remains to be answered.

— Neil Randall

APPLE II

Mean 18, a golf game/simulation from Accolade, is one of the best-playing games for the Apple IIGs (see last month's "Our Favorite Games"). With representations of actual courses and such features as great graphics, club selection, and realistic putting greens, *Mean 18* is a superb mimic of hitting the links.

The program even includes a golf course architect for creating new courses from scratch or adapting existing fairways, greens, and hazards. Trading courses is a lively pastime among dedicated *Mean 18* players. You don't have to look too far to find home-grown courses listed on the major information services like CompuServe, Dephi, The Source, and Genie.

But downloading courses still meant you played alone. Until now, that is. GENIE's Apple II Round Table (GENIE's name for its Apple-specific forum) is starting its first Apple Golf Association (AGA) tournament.

The AGA works like this. You join the Association by entering one of its tournaments, the first of which closed March 18 (don't worry, there are bound to be more). Various formats will be used for the tournaments, which are played on courses downloaded from GENIE's Apple II software libraries. Biweekly reports are made on each member's status and handicap. Scores are reported to the AGA secretary and include information about the course played, a hole-by-hole record of your score, the longest drive, and the number of birdies.

The opening tournament

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was a team effort, with players assigned to teams as they signed up, and it used a two-best ball format. That meant the team's two best balls were counted for the score on each hole.

The tournament was a 54-hole contest played on three courses downloaded from GENIE. The Jacksonville Naval Air Station, Pine Valley, and Virginia Beach's Oceana Naval Base golf courses were available in the software libraries; players retrieved them, placed them on a *Mean 18* disk, and played. The last two courses were, in fact, taken from the Atari forum and modified for the Apple IIGS.

And what would a golf tournament be without prize money? Though it's not in the same league as the PGA, GENIE's AGA is sweetening the pot by putting free online time up for grabs.

To sign up on GENIE, call 1-800-638-9636; the registration fee is \$29.95, and online fees are \$5/hour at either 300 or 1200 bps.

AppleWorks Help

Claris, Apple's new software-only offshoot, is officially on its own now. Their ads have been impossible to miss in the Apple-specific magazines, as well as major publications like the *Wall Street Journal* and the *New York Times*.

What does all this mean for *AppleWorks*, the one Apple II product that Claris has?

More attention, from the look of things. As a software publisher, Claris must pay attention to its customers just as any other publisher who wants to be successful must. That means upgrades, support, and more support. Claris seems to be on the right track with *AppleWorks*.

AppleWorks 2.0 has been available for some time, and though it has some problems, its mail-merge facility and the fact that *Timeout*—probably the best collection of *AppleWorks* add-ons ever—only works with 2.0 makes it a must-buy. Claris picked up the upgrade from Apple and is continuing the \$75 price tag

for moving up to 2.0 (first-time full price for 2.0 is \$249).

Support will be more important to most *AppleWorks* users. This is something Apple never provided, a service that was often desperately needed and which had to be filled by friends, user groups, or publications. Now, however, registered owners of *AppleWorks* can call Claris Technical Support at (415) 962-0371. Staffed from 6 a.m. to 8 p.m. PST Monday through Thursday, and from 6 a.m. to 3 p.m. and from 5:30 p.m. to 8 p.m. Friday, Technical Support will try to handle your *AppleWorks* problems.

You don't have to be a registered user of *AppleWorks 2.0* to make use of Claris' support staff. According to Bob Gafford, director of support, Claris is "committed to the installed base [of *AppleWorks* users]." When you call Technical Support, you're not asked for a registration or serial number, although Gafford said that they'll want your name for their files.

From 8 to 14 support staffers man the phones, each sitting in front of a Macintosh and Apple II computer. There won't be any *AppleWorks* specialists, at least not initially. Instead, each person will be able to field questions on the entire Claris line.

"We're extremely committed to providing support to our customers," said Gafford. "We want to use support to let our customers know we care about them."

Fast Disk Copies

Shareware software is an interesting concept, one that promises much but sometimes doesn't deliver. The idea is that you pay for the program only after you have a chance to try it out, usually for 30 days or so. The programmer also benefits, because he or she doesn't have to resort to traditional distribution channels or find a willing publisher. Users spread the shareware software by giving it to friends or downloading it from bulletin boards or information services.

The quality of shareware

varies widely. Some shareware is good, some is only passable, and some isn't worth the time it takes to load it from disk. One of the best shareware programs, one that every Apple II owner should have, is *Diversi-Copy*.

Diversi-Copy is a fast, efficient disk-copying program which makes use of all available RAM to duplicate disks as quickly as the hardware allows. The program is especially useful to Apple owners who have only one disk drive, the people who normally wrench their wrists swapping disks when copying. *Diversi-Copy* copies unprotected 5¼- and 3½-inch disks by reading as much of the disk's information as possible into RAM. On a 128K Apple, for instance, *Diversi-Copy* will copy a completely filled disk in two passes (that's two reads of the source disk and two writes of the destination disk). An Apple IIGS can copy a full disk in only one pass.

You don't even need to format a blank disk before copying; *Diversi-Copy* formats as it writes to the destination disk. Another feature is its ability to mass-produce copies—the source disk can be held in memory (or as much of it as will fit), then be duped onto as many disks as desired.

Diversi-Copy is particularly attractive to Apple IIGS owners; though many have two drives, one is normally a 3½-inch while the other is a 5¼-inch disk drive. Copying a 3½-inch disk with one drive is an excruciating process of constantly swapping disks, sometimes for up to ten minutes.

Diversi-Copy can be found on many bulletin boards, in user group software libraries, and from its publisher—DSR, 34880 Bunker Hill, Farmington, Michigan 48018-2728. If you keep the program, you're obligated to send \$30 to DSR; for that price you become a registered user. You'll receive the latest version and technical support (though you probably won't need it).

If you own an Apple IIGS and at least one 3½-inch disk drive, make a point to look for DSR's *Diversi-Cache*. You'll need a minimum of 512K in the IIGS, but a megabyte does

much better. The first time a disk block is read when *Diversi-Cache* is active, the data is stored in RAM. All successive reads of this information are lightning fast, since the data is being retrieved from RAM, just as if it had come from a ramdisk. *Diversi-Cache*'s shareware fee is \$35.

Next Slide, Please

Does the term *desktop presentation* mean anything to you? It should, for it's been a catchword at Apple for some time now.

The Apple II line has been making inroads into traditionally Macintosh areas such as desktop publishing, so why not into presentations? Perhaps that's the very question the folks at Brøderbund asked when they decided to publish *ShowOff*, an Apple II presentation tool that just hit the stands (Brøderbund, 17 Paul Drive, San Rafael, California 94904; \$59.95).

Like a lot of Apple II software on the cutting edge, *ShowOff* is specifically for the IIGS. The IIGS's graphics interface, so much like the Macintosh's, makes it a perfect platform for sophisticated and graphics-intensive software.

With *ShowOff*, you can quickly make custom screens built from scratch (the hard way) or by pulling in bits and pieces from the provided borders, backgrounds, and artwork (much easier). Anything from charts and graphs to snappy title pages can be put together in the now-standard IIGS paint program-like interface. Once you've made your masterpiece, you can print it to ImageWriter or LaserWriter on paper or, if you're planning on using an overhead projector to make your presentation, on acetate. To really be on the electronic edge, you can use the computer as a slide projector, showing the screens one by one. *ShowOff* also makes it possible to use the IIGS as a driver for a traditional slide projector for a truly multimedia approach.

— Gregg Keizer ▸

COMPUTE! *specific*



If you've ever waited on your Amiga's disk drive, you'll appreciate *Facc II*, a "floppy accelerator" from ASDG.

Facc II is a disk cache. As you use your computer, *Facc II* monitors your use of the disk drive (or drives) automatically. You tell *Facc II* how much of your system's memory it's allowed to use, and the program does its best to keep the most commonly referenced information in memory. *Facc II* knows all about the structure of an AmigaDOS disk, so it does a better job than its predecessor, *Facc*.

AmigaDOS gurus should be familiar with AddBuffers, AmigaDOS 1.2's built-in disk-caching mechanism. *Facc II* is far superior to AddBuffers, which uses up valuable "chip" RAM and keeps a death-grip on its buffers until a reboot. With *Facc II*, you can free up old buffers or allocate new ones with a few mouse clicks (or CLI commands).

If you've had your eye on a hard drive, but just can't stomach the price, try *Facc II*.

Facc II, ASDG, 925 Stewart St., Madison, WI 53713, (608) 273-6585.

AmigaDOS Cure

AmigaDOS is the weak link in the Amiga's software. Written in BCPL, a precursor of C, its strange structures have always given Amiga programmers trouble. A grass-roots movement sprang up to solve the problem. The AmigaDOS Replacement Project was born.

ARP comes in two parts. The first, *arp.library*, is placed into the *libs* directory on your boot disk. The other part of ARP consists of new commands to replace the ones in your *c* directory.

The ARP commands are smaller, faster, and more versatile than the old AmigaDOS commands. The asterisk (used on virtually every computer but the Amiga) is supported as a wildcard in filename searches, as are the powerful AmigaDOS wildcards. A standard file requestor is included in *arp.library*, as are several useful subroutines.

How will ARP help average Amiga users? Since ARP commands are much smaller than their AmigaDOS equivalents, you'll have more space on your disks. If you commonly load commands into the ramdisk, you'll have more free RAM. Another benefit is that you can expect to see smaller and more robust applications programs from the companies that use ARP.

The developers of ARP have worked closely with Commodore, and have offered to let Commodore use ARP free of charge. There are hopes that Commodore will use ARP on future Workbench disks and even put the *arp.library* in ROM. ARP is currently in the public domain. It can be found on CompuServe and other bulletin boards. Complete documentation is included.

What's next for ARP? That depends only partly on Commodore's willingness to use it. Regardless of Commodore's decision, the developers have made it clear that ARP will be supported. A CLI replacement is possible, as is a Workbench replacement. The DOS and filehandler code may be replaced. If Commodore doesn't use ARP, a user's and programmer's book may be written.

Required Reading

Because of its powerful features, the Amiga can be a tricky computer to program. With the right books, the job is much easier. Here's a quick

look at the books that can help the serious programmer get started (or unstuck).

The Amiga Technical Reference Manuals is a set of four manuals published by Addison-Wesley which cover the Amiga's hardware, Exec, Libraries and Devices, and Intuition. These are the official Commodore manuals. While sometimes criticized as being uneven and difficult to understand, they're generally well written and helpful. In addition, many of the following books assume that you have these four manuals, so it's difficult to program the Amiga without them. *Libraries and Devices* costs \$34.95. The other three are priced at \$24.95 each.

Programmer's Guide to the Amiga, written by Rob Peck and published by Sybex, demystifies the Commodore Manuals. Rob Peck, who worked on the Commodore manuals, was in the perfect position for the job. The book is clear and accurate, with plenty of C language programming examples. The price is \$24.95.

Sybex also publishes the two-volume *Amiga Programmer's Handbook* by Eugene P. Mortimore. *Volume 1* covers graphics, Intuition, and Exec. *Volume 2* discusses the Amiga devices (for example, the Audio Device, the Console Device, and the Gameport Device). Each volume is \$24.95.

Howard W. Sams & Co. publishes *Inside the Amiga* by John Thomas Berry. This is an excellent book for experienced programmers who are new to the Amiga. The examples are written in C. Graphics, sound, speech, and AmigaDOS programming are among the topics covered. The book is priced at \$22.95.

If you want to program the Amiga's graphics system, Sheldon Leemon's excellent *Inside Amiga Graphics* (published by COMPUTE! Books) shows you how. It covers everything from screens and windows to animation. The price is \$16.95.

Sheldon Leemon and Arlan Levitan collaborated on *COMPUTE!'s AmigaDOS Reference Guide*. It is clear and well organized, covering every aspect of AmigaDOS in detail. Be sure to buy the edition of

the book that covers version 1.2 of the operating system. The price is \$14.95.

The total price for all these books is \$235.50. Not a bad price for a peripheral that will help you program your Amiga.

Top Speed

There's been a lot of discussion lately about the relative speed of the three Amigas. The Amiga 500 and 2000 have been accused of being slower than the 1000.

The Amiga uses two types of memory. The first is known as *chip RAM*. This is the first 512K RAM of memory. Expansion memory above 512K is known as *fast RAM*, because it cannot be controlled by the special video and audio hardware in the Amiga. In certain situations, programs in fast RAM run slightly faster than those in chip RAM.

The Amiga 2000 comes with one megabyte of RAM. The Amiga 500 can be easily expanded to one megabyte. The problem is that this second 512K of RAM is not true fast RAM.

If your Amiga 500 or 2000 has more than one megabyte of RAM, you can make it run as fast as an expanded 1000 by adding the command *slowmemlast* to your startup-sequence file. This reorders the memory list to give the true fast memory top priority. This program can be found on the Workbench disk shipped with your computer.

No More Gurus

GOMF! 2.0 is a program that intercepts the dreaded Amiga Guru message which shows up when your Amiga crashes. *GOMF!* lets you "whap" away windows and "nuke" runaway tasks. It's easy to install from CLI or Workbench.

GOMF! 2.0 (\$39.95), HyperTek/Silicon Springs, #120-1140 Austein Ave., Coquitlam, B.C. Canada V3K 3P6, (604) 939-8235.

—Rhett Anderson

FullWrite. At last, the final chapter of Ann Arbor's *FullWrite* story: They sold it. Not to users, but to another company.

Ashton-Tate bought the long-awaited program so its lineup of Macintosh offerings would include a word-processor, a spreadsheet, and a database. Somehow it seems fitting that Ashton-Tate would take over the notorious nonshipping word processor: Its Mac spreadsheet program has been under development, and under tight wraps, for as long as *FullWrite*.

ImageWrite LQ. As I write this, there's a severe shortage of ImageWriter LQs; Apple says that the unexpected high demand for the LQs has caused the shortage. The problem should be resolved by the time you read this, with backlog orders filled and current orders able to be handled.

Another LQ problem was also speedily solved: *Word 3.01* wouldn't work with the printer. A special, free update for LQ owners is available from Microsoft. Call Microsoft and ask about *Word 3.02*.

Macs and DEC's. A few years ago it would have seemed an incredible combination, but the Macintosh made a major showing at New York's DEXPO, DEC's trade show. *Connectivity* is a buzzword this year, and you can, indeed, access a VAX with your Mac. (Most of us knew that all along.)

TI's Macintosh. Apple and TI have teamed up to make the microExplorer, a Macintosh II with a TI LISP machine on a board. Priced at \$14,995, it's the lowest-priced Artificial Intelligence workstation.

Virus and Vaccine

Here's what might be a new word for your collection of computer lingo: *virus*. More than a bug and not quite a worm, it's a type of Trojan Horse. Does that explain it?

A computer virus is a little program that's usually buried in another program; when you run the "host" program, your computer system catches the virus. (That's why it's more than a bug, which stays put as a mistake in a specific program.) Depending on what the strain of the virus is, your computer can start acting up because its operating system has been infected.

A specific Macintosh virus surfaced in mid-February; it was attached to a *HyperCard* stack that was posted on CompuServe. The virus was cooked up by a company called MACMAG; it was a seemingly harmless "world peace" message programmed to pop up on the Mac on March 2, the anniversary of the introduction of the Macintosh II. No one's objecting to the message, just the medium.

In reply, we now have a vaccine. Don Brown, of CE Software (who provide such terrific programs as *MockWrite* and *Calendar Maker*) wrote *Vaccine* and posted it on the electronic services. All you have to do is put its icon into your system folder. *Vaccine* is free. You can download it from CompuServe or GENie, or you can ask around at a user group meeting; someone's bound to have it.

New Macs?

Rumors continue to abound about Apple's laptop Mac. There are so many rumors that some are bound to be correct. The general consensus is that it won't be announced, introduced, or available until 1989; Apple doesn't seem to be satisfied with current screen technology. Best guesses on the specs: a black-on-white screen (what else?), a 20-meg internal hard drive, an internal modem, and the new 1.4-meg

floppy drive. The price will hover around \$4,000. What about those of us who want the portable only for occasional traveling and business trips? I don't need another 20 meg drive, especially in a machine that will sit unused next to my desk Mac most of the time.

Now, balance those rumors against Sculley's insistence that no new Macintoshes will be introduced this year and against reports that there are over 100,000 LapMacs sitting in storage already, waiting to be shipped.

It's anybody's guess what Apple's midrange Mac is going to be. You probably think it's the SE, with the Plus on the bottom and the II on top. That's not it, because the Plus won't be around much longer. (Not that Apple has admitted the inevitable yet.) With the Plus gone, there needs to be a machine between the SE and the II, because there's too much of a performance and price gap between them. Will it be a souped-up SE or a stripped-down II?

Draw and Paint

Aldus (publisher of *PageMaker*) is no longer a one-trick pony. While they were the first to realize the importance of page layout on the Mac, it was Adobe that set the standard for high-end graphics on the Mac with *Illustrator*. Aldus' *Freehand* is now shipping. For \$495, you can get the new color drawing program that provides advanced drawing tools such as those required for Bezier curves. *Freehand* runs on the Mac Plus, SE, and II.

The new *MacPaint* started shipping from Claris in February. It's significantly enhanced from the original version, and it has a few very special features, but not enough to warrant the long wait and new price of \$125. No paint-only program can be worth that much in these days of combined bitmap/object drawing programs.

