1991 COMPUTE CHOICE AWARDS—20 BEST PRODUCTS

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JANUARY 1991

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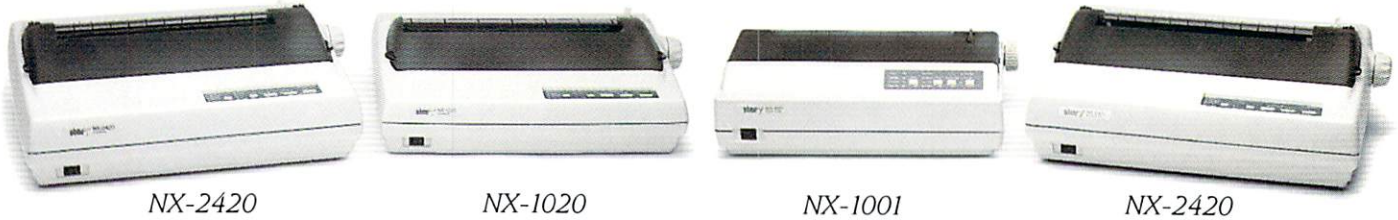

NX-2420 RAINBOW | *NX-1020 RAINBOW* | *NX-1001 MULTI-FONT* | *NX-2420 MULTI-FONT*

For a while there, it was beginning to look like there would never be a dot matrix printer versatile enough to be a real jack-of-all-trades. But no more. Now, for the first time ever, there's a new series of printers designed to bring you big-business performance at a small-business price.

Star's new NX Series printers have all the write stuff you need to get the job done and then some. Let's start with multiple fonts. Each of the four NX Series printers comes equipped with an incredible variety of fonts, sizes and enhancements, which, when combined, put thousands of printstyles at your fingertips. And all offer high resolution graphics for more professional-looking presentations.

Multiple fonts

Advanced paper handling features (which are optional on most printers)

Advanced paper handling

are standard with Star. The switchable push/pull tractor makes changing paper paths a snap—a feature that's especially handy when you're printing a lot of hard-to-manage forms. Plus, convenient paper parking lets you feed single sheets through at the touch of a button—without removing or wasting continuous-feed paper.

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NX printer control panels are designed for the ultimate in user-friendliness. You can easily select up to 14 of the most commonly used functions. And an Electronic Dip Switch Mode lets you customize the control panel with up to 15 of your own power-on settings.

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Star's NX printers are Epson and IBM* compatible for use with most off-the-shelf software packages. Their standard parallel centronics interface with optional serial-to-parallel converter makes them simple to use with most personal computers. All are capable of high-speed, bi-directional printing at extremely low noise levels. And the two *RAINBOW* models—the NX-1020 and NX-2420—even offer printing in seven vibrant colors.

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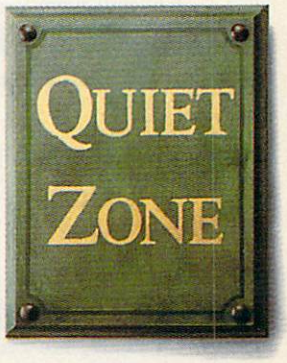

Low noise level

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COMPUTE

JANUARY 1991 VOLUME 13 • NO. 1 • ISSUE 125

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PETER SCISCO
Designing computer products for the consumer market is a difficult task, but it's not impossible.

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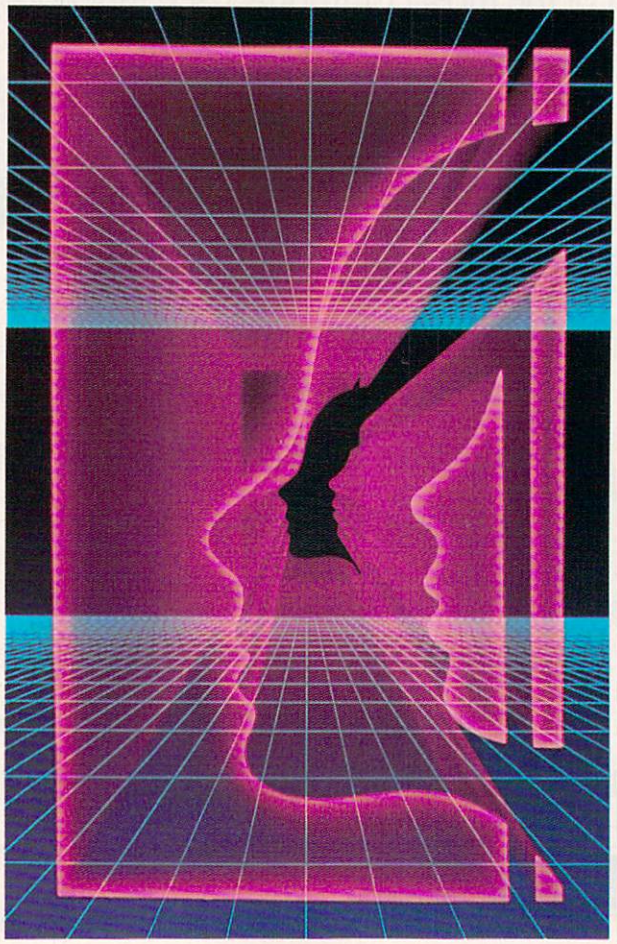

ON THE COVER

Artist Alan Lee Page created our January cover on a Dicomed computer called the Imaginator. The work is a multimedia collection made with still photography and computer-enhancement techniques.

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STUNTS™

You'll never look at racing programs the same way again.

Stunts turns driving games upside down. Literally. It comes with 14 different hair-raising stunts, including pipes and corkscrews for white-knuckle, upside-down driving!

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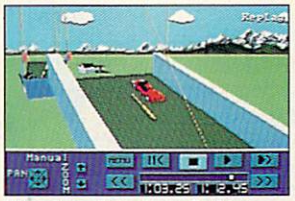

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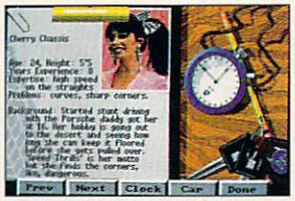

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COMPUTE

PC

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CLIFTON KARNES
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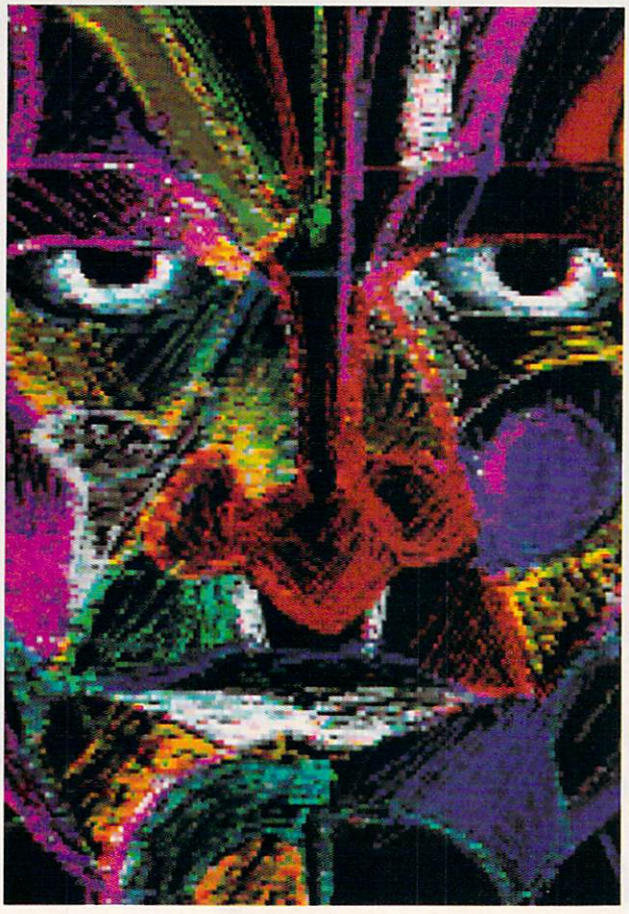
COMPUTE is looking for exceptional computer-generated art for use on future covers and with feature articles. If you're a computer artist interested in national exposure, send us examples of your work in either color slide or transparency format. Include a brief note listing the title of the work and the hardware and software used in its creation. Please address your samples to Art Director, COMPUTE Publications International Limited, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408.



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MICHAEL J. GIBBONS
You no longer are restricted to the 64's memory limitations with this utility that loads and links BASIC subroutines or modules from disk.

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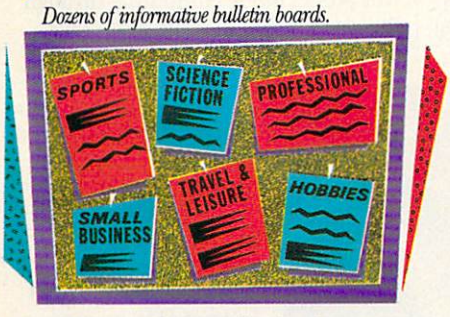

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EDITORIAL LICENSE

PETER SCISCO

The Swiss painter and sculptor Paul Klee once defined art this way: "Art does not render the visible; it renders visible." That phrase has never left me, for it so neatly describes the way the creative process works. The best human endeavors, no matter which field they are born to, do not merely represent the obvious, but instead make the obscure plain. It's true in art, in governance, in industry. It's true even in home computing.

Potentially, every software and hardware product released to the public has an audience, no matter how small or specialized. That's the power of the personal computer. But some products do more than that; they bridge the gulf between specialty and generality. Designed for the individual, they appeal to the group. Sometimes it's a technological innovation. Sometimes it's a different perspective. But whether they're based on innovation or insight, these products shape the computing landscape with an invisible hand and become the standards against which others of their kind are judged.

For the third year, the editors of *COMPUTE* have fought for what each believes to be the best consumer software and hardware products. The merits of each contender weighed evenly in the analysis, but in the end all of the others gave way to the 20 products that top our list. Those that did not come out on top are certainly worthy of your attention; we've tried to guide you with our reviews, "COMPUTE Choice" articles, and features.

This year's winners cover the gamut of home computing, from extended office to entertainment. They appeal to every age, from preschooler to adult. They touch every level of expertise, from power-user professional to eager initiate. The list offers a glimpse into the world of consumer computing and renders visible the many levels of sophistication to be found there.

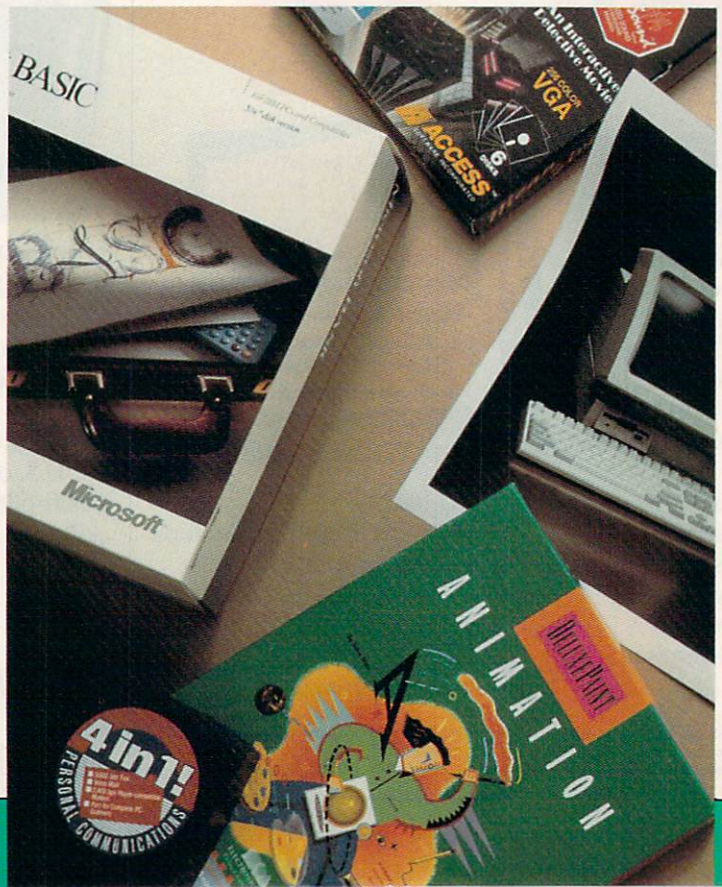
Designing computer products for the consumer market is difficult. Some people think it impossible. Among our winners are several products that defeat that latter judgment and several more that, though not designed as consumer products, nevertheless succeed in bringing technological wonder home.

It's an idea whose time has come, as evidenced by the increased attention being lavished on home computer users over the last six months. New products from major companies give credibility to computer users long dismissed as hobbyists or game players. The home computer owner is finally gaining recognition as a serious, productive computer user, whose needs are as valid as those of anyone in the corporate computer world (many times they're one and the same person) and whose reliance on outside sources for technical support and innovative solutions demands a credible response.

COMPUTE has provided that response for some time and will continue to do so. We'll explore the avenues of technological promise and the strategies of innovation. We'll map the evolving landscape of home computing, even as we maintain our connection to the inventive steps that got us here. And we'll do all of this with one goal in mind: to serve the reader by acting as both guide and medium, as a channel for the exchange of ideas that will propel home computing through this decade and into the next. This month, for example, you can interact with *COMPUTE* by telephone, making your own choices for the best home computer products (see page 16).

That's just one of the many innovations we've planned. In the coming months, you'll be treated to an array of new perspectives. *COMPUTE* remains open to your feedback, and, as always, appreciates your ideas, suggestions, and observations. Like the hardware and software we cover, *COMPUTE* continues to evolve, working to maintain its unique perspective on home computing.

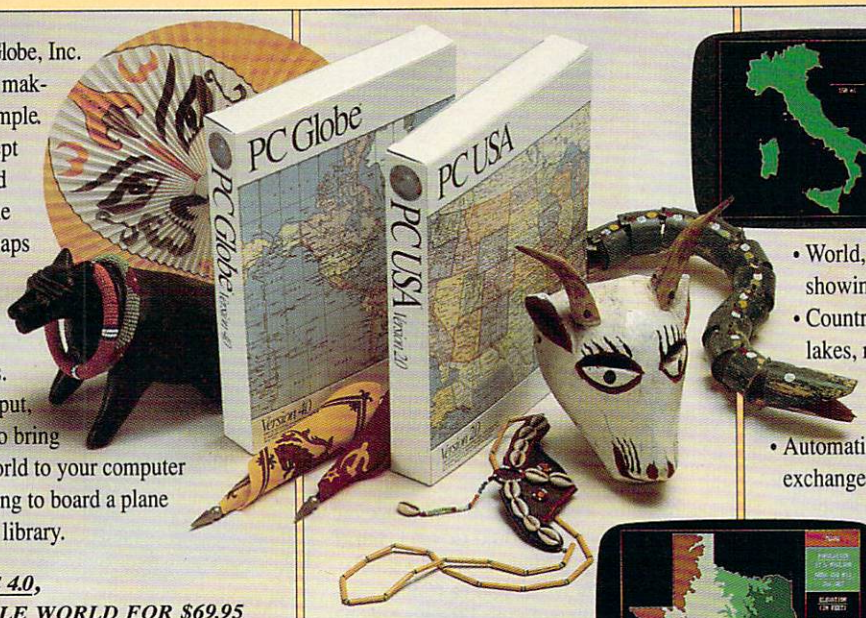
Choice. Grade A. Top gun. Number 1. Here is *COMPUTE*'s tribute to those few home computing products that render the power of home computing visible. ⊡



THINK OF OUR SOFTWARE AS AN ENDLESS SUPPLY OF FREQUENT FLYER MILEAGE.

At PC Globe, Inc. we thrive on making things simple. It's the concept that's allowed us to combine traditional maps and geography with world facts and statistics.

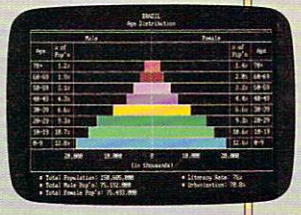
Simply put, you're able to bring the entire world to your computer without having to board a plane or manage a library.



PC GLOBE 4.0, THE WHOLE WORLD FOR $69.95

Here, in the efficient space of a few diskettes, is a simple to use "electronic atlas" that provides instant profiles, detailed maps and enhanced graphics for 190 countries and dependencies. What would ordinarily take hours to research becomes accessible in the split second it takes to press a button.

An almost endless combination of data may be displayed on detailed maps or via colorful bar charts.



What's more, PC Globe software supports popular programs for creating graphics and preparing text.

PC USA 2.0, DISCOVER AMERICA

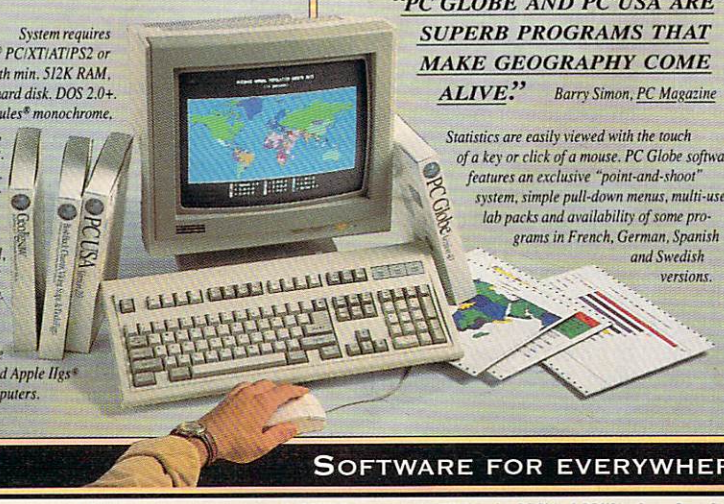
Packed with many of the same features as PC Globe 4.0, PC USA provides current and historical information for all 50 states and Puerto Rico. Included is a self-updating time zone map, detailed state and city data, colorful state flags and songs. It's as if you could take a tour of the states without ever leaving your chair.

Once again, simple to use. Once again, only $69.95.

What we've done here is provide a new set of tools for living in a global world. Affordable programs that allow more time for understanding – and a better understanding of our times.

"PC GLOBE AND PC USA ARE SUPERB PROGRAMS THAT MAKE GEOGRAPHY COME ALIVE." *Barry Simon, PC Magazine*

Statistics are easily viewed with the touch of a key or click of a mouse. PC Globe software features an exclusive "point-and-shoot" system, simple pull-down menus, multi-use lab packs and availability of some programs in French, German, Spanish and Swedish versions.



System requires IBM® PC/XT/AT/PS2 or compatibles with min. 512K RAM, floppy drive or hard disk. DOS 2.0+. Supports Hercules® monochrome, CGA, EGA, or VGA displays. PC Globe, Inc. makes other geography software products for business, travel, entertainment and learning. Selected titles are available for use with the Macintosh® and Apple IIgs® personal computers.

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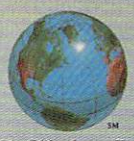

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NEWS & NOTES

They Shoot PCs, Don't They?

Most modern military buffs will recognize the Stinger as an infantry-launched antiaircraft missile. But it's also the name of a tough high-powered PC from Bestway Systems in Yonkers, New York. Under 16-inch gauge cold-rolled steel beats the heart of a 400-watt power supply, a 386 or 486 processor, and a high-capacity uninterruptable power supply. The U.S. Navy has bought several, and the U.S. Army is also interested in the machine—provided it survives the ballistics test.

PETER SCISCO

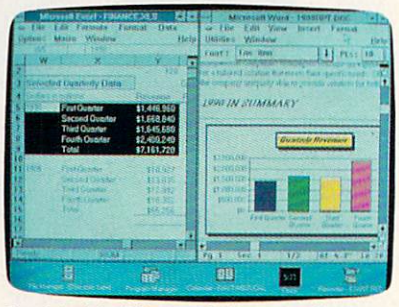
The Final Frontier

Teachers who want to provide their students with the most up-to-date information about the U.S. space program will appreciate NASA Spacelink. This 24-hour bulletin board service provides updates on all current space projects, from daily reports on the space shuttle to situation reports on the Hubble Space Telescope to weekly reports on the Magellan mission to map Venus. In-depth reports on the history of rocketry and space exploration are also available. You can leave messages and questions for NASA personnel or read press releases and recent congressional testimony about NASA. All information can be downloaded for later use. The BBS number (in Huntsville, Alabama) is (205) 895-0028. NASA Spacelink operates at 300, 1200, or 2400 bps; and the parameters are 8, n, and 1.

ROBERT BIXBY

Our Gang

Ever wonder who really developed *Windows* 3.0? Well, just between us, there's a secret key sequence that displays the *Windows* Gang Screen, a list of all the *Windows* 3.0 developers' names. Here's how to get it.



Peek behind these windows to discover a team of Microsoft programmers.

First, minimize all your applications, including the Program Manager. Next, hold down F3 and type *win3.* (Be sure to hold down the F3 key while you're typing *win3.*) Last, release F3 and press the backspace key.

Your wallpaper will be replaced with a screen of the *Win* 3 development team. If the names look a little strange, it's because they're the developers' computer log-ons. Under DADS, for example, you'll see billg for Bill Gates. Click a mouse button or press a key to make the gang screen disappear.

If this whets your appetite for more and you have *Microsoft Word for Windows,* here's how to get that program's gang screen, which includes background fireworks. This is a little involved, so hang on.

Choose Format from the menu bar and Define Styles from the pull-down menu. Click on Options. In the Based On combo box, select Normal (be sure Next Style is Normal). You'll get an error message. Click on OK in the dialog box and Cancel in the Define Styles box.

Next, choose Help from the *Word for Windows* menu bar and About from the pull-down menu. When the dialog box appears, press your Caps Lock key. Now for the big moment: Press and hold the keys O, P, U, and S. The dialog box will be replaced with multicolored fireworks, and the names of the *WinWord* developers will scroll by. Be sure to notice the names under Penguin Trainers. I'm still wondering exactly what they did.

CLIFTON KARNES

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Annoyed by computerized solicitation calls? You'll be glad to hear that the technology that makes them possible is also saving lives. According to an article in the *Wall Street Journal,* Northland Innovation introduced an automated system called *Are You OK?* that calls elderly, homebound, and handicapped individuals at regular intervals. If they fail to answer the telephone on the second attempt, the system notifies the operator (usually a police station or other emergency response service), and someone is dispatched to make sure everything is all right.

By using inexpensive, off-the-shelf technology, Northland Innovations is able to sell the unit at costs easily absorbed by local government or fraternal organizations. For information, contact Northland Innovation, 1626 Terrace Drive, St. Paul, Minnesota 55113.

ROBERT BIXBY

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No doubt about it: The best way to learn to service computers is to actually *build* a state-of-the-art computer from the keyboard on up. As you put the machine together, performing key tests and demonstrations at each stage of assembly, you see for yourself how each part of it works, what can go wrong, and how you can fix it.

Only NRI—the leader in career-building, at-home electronics training for more than 75 years—gives you such practical, real-world computer servicing experience. Indeed, no other training—in school, on the job, *anywhere*— shows you how to troubleshoot and service computers like NRI.

You get in-demand computer servicing skills as you train with your own AT-compatible system—now with 20 meg hard drive

With NRI's exclusive hands-on training, you actually build and keep the powerful new AT-compatible West Coast 1010 ES computer, complete with 1 meg RAM and 20 meg hard disk drive.

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Your NRI hands-on training continues as you install the powerful 20 megabyte hard disk drive—today's most wanted computer peripheral—included in your course to dramatically increase your computer's storage capacity while giving you lightning-quick data access.

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In no time at all, you have the confidence and the know-how to work with, troubleshoot, and service every computer on the market today. Indeed you have what it takes to step into a full-time, money-making career as an industry technician, even start a computer service business of your own.

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LETTERS

Loco for Logo

Richard Leinecker's articles on Logo (*COMPUTE!* May 1990, pp. 28, 76) reawakened an enthusiasm for the language that had died when my old Apple II went into the attic in 1984 and I joined the PC revolution.

Stimulated, I shared my thoughts on Logo with some friends who have a young family. "Great," they said. "Where can we get it?"—a question which, three months later, remains unanswered. Nobody advertises it in your magazine—or anyone else's for that matter—and here in Hong Kong, we do not have the reference sources available to your domestic readers.

First, I tried a Logo clone in Microsoft's CD-ROM library. Bill Gates should be ashamed of that one. It is a pale shadow of the Logo I remember and has an incoherent so-called Help file to which no young mind should be exposed.

In desperation, I tried a pirated copy from our city's infamous Golden Center. Crime does not pay. Not only did it have a virus, but it refused to respond to graphics commands—a defect which some say is due to incompatible DOS versions (I have 3.2).

The worst part of the story is that none of the present generation of computer literates in this part of the world have even heard of Logo. To educate them, and others, perhaps Richard could trace the history of this unique educational tool since it was created by the National Science Foundation in 1968.

Before that, however, please tell us where we can buy it.

TED MILLER
CHEUNG CHAU, HONG KONG

Richard Leinecker responds:
Logo Writer *is available from Logo Computer Systems, 3300 Cote Verdu, Suite 201, Montreal, Quebec, Canada H4R 2B7 (800-321-5646). There are several different packages ranging from a home version to a school version with ready-made lesson plans.*

As for the history of Logo, maybe we can go into it more fully in a future issue.

Compliments

I enjoy your publication and disks. Thanks for removing the exclamation mark from the magazine title. I am a retired engineer from the NASA space program, and while I don't care for games as such, I have gotten my money's worth from your other selections on the disks and have profited from articles in the magazine.

I look forward to more desktop publishing articles and news of new computer technologies.

HAROLD C. HALL
HUNTSVILLE, ALA.

And More Compliments

Finally, there is a magazine that covers both of the computers that I use daily as a journalist and hobbyist—the Amiga and the IBM. Although there *are* a few rough edges (the Amiga section in my Amiga edition is noticeably short on graphics and/or pictures, for example), it looks like *COMPUTE* is well on its way to becoming *the* "complete home computer resource," as your cover states.

JOE VIDUEIRA
WRITER/EDITOR *VISTA* MAGAZINE
COCONUT GROVE, FL

Correction

The Software Toolworks address and telephone number (listed on page 84 of our November issue) have changed. The new address is 60 Leveroni Court, Novato, California 94949. The new telephone number is (415) 883-3000.

Do you have questions or comments? Send your letter—with your name, address, and daytime phone number—to COMPUTE Feedback, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408. We regret that, due to the volume of mail received, we can't respond individually to questions. We reserve the right to edit letters for clarity and length. ⊡

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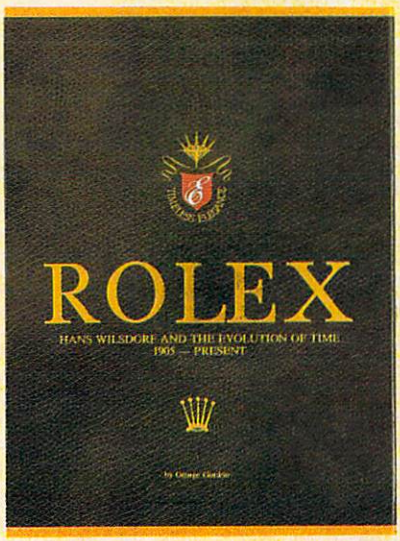

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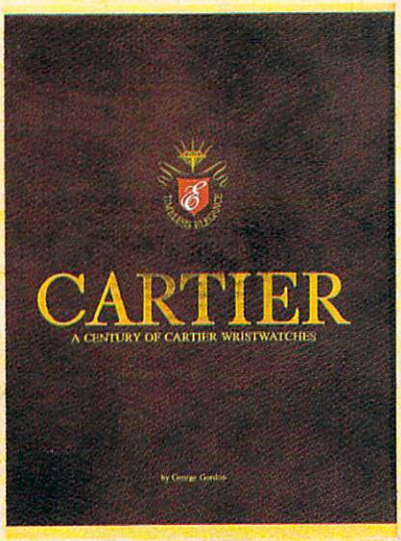

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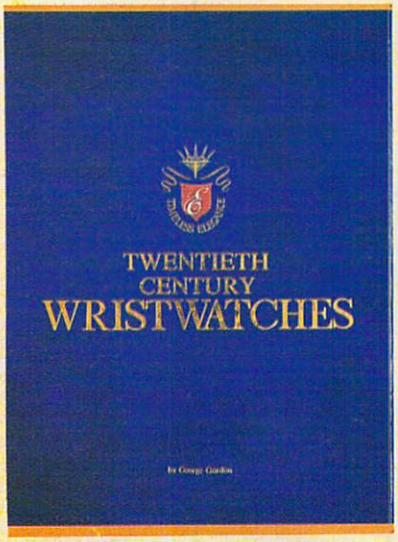

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Please add $10.00 per book for airmail. Send your check or money order to: Timeless Elegance c/o Michael Stevens, General Media, 1965 Broadway, New York, N.Y. 10023 Tel: 212 496-6100. Fax: 212 874-1349. (N.Y. residents add sales tax.)

INTERNATIONAL COLLECTORS OF TIME ASSOCIATION

A new international club for collectors and dealers of wristwatches is being formed with headquarters in four cities, Milan, London, New York and Hong Kong. Called "International Collectors of "Time Association", the club's purpose is to provide an avenue for the exchange of ideas and information between wristwatch collectors.

Each chapter will have its own Board of Directors to oversee that area's activities.

Four meetings of the International Collectors of Time Association (ICTA) are planned per year. The first meeting will be in May, 1990 in Hong Kong at the Park Lane Radisson. The second meeting is scheduled for September, 1990 in London at the Churchill Hotel, followed by the third conference in New York in December, 1990. More details will be provided later, but the Hong Kong meeting will give collectors an opportunity to meet other collectors and dealers from around the world.

We want to organize meetings in Italy, Japan, France and Germany. If you would like to help organize one of these meetings, or any of the three already scheduled, please contact one of the clubs.

A magazine comes complimentary with your membership. Published in English, bi-monthly, it will contain reviews on what's happening in the wristwatch market around the world with reports on sales and auctions, and news about new products just being designed. There will also be a question and answer column for collectors and dealers, as well as a column where watches can be sold or bought. If you have any interest in writing an article for the magazine, sharing an old catalogue or have stories about yours or others' wristwatches, the editor would like to hear from you. The association plans a new book next year, and your wristwatch could be included if you so desire.

Membership fees are US$75.00 per year. (If you require your magazine sent airmail, there is an additional US$25 charge.)

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☐ I want to become a member of the London, Hong Kong, New York, Milan chapter of ICTA (circle one). Enclosed is my cheque for US$_____ to cover membership fees plus any airmail charges.
Cheque made payable to International Collectors of Time Association

☐ I might be interested in attending the Hong Kong, London, New York meeting. 'Please send me more information.

☐ I have an interest in writing/contributing information to the magazine.

☐ I want to help organize one of the meetings, Location:_____

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THE 1991 COMPUTE CHOICE AWARDS

Now in their third year, the COMPUTE Choice Awards recognize those products that best answer the home computer user's diversified needs. You'll see a favorite or two among our prizewinners. There were many worthy contenders this year, as you'll see on page 22 in the article "Honorable Mentions." And to top it all off, *COMPUTE* readers can cast their own votes by phone (see page 16) for products in the four main categories: Home Office, Entertainment, Discovery, and Technical.

We hope the COMPUTE Choice Awards will serve you as you seek products for your computing needs. Use them as a guide, as an indication. Let us put our experience on the line for you. ▷

HOME OFFICE

SMALL BUSINESS ORGANIZER

Microsoft Works 2.0

For new home businesses, the value of a good integrated package can't be overestimated. The comfort of a single interface provides uncomplicated access to several companion applications while it shortens the time it takes to learn any one of them. The newest overhaul to *Microsoft Works,* version 2.0, provides all of these benefits and more. Its seamless integration and powerful applications show once again why, when it comes to low-cost integrated software, this package remains king of the hill.

Beyond the program's easy-to-learn interface lies a group of applications that will serve the needs of almost any home office computer user. The word processor is hardy and boasts a spelling checker and a thesaurus, the spreadsheet is large enough for any but the most complex number-crunching tasks, the database is flexible and easy to use, and the communications module makes getting online easier than ever.

In garnering a COMPUTE Choice Award, Microsoft proves that an upgrade can be more than flash and filigree. *Works* isn't the least expensive integrated package on the market, and it lacks some features offered by its many competitors. But if you're looking for a powerful set of software that incorporates the best in PC interface design, *Works* remains the best of the lot.

WORD PROCESSING

Amí Professional 1.2b

Most people don't need a high-end desktop publishing program. They need a powerful WYSIWYG (What You See Is What You Get) word processor that includes basic desktop publishing capabilities. That's the philosophy behind the *Windows*-based *Amí Professional,* which stresses ease of use and graphics-related features. For the simple tasks for which most people use *PageMaker*—placing graphics on a page, wrapping text around graphics, and drawing rules and boxes—*Amí Pro* can easily do the job. In addition, *Amí Pro* has a generous supply of advanced layout features, including the ability to anchor graphics and sidebars to text, rotate graphics, manipulate gray scales, and create eye-popping charts.

Amí Pro doesn't neglect its word processor side, either. Its meat-and-potatoes features include a spelling checker, a thesaurus, mail merge, and table-of-contents and index generation. More advanced word processing features include sophisticated style sheets, a first-rate table editor, a handy formula editor for simple spreadsheet operations, and extensive macro capabilities. You can even install your favorite program commands as icons on the side of the screen.

For its powerful WYSIWYG text handling and superior layout capabilities, *Amí Professional* earns this year's COMPUTE Choice Award for Word Processing.

DESKTOP PRESENTATION/VIDEO

DeluxePaint Animation

By bringing together powerful animation tools with an interface anyone can use and enjoy, Electronic Arts' *DeluxePaint Animation* has earned its plaudits as a COMPUTE Choice in the categories of Desktop Presentation/Video and Creativity.

Animation is the heart of presentation graphics, and the PC world is well served by *DeluxePaint Animation.* Its mouse-driven interface will be no mystery to anyone who has used *DeluxePaint.* Its tools and procedures are intuitive. Nearly all commands have both menu and keyboard equivalents that allow you to access important page-flipping commands while maintaining your mouse position.

DeluxePaint Animation can provide automatic page flipping, allowing you to use animated brushes to create smooth, realistic motion through a sequence of cels. And you don't have to draw all the intermediate steps in the animation process. *DeluxePaint Animation* does this for you, creating as many changes as you request between two brush shapes. Thus, you can gradually metaphorphose a chicken into an egg or a bouncing ball into text on the screen.

Imaginative people will have no trouble seeing the uses to which this program can be put. There's nothing like live action to put a point across, so this product is a natural for business presentations or catching the eye of passersby at a trade show. But the interface is simple enough to be grasped by children, who will be intrigued by the cartoons they can create.

DESKTOP PUBLISHING/GRAPHICS

Express Publisher

Desktop publishing software keeps getting more and more sophisticated. *Express Publisher* from Power Up! sports 300 dots-per-inch output on PostScript or HP-compatible printers, dot-matrix and ink-jet support, scalable fonts, kerning, autohyphenation, and more. But the most unexpected feature is the price tag—under $150.

Express Publisher gets high marks for its user interface. Mouse support and pull-down menus complement an easy-to-learn icon-based command system. Import text from *Word, Works, WordPerfect, WordStar,* IBM DCA, or ASCII files and place it in an onscreen box. Render the text in Times, Triumvirate, or Univers typefaces (others are available at extra cost); and scale it from 6 to 144 points. The scalable AGFA Compugraphic fonts will print at your printer's highest resolution, whether you're using a $5,000 PostScript printer or a $500 Epson dot-matrix printer.

Liven up your boring text pages with clip-art graphics. Over 200 TIFF-format images are included. If you can't find what you need there, *Express Publisher* imports PCX, GIF, IMG, TIFF, Encapsulated PostScript, *First Publisher, Print Shop,* and *MacPaint*-format images. You can also draw boxes, lines, and circles using built-in tools.

Other high-end features in this low-end DTP program are text-wrapping, paragraph style sheets, and automatic text flow between columns. Best of all, this COMPUTE Choice Award winner doesn't require high-end hardware; it runs fine on a 640K XT-compatible with hard drive.

FINANCE

Pacioli 2000

The success of any business, including one run from home, rests on a solid bottom line. If you're trying to save overhead costs by doing your own accounting, *Pacioli 2000* is a solid investment.

This program includes a general ledger, accounts receivable, accounts payable, billing, inventory control, purchasing, budgeting, and auditing functions—all integrated. Information entered in one module appears in others as well. The well-designed report section helps you manage the multitude of information you'll amass about your company and its vendors and customers.

Some knowledge of accounting is assumed, but you can find plenty of help (often context sensitive) when you need it. The manual and videotape are very good, and M-USA provides free technical support to registered users.

Pacioli 2000 wins a 1991 COMPUTE Choice Award for offering full-featured accounting at less than 50 bucks. Flexible enough to manage cash accounting, accrual accounting, inventory accounting, or accounting for a service-based company, this package is also rigid enough to keep you and your home office on track. ▷

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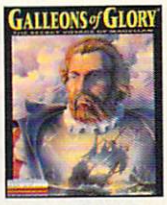

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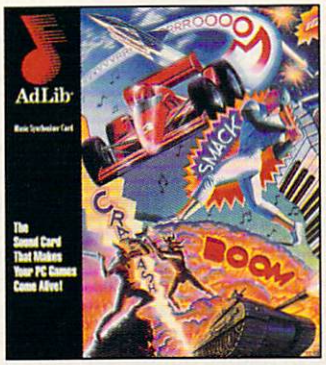
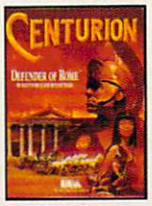
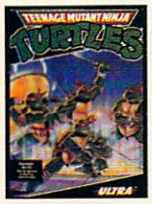


ADLIB

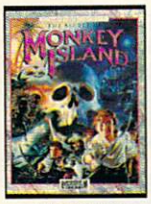
CAPSTONE



ELECTRONIC ARTS



KONAMI/ ULTRA



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ENTERTAINMENT

ARCADE
Crime Wave

Access pushes the limits of arcade with *Crime Wave,* its second game to use digitized actors, sets, and sounds. This time around, a powerful crime syndicate controls large sections of major American cities. Now it has kidnapped the President's daughter—and it's your job to rescue her.

Like *Mean Streets,* Access's other Choice winner, *Crime Wave* features digitized, animated characters that speak to you using RealSound technology. But the story sequences are just window dressing. The heart of the game lies in its fast-action arcade sequences.

You've seldom seen graphics like this outside of the arcade. Digitized characters leap, run, and plunge across the screen unleashing a hail of bullets and rockets. You, as Lucas McCabe, crime fighter, must blow the bad guys out of existence (this game also sets new standards for graphic violence in a computer game). The graphics are photo-realistic, and the sound will have you ducking gunfire—a far cry from the bleeps and bloops most people without sound cards are used to hearing.

SIMULATION
Their Finest Hour

The fortunes of aerial combat change quickly in LucasFilm's outstanding air-combat simulation, *Their Finest Hour: The Battle of Britain.* You become a participant in that aerial battlefield during the summer of 1940, when the German Luftwaffe and the Royal Air Force battled for air supremacy over the English Channel.

Sit in the cockpit of a Spitfire or Hurricane, or fight the war from the German side in a Messerschmitt Bf 109, ME 110 fighter-bomber, or any of four Luftwaffe bombers. Act as pilot, gunner, or bombardier; or switch among all three. Fly more than 50 historically accurate missions.

In addition to its numerous missions and game options, *Battle of Britain* is a winner because it puts you in the heat of the action with remarkable detail. If you fly close to a bomber, you can watch its bombs fall toward the target. Red tracer bullets leap from your machine guns, and hits on enemy planes are marked by smoke and flying debris.

This great simulation doesn't require hours of training. But its nonstop action, numerous missions, and attention to detail mean hours of fun.

WAR/STRATEGY
Harpoon

Even as the Cold War ground toward its inevitable close, one of the most sophisticated war games ever produced burst upon the scene. Despite a variety of bugs in its earliest releases, *Harpoon* lifted computer strategy games to new heights, delivering a complexity and depth of play quite unlike anything else released during the year.

Taking as its venue the Greenland/Iceland/United Kingdom gap, long thought likely to be an area of strategic significance during a superpower confrontation, *Harpoon* gives players control of the ships, aircraft, personnel, and technologies that lie at the heart of modern warfare. Submarines and surface craft, fighters and bombers, and surveillance ships and planes must all be coordinated in an effort to defeat an equally well-armed enemy. A thoughtfully designed, mouse-driven interface makes issuing commands and calling for information simple.

With all bugs long fixed and additional scenario disks released and others planned, *Harpoon* should set the computer strategy standard for some time to come.

FRP/ADVENTURE
Mean Streets

Mean Streets is the first game to feature both full 256-color VGA graphics and Access's patent-pending RealSound digitized music and speech. But there's a lot more to *Mean Streets* than just impressive graphics and sound.

A detective story set in the twenty-first century, *Mean Streets* puts you in the shoes of Tex Murphy, Private Investigator. At the start of the story, you learn that Professor Linsky has taken a dive off the Golden Gate Bridge. The police think it was a suicide; Linsky's daughter thinks it was murder. On your way to finding out the real story behind the prof's untimely demise, you'll drive a flying sports car, dodge bullets in arcade-style gunfights, interview thugs, and search a number of locations for clues. Three-dimensional adventure-game screens and digitized actors playing the various characters in the game make this a standout adventure game.

SPORTS
PGA Tour Golf

The key to any sports simulation lies in its ability to mimic the real thing. Most golf games pin their hopes on copying famous courses and offering PC duffers a choice of clubs. Some go so far as to include wind and other environmental factors. *PGA Tour Golf* does all of these things and goes one better: It puts you on the professional tour, where you play against the big boys.

Graphically, the game is a pleasure to watch. That pleasure is enhanced with fly-by views of each hole, accompanied by a tip from a top PGA golfer. Beginning at the pin, the camera rolls back down the fairway toward the tee, illuminating the approach to the green and the hazards that threaten your success.

But it isn't the graphics that bring *PGA Tour Golf* its COMPUTE Choice Award. It all goes back to realism, the hallmark of any great sports simulation. Whether you chip in from 13 yards out, punch the ball low out of the rough, or putt the ball from the fringe of the green, this game captures every stroke.

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ENTERTAINMENT
- ☐ *Crime Wave*
- ☐ *Their Finest Hour*
- ☐ *Harpoon*
- ☐ *Mean Streets*
- ☐ *PGA Tour Golf*

DISCOVERY
- ☐ *the Manhole*
- ☐ *Super Solvers Midnight Rescue*
- ☐ *Time Machine Earth*
- ☐ *Compton's Multimedia Encyclopedia*
- ☐ *DeluxePaint Animation*

TECHNOLOGY
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Mail responses should be addressed to 1991 *COMPUTE* Readers' Choice Awards, 324 West Wendover Avenue, Ste. 200, Greensboro, North Carolina 27408.

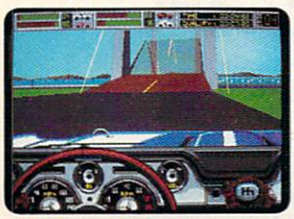
THE OTHERS FOLLOW IN OUR TREADS.

With sound so real and speed so blistering, Stunt Driver™ makes other race car challenges seem like driving with a learner's permit.