MacPaint has *HyperCard*'s tear-off menu palettes for the tools and patterns. You can now rotate and flip lassoed selections as well as those in-

side a rectangle, and you can have up to nine windows open at once.

MacPaint's main innovation is its Snapshot feature. At any time, you can take a "snapshot" of the current document, which is then stored in memory. You can revert to the snapshot at any time. This is a step beyond the old Revert command which took you back to the last version you saved on the disk. Then, there's the Magic Eraser. You use it to get down to the Snapshot version only in the parts of the document you rub with the eraser.

There are other enhancements: a draw-from-center option for shapes, a mouse-coordinate window, and a scale command. But, there's nothing much we haven't seen before in other drawing programs.

MacPaint is nice, even elegant, but not worth its price tag.

More Tips

LivingVideoText's *More* is still the outliner of choice for those who do a lot of outlining. Here's a short collection of tips to get more from *More*.

- Use triple-clicking. Not many programs take advantage of this Macintosh interface option, but *More* does. A triple-click in an outline selects the entire headline. A triple-click inside a document window selects a whole sentence.
- When you're building a tree chart, you can force a line break in a headline by typing a vertical line character (the one on the backslash key). That way, you can get multiple lines of text in a single tree box to break exactly where you want them to break.
- To put an empty box in a tree chart so you can fill it in later by hand, put a blank headline in the outline (just press Return).
- To make underlines in the tree chart instead of boxes, use the Tree Size command and collapse the box down to a single line by dragging the top edge down to the bottom edge.
- When you don't want to leave the keyboard, but you want to open and close docu-

COMPUTE! *specific*

ment windows, use Enter to open and close the window for the current headline. Shift-Enter opens (and closes) a full-size document window.

• Need a word count? Use the Search command and type:

[a-z][a-z][a-z]*

in the Find box. Put nothing in the Replace box. Check the Whole Word and Match Pattern buttons, and click Find All. You'll get the number of words that are three letters or longer. You can count up the entire outline by selecting the Home headline before you do this. Or, count any part of the outline by first selecting any headline; all its subheads, and all the document windows in that portion of the outline, will be included in the count.

— Sharon Zardetto Aker

ATARI ST

Now that the Atari Mega ST is available, there is at last an Atari machine which can successfully penetrate the business market. The Mega is especially attractive to small businesses with limited budgets, since it packs power, lots of memory, and an easy-to-learn control system into a relatively low-priced package. Small businesses tend to have small budgets and limited numbers of employees, so these features can be very important.

Another consideration is the availability of business-oriented software. Not only is there a sufficient number of packages now (at last count, 7 spreadsheets, 11 databases, and 6 word processors), but

some of the packages have been around long enough to have been revised and to be nearly bug-free. Furthermore, there are packages which work identically to (and can even share data with) some of the most popular packages for the IBM PC—and they cost a lot less. Programs which can share data are: *VIP Professional* (similar to *Lotus 1-2-3*), *DBMAN* (similar to *dBASE III+*), and *WordPerfect* on the ST.

Dead BASIC?

What if they gave away a BASIC and nobody paid?

A strange question, but that's what seems to have happened with *DBASIC* from DTack Grounded Company. *DBASIC* is (was?) an extraordinarily fast BASIC, which ignored the ST trappings (menus, mice, dialog boxes, and so on) and even needed its own operating system to run (it couldn't live with TOS). It had its own disk format as well, making it a self-contained environment, separate from anything else for the ST.

In what must be one of the strangest marketing schemes ever conceived, a large number of copies of both the disk and manuals were mailed to magazines, user groups, and free-lance writers. DTack actually encouraged people to share copies of the language. They even printed up disk labels that could be put on the copies. Not many people paid for *DBASIC*; it just didn't fit in well in the ST environment. The language is no more; it reportedly sold only 70 copies at \$40 each.

ST Bookware

Sheldon Leemon's latest books on the ST are must reading for anyone who is interested in programming or in learning what makes these machines tick. The books are the first two volumes of *COMPUTE!'s Technical Reference Guide*,

Atari ST. The first book covers the VDI (Virtual Device Interface). The second discusses the AES (Application Environment Services). The books are \$18.95 each.

The books are similar in format. Each begins with a chapter that addresses the various things you can do with either the VDI or AES. Samples in assembly language, ST BASIC, and C show you how to go about calling the system routines. It's nice to see such helpful examples. The following chapters discuss different topics (like text, and drawing points and lines), again with excellent examples and lucid explanations. If you'd like to use dialog boxes, graphics, windows, and menus, you'd be hard-pressed to find a better set of books. The books end with detailed reference sections which list each function, complete with inputs, results, opcode numbers, and short descriptions.

There are some inaccuracies in the books, but far fewer than in any of the previous reference books that discuss these topics. It is obvious that a tremendous amount of work went into these books. *VDI* and *AES* manage a difficult task—making an operating system interesting.

Play a Game

Oids is a great game. The newest offering from FTL Systems, it follows in the footsteps of such worthy predecessors as *Sundog* and *Dungeon Master*. It's FTL's first arcade-style game, and it's a winner.

In *Oids*, you pilot a small spacecraft above a series of planets. The object is to maneuver the spacecraft above the planet surface and land at certain spots to pick up hostages and return them to a mother ship. Piloting the ship is reminiscent of *Asteroids*: You must rotate the ship to point in the direction you want to go and use your thrusters to increase and decrease your velocity. You must deal with gravity, and landing on the surface while traveling too fast will make you crash.

The surface of the planet contains many natural (such as caves, rocks, hills) and man-made obstacles. The man-made obstacles have a nasty tendency to shoot at you or try to suck your ship down to its doom. You can shoot back with two types of weapons—an unlimited cannon and a much more powerful gun which can take out obstacles the cannon can't touch. You have only limited ammunition for the big gun, however, and you can only get more shells by returning to the mother ship when you've collected eight hostages. Your ship also has a limited fuel supply, which can be replenished by landing next to a fuel dump, and shields, which can only be used for a short period of time. The shields can be recharged, but it costs fuel.

To collect hostages, you must blast open a structure on the surface. When you do, the hostages start moving about. Then you must land and wait for them to climb aboard. This section of the game is reminiscent of *Choplifter*.

The graphics and sound of *Oids* are excellent, but this game really shines in playability. There are several universes you can rescue hostages from, each progressively harder than the last. You can finish this game, get your name in the high scores, and then move on to the next universe. A tremendous amount of testing obviously went into the universes, since you can survive for quite awhile in the early universes. Once you do die, the game even lets you practice against the last planet you were playing (starting out with all four of your ships).

Once you tire of the built-in universes, you can build, play, and save your own using the included editor. It's easy to use: You simply move around the planet surface, pasting down any of the various items available, including rocks, gun emplacements, and hostage barracks. In fact, you can even edit the built-in universes to make them easier (always a temptation). *Oids* is available from FTL, 60 Lusk Boulevard, Suite SC206, San Diego, CA 92121, (619) 453-5711, for \$34.95.

— David Plotkin □

hints & tips

Q Write a Game

Is it possible for me to develop my own games for the Commodore 64?

James Giambostiani

Yes, it is. You can use the built-in BASIC programming language to write your own games. You'll need a good book on programming in BASIC; there are many available. BASIC works just fine for adventure games, word games, and other text-related games. COMPUTE!'s Guide to Adventure Games tells you how to design, write, and play adventure games.

If you're thinking about programming an arcade-style game, you'll find that BASIC is too slow. In that case, you'll have to learn machine language. Since machine language is the computer's native tongue, it executes very quickly. Virtually all commercial games are written in machine language. If you'd like to see how programmers write machine language games, get a copy of COMPUTE!'s Machine Language Games for the Commodore 64.

If you're not up to the challenge of writing a whole game from scratch, several commercial games allow you to customize them. These "construction set" games (including Electronic Arts' Pinball Construction Set by Bill Budge) give you a taste of game design.

Q Apple Lockup

A friend and I use an Apple computer every day of the week in my math teacher's class. We would like to know what POKE statement causes a system lockup when you use the CTRL-RESET function.

Can you send us this information through the mail.

not through the "Hints & Tips" section of your magazine, please?

Michael Maguire

Sorry to blow your cover, Michael, but don't worry—we get several letters like yours every year. The Apple II's reset vector is located at addresses 1010 and 1011, stored in low-byte/high-byte order. Address 1012 must contain the result of the high byte exclusive ORed with 165. You can put the address of any routine you'd like in 1010/1011 and that routine will be called when the CTRL-RESET key combination is pressed.

As a general rule, it's easy to get microcomputers to lock up. Everyone's had the experience of having their computer go to never-never land just when they need the machine the most. It's a frustrating experience most people don't enjoy. The real challenge with micros is to keep them from locking up.

Q 128 Autoboot

I have a Commodore 128 computer. How can I create a BASIC or machine language program that will boot automatically each time I turn on my computer?

William Zhang

Each time you turn on your 128, it reads the first three bytes of sector 0, track 1 of the disk in the drive with device number 8. If it finds a special signature code—the letters CBM—it looks for the filename of a program to load and run. To make a program autoboot, you need to insert the CBM code and the filename of the program you want to run in the boot sector.

If you have a 1571 disk drive, the easiest way to do this is to use the "Autoboot" program that comes on the 1571's Test/Demo disk. It will automatically configure a disk to load and run any program you specify. Since the Autoboot program will need to use sector 0 of track 1, it's best to run the program on a freshly formatted disk.

If you're using a 1541 with your 128, there's a short program called "Autoboot Maker" on page 234 of COMPUTE!'s 128 Programmer's Guide that will do the same thing for you.

Q Pascal for the 64

I have a question about software for my Commodore 64, and you seem the best source for my answers.

I would like to know if there is a Pascal available for the 64. I am an intermediate programmer in Pascal and would like a full-functioning Pascal. Is there such a product? If there is one, where can I buy it?

Curtis Alles

You're in luck. There are three good products available:

- Oxford Pascal, Progressive Peripherals, 464 Kalamath Street, Denver, Colorado 80204, (303) 825-4144. The 64 version is \$29.95, and a 128 edition is also available for \$34.95. Include \$3 for shipping and handling.
- Super Pascal, Abacus Software, 5370 52nd Street, Grand Rapids, Michigan 49508, (616) 698-0330. Both 64 and 128 versions are available for \$59.95 plus \$4 shipping and handling.
- Kyan Pascal, Kyan Software, 1850 Union Street #183, San

Francisco, California 94123, (415) 626-2080. Both 64 and 128 versions are available for \$69.95.

Q Positively Square

I own an IBM compatible and I am having a problem with a program which finds the square root of an expression. More often than not, the expression is negative, and I get an error when I take the square root with the SQR function. Recently, I found out that you could find the square root of an expression by raising it to the one-half power. I tried this and still got an error. What is the problem?

Shane Evans

The problem is that you simply can't take the square root of a negative number. Consider what a square root is: It's the number that multiplied by itself gives the original number. There are two square roots of 9—3 and -3. You'll get 9 when you multiply 3 times 3 or when you multiply -3 times -3.

Now, try to find the square root of -9. You can't do it. No matter what number you multiply by itself, you won't get a negative number. You may want to look closely at your expression to find out why it is negative. It may be faulty.

One solution is to use the ABS function to make the expression positive before you try to take the square root of it. This makes perfect sense for expressions of distance, which can always be thought of as positive, but may be expressed as negative to show direction. □

buyer's guide

Flight Simulator Software

Only with a personal computer can you soar like an eagle or plunge like a peregrine, all from the comfort of an armchair firmly planted on the ground. Whether you're seeking out an aerial enemy or just sightseeing from the stratosphere, there's a flight simulator package listed in this buyer's guide that can take you to new heights of electronic fantasy.

Ace of Aces

Accolade
Commodore 64
\$29.95

A flight simulator based on the R.A.F. Mosquito fighter bomber, this game contains four missions which can be affected by storm clouds and enemy fighter planes.

A.C.E. UXB

Spinnaker Software
Commodore 64
\$19.95

In *A.C.E.*, the Air Combat Emulator, the pilot goes up against other airplanes, tanks, and ships. *A.C.E. II* is also available for two players.

Acrojet

MicroProse
Commodore 64
Joystick required
\$24.95

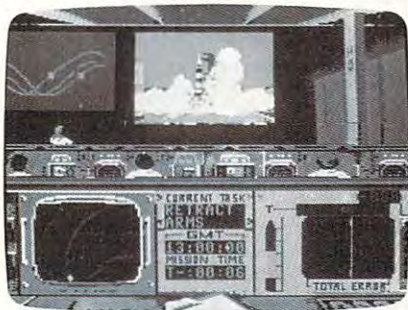
One to four players compete in the decathlon of sport aviation for the title of world's greatest sports pilot. Each player flies a BD5-J sports jet through Immelmans, precision loops, rolls, and inverted ribbon cuts. The program provides 3-D graphics and complete instrument displays.

Airsim-3

Mind Systems
Apple II
48K, joystick required
\$44.95

Pilots learn to take off and land, then fly up the coast of California to San Diego, San Francisco, Long Beach, Santa Barbara, and other flying fields. Aerobatic maneuvers which can be performed include loops, stalls, and rolls. Pilots can also practice flying

with various navigational instruments and set up their own approaches to airfields. The screen displays either a horizontal situation indicator (HSI) or VOR. The package includes approach templates for the California ILS approaches.



Engines started, and, with six seconds until liftoff, *Apollo 18* puts you in mission control and the capsule on missions to the Moon.

Apollo 18: Mission to the Moon

Accolade
Commodore 64
\$29.95

Users can recreate any of the original moon missions of the 1960s, assuming both the role of astronaut and that of mission control specialist. A series of tasks must be performed in order to complete the mission. The program features digitized voice and sound.

B-24

Strategic Simulations
Commodore 64, Apple II, IBM PC
\$34.95

This game simulates 19 World War II missions flown by the 406th Bombardment Group to the Ploesti, Romania, oil fields. Players carry out the duties of the pilot, copilot, navigator, engineer, and bombardier, setting the flight path, speed, altitude, and bomb drop points. Variables include engine performance and accuracy of bombing, as well as random weather conditions. The instrument panel indicates altitude, vertical speed, heading, airspeed, and degree of bank/turn and pitch.

Chennault's Flying Tigers

Discovery Games
Apple II series, Atari
48K required
\$29.95

Players can fly a P40 Tomahawk, P38E Lightning, F2A Buffalo, or one of 15 other aircraft from the World War II era. Each simulation is played in real-time animation and duplicates the firepower, maneuverability, rate of climb, speed, sturdiness, and diving ability of the original planes. The flights simulate air combat over China and the Pacific from 1937 to 1942.

Chuck Yeager's Advanced Flight Trainer

Electronic Arts
Apple II, Commodore 64, IBM PC
64K (Apple); DOS 2.0 or higher required (IBM)
\$29.95 (Apple); \$34.95 (64, IBM)

Computer pilots can learn to fly like General Chuck Yeager, testing new aircraft and performing death-defying stunts. In three levels of instruction, the program explains the basics of flying, such as taking off and landing, advanced maneuvers such as aileron

Caroline D. Hanlon

buyer's guide

rolls and hammerhead stalls, and formation and stunt flying at mach speeds. A test pilot option offers 14 different aircraft—with authentic aircraft evaluation charts—for test flying. A super-fast frame rate helps simulate mach-speed flight, and graphics are shown in three dimensions.

DC-10

MichTron
Sanyo, IBM PC
196K required
\$39.95

The DC-10 is a commercial aircraft with wingspan of more than 155 feet, a cruising speed of 580 mph, and a payload capacity of more than 100,000 pounds. The game *DC-10* simulates flying this plane in and around Europe to six major airports. The instrument panel offers more than 30 readouts, and navigation is supplied by radio aids and VOR beacons. Wind effects and engine emergencies are included in the simulations. The illustrated manual contains instructions on reading the instruments, operating the game, and flying techniques.

Deep Space—Operation Copernicus

Sir-Tech
Commodore 64
\$39.95

Players become the pilot of a Katana war vessel and can choose between four missions to test skill and tactics in flying and fighting amid the hurtling debris of the asteroid cluster known as the Trojan Group. The program features 3-D animated graphics and all objects follow actual laws of motion observed in space.

Echelon

Access
Commodore 64
\$44.95

Echelon is a top-secret military facility of the twenty-first century where pilots learn to fly the Lockheed C-104 Tomahawk, a space combat and exploration vehicle. The player is assigned to patrol a new zone and find the solution to several strange events. The game features four weapons systems, a bidirectional teleporter unit, two 3-D screens, infrared graphics, and the LipStik, a voice-activated control headset to give commands to the spacecraft.

EOS: Earth Orbit Stations

Electronic Arts
Commodore 64
\$29.95

The player is responsible for every aspect of setting up and maintaining space stations, from construction to making a profit. There are 39 different modules to construct, including a shuttleport, a telescope, and a chemical lab. There are seven versions of the simulation, each lasting from 2 to 40 hours. The player can also learn about the planets and the solar system.