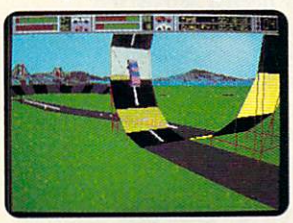
Take the wheel of your classic '66 Shelby Mustang and get set to take off with **Stunt Driver**, the only racing simulation that delivers the blazing speed of real stunt car driving surrounded by full digitized sound. Set against a background of stunning 3-D graphics, you'll roar up loop-the-loops, spiral through corkscrew jumps, and blast off launch ramps. Whip through your choice of nine perilous courses or design your own challenge with the built-in track editor. **Stunt Driver** alone allows you to custom calibrate speed, acceleration, traction and braking settings for both you and your opponents.

Recap the excitement with Video Instant Replay, featuring fast forward, slow-motion, step frame and reverse playback.

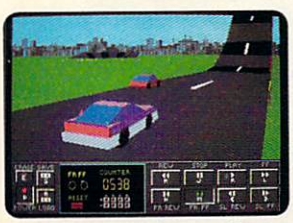
Once you've raced **Stunt Driver**, you'll know why it's the racing challenge to which all others aspire.



Down shift and hit the gas! You'll need plenty of speed to clear that open drawbridge!



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



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

Screens shown are IBM EGA.

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Stunt Driver Vs. The Competition

	Test Drive III™	Stunts™	Stunt Driver™
Sense of Speed (Frame Rate)	slow	average	FAST
Digitized sound effects and PS/1 sound support	no	no	YES; from the internal speaker or with sound cards.
Can design own track	no	yes	YES; plus 9 pre-designed courses
Maximum number of computer opponents	2	1	3
Two player Head-to-Head mode	no	no	YES; via serial cable or modem connection.
Interactive demolition with opponents (Bumping allowed)	no	no-instant death	YES

Available for IBM in CGA, EGA, VGA/MCGA and Tandy.

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DISCOVERY

CHILDREN

the Manhole

Imagine a computer-created world so large you could explore it for months without becoming bored. Add a network of secret passageways; a variety of quirky, yet endearing characters; a seemingly endless supply of surprising details; and a point-and-click interface even a four-year-old can master. Wrap it all in state-of-the-art graphics and punch it up with support for the popular sound boards.

The result might well be *the Manhole* from Activision—a delightful game that isn't really a game. There are no points to tally, no final objective to win, and no rules to follow. You just click on the object you want to examine or the direction you want to explore. A hallway with several doors can take you to a mountain range, an underground river, or a dragon's lair. Click on the dragon's remote control, and the TV shows pictures of other locations. Click on one of the pictures, and you'll be instantly transported there.

Like *Alice in Wonderland* (on which this program is loosely based), *the Manhole* is both grand in scope and devilishly clever in its details.

YOUNG ADULT

Super Solvers Midnight Rescue!

Problem solving is one of the hardest skills to teach, and arguably, it's best left to human instructors. However, *Super Solvers Midnight Rescue!* from The Learning Company soundly squelches that argument.

Among its many strengths, the program has a wonderful plot that will appeal to even the most reluctant readers. The town of Shady Glen has been plagued by a practical joker named Morty Maxwell (a.k.a. the Master of Mischief). The only people who can stop Morty are the children who make up the Super Solvers Club. And all you have to do to become a member is boot the program.

Solving the game's puzzle and defeating Morty require the collecting of clues, which in turn requires careful reading and analysis. But quick reflexes are also called for, as Morty's robot henchmen try to keep you from your task.

Super Solvers Midnight Rescue! deserves its high praise. It enhances some of the most important skills your kids will ever have to learn—reading comprehension and logical reasoning.

ADULT

Time Machine Earth

The PC, it has been said, is a window on the world. This strikingly original and little-known program offers a window on all the faces our world has shown throughout hundreds of millions of years of history—and projects those faces billions of years into the future.

Our planet's features, *Time Machine Earth* teaches, are in constant motion. Huge tectonic plates shift and grind as continents tear apart from one another, resulting in vast land masses grumbling their way toward new configurations. *Time Machine Earth* makes tectonic movement come alive, giving you the opportunity to move through eons, viewing the world from a variety of different perspectives. Shifting plates can be overlaid, continents viewed close-up or from far out in space, with the Earth as a solid or hollow globe.

An easy-to-use interface makes travel through time simple. Good, if brief, documentation includes a reading list for further exploration. *Time Machine Earth,* available in both personal and classroom editions, breaks (almost literally) new ground in educational software.

REFERENCE

Compton's MultiMedia Encyclopedia

Long touted as one of the great potential products of the computer revolution, electronic encyclopedias began to come of age in 1990. The most notable of these, *Compton's MultiMedia Encyclopedia (CMME),* combines text, sound, photos, and other graphics to produce an interactive educational experience that is delightful as well as informative.

Complete on a single CD-ROM disc, *CMME* provides a variety of tools for harvesting its treasures. The index reveals topics by key words, by concept, or by reference. Leave a bookmark to retrace your research trail. Notes can be taken, pictures can be viewed, and snippets of great music or notable speeches can be played.

The price of the product, along with the sophisticated hardware required to use it, virtually ensures that for the time being *CMME* will reside in classrooms or, more likely, libraries and media centers. We hope students will be able to use the product individually, rather than as a group, for *CMME* is at its best as a self-paced learning tool. With its variety of approaches to the body of information it contains, *CMME* is all but inexhaustible, helping to fulfill the promise of both the electronic encyclopedia and CD-ROM itself.

CREATIVITY

DeluxePaint Animation

DeluxePaint Animation was a double COMPUTE Choice winner this year—a first in our history. This is a rare program that offers the same kinds of benefits to business, creative artists, students, and children. To see how this super application can make you a winner, too, read the description under the Desktop Presentation/Video headline.

TECHNICAL

OPERATING ENVIRONMENT/SYSTEM

Windows 3.0

With the release of 3.0, Microsoft has finally delivered on *Windows'* potential. The latest version of this operating environment is a full-featured graphical user interface complete with sculpted 3-D buttons, full-color icons, and masterful multitasking. Microsoft used graphic artists to design 3.0's interface, and it shows. The well-chosen colors and dithering support create varied and subtle shades.

Windows' improvements start with installation. Now a single version of the program supports 8086, 80286, and 80386 PCs; and the setup process is streamlined and simple. Although *Windows* will run on an 8088-/8086-based machine, you really need a 286 or 386 to tap the program's power. With an 80286 and at least one megabyte of memory, *Windows* can multitask *Windows* applications and run almost any DOS program. With an 80386 and at least two megabytes, *Windows* can multitask *Windows* and DOS applications, and it can even run DOS programs in resizable windows.

Windows 3.0 wins the COMPUTE Choice Award for best operating environment because of its superb interface, powerful features, and excellent support for multitasking. An afternoon with this program will convince you that *Windows* is the PC's future.

UTILITY

Switch-It

Imagine being able to switch among your word processor, spreadsheet, database, and a game by simply pressing a key. That's the magic of *Switch-It,* an amazing TSR that uses just 27K of RAM.

Unlike most context-switching programs, *Switch-It* is a breeze to install and a pleasure to use. At setup, *Switch-It* searches your hard disk for applica-

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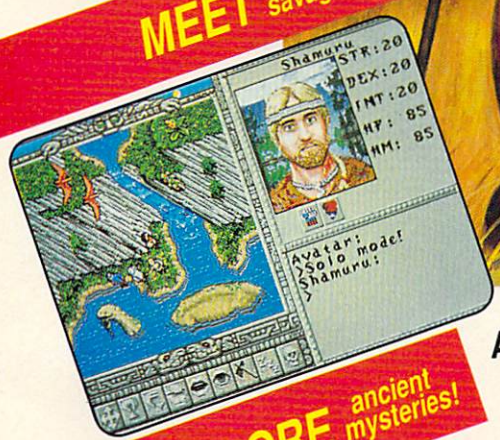

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tions with which it's familiar and automatically installs them. To install other programs, you simply use *Switch-It's* fill-in-the-blanks setup screens. After your programs have been installed, press *Switch-It's* hot key, and you'll see a menu listing your programs. You can select programs by using the cursor keys or by pressing the first letter of the program's name.

If stopping off at the menu slows you down too much, *Switch-It* also lets you assign a hot key for each application so you can move to it instantly. As icing on the cake, *Switch-It* lets you cut and paste between applications and recall recent commands from any DOS prompt.

Switch-It can breathe new life into PCs and ATs and offer them much of the power of multitasking environments like *DESQview* and *Windows*. And that makes it a sure winner.

ADD ON/PERIPHERAL
The Complete Communicator

Economy of space, finance, and function are crucial to a successful home office. The Complete Communicator (TCC) addresses all three areas. Combining telecommunications, voice mail, and fax capability on a single board, TCC turns one expansion slot into a total office communications center.

It's an easy center to operate. TCC's software lets you run communications in either foreground or background, taking advantage of various memory configurations and hardware setups. A 2400-baud modem gives you access to online services and computer-to-computer communication. Voice-mail capabilities include multiple mailboxes, time-and-date stamping of messages, and remote message retrieval. Fax capabilities include 9600-baud transmission, multiple fax transmissions with custom cover sheets, and timed transmission to take advantage of off-peak rates.

This multiplicity of function in a single product exemplifies the sort of value home office workers appreciate. The complete home office needs more products like The Complete Communicator.

STAND-ALONE HARDWARE
PS/1

With the introduction of the PS/1, IBM gave home computing its biggest push in years. Big Blue told the world that computers belonged in the home and put in place a strategy to get them there.

Aggressively marketed through major retailers, the PS/1 is designed to satisfy fundamental home computing needs. The machine comes complete in

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The Complete Communicator
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San Jose, CA 95131
(408) 434-0145

Compton's MultiMedia Encyclopedia
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$795.00 for schools
Britannica Software
345 Fourth St.
San Francisco, CA 94107
(415) 546-1866
(800) 572-2272 outside California

Crime Wave
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Access Software
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Bountiful, UT 84010
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DeluxePaint Animation
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San Mateo, CA 94404
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Power Up! Software
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San Mateo, CA 94403
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Harpoon
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Suite 380
Campbell, CA 95008
(408) 879-9144

the Manhole
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Activision
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P.O. Box 3048
Menlo Park, CA 94025
(800) 227-6900

Mean Streets
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Access Software
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Bountiful, UT 84010
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Microsoft BASIC 7.1
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Microsoft
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(800) 426-9400

Microsoft Works 2.0
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Pacioli 2000
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M-USA Business Systems
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Schenectady, NY 12309
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Windows 3.0
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Microsoft
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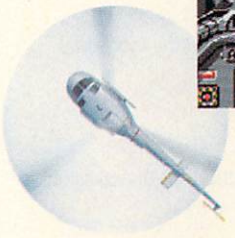
SPELLI

Now Spelling Is Child's Play.

Watch out for that UFO! Super Spellicopter turns your personal computer* into a helicopter cockpit with intelligent, tactical radar and letter-seeking missiles to help zero-in on target letters.

Something to shoot for.
Super Spellicopter challenges players aged 7-14 with 400 words in 40 lists, and 3 levels of difficulty. You can even add words to strengthen specific spelling skills.



It's spellbinding. Super Spellicopter from Britannica Software. It's not just fun, it's guaranteed to improve your child's grades.† For the name and location of the dealer nearest you call 1-800-572-2272.

BRITANNICA® SOFTWARE

Circle Reader Service Number 185

* Requires IBM PC or 100% compatible, 512K RAM and EGA or VGA. Joystick recommended. †If adequate use of this product fails to improve your child's spelling grades, Britannica Software will exchange it for another product of equal value or refund your money completely. See package for details. © 1990, Britannica Software, Inc.

HONORABLE MENTIONS

Small Business Organizer
AlphaWorks 2.0, Alpha Software; *PC File* 5.0, ButtonWare; *Personal Office,* Top Ten Software; *Top Priority,* Power Up!

Word Processing
LetterPerfect, WordPerfect; *PC-Write Lite,* Quicksoft; *Word for Windows,* Microsoft; *WordPerfect* 5.1, WordPerfect; *Wordstar* 6.0, WordStar International

Desktop Presentation/Video
Autodesk Animator, Autodesk; *Charisma,* Micrografx; *DrawPerfect* 1.1, WordPerfect; *Show Partner F/X,* Brightbill-Roberts

Desktop Publishing/Graphics
Arts & Letters, Computer Support; *Avagio,* Unison World; *Corel Draw* 1.2, Corel Systems

Finance
Lotus Spreadsheet for Deskmate, Lotus Development; *Money Matters,* Great American Software; *TurboTax,* ChipSoft; *Wingz* (PC version), Informix Software

Arcade
The Game of Harmony, Accolade; *Ishido,* Accolade; *Welltris,* Spectrum HoloByte

Simulation
A-10 Tank Killer, Dynamix; *Indianapolis 500: The Simulation,* Electronic Arts; *Railroad Tycoon,* MicroProse

War/Strategy
Action Stations, Conflict Analytics; *Bandit Kings of Ancient China,* KOEI; *Centurian,* Electronic Arts; *Tank,* Spectrum HoloByte; *Their Finest Hour,* Lucusfilm Games; *Wolfpack,* Brøderbund

FRP/Adventure
Bad Blood, Origin Systems; *The Colonel's Bequest,* Sierra; *Hero's Quest,* Sierra; *Ultima VI,* Origin Systems

Sports
Hardball II, Accolade; *Jack Nicklaus Unlimited Golf,* Accolade; *Keith van Eron's Pro Soccer,* Microplay Software; *Monday Night Football,* Data East

Children
The Playroom, Brøderbund

Young Adult
The New Print Shop, Brøderbund; *Super Solvers Outnumbered,* The Learning Company

Adult
Home Lawyer, Meca Ventures; *Software Toolworks World Atlas,* Software Toolworks

Reference
Grammatic IV, Reference Software

Creativity
Arts & Letters, Computer Support; *Autosketch,* Autodesk; *Music Studio* 3.0, Activision; *The New Print Shop,* Brøderbund

Operating Environment/System
DR DOS 5.0, Digital Research

Utility
PC Tools Deluxe 6.0, Central Point Software; *PrintVision,* Bloc Publishing; *Take Charge!,* Departmental Technologies

Add On/Peripheral
Canon Bubble Jet 10e printer, Canon; HP DeskJet 500, Hewlett-Packard; Hewlett-Packard LaserJet III, Hewlett-Packard; Practidisk UMFC Plus/2.88MB drive, Practical Computer Technologies

Stand-Alone Hardware
Atari Portfolio, Atari; Sharp PC-6220 laptop, Sharp; Tandy 1100FD laptop, Tandy; Toshiba 1000SE laptop, Toshiba

Programming Language
Borland Turbo C++, Borland International; *Power BASIC,* Spectra

a single box and can be set up by a novice in less than an hour. An easy-to-use interface helps relax those new to computers, while the inclusion of a 2400-baud modem should make telecommunications available to a larger audience than ever before. Technical support itself is delivered via the modem.

The PS/1's 10-MHz 286 processor may not represent the cutting edge of CPU technology, but it's powerful enough to run all but the largest MS-DOS programs. The chip also matches Bill Gates's criteria for entry-level multimedia machines; while IBM has announced no multimedia enhancements for the PS/1, few industry watchers doubt that such announcements will be forthcoming.

It's the seriousness with which IBM and its retail partners have approached the growing home market that earns the PS/1 a COMPUTE Choice Award. Computers—and IBM—are coming home again—this time to stay.

PROGRAMMING LANGUAGE
Microsoft BASIC 7.1

BASIC used to be the Rodney Dangerfield of programming languages—it didn't get any respect. But Microsoft has changed that by developing and consistently improving *QuickBASIC* and, most recently, by releasing *Microsoft BASIC* 7.1, a BASIC intended for professional programmers and *serious* enthusiasts.

BASIC 7.1 has everything you could want in a top-end programming language. Professional tools are on a par with or better than those Microsoft offers C, Assembler, and Pascal programmers. To hit just a few of the high spots, 7.1 comes with *Programmer's Workbench,* an application development environment that combines the best of *QuickBASIC,* Microsoft's *M* editor, and a project manager; the latest version of Microsoft's *CodeView Debugger,* with support for extended memory; a full-blown ISAM library for heavy-duty database applications; and complete OS/2 support.

In addition to an exceptional development environment, *BASIC* 7.1 provides many improved compilation tools. Now you can selectively include or exclude object libraries, and the compiler is fully optimizing. The improvements in both size and speed make the code produced by this compiler as lean and mean as that created with almost any other product. BASIC is back, and *Microsoft BASIC* 7.1 is a landmark product that will garner the respect this excellent language deserves. ⊡

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The twin-jet Me 262 unleashed a volley of 24 air-to-air missiles in less than a tenth of a second. It's just one of the little-known aircraft you'll encounter in *Secrets Weapons of the Luftwaffe.*™ You'll also blast off at 16,000 feet per minute in the incredible Me 163 Komet rocket fighter. And pilot the remarkable Gotha 229, which bore an uncanny resemblance to today's Stealth bomber.

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As you'll read in the 224-page historical manual, Hitler's demand for a blitz bomber delayed deployment of the Me 262s as fighters.

In *Secret Weapons of the Luftwaffe,* you can reverse that decision. And pit these revolutionary weapons with the more familiar German Bf 109 and FW 190 fighters against the Eighth Air Force B-17 Flying Fortresses, P-51 Mustangs, and P-47 Thunderbolts. All technically, historically, and graphically authentic.

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You'll rock with the impact of a direct hit. Struggle for visibility through oil smeared, bullet-shattered canopies. Watch in horror as your engine burns. And wrestle for control against G-forces and rough wind conditions. All with the vivid realism of bit-mapped 256-color VGA graphics and room-rattling sound effects.

In *Secret Weapons of the Luftwaffe,* you'll do more than relive the air combat over Germany from 1943 to 1945. You'll decide for yourself whether these exotic superweapons could have changed the outcome of the war.

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Secret Weapons of the Luftwaffe is available for IBM and 100% compatibles. Visit your retailer or order directly with Visa/MC by calling 1-800-STARWARS (in Canada 1-800-828-7927). ™ and © 1990 LucasArts Entertainment Company. All rights reserved. IBM is a trademark of International Business Machines, Inc.

Circle Reader Service Number 106

CONVERSATIONS

KEITH FERRELL

Jan Davidson is a teacher. The fact that she does her teaching today from the office of the company she founded, rather than from the head of a class, hasn't altered her deep commitment to her profession. You feel that commitment, a concern for students and a love of learning, both in Davidson's software and in conversation with her.

Davidson's awareness of learning as an environment, as a continuum, shows in her products. Software designed to introduce basic skills also prepares students to use higher-order thinking skills. It's all part of Davidson's vision of education and educational software.

"*Math Blaster Plus* and *Math Blaster Mystery,*" she says, "cover the gamut of math from basic knowledge through analysis, synthesis, and evaluation. In the new *Math Blaster Plus,* we go through and teach them the facts, and then we have problems where they have to use these facts."

Throughout, the products are designed to help students transfer newly acquired skills to the real world. "In *Math Blaster Mystery,*" Davidson says, "we help kids break word problems into simple steps. Find out what the problem is asking for, identify the information and equations needed to answer it, and find the answer. These are higher-order thinking skills, and the computer is an effective tool for teaching these skills. I don't sit down and say I'm only going to cover analysis in this product and synthesis in this one. I try to get as much out of each product as I possibly can."

Is one curriculum—math or English, for example—better suited for translation to software than another? "I don't think so. Our math products have been successful not because math is easier to do than spelling or reading, but because people subconsciously associate computers and math. As a parent, I may think, 'Gee, computers may help Johnny with math.' But I don't realize how effective they can be in getting Johnny to read. Computers involve reading."

Davidson speaks from experience. "My son learned to read on the computer because he wanted to play with it. Instead of 'See Dick run,' it was 'Press space bar.' To use the computer, you need to read. You can develop some wonderful language-arts products and draw the kids in and get them reading, thinking, and problem solving, without their realizing how much they're learning."

Jan Davidson

Davidson's products are themselves designed to be used by students, parents, and teachers. "All of our products have editors in them," she says. "We get the students writing, as well as reading. Our reading programs, for example, have tools that students can use to write their own stories and essays, as well as read them."

To use tools such as writing, certain basic levels of educational ability are required. Davidson's products deliberately address all levels of thinking, from drill and practice to problem solving and analysis. The drill-and-practice aspects of Davidson's software may be the most widely known, however, addressing an area too often undervalued by educational theoreticians. By addressing basic skills, Davidson feels, you prepare students for the challenges and delights to be found in the exercise of higher-order skills. You can't, as it were, take an apple from a tree until you can climb the tree.

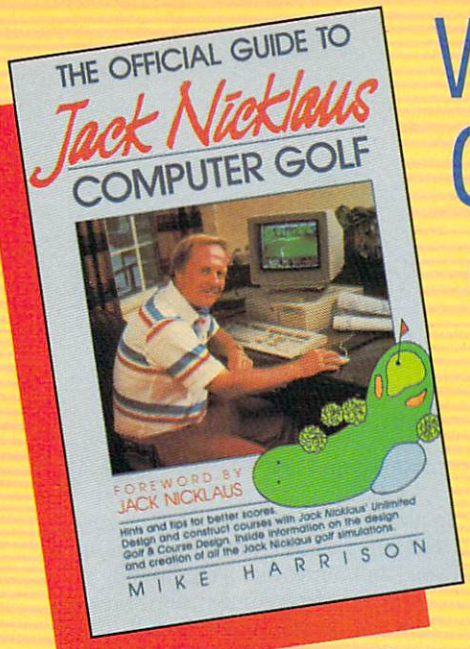
"Think of learning as a continuum," Davidson says, "a gradual process. You go through stages, starting with some very basic things like the ability to recall specific information, then go on to comprehension, application, analysis, and evaluation. All these points need to be covered in education. But the one thing I've found is that you can't bring out higher-order thinking skills if you don't have the lower ones. You've got to have something to think with before you can think. You've got to have a basic vocabulary, be able to read at a certain level, have basic language and math skills to be able to do the analysis, synthesis, and evaluation that are so important to higher-order thinking skills."

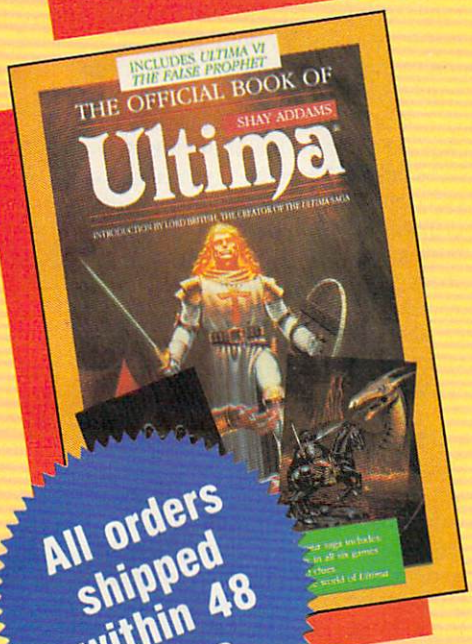
And technology can take part throughout the learning process?

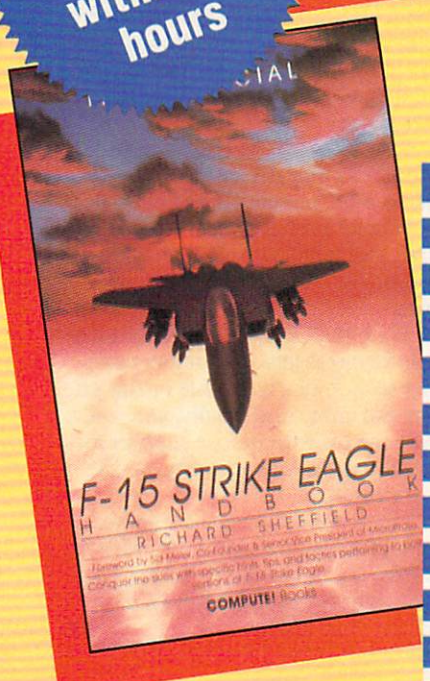
"The computer can play a role at all levels of that spectrum," Davidson says, "both with lower-order thinking skills as well as the higher-order skills. There's a case to be made for educational software at all levels." And Davidson has developed products that fit all along this continuum.

Davidson doesn't see these levels as segregated. "*Word Attack* was developed because I was trying to teach Melville," she says. "The kids didn't have the vocabulary for it. The software was one way of getting them up to speed in the vocabulary so we could do the fun, higher-order thinking skills with it. The highest of the higher-order thinking skills is writing, and you can't write without a vocabulary. You can't function in our society without the basic skills."

A generation of students—and their parents—who've moved with the help of Davidson's software from basic skills to reading Melville and solving complex mathematical problems have reason to be grateful that Jan Davidson moved from classroom to boardroom . . . without leaving the profession of teaching behind. ⊡







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Math Castle

Having fun and doing math usually don't mix. But with *Math Castle* there's a perfect mix of having fun blasting aliens and good, fundamental math practice and learning. This whole-number game has so many options that the needs of a wide range of students are served. And every teacher knows that individualized instruction increases learning.

You can jump right in and play without spending hours reading a manual. The basics include 12 levels of play, selection of any or all of the four operations, and the choice of regular or learning mode. To protect your castle from an onslaught of aliens, you must correctly answer problems. A laser beam zaps the enemy, and you're safe a little while longer.

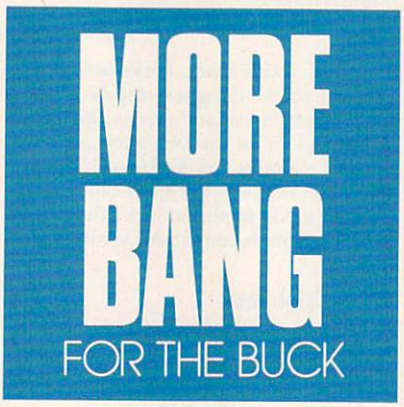
For those who want to take full advantage of the advanced benefits (like advanced levels and user-defined problems), it's as easy as pressing F1. Then, all you have to do is cursor through the options that the program offers.

Go ahead—use the fun and excitement of *Math Castle* to get your kids hooked on math. They'll be reaping the rewards for years to come.

Pharaoh's Tomb

Do you crave exotic adventure? Then get ready for *Pharaoh's Tomb.*

This first adventure of Nevada Smith, an apprentice archaeologist, will keep you intrigued and on the edge of your seat for hours. Through diligent research Nevada has discovered the location of a huge underground pyramid containing treasures beyond belief. But the ancient scrolls also warn of unspeakable dangers and traps. Here's your chance to prove yourself. Nothing will stop you now!



This arcade/adventure game presents 20 uniquely dangerous levels that are riddled with ingenious puzzles and traps. No two levels have the same danger, so you experience incredible variety from level to level. You can save your game to disk and resume play later. And if you finish, you might qualify as an all-time best explorer on the high-score list.

For an escape into a world of unknown dangers, don't switch on the televison; put *Pharaoh's Tomb* in the drive and take the road to adventure.

WordMaster

No matter which word processor you're currently using, you'll want to give *WordMaster* a try. It offers all the features of the big-name programs, including multiple windows, easy block editing, and drop-down menus. It even has automatic macro recording for one-stroke control of multiple commands and text.

Working with *WordMaster,* you can use easy menus or mnemonic keystroke commands for every operation. If you can't remember a command, the program offers context-sensitive help. You'll be able to use the full range of type styles offered by your printer and display bold, italic, or underlined type in different colors on your monitor.

WordMaster supports the most popular printers, including the Hewlett-Packard LaserJet. If you like, you can customize the program for other printers. There's no spelling checker built into the program, but you can check your documents with Borland's *Turbo Lightning* right from the menu. (*Turbo Lightning* is commercial software that must be purchased separately.)

COMPUTE's Productivity PowerPak Sampler

Every MS-DOS machine is shipped with power that most of us don't know about or use. It's the ability to write batch files that make our computing tasks easier. Unfortunately, some things were left out. And that's what *COMPUTE's PC Productivity PowerPak* gives you—the things that were left out. This is a sample collection of 4 of the 38 utilites found in that package.

Just what can you do? You can put a box of any size or color anywhere on the screen. Or put messages of any color on the screen. These two extra commands alone add attractive functionality to every batch file you create.

With the GETKEY command, a single keypress lets you branch to another section of a batch file or run another program. And finally, you can create menus with mouse support for the ultimate in interactive batch-file programming.

If you want to create the professional look for your computer without the fuss, check out this sampler. Then you'll want to order the full *PC Productivity PowerPak.* ▫

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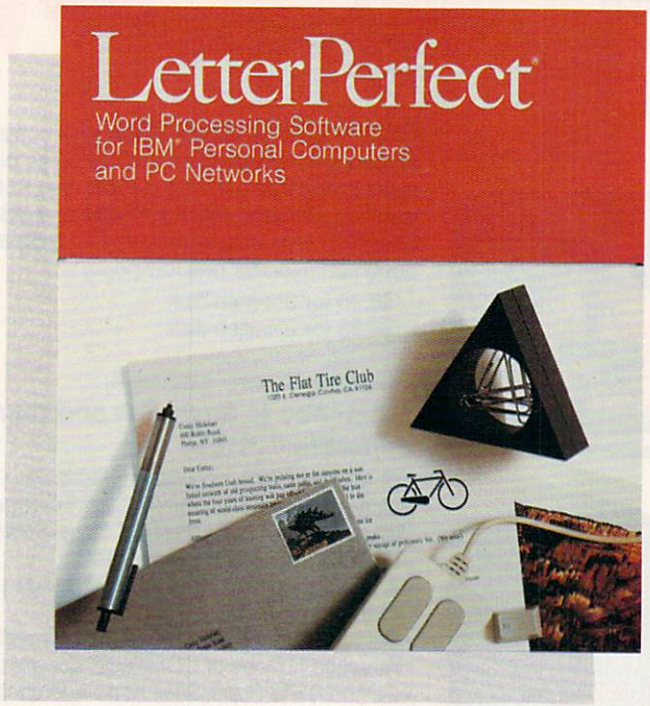

SOUP UP THAT LAPTOP OR OLD XT WITH A POWERFUL WORD PROCESSOR THAT WON'T OVERWHELM YOU OR YOUR CHECKBOOK

COMPUTE CHOICE

JOEY LATIMER

Since 1988, my word processor of choice has been *WordPerfect*. The program is packed with useful features, such as a spelling checker, thesaurus, and print spooler, and gives me quick access to the various type styles and graphics supported by my printer. While *WordPerfect* is an excellent word processor, it's not for everyone. The program doesn't run well on floppy-only systems, requires a minimum of 384K of free memory, and can be overwhelming to typists interested only in creating short, simple documents. Now WordPerfect Corporation has a solution for folks who don't need a powerhouse word processor. *LetterPerfect* is a scaled-down version of *WordPerfect* 5.1, with a feature list and price tag that will please the casual writer.

FFICE

MARK WAGONER © 1990

Gone from *LetterPerfect* are *WordPerfect* features many people rarely use, such as sorting, math calculations, and number columns. Still present are all the commonly used functions, including graphics and text integration, spelling checker, easy font selection, and the friendly thesaurus. The features carried over from *WordPerfect* into *LetterPerfect* work basically the same, but some have been scaled back. The spelling checker in *LetterPerfect,* for instance, checks only the entire document, while *WordPerfect*'s checker lets you check a word, phrase, or page, as well as a document. *WordPerfect*'s print spooler lets you queue several printing jobs and continue typing while your documents print. *LetterPerfect,* on the other hand, will only print your current document, and it makes you wait until it has finished printing before you can move on. Minor differences like these aside, using *LetterPerfect* is just like using *WordPerfect* 5.1.

LetterPerfect comes with six 5¼-inch and three 3½-inch disks, a reference guide, keyboard overlays for six different PC keyboard designs, and a quick-reference pamphlet. Also included is *WordPerfect Shell* 3.0, a DOS shell that lets you launch and switch between multiple applications and cut and paste text between them. Installing *LetterPerfect* on my hard drive was easy and took only about ten minutes. *LetterPerfect*'s installation procedure was replete with helpful prompts and hard to mess up. The only problem I encountered was with the XT-style keyboard overlay. It seemed that every time I tried to type, my palm would hit the overlay and send it whirling onto the floor. A little double-sticky tape solved that problem.

LetterPerfect works on any PC compatible with 330K of free memory and one 720K or two 360K floppy drives, making it an ideal choice for use on laptops or older PCs with limited memory and disk storage. While the program will work with a text-only display card, you'll need CGA, EGA, VGA, or Hercules graphics to use the page-preview feature. In addition, *LetterPerfect* will run on a network. I tested it using a 640K turbo XT system with EGA graphics, an Epson 24-pin printer, and a hard drive.

When you first glance at *LetterPerfect*'s editing screen, you'll notice the program's user interface closely resembles that of *WordPerfect* 5.1. The bottom line of the screen displays the name of the file you're working on, as well as the page number, line, and the cursor's position on the page. Across the top of the screen is a pull-down menu bar. Mouse users can just point at the selection they want and click the mouse button; laptop owners and others without pointing devices can

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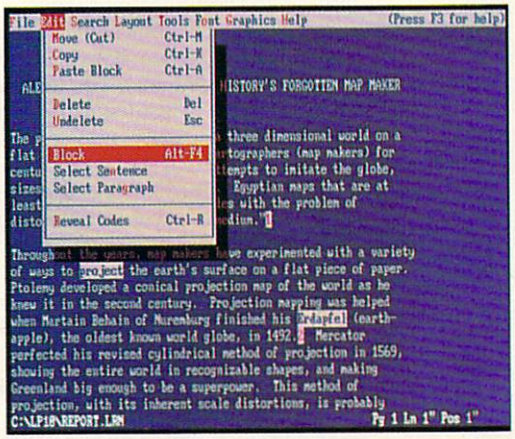
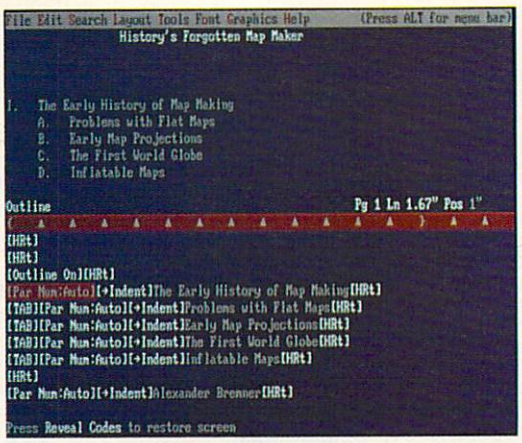
select menu items using the Alt, cursor, and Enter keys. *LetterPerfect* also lets you use *WordPerfect*-style function keys to choose options. I found this the fastest way to access *LetterPerfect*'s features.

LetterPerfect has an extensive online help function. To get instant information, all you have to do is press F1 or pull down the Help menu and then select the topic you need help with from an alphabetized list. You'll find the help function especially useful if you don't thoroughly understand a feature. It will also keep you from having to scrounge around trying to find the reference guide for simple questions. If, after checking the onscreen help and the reference guide, you're still unable to solve a problem, WordPerfect has a toll-free customer support line that operates Monday through Friday from 7 a.m. to 6 p.m. Mountain time. If you have a problem in the evening, there's another support number, but it's a toll call. When I called these lines, I was greeted by friendly and knowledgeable support people who helped me solve my problems in a matter of minutes.



Pull-down menus make memorizing function key assignments unnecessary.



***LetterPerfect*'s Reveal Codes option shows you all formatting commands.**

Using *LetterPerfect*'s graphic features, you can draw

Advertorial

What to Look for In a Home PC

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

The Right Software

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

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

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

Getting Up and Running

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

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

Stretching Out

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

Fortunately, there is a computer that meets all these requirements: the Tandy® 1000 RL home computer. To learn more about home computing and the many benefits of putting a Tandy 1000 RL in your home, please stop by any participating Radio Shack store, dealer or Computer Center at your convenience for a personal demonstration.

lines around sections of your document and import and edit graphic images. *LetterPerfect* will only directly import files in the WPG (WordPerfect Graphics) format, but you can use the included conversion utility to port most popular graphic formats, such as PCX, PIC, HPGL, EPS, and TIFF, to WPG. Once an image has been converted, you can view, size, edit, or invert it and then place it into the document you're working on. You can place borders around graphic images and wrap text around them. This makes it possible to place your letterhead design at the top of correspondence, as well as create simple but professional-looking newsletters and forms.

LetterPerfect has an outliner function that I found especially helpful when working on school papers and articles such as this one. When you activate the outliner, *LetterPerfect* will automatically insert Roman numerals, letters, and numbers in your document, depending on which level of the outline you're currently typing.

The manual included with *LetterPerfect* is well illustrated with clearly written step-by-step instructions. There are nine tutorials you can work through to learn how to use most *LetterPerfect* functions and a complete reference section detailing each command individually. The thorough index and table of contents make finding references easy. Appendices cover topics such as error messages, ASCII conversion, embedded codes, graphics conversion, network installation, and troubleshooting. *LetterPerfect* never crashed while I was using it, and when I did encounter an error, I found the manual's explanations of possible errors and solutions very helpful.

I used *LetterPerfect* to compose this review. After using it for a few days, I decided that I enjoyed using it much more than *WordPerfect* 5.0. The program's mouse support (also present in *WordPerfect* 5.1) won me over.

LetterPerfect contains most of the great features of *WordPerfect* that millions have come to know and love, yet it dispenses with the high price tag. Thanks to its compact size, it can be used on laptops and other systems that can't run the high-end word processors. Whether you're new at word processing or a seasoned professional, *LetterPerfect* is a solid choice. It's priced right, easy to use, but still capable of producing high-quality output.

Ease of Use	★★★★★
Documentation	★★★★
Features	★★★★
Innovation	★★★★

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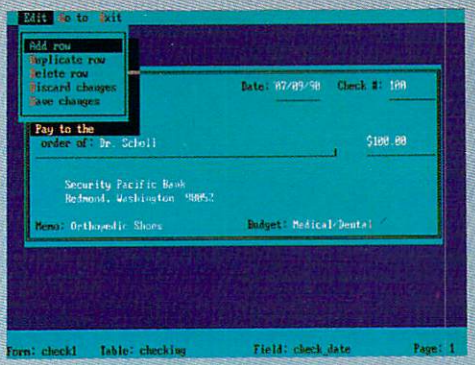

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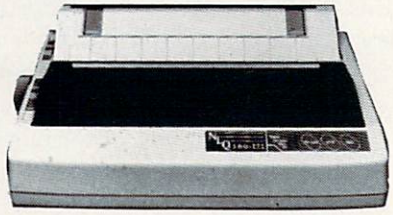

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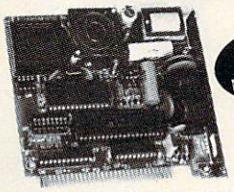

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THE ART OF *Small Business*

ROBERT BIXBY

If you've ever thought of becoming an artist but you're uncomfortable smearing paint or uncoordinated with a Conte crayon, there's still hope. You can supply your own commercial art and design work at a low cost and learn about computer art in the process.

But before you dive into commercial art with a product like *DrawPerfect* or *Charisma,* you need to put aside the idea that you have no talent. With computerized art products, nearly all the work is done for you. After you've mastered a few simple techniques, you'll be generating all the logos, letterheads, and business forms you need. And, as you'll discover, it can be a lot of fun. Unlike most areas of computing, art is practically mistake-free.

MARK WAGONER © 1990

Logology

The company logo is one of our culture's most ubiquitous art forms. People even wear clothes with the labels on the outside to show off the logos of the companies that made them. Logos have increasing value in our postliterate society because they don't require that the consumer be able to read. If they're seen often enough, they can be recognized instantly. And in international business, logos have the added advantage of overcoming language barriers.

> CREATE YOUR OWN COMPANY LOGO, LETTERHEAD, OR BUSINESS FORM

Start with a logo. It's the foundation on which you'll build the other forms of your business communication; your letterhead will show your logo prominently, as will your business forms. When you sponsor softball teams, their uniforms will sport your logo.

There are several different strategies for creating a logo, but the best strategy is to incorporate the name of the business. The big corporations can get away with abstract logos, like Transamerica's (which looks like an arrangement of six hockey sticks). But I'm assuming that your home or small business isn't as large as Transamerica. Therefore, you should consider name recognition as well as logo recognition.

The possibilities based on company name are name only, name with meaningful graphic, and name with abstract graphic. To create these logos, I'll use the latest version of *DrawPerfect* from WordPerfect. It's one of a number of options available at a moderate cost to the home or small business. It not only offers outstanding

graphics for printouts but also has presentation graphics and the ability to use macros both within its own environment and under *WordPerfect*'s *Shell*. In addition, its graphics are directly transportable to *WordPerfect*, the best-selling word processor of all time. It comes with dozens of pieces of clip art which you can use with your *WordPerfect* documents, and you can also use the *WordPerfect* clip art in *DrawPerfect*.

DrawPerfect is far from the only software of its kind in this price range. You could also use *Arts & Letters Graphic Editor, Corel Draw* (both operate under *Windows*), or *GEM Artline*.

For the purposes of this article, we'll make up the name of a company. Since many small businesses are engaged in "massaging information," Baker and Rogers Publishing is a likely name for a company that provides a broad range of services including writing, typesetting, and layout (all of which are performed in *WordPerfect*).

Because she's the creative force in the company, Baker volunteers to create the logo, which must meet the strict standards of Rogers, who's a real stick-in-the-mud. The partners see this as a perfect pairing because they compensate for each other's shortcomings.

The Name Game

Baker sits down at her AT and starts *DrawPerfect*. To begin, she simply writes the name of the company in several different typefaces. (Some of the available typefaces are shown in Figure 1; as you select each typeface, you see an example of it in the box at the upper right.) She takes a critical look at the resulting text, remembering that she has to please not only herself but also her partner and her company's customers, whose preferences are much closer to her partner's than her own. With this in mind, she passes over the script options and chooses WP ROMAN, the last one shown in Figure 2.

Her next step is to size the text large enough to work with. Since all these programs work with outline fonts, there's no reason to stick with the skimpy text. You'll have much more control if you make the text fill the screen and then size it smaller for use. Size is an option on the Edit menu.

The text looks handsome by itself, but it's not very distinctive. It's all too obvious that very little work has gone into it. These are Baker's options at this point:

- To enhance the text by drawing a box around it or by placing rules above and below it
- To rotate the text or distort it in some other way (such as stretching it horizontally or vertically)
- To change the text's appearance by altering its color or fill
- To copy the text and distort the copy

DrawPerfect text is just text. There are a limited number of ways you can distort the actual letters. *Arts & Letters* and similar graphics-based packages let you alter the letters on the screen because the individual letters are treated as clip art once they appear on the screen. *DrawPerfect* does let you select certain text attributes, such as hollow letters, before the text appears on the screen.

To create her first logo, Baker creates the text in outline letters and then copies and rotates them. Next, she creates a white rectangle and the text one last time—this time in front of the rectangle (Figure 3).

To create the second type of logo—a name with a meaningful graphic—Baker could look through her collection of clip art and call up a drawing of a book, computer, or laser printer to use as a background for the name. Creating a name-plus-abstract-design logo would also be fairly simple to design, involving no more than working with the drawing tools in *DrawPerfect* and creating something pleasing to the eye. ▷

Figure 1: Available Typefaces in *DrawPerfect*

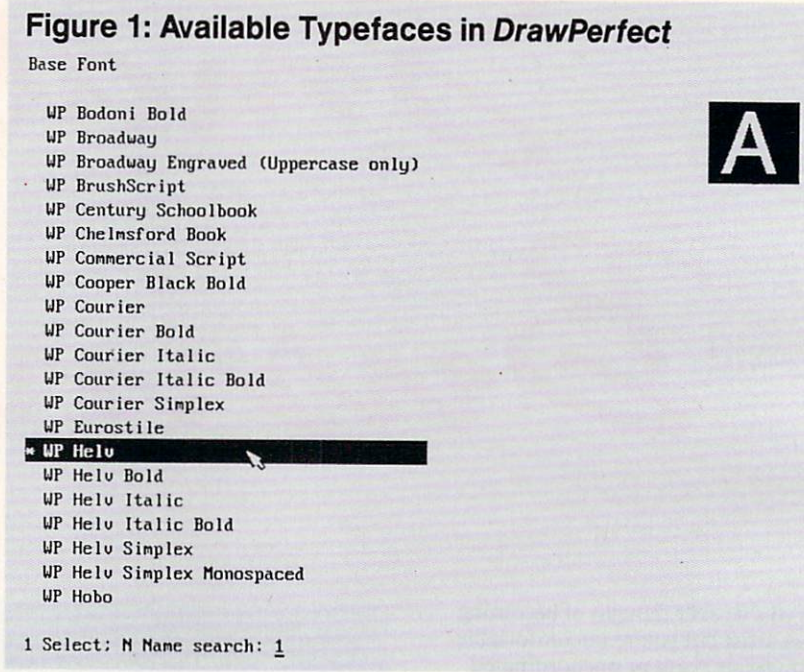
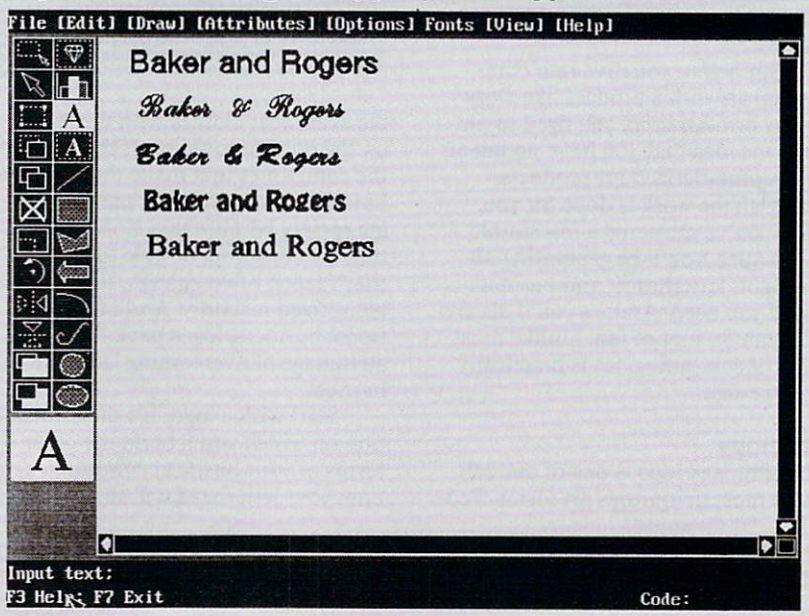


Figure 2: Choosing an Appropriate Typeface



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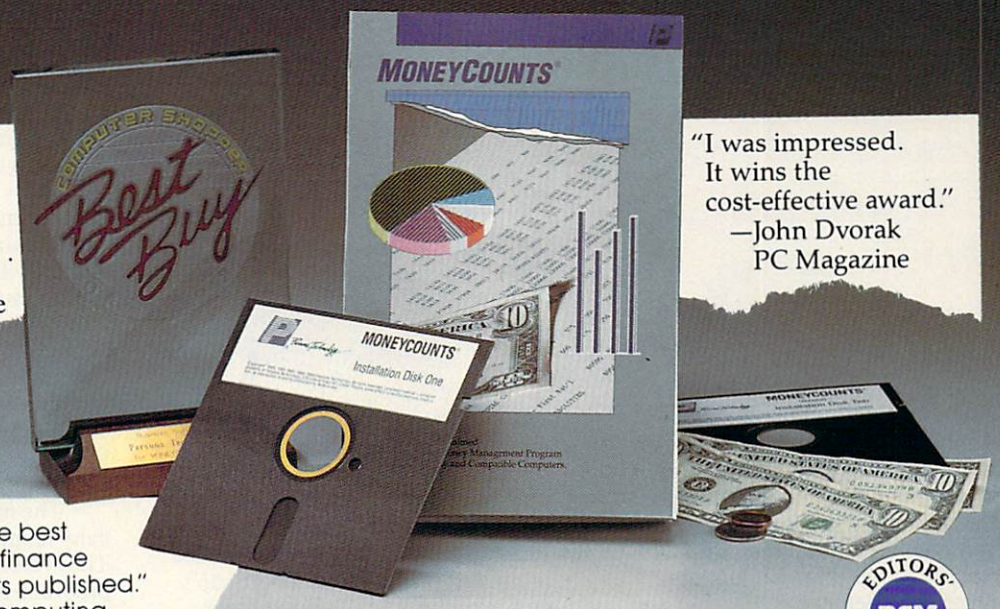

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Figure 3: Rotating Text for an Eye-Catching Logo

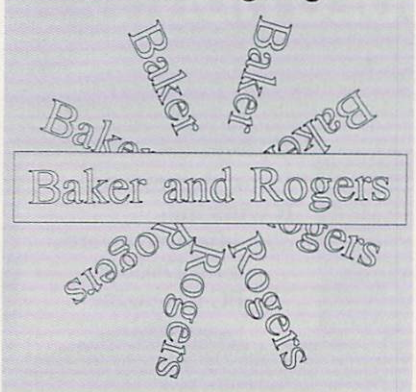
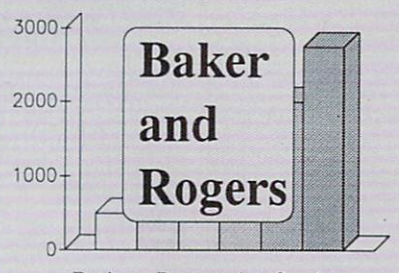


Figure 4: Completed Text-Plus-Graphic Logo



Form Fitting

Assuming that Rogers approved of the logo, Baker has a new project in mind: She plans to apply the logo to the many business forms used by the tiny company. She'll start with a letterhead to represent her business. Once the letterhead is designed, she can print out a single sheet and take it to a print shop for reproduction, print out the sheets herself as they're needed, or turn the letterhead into a WPG graphic and import it into a *WordPerfect* style. WPG graphics can also be converted into other file formats for other word processors, such as *Ami Professional, WordStar,* and *Microsoft Word.*

We'll assume that Baker has chosen the first option. Laser printer toner is expensive enough that it's usually less expensive in the long run to use the laser printer for composition work and a professional printer for actual reproduction.

To turn the logo into something that can be easily altered, Baker chooses the Area Selection option, selects the entire logo, and groups it—turning the logo into a single object that can be moved and stretched. She enters the full name and address of the firm and tries different arrangements of name, address, and logo, easily sliding the elements of the letterhead around on the page until they look just right. Her final solution is only one of an infinite number of pleasing arrangements.

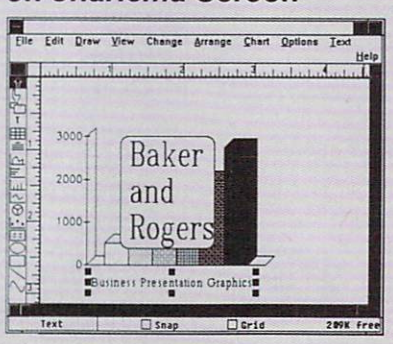
Charismatic

DrawPerfect is one of a small number of non-*Windows*-based draw programs. Most draw programs are designed to operate under *Windows.* One of the first of the *Windows* programs was *Graph Plus* from Micrografx. When it came time to update *Graph Plus,* Micrografx decided it was time to come up with a sexier name as well, and *Charisma* was born. *Charisma,* like *DrawPerfect,* is designed to create presentation graphics, which means it has a built-in facility to display computer screens as if they were slides. Both products can create files that can be turned into real slides for use with a projector. And both can create a number of different graph types based on values provided through links with a spreadsheet program or entered through a spreadsheet-like interface.

Figure 4 shows a text-plus-graphic logo for Baker's company. To create this design, a graph was made using the graphing utility from *Charisma,* and a rounded rectangle was created that frames the name. It was filled with solid white, and the words *Baker and Rogers* were superimposed on top of it in the Times Roman font. (In addition to its outline fonts, *Charisma* uses the fonts available in Baker's Star Laserprinter 8 II with LincPage PostScript emulation. *DrawPerfect* relies on its own outline fonts.)

Figure 5 shows the logo as it appears on the *Charisma* screen. As you can see, *Charisma* is slightly less WYSIWYG than *DrawPerfect.* However, because of its reliance on *Windows, Charisma* is easier to use if you've had some experience with other *Windows*-based graphics programs.

Figure 5: Chart and Logo on *Charisma* Screen



Abstract Art

You've seen the name-only and name-with-meaningful-graphic logos. The last category is name with abstract graphic. It's a fun category, but anyone seriously interested in abstract design will warn you that it isn't to be taken lightly. Because your design can go anywhere or be anything, there's a real danger it will be misinterpreted.

Let's begin with a squiggle. If you repeatedly select Duplicate from the Arrange menu, move the duplicate squiggle slightly to the right, and select Rotate Left 90 Degrees from the Change menu, you should be able to create a bale of wire. Although at first glance the drawing appears random, it tends to draw the eye, and upon closer examination you can see that there's a subtle organization in the design. In fact, you can see that it *is* a design, not just random markings.

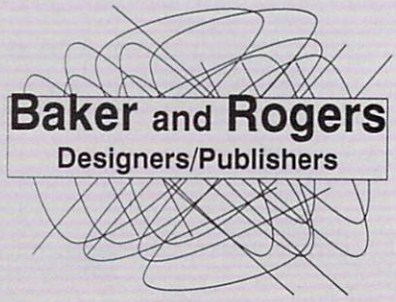
The next step is to add the company name. This time, the Times or Times Roman fonts would be inappropriate because they're traditional fonts with a classic beauty. To use them here would be like putting Mona Lisa's face on a portrait by Picasso. For this logo, seek out something with a more modern appearance, such as Helvetica, as shown in the final logo (Figure 6) or another sans serif font such as AvantGarde.

Extending Your Reach

Your commercial art projects don't have to be limited to logos and letterheads; *Charisma* and *DrawPerfect* are excellent programs for creating business presentations for sales meetings or trade shows. Graphics from each product can be converted into slides by a commercial slide service or you can run a slide show on the computer with a projection monitor.

And in addition to saving you money, these programs can entertain your creative side in the midst of a day of drudgery. Taking a graphics break can help keep you interested and alert and add extra creativity to your bread-and-butter work. ⊡

Figure 6: Completed Name-with-Graphic Logo



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If you've been hesitating about upgrading your computer skills because you couldn't find the time or locate the right program to teach you everything you need to know to be successful in today's world of computers, you'll be happy to hear that CIE's new career course can provide you with the computer technology curriculum you seek in an independent study program you can afford to invest your time in.

CIE's COMPUTER OPERATION and PROGRAMMING course was designed and developed by CIE to provide a complete overall understanding of the unlimited potential today's computers offer, once you learn and discover their full capabilities, in today's high tech environment. CIE's new computer course quickly provides you with the electronics fundamentals essential to fully understand and master the computer's technological potentials for your personal and professional advancement. Upon mastering the fundamentals you will move into high level language programming such as BASIC and C-Language and then use that programming in order to relate the interfacing of electronic hardware circuitry to programming software. As a graduate of the Computer Operation and Programming course, you will be able to successfully understand, analyze, install, troubleshoot, program and maintain the various types of electronic equipment used in business, manufacturing, and service industries.

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We encourage you to look, but you won't find a more comprehensive computer course anywhere! And it's a course designed to fit around your lifestyle and commitments today, so you can be assured of professional successes and financial gains tomorrow.

Please, do yourself a favor and send the attached card or fill out and mail the coupon below for more information about CIE's Computer Operation and Programming course. Do It Today!

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DANIEL JANAL

MAKE YOUR IMAGE SHINE

I recently attended a conference for professional speakers and asked the well-dressed woman on my left what business she was in.

"I speak about visual communications," she said. "Is that like overhead slides and transparencies?" I inquired. "No. It has more to do with presentation skills," she said. "Oh, so you help people deliver speeches," I deduced. "No. I help people present themselves properly in corporate communications situations," she said, further clouding the issue. "Oh, so you write marketing reports and employee newsletters," I said. "No. Different kinds of corporate communications," she insisted. "What kind of communications situations?" I asked, feeling that I was getting colder rather than hotter answers. "At the dinner table," she responded. "Oh, so you tell people which fork to use with which course," I guessed. "That's it!" she exclaimed.

Did this woman know what business she was in? Undoubtedly. Did she have the ability to tell people what business she was in? Undoubtedly not.

I had to ask a series of questions to find out what services she provided and how I could benefit. I was being polite because I was in an awkward situation.

Your prospects probably won't be as polite.

If they don't understand what business you're in, they won't bother to ask follow-up questions. They'll just assume what you have is *not* what they want.

To make sure this doesn't happen to you, tailor your positioning statement so that everyone will know immediately what service you provide.

A person could say, for example, that she's an accountant. The prospect would learn very little from that statement. Instead, she could say,"I'm an accountant who specializes in small businesses." That targets her market specifically.

She also could've chosen any of these areas: personal income-tax planning, large corporations, freelance writers, and actors.

Here are a few more vague professions and more descriptive statements: desktop publisher (design and produce newsletters), personal services manager (walk dogs and buy groceries), marketing specialist (write direct-mail pieces to increase sales), financial consultant (sell stocks).

Do your prospects really understand what services you provide? Here are a few exercises to fine-tune your message. These exercises will help you create a positioning statement for your company so you can clearly communicate your ideas.

What image do you want to pop into people's minds when they hear your company's name? Write three things that come to mind. Now which of those three statements is the one that clearly identifies your company? Practice reading the statement aloud until it sounds right and rolls off your tongue easily. Then get feedback from your peers and family. However, don't ask if they understand it. Chances are they'll say yes so they won't offend you. A better way to get feedback is to ask them to tell you what business you're in. That way, you'll get a more informed view.

This statement is the basis for your verbal contact with prospects—in person and on the phone. If you follow these steps, you'll be able to get your message across clearly.

Although it pays to be clear and specific, you should avoid being so specific that you risk limiting your employment possibilities. According to lawyer Alan Foneberg, when people meet a lawyer at a party, they ask, "What kind of law do you practice?" The reply is usually a one-word answer such as matrimonial, civil, or criminal. Foneberg says this is the wrong approach because you'll be typecast and the prospects will think you perform *only* that function when most lawyers are generalists who can perform many tasks.

Instead, Foneberg advises lawyers to respond, "What kind of lawyer do you need?" That way, people can say they've had a run-in with the landlord and need to halt the eviction process or whatever. The lawyer can then arrange a meeting for the new clients.

Home office workers can use this tactic as well. Let's look at two sample dialogues.

Prospect: What do you do?

Home office worker: I type term papers.

Prospect: (To herself) Oh well, I guess he can't do marketing reports. They're probably too specialized for him anyway. (To the home office worker) That sounds nice. Good luck.

In this case, the home office worker limited his approach, and the prospect didn't realize he could also type marketing reports. Result: a lost sale.

For him to make the sale, the conversation should flow like this.

Prospect: What do you do?

Home office worker: I type. Do you need any typing done?

Prospect: I have a 40-page marketing report with tables and graphs. Can you handle that?

Home office worker: Sure. Tell me about the report.

The home office worker can then discuss terms and fees and close the deal.

By following these steps, you'll be able to get your message across clearly and attract new clients. And that's the first step toward a successful business. ⊡

JOIN THE AIR FORCE AND SEE THE WORLD'S MOST EXOTIC TERMINALS.

Terminals that push pilots beyond their limits.

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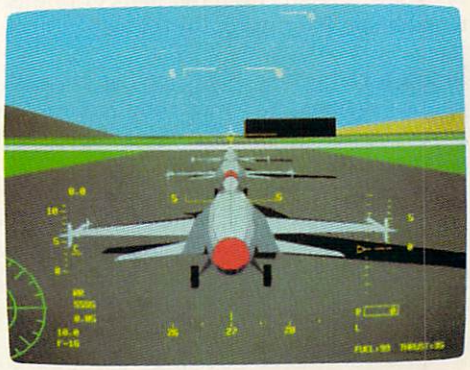
Terminals where futuristic aircraft designs are modified in just seconds.

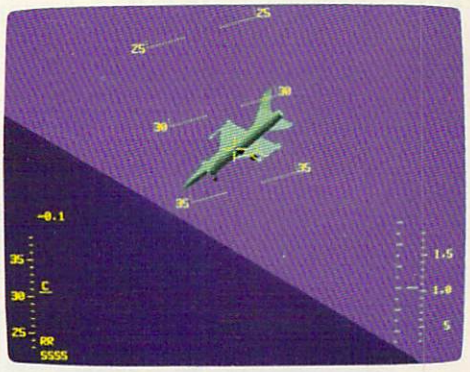
It's all part of the most sophisticated computer technology in the world.

And if you have the desire and the aptitude, you could become a part of it.

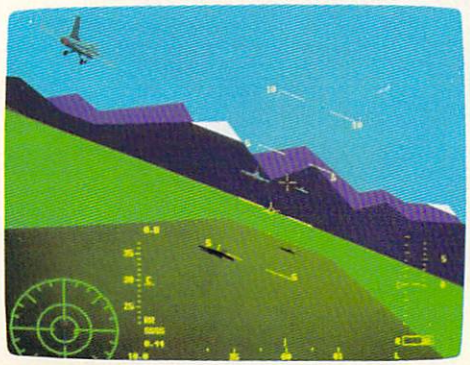


You'll receive not only the highest-quality technical training, but guaranteed hands-on experience. Use equipment and technology so advanced, it may be years before the rest of the world even reads about it.

But there's much more to the Air Force than mainframes and megabytes.



We offer equally exciting opportunities in today's most sought-after fields. Electronics. Medicine. Aircraft mechanics. Communications. Over 200 careers in all.



Plus the chance to pick up college credits or even an Associate of Applied Science degree in the fully-accredited Community College of the Air Force.

Interested? Give us a call at 1-800-423-USAF. You'll find there are some terminals where futures get off the ground.

AIM HIGH.

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Systems that revolutionized the computer industry!

All backed by Northgate® support and service that's unmatched by any other company!

There are a lot of copy-cat "slim-line" systems out there, but don't be confused. These are the ORIGINAL SlimLine systems from the pioneer of this trend-setting technology: Northgate.

In just under a year, SlimLine has become our most popular system. And with good reason. Only SlimLine gives you full 286, 386SX™ and 386™ DX power in a package only 4.25" high and 16.5" square.

Now... four new SlimLine systems! "Northgate for 1991" features a SlimLine family that offers more choice than ever before: SlimLine 286/12, 386SX/16 and 20 MHz.

Our new powerhouse 386/33 rounds out our complete range of systems.

Northgate SlimLine Common Features:

- Small footprint SlimLine case with room for two exposed and one internal half-height devices
- Intel® and Weitek® math coprocessor support
- 150 watt power supply
- Clock calendar chip rated at five years
- Front mounted reset and high/low speed controls
- MS-DOS 4.01 and GW-BASIC installed
- On-line User's Guide to MS-DOS 4.01
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- 1 parallel and 2 serial ports
- Built-in VGA video adapter
- Built-in IDE hard drive and floppy disk controllers
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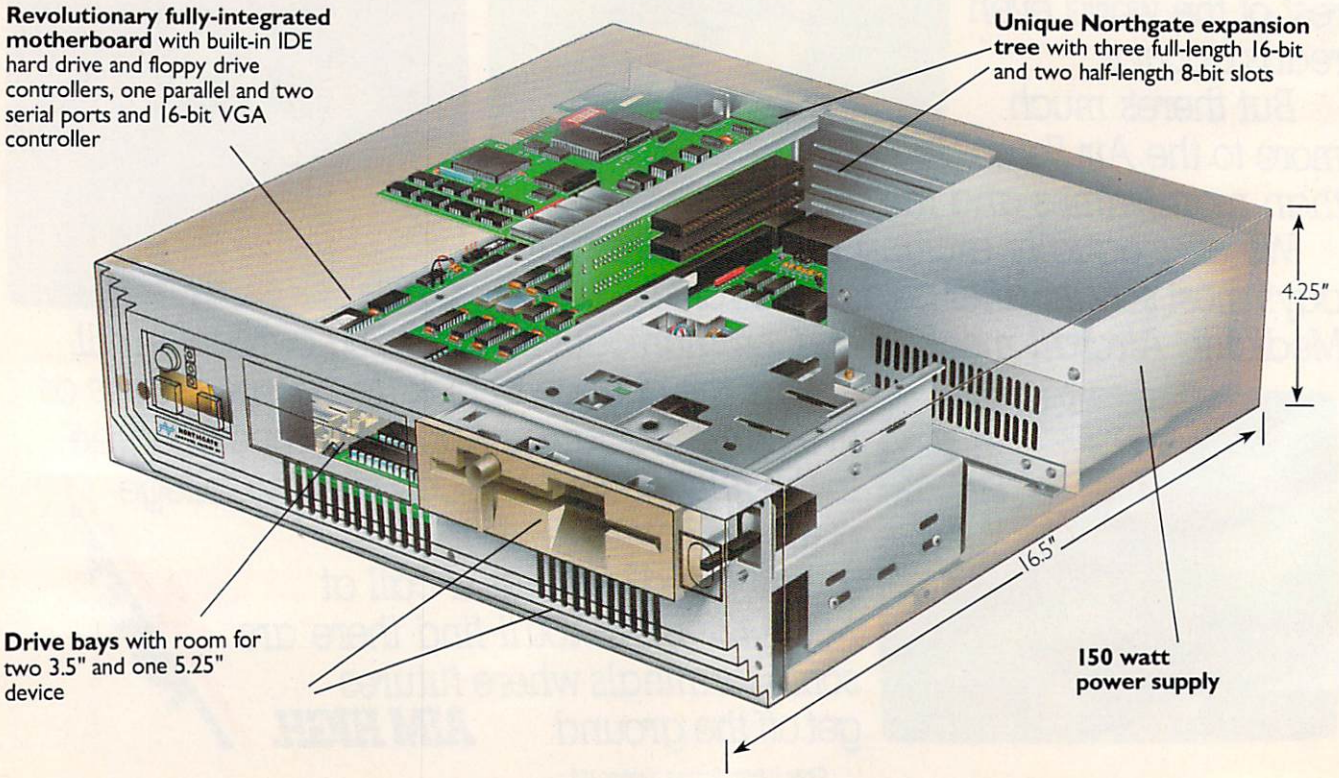
Here's how we put full power into a performance package only 4.25" high!



Here they are...the Northgate family of Super SlimLines.™ One format, four sensational systems—take your pick!

NEW! SlimLine 286/12 MHz

Ideal entry level system for use as network terminal or stand alone system for office and home use. Excellent for word processing, simple spreadsheet and light graphics programs.

- Intel® 80286/12 MHz processor
- 2Mb of RAM on motherboard
- 40Mb hard drive
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- 12" VGA gray scale monitor
- *OmniKey*® keyboard

$1699.00 Or as low as $60.00 per month*

NEW! SlimLine 386SX/16 and 20 MHz with 64K cache

No ordinary SX! Northgate engineered these systems with 64K cache memory to allow you to run Microsoft Windows and other 32-bit software at quick cache-enhanced speeds. Handles database management, graphics and spreadsheet applications with ease. Choose 16 or 20 MHz models.

- Intel 80386SX 16 or 20 MHz processor
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- 40Mb hard drive
- 64K SRAM read/write-back cache
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386SX/16 **$1999.00** Or as low as $70.00 per month*

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The system that started it all ... SlimLine 386/20 MHz!

SlimLine 386/20 zips through complex spreadsheets, moderate programming needs, desktop publishing and other demanding applications.

- Intel 80386/20 MHz processor
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- *OmniKey* keyboard

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NEW! SlimLine 386/33 MHz powered up with 64K cache!

Now for the first time ever, you can get award-winning Northgate Elegance™ performance in our SlimLine case! SlimLine 386/33 is ideal for speeding through processor-intensive tasks like desktop publishing, CAD/CAM, large database and business programming applications.

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- 64K SRAM read/write-back cache
- 40Mb hard drive
- 1.2Mb and 1.44Mb floppies
- 12" VGA gray scale monitor
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- *OmniKey* keyboard

$2899.00 Or as low as $105.00 per month*

Standard SlimLine Upgrades (Add to the base system price)

Hard Drives	12" Gold Star VGA Gray Scale 640 x 480	Gold Star 14" VGA Color 640 x 480	Panasonic 14" VGA Color 1024 x 768	NEC 3D 14" VGA Color 1024 x 768
40Mb IDE	$ 0.00	$300.00	$ 400.00	$ 650.00
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"Northgate stops at nothing to please its customers!" *PC Magazine* Sept. 25, 1990

- NEW 60-Day No-Risk Trial—if you aren't 100% satisfied, return it!
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- Northgate responds to your needs with overnight shipment of parts—at our expense!
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- Unique 24-hour toll-free technical support—the industry's best!
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24 HOURS EVERY DAY **800-548-1993**
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PC MAGAZINE EDITORS' CHOICE

INFO WORLD #1 1989 TOP 100

COMPUTER SHOPPER Best Buy

When we say Northgate manufactures the highest-performing, best-supported computer systems in the world ... it's a fact. Industry experts and customers worldwide agree!

In test after test, Northgate Elegance systems perform flawlessly. After the competition has been put through the same demanding paces, only Elegance 386 and 486 emerge as the winners.

And here's the proof! Northgate has won four *PC Magazine* Editors' Choice Awards, two *Computer Shopper* Best Buy Awards and received *InfoWorld's* Number One and Number Two Products of 1989.

PLUS AT PRESS TIME ... Northgate received word from *Computer Shopper* that Elegance 486/25i won a 1990 Best Buy Award. That makes an unprecedented FOUR YEARS IN A ROW Northgate received *Computer Shopper's* prestigious honor!

We'd be fooling ourselves (and underestimating you) if we thought you'd buy based on performance alone. That's why Northgate has a corporate commitment to customer service that's equally impressive. No puffery here...

"...Northgate stops at nothing to please its customers." *PC Magazine* September 25, 1990

- **Free delivery to your office or home.**
- **NEW 60-Day No-Risk Trial!** To serve you better, Northgate has doubled its No-Risk Trial period to 60 days.
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- **Northgate makes state-of-the-art power affordable!** Charge your purchase to your Big 'N' card, VISA or MasterCard. Ask about financing and leasing options, too!
- Call Northgate before you decide to buy elsewhere. You'll be amazed at our new low pricing!

"What WordPerfect® is to software support, Northgate is to hardware, and there are even a few things WordPerfect could learn from the folks in Minneapolis."

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Bay Area Computer Currents
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Select desktop or optional vertical power case.

Northgate's elegant desktop case features 5-bays with room for 3 exposed and 2 internal half-height devices. Comes with 200 watt power supply. For greater expansion capabilities, choose our vertical 7-bay powerhouse with a 220 watt power supply.

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As a cost-efficient, dependable network file server, Page Mode has no equal. Its realiability is confirmed by Novell® certification and by users of office networks every day. Northgate boosts performance of this 386/20 workhorse through the use of an efficient page mode memory management scheme. Other performance features include:

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- 40Mb hard drive
- 1.44Mb and 1.2Mb floppy drives
- 16-bit VGA video adapter
- Eight expansion card slots
- One parallel and two serial ports
- MS-DOS 4.01 and GW-BASIC installed
- Microsoft® Windows™ 3.0 and mouse
- 14" VGA gray scale monitor
- *OmniKey* keyboard
- FCC Class B Certified

$2499.00 Or as low as $85.00 per month*

Northgate Elegance 386/486 Common Features:

- American-made motherboard
- RAM expansion up to 8Mb on motherboard (16Mb total RAM with 32-bit memory card)
- 16-bit VGA video adapter
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- MS-DOS 4.01 and GW-BASIC installed
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Northgate Elegance 386/25 & 33 MHz

The best in their respective classes! Both are ideally suited for managing large databases (over 1000 records), full-time business accounting, multitasking and other demanding applications.

Northgate gives you a powerful standard configuration including high-speed 64K RAM cache and 4Mb of RAM. Take a look at everything you get:

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Northgate Elegance 486/25 and NEW 486/33 MHz ISA

In addition to receiving an Editors' Choice and 1990 *Computer Shopper* Best Buy Award, Elegance 486/25i outscored all competitors in *InfoWorld* Magazine's 1990 reviews of 486 systems. Elegance "leads the pack by a comfortable margin", they said. "It offers impressive performance, exceptional expandability and it is tops in support and value."†

NOW! Northgate introduces the next generation—Elegance 486/33 ISA. Both systems are ideal for heavy-duty business applications like full time database management, CAD/CAM, financial planning, accounting and programming. Includes:

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- 40Mb hard drive
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- 3.5" 1.44Mb and 5.25" 1.2Mb floppy drives
- 16-bit VGA video adapter
- 14" VGA gray scale monitor
- *OmniKey* keyboard
- Novell Certified (486/25)

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40Mb IDE	$ 0.00	$300.00	$ 400.00	$ 650.00
80Mb IDE	$200.00	$500.00	$ 600.00	$ 850.00
100Mb IDE	$300.00	$600.00	$ 700.00	$ 950.00
200Mb IDE	$600.00	$900.00	$1000.00	$1250.00

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Look... 12 F-keys on top AND LEFT!

OmniKey/ULTRA

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Look! More exclusive features!

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- Interchangeable CTRL, ALT and CAPS LOCK keys
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- Exclusive period/comma lock key locks out these <>, locks punctuation in
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- Unmatched compatibility with IBM®-type systems
- Lifetime quality double-injected keycaps
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Now! ONLY $129.00 FOB Minneapolis, MN

OmniKey/102 with F-keys on the left

First keyboard to get back to the basics! 12 F-keys on left for fast one-hand combination commands. Readers of ***Computer Shopper*** named ***OmniKey*/102** their "Best Buy."

- Northgate's original 102 key design
- 12 function keys on the left
- Interchangeable ALT, CAPS LOCK, and CTRL keys
- Large L-shaped ENTER key
- Calculator-style numeric keypad with added equals key
- Five year warranty
- 60-day no-risk trial
- Separate inverted T cursor control pad
- Unmatched compatibility with IBM-type systems
- ALPS click/tactile mechanical key switches
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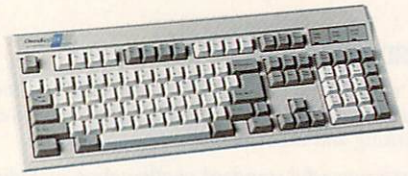
***OmniKey*/102 ONLY $89.00** FOB Minneapolis, MN

Inventory Reduction...Quantities Limited!



***OmniKey*/101** with F-keys on top and 20% smaller footprint

- Enhanced 101 key layout
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- Calculator-style numeric keypad with added equals key
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Northgate makes it easy for you to own award-winning 286, 386™ and 486™ computer systems ... just say "charge it" to your Northgate Big 'N' credit card.

It's easy! Simply fill in the Big 'N' information form and send it to Northgate for prompt attention. Once you're approved, call our systems consultants, toll-free, to select the Northgate that's right for you.

Northgate leases systems too! Choose from flexible terms up to five years. It's never been easier to get high-performance Northgate systems than it is right now!

Fill out and return this form today!

Call Northgate Now!

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HOURS: Monday - Friday 7 a.m. - 8 p.m. CST

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OPEN YOUR CREDIT CARD ACCOUNT BY FILLING OUT THE APPLICATION BELOW.

Please complete all appropriate sections, providing at least two years residence and employment history. If you are self-employed, please be sure to complete section d. **THIS IS NOT A CREDIT AGREEMENT!** One will be sent to you upon authorization of an account. (This Form Must Be Signed To Process Your Order.) All Financed Purchases Are Subject To Credit Approval. **If You Have Any Credit Questions, Please Call For Assistance.** Thank You!

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☐ JOINT CREDIT with another person. Complete entire application.
☐ INDIVIDUAL CREDIT complete only individual section.
☐ INDIVIDUAL CREDIT but rely on income of another. Complete entire application.
*If you are a married Wisconsin applicant, you must provide your spouse's information as indicated, even though your spouse may not be signing the contract.

NOTICE TO WISCONSIN APPLICANTS
You must disclose your marital status:
☐ married
☐ unmarried
☐ legally separated

a. Personal Information

NAME _____ HOME PHONE (___) _____
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DATE OF RESIDENCE MO. _____ YR. _____ BUY ☐ RENT ☐ OTHER ☐ _____
PREVIOUS ADDRESS _____
EMPLOYER _____ DATE OF EMPLOYMENT MO. _____ YR. _____
MONTHLY GROSS SALARY $ _____ BUSINESS PHONE (___) _____
PREVIOUS EMPLOYER _____ DATES OF EMPLOYMENT _____ TO _____

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SOCIAL SECURITY NUMBER _____ DATE OF BIRTH ___/___/___
ADDRESS _____ CITY _____ ST _____ ZIP _____
DATE OF RESIDENCE MO. _____ YR. _____
JOINT APPLICANT'S EMPLOYER _____ DATE OF EMPLOYMENT MO. _____ YR. _____
MONTHLY GROSS SALARY $ _____ BUSINESS PHONE (___) _____
NAME AND ADDRESS OF NEAREST RELATIVE NOT LIVING WITH YOU _____
_____ RELATIONSHIP _____

d. Self-Employment Information

BUSINESS NAME _____ BUSINESS PHONE (___) _____
TYPE OF BUSINESS ☐ Proprietorship ☐ Partnership ☐ Corporation IN BUSINESS SINCE _____
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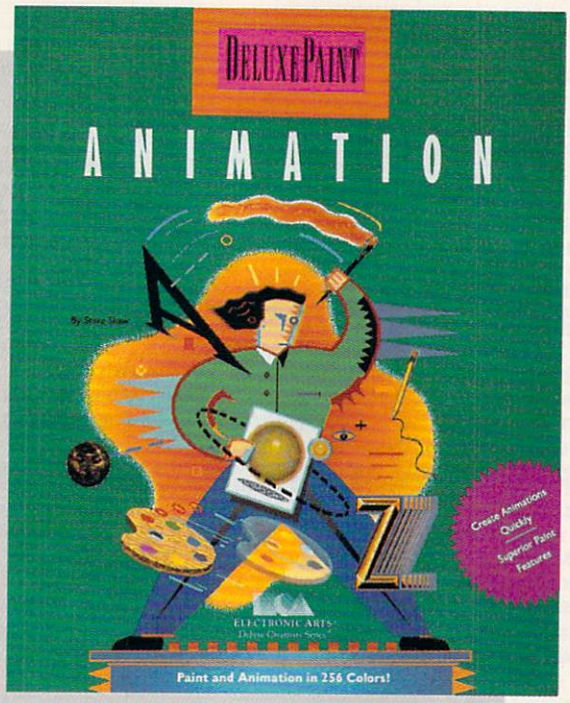

COMPUTE CHOICE

MANIPULATE OBJECTS AND MAKE THEM COME TO LIFE IN THIS REMARKABLE ANIMATION PROGRAM

WAYNE N. KAWAMOTO

Animation makes anything possible. Elephants can fly, wooden puppets can come to life, rabbits can make wisecracks, and pitiful coyotes can spring resiliently back after being run over, blown up, and hurled down from precipitous heights.

Now *DeluxePaint Animation* from Electronic Arts gives you the power of the computer to create stunning animation sequences that rival Saturday-morning cartoons. The program's animation tools and first-rate paint will unleash your imagination.

I don't consider myself an artist (years ago I did design the back cover of my junior high school yearbook), but with this program and a reasonable investment of time, I could create animations that impressed me and everyone that I roped into watching them.

The basic idea behind animation is to create a series of frames, or *cels,* that differ slightly. If you rapidly view these frames in sequence, they create the illusion of motion. Everybody has seen cartoon flip books—the concept is the same on the computer and, for that matter, in the production of commercial cartoons.

DeluxePaint Animation (DA) allows you to paint and manipulate objects on individual frames. It will also create in-between frames, the ones needed to complete the illusion of motion between images.

At the most basic level, you can sequence the screens frame by frame and draw the different pictures. But you'll really want to take advantage of *DA*'s powerful animation tools.

DA features an animation technique called *animpainting.* Here the

RY

MARK WAGONER © 1990

computer automatically sequences frames while you draw. For example, if you want to show a ball moving around, you draw a ball, get into animpainting mode, and just move the ball with your mouse as you want to see it in your cartoon. *DA* will automatically flip the frames as you draw, so when you replay the cartoon, the ball will fly around exactly as you drew it.

You can also create *animbrushes.* These are animated sequences that you can insert into other cartoons. This particular feature came in handy when I wanted a rotating planet in an outer-space animation that I was making. After first creating an endless looping cartoon of the spinning planet, I saved the entire sequence as an animbrush. When I put together the full cartoon with all of the elements, which included comets and moving galaxies, I merely inserted the animated planet into the scene.

DA includes some professionally created animbrushes—detailed birds, fish, and human figures. You can blend these moving figures into your own cartoons, almost as if they were animated clip art.

Manipulate objects any number of ways.

You can also use a variety of commands to have *DA* animate your images in delightfully impressive ways.

To change one object into another, you can produce transformations with the metamorphose animbrush. You create or select two objects and tell *DA* how many frames you want for the change; *DA* will provide all the in-between frames. The tutorial shows you how to make an amazing sequence in which an egg gradually turns into a chicken. The resulting animation is surprisingly smooth, even though you have very different shapes and colors.

With move commands, you can tell *DA* to move objects anywhere, rotate them, and even make them look as if they're flying toward or away from the screen. Using a Cartesian coordinate system (remember Algebra 1A in high school?), you can tell *DA* to move an object so many spaces, along any combination of axes and within a given number of frames. The results are images that go virtually anyplace on the screen, tumble, and even move away while gradually diminishing in size. The possibilities for movement are endless. You can even make your objects bounce and fall naturally as if they were real objects.

The program can also do color-cycling animation, in which sequences of color create the illusion of motion. Use this feature to make colorful movie marquees and falling snow.

You can also animate figures against scrolling backgrounds that are wider than your viewing screen. The characters can appear to walk along a street or through a changing forest. You cannot, however, create scrolling backgrounds in *DA;* you have to use the companion product, *DeluxePaint II Enhanced.*

Three-dimensional effects can simulate the view from the cockpit of a plane, which is very much like the view in most flight simulators. *DA* can generate a moving horizon and land, and it even lets you do barrel rolls in your plane.

Besides being an animation program, *DA* is an excellent paint program. Bearing a strong resemblance to its cousin, *DeluxePaint II Enhanced, DA* has inherited virtually all the paint features and the easy interface. ▷

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C191

Although I had never worked with *DeluxePaint* before, I found painting with it easy and the results impressive.

You can paint in 256 colors, which may at first seem overwhelming, but the interface lets you view all the colors at once for easy selection. Since subtle differences in hue can be hard to tell apart, I really liked the color-matching tool, which determines what color you have already painted with. All you do is select the tool and click on the color that you want to match in your drawing, and then *DA* automatically loads that color for your brush.

You can create impressive 3-D figures in the perspective mode. Here you position a vanishing point to which all of your objects will be oriented. As you create shapes to form the final object, *DA* alters them to fit your perspective.

You can also create stencils to mask areas of your drawings. Like electronic masking tape, the stencils allow you to color tricky areas without having to worry about painting over something else.

Of course, *DA* features the requisite array of painting tools you would expect in a high-end paint program. With these tools, you can create circles, curves, rectangles, and gradients of color; fill areas; adjust brush sizes; and magnify areas for more detailed drawing. I liked using the right and left buttons on my mouse to control different colors. This kind of control makes drawing and erasing easy. Another handy feature is the ability to alter brush sizes as you draw.

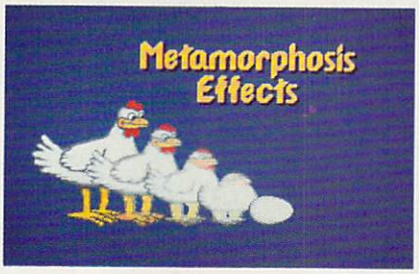
DA also provides a play utility that allows your friends to play your animation on their computers. A conversion utility lets you import pictures in other paint formats, and a camera function will take pictures of graphic screens so that you can use them in *DA*.

I don't know what *DA*'s actual limits are, but I created animation that had at least ten different elements simultaneously moving. Birds fly with flapping wings, figures walk or dance, titles rotate and grow in size, pie charts "fly together," balls bounce away in the distance, images transform into other objects—the effects are endless.

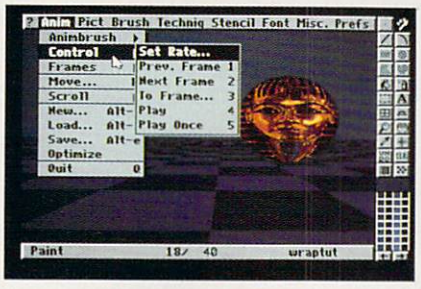
The program turned out to be a lot of fun. I created a pretty decent picture of Flounder, the fish from Disney's *The Little Mermaid.* After saving this as a brush, I animated him against a blue ocean backdrop. Seeing Flounder wink and swim around enchanted my four-year-old daughter.

Inspired by an article that discusses how directors use computer animation to preview special effects in movies and because I happen to be something of a Trekkie (both generations), I made a cartoon of the opening sequence from "Star Trek."

My final cartoon was complete with moving planets, shooting stars, and, of course, an Enterprise starship that jumped to warpspeed. All I needed was Captain Jean Luc Picard's opening narration.



Create remarkable transformations with the program's metamorphose animbrush.



You can insert animbrushes (animated sequences) into other cartoons.

Generally, the results are excellent, but don't expect classic Disney quality. With some work you can probably get results similar to the limited animation shown on children's Saturday-morning television. The professionally created examples included with the program, particularly the mermaid and the spinning King Tuts, are truly spectacular.

You can use *DA* to develop attractive sales and point-of-purchase demos, illustrate educational concepts, and preview sequences before filming them. But I think that this program is, most of all, a colorful, animated screen full of fun.

Prepare for some investment of time to get started. It takes a while to really get the animation concepts down. The interface and screens are intuitive and easily understood, particularly if you've used paint programs before. The program relies on a mouse, and you can use keyboard shortcuts.

The thick 295-page manual is very well written, considering that the writers had to explain an entire paint program and then the animation features. The manual's only drawbacks are, first, that it asks you to use some features before it explains them and, second, that some icons are hard to read. But overall, it gives excellent step-by-step examples and starts you on your way.