Falcon

Spectrum Holobyte
Macintosh, IBM PC
1 megabyte (Macintosh); minimum 256K with DOS 2.0 or higher and CGA, EGA, or Hercules card required (IBM)
\$49.95

Players simulate flying the F-16A Fighting Falcon jet fighter. *Falcon* features dogfights with other players by

computer link, four alternating heads-up displays (HUDs), digitized airplane images, sound effects, a strike mission mode, and multiple skill levels. The Falcon and enemy planes can perform realistic maneuvers such as barrel rolls, yoyos, jinking, and scissors. strike mission mode, and multiple skill levels. The Falcon and enemy planes can perform realistic maneuvers such as barrel rolls, yoyos, jinking, and scissors.

F-15 Strike Eagle

MicroProse
Apple II, Atari, Commodore 64, IBM PC
CGA required (IBM)
\$34.95

Players can take part in seven historical flight missions, from dropping M-82 bombs on a Libyan oil refinery to firing air-to-air missiles at a Syrian fighter. This F-15 combat jet flight simulator displays more than 24 cockpit controls and features radar, launch indicators, electronic defenses, missiles, and acrobatic and mach-speed capabilities. There are four skill levels.

Flight Simulator

Microsoft
Macintosh, IBM PC
128K (Macintosh); CGA required (IBM)
\$49.95

Computer pilots can fly a single-engine Cessna 182 or a Gates Learjet with this flight simulator. Macintosh users with more than 128K can also fly a World War I fighter plane. The program takes pilots on scenic flights over the continental U.S., Mexico, Canada, and the Caribbean, and to 118 airports. The instrument panel is displayed on the screen and includes flight controls and VFT and IFR instrumentation. Conditions such as wind, time of day, and reliability of aircraft can be set by the pilot, and the player has an out-of-the-window view much like an actual pilot's.



Chuck Yeager's Advanced Flight Simulator features fast flying and realistic aircraft performance.

Flight Simulator II

SubLOGIC
Apple II, Commodore 64, Atari
48K (Apple, Atari) required; joystick optional
\$49.95

Players can simulate flying a Piper 181 Cherokee Archer plane to more than 80 airports in four scenery areas, practicing takeoffs, landings, and aerobatics, and even taking part in a World War I Ace aerial battle. Flight controls and instrumentation are displayed on the computer screen, and the view outside the cockpit appears in high-speed, three-dimensional graphics.

Flight Simulator II

SubLOGIC
Amiga, Atari ST
512K required; joystick optional
\$49.95

Potential pilots fly either a Cessna 182 or a Gates Learjet in this version of *Flight Simulator II*. There are more than 130 airports in five different scenery areas, and the multiwindow view allows three external views of the plane. With the multiplayer option, two or more fliers can connect their machines by modem and fly together through the same airspace.

Fokker Triplane

PBI Software
Macintosh
128K required
\$59.95

A simulation of the three-winged World War I German fighter plane, this game lets players perform loops, dives, rolls, bank turns, air acrobatics, and combat flying maneuvers. Loosely based on the Fokker Triplane flown by Baron Manfred von Richthofen, "The Red Baron," the instrument panel displays an altimeter, artificial horizon, airspeed, an ADF-VOR navigational system, a fuel gauge, a throttle gauge, and a gun sight. Players can view the field from the cockpit, the left and right wings of the plane, and from the rear. Simulation details include rudder control, stalling, fuel consumption, 3-D graphics, animation, and sound effects.

Gunship

MicroProse
Amiga, Atari ST, Commodore 64, IBM PC and compatibles
Joystick; 256K, CGA or EGA required (IBM)
\$49.95 (Amiga, ST, IBM); 34.95 (64)

Players take control of an AH-64 Apache helicopter to carry out seven rescue, search and destroy, and covert missions. The Apache is loaded with 11 guided missiles, four guns, Hellfire laser missiles, a zoom-TV gun sight, and the integrated helmet targeting system (IHTS). The missions take place around the world, from Southeast Asia to Central America. This flight simulation program uses 3-D graphics and a joystick flying system.

Harrier Combat Simulator

Mirrorsoft
Atari ST
\$49.95

Developed in conjunction with the British Aerospace, this game simulates combat flight of the Harrier aircraft. Players can maneuver the jet through vertical takeoffs, barrel-roll attacks, air and ground combat, and firing the heat-seeking sidewinder missiles. The mission is to destroy the enemy's headquarters 500 miles away.

Harrier Strike Mission II

Miles Computing
Macintosh
512K required
\$49.95

The Harrier jump jet is outfitted with a 30mm Aden cannon, torpedoes, bombs, Aim-9 sidewinders, Matra Rockets, and camera-guided missiles. In this combat simulation, players can fly the jump jet on six different missions—Falklands, Raid on Libya, Surrounded at Sea, Dirty Dozen, Space Wars, and Free

Flight. Options include night or day flight, fill-in or vector graphics, fixed or floating gun sight, heads-up display, intelligence map, multiple viewing angles, and peacetime or war.

Japan Scenery Disk

SubLOGIC
Apple II, Atari, Commodore 64, IBM PC
Flight Simulator, Flight Simulator II, or Jet required
\$24.95

A scenery disk to be used with *Flight Simulator, Flight Simulator II, Jet*, or any other SubLOGIC flight simulator, this disk covers the area from Tokyo to Osaka, Japan, in detail. It can be used for visual flight or cross-country navigation and includes downtown Tokyo, Mt. Fuji, the Shin Kansen bullet-train network, Osakajo castle, and many mountains, lakes, and waterways.

Jet

SubLOGIC
Apple II, Commodore 64
64K required (Apple); joystick optional
\$39.95

Computer "Top Guns" take the pilot's seat of an F-16 Fighting Falcon or F-18 Hornet jet fighter. There's a free-flight mode for noncombat maneuvers, as well as various options for aerial dogfights or target strikes.

Jet Combat Simulator

Epyx
Commodore 64
\$19.95

Assume the pilot's seat of a McDonnell Douglas F-15 Eagle jet fighter in this simulation. Learn to take off, land, and perform offensive and defensive maneuvers with the aircraft while avoiding crashes, spins, and enemy planes and artillery.

Jump Jet

Eurosoft
Commodore 64
\$24.95

Five skill levels help players practice flying the Sea Harrier VTOL. Also known as the Jump Jet, this plane can take off or land vertically on the deck of an aircraft carrier, hover, and fly backwards. A simulation of the radar, the range finder, and the instrument panel appears on the screen. Sidewinder missiles may be used against enemy aircraft, and sonic warning messages are sent to the pilot through the Commodore's sound system.

Kennedy Approach

MicroProse
Commodore 64
\$24.95

This simulator puts the player in the air-traffic control towers of some of the busiest airports. A computer-generated voice provides the communications from approaching aircraft and warns of life-threatening emergencies. The player must safely land all the planes, ranging from two-seater private planes to the Concorde.

Learning to Fly with Flight Simulator

John Rafferty
COMPUTE! Publications
ISBN 0-87455-115-3
\$12.95

John Rafferty, an instrument-rated pilot, provides 26 training flight scenarios to help computer pilots learn to fly using *Flight Simulator* or *Flight Simulator II*. He begins with fundamentals such as takeoffs and landings and continues the lessons through stalls, engine failures, navigating with the NAV radios, and planning approaches. The book includes airport approach charts for several major airports.

Lunar Explorer

Spectrum HoloByte
Apple II, IBM PC
48K (Apple); 128K (IBM PC)
\$29.95

Lunar Explorer offers players the opportunity to pilot a lunar-landing vehicle. Views include the lunar base, refueling stations, craters, rilles, constellations, and the Apollo 11 landing site. After training is complete, the player can use the vehicle to circle the moon or skim over the lunar surface.

Orbiter

Spectrum HoloByte
Atari ST, Macintosh, IBM PC and compatibles
\$49.95

Users learn to control a space shuttle from launch to landing with this simulator. Missions include launching, rescuing, or repairing satellites or the floating space laboratory. Players can also walk in space with the manned maneuvering unit. Speech synthesis with some of the computers enables the mission control feature to talk to the player.

Project: Stealth Fighter

MicroProse
Commodore 64
\$39.95

Future pilots can fly a new stealth aircraft on secret missions over North Africa or the Eastern Bloc countries, carrying out bombing raids and gathering classified information. Not only must the pilot be able to fly and fight the aircraft, but he or she also must master the jet's electromagnetic profile to avoid radar detection. The graphics portray heads-up displays (HUDs) and 3-D cockpit views.

Pylon Racer

Mind Systems Corporation
IBM PC or compatible
128K and CGA required; joystick and modem recommended
\$44.95

With *Pylon Racer*, pilots can view their flights from outside the plane or change modes and watch the race from inside the cockpit. This flight simulator allows computer pilots to race their planes against each other or the computer. Flight data for each flight or race can be saved to disk so players can study their performance or send the disk to a friend for a race by proxy. Two 1200-bps modems, one with auto-answer, are required for realtime racing via phone lines; the computers can also be connected using a cable and a null modem. The flights are displayed in color and 3-D graphics.

San Francisco STAR Scenery Disk

SubLOGIC
Apple II, Atari, Commodore 64, IBM PC
Flight Simulator, Flight Simulator II, or Jet required
\$24.95

A scenery disk to be used with *Flight Simulator, Flight Simulator II, Jet*, or any other SubLOGIC flight simulator, this disk covers the San Francisco Bay area in detail. It's designed mainly for visual flight and includes Fisherman's Wharf, Alcatraz Island, the Golden Gate and Bay Bridges, and prominent buildings in the San Francisco-San Jose-Oakland areas.

Scenery Disk #1

SubLOGIC
Apple II, Atari, Commodore 64, IBM PC
Flight Simulator, Flight Simulator II, or Jet required
\$19.95

One in a series of disks that provide additional scenery and flying environment when used with *Flight Simulator, Flight Simulator II, Jet*, or other SubLOGIC flight simulators. This disk includes airports, radio-navigation aids, cities, highways, rivers, and lakes, and covers parts of Texas: Dallas-Ft. Worth, Houston, San Antonio, and Brownsville.



Stealth Mission, the newest SubLogic flight simulation effort, brings clandestine flying to the Commodore 64.

Scenery Disk #2

SubLOGIC
Apple II, Atari, Commodore 64, IBM PC
Flight Simulator, Flight Simulator II, or Jet required
\$19.95

Another disk which provides additional scenery and flying environment when used with *Flight Simulator, Flight Simulator II, Jet*, or other SubLOGIC flight simulators. Includes airports, radio-navigation aids, cities, highways, rivers, and lakes, and covers parts of the Southwest: Phoenix, Albuquerque, and El Paso.

Scenery Disk #3

SubLOGIC
Apple II, Atari, Commodore 64, IBM PC
Flight Simulator, Flight Simulator II, or Jet required
\$19.95

Includes airports, radio-navigation aids, cities, highways, rivers, and lakes, and covers parts of California and the Southwest: San Francisco, Los Angeles, and Las Vegas.

Scenery Disk #5

SubLOGIC

Apple II, Atari, Commodore 64, IBM PC

Flight Simulator, Flight Simulator II, or Jet required
\$19.95

Displays airports, cities, highways, rivers, and lakes in parts of the Mountain states: Salt Lake City, Cheyenne, and Denver.

Scenery Disk #6

SubLOGIC

Apple II, Atari, Commodore 64, IBM PC

Flight Simulator, Flight Simulator II, or Jet required
\$19.95

This disk covers parts of the Midwest: Omaha, Wichita, and Kansas City. For use with *Flight Simulator, Flight Simulator II, Jet*, or other SubLOGIC flight simulators.

Scenery Disk #7

SubLOGIC

Apple II, Atari, Commodore 64, IBM PC

Flight Simulator, Flight Simulator II, or Jet required
\$24.95

Additional scenery and flying environments for *Flight Simulator, Flight Simulator II, Jet*, or other SubLOGIC flight simulators. Includes airports, radio-navigation aids, cities, highways, rivers, and lakes in parts of the East coast: Washington, D.C., Charlotte, Jacksonville, and Miami.

Scenery Disk #11

SubLOGIC

Apple II, Atari, Commodore 64, IBM PC

Flight Simulator, Flight Simulator II, or Jet required
\$24.95

This disk offers more scenery with *Flight Simulator, Flight Simulator II*, and *Jet*. It includes airports, radio-navigation aids, cities, highways, rivers, lakes, and a hot-air balloon in the central Great Lakes area. There are views of Detroit, Pittsburgh, and Niagara Falls.

Solo Flight

MicroProse

Commodore 64

\$24.95

This civilian flight simulator lets the player experience the thrill of a first solo flight. Onscreen instructions guide the pilot through the basics of flight. There are 21 airports to fly to, and a mail mission option gives the player the opportunity to choose a route to follow in delivering airmail. The program features instrument displays, navigation maps, dual VORs, emergencies, and weather changes.

Spitfire 40

Avalon Hill

Atari, Commodore 64/128

64K required (Atari)

\$35.00

Players can fly a Mark II Supermarine Spitfire simulation, shoot down German bombers before they reach Britain, land, and record flight hours and number of kills on a disk. Medals are awarded and there is a flying certificate for 50 hours in flight. The screen displays a full-color instrument panel.

Spitfire Simulator

Mind Systems Corporation

Apple II

48K, DOS 3.3, joystick or game paddles required
\$40.00

Spitfire pilots have eight targets to pursue and destroy in this flight simulator based on the Supermarine Spitfire Mk1. The game is set in England during the Battle of Britain (1941), and the player's objective is to protect the nation from German fighters and bombers. The Spitfire can shoot down enemy aircraft with its machine guns, but then the plane must safely make it back to the aerodrome before running out of fuel. Pilots can also maneuver their aircraft through loops, rolls, stalls, and other aerobatics. Targets, the aerodrome, and grid scenes are displayed in 3-D, hires graphics.

Stealth Mission

SubLOGIC

Commodore 64

Color monitor recommended
\$49.95

Pop-up instrument panels and a targeting computer help Commodore aces pilot an F-19 stealth fighter, a Navy F-14 Tomcat, or the X-29 with its experimental forward-swept wing. The targeting computer can be used to detect, track, and lock onto enemy targets, and the electronic countermeasures help defend against land, air, and sea attacks. Instrument panels support complete VOR, ILS, ADF, and DME cross-country navigation. Action can be watched from the cockpit or a spot plane, control tower, map, or missile's-eye view.

Super Huey

Cosmi Corporation

Amiga, Atari, Atari ST, Commodore 64

\$19.95 (Amiga, ST); \$12.95 (Atari, 64)

This helicopter flight simulator takes advantage of the graphic and sound capabilities of the Amiga and Atari ST. Players can choose from four scenarios. In Solo Flight, players are trained in flight techniques and become familiar with the helicopter's instruments. Rescue requires players to find and pick up stranded military personnel. Explore provides players with the opportunity to fly unexplored territory and map the terrain. In Combat, players defend a secret desert installation from unknown hostile forces.

3-D Helicopter Simulator

Sierra On-Line

IBM PC, Tandy

Hercules monochrome or CGA required; Hayes-compatible modem optional

\$49.95

Computer pilots can simulate flying a McDonnell Douglas Apache helicopter with this program. The manuals contain information on flying the chopper, the limits and restraints of a helicopter, and how to handle emergency situations. Players can practice takeoffs and landings at the Los Angeles International Airport and navigate around the skies of Paris. The pilot can also engage in an air battle over Manhattan with another helicopter. Two players can compete by connecting their computers with a 1200-bps modem.

ThunderChopper

ActionSoft

Apple II, Commodore 64

\$29.95

Players are in command of a Hughes 530MG Defender helicopter facing escort, land and sea rescue, and combat scenarios. The action can be seen through the cockpit windows in either day, dusk, or night flight modes. The onboard flight computer provides mission instructions and pilot performance feedback while monitoring the status of all onboard systems. Advanced instrumentation is patterned after equipment now being tested by the U.S. Army. Armament includes TOW and Stinger missiles, a Hughes Chain Gun, and Zuni rockets.

Tomahawk

Datasoft

Commodore 64

\$34.95

The player selects combat or training missions at four levels to simulate flying a U.S. Army Apache helicopter. Simulations include ground attack, air-to-air interception, day- and night-vision systems, and flying by instruments. The display is three-dimensional.

Top Gun

Mindscape

Commodore 64, IBM PC

\$9.95

Jet jockeys can take the pilot's seat of an F-14 Tomcat in this combat flight simulation. The jets are equipped with heat-seeking missiles and 22mm rapid-fire cannons to shoot targets, or the pilot can maneuver the jet out of the way of enemy fire. Two players compete against each other, or one can compete against the computer.

Top Gunner Collection

MicroProse

Commodore 64

\$24.95

Three flight simulators are included in this one package. *Hellcat Ace* is a World War II air-to-air combat simulator that takes the player on 14 missions over the Pacific. Maneuvers include loops, aileron rolls, bail-outs, and ocean ditches. An F-86 Sabre battles a MiG-15 in *MIG Alley Ace*. Players fly a rescue helicopter through an underground labyrinth in search of trapped captives in *Air Rescue*. All three games feature multiple difficulty levels.

Flight Simulator Joysticks

FlightStick

CH Products

Apple II, IBM PC

\$74.95 (Apple); \$79.95 (IBM)

The FlightStick from CH Products is designed to be used with flight simulator software or conventional programs. It has a pistol-grip handle with trigger and fire buttons that provide audio and tactical feedback when fired. The IBM model has a thumbwheel control that functions as a throttle when used with *Flight Simulator* and *Chuck Yeager's Advanced Flight Trainer*.

Flight Simulator Software Publishers

For more information about the flight simulator software listed in the Buyer's Guide, contact the publishers listed below.

Access 2561 S. 1560 West Woods Cross, UT 84087	Cosmi 415 N. Figueroa St. Wilmington, CA 90744	Microcube P.O. Box 488 Leesburg, VA 22075	Mindscape 3444 Dundee Rd. Northbrook, IL 60062	Spectrum Holobyte 2061 Challenger Dr., Suite 325 Alameda, CA 94501
Accolade 20813 Stevens Creek Blvd. Cupertino, CA 95014	Discovery Games 936 W. Highway 36 St. Paul, MN 55113	MicroProse 180 Lakefront Dr. Hunt Valley, MD 21030	Mind Systems P.O. Box 506 Northampton, MA 01061	Spinnaker Software One Kendall Square Cambridge, MA 02139
ActionSoft 201 W. Springfield Ave. Suite 711 Champaign, IL 61820	Electronic Arts 1820 Gateway Dr. San Mateo, CA 94404	Microsoft 16011 NE 36th Way Box 97017 Redmond, WA 98073-9717	PBI Software 1163 Triton Dr. Foster City, CA 94404	Strategic Simulations 1046 N. Rengstorff Ave. Mountain View, CA 94598
Avalon Hill 4517 Harford Rd. Baltimore, MD 21214	Epyx P.O. Box 8020 Redwood City, CA 94063	Microsoft Press 16011 NE 36th Way Box 97017 Redmond, WA 98073-9717	Sierra On-Line P.O. Box 495 Coarsegold, CA 93614	SubLogic 713 Edgebrook Dr. Champaign, IL 61820
CH Products 125 Stone Dr. San Marcos, CA 92069	Eurosoft International 114 East Ave. Norwalk, CT 06851	Miles Computing 7741 Alabama Ave., Suite 2 Canoga Park, CA 91304	Sir-Tech P.O. Box 245 Charlestown Ogdensburg Mall Ogdensburg, NY 13669	Tab Books P.O. Box 40 Blue Ridge Summit, PA 17214
COMPUTE! Publications Customer Service P.O. Box 5038 F.D.R. Station New York, NY 10150	MichTron 576 S. Telegraph Pontiac, MI 48053			

MicroFlyte Joystick

Microcube Corporation
Amiga, Atari ST
\$119.95

A proportional-control joystick for use with *Flight Simulator II*, the Microflyte joystick plugs into the mouse port on the Amiga and Atari ST. The device operates with software that uses the mouse controller. The main stick and four other switches control throttle, brakes, guns (World War I mode), flaps, elevators, and aileron and rudder.

MicroFlyte PC Joystick

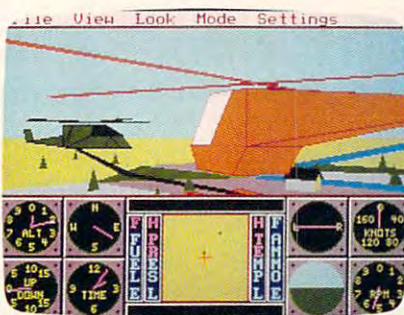
Microcube Corporation
IBM PC and compatibles
\$159.95

A microprocessor-controlled joystick, the PC version connects to the computer through the keyboard input port. The proportional joystick has two axes for aileron and elevator movements and one axis for throttle control. There are ten push-button, labeled switches for additional flight controls.

Maxx Aircraft Steering Yoke

Electronic Arts
IBM, Tandy
\$129.95

Maxx is modeled after the steering devices in actual aircraft. It has action buttons on each yoke arm for



Battle another chopper over Manhattan in 3-D Helicopter Simulator by connecting two computers with modems.

thumb-tip control, and the slide throttle is located in the center of the device. The yoke is made of super-tough nylon, and the shaft is stainless steel. Two thumbscrews are used to clamp the yoke to the table. Maxx can be calibrated to work with simulation programs from Electronic Arts, Microsoft, MicroProse, and other publishers.

MicroFlyte ATC Joystick

Microcube Corporation
Commodore 64, Atari
\$59.95

This open-gimbal, pot-type joystick can be used with *Flight Simulator II*. The main stick and four other switches control the throttle, brakes, guns (World War I mode), flaps, elevators, and aileron and rudder. The package includes a software driver program to access the paddle ports and an operating manual. Other drivers for different flight simulation software is available.

The Lip Stik Plus

Access
\$24.95

A voice-activated control headset, Lip Stik Plus can be used with a joystick to control ship and weapons movement in *Echelon*. It uses a switched-voltage, positive-feedback controlled amplifier and is built into a headset. The joystick is plugged into the Lip Stik Plus. The Lip Stik is included in packages of *Echelon*, or Lip Stik Plus can be purchased separately. □

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and Prepare
Your Taxes**

Each month, "Fast Looks" offers up snapshots of the newest software and hardware for the Amiga, Atari ST, Apple II, Commodore 64/128, IBM PC, and Macintosh lines of personal computers. Capsule reviews look at notable programs and peripherals, products which have just arrived in our offices and which haven't yet been fully evaluated.

Fast Looks gives you glimpses of important and interesting software and hardware *now*, not next month.

Robot Readers

There are very few educational programs available for the Amiga. Hilton Android's *Robot Readers* are among the first and most interesting offerings. There are currently four programs in the series—*Chicken Little*, *Three Little Pigs*, *Aesop's Fables*, and *Little Red Hen*.

I have mixed feelings about the programs. First, the *Robot Readers* stories are shorter and less interesting than the actual books. At \$29.95 each, *Robot Readers* are certainly more expensive. It is fun to page through the computer books, though. The mouse interface makes it easy to turn the pages and make the computer read the words. The pictures are colorful and attractive. And each character has its own voice.

But if you've heard the Amiga speak, you will understand *Robot Readers*' biggest problem. The best thing you can say about the Amiga's built-in speech is that it sounds foreign. The worst you can say is that it is unintelligible. In one *Robot Readers* exercise, the storyteller says a word, and the

child must point at it with the mouse pointer. Two- or three-syllable words work well, but it's frustrating to hear the program speak an Amiga nonsense syllable and then wait for you to choose the correct word.

Robot Readers could be helpful at the right dosage, though. Many children are fascinated by the interactive nature of computers. Who knows, they might learn something.

— RA

Amiga—\$29.95 each
Hilton Android
P.O. Box 7437
Huntington Beach, CA 92615
(714) 963-4584

The Conservor and System Saver IIGS

Keeping a computer cool goes a long way in keeping it healthy. Heat buildup inside a computer's case can shorten a computer's lifespan and make its operation unreliable.

The Apple IIGS doesn't come equipped with a fan, as do many other computers. But add a few boards, and the machine begs for a soothing breeze across its circuits. In fact, Apple recommends that you install a fan if you have more than two boards installed. Apple's fan, however, takes up room inside the case.

Two companies, MDIdeas and Kensington, have solved the IIGS's breathing problem, among others, in a similar, yet different fashion. Both units are plastic tinted the same color as the IIGS; both are well-built and should stand years of use.

MDIdeas' Conservor is an L-shaped unit that fits on top of the the IIGS. A small fan is built into the back of the platform, where you'll find a row of six power outlets for the printer, monitor, and other peripherals. Two open bays at the front of the Conservor are used to place 3½-inch disk drives. Three front-mounted switches control the power. A surge suppressor is built in.

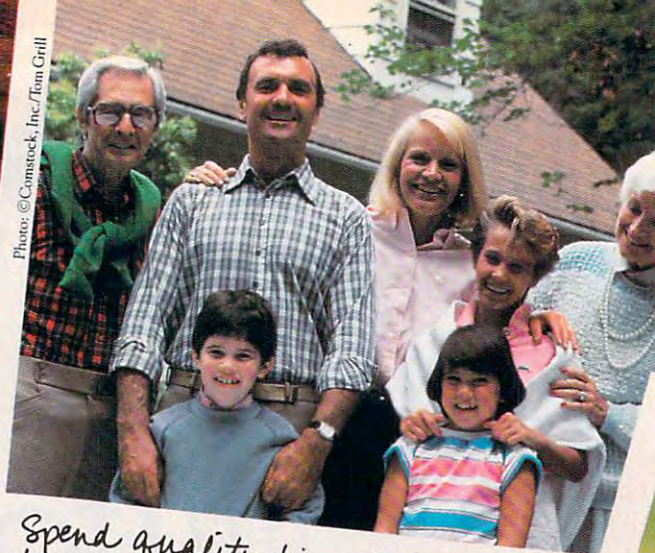
Kensington's System Saver GS has many of the same features: rearward facing power outlets (four), surge sup-

Photo: © Chuck Keeler Jr./After Image



Businesses, schools, groups... communities everywhere sponsor free events during Computer Learning Month.

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Spend quality time learning together with our free Family Activities Guide.

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*Endorsed by the National Education Association, American Federation of Teachers, and many more.

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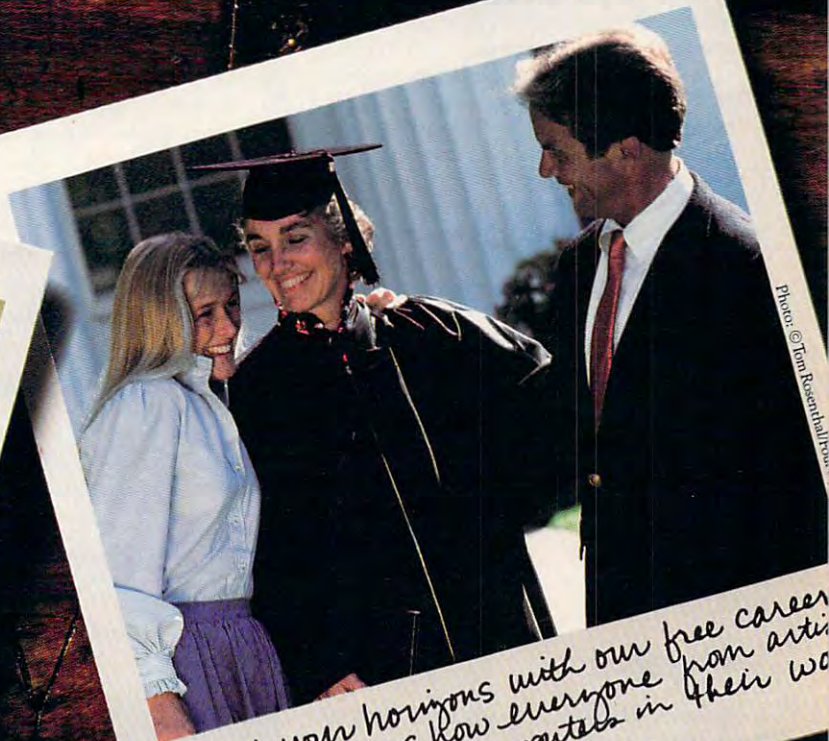
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pression, and front-mounted switches. It, too, is placed between the computer case and the monitor so that its fan can draw air up and through the IIGs. The System Saver, however, does not have spaces for the disk drives.

The Kensington unit is less expensive, but the Conservor is actually the better buy. Stashing the disk drives underneath the monitor gets them off the desktop and reduces the inevitable clutter around a computer. Although the Conservor's fan is slightly louder than the System Saver's, neither fan is distracting, even in a quiet room.

—GK

Apple IIGs—\$129.95 (Conservor); \$99.95 (System Saver as)

MDIdeas
1163 Triton Dr.
Foster City, CA 94404
(415) 573-0580

Kensington Microwave
251 Park Ave. South
New York, NY 10010
(212) 475-5200

Physics

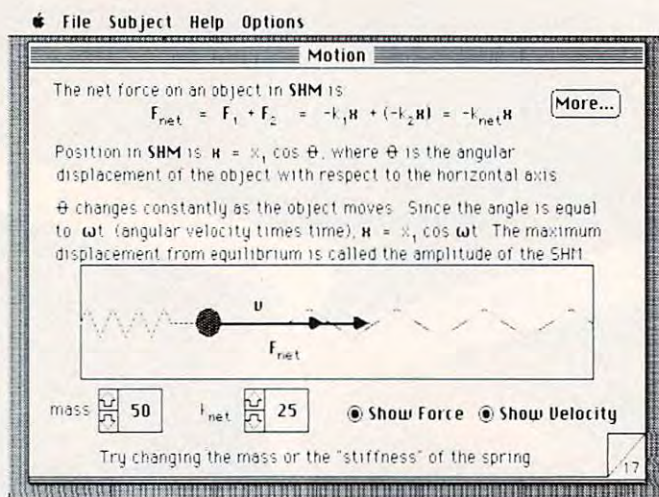
Bringing physics to life on a chalkboard or from a textbook can be an exercise in frustration for both students and teachers. Whether you're trying to see Newtonian laws in action or learn the different properties of light, static images just don't do justice to the physical forces surrounding us.

It's difficult to imagine a better, more integrated presentation of physics than Broderbund's *Physics* for the Macintosh. With a combination of onscreen tutorial text, more than 300 physics problems, and an exceptional implementation of animated examples, *Physics* is the perfect complement to any high school or college physics course.

Physics' two disks contain 12 chapters of material, ranging across a standard physics curriculum that contains a wealth of material. Each chapter presents a balanced array of rules, explanations, formulas, problems, and animations. The program is well-organized, and you'll find getting around within it very intuitive.

What makes *Physics* exceptional are the many ways the program allows you to observe and alter the forces of nature. There are dozens of interactive experiments in which you can play with the variables to see how physical laws work with and against one another.

Physics is an elegant educational program: It's easy to use, graphically im-



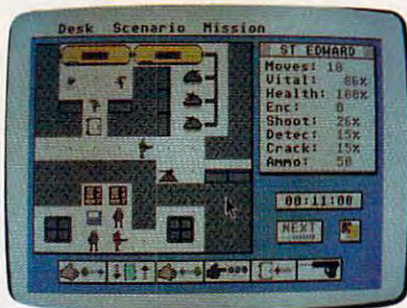
Animated examples offer you the chance to interact with the forces of nature.

pressive, appropriate for the audience it seeks, and intelligently organized.

—SB

Macintosh with at least 512K—\$99.95

Broderbund
17 Paul Dr.
San Rafael, CA 94903-2101
(415) 492-3200



Put on your space armor and get ready for the fast-action science fiction world of *Breach*.

Breach

This game captures perfectly the feel of those hard-combat, high-tech science-fiction war stories.

Breach offers a variety of battle scenarios loaded with heavily armed hostiles—overlords, soldiers, beasts, robots—and clear mission objectives. As squad leader, you guide up to 20 marines through enemy fire, accomplishing the rescue of prisoners, capturing datapacks, disrupting facilities.

Your marines have the equipment and skills to do the job. Depending upon the scenario, they can be armed with grenades, rocket launchers, demolition charges, and so on, in addition to the blaster each carries. The core of your

corps is the Marauder, the standard marine, with fewer numbers of Scouts, Psionic Talents, and Infiltrators.

The key member is the Squad Leader. If he dies, the game ends. If he lives and the mission is accomplished, his skills increase, making him more capable for the next mission.

The game is played by turns, each taking 30 seconds of mission time. Each marine is controlled via a simple icon—and on the IBM, function key—interface. With movement points renewed each turn, you can move vertically or horizontally, fire weapons, use sophisticated tools. Put your people in position; then sweat out the enemy movement phase. Movement is nicely animated.

Scenarios range from a simple prisoner rescue to all-out combat against impossible odds. Settings are fully realized, with multifloored buildings, working lift- and dropshafts, doors, furniture, stun fields, and more.

Breach also contains an elegant and easy-to-use scenario building kit. Documentation is sufficient, if not elaborate; it's also handsomely illustrated. The game is not copy-protected and can be run from hard disk.

—KF

Amiga—\$39.95
Atari ST—\$39.95
IBM, 320K, CGA or equivalent—\$39.95
Macintosh, 512K (does not run on Macintosh II)—\$39.95

Omnitrend Software
P.O. Box 733
West Simsbury, CT 06092
(203) 658-6917

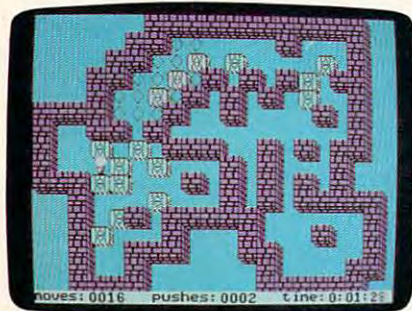
Contributing to *Fast Looks* this month were Rhett Anderson; Selby Bateman; Keith Ferrell; and Gregg Keizer.



Soko-Ban

Maybe you've dreamed about being your own boss, putting your feet up on the desk and letting others do the work. But have you stopped to consider how you would manage if your workers went on strike? A new game called *Soko-Ban* puts you in charge of a warehouse without any workers. Will you get the crates into the storeroom, or just turn the floor into a giant logjam?

Soko-Ban is a maze game with 50 levels of difficulty. Each level is laid out like the floor of a warehouse with crates scattered throughout. The idea is to get all the crates into a storeroom. This may sound easy, but it's not.



Pushing boxes around was never harder than in the insanely enjoyable *Soko-Ban*.

There are a lot of rooms, the corridors are narrow and winding, and there are only a few doorways. Not only that, but the crates themselves always seem to be in the worst possible positions—stacked next to one another forming a wall, standing in a doorway, or blocking a corridor.