The hardware requirements are steep. You must have a VGA monitor and card and a mouse. *DA* runs the program in the 256-color, 320 × 200 VGA mode. Also, the manufacturer recommends that you have at least a 286-based computer or faster, and you must have a hard drive to hold the program's three megabytes of data. (Actually, the manufacturer encourages you to have five megabytes of free hard disk space.)

With *DA,* the PC now has animation power comparable to that of the Amiga and Macintosh. *DA* is an outstanding choice if you're looking for an animation program. There's another highly regarded animation program called *Autodesk Animator* that's also a COMPUTE Choice (see January 1990 *COMPUTE!*); it is, however, more expensive.

For those of you familiar with the older animation program *Fantavision, DA* belongs to an entire new generation that can handle more elements, avoid distorting objects when rotating, and give you a real 256-color paint program to draw with. Comparing *Fantavision* with *DA* is like comparing the MS-DOS text editor Edlin with a high-end word processor.

DeluxePaint Animation is an excellent program. It not only gives you comprehensive paint and animation capabilities, but it also makes using them fun and easy.

Ease of Use	★★★★
Documentation	★★★★
Features	★★★★★
Innovation	★★★★

DeluxePaint Animation
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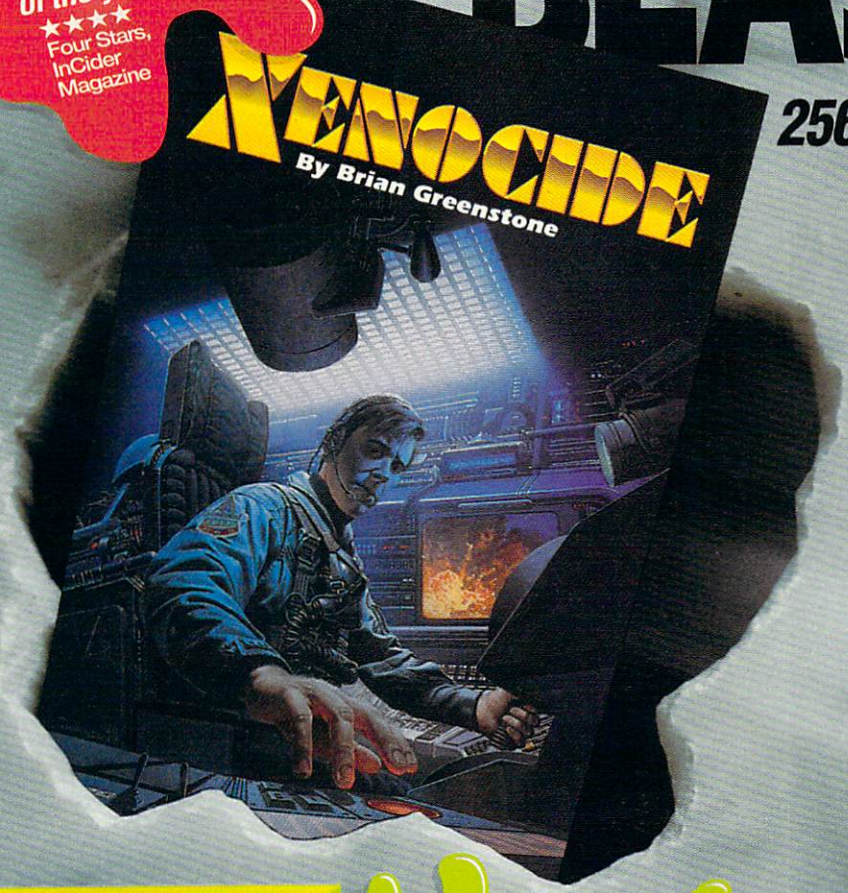

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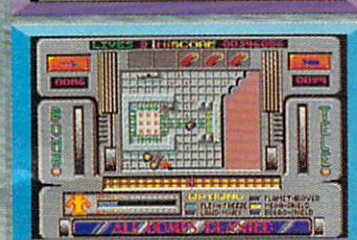
Level 3: A scuba dive through hell. You'll need all your fighting skills to ward off the denizens of the deep, and a sharp mind to search out hidden keys required to open doors to passages leading to the level below. Find the keys and get ready for the hard part – finding your way through the correct doors!



Level 4: The labyrinth bio-lab. Blast your way through hordes of xenomorphs in overhead view. Figure out the path to the central core, plant your bombs and then fight your way to the teleporter before the moon and it's 'morphs are blown to space dust in a flash of sound and fury on your screen!

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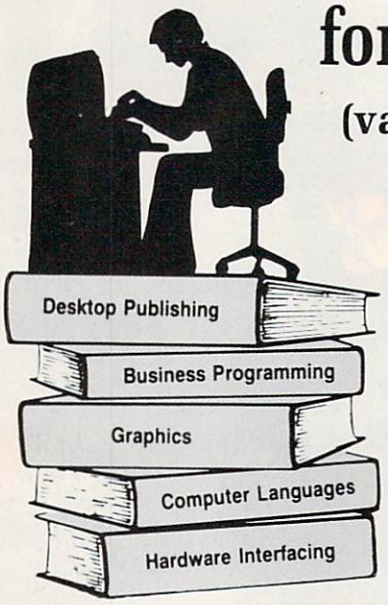

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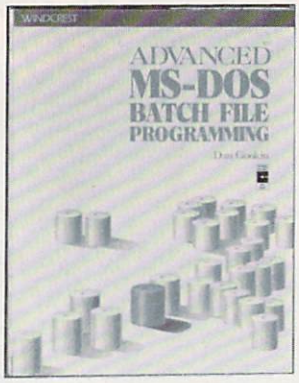

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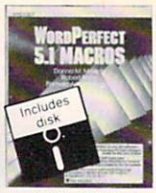

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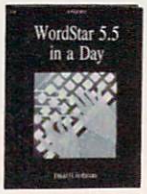

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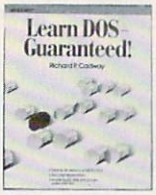

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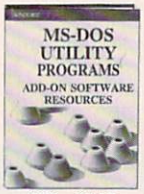

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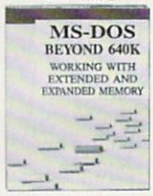

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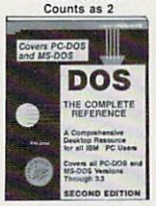

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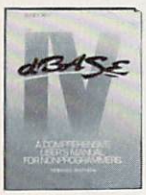

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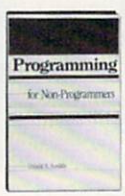

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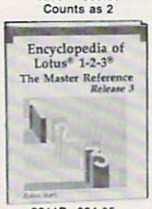

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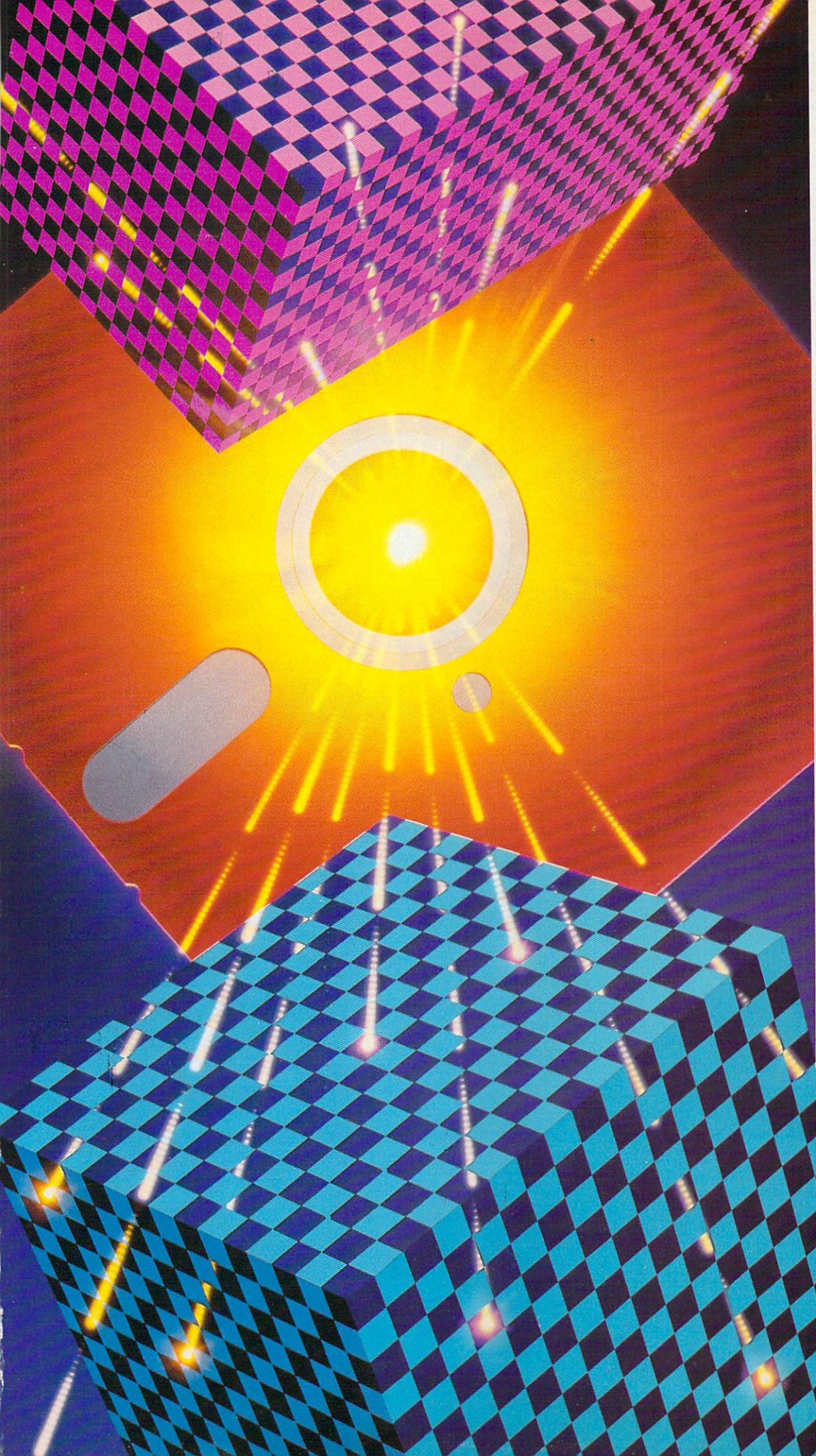

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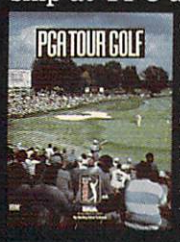

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SPECIAL SECTION

THE WORLDS OF ELECTRONIC GAMES

OMNI AND *COMPUTE* LOOK AT AN ENTERTAINMENT REVOLUTION

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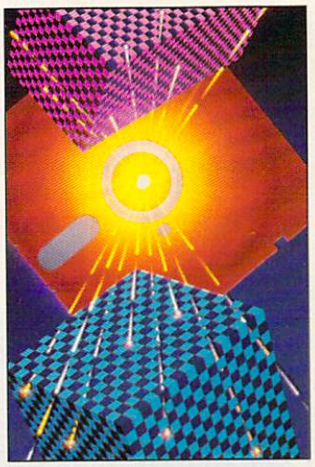


Electronic games grow more sophisticated every year. This special section looks at some of the exciting interactive worlds available today, and some that might be available tomorrow.

THE PAST, PRESENT, AND FUTURE OF ELECTRONIC GAMES

ELECTRONIC WORLDS WITHOUT END

BY KEITH FERRELL

They're everywhere! In less than two decades—remember *Spacewar* and *Pong*?—interactive electronic entertainment has become a global fact of life. In coin arcades, in living rooms, and increasingly on portable game units, electronic play has never been more popular, more sophisticated, or more widespread.

It's easy to understand why. Today's electronic games, whether played on computer, dedicated game console, or coin-operated unit, are more than just diversions. Good ones become gateways to worlds we might otherwise never visit. The best achieve something like art.

We are reaching a point where interactive electronics can re-create virtually anything.

Basically the appeal of interactive electronics is twofold. First, video and computer games draw on our sense of fun, our need for play. More subtly, the games appear at least to provide some long-desired control over the television screen. This point might be argued by those dedicated gamers—and their parents, spouses, and friends—who spend dozens of hours locked in electronic interplay. Who's in charge—game or gamer? Interactive addiction, indeed, might well be a subject for investigation.

Rarely has an addiction been so appealing. Through interactive electronics, we can journey to the far future or the distant past, achieve athletic greatness, become armchair generals out to change the course of history, challenge our eye–hand coordination, simulate high-tech aircraft and vehicles, play games that teach while they entertain.

We are reaching a point where interactive electronics can re-create, to one degree or another, virtually *anything*.

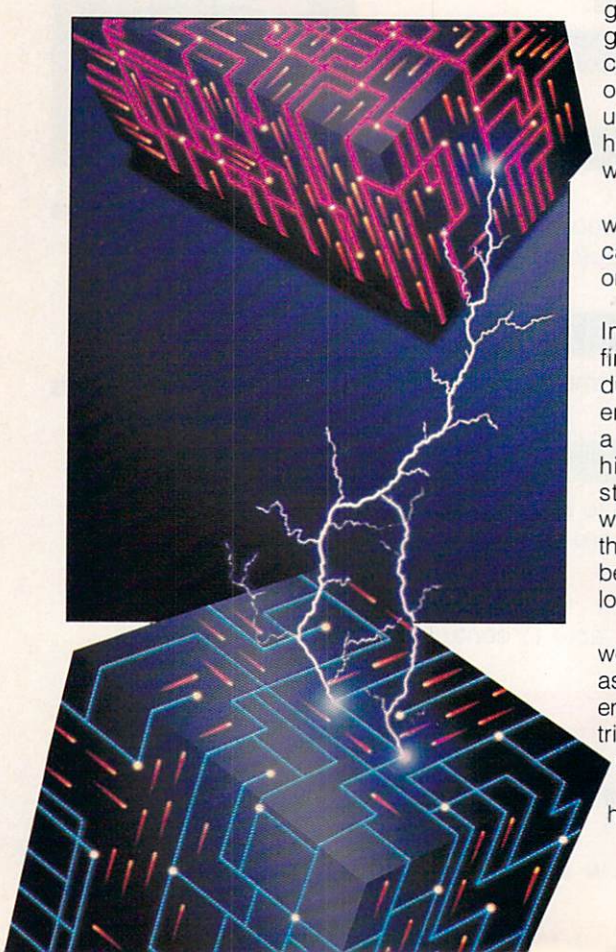
It didn't start out that way. In the Seventies, when the first video games were introduced, many thought the new entertainment media would be a flash in the pan. The first hint that video games had struck a responsive chord with the public came when those early arcade machines began jamming—from an overload of coins!

What worked in arcades worked even better at home, as Atari found with its phenomenally successful Atari 2600 cartridge console. Millions of consoles and tens of millions of games moved into households almost overnight.

At the same time, many households embraced early personal computers, notably the Commodore 64, the Apple II, and early IBM PCs. While the computers ostensibly served higher purposes than entertainment—word processing, financial management—the platforms immediately attracted the talents of game designers.

What the entertainment marketplace giveth, that same marketplace taketh away. By 1984 the initial video game boom had collapsed cataclysmically, with dozens of companies going bankrupt as quickly as they'd flourished. Legend has it that millions of Atari cartridges, unwanted by retailers or the public, were buried in a desert landfill somewhere in the American West. Informed analysis suggested at the time that the video game boom was over, its flash-in-the-pan nature having simply taken a little longer to play out than was first suspected.

You can't keep a good entertainment medium down, though. The computer software side of the industry never shrank as much as the cartridge side, and excellent disc-based games continued to appear throughout the Eighties. Nor was the cartridge environment as dead as the analysts thought. By 1987 a new name was making noise in the field of video games: Nintendo. By 1990 Nintendo had not only revived the video game market, it had nurtured that market to a size and scope far beyond even Atari's heyday. Nintendo clothing, Nintendo books, Nintendo television, even Nintendo cereal have all appeared over the past three years as



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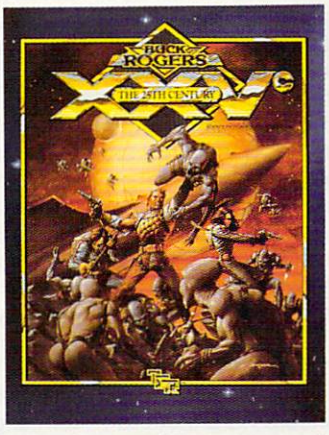

The XXVc role-playing game is packed with adventure, fantastic civilizations, genetically-engineered races, and future-science technology. This game contains action-packed adventures sure to thrill science-fiction fans and game players alike.

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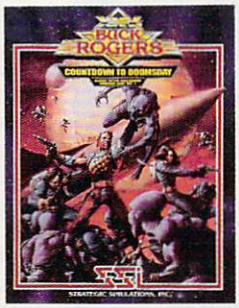

Earth's future is in your hands! Look for these games at book, computer, hobby and comic stores everywhere.

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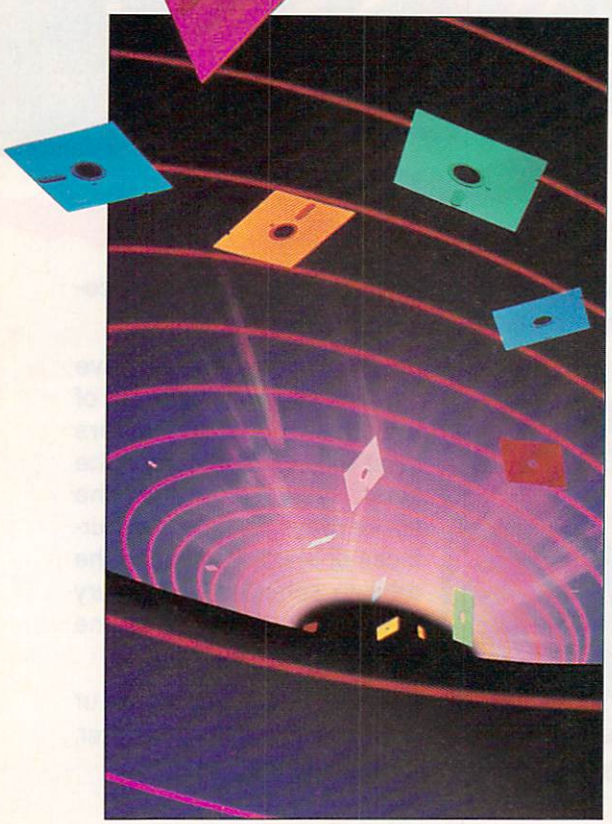
Before long, home entertainment systems will let us write, produce, direct, and star in our own movies.

the company achieved billions of dollars in sales each year.

Those sales made clear an important point: Interactive entertainment had become a fixture of the modern household and would remain so. In 1991, there are more approaches to interactive entertainment than ever before. Nintendo continues to dominate the cartridge scene, although its dominance faces stiff competition from Sega and NEC. Sega's Genesis system boasts a more powerful processor and more sophisticated graphics and sound than Nintendo's, while NEC's TurboGrafx offers a CD-ROM (compact disc, read-only memory) drive whose storage capacity is enormous. New systems such as SNK's Neo-Geo continue to ring changes on the basic game console format.



Portability is another area of excitement, again defined by Nintendo. The company's GameBoy achieved perhaps the clearest codification of interactivity's popularity when, on a recent edition of *Real Life With Jane Pauley,* a child was shown playing with a GameBoy in the back of the covered wagon in which his family was experiencing a "frontier" vacation. As far as video games go, you *can* take them with you—and you may not be able to get away from them. Atari, NEC, and Sega are all mounting efforts to challenge Nintendo in the portable gaming marketplace.

I'll admit a prejudice right here: I think the best, most exciting games around are developed for personal computers. (Having said that, I'll also own up to my own interactive entertainment bias: I use a fast 386 PC with super VGA graphics, an NEC CD-ROM drive, and Ad-Lib soundboard with speakers attached. Now, *there's* an entertainment system.)

The best PC games are elegantly programmed, taking advantage of the machine's power and minimizing its vulnerabilities in order to enhance the electronic illusions being created. Indeed, some games are far more elegantly programmed than the business software for which the PC is primarily intended. Word processor and spreadsheet designers and programmers could take more than a few pages from the book of game maestros.

Today even education dances to an increasingly electronic, interactive beat. Educational software is often as entertaining as game software, with the added benefit that you're improving your mind as you play. Many games, in fact, have serious educational underpinnings, presented with distinct points of view.

That's a thumbnail sketch of today's worlds of electronic games. Diverse and diverting, the games have spread throughout the world and show no sign of retreating.

And tomorrow?

The skills learned over the first decade of interactive entertainment's life will serve as the foundation for the next generation of games. Programmers' toolboxes now contain thousands of routines and shortcuts. Just as film, recorded music, and television have libraries of effects, so will the entertainment software industry continue to add to its collection. Don't be surprised to see many interactive effects actually mirroring familiar film techniques. Before long, home entertainment systems will let us write, produce, direct, and star in our own movies.

The software itself, both on disc and on cartridge, will grow more sophisticated. The distance between electronic reality and the real world will continue to shrink. Already we're seeing sports games that simulate everything from the influence of a breeze on a baseball to the effect of blades of grass on a golf ball's lie. Historical games incorporate social and political factors in warfare simulations. Simple arcade adventures are hardly simple anymore, with action mov-

CONTINUED ON PAGE 86

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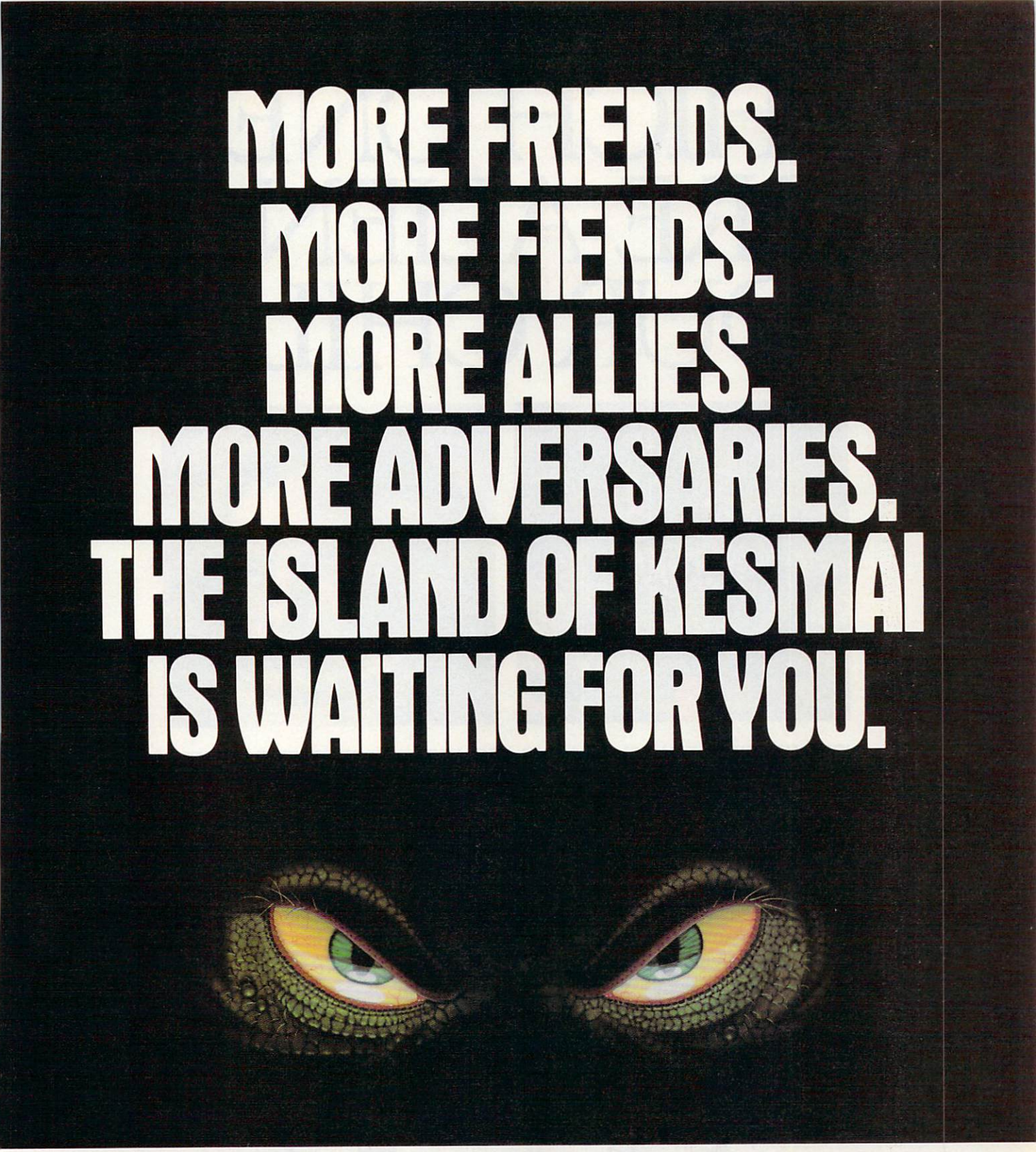

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REALMS OF ADVENTURE

From dungeons and dragons to galaxies far, far away, computer games provide a wide world of fantasy

BY KELLEE MONAHAN

"Who goes there?" bellows the Dungeon Master. "I, the brave knight. I have come to defeat the Red Dragon, he who has robbed and pillaged the countryside. I've come to reclaim his lair's treasure, of which he is undeserving." The spell is cast and you enter the world of game role playing. The forces of evil stand before you. What will you do? This is medieval legend in the remaking. Role-playing gamers can journey to worlds of gothic horror, wild West adventure, or epic saga.

The more you know about the historical period you're playing in, the better off you are. Gary Gygax, a Chicago insurance broker, designed the first role-playing game, *Dungeons and Dragons,* in 1974. Now the game and publishing company TSR provides fantasy adventures for some 10 million players worldwide. Frank Beuttell, a TSR executive, says, "In spite of the economy, business is strong. People would rather do without other things before giving up their hobby."

Interactive adventure games take you around the world—and beyond. Clockwise, from upper left: Starship pilots race for the hangar in Origin's *Wing Commander.* Spectrum HoloByte takes off with *Flight of the Intruder,* based on the Stephen Coonts novel, and *Student Driver,* fulfilling every Sunday driver's fantasies. Broderbund combines entertainment and astronomy education in *Where in Space Is Han Solo?* And the company's *Carmen Sandiego* will be a Saturday-morning television program.

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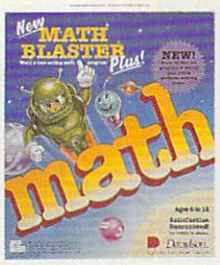

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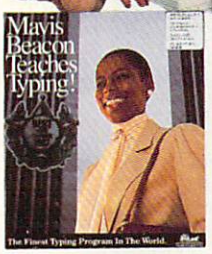

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GAMES THAT TEACH ARE MORE FUN THAN EVER

LEARN AND PLAY, PLAY AND LEARN

The computer has long been viewed as a boon to the educational process, and educational software designers are making the most of it. Many educational software publishers are taking lessons from computer game designers, using entertainment techniques to make learning more appealing to students.

Entertaining educational games and products span the classroom curriculum. Publishers such as Britannica Software, Davidson and Associates, The Learning Company, and Broderbund use software to make math, language arts, social studies, and the sciences more accessible to today's students, both at school and at home.

The engagement offered by interactivity serves as a spur to study. At the most basic—and in some ways most important—level, that of drill and practice, the computer offers an unexpected advantage over human teachers. The software doesn't get tired, processors don't lose patience; an educational program is able to continue working with a student long after a human teacher would tire or grow impatient.

But drill and practice isn't everything, merely the foundation on which everything else rests. What do software designers build on top of drill-and-practice sessions? Problem solving, analysis, deductive reasoning, word problems, real world situations, and more—all of it educational and all of it disguised as play.

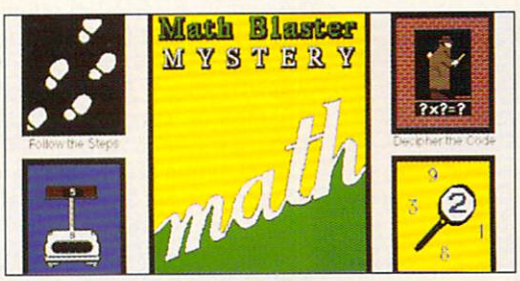
Consider The Learning Company's latest entry in its *Super Solvers* series: *Challenge of the Ancient Empires!* Using techniques familiar from arcade games, *Challenge*'s designers pit players against mysteries involving ancient treasures and lost civilizations. In the midst of arcade sequences, students also find themselves solving mysteries, putting together puzzles, and making decisions.

Davidson and Associates has produced a long-running series of educational software products aimed at coordinating students' mastery of basic vocabulary and math skills and translating those skills into higher-order thinking. *Math Blaster Mystery,* for example, helps students make the transition from fundamental math skills to applying those skills to real world problems.

Britannica Software's *Revolution '76* attempts nothing less than a re-creation of the American Revolutionary War, couched in the form of a game but filled with interesting facts and insights. Even young players discover very quickly the human, fiscal, and emotional side of the war for independence, as well as its political and military nature.

Educational entertainment remains in its infancy, yet those companies that have made a commitment to the field are assembling an array of tools and techniques that will serve them well as technology evolves.

Oddly—or perhaps not so oddly—the technologies that have the strongest hold on the minds of the young have yet to make much of an effort to provide educational entertainment for their players. Nintendo, Sega, and NEC doubtless know which side of the market their bread is buttered on, yet it would be refreshing, and probably profitable, for the big video game companies to offer at least an occasional educational cartridge. ⊡



Challenge of the Ancient Empires! **(left) and *Math Blaster Mystery*** **(below) let kids play while they learn.**

DIFFERENT CULTURES PLAY DIFFERENT GAMES. OR DO THEY?

THE GAMING GLOBE

BY BOB LINDSTROM

North America, Europe, and Japan have all embraced electronic games. But not the same games, or even the same style of games.

Let's hear it for Mom, apple pie, and joysticks. The video game and computer game are uniquely American inventions. And today, nearly 30 percent of American households own video games. In 1990 Americans bought $5 billion of video game systems and cartridges. Much of this video game excitement must be credited to Japan-based Nintendo. The company's domestic subsidiary has sold 25 million Nintendo Entertainment Systems (NES) to American homes.

Interestingly enough, 50 percent of those games are being purchased by adults, and not just to keep the kids quiet. "There is a change in awareness about video games among adults," says Nintendo Gamemaster Howard Phillips. "Just as cartoons used to be just for children, animation is now seen as entertainment for adults as well as kids. Video games also used to be considered 'kid stuff,' but video entertainment is for everybody."

The computer game precursors of video entertainment have always targeted adults. It's one of the reasons that American game designers remain the international champs of computer simulation software such as flight simulators, urban simulations, and other "you are vicariously there" illusion makers.

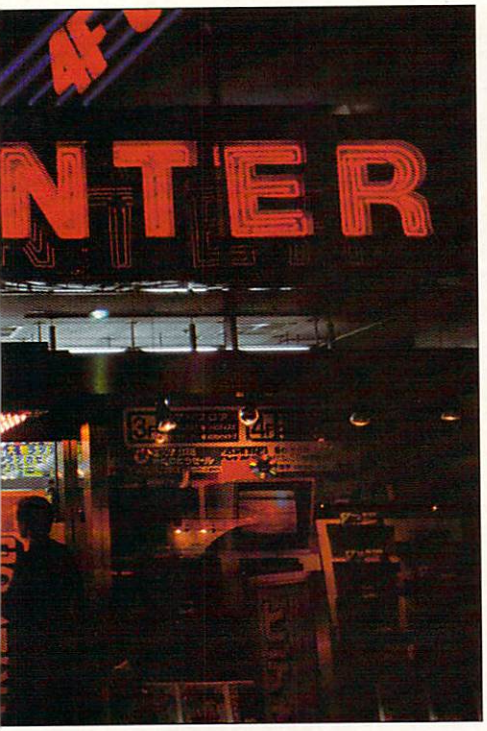
"In Europe the computer game industry was much more youth oriented than in the United States. In the States the disc-based IBM PC market attracted a much more mature audience looking for more mature games," explains Sid Meier, vice president and cofounder of MicroProse Software, Inc.

Meier notes that the next generation of video game systems may well be a growing source of adult entertainment in the future. And older gamers seem poised and ready to confirm Meier's theory.

"There is an opening for a standard game machine with the power to do simulations and the household penetration to be a commercial force," Meier says. "Then you'll see cartridge-based simulations with a lot more sophistication."

Japanese students stand in line up to five hours to be the first to buy new games for the Nintendo Entertainment System (called the Famicom in Japan). Stores are asked to sell cartridges only during after-school hours in order to stem the waves of school absenteeism accompanying the release of popular games. Role-playing enthusiasts snapped up 1.3 million copies of the latest installment of the *Dragon Quest* series in a single day in early 1990. And Japanese fans of the American-born Ultima game series clamor for Ultima comic books, compact discs, and a cartoon series appearing on Japanese TV.

There is a virtual video game mania in Japan, according to Corey Sandler, coauthor of Bantam Books' *The Ultimate Unauthorized Nintendo Game Strategies* series. Last year in Tokyo's Akihabara district, which has a concentration of consumer electronics stores, Sandler found "lines of children aged ten to fifteen that went on two deep for about four blocks. In the Japanese style, it was completely order-

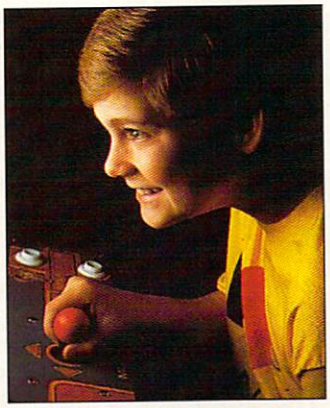


ly. When I got to the front, I found it was kids waiting to buy Nintendo's *Super Mario Brothers 3*."

Children don't have a monopoly on video game compulsion, though. "Adults are also involved with video games in Japan," Sandler notes. Japanese players can download new products directly from the manufacturer to their home systems. All that is needed is a telephone connection and a credit card.

Which games are most popular? "The video games we get here reflect what's been successful in Japan," says Sandler. "But the most popular game categories are role playing, baseball games, and, of course, the classic arcade action games."

As in the United States, Nintendo reigns in Japan as the most popular video game system. In 1990, NEC's TurboGrafx-16 (known as the PC Engine in Japan) approached NES's sales. Nintendo will counterattack with its powerful next-generation Super Famicom, and the video game system "wars" will intensify throughout 1991.



Industry observers believe that the pitched battle will rage in the United States in late 1991 with Nintendo, NEC, and Sega's Genesis as the principal combatants.

Depending on their generation, Americans perceive the United Kingdom and Europe as the birthplace of the enduring popularity of the Beatles, or the cradle of profound Western art and literature. Just don't look for much that is enduring or deep in British and European video game culture. "It's a lot of sizzle and no meat," explains game designer Chris Roberts, a Briton who is director of new technology for Origin Systems in Austin, Texas, and designer of Origin's *Wing Commander* spaceflight simulator. "In the United Kingdom and Europe, we don't go for great strategy games, or deep and complex games. It's very flashy graphics, great sound, and arcade action," says Roberts.

In the hit-driven European marketplace, a game for the popular Commodore Amiga or Atari ST computer may sell 100,000 copies during its first month of release; "then it will be dead," says Roberts. As a result, European designers favor arcade games that are fast to create and provide the maximum in "quick, instant gratification."

In the quest for buyer gratification, however, the Europeans have become the masters of breathtaking computer game spectacles. Products such as Britain-based Psygnosis' *Shadow of the Beast I* and *II* boast exotically detailed artwork, stunning animation, and ear-torching Euro-rock musical scores.

Unlike the United States, Europe has not taken cartridge-based game systems like the NES to its Old World heart.

"Since the Europeans are very sensitive to the quality of sound and graphics, not that many people want to buy Nintendo-looking games," comments Roberts. Game players who have fried their eyes on the sizzling graphics of the Amiga or Atari aren't interested in the less colorful visuals of the NES.

"But the new sixteen-bit machines may make inroads in the United Kingdom and Europe," says Roberts. The graphic quality and competitive pricing of these systems, compared with computer system price and performance, may attract Europeans, who traditionally have limited disposable income. ⊡

SCIENCE-FICTION GAMES MAKE THE MOST OF COMPUTER TECHNOLOGY

FAR STARS AND DISTANT WORLDS

Science fiction and interactive electronics are made for each other. There's something, after all, science-fictional about interactive games themselves, about the act of plugging yourself in to an artificial world over which you exert total control.

For a while it looked as though electronic SF might consist solely of dueling spacecraft. *Spacewar,* one of the first successful arcade games, pitted starships against each other in a universe filled with gravity wells, stars, and black holes. *Asteroids,* not long after, made the universe simpler and struck a more popular chord: Give players a spacecraft and weapons, then let them blast away to their hearts' content. Arcades and video game consoles have gone far with this basic approach.

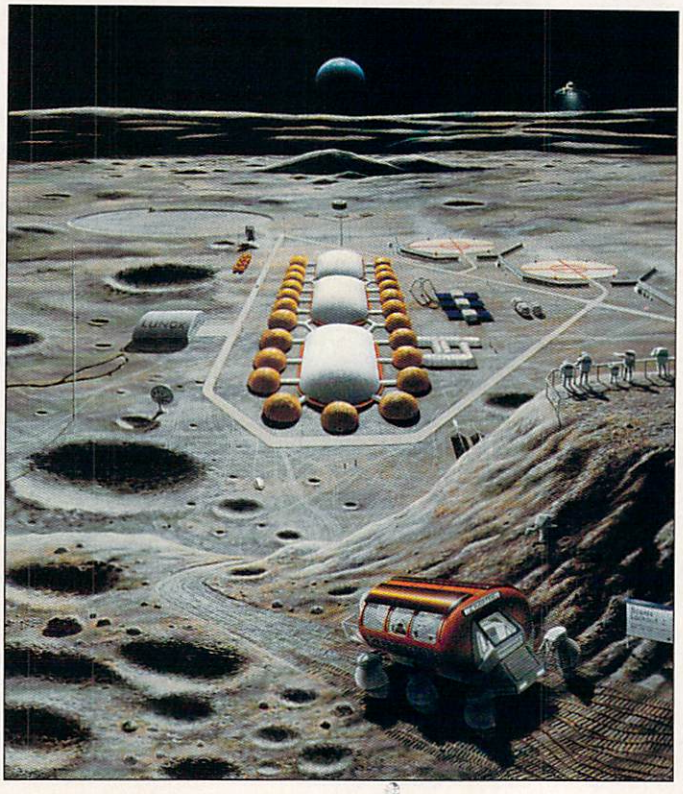
SF on computers, however, has become more sophisticated. In the mid-Eighties, for example, Electronic Arts' *M.U.L.E.* provided players with a more challenging universe, letting them dispatch robots to explore and establish trade. *Elite,* from Firebird, created a vast starscape, populated it with warriors and pirates, and sent players forth to live or die electronically.

Some companies have even specialized in SF software. Texas-based Interstel built an entire gaming universe around its *Starfleet* series. Fans of hard-core space combat flock to Omnitrend's products, notably the *Breach* line. In *Breach* you assume the role of a leader in an elite military outfit: Dropped into dangerous situations, it's up to you to command your troops, accomplish predefined missions, and keep yourself alive so that you can fight again.

Software companies continue to hone their skills in the creation of science-fictional universes. Electronic Arts' *Starflight* series offers players hundreds of worlds ripe for exploration and exploitation, along with a galaxywide mystery to be solved. *Midwinter* from Microplay puts you in a post-apocalypse world, challenging you to save civilization.

Virgin Mastertronic's *Overlord* gives you the tools to rebuild worlds and create a galactic empire. Sierra On-Line's *Space Quest* series gives interstellar adventure a satirical twist. Access Software makes deadly future streets come alive in games such as *Crime Wave* and *Countdown.* And Origin's *Wing Commander* brilliantly reinvents spaceship combat in a game that screams for a fast PC and a good sound system.

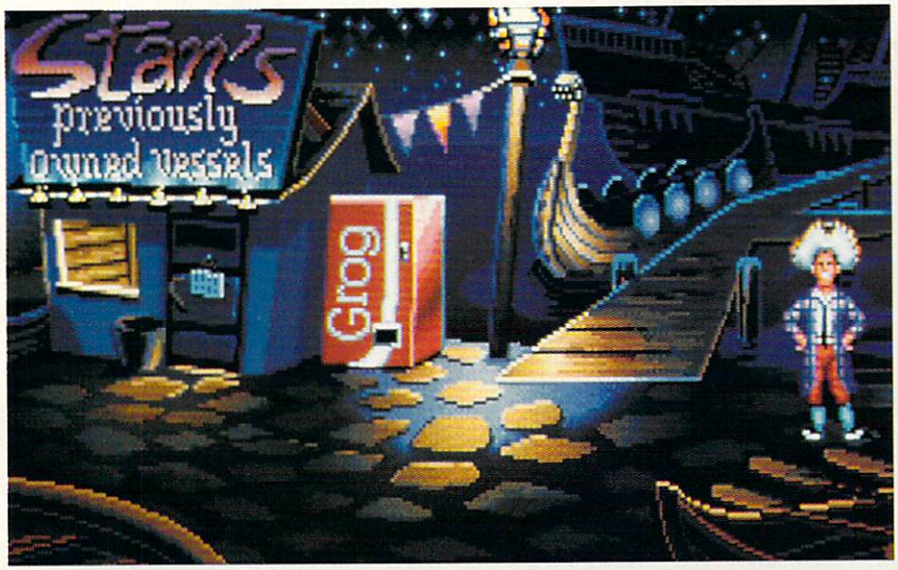
In recent years some science-fiction writers' literary works have made the transition from printed page to electronic screen. *Omni* contributors Wil-



B.A.T. **(above) provides danger and adventure in time, while** ***Moonbase*** **(right) takes a hard look at exploiting the harsh lunar environment.**

LucasArts on the art and science of entertainment

THESE PIRATES HAVE TONGUES AS SHARP AS THEIR SWORDS.



Lucasfilm™ Games' swashbuckling new graphic adventure lets you trade insults with some of the saltiest seamen to ever sail the seven seas.

In *The Secret of Monkey Island,*™ you'll sling one-liners with a fast-talking used ship salesman, a sarcastic swordmaster, a wisecracking corpse, and a prisoner whose breath would stop a horse. You'll also hunt for buried treasure, chase after a beautiful woman, and—perhaps—unravel one of the twistiest plots in the history of adventure gaming.

You're short, broke, clueless and friendless.

And you've just arrived on Mêlée Island seeking fame and fortune. Explaining to anyone who'll listen that you want to be a pirate.

Being the easy-going types they are, your new pirate pals invite you into the club. Just as soon as you've completed three *tiny* trials.

Among other things, you'll need to sedate some piranha poodles, burglarize the governor's mansion, and do business with the scum of the earth. And if that's not enough, you'll have to figure out whether the 300-pound voodoo priestess covets your rubber chicken, fetid fish, pack of breath mints, or…

If the brigands don't grab you, the graphics will.