Fortunately, you have help. But it's only an outdated 1984-model Mechanical Warehouseman. Since it can only push one crate at a time, the only easy thing about this game is getting yourself stuck.

It pays to come up with a strategy before you start. Since there is really only one way to accomplish your task, you have to think several moves ahead. You can easily get into trouble by pushing a crate against a wall or into a cul-de-sac. Usually, though, there is a key crate—that one crate which, when moved, opens up the whole floor. Your job will be much easier if you can identify that crate.

But finding the key crate is only part of a good strategic plan. Once you've found it, you have to figure out how to get to it. That's where the real

mental gymnastics come into play. Often you'll have to make several moves that seem to box yourself in, but in fact are necessary to get to that key crate.

You may think that once you've gotten a crate into the storeroom you're home free, but storing the crates takes as much planning as moving them. If you're not careful, you'll find there's no way to get the final crate into that one remaining storage square. Don't forget—whether you're moving crates or storing them, one wrong move can leave you trapped.

Scoring is based on the number of crates you can get into the storeroom. A bonus is awarded for clearing the floor. Your score is then reduced by the number of pushes you took. Records are kept of the fastest times, fewest pushes, and fewest moves at each level. Since you have access to any level at any time, you don't have to progress linearly through the mazes. Should you feel unchallenged by one level, try another ten floors higher. Sooner or later you'll meet your match.

Once you feel confident of your crate-moving ability, you'll be ready for the tournament mode, where two to four players can match their wits. Here, time becomes a bigger factor. Decide beforehand on the amount of time (from 1 to 20 minutes) each player will be allowed. The winner is the one who most efficiently stores the most crates within the agreed-upon time. No fair peeking, though—since each player has the same game to complete, those going later could have an unfair advantage. Here again, solid strategy is the key to success. But don't be too deliberate—while you are planning, the clock is running and your score is decreasing.

Perhaps the best feature of *Soko-Ban* is its edit mode. There, you can make and save your own mazes. The edit screen has all the elements you'll need to build a maze—wall segments, crates, and storage squares. Once the maze is built, there is a test window which allows you to check its viability. If it passes, you'll be able to save it to any of 49 additional levels provided.

Soko-Ban's graphics are better than most. Despite the fact that the game deals with boxes and right-angled walls, there is a great deal of visual detail and texture. Though you look down on your warehouse from above, the floor plan isn't like a blueprint. The 3-D aspect of the walls and crates adds to the realism, as does your Mechanical Warehouseman, which moves like the real thing, its arms and legs pushing when it is up against a crate.

Soko-Ban may not be suited to the gung-ho action-adventure gamer, but if you're a puzzle solver, it's one of the best challenges you can find.

— Brian Wierda

Soko-Ban

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Mixed-Up Mother Goose

We owe a lot to Mother Goose. She's the reason we know where Miss Muffet sat. Mother Goose taught us why Jack has to be nimble and where the crooked man lives. *Hickory, dickory, dock* makes sense because of her. Thanks to Mother Goose, the old woman who lived in the shoe was probably the first property owner you ever met.

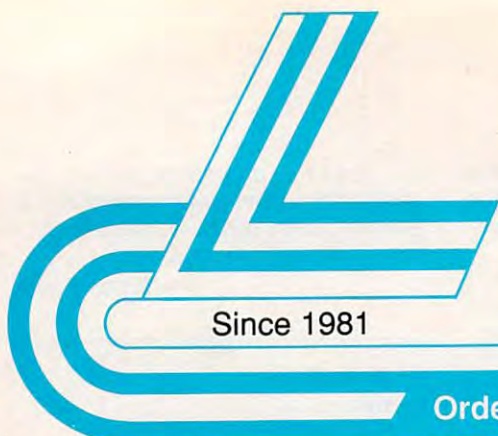


Fractured versions of old favorite rhymes challenge children ages 4 and up.

Now there's *Mixed-Up Mother Goose*, a new software package by Roberta Williams and Sierra On-Line that makes the first lady of fairy tales electronic. Included in this edition are 18 old favorites, performed in colorful, animated pictures. The stories are definitely Mother Goose, but they're "mixed-up" in a fun way.

The program is designed for children aged 4 and up, and for their parents. The program personalizes itself, asking for the child's name and incorporating it into the game. You may have to help a young player with this, at least the first few times, but afterwards, even a

continued on page 62



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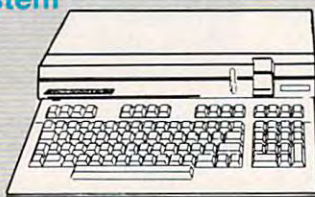
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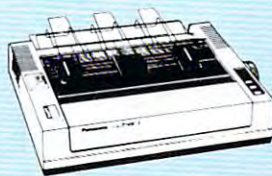
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continued from page 57

four-year-old should have no trouble playing. Players use the arrow keys or joystick to pick from eight different cartoon kids. The child can pick the character who most resembles him- or herself, or one that the child simply likes.

When the game begins, the child's character appears in bed. A dialogue balloon calls your child by name and says, "Goodnight." The bedroom lights go out, the door shuts, and moonlight comes through the windows. The child's eyes blink shut as sleep arrives.

An animated dream begins as the child flies away on the downy back of a great big goose. Soon the pair reach the land of Mother Goose, where your child is greeted personally, by Mother Goose herself. She's standing in front of her famous cottage, asking for help.

The nursery rhymes are all mixed up—Jack and Jill can't find their pail, the cat has lost his fiddle, and Little Bo Peep has lost, well, you know the story. Your job is to find and bring the missing objects to the right rhyme character, correctly completing the rhyme.

Once the rhyme is complete, the character performs the rhyme, with music, in a lively 3-D animated sequence. During the performance, the words to the rhyme are displayed so the child can read along. Prereaders may even learn some new words (such as *Humpty Dumpty*).

With more than 40 screens and 18 characters, there's plenty to do in Mother Goose Land. Old King Cole can't find his pipe, bowl, or fiddlers—three separate challenges. Little Jack Horner wants his Christmas pie, and Humpty Dumpty needs a ladder to reach the wall.

You don't have to fix everything at once. Take some time to go walking and looking. You never know what you'll encounter. After all, there are people living in pumpkins around here.

As you enjoy the local scenery, you may come across Jack's missing candlestick, or another lost item. To pick it up, just walk to it. The object appears in the inventory box on the upper right corner of the screen. Pick up Mary's lamb, or Bo Peep's sheep, and they follow your character merrily wherever you go.

Fixing all 18 rhymes can take longer than one sitting, so a feature which allows you to save a game is provided. Pull-down menus are available to adjust the speed of the animation and level of play to match each child's ability. Setup may require your direct supervision, but the actual game requires players to use only the arrow keys or joystick.

Mixed-Up Mother Goose is more like an electronic storybook than a computer game. Roberta Williams plunges your child into a nursery rhyme land that teaches the great old rhymes in a creative new way and adds a dose of humor.

Some extras include arrow stickers for keypads that lack them and a handsome poster with all the words to all the rhymes. An obvious feel for what works with kids makes *Mixed-Up Mother Goose* a happy choice for younger children just learning the computer—or just learning Mother Goose.

— Ed Ferrell

Mixed-Up Mother Goose

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Arkanoid

Arkanoid takes over your Amiga.

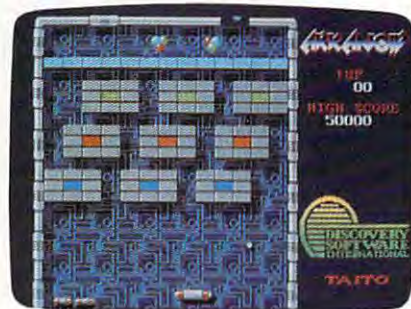
This fast-action arcade game literally grabs your computer by shutting down the Amiga's multitasking operating system. It loads quickly and takes full control of the computer. If you pop the disk out of the drive, you won't hear the familiar click-click-click of the Amiga waiting for the next disk. And don't expect to be able to drag this game out of the way to use a word processor or spreadsheet—*Arkanoid* has taken over.

And expect *Arkanoid* to take control of your Amiga often. The game's fun. After a bout of programming, digitizing, or calculating, you just can't resist playing.

When the Amiga was first conceived (it was called the Amiga Lorraine back then), it was planned as a high-end game machine. As the Lorraine took shape, the game market went bust. So a keyboard was added, and a 3½-inch drive, and a mouse, and RGB output. The Amiga ended up a powerful computer. But deep inside, it's still a game machine.

Discovery Software International, makers of *Arkanoid*, have taken advantage of the Amiga's history to produce a game with sound and graphics that no other home computer can match.

Arkanoid is a history lesson itself. It's a variation of Atari's age-old classic *Breakout* (which, incidentally, was put together by another piece of history—Apple cofounder Steve Wozniak). Taito's coin-op version of *Arkanoid* showed up two years ago and became an instant success.



Arkanoid's hypnotic action closely reproduces the arcade version's but puts it on your Amiga screen where quarters aren't required.

Arkanoid inherits the hypnotic rhythm of *Breakout* but adds a few interesting twists. There are 33 levels. Each has a different configuration of bricks and hazards. Some bricks are permanent, others must be hit several times before they'll disappear, and still others release "capsules" which give you various powers if you can catch them with your paddle. You progress to the next level by using a paddle to knock the ball against every breakable brick on the screen.

Discovery has done a great job with the game. It looks and plays just like the arcade version of the game, and the stereo sound is spectacular. *Arkanoid* is Discovery's first game, but not its first Amiga program. Discovery also sells *Marauder II*, the premier disk-copy utility for the Amiga. *Marauder* copies nearly all Amiga programs, and it deprotects many of those, allowing them to be placed in a ramdisk or on a hard drive. Before *Arkanoid* was released, people speculated whether or not *Arkanoid* would be copy-protected. If it was, and *Marauder* could not copy it, that would make *Marauder* less useful. If it wasn't protected, *Arkanoid* could be easily pirated. *Arkanoid* is heavily copy-protected. This leaves Discovery open to charges of hypocrisy from competitors (whose disks can be

copied by *Marauder*) and Discovery's own customers (who bought *Marauder*). There is no way to copy *Arkanoid* to a hard drive, but owners of the game may purchase a backup disk for \$3.00.

Arkanoid for the Amiga really does look like the arcade game, but there are differences. The arcade game's screen is vertically oriented, while the Amiga's screen is horizontal. This is often a problem with arcade translations. It makes the screen a bit smaller than it might be. Discovery used the Amiga's overscan capability to make the game area as large as possible.

Another difference is the use of a mouse as opposed to paddle control. It's easy enough to keep the mouse under one ball (at least until your hand hits the computer or slides off your desk), but it's virtually impossible to keep three balls going at once—something that is possible with paddles. Since the Amiga can use standard Atari game paddles, it would have been nice if Discovery had added paddle control as an option.

At least you never need to put a quarter in the home version of *Arkanoid*.

— Rhett Anderson

Arkanoid

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Dac-Easy Light

Debit. Credit. Liability. Money terms. Accounting terms. Don't run screaming for your CPA yet, though, because *Dac-Easy Light* can step up and go to financial bat for you. This easy-to-use home and office accounting program for your IBM PC or compatible can transform the ledger-phobic into an astute personal accountant.

This program is extremely easy to install. I tested *Dac-Easy Light* on an AT&T 6300 with a 20-megabyte hard drive and a Panasonic KX-P1090i dot-matrix printer. It took less than five minutes to go from opening the package to viewing the main screen.

The first time you use the program, you're asked if you have a color moni-

tor, whether you want to create Personal or Business Accounts, and what kind of printer you're using. If your printer isn't on the list, you can enter its decimal escape codes for Normal, Compressed, and Near-Letter-Quality printing. You can also specify a password at this point, protecting your accounting data from unauthorized access.



Most of the accounting work in the check writing function of *Dac-Easy Light* is done for you.

The main *Dac-Easy Light* screen opens with a menu bar across the top, containing the seven menus for the program: Banks, Reconcile, Credit Cards, Invoice, Accounting, Print, and Quit. To choose a menu, you use the cursor keys to highlight the one you want and press Enter—or type the first letter of the menu (such as *r* for Reconcile) on the keyboard. The menu options drop down on the screen. You then choose one of these options in the same fashion. I found this environment very intuitive and nonintimidating, helpful when you're apprehensive about using an accounting package in the first place.

How does *Dac-Easy Light* work? Depending upon the level at which you're operating or the task you want to accomplish, you choose one of the main menus in order to enter and manipulate your financial data. This information is generally entered and edited through the use of pop-up windows.

The Banks menu lets you enter your bank balances, checks, deposits, and so on. From here, you can actually print checks (using your own or DAC's forms) if you wish. *Dac-Easy Light* lets you define up to 99 bank accounts (either checking or savings).

During the check writing process, you assign the check's amount to a specific expense category. For example, you would probably assign your electric bill payment to the *utilities* expense category. These categories appear in a pop-up window, where you use the cursor keys to choose between them. When

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you select an expense category, *Dac-Easy Light* automatically enters the amount of the check into that particular category, thereby setting up expense accounts without actually calling them to your attention. In this transparent menu feature, the majority of the accounting work is painlessly done for you.

With Reconciliation, you can mark off cleared and outstanding checks—thus maintaining your correct checkbook balance. Thankfully, you're able to use this menu to make banking adjustments, if you have (like me, for instance) forgotten to enter the monthly bank charge, and just can't figure out why your checkbook won't balance.

In the Credit Card menu, you record your credit-card debt (also known as *short term liability*). The majority of credit cards are already installed—with American Express, MasterCard, and Visa heading the list. Again, through the use of menus and pop-up windows, you enter your credit-card financial data and assign the amount to a specific expense category. Since you can make up to four expense assignments per entry, this goes fairly quickly.

When you graduate to the Accounting menu, you can no longer pretend you're not using an accounting package. Here, you have direct control over your accounts. Terms like *credit* and *debit* are inescapable, and the actual mechanics of the package become more clear. The Accounting menu offers, among other features, a general ledger that records every transaction you make, a month- and year-end close-out procedure, and a budget routine that lets you project what-if scenarios into your financial future. The Invoice menu primarily lets you create and print invoices, and it records the transactions in the appropriate accounts.

Dac-Easy Light provides a seemingly endless number of report formats which let you detail almost any aspect of your financial information. They include: Activity, Actual, Budget, Journal, Variance, and Transaction Reports; Balance Sheets; and Financial and Income Statements. Notably, you can also print mailing labels with little trouble.

The manual is clear; it's easy to find specific information. My one request though, is that a tutorial be provided for those of us who really don't have a clue as to how to get started.

Dac-Easy Light's strongest feature is its ability to let the user work at his or her own level. By mainly using the Banks and Credit Card menus, a user never has to get into accounting concepts. For the person who is well-versed

in accounting procedure, *Dac-Easy Light* offers the option of credit and debit entry by account. There's something here for everyone.

— Lynne Weatherman

Dac-Easy Light

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Stickybear Math 2 & Stickybear Reading Comprehension

Only a few programs—programs that work as well in the home as they do in the classroom—are savored by both parents and teachers. A program that can keep a child's attention amid the distractions at home, yet meet the requirements of professional educators, is a program to be cherished. Almost any software with the Stickybear label fits these descriptions.

Stickybear software shines in the drill-and-practice areas, and these two programs—*Stickybear Math 2* and *Stickybear Reading Comprehension*—are no exception. Both packages present material to children in a manner that's pleasing yet repetitive. If you're looking for a program to hammer home the message, whether in math or reading, these are two to load up.

Math 2 covers multiplication and division in 37 levels of increasing difficulty. Written for children aged seven and up, *Stickybear Math 2* presents problems in worksheetlike fashion, such as $3 \times 2 =$, for the student to answer. Wrong answers are greeted with a harsh buzz, while right ones are rewarded with a gentle chime and one of a variety of simple animated displays. In one sequence, for instance, pies trundle along a conveyor belt, while in another a ship shoots at a beachside fortress.

Division problems are sometimes shown in long-division format and require a different method of entering answers. Normally, multiplication (and some division) problem answers are typed in from left to right—entering 12, for example, means pressing 1 then 2. In working through a long division problem, however, students must enter values backward, from right to left. The different entry procedures can be confusing.

Stickybear Math 2 is an intelligent program. As children solve the problems at one level, the program automatically advances them to the next. If a student is having trouble with the problems, the program drops a level of difficulty.

A nice feature is the Report Card option, which keeps track of up to 39 children's names and progress, though only in the most recent session. This is particularly useful in a classroom, where the teacher can easily monitor each student's performance. Adding a cumulative report to show progress from session to session would make the Report Card even more valuable.

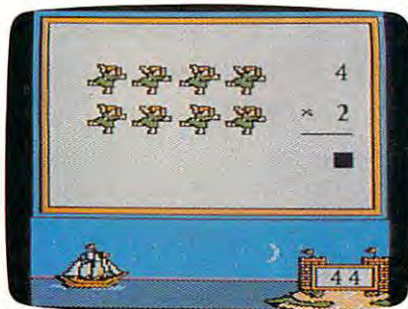
With levels that cover almost all possible multiplication and division permutations, and with levels that move naturally from easy to more difficult levels, *Stickybear Math 2* is a well-designed program that adds some flash to the tedious practice of mathematics skills.