Lucasfilm Games set today's graphic standards with games like *Loom* and *Indiana Jones and the Last Crusade.* Now *The Secret of Monkey Island* ups the standards a few more notches with stunning 256-color VGA graphics (16-color EGA version also available), proportionally scaled animated characters, and cinematic pans and camera angles.

Our acclaimed point 'n' click interface has been improved even more. So have our sound effects, which are backed by a captivating calypso and reggae music track.

Enter the Monkey Island Treasure Hunt and win a FREE Carnival Caribbean cruise!

If you can solve a few sneaky puzzles in a special demo of *The Secrets of Monkey Island,* you might just win one of the sweetest prizes since Captain Kidd's treasure chest. A Carnival Cruise for two, one of a hundred AdLib™ sound cards, or one of hundreds more prizes! You'll find the demo and complete rules in specially-marked boxes of 3M diskettes. Or send a self-addressed, stamped disk mailer to: Monkey Demo, PO Box 10228, San Rafael, CA 94912.

So act fast, think fast, and enter fast. Because while playing *The Secret of Monkey Island* is an adventure, winning the Treasure Hunt is a real trip.

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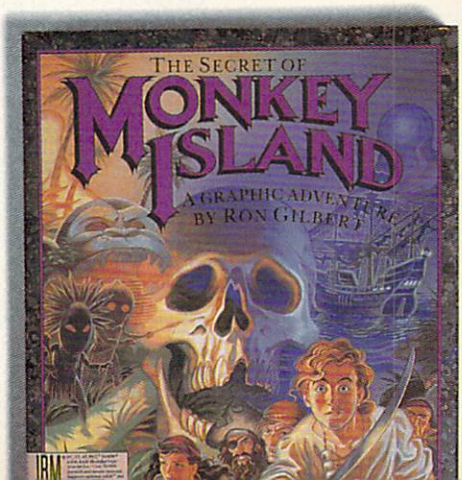


The Secret of Monkey Island is available for IBM and 100% compatibles in 16-color EGA and 256-color VGA versions. Visit your retailer or order directly with Visa/MC by calling 1-800-STARWARS (in Canada 1-800-828-7927). ™ and © 1990, LucasArts Entertainment Company. All rights reserved. IBM is a trademark of International Business Machines, Inc. 3M is a trademark of 3M Corp. AdLib is a trademark of AdLib, Inc. Cruise prize arranged with the "Fun Ships" of Carnival Cruise Lines, The Most Popular Cruise Line In The World; ship's registry: Bahamas and Liberia.

liam Gibson and George Alec Effinger have seen their works become interactive computer games. Interplay transformed Gibson's *Neuromancer* into an interactive environment that captured many of the novel's cyberpunk details. Effinger himself worked with Infocom (a division of Mediagenic) on the creation of *Circuit's Edge*, an electronic version of the future Middle East he writes about in such novels as *A Fire in the Sun*. What, one wonders, might a Larry Niven or Frederik Pohl produce if teamed with the right programmer?

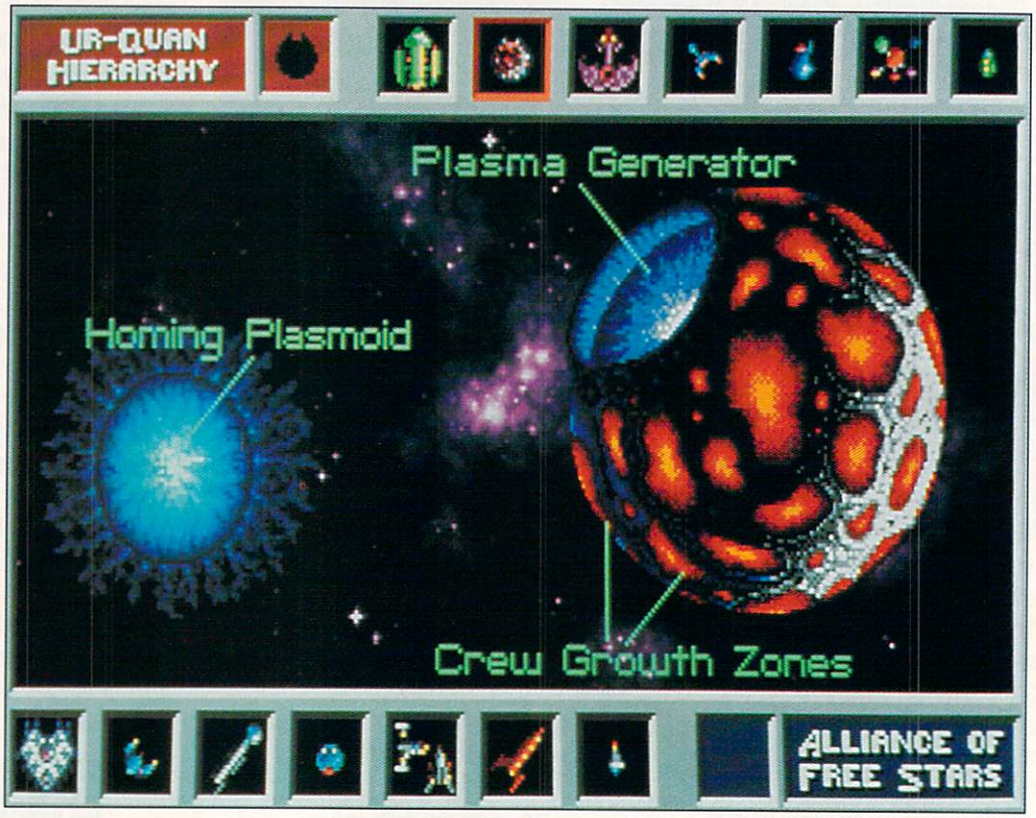
New technologies, of course, will make electronic SF even more convincing. CD-ROM offers the vast storage capacity of a CD, making it possible to store hundreds of megabytes of data, imagery, and sound on a single disc. With that sort of capacity you can look forward to games that talk, images that are animated with almost lifelike movements, and even worlds whose visual richness approaches that found in a television program.

Further down the technological highway we can expect virtual reality games that will let you essentially "step into" your computer screen, or fool you into thinking you've done so. Imagine sitting in your favorite easy chair and having it transformed as if by magic into the center seat of the starship *Enterprise*. Can *Star Trek: The Next Generation*'s holodeck be far behind?

The appeal and possibilities of the new technologies, along with the increasing respectability of interactive entertainment as an art form, will go a long way toward attracting better storytellers.

As interactive electronic media become more widespread, and their capabilities more supple, we may see whole new approaches to storytelling and world building. Science fiction creates myths for a technological world; interactive SF may well use technology itself to underpin those myths. Look for the next renaissance in SF to flow, at least in part, from interactive electronics as well as the printed page and film.

Science-fiction games are indeed growing up with computer and video game technology. Next stop, the stars.... ⊡



Crashing suns and exploding spacecraft are all in a day's work in *Star Control*.

YOU NEED A SET OF THESE

TO PLAY ONE OF THESE

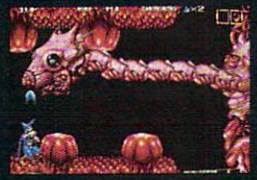
These spheres represent the elements that contain mystic powers you must achieve... to stay alive in NEO•GEO®'s exciting new adventure, MAGICIAN LORD. As ELTA, you'll fight off brutal attacks by fiendish enemies as you travel through a terror-filled fantasy world. You'll need all the power you can get!

MAGICIAN LORD is just one of many challenging NEO•GEO action, sports & role playing fantasy games. All feature today's most advanced 4-dimensional graphics, with vivid detail and effects, 65,000 colors and an amazing 15-channel real voice stereo sound track. All pumped out by 330 meg hardware!

So NEO•GEO can deliver in-your-face realism that Nintendo, Sega, and NEC simply don't have the capacity to match.

NEO•GEO also has great Network capability, a unique Memory Card that lets you save your game at any stage, and coming soon, software applications for modem play, home shopping, banking and more.

NEO•GEO is clearly the system of choice for vid freaks of all ages. The question is, do you have what it takes?



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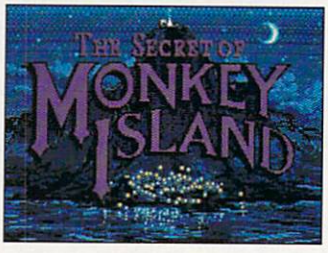
INTERACTIVE ELECTRONIC VOYAGES OF DISCOVERY ATTRACT ARMCHAIR ADVENTURERS

EXPLORATION GAMES



Pirates! **(top) sends you forth to conquer the Caribbean, while *The Secret of Monkey Island* (bottom) offers more humorous explorations.**

The impulse to explore is as old as the human race. It's an impulse that's been eagerly adopted by developers of entertainment software.

Take a video or computer monitor. Place a character or a vehicle on it. Let the player know there's an electronic world awaiting discovery, and watch what happens. That old human impulse comes into play, and via keyboard, joystick, or mouse, the exploration begins.

Some of the earliest computer and video games were built around the explorative urge. Fantasy role-playing games such as Origin's *Ultima* or Nintendo's *Zelda* draw as much on the desire to see what's around the next corner as they do on the desire to face dreadful monsters or cast powerful spells. Just as much of the most popular fantasy literature is quest based—heroes on a journey through unfamiliar territory—so does much of electronic fantasy take the quest as its theme.

Some quests are more realistic. *Seven Cities of Gold,* an early title from Electronic Arts, re-created the Spanish exploration of the New World. A couple of years later, MicroProse broke new ground with *Pirates!* which took as its universe the Caribbean during the great days of fighting sail, of buccaneers and colonial governments, shifting alliances and intrigues. *Pirates!* appealed to that exploring impulse, providing players with the tools—ships and crews, maps and winds—to set sail in search of treasure and danger.

Empire, a classic war game, combines military strategy and confrontation with world exploration. Upon beginning the game you are confronted with a screen completely blackened, save for a single square. From that square you dispatch ground, air, and sea forces, uncovering a bit more of the world's nature at each turn. Continents and islands reveal themselves gradually, as does, eventually, the location of the enemy.

Exploration need not take place in a huge world or on a global stage. *Maniac Mansion,* from Lucasfilm Games on disc and Jaleco on Nintendo cartridge, presents players with a mysterious old house filled with slightly dotty, slightly dangerous residents. Poke around the mansion and discover secret passages, dreary dungeons, and startlingly interactive rooms.

In its most recent releases, Lucasfilm continues to mine exploration. *Loom* is a simple fantasy, set in a world where the very nature of reality must be woven—or unraveled. *The Secret of Monkey Island* is more lighthearted.

Players assume the role of Guybrush Threepwood, an earnest if somewhat foolish young man out to seek his fortune in a world filled with puns, sight gags, and silliness.

Among the most unusual exploring games is one currently under development by Infogrames in France. This is a haunted house game, one that takes place in the dark. As currently planned, the game will present players with a blank screen, challenging them to navigate through the haunted house by way of sound effects.

As computer and video game technology grows, we can expect much more complex and sophisticated exploration games. Imagine, if you will, re-creating the voyages of Drake, the Antarctic journeys of Scott, the flights of Lindbergh.

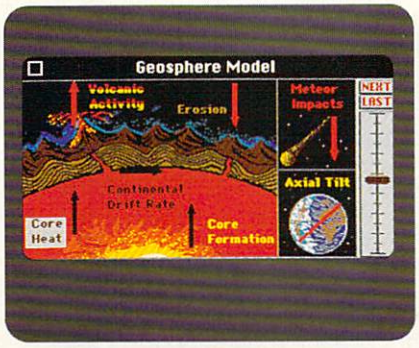
Other explorers, real and imaginary, call out to our imaginations. Who knows what we might find? Before long, you may face a character deep in an unexplored region of your computer and say, "Dr. Livingstone, I presume?" ⊡

TAKE OVER THE WORLD.

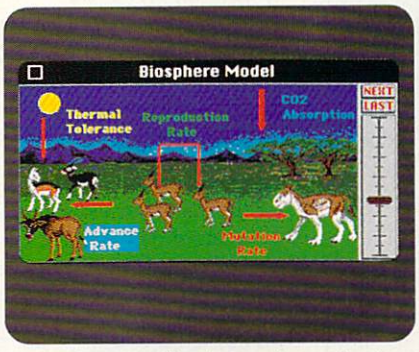
You get seven world scenarios plus unlimited random planets. So you'll never be strictly earthbound.

Mess with the world and it becomes an unhappy place to live. When you're smiling, though, the whole world smiles with you.

SimEarth plays all your favorite cataclysmic hits. Including volcanos, meteor strikes, earthquakes, and continental drift.



Find out what precisely makes your world tick. And what'll make it stop ticking.



Use your animal instincts and your planet will thrive, producing a rich abundance of life.

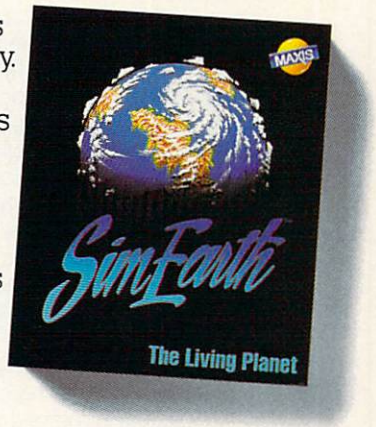
Make the wrong decision and you could wipe out life as you know it. Hey, nobody said the job was going to be easy.

MAXIS

The only way to follow an act like SimCity®–1990's runaway Number One game–is to think globally. The result is SimEarth™.

Instead of a city to run, SimEarth gives you the reins to the entire planet. Evolution, continental drift, climate, atmosphere, hurricanes, nuclear fallout, acid rain, civilization, and a bunch of other disasters. All the cool stuff you need to rule the world.

Play SimEarth to the end of time. About 10 billion years or so, give or take a millenium. Getting raves everywhere, SimEarth is indeed destined to take over the world.



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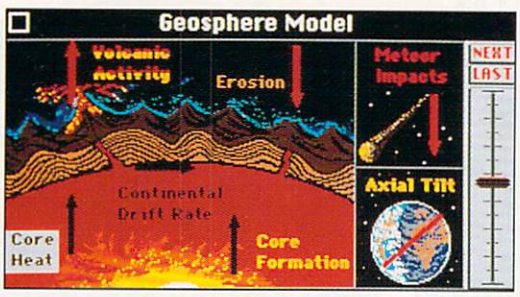
GAMES CAN GIVE YOU THE
POWERS OF A GOD, A PRESIDENT, A BILLIONAIRE

BUILDING WORLDS

In Sid Meier's *Railroad Tycoon* (top), your world is the burgeoning frontier, your task the establishment of a successful railroad. *SimEarth* (bottom) gives you whole worlds to play with, entire ecosystems to explore.



Sit in front of a computer screen long enough and it becomes a world in itself. A growing number of game designers are taking advantage of that to create games in which players build self-contained worlds.

"Environment" games give players the opportunity to control some aspect of a world's development, whether ecological, social, or industrial. Maxis' *SimCity,* perhaps the most famous example of this type of game, provides players with undeveloped land and the tools to turn that land into a thriving metropolis—or a polluted, overpopulated nightmare. Running a growing city is no more easily achieved in a computer world than in reality.

Designer Chris Crawford, whose *Balance of Power* translated superpower tension into a tense software experience, recently released *Balance of the Planet* through Accolade. This time Crawford's turf is the global environment itself, with players forced to make choices between ecological concerns and civilization's needs.

Sid Meier, whose MicroProse games such as *Red Storm Rising* and *F-15 Strike Eagle* helped define state-of-the-art military simulators, has turned to more peaceful pursuits with *Railroad Tycoon.* Players are transported to the early days of steam-powered transportation, provided with capital, and challenged to build a successful rail empire.

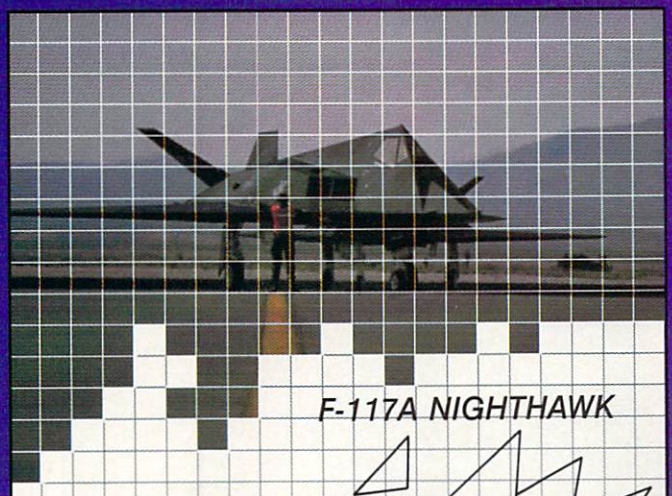
The team that designed *SimCity* set themselves the largest of all possible tasks in *SimEarth:* Create a simulation of an entire world. Their starting point was the Gaia theory proposed by James Lovelock and Lynn Margulis, which, put *very* simply, views a planet as a single organism. In the game this vision becomes a living electronic entity as you guide the transformation of worlds—Earth among them, but also Mars and others—from primordial matter to thriving ecospheres.

From macrocosm to microcosm, there's a school of thought that argues that electronic life can be created, or at least considered. Cellular automata—software representations of living, evolving life forms—are already replicating in computers around the world, producing some very surprising offspring. Mathematician and science-fiction writer Rudy Rucker has created one of the most engaging cellular automata programs, called, appropriately enough, *Rudy Rucker's Cellular Automata.*

What all of these programs have in common is a sense of consequences, of the effect of decisions and actions on a larger world. Make the wrong decision and you have to live with its ramifications throughout the rest of the game. Make the right decision and watch its consequences flower. The best world-building games give latitude to "right" and "wrong" decisions, just as the real world does.

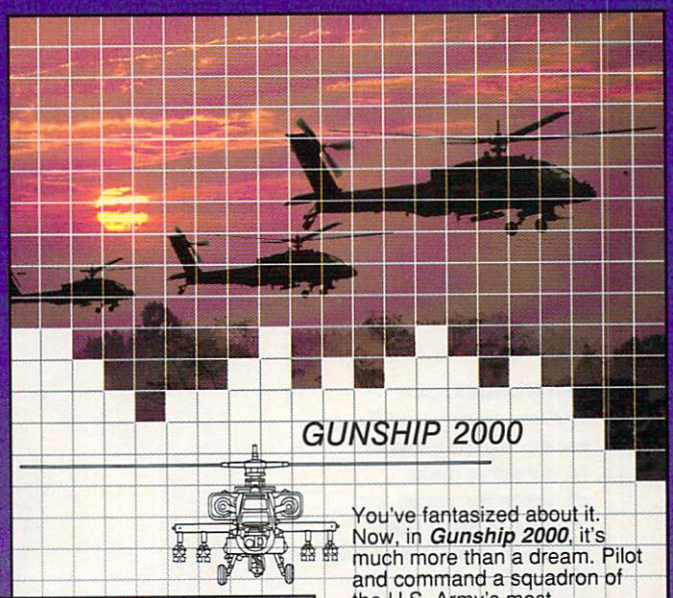
There's a fine line, obviously, between world-building games and educational software, but it's a line that many designers happily tread. By making learning "painless," environment games pass along quite sophisticated lessons to their players. Because the programs are malleable—your worlds reflect your choices—you are your own teacher. That's a learning experience to be savored—and enjoyed. ⊡

Three New Fantasies From MicroProse. Only One Of Them Is Make-Believe.



F-117A NIGHTHAWK

Piloting ***F-117A Nighthawk Stealth Fighter 2.0*** is fantastic, but it's no flight of fancy. It's a thoroughly-researched, sophisticated simulation of America's radar-elusive jet. New scenarios (including Iraq), more powerful weapons and even better graphics than in *F-19*, the game the Software Publishers Association voted Simulation of the Year in 1989.



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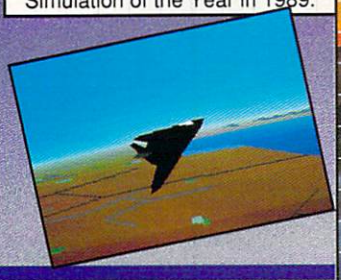

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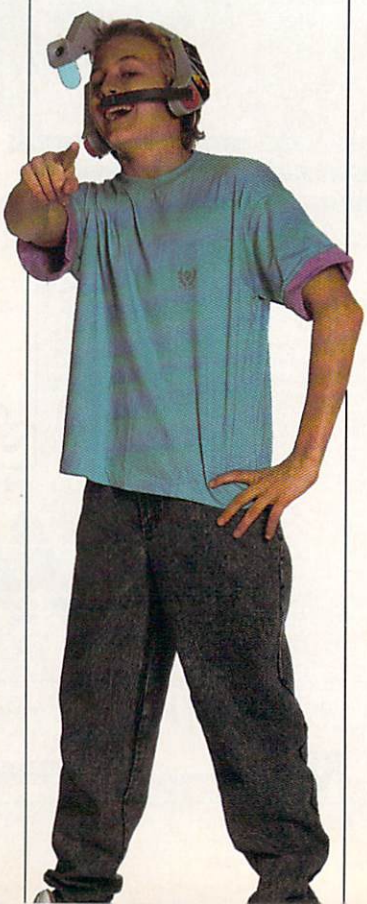

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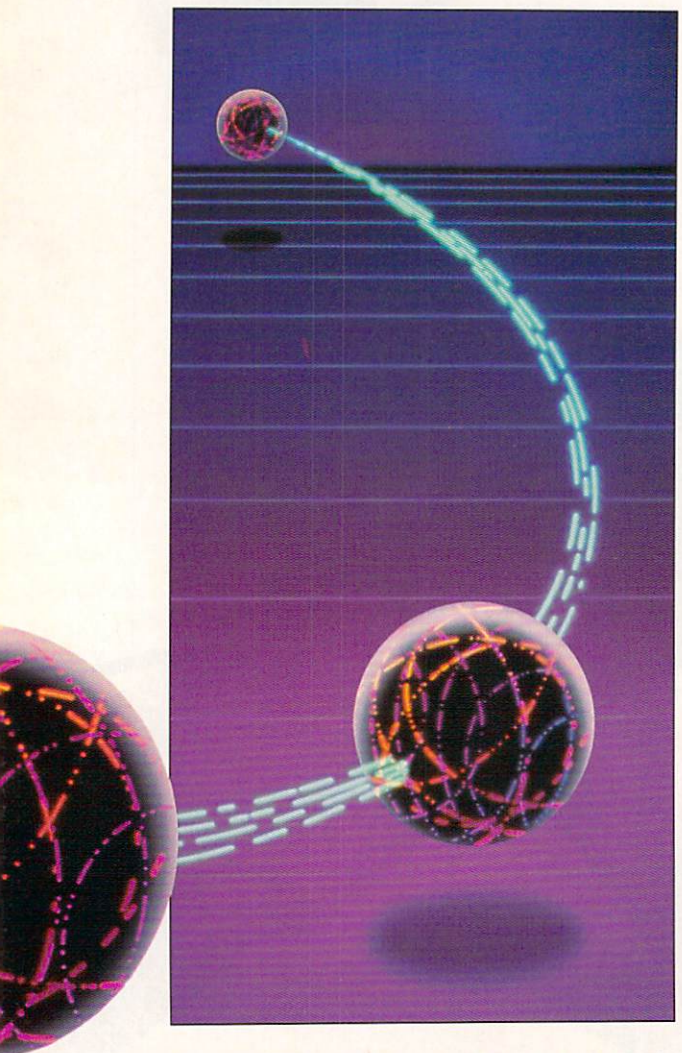
CONTINUED FROM PAGE 62

ing in an increasing number of dimensions, using more vivid graphics and sound effects than those Atari players of a decade ago could imagine.

Imagine an interactive universe where people meet electronically from throughout the world.

The software will grow smarter as well. Artificial intelligence has become an increasingly popular aspect of some games. Future entertainment software will quickly and effectively learn your gaming preferences, structuring its own responses accordingly.



The video game console, the coin-operated arcade machine, and the personal computer won't be the only media for interactive entertainment. Some form of interactivity will be built into future televisions themselves. As the tube becomes smarter, acquiring more and more of the characteristics of a computer, it's only logical that interactive entertainment be added to TV's traditional passive entertainment delivery.

On-line telecommunications services such as Prodigy, GEnie, and CompuServe are experimenting with new approaches to entertainment. Look for large on-line games to become even more popular and assume new roles. One can imagine whole interactive universes where people meet electronically from across the world to play together.

New storage media such as CD-ROM will add dramatically to the size of the games available to us. As data storage devices become less expensive and more widely distributed, game designers will leap at the opportunity to extend their visions with more convincing images and sounds.

Speaking, as it were, of sounds, you'll probably be talking to your games before too many more years pass. While the bulk of the research effort into speech recognition and synthesis technology is aimed at the business marketplace, business advances have a way of being turned into entertainment opportunities. Some games are already "talking;" in another five years you might find yourself training your favorite simulator to respond to your own words.

And that's just a glimpse. Travel back in time a decade or so and ask someone playing *Pong* or *Spacewar* what the future of video games held, and the speculation would doubtless be too conservative by half. As is, undoubtedly, my own.

Interactive entertainment will continue to grow and prosper. As the technology becomes more widespread, via consoles, computers, and smarter televisions, there's a chance that we'll see interactive entertainment become the largest of all the entertainment industries.

There are opportunities and delights in such a future—who wouldn't want, for an hour or two, to drop into a convincing alternate world, to display skills and live through experiences the mundane world denies us?

There may be traps as well. The interactive addictions I spoke of early in this piece may become a reality. Some teachers see video games as further lowering an already low literacy rate. The most popular games tend to be the most violent. Some games carry an increasingly sexual content. How far can games go?

The resolution of that and other, related questions will take years, and each resolution will in turn produce new questions, new areas of excitement and concern.

It is clear, though, that far from being a flash in the pan, interactive entertainment has become part of the firmament of popular world culture. It is here to stay, ready to transport us, electronically, to interactive worlds of entertainment without end. ⊡

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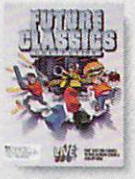

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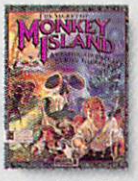

Lucasfilm's The Secret of Monkey Island

Electronic Arts' Stormovik: Soviet Attack Fighter SU-25

Virgin Mastertronic's SPOT™

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DigiTek's DINOWARS

System Requirements: IBM® PC, XT, AT, 386, 486 or compatible with 256K RAM, DOS 2.0 or higher, CGA, EGA, VGA or MGA, and headset or external speaker.

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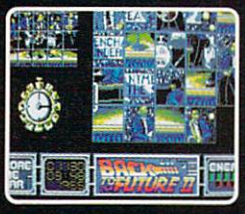

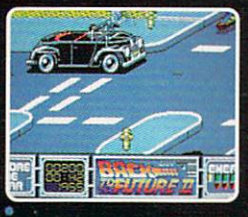
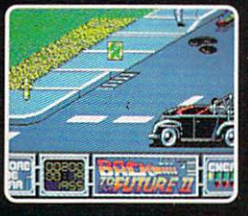

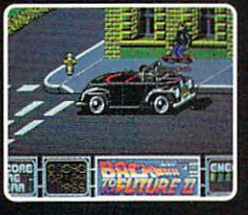

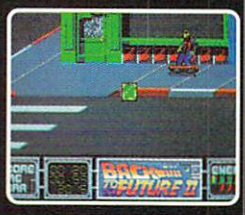

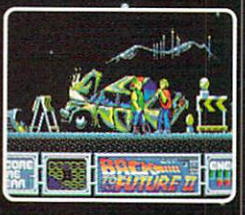
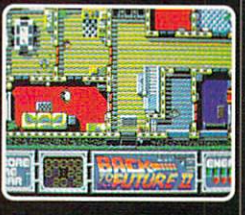

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PC VIEW

CLIFTON KARNES

We tend to think of PCs as high-powered calculators, but they're much more than that—they're expert communicators. And because they're natural communicators, PCs tend to form groups, linked together in networks.

Put any group together, and you have a society. PCs, not surprisingly, have tended to form societies that mirror human ones.

Not only is communication the main requirement for a society, but you could even argue that society *is* communication. Different societies offer different ways of communicating those things important to the society—food, shelter, emotional support, and information. The lines of communication—how much of what goes where—determine the texture and quality of a society.

In primitive societies, for example, communication lines are often one-way. Tribute and valuables flow in one direction—toward the leader—and orders flow in the other—toward the workers.

Which brings us to the fundamental question about societies: What is the purpose of a society, and what is the individual's role in it?

A quick look at history shows that humanity has demonstrated three major social structures. In the first, the society exists to serve a single leader. Individuals in this kind of society are unimportant. Until recently, almost every society on earth followed this philosophy. Pharaohs, kings and queens, and military dictators all head these kinds of societies.

The second structure says that the society as a whole is the important entity. Individual members are, as individuals, unimportant. Communism is the best example of this kind of organization.

The third type of organization holds that the individual is all-important and that society exists to serve its individual members. Most western democracies follow this philosophy, at least to some degree.

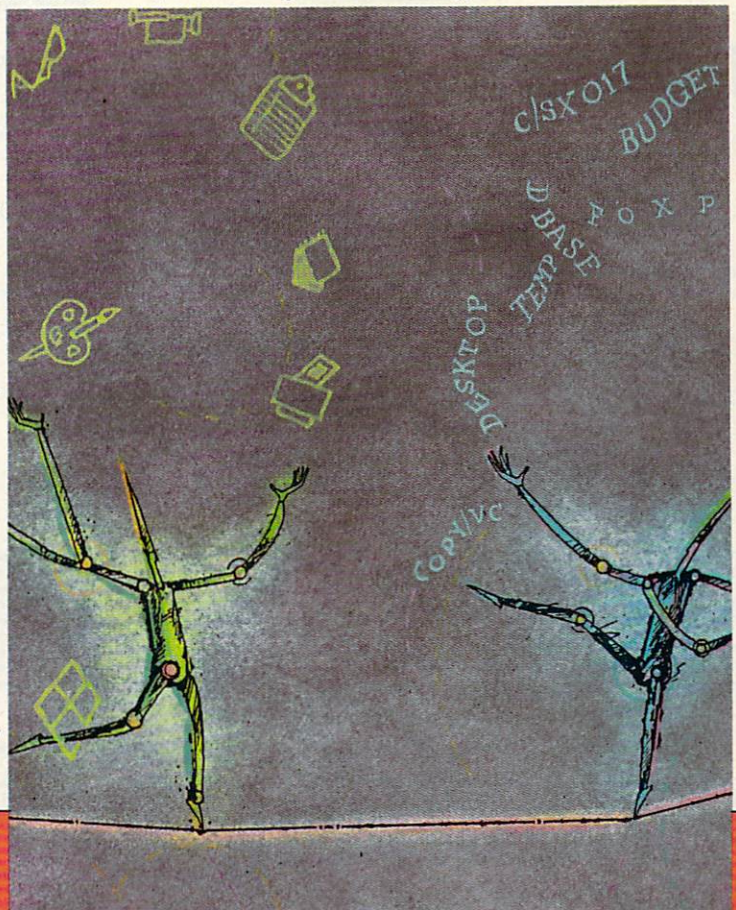
All this may sound pretty far removed from the world of computers, but it isn't. Each of these societies has a computer-based counterpart.

Most personal computers, certainly home and small-business machines, form groups using the third, democratic, model of society. When you use a modem to connect to an online service, such as CompuServe, GEnie, Delphi, Prodigy, or a local BBS, you're part of a democratic network. You're the one in control. If the network works for you, great. If it doesn't, you can simply log off. Networking isn't mandatory; it's voluntary. This was the earliest type of PC society, and it's still the largest.

Recent changes in PC organization, however, have begun to mirror the other types of societies. And even home and small-business users will see pressure in the future to move to these other, more restrictive organizational structures.

The second type of society, in which the group is all-important, is reflected in the organization of many LANs (Local Area Networks). An administrator controls which programs are run and how they're customized. LANs can make sharing peripherals, programs, data, and messages easier, but they can also strip members of their individual rights.

To see the first type of society—the dictatorship—you can look at the way PCs are handled in some mainframe environments. When a PC is relegated to serving as little more than a terminal, information, the gold of the computer age, flows to the mainframe, and orders, from the mainframe to the PC.



You may be surprised to learn that you can now buy PCs without floppy disk drives. These machines are the fruit of this type of society. Without a floppy drive, the only way to get programs or data into your PC is from the mainframe.

When PCs are networked into a democratic society, the result can be one of the greatest benefits of the computer revolution. Computers linked in communistic or dictatorial systems, on the other hand, may be productive parts of larger, efficient systems; but something is lost when personal computers stop being *personal.* ⊡

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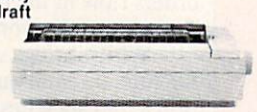

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FEEDBACK

QUESTIONS FROM OUR READERS

Austin Cooler

I recently purchased an Austin 386. I'm thrilled with the speed, but now I have a problem playing games: The machine is too fast! I need some way to slow down my machine when I'm using it for fun. Is there a utility that can solve this problem?

KATHY MORRIS
AUSTIN, TX

You can slow the Austin to 8 MHz with the Ctrl-Alt-minus key combination.

Most PCs and XTs with multiple speeds have a key combination or DOS command that changes the speed of the processor, while most 286 and 386 machines accomplish this with a "turbo" switch on the front panel.

There are some programs whose only function is to turn down the gas on fire-breathing PCs to make gameplay possible. One of these, Whoa!, *appeared on the May 1988* COMPUTE!'s PC *disk.*

If you have any other technical questions, Austin has a very responsive technical support staff available at (800) 752-4171.

Release Me!

Sometimes when I'm programming, I'd like to turn off the memory-resident programs I've loaded because they keep me from accomplishing certain tasks. How do you clear these programs from the computer's memory without rebooting?

EDMOND RYAN
FISHKILL, NY

You could buy a commercial TSR manager like POPDROP, *or you could pick up a shareware or freeware program that does about the same thing.* COMPUTE!'s PC Magazine *subscribers are in luck. The January 1990 disk featured a series of programs specially designed to work with TSRs, and two of those programs,* Mark *and* Release, *can be used to install and remove any TSR.*

Virtual Drives

I've seen references to ramdisks in several computer magazines. What exactly is a ramdisk, and how is it used? Does it require special memory?

EDWARD DANSKER
BLOOMFIELD, CT

It's possible to use large amounts of extra RAM memory as a simulated disk drive. In fact, since the price of RAM chips has dropped drastically over the past few years (notwithstanding recent price hikes because of a RAM shortage), ramdisks have become quite popular. A ramdisk is very fast—even faster than a hard drive. Unfortunately, anything stored in a ramdisk is lost when you turn off your computer. Therefore, a ramdisk is best used for temporary storage.

You don't need special memory for a ramdisk; you only need special software known as a device driver. *This can be found on your DOS master disk with the name RAMDRIVE.SYS or VDISK.SYS. Put the file on your boot disk and modify your CONFIG.SYS file. Add the line DEVICE=C:\SYS\RAMDRIVE.SYS* size sectorsize entries *to your CONFIG.SYS file.*

The first parameter, DEVICE = \path \RAMDRIVE.SYS, *tells your PC where to find the device driver. It assumes you have created a subdirectory called SYS and copied RAMDRIVE.SYS to it.*

The second parameter, size, *tells your computer how much memory to reserve for the ramdisk.* Sectorsize *tells the PC how many bytes to reserve for each sector. This can be either 128, 256, or 512. The final parameter,* entries, *specifies the number of directory entries the ramdisk can hold.*

If you have extended memory, appending the /E switch tells the PC to use extended memory for the ramdisk. Thus, the entry DEVICE=C:\SYS\RAMDRIVE.SYS 128 256 64 /E tells the system to create a 128K ramdisk in extended memory using 256-byte sectors and having a maximum of 64 directory entries. Once you've modified and saved your CONFIG.SYS file, reboot, and the ramdisk will automatically be created.

Once the ramdisk is created, it can be used like any other type of drive. You can't DISKCOPY a ramdisk, but you can copy individual files to or from it. This can be very useful for computers without a hard drive. If you own a PC with only floppy drives and you want to use a ramdisk, add the following lines to your AUTOEXEC.BAT file.

```
COPY A:\COMMAND.COM d:
SET COMSPEC=d:\COMMAND.COM
```

Replace the d: *in these commands with the correct drive specification for the ramdisk (DOS usually assigns the letter* C *to a ramdisk on a one- or two-drive system). The first command copies the COMMAND.COM file to the ramdisk, and the second tells DOS to look for it there. With COMMAND.COM in the ramdisk, you'll never see the message* Insert disk with COMMAND.COM in drive A *again.*

A 3½-Inch Edsel?

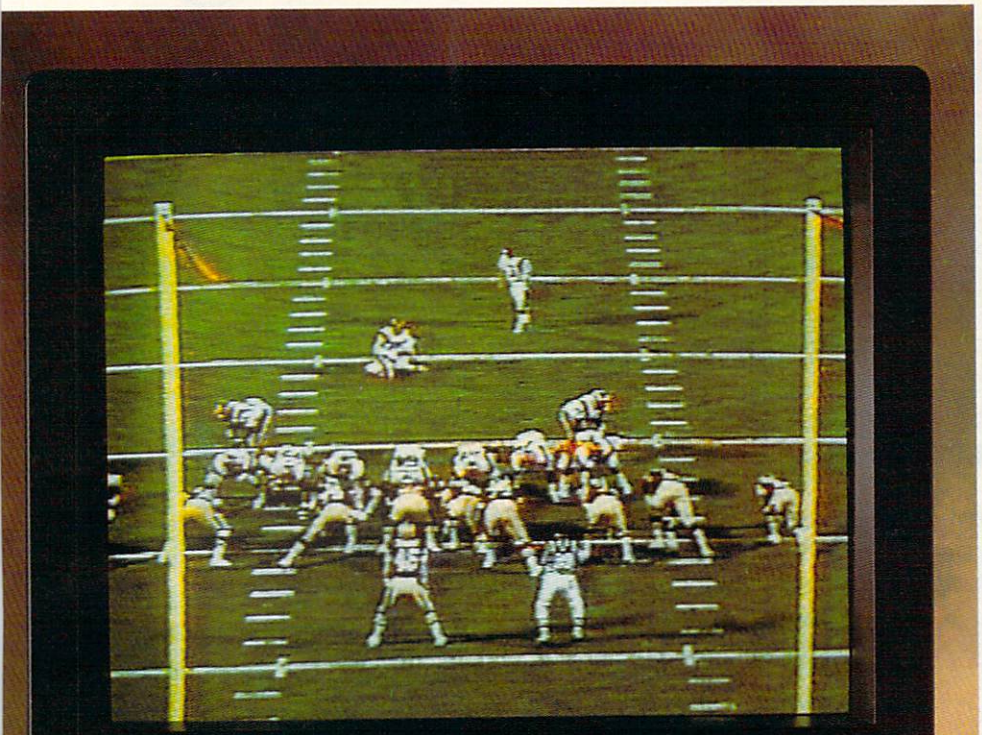
While I am happy with my Tandy 1000HX and particularly its 3½-inch drive, I am frustrated that most software is only available on 5¼-inch disks. Is the 3½-inch disk catching on, or are we 3½-inch owners stuck with an Edsel?

ROBERT REINAUER
BAINBRIDGE ISLAND, WA

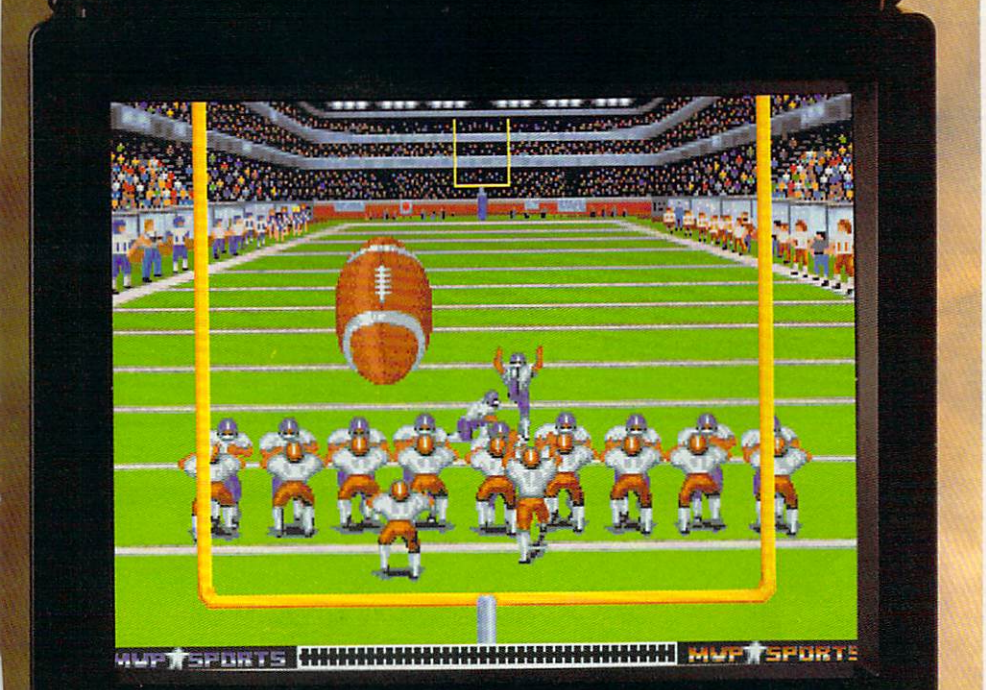
I wouldn't speak too harshly about the Edsel. Have you priced one lately? The 3½-inch drive is very popular. Most software manufacturers provide 3½-inch versions of their products (no one would be foolish enough to completely write off the huge Tandy market). Stores, however, have a problem with shelf space.

continued on page PC-8

Two ways to play an American tradition.



Play the Tape.



Then Play the Game.

Screens shown are from the IBM and Amiga versions. Other versions may vary. Brand or product names are trademarks or registered trademarks of their respective holders.
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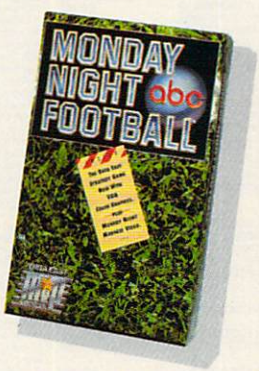

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FEEDBACK

continued from page PC-4

They tend to stock what is most popular without giving much thought to hardware market share.

In a few years the situation may be reversed. Make your dealer aware that he's losing sales because he isn't stocking 3½-inch products.

If you accidentally purchase a 5¼-inch version, contact the company right away and let it know what happened. Most software publishers will replace disks for just the cost of postage and handling (some will do it free).

Tales from Decrypt

I understand that there is a program called RCRYPT that can be used to encrypt a file. I would like to know how it works, how to use it, and what kind of files you would use it with.

KIRK LESLIE
ENOREE, SC

Encryption is used to make text and database files unreadable by spies, co-workers, and family members. Your letter awakened the 007 in all of us at COMPUTE. *We searched long and hard for the RCRYPT program you mentioned and were unable to produce it. However, if you are interested in encrypting files, there are several options open.*

It is fairly simple to write a BASIC program that encrypts a file. Here's one named CRYPT.BAS written in QuickBASIC.

```
S$=COMMAND$
FOR I = 1 TO LEN(S$)
  IF MID$(S$,I,1)=" " THEN
    GOTO PROCESS
  END IF
NEXT
? "MUST FOLLOW PATTERN"
? "CRYPT filename key"
END

PROCESS:
FILE$=" ":CRYPT=0:I=0
DO UNTIL A$ = " "
  I=I+1
  A$=MID$(S$,I,1)
  FILE$ = FILE$ + A$
LOOP

DO UNTIL A$<> " "
  I=I+1
  A$=MID$(S$,I,1)
LOOP
DO UNTIL A$ = " "
  A$=MID$(S$,I,1)
  I=I+1
  CRYPT$=CRYPT$+A$
LOOP

CRYPT=LEN(CRYPT$)
OPEN FILE$ FOR BINARY AS
#1
A=LOF(1)
FI$="ENCRYPT"
OPEN FI$ FOR OUTPUT AS #2
I=0
'The encryption happens here
FOR J = 1 TO A
  S$ = INPUT$(1,#1)
  S$=LEFT$(S$+" ",1)
  I=I+1
  IF I > CRYPT THEN I=1
  M=ASC(S$)
  N=ASC(MID$(CRYPT$,I,1))
  T$=CHR$(M XOR N)
  PRINT#2,T$;
NEXT
CLOSE
```

This program uses a keyword to encrypt a file. The keyword can be as long as DOS will accept (provided that there are no spaces) or as short as a single character.

The exclusive OR operator (XOR) alters the bits in the bytes that make up the file to make them unreadable. Since the encryption is one level more difficult than simple letter substitution, it would be quite difficult to crack without the key, unless there are a lot of spaces in the text. Wherever a space appears in the text, a letter of the keyword will show through; if there are several spaces in a row, the entire keyword will be exposed.

If you wanted to make it more difficult still, you could run CRYPT twice. To make the program itself more powerful, you could alter the keyword each time the program cycles through it, or you could write a routine that XORs a second keyword with the first (the second keyword could be built into the system or provided on the command line). You might also write a routine that scrambles the characters in the file after they've been encrypted.

The complexity of the encryption depends on the value of the data and the savvy of the person from whom you're hiding it. The KGB and NSA can probably crack any code, while your spouse might be discouraged by a simple letter-substitution code.

The syntax for the command that's generated when this file is compiled is

CRYPT *filename key*

When you run the program, the encrypted file will be named ENCRYPT. Make a backup of the original, delete it, and then rename ENCRYPT to the original filename. To decrypt the file, use the same command, filename, and key. The file written to ENCRYPT will be your original file. If someone attempts to decrypt the file with the wrong code, the resulting ENCRYPT file will be gibberish.

Unfortunately, you can't simply run CRYPT on ENCRYPT. Unless ENCRYPT is very short, the program will fail and only part of the file will be decrypted.

Another alternative is ARC's *encryption option (/g), which encrypts files while they're being compressed (simply compressing a file will make it virtually unreadable).* PC Tools Deluxe *includes an encryption utility called PC Secure.*

Many applications allow you to protect documents. WordPerfect, *for example, lets you assign a password to files. You can't read a password-protected file with a text editor.*

Most encryption programs work on the minicomputer, mainframe, and LAN level, where system protection is a top priority. Passwords and lockout keys seem to work well for PCs, so file encryption has not been an important area of PC software development.

Readers whose letters appear in "Feedback" will receive a free COMPUTE's PC clock radio while supplies last. Do you have a question about hardware or software? Or have you discovered something that could help other PC users? If so, we want to hear from you. Write to COMPUTE's PC Feedback, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408. We regret that we cannot provide personal replies to technical questions. ⊡

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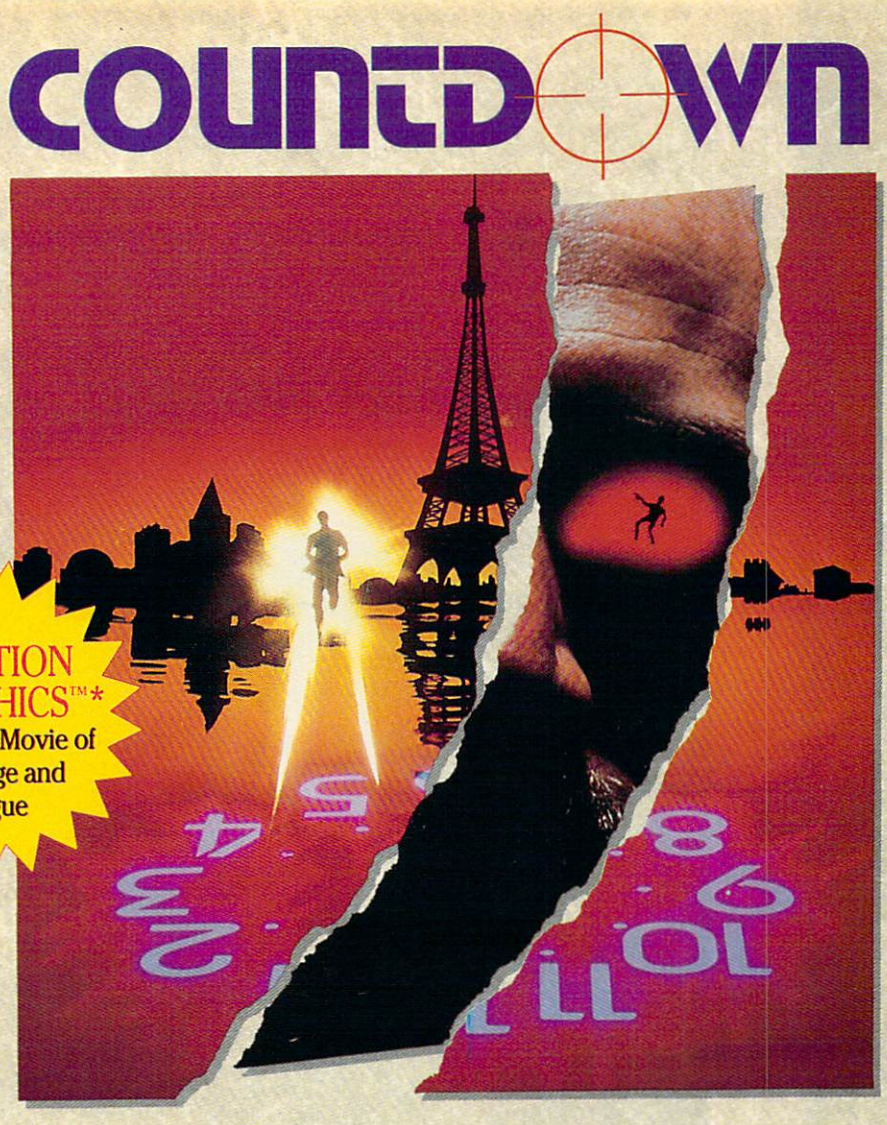

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Windows and DESQview go Head to Head

Multitasking Showdown

We've all seen representations of Shiva, the many-armed Hindu god, his multiple hands in several different attitudes, holding symbols of life and death, while he simultaneously dances and meditates. Humans are at least touched by the divine: We often work at more than one thing at a time, despite the fact that we have only two hands. We can switch between tasks fairly rapidly.

The PC is burdened with a one-track mind. A typical PC operating under MS-DOS is designed to take on a single task, complete it, and move to its next assignment.

People, however, are rarely afforded the luxury of dedicating themselves to one task and one task only. More commonly, we find our attention jumping around among multiple projects. We may, for instance, be working on last year's annual sales report and next year's budget at the same time, but yesterday's PC running yesterday's software can't even keep up with *this* relatively simple mental juggling act.

If you could transform your single-tasking DOS-based PC into a multitasking tool, would you be interested?

The good news is that this can be accomplished with relative ease and at a surprisingly low cost.

Multitasking Environments

Two popular programs, *DESQview* (Quarterdeck Office Systems, 606-B Venice Boulevard, Venice, California 90291; 213-314-3240; $129) and *Windows* (Microsoft, One Microsoft Way, Redmond, Washington 98052; 206-882-8080; $149), specialize in endowing DOS with the ability to multitask: to run multiple applications concurrently on your DOS-based PC.

Equally important, since both *DESQview* and *Windows* themselves run under DOS, they permit you to multitask virtually any DOS application already on the market. By contrast, OS/2, Microsoft's much-touted second-generation operating system, requires that you replace your current DOS applications with all new software (much of which has yet to be written) before you'll be able to take full advantage of its multitasking capabilities.

Despite their shared goal of adding the ability to multitask to your PC arsenal, *DESQview* and *Windows* differ radically in many critical areas. But before looking at these differences, let's examine one of the most obvious similarities between *DESQview* and *Windows*—specifically, the basic technique used by both programs to accomplish the feat of multitasking under DOS. ▷

JACK NIMERSHEIM

Sleight of Hand

To get an idea of how *DESQview* and *Windows* work, you need look no farther than your kitchen. Suppose you had to prepare a three-course meal on a single-burner hot plate. One way to accomplish this would be to complete each course before starting the next. Unfortunately, by the time the final course was ready, the food prepared first would be too cold to serve (assuming that vichyssoise was not on the menu).

But what if, instead, you heated up the first course for a short time, then removed it and began cooking the second? Several minutes later, you'd replace the second course with the third. After a bit, you could remove the third course and go back to heating up the first, then replace the first with the second, the second with the third, and so on—continuing to dedicate a short period of burner time to each course until all three items were adequately cooked.

Using this technique, your entire dinner would be ready to serve at approximately the same time, with none of your guests ever suspecting that you had been forced to prepare their three-course meal on a single burner.

Both *DESQview* and *Windows* use a variation on this technique (called *time slicing*) to multitask programs running under DOS. By providing CPU time in round-robin fashion to however many programs you have loaded into RAM, *DESQview* and *Windows* fool each application into thinking that it, and it alone, has exclusive access to your system resources. Furthermore, this prestidigitation occurs at such a rapid pace that you'll barely be aware that it's happening.

There are similarities in the ways *Windows* and *DESQview* manipulate your CPU, but what sets them apart from one another? Let's begin with their appearance.

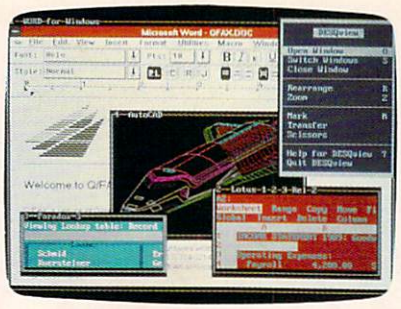
Words or Pictures

DESQview eschews the colorful displays and stylized icons that define a graphical user interface (GUI) like *Windows,* opting instead for a spartan interface not very different from the one employed by MS-DOS.

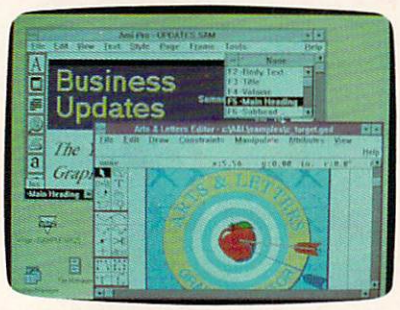
All *DESQview* display elements (command options, pull-down menu boxes, window borders, and the like) are generated using the standard PC character set on the text screen. *DESQview* is perfectly capable of running graphics programs in a multitasking session; only *DESQview's* top-level user interface is limited to character-based operation.

Windows, on the other hand, relies on a bitmapped display, where each picture element (pixel) must be individually controlled. A typical VGA display is composed of over 300,000 pixels. As you might suspect, the added resources required to manage the graphical *Windows* display can slow a system down considerably. Therefore, *DESQview* gets the nod over *Windows,* at least as far as speed is concerned.

However, a GUI such as *Windows* has several advantages over a character-based operating environment. GUIs are generally easier to learn and use. These factors take on added significance on a system used by newcomers to PCs. And the fact that one *Windows* program bears at least a passing resemblance to another makes retraining less troublesome when it comes time to upgrade or change applications.



Text-based *DESQview*.



Graphics-based *Windows*.

Iconoclast

With the recent release of *Windows* 3.0, Microsoft finally delivered on its longstanding promise to provide a true graphical interface for DOS-based personal computers. The result is an operating environment that even PC neophytes should have little trouble navigating, once they've mastered a few basic techniques.

Windows' reliance on icons, mouse support, and pull-down menus greatly simplifies most PC operations. Starting an application in *Windows,* for example, is a simple matter of positioning a mouse pointer over that application's icon and then double-clicking the mouse button. This point-and-click paradigm carries over into virtually all areas of *Windows* operations.

If you've ever worked in standard DOS, the command COPY/V C:\TEMP\BUDGET90 D:\LOTUS\DATA\ will look depressingly familiar. This kind of command structure—in this case, a relatively simple command whose sole purpose is to copy a file from one DOS directory to another—can induce nightmares in people just learning how to use a PC. By contrast, performing this same COPY operation under *Windows* is as easy as dragging an icon associated with the BUDGET90 file from its initial location on the *Windows* display to a second window representing the destination directory. In short, *Windows* simplifies DOS operations to such a degree that computer journalists can now legitimately include the words *intuitive* and *PC* in the same sentence.

To be fair, *DESQview's* pull-down menus and dialog boxes also simplify PC operations. In terms of user friendliness, however, *Windows* takes the blue ribbon. ▷

Context Switching and Multitasking

Context switching is an alternative to multitasking. If you often want to access more than one application during the course of your normal PC operations but you don't need to have these applications running when they aren't in view, context switching (also known as task switching) may be what you need.

Context switching differs from multitasking in that only a single program is actually executing code at any given time, even if multiple applications have been loaded into memory. If you're using context-switching software and access one program, any other application running in that session is temporarily suspended, and a snapshot of its current operation is maintained in memory or stored to a disk file. Calling up one of the suspended applications causes it to be shuffled back into active RAM and once again made operational.

For example, one popular context-switching program, *Switch-It* (Better Software Technology, 55 New York Avenue, Framingham, Massachusetts 01701; 800-848-0286; $99.95), lets you load up to 100 programs in a 640K system—providing, of course, that you have enough free disk space or expanded memory (EMS) to support program swapping on such a large scale.

In truth, context switching resembles using the hold button on a multiline telephone. While it's not possible to carry on more than one conversation at a time under such conditions, you can quickly switch your attention between two or more callers. Context switching provides a convenience to people who don't require full multitasking but would profit from quick and easy access to several DOS applications.

Photos Courtesy of Imperial War Museum, London, England

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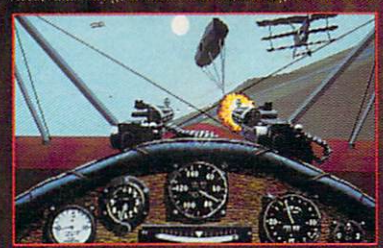

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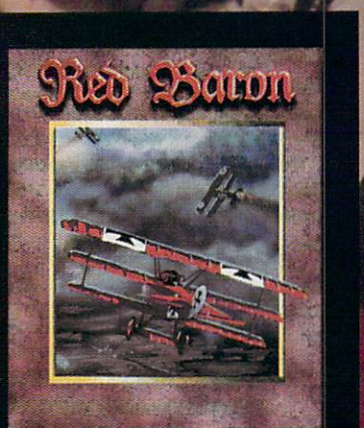

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Moving into Multitasking

The goal of any multitasking environment is to permit you to run multiple applications under DOS. Therefore, multitasking is the most critical area for comparison between *DESQview* and *Windows*. How well does each program set up and manage a multitasking session?

The flippant answer to this question is, quite well. Admittedly, *DESQview* and *Windows* had their share of growing pains through the years. Both take some potentially risky liberties with DOS's native, single-tasking architecture. Early releases of each package were not always 100-percent dependable, especially when it came to managing so-called misbehaved programs—applications that bypassed the standard BIOS routines to improve their performance.

Subsequent upgrades of both *DESQview* and *Windows* have eliminated most of these incompatibility problems. With rare exceptions, both *DESQview* and *Windows* are now capable of handling virtually any DOS program.

I've been working with the latest versions of both *DESQview* and *Windows* 3.0 for several months and have yet to encounter a conflict that could not be resolved with a relatively minor adjustment to either the multitasking environment itself or the problematic application program.

Since they're roughly equal in technical proficiency, the choice between *DESQview* and *Windows* boils down to a personal one based on how you'll use a multitasking environment rather than all the possible uses to which such an environment can be applied.

The Machine Matters

Given the strain time slicing places on your system's CPU, it only makes sense that the kind of computer system you own will influence the overall performance of your multitasking environment.

DESQview will run on any IBM-compatible PC, including 8088- or 8086-based XT-compatible systems having only 512K of RAM. Of course, multitasking on such a system would be severely limited; all your multitasking programs would have to fit within 512K. You'd have trouble finding programs of consequence that would take up so little room.

Windows will run—in real mode—on an 8088 or 8086 machine with 640K, but real mode has the same limitation as we found in *DESQview:* All the multitasking programs must fit entirely within the 640K of conventional memory. You can multitask programs designed to run under *Windows* (these programs are sometimes described as *Windows*-aware) using extended memory under *Windows* in standard mode, which, at minimum, requires an 80286-based AT with at least one megabyte of memory, including at least 256K of extended memory. But once again, all the multitasking programs must fit within 640K of conventional memory. If you want to multitask DOS programs under *Windows,* your minimum system must be an 80386 with two megabytes of RAM. These three aspects of *Windows* are covered in full in the accompanying article "Three Faces of *Windows*."

Of course, the more advanced your PC, the more efficiently it will multitask, regardless of whether you ultimately settle on *DESQview* or *Windows*—or even a combination of the two (see "The Best of Both Worlds").

The performance of *DESQview* improves dramatically when it's run on a 80286 AT compatible. And both programs are designed to take full advantage of the advanced memory-management features built into Intel's 80386 and 80486 microprocessors.

DESQview users will need to buy a second program—Quarterdeck's $59 *QEMM-386* memory manager—to accomplish this (these products can be bought as a set), while the basic *Windows* package includes everything required to run *Windows* efficiently on any IBM-compatible computer (see "Three Faces of *Windows*").

The Best of Both Worlds

I'm going to let you in on a little secret: It's possible to set up *Windows* 3.0 so that it will run under *DESQview.* Why would you ever want to do this? That's easy. Running *Windows* within a *DESQview* multitasking session allows you to access most of the advanced features associated with each of these DOS multitasking environments—the best of both worlds.

You'll be able to run the impressive *Windows*-aware programs currently flooding the PC market (*Arts & Letters; Excel; Ventura Publisher, Windows Edition; Ami Professional; Word for Windows; Microphone II,* and so forth) and still take advantage of the fact that *DESQview* will execute and switch between standard DOS applications more quickly than its graphics-based competition.

The most critical caveat attached to setting up this hybrid configuration is that, at the time of this writing, the only way to avoid conflicts with *Windows* is to run it in real mode. Rumor has it, however, that a planned *DESQview* upgrade will be compatible with all three *Windows* modes.

Three Faces of *Windows*

Starting with *Windows* 3.0, Microsoft eliminated the need to buy different versions of *Windows* for different PC systems. Rather than existing as discrete products (like *Windows/286* and *Windows/386*), *Windows* 3.0 can configure itself to run in one of three operational modes: real, standard, and 386 enhanced.

Get Real

When running in real mode, *Windows* 3.0 is limited to performing all of its multitasking operations in that 640K block of memory commonly referred to as conventional RAM.

If the total memory required by the programs you're using exceeds 640K, *Windows* automatically reverts to context switching rather than multitasking (see "Context Switching and Multitasking"). *Windows* 3.0 automatically configures itself to operate in real mode on any system that has less than one megabyte of RAM.

New Standard

When running in standard mode, *Windows* can transfer some of its operations to extended memory. This increases the amount of conventional RAM available to actually run standard DOS applications. A second major benefit to running *Windows* in standard mode is that it actually allows text-based programs that employ standard DOS extenders to run in so-called protected mode, thus effectively breaking that infamous 640K DOS barrier. (Perhaps the best known program that currently employs DOS extenders is *Lotus 1-2-3* release 3.)

Peak Performance

The ultimate *Windows* configuration is 386-enhanced mode. In addition to supporting all of the features associated with running *Windows* in standard mode, 386-enhanced mode takes advantage of the advanced memory-management capabilities built into Intel's 80386 and 80486 microprocessors. Primary among these is their ability to use extended memory to set up so-called virtual 8086 machines—discrete segments of RAM that function as if they were isolated 8086-based XT-compatible systems.

Generally, *Windows* itself determines its best operating mode for your system hardware. However, by including the appropriate command switch with the WIN command normally used to start *Windows*, you can override this default configuration. Starting a multitasking session with a WIN /R command, for example, forces *Windows* to run in real mode.

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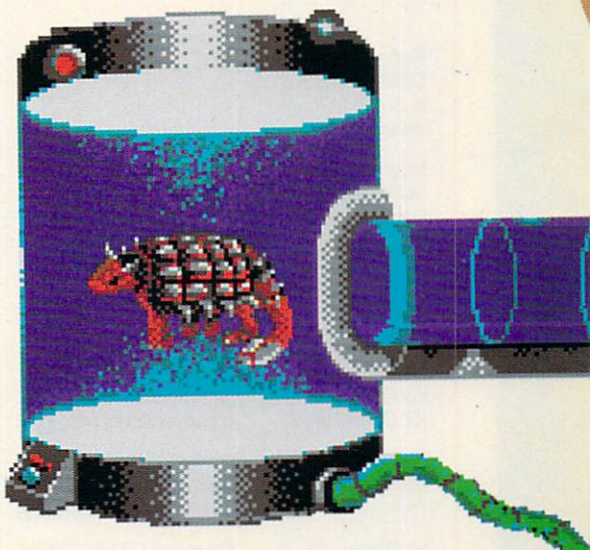

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HOW THEY COMPARE

Here's an item-by-item comparison of *Windows* and *DESQview* features and requirements.

	DESQview	*Windows*
Cost	$129 (*DESQview* only) 59 (*QEMM* memory manager) 179 (*DESQview* 386 combination)	$149
Minimum System Requirements	Any IBM-compatible PC 512K of RAM Any display DOS 2.0 or higher Hard disk recommended	286-based AT (minimum) 640K of RAM Graphics display DOS 3.1 or higher Hard disk
User Interface	Character-based display with pull-down command menus	Graphical interface that includes both icons and pull-down menus
Bundled Applications	None	*Write, Paintbrush, Terminal, Cardfile, Calculator, Calendar, Clock, Notepad, Macro Recorder, File Manager*
Mouse Support	Yes	Yes (recommended)
Runs Standard DOS Programs	Yes	Yes
Runs Graphics Programs	Yes	Yes
Adjustable Windows	Yes	Yes
Uses Macros	Yes	Yes
Cut-and-Paste Text	Yes	Yes
Cut-and-Paste Graphics	No	Yes
Data Exchange	Mark-and-Transfer Feature	*Windows* clipboard Also, allows dynamic linking of data between applications designed to support the *Windows* DDE feature
Runs Standard DOS Program in Small Windows	Yes	Only in 386-enhanced mode
Minimum Multitasking Requirements	XT compatible with 512K of RAM	286-based AT with 1MB of RAM
Minimal Recommended Multitasking Environment	386-based system with 2MB of RAM	286-based AT with 2MB of RAM
Multitasks on 8088-Based XT Compatible	Yes (providing all open applications fit in conventional memory)	Yes (providing all open applications fit in conventional memory)
Multitasks on 286-Based AT	Yes (providing all open applications fit in conventional memory)	Yes (providing all open applications fit in conventional memory)
Multitasks on 386-Based System	Yes (uses *QEMM-386* memory manager to convert extended memory to expanded memory)	Yes (uses HIMEM.SYS to access extended memory and run in 386-enhanced mode)

Making the Choice

In some situations, choosing between *DESQview* and *Windows* is a relatively straightforward proposition. If you work exclusively with standard, character-based DOS applications—that is, programs not specifically designed to run under *Windows*—then *DESQview* is the logical choice.

The greater speed of the *DESQview* text-based interface makes this decision an easy one. Additionally, *DESQview* is slightly more utilitarian if your PC is an 8088- or 8086-based XT compatible and the only choice if your computer lacks a graphics adaptor capable of running the *Windows* GUI or has only 512K.

On the other hand, *Windows* offers the user-friendly attributes commonly associated with GUIs: icons, point-and-click procedures, interactive dialog boxes, and the like. If you're new to personal computing and want to avail yourself of the advantages of multitasking, it's hard to imagine a DOS environment easier to install, learn, or use than *Windows* 3.0.

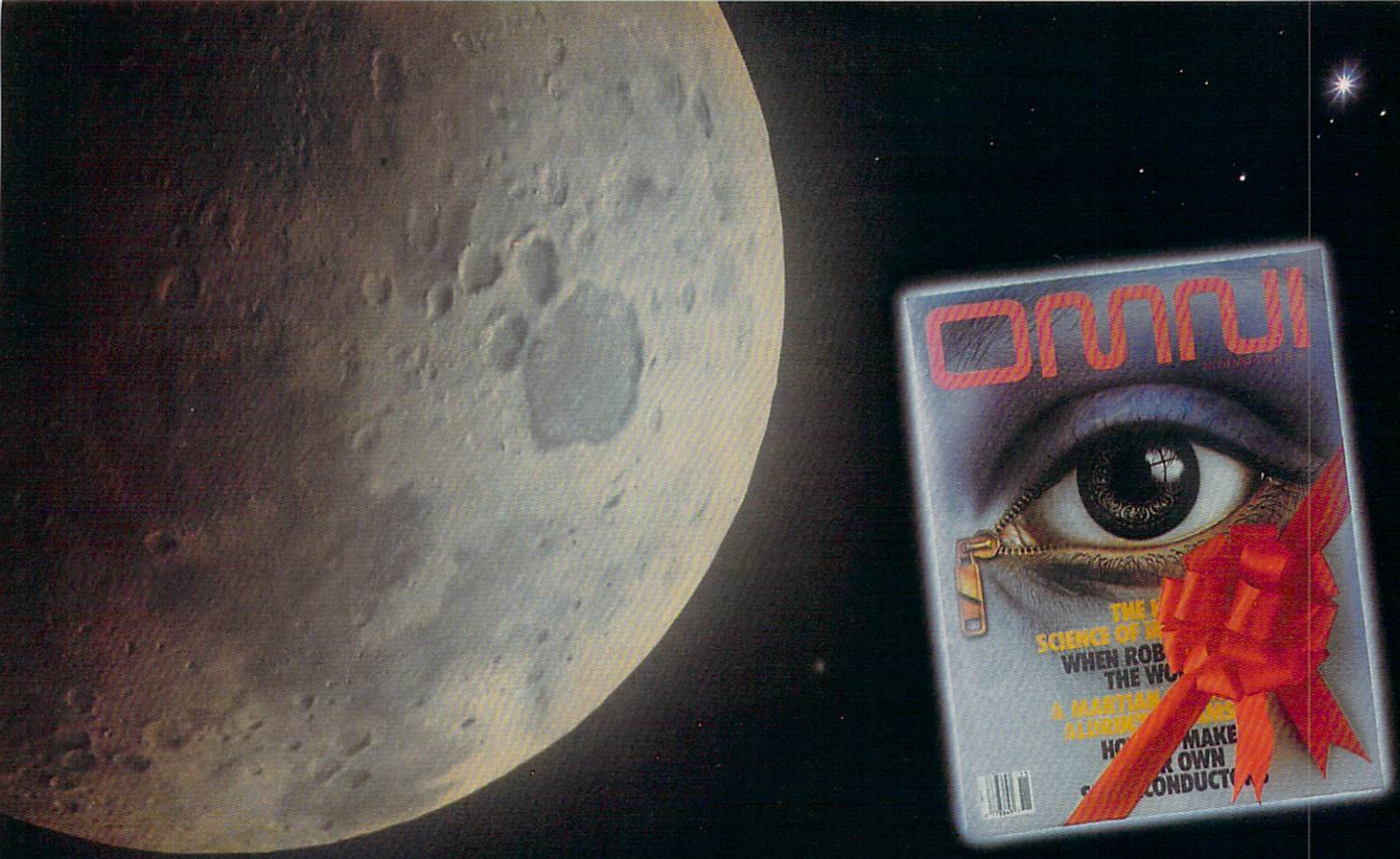
Given *Windows'* graphical interface, it's also the logical choice if you work primarily in graphics-based applications such as desktop publishing, CAD, draw programs, and the like—especially if the specific programs you use for these activities are *Windows*-aware.

The third alternative is a mix-and-match environment, where you use both standard DOS and *Windows* applications. In this case, the choice of whether to organize your multitasking under *DESQview* or *Windows* requires a little more thought.

DESQview handles both character-based and graphics programs with equal ease. Its speed and flexibility should influence your decision.

However, accessing some of *DESQview's* more advanced features requires a level of technical knowledge surpassing that demanded by *Windows* 3.0. Unlike *DESQview* and, to a certain degree, earlier versions of *Windows* itself, *Windows* 3.0 puts its own house in order. It places few demands on the user.

In the final analysis, *Windows* and *DESQview* perform exactly as promised, bringing almost divine power to the world of silicon. Each endows DOS with the ability to multitask. Regardless of which one you choose, adding multitasking capability to your system will improve your efficiency and increase your overall PC productivity. It will allow your computer to work efficiently on multiple projects at your own pace. And that, after all, is what using a personal computer is all about. ⊡



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INTRODOS

TONY ROBERTS

NEED TO MOVE DATA? XCOPY TO THE RESCUE

One of the hidden jewels in DOS versions 3.2 and higher is the XCOPY command. XCOPY is a clear improvement over COPY, but many users ignore it, probably for two reasons. First, COPY is easy, convenient, and already learned; second, one look at the XCOPY page in any DOS manual can scare even DOS aficionados. You have a choice of eight possible switches, and it's hard to know where to begin. Why use XCOPY? It's faster, more powerful, and smarter.

In moving data from a hard disk to a floppy or vice versa, XCOPY reduces the transaction time by about 20 percent. The saving comes because COPY reads and writes each file individually, but XCOPY reads as many files into memory as it can and then writes out the whole group at once.

XCOPY also eliminates the pain of copying files in subdirectories from one disk to another. The command XCOPY A:*.* B: /S copies all the files in the current directory and its subdirectories on drive A to drive B, creating any necessary subdirectories as it goes. If you add /E, empty subdirectories on the source disk will be created on the target disk as well.

If you carry disks with work in progress from your office to your home, XCOPY can help make sure you have the latest versions of the files you need wherever you are. One way to do this is by using the /D, or date, switch. This tells XCOPY to copy only those files that were changed on or after a certain date.

Let's say you're working on a proposal that consists of several data files. The files you're working on are all in the same subdirectory, and all have the extension DAT.

The command XCOPY C:*.DAT A: /D:*mm/dd/yy* (substituting the current date for *mm/dd/yy*) copies all the DAT files that were modified today to the disk in drive A. Once you arrive home, switch to the subdirectory that holds your data files and reverse the procedure with the command XCOPY A: C: /D:*mm/dd/yy*. When you've finished your work for the evening, use the first command again to update the data files on the disk; then tomorrow morning use the second command to update the files on the hard disk at work.

Using the date switch works well unless there are too many files to fit on one disk. If that's the case, let XCOPY copy files based on the status of the archive bit.

The archive bit is a piece of information DOS keeps about every file. It's a simple on/off switch. If it's on, the file has been changed since the last backup. If it's off, no changes to the file have occurred.

Later versions of DOS include a command, ATTRIB, that allows you to change the file status bits, which, besides archive, include read-only, hidden, and system file attributes. Most disk utility programs also have ATTRIB commands, and their versions are usually more powerful and easier to use than their DOS counterparts.

Let's say you want to keep daily backups of the files in your word processing subdirectory. Switch to that subdirectory; then use the command ATTRIB -A to turn off the archive bit in each of the files.

Now, as you create new files or modify existing ones, the archive bits for those files will be turned on. At day's end, you can use XCOPY with the /M switch to copy only those files that have been changed. The command would be XCOPY C: A: /M.

XCOPY will begin copying changed files from the current subdirectory to the disk on drive A. At the same time, it will turn off the archive bit for each of the files it successfully copies. If you have several files to copy, the disk in drive A will eventually get too full to hold more information, and XCOPY will stop work and display an error message indicating that the disk is full.

When this happens, insert another disk and repeat the XCOPY. The files that were copied to the first disk won't be copied again because their archive bit is no longer on. Repeat the process until all the files you want to back up have been copied.

If you're interested in automating this daily backup process, you could set up a batch file that would copy the files from several subdirectories. To make such a batch file work successfully, though, you'd have to know whether all the files in one subdirectory were successfully copied before going on.

The ERRORLEVEL command from DOS's batch programming language could be used for this task. If XCOPY exits without completing its task, it sets an ERRORLEVEL code. Your batch program can test for that condition, and if it occurs, you can prompt the user to insert a new disk and then have the batch file repeat the previous command to copy the remaining files to the floppy.

Four of the eight XCOPY switches have been mentioned. The others are less used but could come in handy for certain applications. Check out XCOPY in your DOS manual and see if this powerful command's other options are useful to you. ⊡

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- **Total Recall** (1245) This program helps you to quickly memorize words and information on any subject.
- **School Mom** (1251) Teaches kids (2–14) the basics of art, music, spelling, English and math. FANTASTIC!
- **Word Whiz** (1252) A challenging word game that tests your vocabulary.
- **Word Gallery** (1256) Teaches children to associate the printed word with the object it describes.

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- **Almanac** (1470) A fantastic calendar program with many features.
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WORD PROCESSING

- **Readability Plus** (1340) A computerized writing style analyzer.
- [3] **PC-Write 3.03** (1851–1853) The BEST word processor for under $200! Complete w/spell checking. (3 disks) 512K
- [2] **WP 5.0 Learning Sys.** (1863,1864) Helps you learn to use or become a better *Word Perfect 5.0* user. (2 disks)
- [3] **WP 5.1 Learning Sys** (1865–1867) Learn all the powerful new features of WP 5.1. HD
- [2] **ClipArt** (1875,1876) A huge collection of art/graphics for *Word Perfect 5.0+*.
- **Letter Blitzer** (1882) A mail merge and letter writing program. HD, 512K

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- [2] **PC-Draft** (1533,1534) A high-quality drawing program. (2 disks) CGA
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- [4] **Wisdom of the Ages** (1316–1319) Over 6000 great quotations from the greatest minds of history. (4 disks)
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- **Automenu** (1409) A very professional hard disk menu system. Run any of your programs from a custom menu.
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- **VirusScan** (1440) Make sure your computer is virus-free with this valuable utility. Highly recommended!

GAMES

- **AdventureWare** (1934) Five excellent adventure games.
- **Baseball** (1916) Great arcade action and baseball strategy. CGA
- **Conquer** (1984) Try to take over as much of the world as you can. Similar to Risk. CGA
- **Cribbage Partner** (1947) A very realistic cribbage simulation.
- **Double Blocks** (1970) A TERRIFIC Tetris clone for 1 or 2 players. Records top scores. You will love this!
- **18-Hole Miniature Golf** (1915) Kids really love this one! CGA
- **Insanity** (1946) Find your way out of this maze before you go insane! CGA
- **Kid Games** (1938) These games are both fun and educational. CGA
- **Kingdom of Kroz** (1952) An excellent, award-winning adventure game.
- **McMurphy's Mansion** (1966) Search a spooky Scottish castle for treasure.
- **PAC-Man & More!** (1930) PAC-Man and Ms. PAC-Man clones. CGA
- **PC Jigsaw** (1976) Creates a beautiful puzzle for you to put back together.
- **PC-Pro Golf II** (1975) Choose your club and swing away at one of the world's most beautiful country clubs (Amherst). Excellent graphics! CGA
- **Pinball** (1941) Great sound and fast play on 5 different "machines." CGA
- **Pharaoh's Tomb** (1974) Face monsters and traps as you explore the pyramid. Your goal is to survive! CGA
- **Popcorn** (1913) A great improvement over Breakout with many neat features. CGA
- **Power Chess** (1981) An excellent chess program with great graphics.
- **Scrabble** (1957) Test your word power with this always fun game. CGA
- **Sharks** (1917) An underwater action arcade game. Avoid hungry sharks!
- **Sports Games** (1927) Bowling, archery, and pool. CGA
- **Star Trek** (1948) Two versions for all you TREKies out there.
- **Strategic Games** (1926) Fight on land and sea in this war simulation.
- **SUPER Arcade I** (1906) A collection of famous arcade hits like Qubert, Centipede, Pango, and more! CGA
- **SUPER Pinball II** (1951) Five more fantastic pinball games. CGA
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- **Video Poker/Ultima 21** (1945) The BEST poker and blackjack games!
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EGA GAMES

(The following require EGA monitors)

- **Bass Tour** (1925) An amazing game with excellent graphics. Fish in your choice of lakes. Very realistic. EGA
- **Captain Comic** (1961) The BEST arcade game ever! Superior graphics! EGA
- **EGA Coloring Book** (1963) A graphically beautiful and easy-to-use coloring program that kids love! EGA
- **EGA Golf** (1929) A challenging golf game with beautiful graphics. EGA
- **EGA Star Trek** (1951) You control the Starship Enterprise in this, the ULTIMATE Star Trek game! EGA
- **Frac** (1991) A three-dimensional Tetris-like game. Challenging! EGA
- **Super Fly** (1939) Swat the Super Fly before you are surrounded by the swarm. Multiple rounds of play make this a great game. EGA

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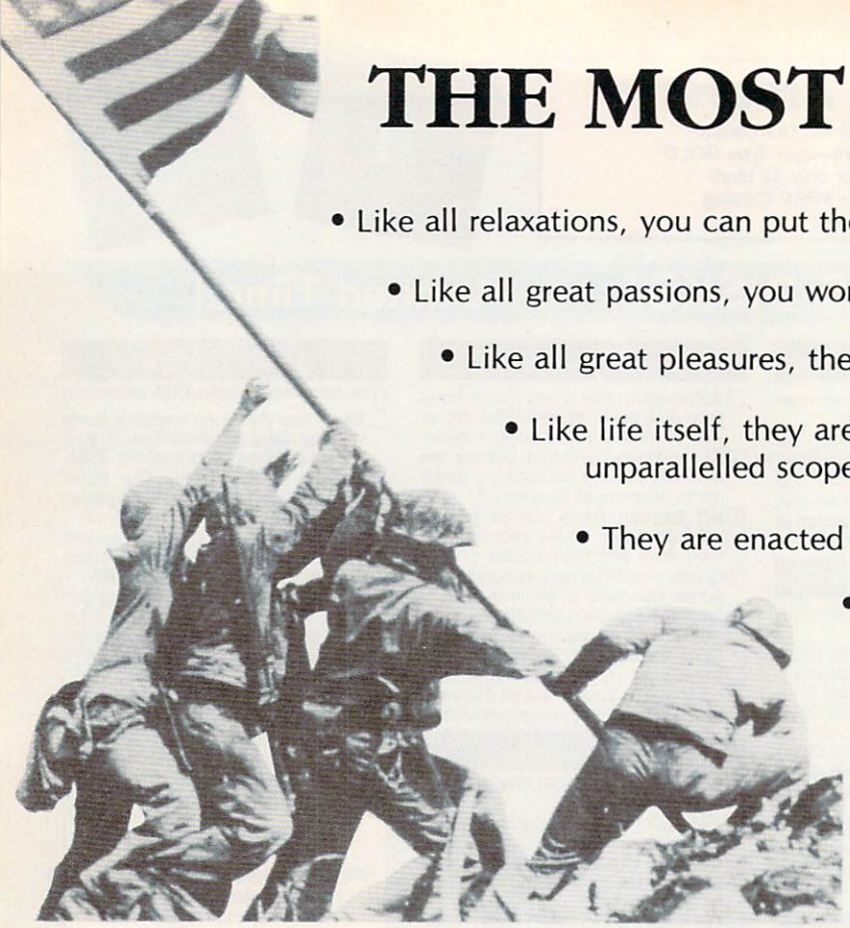

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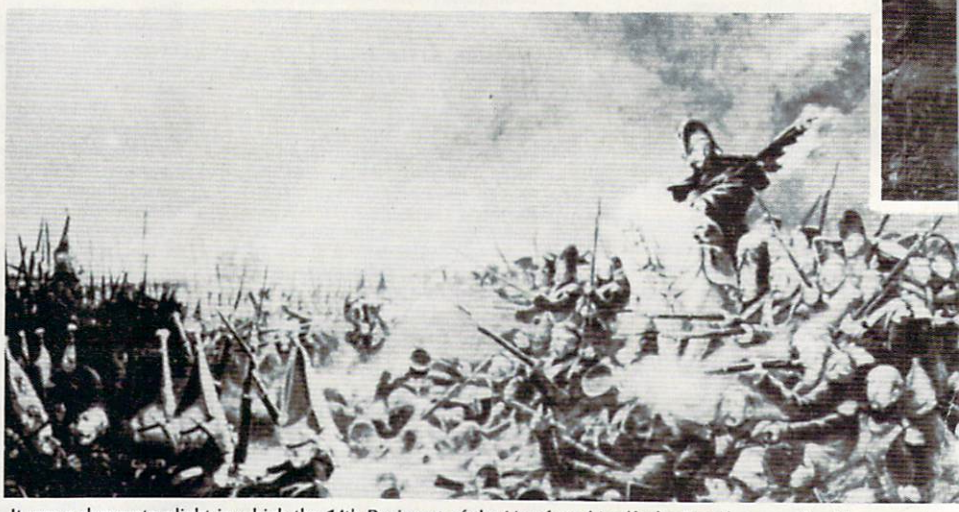

It was a desperate plight in which the 14th Regiment of the Line found itself, the French square harshly pressed.

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British ships of the line after Nelson's triumph at Aboukir Bay.

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A French hussar and a dragoon talk with their sentries posted nearby.

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The tapestry of these struggles was dark to its creators, its final outcome obscure and inevitably the result of a panoply of individual efforts. For example, the French were undone in Spain by Napoleon's inability to personally supervise the campaign.

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During the years 1805-1810 a four-cornered struggle for hegemony raged over German and Italian speaking Europe. Empires rose and Empires fell. In the course of this epochal clash of powers the first French Empire under the Emperor Napoleon I broke the back of the Habsburg Empire, twice defeated the Empire of all the Russias and virtually dismembered the Kingdom of Prussia.

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The Kingdom of Prussia .....
The Ottoman Empire .....
Other Power (e.g. Spain) .....

(1 to 2)	*(1 to 2)*
Field Commander	Army .....
Strategic/Political Commander.....	Navy .....

☐ **MUSKETS & MULES**

Please number countries in order of preference:
(1 to 3)

French .....
Austrian .....
Russian .....
Prussian .....

C-12

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NEWS & NOTES

dBase Sequel

It seems that Ashton-Tate's been listening to *dBase* users. Complaints about *dBase IV*'s massive size and lumbering operation have abounded ever since the new database management program was released. According to Ashton-Tate, *dBase IV* version 1.1 requires significantly less memory yet features increased performance, improvements in its Structured Query Language (SQL), a simplified installation procedure, new language commands, and more.

dBase IV 1.1's menu-driven Control Center, with its Design Tools, lets users manage data without having to write program code, while the program's application development environment and the *dBase* language itself allow developers to build applications faster without sacrificing flexibility. The program's Memory Management System handles overlays more efficiently, requiring only 450K of RAM. The overlay-dependent areas of *dBase IV* 1.1 also were supercharged, improving performance when the user is working at the Control Center and in programs that use menus and windows.