Stickybear Reading Comprehension is another program in the Stickybear mold. Each of the program's six levels includes several short stories or passages which the child reads. After reading, the student answers two to five multiple-choice questions which test reading comprehension. At any time, the story can be recalled by the press of the space bar.

When one story is completed, another in the level can be called. Tales range from short fiction (a story of a small dog who grows to be larger than his master) to nonfiction (the account of the first manned landing on the Moon), and they're appropriate, according to the software, for grades 2-4.

Like *Stickybear Math 2*, *Reading Comprehension* lets teachers or parents customize the program for each user, though that's restricted to setting the starting level and the number of attempts allowed for each answer. A Report Card feature keeps track of up to 39 students' progress. Here, though, the report displays both cumulative and current session marks, an improvement over *Math 2*'s briefer Report Card.

The best thing about *Reading Comprehension* is that parents or teachers can create new stories and questions,



Basic math drills become colorful fun in *Stickybear Math 2*.

then store up to five on the disk. A simple word processor makes it easy to type in a story of up to 250 lines. The number of questions for each story is set (up to nine), then each question is entered, the possible answers are typed in, and the correct answer is marked. It takes only a few minutes to create a custom story.

Stickybear Reading Comprehension takes a standard classroom activity and puts it on the computer—no great feat perhaps, but it does it with a minimum of fuss—and adds some important extras, such as the Report Card

and the ability to generate new stories and questions.

Both of these Stickybear programs are good examples of solid, though not spectacular, programs which can find comfortable homes in a number of educational settings. If you're looking for drill-and-practice-style software, Stickybear is a good place to start.

—Gregg Keizer

Stickybear Math 2 Stickybear Reading Comprehension

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The Train

"I've got a thing about trains," Johnny Cash sang once.

Well, so do many of us, which makes it all the more surprising how few effective railroad simulations there have been. After all, model railroading was an interactive hobby long before there were any computers, much less personal ones.

The problem is that driving a train on a computer is simply not a dynamic activity. While laying out tracks and "building" railroad lines has formed the basis of a couple of enjoyable software packages, until now no one has found an effective means of delivering the challenge of sitting in the cab.

Accolade solves this problem neatly with *The Train: Escape to Normandy*. Taking its cue as well as its title from the 1965 John Frankenheimer film, *The Train* combines the operation of the locomotive with capturing it, holding onto it, and driving it through heavy enemy resistance. You not only have to stoke coal, you have to fight World War II. ▶

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The strategy works. Instead of Burt Lancaster and Jeanne Moreau, there are only you and Le Duc, your partner in the French Resistance. Together you must mount an assault on the train station where a train bearing priceless French art treasures waits.

This initial action is fast and furious, almost an arcade shooting gallery. You must put down covering fire while Le Duc sneaks aboard the train. The Germans fire back, but slapping the space bar lets you duck—if you're fast enough. In fact, while the combination of aiming and firing from the joystick and keeping a hand free for ducking is at first unwieldy, it nevertheless gives this segment of the game a surprising richness. So much is going on that it feels like you're really in the thick of things.



You're laying down covering fire for Le Duc as he dashes from the station.

Once you've boarded the train, your work really begins. From the cab, you must monitor all of the systems that make the train work. You can shovel coal, blow off excess steam, throttle up to speed and brake down from it, run forward or reverse, and sound the train's whistle. The various systems are accessed via a triangular cursor controlled by the joystick. Don't get cocky; it takes a lot of coordinated effort to make the train go.

Controlling the train's operation is less than half the battle, though. Once you're rolling, you have to fight through heavy German resistance in hopes of delivering the artistic cargo to Allied forces in Normandy.

Several routes are available. *The Train* includes a map view, showing the rail lines at your disposal. You can throw switches, rerouting yourself. Color coding offers a hint of which territory is in whose hands. Train stations in friendly hands offer you the opportunity to send telegraph messages to other members of the Resistance, as well as the chance to monitor German communications. Stations held by the Germans can

either be run—if you're brave enough—or attacked as in the start of the game.

To reach those stations, though, you must overcome other obstacles. Bridges are heavily defended by German gunboats. You can't run a bridge, but must bring the train to a halt and open up on the Nazis with the 155mm gun you captured along with the train. This was, for me, the most difficult of all the challenges: You have to put just the right elevation on the gun to have any chance of hitting the enemy. Aiming seems to be much easier for the Germans.

Even if you get past the bridges, there's the question of repairing damage, as well as taking on additional coal and water. These can be accomplished only at a station, so it behooves you to keep a weather eye on the map screen, watching for stations under friendly control.

While you're naturally restricted to train tracks, the Germans aren't held back. If you get past their boats, you have to face their air power. Fighters can come at you from the front or rear; fortunately, you have a gun atop the coal car and another mounted in the caboose. As with the gunboat attacks, damage can occur not only to the train, but also to the art treasures it carries. Keep your eyes on the skies as well as on the rails!

I like this game a lot. It's different, communicating a real sense of locomotive power and complexity, as well as action and excitement. The graphics are all excellent, although the control cursor could be brighter. Sounds and animation are likewise well handled, and the control interface is easy to learn.

It's less easy to master the game. There's no simple way to run all of the train's systems smoothly while simultaneously fending off the Germans. But, then, Burt Lancaster didn't have it easy, either.

Nor was Lancaster the only one to drive a train through tough times. Other trains could make other games. How about the Orient Express? The Silver Streak? The City of New Orleans?

— Keith Ferrell

The Train

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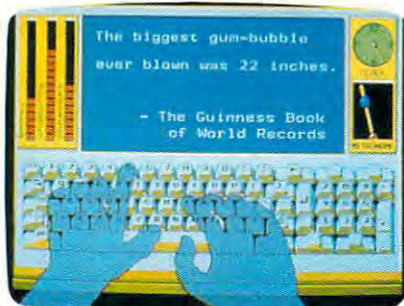
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Mavis Beacon Teaches Typing!

In his pioneering but slightly odd publication called "The Typewriter Magazine," William O. Wyckoff insisted that a writer who wrote with pen and ink risked "pen paralysis, loss of sight, and curvature of the spine."

Wyckoff wrote this in 1878. He advocated using a typewriter, a machine invented only six years earlier, to solve all of these problems and to help an aspiring worker advance up the corporate ladder to fame and fortune.



This hands-on-the-keyboard display is just one way the imaginary Mavis Beacon teaches typing.

One hundred ten years later, millions of adults and youngsters are learning keyboard skills on desktop computers with the same goal in mind: to develop job skills and to become part of the ongoing revolution in word processing. That makes typing programs such as *Mavis Beacon Teaches Typing!* valuable keys which can open doors of opportunity.

If I were to imagine the perfect typing teacher, I'd look for a teacher who taught me the fundamentals, gave me personal attention, made typing interesting, encouraged me to practice on my own, and pointed me toward a practical use of my new skill. *Mavis Beacon Teaches Typing!* may not be the perfect teacher (or even the perfect program), but it does surprisingly well in all five of these categories. Whether you're a jaded writer, an aspiring young career person, or a sixth-grader, *Mavis* is the best typing teacher for the money.

The program solidly grounds you in the fundamentals. The IIGS version has a Keys and Fingers feature which shows the computer keyboard and an animated replica of your fingers on the computer screen. As you move and press the keys, the fingers on the screen move and press the keys on the screen. ▶

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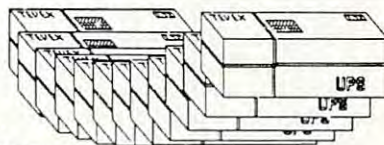
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You're free to look up at the screen at the keys and learn their location by feel. This kinesthetic approach to typing, which results in a dramatic increase in typing speed, is commonly known as *touch typing*.

Mavis Beacon is also an example of artificial intelligence in action. It is curious, alert, and analytical. When you first sit down, the program asks you to tell it about yourself; that information is used to personalize your lessons. Next, *Mavis* sets up lessons, then sits back and watches how you do. It keeps track of every key you type and the pace at which you're typing. It's smart enough to notice when you're bored, confused, or angry. For instance, if it sees you type a long string of incorrect characters, it assumes you're frustrated and upset, and it quickly recommends a change of lesson or a switch to the arcade game.

Online Help messages are just a keystroke away. And if you'd like to see how you're doing, *Mavis* can display as many as 19 progress charts which track your speed, accuracy, and other typing characteristics back to the first keystroke of your first lesson.

As you work, *Mavis* analyzes everything, and designs and redesigns new lesson plans to help strengthen your weakest areas. *Mavis* can recognize problems in more than 19 different error categories, and can instantly fashion a lesson to help you around those problems. On the other hand, if you're eager to practice on certain keys, with certain fingers, with a certain body of text, you can intervene and take control of your lesson, or even design a new lesson of your own.

Multiple screens, colorful graphics, sound effects, and games make *Mavis* a welcome improvement over the dry, sterile typing classrooms of yesteryear. I particularly like the Workshop classroom, where I can set up a metronome to tap out a beat to give me a rhythm for my typing. The Workshop also has a clock which lets you challenge yourself with timed lessons. Its dials show speed, accuracy, and progress to give you visual feedback during the lesson.

When you get tired of working through the normal lessons, you can opt for *Mavis's* Arcade Game. You suddenly find yourself in the rugged Wyoming outback in a high-performance road racer, chasing after a character known as Red Walter. Crawling across your racer's front windshield are the letters and words you need to type. If you type fast enough, you pull even with Red Walter. If you type even faster, you

zoom by and win the race.

Mavis shows the right combination of intelligence and sensitivity to keep your attention. It's programmed to keep challenging you with fresh, new lessons and to recognize any hint of boredom or frustration. Yet if you want to take off on your own, it encourages you to experiment, and it offers you several options to foster your independence.

My family and I were extremely impressed with this program. We enjoyed using it, and we all improved our typing skills as a result. In addition, I'd like to recommend the program's excellent manual. Two of its sections—on the Dvorak keyboard and on the history of typing—are especially well written and informative.

Included with *Mavis* is a résumé-writing program which helps you organize the basic information that goes into a résumé. Though the default résumé form is quite simple, it may be all you need. After filling in the blanks, you can print the résumé as is or export it to a word processor.

The only negative comment came from my daughter, who had trouble manipulating the program disk and the data disk so that the program could manage her typing records and update her past typing sessions with information from her current session. One time she grew so frustrated with this feature that she turned off the computer and relaunched the program a moment later under an assumed name. Software ToolWorks, *Mavis's* publisher, has responded to this problem by offering to send a new disk for an additional \$10. The new disk can be copied an unlimited number of times and does not require the key (original program) disk at any time.

— Fred D'Ignazio

Mavis Beacon Teaches Typing!

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PFS: First Publisher

PFS: First Publisher is an inexpensive and easy-to-use desktop publishing package for IBM PCs and compatibles. With *First Publisher*, words and pictures can be combined to create publications which use both text and graphics—newsletters, announcements, business cards, and more.

The program is easily set up, and easy to get used to. I tested *First Publisher* on an AT & T 6300 with a 20-megabyte hard drive, a generic mouse, and a Panasonic KX-P1090i dot-matrix printer. It only took 15 minutes from the time I opened the package to when I began to push the mouse around the *First Publisher* workscreen.



Graphic images can easily be resized as well as inverted, flipped, or duplicated.

The workscreen resembles a Macintosh or GEM environment, with a menu bar across the top, and scroll bar and editing tools down the side. To display a command, mouse to a menu and click. If you have no mouse, the program includes keyboard equivalent commands.

First Publisher uses "overlays" to combine text and graphics on the screen. These transparent overlays (think of them as two stacked sheets of plastic—clear except for your text or graphic) work independently of each other—when you're editing text, you cannot edit graphics, and vice versa. You can easily switch between overlays by choosing the tool (or menu command) that is associated with the current task. For example, if you're creating an illustration and want to add a title, choose the text tool. Your cursor changes appropriately; you can now enter and format text, but you cannot make any changes to your illustration. Then, to resume editing your illustration, simply choose a graphics tool.

Text position is determined primarily through the position of baselines on the page. Baselines function like the

lines on ruled paper, with the difference that these lines are adjustable. To adjust text in *First Publisher*, move the baseline on which the text is placed.

You can import text created in other programs by first saving it in an ASCII format with a .txt extension, then retrieving it in *First Publisher*. Conversely, if text created in *First Publisher* needs extensive changes, you're able to save it in *First Publisher's* ASCII format and then export it into your word processor for editing. *First Publisher* can use files created by other PFS programs—*First Choice*, *Write*, *Professional Write*—without going through this ASCII transformation.

Four type fonts are available when the program first boots. Nine additional fonts come with the package, and they are quickly and easily installed. Type styles can be boldfaced or italicized, and the package offers a good choice of point sizes.

Part of the attraction of desktop publishing is the ability to combine text with images. *First Publisher* offers several strategies for doing so. You can create your own images, retrieve images created with other software (like clip art collections), or use the sample images included with the program. Images can be moved around, erased or added to, duplicated, sized (made taller, shorter, or stretched diagonally), flipped vertically or horizontally, inverted, and edited pixel by pixel. With the graphics text tool, text can be created as a graphic, and then manipulated like any other image—a nice touch for making banner headlines. *First Publisher* reads *PC Paintbrush*, *PC PaintPlus*, *MS Windows Paint*, *LOGIPAIN*, and *Publisher's Paintbrush* files.

A nice addition to *First Publisher* is Snapshot, a memory-resident utility which takes a "photograph" of any software program screen. Snap2Art then turns the photo into a directly importable graphic, making your access to images limited only by your software.

The test of any desktop publishing package occurs when text and graphics are brought together in the finished product. *First Publisher* is a page-oriented program. Entering more text than will fit on a single page forces the extra text into an overflow area. When this happens, you can edit your current page to make room for the additional text, move the text to a new page or another page in your file, or leave it in the overflow area—it remains associated with the page on the screen, but doesn't print. Importing files larger than one page results in the automatic creation of

additional pages. Essentially, you must create each page individually. As a result, it's a good idea to plan your page layout ahead of time.

While each page must be created individually, you can store more than one created page in a file. Jumping from page to page within a file requires only a two-key combination.

First Publisher's page commands are intuitive and straightforward. With them you enter the number of columns on your page (as many as four), line-spacing, margin and gutter size, and justification (left, right, full, and centered). Picturewrap does just what the name indicates, wrapping text around graphics, making the text lines follow the outline of the image. Show Page (usable from either text or graphics overlays) displays a miniature version of your page layout on the screen.

The program's documentation is clear and logical; keyboard commands are listed and explained along with their mouse counterparts. Design guidelines (for desktop publishers with no design experience) are included, and the tutorial and example chapters can be followed while you're working on the screen.

First Publisher supports a variety of dot-matrix printers, the Apple LaserWriter, LaserWriter Plus (or other PostScript-compatible printers), and the Hewlett-Packard LaserJet+, and LaserJet Series II with 92286 B or F cartridge. A laser printer-support appendix contains user tips and complete installation instructions.

PFS: First Publisher is an intuitive, easy-to-use first publishing package. It does not include all the features of higher-end desktop publishing packages, but neither does it carry a high-end price tag. Its ability to work with more than one page in a file differentiates it from other moderately priced desktop publishing packages. If you're interested in creating professional-looking pages with a minimum of fuss, then *First Publisher* is worth considering.

— Lynne Weatherman

PFS: First Publisher

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REVIEWS



Wordstar 2000 Plus

I've used four different word processing programs, and MicroPro's new edition (version 3) of *WordStar 2000 Plus* is by far the most imposing, at least at first glance. It comes in a hefty slipcase, accompanied by three manuals (learning, general reference, and companion programs), a stack of non-copy-protected disks, and keyboard overlays. The manuals are thorough, with a structured clarity conspicuously absent in most software manuals. MicroPro scores high marks for sufficient and accessible documentation—important factors for me since reading my first software manual, which might as well have been written in Aramaic.

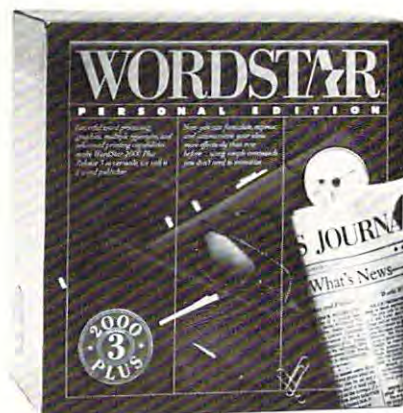
Help screens can be called from within the software itself at a stroke of a function key. Specific help, too, sometimes pops up at a touch of that key, illuminating what you just did (or thought you'd done). The documentation and help utilities should go a long way toward easing your entry into *WordStar 2000 Plus*'s powerful world.

It takes some time to get accustomed to the power at your disposal. The new, alphabetically-mnemonic command keys work on four levels with the Control, Alt, and Shift in combination with (or without) the function keys. Control QA, for instance, abandons the file; Control QS saves it and then quits; Control QC saves and continues in editing. If you're coming into this program from a plain *WordStar* background (like me), you may need several days to adjust to the change. But the new commands are logical, and the macros are easy to create and use, providing sensible alternatives to irritating command chains.

The program's thesaurus (from *Rogert's II*) contains 550,000 synonyms; the dictionary (*American Heritage*) 40,000 base words. These are excellent tools that work at individual word levels or with full files, offering viable synonyms, showing definitions, or making spelling corrections at a keystroke. The multiple windows are nice, as long as you're content to edit in only one window.