While using SQL, users can now browse tables; run reports, labels, and queries; and utilize 23 new or enhanced *dBase* commands. In addition to new language commands, users can also take advantage of conditional indexes, less restricted user-defined functions and ON commands, and an Organize menu accessed from the Browse and Edit screens.

These changes cover many of the things *dBase IV* users have been asking for—and not a moment too soon. Some tough competitors have been breathing down Ashton-Tate's neck, and these changes could be just what *dBase IV* needs to become competitive again. *dBase IV* version 1.1, standard edition, sells for a list price of $795. A developer's edition is available for $1,295, and a LAN Pack option sells for $995.

Ashton-Tate Customer Service, 20101 Hamilton Ave., Torrance, CA 90509

In the Chips

Microchips are now big business, and manufacturers such as Intel, Motorola, and others are probably more than a little worried about Gilbert Hyatt. On July 17, Hyatt, a 52-year-old engineer, received a patent for a computer chip that he invented 20 years ago. The patent seems to include chips used in computers and nearly all electronic devices, such as calculators, dishwashers, and even cars.

Before Hyatt's patent, the invention of the microchip was generally credited to a team of Intel engineers, including Ted Hoff, Federico Faggin, and Stan Mazor. They started work on the idea of the microchip in 1969 and produced the first one by 1971. However, Hyatt invented his first microchip in 1968 and has been attempting to get a patent on it for the past 20 years. The major chip manufacturers have vowed to try every possible way to show that Hyatt's patent doesn't apply to their products. If they lose the fight, however, hundreds of millions of dollars in royalties could start flowing Hyatt's way.

The Sun Moon Star Also Rises

CD-ROM is on the rise, and so is Sun Moon Star. The company's new 286-12/CD system and stand-alone CD-Set CD-ROM drive are among the first that are well suited for small business and home office computing, and the company seems to have a solid grasp on what its customers want. Bundled with approximately $2,000 worth of CD-ROM software and Sun Moon Star's proprietary installation disc, *CD-SetGo,* the new line offers almost instant productivity. The eight discs included in the CD-ROM library include *Microsoft Bookshelf; Microsoft Small Business Consultant; Microsoft Stat Pak;* Software Toolworks' *World Atlas, Illustrated Encyclopedia,* and *CD Game Pak;* WGE Publishing's *CD Audio Guide;* and General Information Systems' *Hotline II Executive.*

Useful CDs for artists and desktop publishers are also available from other sources. NEC has released CDs containing photography and drawings.

The 286-12/CD system includes a 40MB hard disk, 1MB of RAM, an internal 1.2MB 5¼-inch floppy drive, the CD-ROM drive, and a VGA monitor. In addition to the CD-ROM software, the 40MB hard disk is preloaded with MS-DOS 3.3, GEM/3 Desktop, *GEM DRAW, PFS:First Choice,* and *CheckIt.* The 286-12/CD is priced at $2,995. CD-Set external CD-ROM drive is priced at $995.

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continued on page PC-32

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One of the best sources of help with any computer problem is as close as your local BBS. This is especially true if you have a hardware question or need help with a popular program. There's probably someone on the BBS who has solved a similar problem.

Just leave an open message describing your problem and asking for help. Most BBS users scan all new messages each time they log on, so your question will get the attention of almost every user. In most cases, you'll find an answer within 24 hours.

How accurate are the answers you get from BBS users? Many times, they're even better than the advice you'll get on a busy voice-support line. A BBS user who takes the time to help you solve a problem is an end-user who understands your situation.

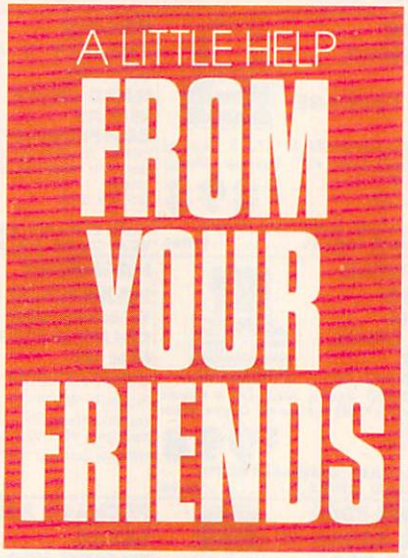
Companies, both large and small, recognize the popularity of commercial online services, like CompuServe and GEnie. If you subscribe to one of these services, your online support options are many.

CompuServe offers the widest selection of official support forums, with companies like Microsoft, Borland, Ashton-Tate, Norton, Adobe, and many others offering customer support. The list grows almost weekly and even includes smaller companies like ButtonWare and DataStorm.

GEnie also offers a good assortment of support areas among its roundtables. Microsoft is there, along with Ashton-Tate, Borland, Hayes, WordPerfect, and more. You'll find direct and fast answers to your questions from all of them.

It's easy to discover if a company offers support. On CompuServe, enter GO INDEX at any prompt. If you're a GEnie user, just enter INDEX. You can then search for support areas by selecting the search feature from a menu.

Once you've found a support forum, use the service's normal message commands to ask your question. As with local BBSs, you'll usually find your answer within 24 hours.



You'll find more than just answers on official support forums. Each company maintains a library of files, including drivers for your favorite monitor or printer, program updates, and utilities designed to enhance your productivity.

Official support forums aren't your only options on these commercial services. As on a local BBS, you can ask for help from other users as well. All you need to do is check into your favorite forum and pose your question.

Naturally, you'll have to pay the normal charges when you call a commercial online service, but the solution is usually worth its cost.

Typically, you can pose your question in just a minute or two and read the answer in just as short a time. Since most companies no longer offer toll-free support lines, it could end up costing less than a voice call.

As companies discover the benefits of online user support, many have taken the next step: offering a dedicated BBS just for product support. This support method was pioneered by shareware programmers, but it's rapidly spreading to major corporations.

Microsoft, for example, recently put its support BBS online. You can call it at (206) 646-9145 to have questions answered or to download updated printer and display drivers. Other companies also offer dedicated BBS lines. Check your hardware and software manuals for these numbers or call the company's voice-support number and ask about BBS support.

It's often said that the only stupid question is the one that isn't asked. But how you pose your question often determines whether or not you get the answer you need. Whether you call a local BBS, a commercial service, or a dedicated support BBS, you need to ask the right question. Here's a list of the items you should include whenever you ask for help.

- The name and version number of your software. If you're asking about a hardware problem, provide the model number of the hardware in question.
- A detailed description of your system, including CPU type, amount of memory, DOS version, monitor type, and any special hardware involved in the problem. If you're using memory-resident programs, list them as well.
- Details about the problem. The more specific these are, the better. Describe exactly what you were doing when the problem occurred and precisely what happened.
- If an error message was displayed when the problem occurred, quote it exactly when asking your question.

If you always include the information above, you'll be assured of accurate and helpful advice. ⊡

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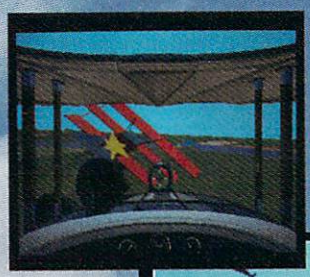

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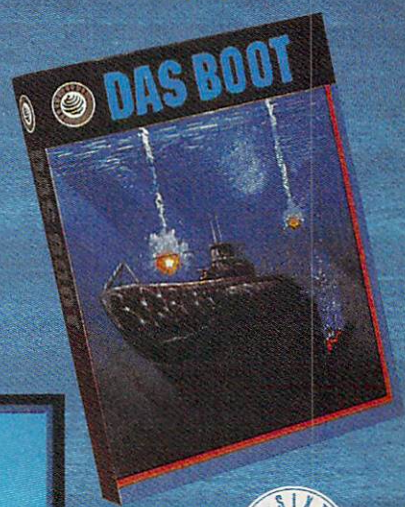

VGA periscope view of enemy aircraft

VGA 256 color mine field under North Atlantic

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ON DISK UPDATE

JOYCE SIDES

If you've called the technical support department during our transition period, we'd like to thank you for your patience. It's been pretty hectic around here, but the rough spots should be smoothing out now. We're trying a different approach to technical support. We'll return calls from 3:00 p.m. to 5:00 p.m. EST, Monday, Wednesday, and Friday. If you can't take a call between these hours, specify the day of the week and a time during that day when you can be reached.

You can still call between 9:00 a.m. and 4:30 p.m. EST, Monday through Friday at (919) 275-9809 to leave a message. Please state the nature of the problem when you call. We'll make two attempts to return your call.

Be sure to send in your completed disk survey form included in the Information and Extras menu option offered when you run *CMOS (COMPUTE's Menu Operating System).*

We'd like to hear from you, even if your comments are critical. The survey forms help us decide what types of programs to include on the disk. This is your chance to let your voice be heard.

Before you fill out the form, however, spend some time with the program. Please don't judge any program too severely until you've had sufficient time to work with it. Sometimes first impressions can be deceiving; try a program several times before making your decision about whether it's worthwhile or not. We take your comments very seriously, but we want you to give a fair assessment on the disk survey forms.

Notice that there's a request for your name and address located near the bottom of the current survey form. Some of you have complained of a problem but haven't included a return address or phone number. We can't help you solve your problem if we don't know how to get in touch with you.

For those of you who'd like to expand your disk library, we offer several special disk products. Available now are *COMPUTE's Best PC Games Disk,* a collection of some of our favorite previously published arcade and educational games; the *Mean 18 Course Disk,* six originally designed golf courses to add to your *Mean 18* collection; and *COMPUTE's SharePak Disk,* a thematic disk containing 3–5 large application packages released as shareware. This disk can be ordered from each issue, or you can subscribe to it.

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Coming soon is a disk filled with 38 different utility programs ranging from a directory killer, which removes a directory without having to delete the individual files and directories below it, to a batch file menu creator, which includes full mouse support. To order any of our disk products, write to us at 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408.

Viruscan and *Sine* Variables

If you've had problems running *Viruscan* (March 1990) or *Sine* (May 1990) from *CMOS,* you may have entered the parameters incorrectly.

Anytime *CMOS* offers the Run option for a program and allows you to enter one or more parameters, don't enter the program name. Only enter the parameters needed to run the program. For instance, to run *Viruscan,* enter the drive letter (followed by a colon) when asked for parameters.

Some systems won't run *Sine* from the menu because of memory limitations, especially when you're using hi-res modes. If you receive a runtime error message, you should install the program, exit the menu, and run it from DOS by typing SINE at the prompt.

What's in a Filename?

The filename of the executable file for *SetRAM* (May 1990) was misspelled in the documentation file SETRAM.DOC. The correct spelling of the filename is SETRAM.EXE.

Chex It Out

For those of you who own monochrome systems and can't read the *Chex* data screen, here are a few tips on how to customize the screen so you can read it better.

First, install the program from *CMOS,* switch to the disk or directory where the installed files reside, and load the program by typing CHEX at the DOS prompt.

Press F8 and then C to bring up the Custom Options menu. The cursor is located on the first line beside Headings and Line Color. Enter 112 at the cursor position and in the next column. Press Enter after you've typed each number.

After you've pressed Enter the second time, the cursor will be located on the second line, Detail Color. Enter 15 twice, pressing Enter after each number. If you'd like, you can also change the Window Color to 15 in both columns. Now press Esc and Y to return to the data screen.

You should be able to see the column headings; the first line, which contains Balance Forward; and the bottom two lines with function-key equivalent information. If the display still is not satisfactory, return to the Custom Options menu and try a different number. The choices range from 0 to 128. ⊡

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HOT TIPS

HINTS AND TIPS FROM OUR READERS

I've found a way to quickly load and run any program on a hard drive. I created a batch file called RUN.BAT that moves to the drive and directory where the program is located, runs the program, and returns to the root directory.

```
ECHO OFF
PAUSE
ECHO %2 is now loading
%1
CD \%2
%2
CD \
```

Use the following syntax to run the batch file: RUN *drive*:*filename*. The directory name and the executable filename must be the same because the same parameter is used for each, and the directory must be located under the root directory for RUN.BAT to work properly.

The batch file can be altered to work with your hard drive configuration. For instance, if you have a WORK directory under the root that contains all your program subdirectories, change line 5 in the batch file to CD \WORK \%2. If you have more than one main directory under the root, such as WORK and DOS, you could create more than one batch file and name them RUNWORK.BAT and RUNDOS.BAT, and so on.

Matthew Beaudoin
Pawcatuck, CT

Xtree Pro

I use *Xtree Pro,* and at times I get a message that says there's not enough memory to display all the files. To get rid of this message, I use the XTPROCFG.EXE file to increase the number of files that *Xtree* will hold.

Norma Gene Butler
Nashville, TN

Color Prompting

Setting the screen colors in the DOS environment is difficult at best unless you use a program like *ColorSet* (*COMPUTE!'s PC Magazine,* March 1989). I found a way to set the colors for the screen using the DOS PROMPT command and the ANSI.SYS codes. It's not as easy as running a program written for that purpose, but manipulating the screen colors with the PROMPT command is a lot of fun.

Before you begin, be sure the statement below is included in your CONFIG.SYS file. Substitute the correct drive specification for *drive*: and the full path where ANSI.SYS is located for *path.* After the line is added to your CONFIG.SYS file, reboot your system.

DEVICE=*drive*:*path*\ANSI.SYS

The command syntax to change the background and foreground (or text) colors is as follows:

PROMPT $e[*bkgd;foregd;attribute*m

The background *(bkgd)* colors range from 40 to 47, and the foreground *(foregd)* colors range from 30 to 37. These numbers represent the following colors:

30	40	Black
31	41	Red
32	42	Green
33	43	Yellow
34	44	Blue
35	45	Magenta
36	46	Cyan
37	47	White

You can also set the display attribute by including 0–8 in the command.

0	Normal
1	Bold
4	Underline
5	Flashing
7	Reverse
8	Invisible

Remember to separate the numbers with semicolons. You don't have to include all three numbers. If you want to change the foreground but not the background color, enter only the foreground color number in the command, such as $e[36m for cyan text.

Richard Bigot
Paris, France

Take a Scroll

In a recent issue of *COMPUTE* magazine, a review of *WordPerfect* 5.1 stated that the mouse could not be used to scroll through the document. On the contrary, it scrolls beautifully. Press and hold the right mouse button, drag the cursor in any direction, and the screen will scroll. Hold the left button and drag the mouse pointer to block text. These are features that I use daily.

Ric French
Jacksonville, FL

Swap It

There have been times when I wanted to swap the contents of two files and not lose the contents of either one. I wrote the following batch file called SWAP.BAT to exchange the contents of two files the easy way.

```
ECHO OFF
CTTY NUL
COPY %1 TEMP.DOC
COPY %2 %1
COPY TEMP.DOC %2
DEL TEMP.DOC
CTTY CON
```

To use the batch file, enter SWAP *file1.ext file2.ext.* The contents of *file1* will be swapped for the contents of *file2.* The CTTY NUL command keeps the message *1 file copied* from being displayed on the screen.

Fred Wood
Hubert, NC

If you have an interesting tip that you think would help other PC users, send it along with your name, address, and Social Security number to COMPUTE's PC Hot Tips, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408. We'll pay you $25–$50 and send you a COMPUTE's PC LCD clock radio for each tip we publish. ⊡

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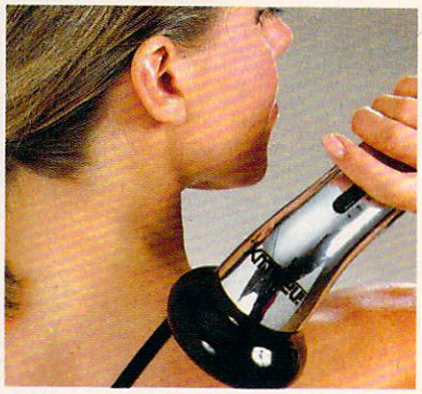

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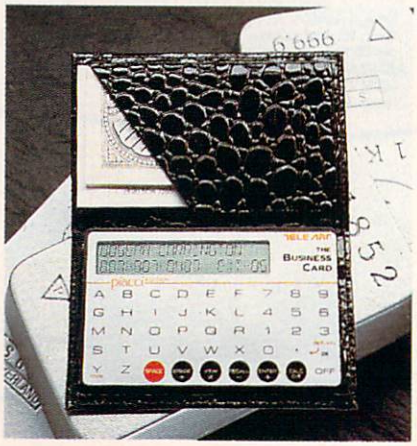

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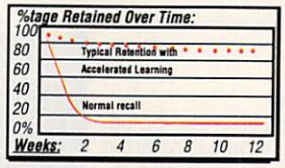
continued from page PC-22

Foreign Intelligence:

". . . American managers with language skills open more doors"
Wall Street Journal Editorial

BREAKTHROUGHS in language technology *by European learning researcher Dr. Georgi Lozanov are the basis of the remarkable Accelerated Learning Language Series. The series is so effective, we guarantee you'll be hearing, reading, understanding and beginning to converse in your new language in 30 days – or your money back.*



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A Friend Indeed

A pair of products are making headlines at Brøderbund: a new companion for *Print Shop* and a royal road to calculus.

The New Print Shop Companion, for use with *The New Print Shop* on IBM PC and compatible computers, now features an entry-level page designer with special templates and typefaces. Its text editor allows users to type letters on letterheads created with *The New Print Shop.*

The New Print Shop Companion also allows users to create envelopes that match their *Print Shop* letters and greeting cards. Expanded editors make it easy to design and customize monochrome graphics, borders, and fonts to use with *The New Print Shop.* Cataloger, a special utility, prints reference pages so users can quickly find whatever they're looking for. In all, it's a true friend for a great product—and it retails for a mere $49.95.

Here's another winner from Brøderbund Software: *Calculus.* Taking advantage of the *Microsoft Windows* environment allowed Brøderbund to enhance its new *Calculus* tutorial software package. The program includes more than 300 problems, covering an entire year's classic curriculum.

Although it's compatible with major textbooks on the subject, *Calculus* includes something you don't get with printed books: an automated index and table of contents and more than 60 animations with an emphasis on graphing and graph manipulations. A special module animates, demonstrates, and explains the sequence of operations required to solve basic calculus problems.

Even if you don't have *Microsoft Windows,* you can still run this package because it comes with runtime *Microsoft Windows.* The suggested retail price of *Calculus* is $99.

Brøderbund Software, 17 Paul Dr., San Rafael, CA 94913

News & Notes by Alan R. Bechtold, editor of *Info-Mat Magazine,* an electronic news weekly published by BBS Press Service. ⊡

AMIGA VIEW

DENNY ATKIN

It's that time of year again. The holidays are just around the corner (aren't magazine cover dates fun?), the snow is piling deep in the North (and the grass is turning a sickly shade of brown in the South), and COMPUTE is handing out its annual Choice Awards.

One thing you'll notice about the award winners is that they all run on MS-DOS computers. You won't find an Amiga-specific program in the bunch; MS-DOS compatibility was a prerequisite to nomination. This will anger some of you, but when you stop and take an objective look at the size and makeup of the consumer software market, you'll realize that it wasn't an unreasonable editorial decision.

The programs that did win deserved to. Take, for instance, Access's incredible *Mean Streets,* a fascinating graphics adventure with full 256-color VGA graphics and digitized RealSound. This program holds its own against any of its Amiga counterparts (and it will be available on the Amiga soon). Or *Windows* 3.0, which finally brings to high-end IBM PCs some of the capabilities that all Amiga owners have enjoyed since 1985.

There are a couple of Amiga programs, though, that had they been nominated, probably would've taken home prizes. *AmigaVision,* Commodore's new multimedia authoring system, would've had a clear shot at winning the Programming Language award. If you've ever taken even a basic computer programming class, you learned about flow charts. You plotted out your program as a series of interconnected icons on paper; then you translated it into the equivalent BASIC or Pascal code. With *AmigaVision,* after you've created the flow chart, you're ready to run your program. You can create a multimedia presentation complete with animation and music, an educational quiz program, or a *dBase*-compatible database entry program without ever touching the keyboard.

Softlogik's *PageStream* 2.0 (look for a full review of the enhanced version 2.1 next month) certainly would've had a shot at the Desktop Publishing award. This update is unmatched in its flexibility. The program supports not only its own outline fonts, but also IBM and converted Macintosh PostScript Type 1 and Type 3 fonts, and Compugraphic outline fonts to boot. It renders them smoothly both to the screen and to any printer, dot-matrix or laser. Plus, it will import nearly every popular graphics format, including standard and 24-bit IFF, *MacPaint,* TIFF, GIF, Encapsulated PostScript, GEM Metafiles, *Professional Draw* clips, and others. It's a truly professional program that meets or exceeds the needs of all but the most demanding users.

Looking back, 1990 was a banner year for Amiga software. ASDG's *The Art Department* and *Art Department Professional* have made the Amiga a serious choice for graphics professionals and software houses that must render art on multiple platforms. Gold Disk's *Professional Page,* the first DTP program for any computer capable of four-color process separation, now supports Pantone colors with its 2.0 upgrade. New Horizons' *ProWrite* 3.1's ease of use, multiple-column support, huge thesaurus, ability to mix color graphics with printer fonts, and unlimited extensibility through its *ARexx* port make it ideal for beginners and pros. And the big news at press time: Macintosh multimedia giant MacroMind announced they will be doing an Amiga player for *Director* presentations.

It's been an active year on the entertainment front, too. Incredible games such as Psygnosis' *Shadow of the Beast II* and Cinemaware's *Wings* keep the Amiga at the leading edge of game-playing technology. And the major publishers, some of whom dropped out of the Amiga market in the late 1980s, are back in force with fantastic Amiga conversions.

Right now the market research says the momentum is with MS-DOS. But with Amiga software getting better and better and over 2 million Amigas already in the field, the market is bound to stand up and take notice. And it's about time. ⊡

NEWS & NOTES

ANOTHER NEW AMIGA

By the time you read this, Commodore either will or will not have shown its new 3500 computer at the big fall Comdex show in Las Vegas. The 3500 is said to be little more than a 3000 in a tower case (it will definitely not come with a 68040 processor). The larger case will allow for more internal disk drives and more expansion slots, both Amiga and IBM. Since there isn't any new technology in the 3500, it should be a snap to get it ready on time, right? Well, maybe. Even though the main difference is the case, word is that the original design was based on the PC-60, Commodore's 80386 tower-case PC, whose aesthetics can most charitably be described as functional. The last thing that Commodore officials want to do now is introduce another ugly computer. So the 3500 may be delayed, pending a facelift. While they're at it, Commodore might want to modify the 3500 to accept NewTek's Video Toaster. We've been told that even the larger tower-case model won't have the right size video slot for the long-awaited appliance.

Speaking of new models, we keep hearing rumors about a cost-reduced version of the 2000 to match the 3000's slim profile. This computer appears to be about nine months to a year away, but the main thing we've been hearing is that it will have a couple of Amiga expansion slots but no PC slots. The big question is whether it will use a 68000 or a higher-powered processor. We're rooting for at least a 68020. Only Apple would have the nerve to introduce another 68000-based computer at this late date.

—SHELDON LEEMON

A MEG O' CHIP

About the only feature of the 3000 that you can't duplicate on the 2000 by using add-on cards is the ability to use two megabytes of chip RAM. DKB Software of Milford, Michigan, is planning to change all that, however, with its MegAChip board, an add-in that allows you to retrofit the new two-meg Agnus chip to the 2000. This little board contains both the new Agnus chip and one megabyte of RAM, and it plugs right into the Fat Agnus socket.

The board should be in production by the time you read this; it will sell for $299.95 with a meg of RAM but no two-meg Agnus chip. You'll have to obtain that chip yourself as a service part, since Commodore has declined to furnish them directly to DKB. According to DKB, the reason stated was that the company "does not want to blur the distinctions between the 3000 and 2000 product lines."

DKB is also considering marketing a board that would allow you to switch between version 1.3 ROMs and 2.0 (as does Utilities Unlimited in Oregon) "if there is enough demand for such a product." Give me a break. As hard as Commodore has tried to keep version 2.0 compatible with previous releases, with all of its enhancements it will clearly break more software than any previous update. As soon as users find out that it won't run their 1987 *Bug Blaster* game, they'll be clamoring for a product that allows them to switch back and forth.

—SHELDON LEEMON

A Really Big Show

The AmiEXPO held last October at the Disneyland Hotel in Anaheim was Ami Shows' best attended California event—and with 12,415 paid attendees, the most heavily attended AmiEXPO ever held in the USA.

There were more products on display than I have space to write about, so I'll cover here the newest products and the highlights of the exhibits.

The hardware. This AmiEXPO provided a cornucopia of products for hardware fans, as many innovative new goodies were shown.

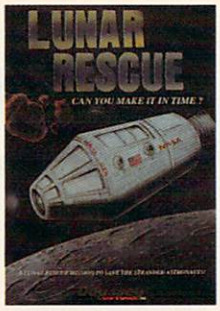
Black Belt Systems demonstrated their HAM-E, a book-sized external box that can display 262,144 colors out of a palette of 16 million.

Twenty feet away in a booth big enough to be a Rose Parade float, Digital Creations showed off DCTV (shipping soon), coupled with its 24-bit NTSC paint package.

California Access, known for its floppy drives, had a dazzling booth resembling a fifties-style cafe and showed Bodega Bay,

continued on page A-27 ▷

= INSIDER NEWS AND GOSSIP



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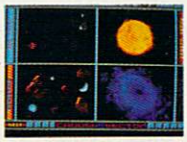

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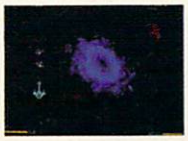

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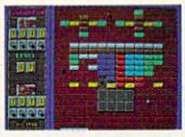

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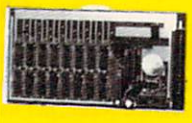

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OPENING NEW WINDOWS

YOU'LL VIEW YOUR AMIGA FROM A NEW PERSPECTIVE AFTER UPGRADING TO WORKBENCH 2.0

My regular sojourns through information networks and trade shows provide opportunities to talk with many Amiga owners, and I've noticed some consternation about the new Amiga operating system, Workbench 2.0. Most people make positive noises, yet many of them wonder why they should bother with it since Workbench 1.3 seems to do the job. I liked Workbench 1.3, too, but I'm here to tell you that once you've tried Workbench 2.0, you'll never want to see 1.3 again, much less be stuck using it. ▷

PEGGY HERRINGTON

Not only do you get two vastly improved operating systems (both graphics interface and text-based shell), but 2.0 also offers a number of utility programs that can dramatically ease your computing life.

One feature of Workbench 2.0 I particularly like is that, memory permitting, you can open virtual windows—displays bigger than your monitor's screen. You might wonder why you'd want a window that you have to scroll around in. But wouldn't it be nice to simply slide your current screen to the side and find your disk icons waiting for you on the Workbench? You can set this up easily using 2.0's Screenmode Preferences utility. Simply select AutoScroll, interlace display mode, and a screen size of 800 × 400 pixels. The Workbench will immediately reopen larger than life. (Under 1.3, you'd have to reboot before changes would take place.) Place and snapshot your disk icons vertically down the left side of the window. Then open any program that resides on the Workbench and drag it as far right as possible, resizing it to fill the visible portion of the screen.

I open a shell, complete with close gadget, in that rightmost position by adding the following line to my startup-sequence file: NewShell "Con:120/15/674/363/Peg's Shell/CLOSE". That puts about two inches of the Workbench offscreen to the left with my disk icons. Scrolling the screen horizontally is as easy as moving the mouse to the far right or left. An added bonus to the virtual Workbench screen is that you can resize a shell or text-editing window to properly display text files with lines longer than 79 characters.

2.0 Window and Screen Management

Under 2.0 you can open windows on the Workbench without worrying about resizing them with the mouse to get to those underneath. There are four ways to manage windows now. A menu bar zoom gadget expands and shrinks windows. You can use the Commodities program IHelp to configure your function keys with commands to make windows bigger or smaller and cycle through them as if you had clicked on the front/back gadget with the mouse pointer. Activate the window you're after as you cycle through them by repeatedly pressing one function key, and expand it to full size with the press of another. Shrink the window again with a third function key when you're through, and then move on to your next project.

The new Workbench Tools menu provides an alternative to clicking on oft-used icons and is particularly handy if you have a hard disk. Usually the program in question adds itself to the Tools menu, but there's a public domain utility available called *AddTools* by Steve Tibbett that lets you add any program to the Tools menu, including the Shell. Once you've started up a Tools-compatible application, selecting it again from that menu will force its screen or window to the front.

There are 21 fewer commands in the 2.0 Workbench's C directory than in its 1.3 counterpart, but don't let that fool you.

The fourth way to avoid pawing through icons and windows is available through the new Leave Out command on Workbench 2.0's Icons menu. All you do is drag a program's icon onto the Workbench and select Leave Out either from the menu or with the keyboard shortcut Right Amiga–L. If you change your mind, highlight it again and select Put Away or press Right Amiga–P. The Shell icon is right on my Workbench screen when I start my system, thanks to Leave Out.

Built-in Programs

Workbench 2.0 comes with a number of utility programs, several of which have been reworked since 1.3. Notably missing is Notepad, but you'll find that the new, improved Ed is a very smart replacement. You won't believe your eyes when you see its new user-definable pull-down menus. Although Ed doesn't do fonts or page formatting, you can paste text into it from other applications (even the Shell) by highlighting text with the mouse and pasting with the standard Right Amiga–V keyboard command. Workbench 2.0 has several other nice utilities, as detailed below.

You can launch programs under Workbench 2.0 by double-clicking on icons or filenames or by selecting them from the newly added Tools menu.

Display. Something we've always needed, Display is a standard graphics presentation program. Display will show IFF pictures in all standard resolutions, including HalfBright. You can show graphics individually, in groups by names, or from a list of names in a file. You can control your slideshow using Display's built-in timer or move back and forth between pics using the mouse buttons. The program will loop for continuous slideshows, will send screens to your printer, and will work equally well from the Shell or Workbench.

NoCapsLock. Disables the Caps Lock key so you don't need to worry about hitting it accidentally.

IHelp. Cool for keyboard users, IHelp lets you set function key equivalents for things usually accomplished by mouse control. For instance, you can cycle windows and screens to the frontmost position, resize them large or small, and even close windows and programs just as though you'd used the mouse.

Blanker. Blanks your monitor screen if there's no keyboard or mouse activity for a length of time that you set. Touching the mouse or keyboard reactivates the display.

AutoPoint. Enables Sun workstation-style window activation, meaning a window is activated when the mouse pointer passes over any portion of it, rather than your having to click the mouse button. I like this feature in theory, but in practice it makes movement of the pointer jerky and hard to control.

FKey. Using FKey, you can tie macros to your function keys. For instance, you might define F1 as "Dir DF1:". Press F1 while you're in a Shell window to get a directory of your external drive.

New AmigaDOS Commands

There are 21 fewer commands in the 2.0 Workbench's C directory than in its 1.3 counterpart, but don't let that fool you; 30 commands are already resident in memory when you boot, resulting in faster response times when they're called. And floppy users won't have to insert the Workbench disk every time they want to execute one of those com-

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mands. New AmigaDOS commands include CPU, EndShell, Get, IPrefs, MakeLink, Set, UnAlias, Unset, and UnSetEnv. The majority of old familiars have been rewritten and optimized.

The CD command, although resident in 2.0, is now obsolete. Type the name of a disk or the device number of the drive (for instance, DF1:), and the system takes you there without requiring the use of CD. Entering the name of a directory on a disk you've already addressed that way will take you there without CD as well.

If typing Endcli is too much trouble for you, the new keyboard shortcut Control-/ will nuke your current shell (you can also close it by clicking on the Shell's close box). And one of the nicest AmigaDOS enhancements is that you can highlight and paste text from a shell into any program that accepts the standard keyboard paste command, Right Amiga–V.

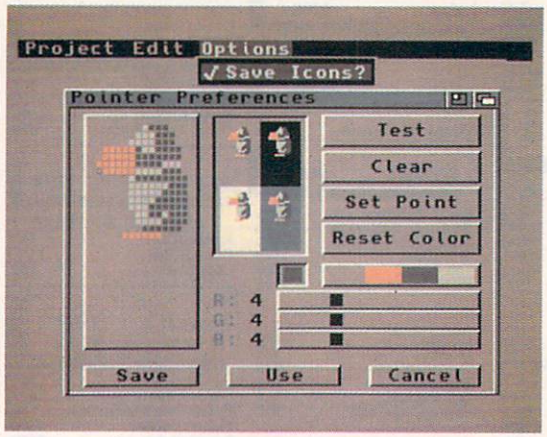
Magic Icons

What deservedly gets the most attention is Workbench 2.0's beautiful, slick, professional, awesome, cool, much-improved new icon system. All files—not just those with associated .info files—can be seen and manipulated from the Workbench using the mouse. This feature alone makes 2.0 worth the upgrade. Previous versions of Workbench made it impossible to see what was inside a drawer that didn't have an icon without resorting to opening a CLI. With 2.0, you can insert any disk—even those made with previous Workbench versions—and, by selecting Show All Files on the Window menu, see everything on that disk represented as temporary icons the system creates for you.

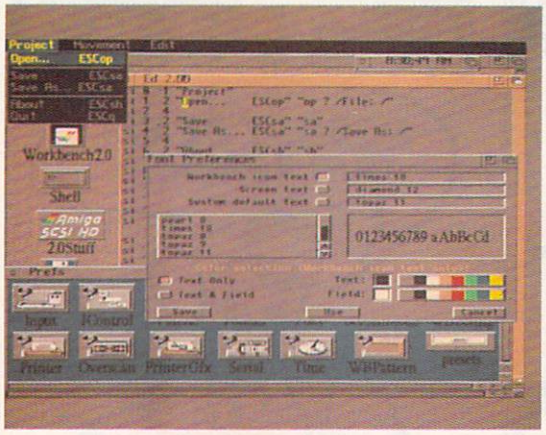
And there's more. Icons don't reveal many particulars about files (such as size, protection bits, and the date and time of creation). The 2.0 Workbench offers access to that data in a mouse-accessible manner. You can now see all files (sorted by name, date, or size) in a text-based Workbench window listing.

Double-clicking on any file opens a requester into which you can enter instructions. Say, for example, that you wanted to use the Info command to see how much space was left on DF1:. Under older versions of the Workbench, you would have had to open a CLI or Shell window. Under 2.0, you can select Show All Files on your Workbench disk, double-click on the C drawer, and then double-click on the Info icon. A window will open with the Info command in a string gadget. Type any arguments to the command (in this case, type DF1:) and hit Return. Another window will open with the output of the Info command.

The Amiga has long been the only PC to provide both built-in graphics and text-based operating systems, but Workbench 2.0 makes the graphics operating system truly viable for the first time. With it, you can do anything from either environment not only easily but elegantly.



The improved Pointer editor is just one of many new stand-alone Preferences programs.



Other enhanced 2.0 programs include an Ed editor with pull-down menus and a Font Preferences editor.

Backgrounds and Colors and Fonts—Oh, My!

Workbench 2.0 also sports great new colors and background patterns that let you differentiate between different types of windows at a glance.

It offers a slew of new keyboard command shortcuts, such as Right Amiga–I to open an icon's Information window. It will even create a new drawer or directory, complete with icon, from a pull-down menu or with the Right Amiga–N shortcut.

Fonts are shown in the Fonts Preferences window—no more guesswork about which one you want to use—and you can use three different fonts for icons, windows, and menus. There's a new Workbench Startup window into which you can drag any file by icon or name and have it active when you boot your system. For example, you can put Clock and Shell there, and they'll be ready and waiting when you start up your Amiga.

Both the Workbench and AmigaDOS operate faster; there's substantially less waiting around for things to load. Another productivity speedup comes from the *ARexx* macro language, which comes with 2.0. *ARexx* allows communication between products developed by different companies as well as being a sophisticated language suitable for creating simple utilities and complex batch files.

I've found overall compatibility with existing programs is reasonably good with 2.0, with the exception of menu formatting on some programs due to 2.0's more permissive use of fonts. But the advantages of 2.0 are worth putting up with any problems you might encounter. If the Workbench had been this good when I started using the Amiga, I wouldn't have bothered to learn the CLI.

Get Your ROMs

Some of the consternation I'm hearing about 2.0 may be due to the fact that, as I write this, Commodore has not announced in detail what will come with Workbench 2.0 or its price. In order to upgrade to 2.0, you'll have to have your Kickstart 1.2 or 1.3 ROM chip swapped for a new 2.0 ROM. (Amiga 1000 owners will have to add a third-party expansion device such as the Rejuvenator to add a Kickstart ROM; 2.0 is too large to be loaded into the 1000's Kickstart RAM.) For most of us, that means taking our Amigas to a technician. I urge you to go for it.

While you're at it, have the SuperAgnus installed as well. It changes the second 512K of memory in your 2000 or expanded 500 into Chip RAM, literally doubling your system's general usability. I'd stack my Amiga 2000—with 3MB of RAM, a 65MB hard drive, SuperAgnus, and Workbench 2.0—up against any stock PC on the market today. I think the only system in its price range that could humble it would be the Amiga 3000—which comes with Workbench 2.0 right out of the box. ⊡

3 THREE NEW PRODUCTS FROM ICD

Flicker Free Video™

With *Flicker Free Video* (FFV) and a standard VGA or multi–frequency monitor, any Amiga® 500, 1000, or 2000 computer can produce a high quality display, free of interlace flicker and visible scan lines. Installation requires no soldering or advanced technical knowledge and frees the video slot in Amiga 2000 computers for other uses. *FFV* is compatible with all software, works in low and high resolutions interlaced or not, and has no genlock conflicts. *FFV* uses a multi–layer circuit board and surface–mounted components, packing a lot of power into a very small space. Both PAL and NTSC are automatically recognized and fully supported. Full overscan is supported, not just a limited overscan. Three megabits of random access memory are used to ensure compatibility with overscan screens as large as the Amiga can produce.

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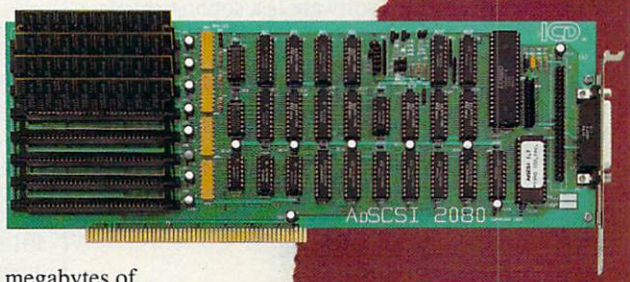

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FEEDBACK

QUESTIONS FROM OUR READERS

Math 101

I just read a letter from Don Hilke titled "Did the Amiga Flunk Math?" in the "Feedback" column in the November 1990 Amiga Resource. Mr. Hilke complained about the lack of mathematics software for the Amiga.

I do all of my mathematical work on my Amiga. For my work, I use a computer algebra system called *Maple*. The Amiga version of *Maple* is available from Waterloo Maple Software. This very powerful software comes with libraries containing routines for doing every level of mathematics from basic algebra and trigonometry up to advanced calculus and differential equations. It can handle problems in complex variables, statistics, and linear algebra. This software will give solutions to problems symbolically—that is, in terms of variables and mathematical expressions. It is even capable of expressing solutions in the form of FORTRAN code.

This software is a sophisticated tool for scientists and engineers. It is definitely not a toy for the kiddies! I would match this software against just about any mathematics software available for the IBM PC or for the Macintosh.

I hope Mr. Hilke contacts Waterloo Software and finds out what his Amiga is capable of.

ELLIOT JACOBS
ORMOND BEACH, FL

Maple's Amiga version is available for $395 (U.S.) from Waterloo Maple Software, 160 Columbia Street West, Waterloo, Ontario, Canada N2L 3L3; (519) 747-2373. The package requires an Amiga with 1MB of memory and 10MB of free hard disk space.

Getting the Word Out

Just think of it. Until today, with the release of the first issue of the new *COMPUTE* magazine, the only place a PC user would get information on the Amiga computer world was in the slim offerings of *Computer Shopper*. After all, why would anyone but an Amiga owner purchase or subscribe to an Amiga-specific publication?

Up until now, an inquiring PC user online with any of the Amiga bulletin boards was lambasted with "Amiga arrogance" and made to feel lower than cell life.

While I was initially disappointed at the demise of *Amiga Resource* as a separate magazine, I now realize that, for the first time, information on the real world of Amiga computing will be placed gently into the hands of thousands of PC users.

It's ironic that *COMPUTE* is going to accomplish in one instant of consolidation what Commodore's marketing department has been trying to do for almost six years now: inform the general computing public about the merits of the Amiga, its operating system, and its support community. Bravo.

MICHAEL GERARD
CLEVELAND, OH

Stuck with Skinny Agnes?

I own an Amiga 500 with the Rev. 6 motherboard, the SuperAgnes (8372a), and an Imtronics ProRam 2.3 internal expansion board which isn't populated. The manual says that the board is incapable of providing any CHIP RAM, as Commodore's 501 expander is capable of doing. Is there any way to obtain more CHIP memory, or am I doomed to 512K of CHIP memory? Or is the manual lying to me?

Also, I was wondering about a new case for the Amiga 500. All the other models have detached keyboards. Why couldn't the 500 be designed with that luxury?

KEN HUMPHREY
SEAT PLEASANT, MD

We attempted to contact Imtronics about the ProRam, but there was no answer at its published number. However, if the manual states that the ProRam can't extend CHIP RAM, then it probably can't.

There's even worse news on the CHIP RAM front, this time from Commodore itself. The company sent out a service bulletin in October to all its U.S. dealers stating that modifying an Amiga 500 to utilize one megabyte of CHIP RAM would not be supported by Commodore. It went on to say that if the modification were made, even by an authorized service center, the machine's warranty would be voided. With Commodore's new one-year warranty and Commodore Express service program, Amiga owners may want to think twice about making warranty-voiding modifications.

However, some of our contributing editors have modified their Amiga 500s with SuperAgnes chips to utilize one megabyte of CHIP memory and have had no problems with their machines. There's no technical reason for not making the modification to your Amiga. It seems Commodore is simply trying to further differentiate the 500 from the 2000.

Commodore designed the Amiga 500 as a one-piece unit to reduce manufacturing costs. While you probably won't see a 500 with a detachable keyboard from Commodore any time soon, if you're handy with a screwdriver, you can make such a modification yourself.

Pre'Spect Technics (1085 St. Alexandre, Suite 500, Montreal, Quebec, Canada H2Z 1P4; 514-954-1483) has released the Black Workstation case. After you've removed your A500's motherboard and keyboard and placed them in Pre'Spect's $320 case, your machine takes on the appearance of a sleek black Amiga 1000.

Send questions or comments to Feedback, Amiga Resource, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408. We regret that, due to the volume of mail received, we cannot respond individually to questions. We reserve the right to edit letters for clarity and length. ⊡

SPOTLIGHT

JOHN FOUST

HARD DRIVIN' YOUR AMIGA

This month's "Spotlight" is dedicated to floppy disk users. Floppy-based Amigaphiles have no less enthusiasm than hard disk users, but they might as well be using completely different computers.