Extended memory support (which utilizes all available memory over 640K) greatly enhances the speed of *2000 Plus*—once the file is fully summoned. Although loading a long file is not speeded up, once the file is in memory, *Wordstar 2000*'s touted lightning-fast maneuvers come into play.

Cursor speed may be changed to



Wordstar 2000 breathes new life into one of the oldest word processors around.

move from 1 to 240 characters per second. Add to that the utilities and well thought-out extras of *2000 Plus*—page preview, automatic paragraph reformatting, indexing, file locating, a powerful spelling/thesaurus resource, multiple windows—and you have a system that can turn even a die-hard *WordStar* user (like myself) into a *2000 Plus* apostate.

Wordstar 2000 can insert graphics (from a variety of clip art, or from your own creations) directly into the text. Image scanning, and line and box drawing let you make pictorial run-arounds within your prose. Since it also lets you create documents in double or triple columns, the raw capability of *2000*, with its font-oriented formatting, labors like a powerful newspaper mainframe. Printer definition files format according to fonts (with 32 available). There is no doubt that *2000 Plus* is an aggressive tool for making desktop publishing a reality for yourself or your business.

The new *Wordstar 2000 Plus* also comes with Telmerge, its integrated, fully automated telecommunications package, and with assorted companion programs. Showtext lets you concoct, modify, and print various tables, financial report formats, charts, and bulleted lists with sufficient resolution for overhead projection. Fill-a-Form harnesses the grid and template to let your printer handle invoices, shipping labels, or other standard forms as precisely as you can on a typewriter (but with the option of calculations and data checks). And PC-Outline simplifies outlining to help you with structured writing.

The desktop publishing component is designed for any dot-matrix printer, but especially for laser printers. If you use coated paper with your laser printer, you're on your way to camera-

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REVIEWS

ready copy. This aspect of 2000 Plus is most impressive.

I did encounter some printer hang-ups when I didn't respond *Yes to Print and continue working?* And the graphics package that comes with 2000 Plus wouldn't install (I wound up copying it to the appropriate subdirectory). Technical support responses to these questions were somewhat equivocal.

One technician indicated that MicroPro was aware of the printer problem and was working to correct it. A follow-up caller suggested the BIOS ROM (Phoenix) in my computer was the culprit. My inability to install the graphics package that comes with 2000 Plus suggests that the ROM may indeed be the problem. (On the other hand, my Kaypro PC has heretofore, under many tests, always been fully IBM compatible.)

WordStar 2000 once had the reputation of being a patched-together program. It didn't use the regular *WordStar* command set, so die-hard users wouldn't switch. But *WordStar 2000 Plus* is far more amenable with its conversion abilities and more compatible file systems. Add to that its bundled companion programs and radical desktop leadership and you have a conspicuously refined system that is state-of-the-art PC word-processing.

— Bob Gingham

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Tax simplification is anything but. The phrase is a well-known oxymoron, since virtually every time Congress simplifies taxes, the process of filing them becomes more complex and time-consuming. The most recent tax law overhaul was no exception. Tax preparation software can help you manage this complexity.

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gram. However, *Tax Preparer* from HowardSoft does provide plenty of printed information, and the program makes calculating taxes easier, allowing you to quickly test what-if scenarios.

Immediately after installing the software, you'll probably want to jump in and start entering information. Be patient. *Tax Preparer* works logically and quickly, but it isn't very intuitive.

A thorough reading of the software documentation is important. Onscreen help files are sparse, and many of the program's features can easily go unnoticed. The program's manuals make up for the missing onscreen documentation, providing plenty of information on the IRS tax forms.

One of *Tax Preparer's* most useful features is the Road Map, which guides a beginner through the proper forms in a reasonable and logical order. The Road Map helps ensure a complete return. It makes it possible to jump back and forth among Form 1040 and any of the supporting schedules, forms, or worksheets, for example.

A single keypress enables you to add supporting information and explanatory text to your return, including a list of the individual items that make up virtually any total on the final version. For instance, when you list the names of the lenders and amount paid in interest to each, *Tax Preparer* automatically enters the correct total into the appropriate line on the return. These supporting pages may be printed for inclusion with the final mailed-in version of the return, or they may be "detached" for a permanent recording of the logic you used on your tax return.

Tax Preparer is acceptably fast, and, since it looks to see how much memory your computer has available and then installs itself as fully as possible, disk access delays are reduced.

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Tax Preparer provides high-volume data entry methods in addition to the Road Map provided for individuals. These options include an intermediate level Pre-Format data entry mode and a True-Batch mode. Individuals may choose the Pre-Format method for updating a return, while the batch method is designed for professional tax assistance services. *Tax Preparer* produces work sheets for tax-preparation personnel to use while gathering information from clients, and it also optionally makes use of "hash totals" to verify the validity of figures keyed by data entry personnel.

Although online help and the speed of booting the software could be improved, *Tax Preparer* excels at the heart of its task: automatically (if you wish) asking the right questions and generating the proper tax forms for your return. Those who must file several schedules and forms for self-employment and small business purposes will appreciate the linkage between the several forms, which reduces the tedium and eliminates transcription errors.

Just as word processing changes the process of writing and rewriting by reducing the effort of revision, *Tax Preparer* changes the process of filing a return.

— J. Blake Lambert

Tax Preparer

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Publish It! is like a cumbersome software suitcase. It has lots of pockets and compartments for storing not only the necessities, but also the comforts you will need for a trip to the mysterious and exotic land of desktop publishing.

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Publish It! comes in an attractive package which suggests some possible uses and outlines the features of the program. There's no warning, though, that you'll need nearly an entire box of blank disks to get started. Eight 5¼-inch disks are required to make working copies of the program, sample files, two font disks, and four art disks. Though the program comes on four double-sided 5¼-inch disks, don't use a disk notcher to create flippable backups. When accessing files or printing a document with several fonts/typefaces, the program frequently requires access to two disks. Up to four drives are supported.

Publish It!'s best features are its faithful reproduction of the Macintosh user interface and high-quality output. A well-designed layout screen, clever icons, changeable ruler units, informative dialog boxes, convenient scroll boxes, pull-down menus, and mouse (or joystick) control with keyboard shortcuts make the program easy to learn and use.

The printed output is excellent. Six detailed typefaces in several point sizes make *Publish It!* documents rival Macintosh results on a dot-matrix printer.

The program's weakest features are its speed (or rather the lack of it) and its accompanying clip art. The program's flow is constantly interrupted by disk access when a new function is called or when the screen is redrawn after changes are made. And the cartoonish clip art suffers when compared to the elegant typefaces.

Don't use *Publish It!* to type in great lengths of text. Though the built-in word processor buffers keyboard input, it soon falls behind quick fingers. The program works optimally if you write using *AppleWorks*, *Bank Street Writer*, or a ProDOS word processor that exports ASCII text files and then import the file to *Publish It!*.

The *Publish It!* graphics toolbox is adequate but far from comprehensive. Rules (lines) and geometric shapes are available, but freehands, diagonals, and ovals cannot be drawn. You should use a ProDOS graphics program like *MousePaint* or *DazzleDraw* to create your artwork and then load the file into *Publish It!* for cropping and placement.

Graphics figures and text columns created with or imported into *Publish It!* are treated as *objects*. Resizing a graphic is often difficult, since there is little tolerance for positioning the cursor on the wrong part of the object's handle. You



Macintosh-style desktop publishing comes to the Apple II with *Publish It!* and its graphics interface.

can group graphic objects together, but the group can become separated when you move it around the screen.

The documentation is thorough. It includes a tutorial which takes you through the rudiments of program operation but omits most of the intricacies.

Publish It! has two blatant omissions. The unforgivable lack of an undo function makes it important that you save your work frequently, since some editing changes are irreversible. Another problem is that there isn't a dialog box to warn you against inadvertently opening a second file atop a file that hasn't been saved. Multiple open files aren't possible, so the first file is lost.

Printing is *excruciatingly* slow; the time doubles when you choose the higher quality double-strike option. Some printing time includes frequent disk accesses whenever new fonts and typefaces are encountered within a document. A sample four-page newsletter file took more than an hour to print; one page required 25 minutes.

Publish It!, like the fully packed suitcase, has nearly every conceivable feature you'd like to have in a page-layout program.

—Duncan Teague

Publish It!

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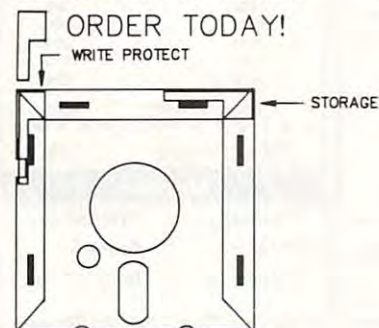
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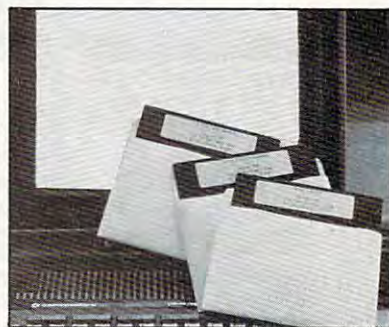
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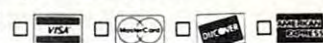
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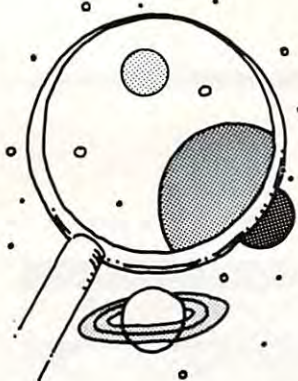
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discoveries

DAVID STANTON



Don't Buy a Computer for the Kids. Instead, Get One for Yourself, Then Bait the Computer Hook

A friend recently bought an Apple IIe for his family. "I'm hoping it will help them in school," he proffered, speaking of his middle-aged daughters (one 11, the other 14)."

He had purchased an excellent system, complete with printer and attractive computer desk. While we discussed the educational value of home computers and other such high-minded trivia, his wife was engaged in more practical matters.

Fearlessly she followed Carmen Sandiego from Singapore to London to New York, dodging knives and bullets in her dogged pursuit of the notorious criminal. Just when all seemed lost, she heard echoes of villainous music. She glanced up. There in the shadows she saw him—her unsavory suspect stealing away into the night.

He was shrewd. She was shrewder.

"What country uses the Yuan for money?" she mumbled to herself, apparently accustomed to living with danger. One of the girls had already grabbed the almanac. "No, honey. Let me do it," Mom pleaded. "This is no job for young girls!" she muttered to herself. But the girls would have none of it. They insisted on helping, and, to avoid making a scene, Mom conceded.

So on we talked, and onward marched the mother/daughter international law enforcement agency, catching thief after thief. Only an occasional disagreement—about who would hold the almanac or which city sold designer jeans—disrupted the successful detective team.

Eventually, Carmen Sandiego would be caught. (Strange that such a crafty criminal should become the most frequently captured.) And with each new capture, another detective learns a bit more about world geography. With each keystroke, he or she gains a bit more confidence in computer skills.

Who could deny the importance of those skills nowadays? So convinced are some school districts that many have made computer literacy classes compulsory for students from elementary to high school. So concerned are some parents that many have bought expensive systems for their children without really knowing why.

All agree on one thing: Kids must be taught about computers whether they like it or not.

Whatever happened to motivation?

When should we start insisting that children become familiar with computers? How early should we start teaching keyboard skills? At what age should we make children

sit down and learn word processing and databases? What skills should we require all students to develop before graduation?

Schools must deal with such issues. As the theory goes, schools must expose all children to computers. In practice, though, the mere act of forcing technology on children, at school or at home, causes some to rebel.

In fact, any attempt to push computers on others "for their own good" suggests an underlying lack of faith in the technology. If word processing really saves time and produces better results, use word processing and let others do things the hard way. If learning is really more efficient and more fun with computer-assisted instruction, keep it to yourself unless the children insist. Eventually, they'll catch on.

In other words, don't buy a computer for the kids. Instead, get one for yourself. Buy a couple of good software programs and use them. Enjoy them. OK, to avoid charges of selfishness, make them available to the rest of the family if you must. But remain low-key. Once others discover the pleasure of computing, you'll never have another peaceful moment at the machine.

To bait the computer hook, you need good software. Here's a sampling.

One of the most popular programs with people of all ages is Brøderbund's *Where in the World is Carmen Sandiego* (described above). Versions are available for the Apple II, IBM and compatibles, Macintosh, and Commodore 64/128.

Crossword fanatics will love Mindscape's latest version of *Crossword Magic*. It helps users create their own puzzles on any subject. Puzzles can be printed out, or friends can solve them right on the screen. (Apple II, Commodore 64, Macintosh, 8-bit Atari, and IBM with color graphics card.)

If graphics are your game, try *Blazing Paddles* by Baudville (Apple II, Commodore 64), or, for the younger set, *Walt Disney Comic Strip Maker* (Sunburst Communications/Apple II).

Finally, Brøderbund offers several versions of its classic *Print Shop* (Apple II/IIGS, IBM, Commodore 64/128, and Macintosh). Newer versions support color printouts and the higher resolution on the Apple IIGS.

Tempt your children with fun programs like these, and you won't have to drag them to the computer—they'll come of their own accord. □

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

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continued from page 8

more than 200 government and private publications into a single CD; the information relates to the operation and management of small businesses. *Stat Pack*, at \$125, compiles government facts and figures related to business, economics, and other areas.

Product announcements naturally played a big part of the conference. This part of the show was stolen by Apple and Tandy. Apple's announcement of its CD-ROM player came complete with multimedia flash and sizzle; the product should be available by the time you read this. Tandy's announcement was more low-key, but at the same time perhaps more far-reaching. Through its Radio Shack network of retail

stores, the company will begin selling the Hitachi CD-ROM player, a move that immediately makes players more accessible than ever before.

Other product announcements and demonstrations were divided between hardware and software. On the hardware front, half-height CD-ROM drives made a big splash, with units shown by Amdek, Hitachi, and Sanyo. NSA showed a unit designed specifically for Compaq computers. Atari was present showing an as yet unreleased CD player which, the company promises, will be priced under \$600 and will play audio CDs as well as CD-ROM discs (the Apple CD-ROM drive does this as well).

On the software front, the conference's big word was *hypermedia*, with developer after developer talking of hyper this and hyper that. Apple's *HyperCard* got a lot of attention as a platform for accessing CD-ROM applications, although the attention paid it seemed disproportionate considering who the conference's host was.

Whatever the platform and software for accessing CD-

ROM based material, it was clear that optical storage is about to break loose in several directions.

Those directions were addressed during the general information sessions, which proceeded along four topic-oriented tracks: the transition to CD-ROM from other storage media, the preparation of CD-ROM materials, technical questions involved in CD-ROM, and the creative process by which new art and educational forms will be produced using these developing media. There was general agreement that CD-ROM, now an industry whose size is measured in tens of millions of dollars, will be a multibillion dollar industry within a very few years.

There was a surprising level of agreement that a substantial consumer market is also developing for optical storage devices and software.

Among the speakers who generated attention were Microsoft head Bill Gates, who painted a picture of the industry's growth; McGraw-Hill chief Joseph Dionne, who spoke eloquently of the place of traditional publishing in the new world of optical media; Jim Manzi, head of Lotus, who sounded a cautionary note about computers causing people to spend more time at work rather than less; and scientist Marvin Minsky, who gently pointed out that CD-ROM is, after all, another storage system—a means for organizing information, not a new way of thinking.

Despite Apple's claim to CD-ROM, the conference was clearly Microsoft's show. Microsoft's pride of place in the CD-ROM universe was on full display, as was its commitment to continued support. Good show!

—KF

MS-DOS Takes Charge of Fun Software

If you own an IBM PC, Tandy, or other compatible computer, you probably already knew this: MS-DOS entertainment software has been taking your computer by storm.

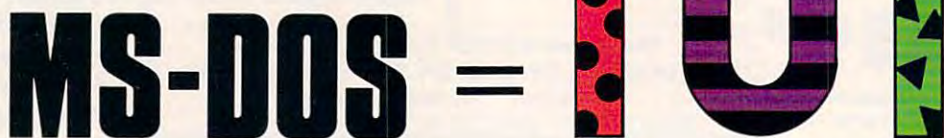
Fun software, according to the Software Publishers Association, was the fastest-growing category during 1987. Overall, recreational software accounted for less than nine percent of total sales, but its percentage increase from the first three months of '87 to the last three months

account for a lot of entertainment software sales, but because software publishers are naturally eager to sell to the most receptive market, they're likely to give those mature machines shorter shrift in the future.

Other information buried in the SPA sales figures shows that IBM computers are encroaching on Apple's most prized market—education.

Though Apple II programs made up more than half of the

education software sales, nearly 30 percent was in MS-DOS packages. Apple and IBM rule the schools now, but IBM is moving up fast.



was an astonishing 105 percent.

And MS-DOS software had the lion's share of that increase—more than a third of the entertainment software sold last year was for the MS-DOS line. MS-DOS recreational programs outsold Apple II fun software 2:1, trounced the businesslike Macintosh 7:1, and even bested the game-blessed Commodore 64 and 128 by \$25 million in sales.

Because entertainment software is bought for the home, not the office, the numbers indicate that the IBM PC and the plethora of MS-DOS clones have become the dominant systems in the home. It's a blow to Commodore and Apple, who have held that position in the past.

Both Apple II and Commodore 64/128 software sales grew during 1987, but at far slower rates than the MS-DOS category. That means software publishers, especially publishers of fun software, are more likely to turn first to the IBM world for their products. Apple II and Commodore, with their huge installed base, will continue to

And the Macintosh, a system that's been making great inroads into business of late, was the software sales growth leader of '87. Eighty-one percent more Mac software was sold in the fourth quarter of the year than in the first. Total Macintosh software sales were second only to MS-DOS. Even so, Macintosh software sales amounted to just over one-tenth of the total MS-DOS figure. The Macintosh may be getting into business, but the leader (by far) is still IBM and its copiers.

But high MS-DOS sales figures didn't translate into lots of trophies at the 1988 SPA Excellence in Software Awards ceremony in Berkeley, California. Of the 26 awards, 16 were given for Macintosh programs.

IBM entertainment software was represented, however, by such winners as Brøderbund's *Ancient Art of War at Sea* (Best Packaging, Best Action/Strategy Program) and Britannica's *Designasaurus* (Best Preschool or Primary School Program, Best Educational Program).

— GK

New PC Virus Innoculation

Rumors of PC viruses spread through the computer community like wildfire this spring. To help PC users (especially the corporate variety) sleep better at night, Lasertrieve (395 Main Street, Metuchen, New Jersey 08840) has announced a revolutionary new service and product package called *VirALARM*. *VirALARM* is designed to protect your PC from viruses by detecting infestation and alerting you to their existence before the virus can spread to other programs.

According to Lasertrieve president, Arnold Singer, *VirALARM* will add less than 5K to any program it protects and will perform its checking routines in less than three seconds. Lasertrieve offers several protection plans.

The first, called the green plan, is designed for software publishers. Using this plan, an inoculation would be an integral part of the software, with the cost either absorbed by the publisher or transferred to buyers.

The yellow plan is designed to inoculate individual programs for an organization with several PCs. If a company is using ten copies of a particular product, they might opt for Lasertrieve's yellow plan and inoculate their existing copies.

The last plan is the red inoculation. This prophylaxis is performed on individual PCs. The success of both this plan and the yellow plan depend on the user having a virus-free program to inoculate.

Lasertrieve is selling the *VirALARM* service to corporations rather than individuals. Corporate costs vary with the number of machines and the plan selected, but range from \$2,000 to \$50,000.

How impervious to infection are programs inoculated with *VirALARM*? According to Mr. Singer, "*VirALARM* programs are 99 and 44/100 percent pure—like the soap. There's no way we can make a product that we can guarantee as 100-percent effective, but we're trying."

In a related story, Commodore, makers of the Amiga (the computer which played host to the first known micro-computer virus), is offering continually updated antiviral programs to its users free of charge. According to sources inside Commodore, the company is devoting some of its technical support to the full-time job of detecting new virus strains and to updating Commodore's antiviral program.

— CK

Beware Betaware

In a departure from traditional practices in the software industry, powerhouse word processing publisher WordPerfect released the Macintosh version of its namesake program in an unfinished form, calling it *betaware*.

Long delayed and more than a year overdue, *WordPerfect* for the Macintosh was made available in a prerelease,

or beta, version during the January MacWorld Expo in San Francisco. For \$99, users received the software, final documentation (completed even though the software wasn't), and the standard WordPerfect toll-free telephone support. When the final version is ready, said

WordPerfect, betaware buyers would receive a free upgrade.



To many people, that sounded like a good idea. The suggested retail price of the finished WordPerfect is \$395, so betaware owners were getting the program for a quarter of its completed cost.

But the deliberate selling of a buggy product can be dangerous. Traditionally, beta testers are part of a small, controlled group who don't pay for the product, who are expected to report programs to the publisher, and who know what they're getting into. Betaware, however, means that people are paying for the privilege of using an undependable product. Users may not realize they have to take extra precautions to safeguard their work (and perhaps even other files on the floppy or hard disk) against loss when the program crashes, as most beta versions tend to do.

WordPerfect wasn't the only manufacturer to offer a betaware product at MacWorld Expo. Ann Arbor said it gave out 10,000 demo copies of its *FullWrite Professional*, another power word processor for the Macintosh, to those who had already placed orders, as well as to attendees of Expo.

— GK

Apple Spins Out CD-ROM Drive

With the introduction of its AppleCD SC CD-ROM drive, Apple becomes one of the first consumer computer companies to dive into the untested waters of compact disc storage and retrieval.

CD-ROM, an information storage system which uses digitally recorded discs similar to audio CDs, can pack over 550 megabytes of data on one 12-centimeter disc. Access time is much slower than with a hard drive, the most popular mass storage format now used with personal computers, but the sheer mass of available information more than makes up for the wait. Applications of CD-ROM have been slow in coming, but the system is tailor made for space-hungry graphics and sound. Vast reference works, from encyclopedias and dictionaries to census data and legal decisions, can be packed on a single disc.

Apple showed the AppleCD SC at Microsoft's Conference on CD-ROM in early March. The drive works with both of Apple's lines; it connects to the Macintosh Plus, SE, or II via the computer's built-in SCSI port (hence the SC designation for the drive).

All that's needed is a cable. To use the AppleCD SC with an Apple II+, IIe, or IIGs, Apple's SCSI interface card, which plugs into one of the empty slots inside the computer is needed. From the outside, the drive looks a lot like Apple's external hard disk drive; its footprint is just a bit larger than the Macintosh SE. Compact discs are loaded into the front of the drive in a small plastic disc caddy.

The drive can also play audio CDs, even while other applications are in use on the connected computer. Both headphone jack and RCA jacks are on the back of the drive so that headphones or external stereo speakers can be plugged into the unit.

Supporting Apple II (ProDOS), Macintosh (HFS), and High Sierra file formats, the drive is able to use a variety of

CD-ROM titles. The High Sierra format is particularly important, because it's gained wide acceptance among CD-ROM disc publishers. Initially, the drive will be shipped without High Sierra capabilities, but a software upgrade will be made available this summer (supposedly in August, according to inside sources).

Apple made a point to mention *HyperCard* as the best interface for accessing information from the drive. *HyperCard*, all the rage for its hypertext abilities, has been touted since its introduction as the perfect software for managing mass quantities of information.

Hooking up a CD-ROM drive to a Macintosh (the most obvious machine, since it has the SCSI interface already present) would put an enormous amount of information at



The Apple CD SC down loads from the front using a plastic disc caddy.

one's disposal. Desktop publishing, with its disk-gobbling fonts and graphics, is one possible use of the drive. Connect an AppleCD SC to a Mac and an entire font library would be available for downloading to a LaserWriter.

Another immediate application for CD-ROM is in the field of digitized sounds. Unlike synthesized sounds, which are manufactured by the computer,

digitized sounds are stored on disk. Using CD-ROM, for instance, sounds could be loaded into the Macintosh during the course of a game.

The CD SC drive will work with *AppleShare 2.0*, due out this summer, thus making it able to be shared on a network. Apple has priced the CD SC drive, available only through Apple dealers, at \$1,199.

— GK

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ware manufacturers). Like *D&D* if you get in too deep, you tend to eat, speak, and breath CD-ROM every waking moment. The only known cures include forays to local used-book stores, road trips to Mt. Ranier to plant the first CD-ROM disc above 14,000 feet, and getting buzzed by a gaggle of low flying F-16's out by Lowrey Air Force base, all of which helped me keep the week in proper perspective:

Lasertrieve clinched the best costume honors by decking its folks out in white lab coats and sending them careening through the aisles issuing prescriptions for *Vir-ALARM* software inoculations designed to foil the spread of software viruses.

Tandy, who had been making lots of noise prior to the conference about getting into the CD-ROM swim, decided to wade in the shallows instead by opting to make a \$1,000 Hitachi player available on a special-order basis from its Radio Shack computer outlets.

Silliest display on the exhibit floor was IBM's unmanned booth, where a lone PC was running a mechanical parts catalog application from an attached non-IBM CD-ROM player. A small printed sign more or less stated "just because we have a CD-ROM player hooked up to one of our machines, don't jump to any conclusions about IBM endorsing CD-ROM. Furthermore, if you take it upon yourself to hook somebody else's gear up to one of our machines, we don't want to hear about."

The Steve Martin Lonely Guy Award went to Atari, whose under-\$600 CD-ROM drive for their ST series generated little interest at the show. Many attendees viewed the third quarter availability date as more than optimistic. Atari personnel involved with the project admitted that while some ST developers would receive units in early April, software drivers and search engines would be a long time coming for the ST. The units displayed at the show (reportedly manufactured by Chinon of Japan) were capable of using both data and audio CDs and sported a removable infrared remote control.

Tramiel's troops raised fewer eyebrows than expected with their CD-ROM drive pricing. The reason: Since last year, bargain-minded owners of IBM PC and AT clones have been able to buy a player (bundled with a CD containing over 3000 public domain programs) for \$639 from ALDE Publishing of Minneapolis.

The wackiest giveaway of the conference was a CD-ROM being passed out by the Uni-

versity of Alabama. It was pressed into my palm by a beaming student who gushed "It's got a lot of U.S. Census data on it."

"Thanks!" I replied, "Is it in High Sierra format?"

"Well . . . not really. . . . Unfortunately, JVC pressed it in a weird format, so the disk is pretty much unreadable."

The worst-kept secret of the show was the introduction of an Apple CD-ROM player that can be directly attached to an SCSI port on a Macintosh or Apple II (equipped with an SCSI card) and can be shared on an AppleTalk network by multiple systems.

Some attendees were put off by the Apple unit's relatively high price (\$1,199), and a significant number of conference veterans were miffed by Apple's cheery yup-scale attitude, which can be summed up as: "Hi! We're from Cupertino, and we'd like to thank you folks for agreeing on a data format standard. Now we're going to show you the right way to do CD-ROM applications for the rest of us."

As many Apple watchers had predicted, the "right way" turns out to be *HyperCard* on the Macintosh. CD-ROM does seem a logical way to deliver massive *HyperCard* stacks, and the stacks Apple demonstrated were slick and carefully thought out.

When it comes to CD-ROM, Microsoft and Apple are locked in a classic love/hate relationship. Bill Gates and his crowd may have welcomed Apple's endorsement of the media it has championed for several years, but was less than thrilled by Jean-Louis Gassée, Apple's unmitigated Gaul, referring to MS-DOS-based CD-ROM applications as having "user interfaces designed by the KGB."

Gassée also provided a graphic demonstration of the principle of WORM (Write Once, Read Many) drives by making the same speech at both the general conference new announcement session and the Apple press conference that followed several hours later.

What's the bottom line? Contrary to all the hype, CD-ROM is just another storage medium, albeit a relatively dense one. At present prices, it may find a niche in educational networks and as luxury peripherals on some enthusiasts' systems. If CD-ROM is to really take hold, \$200 players must become available within three years or so. When that happens, (and there's no reason it can't), CD-ROM will become the medium of choice for distribution of massive software applications. □

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levitations

ARLAN LEVITAN

CD-ROM Conference Wows 'Em as IBM Gets Lonely, Apple Talks of the KGB, and We Plant a Disc on Mt. Ranier

I'm a sucker for leading edge technology. Not content with being the only guy on my block with a nuclear-powered can opener, last summer I took it upon myself to purchase an Amdek CD-ROM player and *Microsoft Bookshelf* for my PC AT clone.

CD-ROM discs look just like an audio compact disc, but they contain data instead of music. *Microsoft Bookshelf*, for instance, is a CD-ROM that holds *The American Heritage Dictionary*, *Bartlett's Familiar Quotations*, *Roget's Thesaurus*, *The World Almanac*, and a half-dozen other reference works that I can call up from within my word processor. *Bookshelf* lets me perform keyword searches on the reference works at hand and then cut and paste information into my working document. The Amdek drive also comes equipped with software and a set of audio outputs that let me slap on Stevie Winwood or a dash of Mahler when I'm in a toe-tapping mood.

While *Bookshelf* is handy, CD-ROM hasn't taken off in a big way. Only a few other titles of general interest are currently available, most notably, a text-only version of Grolier's encyclopedia and collections of public domain IBM PC software. Since players are still relatively expensive (\$600 and up), CD-ROM developers have tended to concentrate on vertical markets where users are willing to spend big bucks. I'm as interested as the next guy in a copy of *Books in Print* or a U.S. map atlas on CD-ROM, but my wallet tends to go into convulsions when confronted with a \$1,000 price tag for such goodies.

If you want to know what's hot and what's not in the world of CD-ROM, make your way to Seattle, Washington during the first week of March for the International Conference on CD-ROM.

I flew into the Puget Sound area on Northwest Airlines in the midst of a threatened strike. Northwest's flight attendants had been working without a contract for several days, and their tentativeness established a feeling of uncertainty that uncannily carried throughout the week's confab.

Last year's conference had been accompanied by three days of torrential downpours. Microsoft, our host, armed attendees to this year's bash with oversized golf umbrellas emblazoned with their corporate logo.

Seattle may be wet, but it's an interesting town with a refreshingly laid-back attitude. While the suit-to-sandal ratio at the conference itself was exceedingly high, we made several forays into the local environs

and got the distinct impression that "formal dress" in the Northwest means wearing a tie with your flannel shirt.

Microsoft had spearheaded development of a standard data layout for CD-ROMs, previously dubbed the "High Sierra" format. At their Monday evening press conference, they announced that the International Standards Organization (ISO) has blessed a slightly modified version of High Sierra as "ISO 9660", the new standard format for CD-ROM. While Microsoft announced that version 2.0 of their CD-ROM extensions for MS-DOS would support both formats, there was general agreement that the "ISO 9660" moniker lacked panache and seemed more suitable as the name of a new food or detergent additive.

Microsoft also introduced two new mass-market CD-ROM titles: *Stat Pack* and *Small Business Consultant*. *Stat Pack* is a collection of social, business, political, economic, and agricultural statistics compiled by the U.S. government. For only \$125, owners of CD-ROM drives can attempt to correlate the per capita consumption of Cheez Whiz in election years in which the republican candidate won the presidency. *Small Business Consultant* contains the full text of over 220 government publications dealing with questions most commonly asked by small business operators. A nice idea, but I have difficulty with the concept of taking business advice from an enterprise that hasn't been able to turn a profit in over 50 years.

The press conference was followed by a reception where cool jazz, champagne, and fresh salmon were as abundant as bytes on a CD-ROM. Bill Gates dropped by and mingled amongst the suits, artfully demonstrating that when you're worth a couple billion bucks, you can afford to be the only one at a cocktail party dressed in a pullover V-neck sweater with chinos and loafers.

The next three days were a blur of new product announcements, demonstrations, and apocryphal pronouncements by industry soothsayers. The primary danger of a conference with a narrow focus is a sort of one-dimensional tunnel vision that can engulf the most reticent skeptic. CD-ROM conference attendees tend to fall into one of a few character classes, somewhat akin to the personas found in *Dungeons and Dragons*. Priests (Microsoft, Apple), Wizards (search engine builders), Lords (information providers), Elves (disk pressers) and Ninjas (hard-

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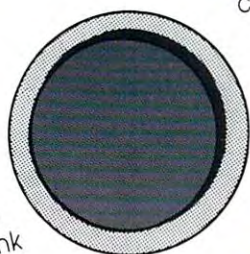
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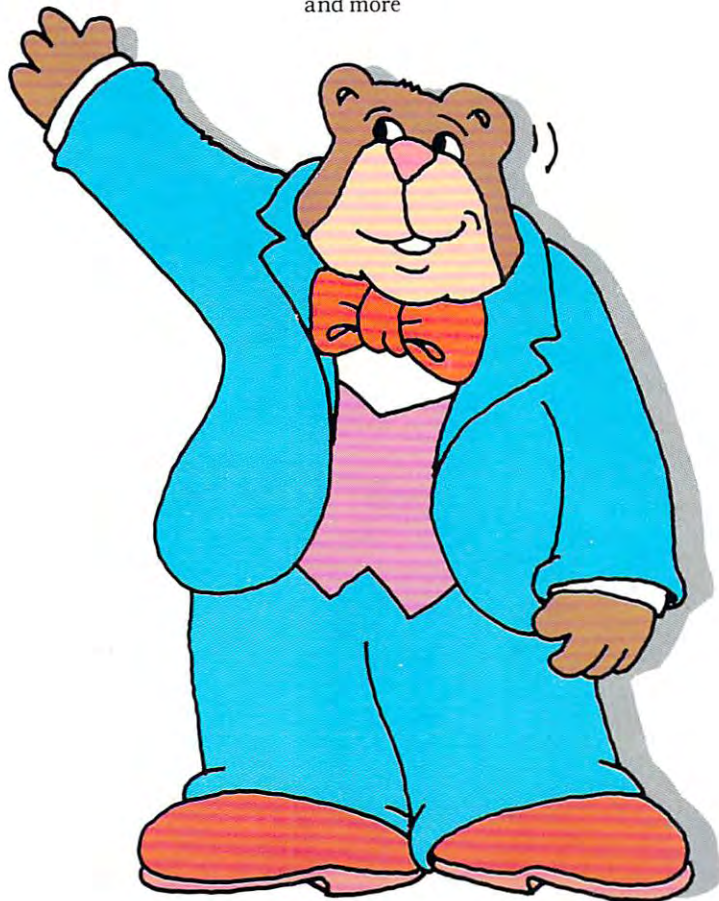
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