Hopefully, if you've yet to purchase a hard disk, this column will convince you to make the leap. An Amiga with a hard disk becomes a radically different machine. With floppies, you tend to avoid tasks that take minutes of disk gronking and swapping. On a hard disk, all tasks take only seconds.

A hard disk is like a big, fast floppy disk. Like a floppy, it stores programs and data. Unlike a floppy, it gives fast access to that information. Ads for hard disks can be confusing. They quote milliseconds and megabytes, but I've never seen one that said "Buy one and save time." That's the most important reason to buy a hard disk.

Here's a simple comparison. Starting *DeluxePaint* from floppies takes almost two minutes. Loading it from a hard disk takes between five and ten seconds. Once inside *DeluxePaint,* bring up the font requester by clicking the right button with the pointer over the text tool icon. Searching a disk for available fonts takes only a few seconds on a hard disk but might take nearly a minute on a floppy, especially if you're using a full custom font disk.

Many floppy-based Amiga users resort to rebooting on a program's own Workbench disk, the disk that came straight out of the product's box. They've correctly discovered that some applications don't work unless you reboot using that program's disk. Rebooting on the program's own Workbench disk solves the problem with wasted time and effort.

With a hard disk, there's no need to reboot between applications. It's much easier to take advantage of the Amiga's multitasking when you don't need to reboot. The hard disk becomes a universal Workbench boot disk that's compatible with every one of your programs. It holds all the files that each program needs, and there's no need to swap floppies.

Running a software package that comes with three or four disks of programs, data, and tutorials can be a hassle. To store a file on one of your own disks, you need to remove one of the program's disks, and it always seems that it wants that disk back immediately. With a hard disk, all of the program's disks can be stored on the hard drive, freeing your floppies for loading and saving your own data. You won't see *Please insert volume XYZ in any drive* again.

Before shopping for a hard disk, you should know how to decipher hard disk advertisements. The smallest hard drives sold today hold 20 megabytes, or about 25 floppies of information. Buying a larger disk means a small incremental cost, so spending an extra $100 today might get an extra 10 or 20 megabytes. Most drives can be reinstalled in a new system if you trade up to an Amiga 2000 or 3000, so think of it as an investment. Unless you've got an especially demanding program in mind, a 30- or 40-megabyte drive will serve you well.

Hard drives themselves are rated in milliseconds. A typical low-priced drive takes 65 milliseconds to seek out information on the disk. Some higher-priced drives perform the same seek in 18 milliseconds. If you can afford a faster drive, it's worth it, but a slow drive is still better than a floppy.

How do you copy programs to a hard drive? Most hard disks come with scripts that copy Workbench to the drive. Copying the Workbench and Extras disks to a hard disk consumes less than three megabytes, leaving plenty of room for other applications. Most newer applications come with scripts for hard disk installation. Remember, if you're consolidating programs from bootable Workbench disks, you might only need to copy 200K or 300K of files from the floppy to the hard drive because you only need one copy of Workbench on the hard drive.

If you bought an auto-booting hard disk, all you do is turn on your Amiga; seconds later, the Workbench screen appears. If the disk isn't auto-booting, you'll insert a minimal Workbench boot floppy, and then the Workbench will appear with a new icon for the hard disk. Within this disk drawer, you can place more drawers and the icons for each of the applications you use most often. Chances are that you'll have plenty of extra space to store more pictures, texts, and sounds than ever. Of course, you're free to start programs from a floppy as you did before.

There are other hidden costs to operating a hard disk drive. Unless your hard drive already includes one, you'll need to purchase a backup program, which preserves all the data on your hard disk by copying it to floppies. Think of it as an insurance policy. If something goes wrong with the drive, you won't lose any data or programs. If it has taken many hours to arrange the applications, drawers, and icons on your hard disk, you don't want to lose that work, either. After the drive has been repaired or reformatted, you can restore it to its original state. It's good to keep an extra set of backups in a safe place away from the computer. You'll need to reserve a stack of disks for these backups.

Thanks go out to Harold Maybeck, who helped to describe what it's like to live without a hard disk. ⊡

ABSTRACTIONS

ARLAN LEVITAN

THINGS ARE GETTING WEIRD

What the heck is going on at my favorite computer company? If things get any weirder, it will have to reincorporate as Twin Peaks Computers. Recent events at Commodore leave the distinct impression that while the wagons are being drawn into a circle, the muskets seem to be pointed in the wrong direction.

At Commodore's home base in West Chester, Pennsylvania, heads are rolling in the marketing department faster than in *Nightmare on Elm Street*. At least six key executives, including the VP of marketing, have vanished in a flurry of pink slips and resignations, and company-wide cutbacks are rumored to be on the way. My sources posit two likely scenarios, with the first placing the axe in the hands of Commodore president Harry Copperman, who has reportedly been less than enthused with marketing's advertising campaigns, or recent lack thereof. The alternative view places Copperman's own tenure in jeopardy, with Commodore chairman Irving Gould cast as the Lord High Executioner. "Irv, I'll take golden parachutes for 500, please."

It's generally conceded that, other than a garish press conference, the marketing group failed to sustain any appreciable Amiga 3000 momentum. The 3000 was prominently featured in dozens of magazines last summer and received generally favorable treatment. Since then, the new machine has made like Elvis. It's a real shame. Besides being jackrabbit quick in Amiga mode, the 3000 packs plenty of punch when outfitted with ReadySoft's A-Max Macintosh emulator package. I recently clocked the aforementioned combo as being slightly faster than a pricey Macintosh IIci.

The few criticisms leveled against the 3000, concerning expandability, should be addressed with the introduction of the Amiga 3500 at the winter COMDEX show in Las Vegas. The 3500 will be housed in a floor-standing tower case, with plenty of expansion slots and a 100-megabyte hard disk standard and higher capacity drives offered as options. Unfortunately, the fate of a UNIX version of the 3000 seems to be up in the air. The software is reportedly ready to fly, and the system's price/performance ratio makes it a potential PC and Mac workstation killer, but Commodore higher-ups are questioning the firm's ability to sell such a machine into the Fortune 500. It seems nobody is willing to step up to building a corporate sales staff that will actually call on prospective customers.

What little advertising that is planned for the 1990 holiday season is focused on the Amiga 500. The theme of most of the ads is *What do you do when your mind outgrows Nintendo?* Anyone passingly familiar with the home videogame market knows what those people do. They buy Sega Genesis systems.

The only thing that may keep things hot is the impending release of NewTek's Video Toaster, which may end up making the Amiga a de rigueur part of any professional or semipro video studio. Commodore execs recently visited NewTek's headquarters/clubhouse in beautiful downtown Topeka. Although they were mightily impressed, they reportedly declined to butter NewTek's toast or kick in any additional bread for Toaster promotion.

There are also strong indications that Commodore may be prepared to throw the baby out with the bath water. Spokespersons for Commodore USA have recently taken great pains to distance themselves from the company's CDTV project. When questioned about the status of the Amiga-based appliance, Commodore USA representatives disavow any knowledge concerning CDTV, insisting that all aspects of product development and delivery are being handled solely by the company's international division. The inside word is that the project is hopelessly behind schedule, and it's even money whether CDTV will ever become more than a vapor product.

Meanwhile in the United Kingdom, Commodore has released a computer in game-machine clothing. Amiga fans will be disappointed to learn that the new machine is not based on a stripped-down Amiga 500. With no CDTVs to ship, Commodore has come up with a plan to empty those warehouses chock-full of Commodore 64s that can't be given away for love nor money. Those crazy Brits have unleashed the 64GS, a mutated, keyboardless C64 with a cartridge slot and joystick ports. Commodore is packing four games into each cartridge in an effort to fend off increasing sales of game machines in England and Western Europe.

There's a ray of hope amidst all of this doom and gloom. By most accounts there are almost 2 million Amiga owners spread over the face of the planet. Stock analysts estimate that CBM chairman Irving Gould holds about 5 million shares of Commodore stock, which has been going for a shade under 5 bucks a share. If we all kick in 12 bucks or so, we can buy out Irv and install yours truly as chairman of the board. How can we lose? I'll be the first to admit that I've demonstrated a total lack of managerial and/or administrative ability during the ten years I've been writing for *COMPUTE* and that I'm prone to inappropriate random irrational acts. Look at it this way—at the very worst, it'll be a wash. ⊡

LET'S FACE IT—MAIL ORDER HOUSES ARE *NOT* ALL THE SAME!

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CLI CLIPS

JIM BUTTERFIELD

MISSING MOUSE BLUES

There are times when you want to do mouse things but it's inconvenient to use the mouse. Perhaps you have a cramped work area, and the mouse doesn't have grazing space. Perhaps your mouse is buried in a mound of documents. Or your mouse is broken. Recently, I even talked to a poor soul whose mouse had been stolen. Mousenappers? The mind boggles.

You can use the keyboard to do mouse things. The qualifier keys on each side of the space bar and the cursor keys are all you need to do the trick. To move the mouse, hold down one of the Amiga keys (the keys marked *A* next to the space bar), and press a cursor key. The mouse accelerates as the key is held down, so you'll need to develop a tap-and-release method in order to position the pointer exactly as desired. To simulate a left–mouse button click, press both the left-Alt and left-Amiga keys; for a right-button menu click, hold down right-Alt and right-Amiga keys.

In principle, you can do almost anything with the keyboard that you normally do with a mouse. It takes some skill to handle resizing a window or selecting a menu item, and using a drawing program becomes impractical. Your fingers don't seem to be long enough to reach all the necessary keys; it's best to have a real mouse on hand. Find it, fix it, make room for it, or buy a new one if you need to.

Starting from the CLI or Workbench. Some programs, such as the commands in your C directory, can't be started from the Workbench. You must type the command at a CLI or Shell prompt. Workbench 2.0 has a whole new set of features that allow virtually any program to be launched from the Workbench. If you don't have 2.0, it's no hardship to type the commands, unless your Amiga is as bad at spelling as mine seems to be. (When things go wrong, I always blame my computer.)

Many Amiga programs may be started either way: from the Workbench by double-clicking the icon, or from the CLI by typing the program name. Sometimes, however, the program seems to run differently according to which way you started it. Tasks launched from the Workbench don't always look the same as they do when they are run from the CLI. There are two major reasons for this.

Icon files. First, there may be extra information stored within the icon of the program. The icon is stored in a file that's named the same as your application, except that it ends with the file extension *.info*.

If you click once on a Workbench icon and then select Info from the Workbench menu, you'll see this extra information in the area called Tool Types. Sometimes this area is empty, and sometimes it contains a lot of data. Use the scroll gadgets to examine the entire list of Tool Types.

When you start a program by double-clicking on its icon, the Workbench reads the .info file and its contents. The Workbench then starts the appropriate program and delivers the extra data from the .info file to the program. This way, you can customize features such as window size, fonts, and colors using information stored in the .info file.

But CLI knows nothing of any .info file and starts a program without reference to any such supplementary data. For example, if you type ZONK, the program called *Zonk* will begin to run immediately. The Amiga will take no notice of a file called Zonk.info or its contents.

Many programs also allow you to specify options as part of a CLI command line. These options usually serve the same purpose as the data within a .info file. Options, or *switches,* are often preceded by a dash character. For example, the *WordPerfect* icon might contain a Tool Types option named *WORK AREA.* To invoke this same option from the CLI, you would type WP -w followed by the size of work area you needed. As always, check the program's documentation to see how it handles this kind of thing.

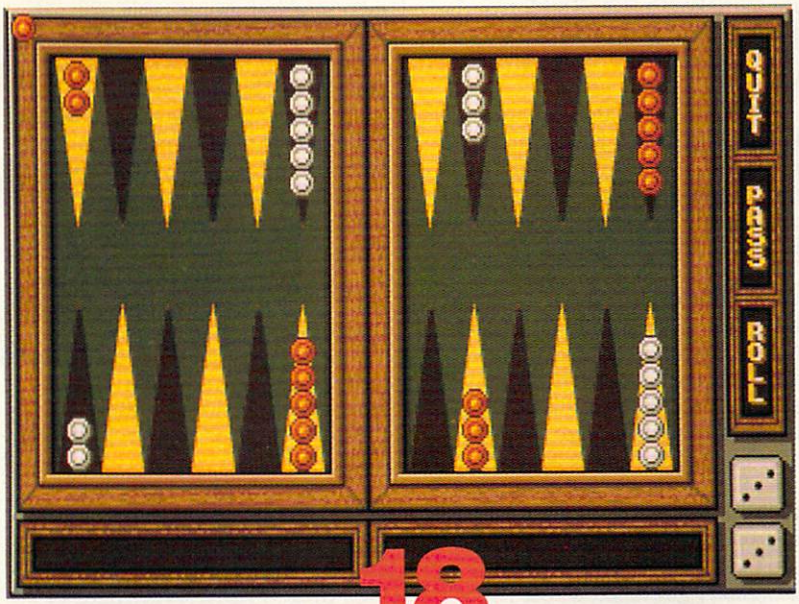
Current directory. A second reason that CLI and Workbench programs seem to run differently is related to the program's *current directory.* When you double-click on a Workbench icon, the current directory is set to that program's drawer. If the program then starts looking for files, it will most likely look in this drawer. Such startup data files may contain pictures, hot-key information, text, or almost anything else.

In contrast, a program started from the CLI will often not change the current directory that is active at that time. If such a program looks for files, it may look in your currently specified CLI directory rather than in the directory containing the program and support files.

Suppose your current directory is RAM: and you decide to start a program by typing its full path name, DF0:SOURCE. The program will start to run and might start to look for special files. Chances are it won't look in DF0:, where the files are actually stored. Instead, it will look in the current directory, which is RAM:, and won't find the files it needs.

If you suspect that this is your problem with a program started from the CLI, the fix is easy. Just change the current directory to the one containing the program and support files before you start. In the previous example, you would type CD DF0: and then type SOURCE. ⊡

ON DISK



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GAMMONX

STEVE TIBBETT
AND
BRAD SCHENCK

Note from the Editors: GammonX *is an Amiga version of the classic board game backgammon. For its five levels of computer opponents and its stunning graphics,* GammonX *received third place in the Amiga Resource $10,000 programming contest.*

Getting Started

To run the program, double-click on the *GammonX* icon, which can be found in the GammonX drawer on this issue's companion disk. *GammonX* will display a series of credits windows. Click on each window to make it go away. *GammonX* may also be started from the CLI. Be sure to change directories (CD) to the *GammonX* directory so that the program can find its graphics file (GammonX-.Dat). *GammonX* is fully multitasking so that you can play while you work. Press Left Amiga–N to get to the Workbench screen and Left Amiga–M to get back to *GammonX*.

You set up and start the game using the program's menus. The *GammonX* menu has three selections: New Game, About, and Quit. New Game starts a game, About displays the first credits window, and Quit exits the game. The other two menus let you choose the players. The player controlling either side can be human or one of five types of computer player. So you can play human against human, computer against human, or computer against computer.

To start the game, set up the light and dark players as you wish and then select New Game. The computer will roll the dice. In *GammonX,* the player controlling the dark pieces moves first. You can always tell whose turn it is by looking at the turn indicator (a white or brown backgammon piece) at the top left corner of the screen.

There are three gadgets on the right side of the screen. Quit immediately exits *GammonX*. Pass allows you to give up your turn when you cannot make a move. Roll forces the computer to move your pieces, which is handy for beginners who are just learning to play the game.

In *GammonX,* the computer rolls the dice. To move a piece, you move the mouse pointer over it and press the left mouse button. While holding down the button, drag the piece to its destination. Then release the button.

How to Play

Backgammon's rules are fairly simple. The backgammon board is divided vertically by a bar. The lower left quadrant is the home table of the dark side. The upper left quadrant is the home table of the light side. Each player has 15 pieces (called *men*), which start the game on four triangles (called *points*). The dark men move from left to right across the top of the table, then right to left across the bottom of the table. The light men move from left to right across the bottom of the table, then from right to left across the top of the table.

In *GammonX,* the dark player moves first. During your move, you choose one of your men and move it along the points according to the value of one of the dice. Then you choose another man (or the same one) and move it according to the value of the other die. In the case of doubles, each die is used twice. For example, a pair of 6s means that four men can be moved 6 points each, two men may move 12 points, two men can move 6 and one man can move 12, and so on.

You can't make a move if it means your man will land on a point occupied by two or more opposing men. If your man is placed on a point containing a single opposing man, the opposing man is sent onto the bar.

If you have a piece on the bar, you can't move until that piece has been taken off the bar. You can take your man off the bar if you roll a number which specifies a point in your opponent's home table that doesn't have two or more opposing men. For example, if you have one piece on the bar and you roll a 1 and a 2, you can place the piece on the table on the leftmost point of your opponent's home table or on the point next to it, assuming that one of those points has fewer than two opposing men already sitting on it.

When you've moved all of your men into your home table, you can begin to bear off. Bearing off is the procedure of removing pieces from the board. The ultimate goal of the game is to bear off all of your pieces. You bear off men according to the dice you roll. For example, if you roll a 3 and a 5, you can pull one piece off the third point from the left and one from the fifth point from the left. If a die indicates a point that's unoccupied, you bear a piece off of the highest point below that value.

GammonX makes it easy to learn how to play backgammon. It doesn't let you make illegal moves, and if you get stuck, you can click on Roll to make *GammonX* move your pieces for you.

There's a lot of strategy to backgammon. To learn more about the game's rules and its strategies, read *According to Hoyle* by Richard L. Frey (Fawcett Crest Books).

SPHEROIDS

KEVEN DIXON
AND
TROY TUCKER

In the year 2100, nuclear weapons are relics of a forgotten era. In this day and age, countries settle their differences in a duel between representative gladiators. The site of their engagement is the Arena, a manmade battlefield consisting of treacherous pits and hills.

At the start of each duel, six lethal spheroid bombs are randomly scattered about the Arena. Each contestant moves about in a hovercraft, collecting the bombs and then firing them at the opposing gladiator. Because of their spherical shape, the bombs roll across the Arena at high speeds. But at the same time, the undulating surface of the playfield makes their movement unpredictable. As you'll soon learn, the keys to survival in *Spheroids* are quick reflexes and a deadly aim.

Getting Started

To play *Spheroids,* plug one or two

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DISCOVER

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joysticks into your Amiga and then double-click on the *Spheroids* icon. After a short delay, the game screen will appear. Before each game, you must select a battlefield. There are seven to choose from: Open, Quadrate, Diamond, Cyclone, Corner, Cross, and Lattice; these are selected by pressing F1 through F7, respectively. Each battlefield, with the exception of Open, contains mounds and depressions. These appear as diamond-shaped objects on the screen and come in three different sizes. Mounds are yellow, while depressions are gray.

Every battlefield contains a teleport device that appears on the screen as a pulsating purple square. When a hovercraft or a spheroid enters the teleporter, it's transferred randomly to another location on the playfield. In the process, the teleported object retains its original velocity and direction.

After you've selected a battlefield, you must select the type of game to play. Press F8 for computer vs. computer, F9 for player vs. computer, or F10 for player vs. player. Play begins after you've made a selection. Initially, each player is given nine hovercraft. The green ship, controlled by joystick 1, appears at the upper right corner of the screen; the blue ship, controlled by joystick 2, is at the lower left. The number of craft remaining for each player is shown at the top of the screen. The game ends when you've destroyed your opponent's entire hovercraft fleet.

If you're slow in making your selections, the game will enter a demo computer vs. computer game. It's a good idea to watch the demo for a few minutes prior to playing, so you can see how the undulations affect the hovercraft and the spheroid bombs. Press Esc at any time to exit.

Playing the Game

Players use bombs, or spheroids, to try to eliminate the opponent. Six spheroids are scattered randomly across the battlefield. These small devices are collected and fired from the hovercraft. When launched, they roll across the battlefield at high speeds. To pick up a spheroid, simply guide your hovercraft over one. When you're ready to fire, push the joystick in the direction you wish to shoot and press the fire button.

Once fired, the spheroid assumes the color of the firing ship. If the opposing player's ship comes into contact with a spheroid armed by your craft, the ship is instantly destroyed. Armed spheroids have enough momentum to propel themselves about two lengths of the Arena. When its energy has dissipated, the spheroid slows, and its color reverts back to neutral red. Either player can now pick it up and rearm it.

Since the spheroid bombs roll along the surface, the mounds and depressions affect the way they travel across the playfield. For example, if a spheroid is fired into a depression, it will roll around the sides until it eventually settles in the center.

When the game is over, the appropriate bar at the top of the screen will flash, indicating the winner. At this point you can change battlefields with the function keys or immediately begin a new game on the same field. Press Esc to exit the demo mode or a game in progress; then press Esc again to quit the program.

Game Tips

There are several playing strategies that you might like to try. If you fire a spheroid into the teleporter, occasionally it will materialize next to your opponent, destroying his or her craft in the process. Also, try using the mounds and depressions for bank shots.

At times, your craft will fall into a depression. If you simply thrust in the direction that you want to go, it will take you a while to escape. The quick-

est way to get out of a depression is by rocking your hovercraft back and forth until you gain enough momentum to escape.

Sometimes, several spheroids will appear very close together. If you hold down the fire button and maneuver around them, you'll fire a deadly volley in the direction you're traveling. Firing a stream of spheroids into the teleporter is almost certain death for your opponent. Since the teleported spheroids materialize in different locations, your opponent will have a hard time evading all of them.

MOUNTAINS

L. C. HASELMAN

One of the most fascinating things computers do is mimic reality. When workstation computers with powerful graphics became available, programmers took a break from simulating traffic lights and began to model the visual world. *Mountains* brings fractal landscapes to the most graphically powerful home computer—your Amiga.

Mountains is a complex program with many features, but it's easy to get started building landscapes with the program. Just run the program from the Workbench by double-clicking on the *Mountains* icon in the Mountains drawer or by typing RUN MOUNTAINS from the CLI. When the *Mountains* screen appears, select the first item in the first menu (Demo). *Mountains* will generate a random landscape (you'll see an overhead view) and then render that landscape in three dimensions.

The demo landscape isn't perfect; it fills only part of the screen. But it does show you the program's potential.

Impressed? The program can do much more. *Mountains* lets you draw your own landscapes with special tools. You can view your landscape from any direction. And if you'd like, you can save your scene as an IFF image.

Getting to Know *Mountains*

When you selected Demo, you saw a 100 × 100 rectangle in the upper left corner of the screen. This is the map area used in creating mountains. This map area is an overhead view with color-coded altitude information.

The first menu, Control, has six items: Demo, Interrupt, Save Image, Map Data, Clear All, and Undo.

Demo creates a sample landscape, and Interrupt halts *Mountains* while it's rendering a scene. You can save your scene to disk with Save Image; just type the full pathname (such as dh1:images/TwinPeaks) and then click on Store. The Map Data option lets you load or save the point-by-point data of your scene so that you can later render your scene from a different angle. Type in the full pathname of the file you wish to save or load.

Clear All clears the screen and the map data, and Undo lets you correct mistakes or change your mind. (You can even Undo a Clear All if you'd like.) Undo won't be available unless you have enough free memory. If you find that you can't perform an Undo, you may wish to flip back to the Workbench screen (with Left Amiga–M) and close any memory-intensive programs you may be running. Finally, Quit exits *Mountains*.

Options Galore

The next menu, Options, also has six items: Create, Magnify, Lake, Base, Top, and ReScale.

Create lets you place your own peaks on the map. Selecting Create pops the map up onto the screen. The pointer changes into a small rectangle, and a gadget appears to the right of the map. This is the altitude gadget, which determines the height of the mountains that will be created. Adjust the altitude gadget to about half its maximum value. Draw a rectangle anywhere on the map by holding down the mouse button and dragging the pointer. Release the mouse button, and a mountain will be drawn.

Magnify lets you zoom in on part of your map. For instance, suppose that you've drawn a whole range of mountains but you decide that you'd like to just use one of them. Magnify lets you strip out the surrounding area. When you select Magnify, the map pops, and the mouse pointer turns into a small rectangle. Click on the upper left corner of the desired area and drag it to the lower right quadrant. The map will be redrawn when you release the left mouse button.

Lake lets you set sea level to any height you wish. When you select this item, the mouse pointer will turn into a crosshairs pointer. Click on the map at the point where you'd like sea level to be. All connected points at that level or lower will be rendered as water.

Base lets you set a low point for the land. It works much the same as Lake, except that it affects the entire map, not just adjacent areas. Use Base to create flat valleys or plains.

Top levels off the peaks of mountains. When you select this item, the mouse pointer will turn into a crosshairs pointer. Click on the map, and all points above the altitude you clicked on will be reduced to the level you've chosen. Use Top to create mesas.

ReScale lets you change the data in the map so that it ranges from minimum to maximum elevations (0 and 10,000 units, respectively). If you've used Zoom, Base, Top, or Create, you should try ReScale. The colors in the 3-D image are assigned according to the elevation. If you try ReScale and don't like the effect, select Undo to return to the previous map.

Flexible Viewpoints

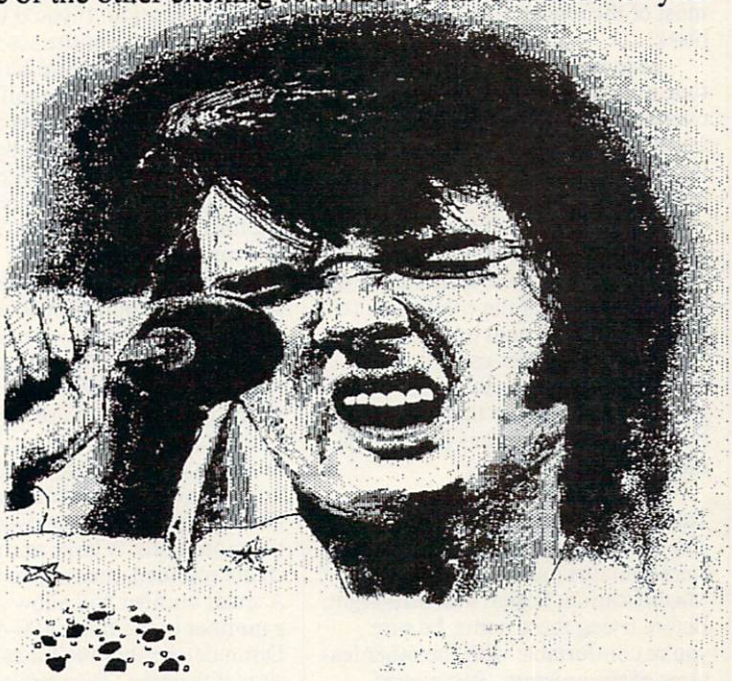
The next menu, Display, has eight items, which control the screen display: Clear, Color, Scale, Frame, Mesh, Sky, Map, and 3D Plot.

Color lets you choose the color palette for your scene. There are three choices: Map makes the map easier to view, Day sets daytime coloration, and Night sets nighttime coloration. You can toggle Scale on and off. When Scale is on, the colors will be assigned so that the maximum elevation will have the maximum color. This does not effect the map data. If Scale is off, colors will be assigned according to the map elevations with 0 being the minimum and 10,000 the maximum. Note that it's possible for elevations to be greater than 10,000—unless the map has been ReScaled.

Frame can also be toggled on and off. When it's on, only the outlines of the polygons that make up the rendered scene will be drawn. When it's off, a filled polygon will be drawn. Use Frame for an interesting effect. ▷

GHOST OF ELVIS HAUNTS COMPUTER
New Year Sighting Creates Havoc With DTP

Elvis Presley is alive and kicking, from one Amigaphile's point of view. Every time a graphic is imported into his Desktop Publishing program it comes up as The King (see illustration below). This Amigan, who wishes to remain anonymous, was able to scan the graphic as a permanent piece of clip-art and has submitted it to our library for distribution. You too can obtain this and other exciting pieces of clip-art (this one is on disk #9075, Clip Art #3) by sending in $3.99 plus $2.00 shipping and handling to the address below, or you can call our TOLL FREE number. But before you do take a look at some of the other exciting software we have in store for you:



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Note that Frame works best when the polygons making up the scene are relatively large. Mesh is similar to frame, except that the polygon is drawn in the appropriate color and outlined in black. If you're using a high-resolution grid (that is, your polygons are small), most of the rendered image will be black.

Map brings up the overhead altitude map. This map will probably overlap your rendered image. Selecting 3D Plot or Clear will erase the map. Selecting Sky adds a simple blue swatch of color behind the scene.

3D Plot lets you render your scene. There are three types of 3D Plot. The first is lines, which gives you a quick preview of the coloration, rotation, and placement of your scene. Quads and Triangles use four- and three-sided polygons to render your scene. Quads is faster than Triangles, but Triangles sometimes produces a more detailed image.

Taking Control

The final menu is Parameters. Parameters contains four items: Rotation, Magnification, Scales, and Size-Light. Before trying these items, be sure you're comfortable with the other features of the program. Parameters gives *Mountains* its power. But it will take some experimenting to use that power wisely.

Using Rotation, you can control the angle and position from which you view the scene. When you select Rotation, a requester opens with four numeric gadgets: X-Angle, Z-Angle, X-Start, and Y-Start. X-Angle can range from 0 to 90. At 0, you're looking at the scene from the ground, edge on. At 90, you're looking from the air, straight down. Angles from 20 to 40 degrees are typical. Z-Angle lets you walk around the scene. An angle of 0 lets you look from the south end of the map, an angle of 90 lets you look from the west edge of the map, an angle of 180 lets you look from the north, and an angle of 270 lets you look from the east. The default value is 10, a number just far enough away from 0 to keep the image from looking square or boxish. X-Start and Y-Start let you center the scene on your screen. Since the screen is 320 pixels wide, 160 is the default X-Start value. Since the mountains come up from the base of the terrain, the default Y-Start is 120, about 20 pixels below the center of the screen.

Magnification controls the size of the rendered image. Magnification opens a requester with four numeric gadgets: X-Axis, Y-Axis, Z-Axis, and View-Pt. X-Axis controls the horizontal magnification. If you'd like to have the image fill the entire screen, increase this number. Similarly, Y-Axis controls the vertical magnification of the image. Z-Axis controls how steep the mountains are. If you want your mountains to be more jagged, increase this number. If you'd rather have rolling hills and gentle valleys, decrease this number.

Scales controls the look of your scene by controlling the low-level fractal creation engine. It opens a requester with four numeric gadgets. The changes you make here will be reflected the next time you use Demo or Create to build mountains. These numbers do not affect the display of mountains you've already built. The Form gadget affects the overall look of the mountains. A large number will create rounded, massive mountains. A small number will allow spires. Use a number in the range 100–900. F Dimn determines the fractal dimension of the map. The smaller the number, the more rugged your terrain; use a number in the range 0–100. Delta is the maximum change allowed in altitude from one point to the next. Scale is the maximum elevation that will be used by the ReScale option; 10,000 is the maximum allowed. For example, 5,000 would scale the map to half the maximum elevation.

The final menu item, Size-Light, controls the size of the map and the lighting. When you expand a scene to fill the entire screen, you'll find that the default size settings make for a rather chunky map. To increase the resolution of your image, increase the map size. X-Size and Y-Size default to 100 each. This makes a map with 10,000 points. If you'd like greater resolution, increase these values. But beware: Working with a 200 × 198 map will be about four times slower than working with a 100 × 100 map. The maximum X-Size is 300; the maximum Y-Size is 198. For reference, each map point requires three bytes of memory with a similar amount being needed by the undo buffer.

Light controls the angle at which the light strikes the scene. Use a number in the range 0–90. The default value is 45, which corresponds to about 9:30 a.m. A value of 0 places the sun at the horizon. A value of 90 puts the sun directly overhead.

Quad controls the direction from which the light is coming. The top of the map is 1, the right side is 2, the bottom is 3, and the left side is 4. Any other number makes the light overcast and diffuse.

Technical Information

Mountains is a multitasking program. To flip to the Workbench, press Left Amiga–M. To flip back, press Left Amiga–N. *Mountains* was written in *J-Forth,* a language known for its efficiency and quick integer arithmetic.

OTHER PROGRAMS ON DISK

There are a few handy programs contained in the *Amiga Resource Disk*'s C directory that some readers may not be familiar with.

RD

A speedy program for reading text files, *RD* works from the Workbench or CLI. Copy *RD* to the C directory of your Workbench disk. To use it from the Workbench, use the Info menu item to change the Default Tool of your text file's icon to C:RD. From the command line, you just type RD *filename(s),* where *filename(s)* is the name or names of the files you wish to read. *RD* also supports both AmigaDOS- and ARP-style wildcards; typing RD ~*.info will allow you to read all files that don't end with the .info extension.

New in *RD* 1.1: Screen handling is up to two times faster. It no longer needs arp.library, so you can add it to almost-full Workbench disks. *RD* now handles complex escape sequences and supports Workbench 2.0–style scroll bars and system fonts.

V

This utility displays both standard IFF and Sliced HAM pictures. The stripped-down version included on this month's disk no longer requires the 17K arp.library file but only works from the Workbench.

To use *V,* copy it to the C directory on your Workbench disk and change the Default Tool of your picture's icon to C:V. Then just click on your picture's icon to show it.

ColorBench

This tiny utility adds an extra bitplane to your Workbench screen so you can utilize eight-color icons. Just copy it to the C directory of your Workbench disk and add the command COLORBENCH to your S:startup-sequence file.

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IMD AND MAKEEMPTY

Dale McBane

Intuition MakeDir (IMD) is a replacement for the MakeDir program that's found in the C directory of your Workbench disk. It works the same way that MakeDir works except that it can create a Workbench icon for the directory. If you use *IMD* on a directory that already exists, that directory will be unchanged, but it will now have an icon so that you can view it from the Workbench.

MakeEmpty is a MakeDir program for Workbench users. It lets you create a directory called Empty. Normally, you must duplicate a drawer (a drawer is the Workbench name for a directory) called Empty to create a new directory. Then you must drag that drawer over to its destination. By using extended selection, *MakeEmpty* lets you create a new drawer wherever you want it.

Using *IMD*

First, copy *IMD* from the C directory of the *Amiga Resource Disk* to the C (Command) directory on your Workbench disk or hard drive. Enter COPY RESOURCE9:IMAKEDIR/IMD C: at a CLI or Shell prompt to do this. Type *IMD* to see the command's usage instructions. Here's the syntax of the instruction:

IMD *dirname* [*infofilename*|NOICONS]

Dirname is the name of the directory to create, *infofilename* is the name of a .info file to be used as the source for the icon of the directory (optional), and NOICONS is an optional parameter that prevents *IMD* from creating an icon for the directory.

Here are a few examples of how to use *IMD*.

IMD RAM:fred

IMD creates the directory RAM:fred and then looks for the file S:Drawer-.info. If *IMD* finds S:Drawer.info, it copies the file to RAM:fred.info. If it doesn't find the file, the program writes a default icon to RAM:fred.info.

IMD RAM:fred SYS:Empty.info

IMD creates the directory RAM:fred and then looks for SYS:Empty.info. If it finds SYS:Empty.info, it copies the file to RAM:fred.info. If it doesn't find SYS:Empty.info, it tries to copy S:Drawer.info. If that fails, it writes the default.

IMD RAM:fred NOICONS

IMD will then behave just like MakeDir. If you'd like to make some room on your boot disk, you can delete MakeDir from the C directory and rename *IMD* to MakeDir. (Always work with a copy of your Workbench disk, not the original.) Or you can delete MakeDir, leave *IMD* named as it is, and place the following line in your startup-sequence file or your shell-startup:

```
ALIAS MakeDir "IMD [ ]
  NOICONS"
```

Then you can type *IMD* if you want an icon created or MakeDir if you don't.

If you don't like *IMD*'s default icon, you can replace it with your own icon. Simply copy a drawer .info file to s:Drawer.info, and *IMD* will automatically use that .info file from now on.

Using *MakeEmpty*

Using the Workbench, drag *MakeEmpty* from the *Resource Disk* to your Workbench's Utilities drawer. When you want to make a drawer, open the Utilities drawer so that you can see the *MakeEmpty* icon. Click once on a disk or drawer icon to select it. Then hold down Shift and double-click on the *MakeEmpty* icon. It's that easy. Because of a limitation of the Workbench, you may need to close the destination window and reopen it to see the new folder. Use the Rename Workbench menu item to change the name of the drawer. ⊡

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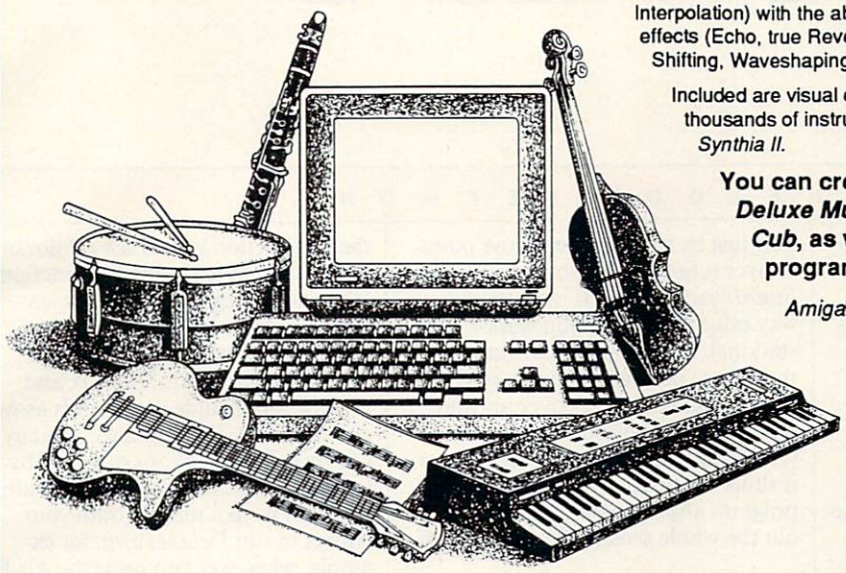

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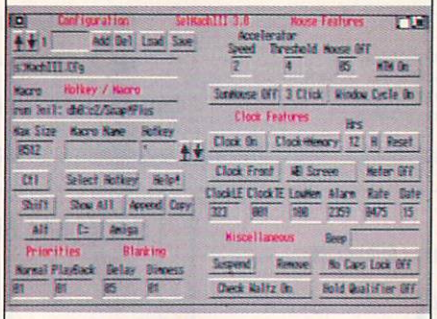
SHELDON LEEMON

When it comes to making everyday computer operations a little faster and a little easier, almost everybody has an opinion on how it should be done. That's one reason so much shareware programming effort is expended on certain categories of utilities. A good example is the category I like to refer to as *mouse thingies.* These catchall programs usually incorporate a mouse accelerator, a clock, a screen blanker, and about a dozen other mouse- and window-manipulation tools. While programs like *DMouse* and *Qmouse* have their supporters, my personal favorite is *Mach III,* which you'll find in the Download drawer of this month's *Amiga Resource Disk. Mach III* combines loads of useful functions into a single program. Best of all, it lets you tailor these functions to suit your exact needs.

Mach III disproves the adage that you can't teach an old mouse new tricks. Its first lesson is mouse-pointer acceleration. Acceleration is better than just making the pointer faster, because when you increase the distance the mouse pointer travels for each inch you roll the mouse, you lose accuracy. An accelerator makes the mouse move faster the farther you roll it, so that it zips along if you move from one side of the screen to the other, but it travels at the normal speed if you just move it a little bit. *Mach III*'s accelerator gives you the choice of multiple rates and threshold settings.

The program provides plenty of other mouse-related features, too. The mouse-to-menu feature automatically moves the mouse pointer to the top of the screen when you press the right mouse button. *Mach III* also lets you use the mouse to depth-arrange windows and screen. If you hold down the left button and click the right button over the topmost window, it will move to the back of the stack. If you triple-click on a window in the back, it will move to the front. If you perform these tricks outside of a window, the whole screen moves to the front or back. *Mach III* lets you activate a window just by moving the mouse pointer over it (a feature known as *SunMouse,* because it imitates the way mice behave on Sun workstations). Finally, *Mach III* turns off the mouse pointer when you start typing (so that it doesn't cover up your text) or after a period of inactivity. (Note that when it blanks the pointer, it shuts off all other sprites, too.) The program also lets you dim or black out the whole screen after a period of inactivity. All of these features may be disabled or adjusted.



***Mach III*'s setup screen.**

Mach III's clock has everything but the kitchen sink. It can display the time and date, the time and amount of free memory, time only, or memory only. When time is money (like when you're using an online service that charges by the minute), it can display the accumulated charges in dollars and cents, instead of in minutes. The clock display changes color to warn you if free memory falls below a certain level. The clock also has an alarm that can play a sampled sound file. You can easily set the position of the clock display, and you can also specify whether you want the clock to always pop in front of any window or even to the topmost screen.

As if all that weren't enough, *Mach III* has outstanding macro capabilities as well. Macros are recorded keyboard and mouse events that you can play back by pressing a hot-key combination. A simple example of a keyboard macro would be assigning the string "diskcopy df0: to df1:" to the F1 function key. *Mach III* doesn't restrict you to replacing the function keys with strings of alphabetic keystrokes, however. You can use any exotic hot-key combination you can think of (such as Alt-Shift-Q), and macros can include commands as well as keystrokes. You can also turn any of *Mach III*'s functions on or off by using macros. You can even execute a program from a macro (train your Amiga to run *DeluxePaint,* for example, whenever you press the Alt-P combination).

A macro can call another macro or itself. Creating a macro is a snap. You can either enter the text and escape commands manually with the *SetMachIII* configuration program, or you can have *SetMachIII* record your keystrokes and mouse movements as you go.

Mach III's macros have some unique features. For example, the program allows you to link a set of configuration options to a particular window. That means you can have one set of macro keys in effect for your shell window, and automatically switch to another set of keys (or no macros at all) when you activate a program window. There's also an autoexecution feature that allows you to automatically execute a particular macro when you start the *Mach III* program, at a certain time of day, or even every few minutes. Finally, *Mach III* has an *ARexx* port that allows you to execute a *Mach III* macro under the control of another program.

Although *Mach III* started out as a mouse accelerator, it has branched out to give excellent control over the entire stream of input events (mouse movement, button clicks, and keystrokes). While Workbench 2.0 makes a start at providing these kinds of facilities with its mouse acceleration, window click-to-font options, and Commodities Exchange (which provides screen blanking, window sizing with hot keys, and keyboard macros), it still can't match *Mach III*'s wide range of custom settings and versatile programmability. ▣

an A500 expansion module holding four A2000 Zorro II cards, three drives, a power supply, and a fan.

Great Valley Products' large booth was filled with the things hardware dreams are made of, including a 600MB Ricoh magneto-optical drive.

ICD wowed the crowds with three minutes of *Predator* film and soundtrack (over 300MB of hard drive data) playing back in realtime at 24 frames per second under joystick control. ICD also showed its Flicker Free Video board, which works on all Amigas.

Progressive Peripherals & Software had the show's only functioning 68040 card for the A3000 in an early prototype (the computer case was open, and a fan was blowing across the CPU to cool it), and on the same board was an astonishing data-compression chip which effectively doubles the size of any disk it writes to by compressing and decompressing data in realtime.
PP & S also previewed the Video Blender, a genlock with switching, wipes, f/x, luma-keying, and more.

The software. New software packages were also in abundance. HoloSoft Technologies' new animation/paint program, *Graphics Workshop,* might turn out to be the sleeper of the year. Its includes a ten-brush library, gray scaling, line-art, polygons, rays, patterns, shadows, cell animation, 20 separate palettes, and 1289 simultaneous onscreen colors.

MicroPACE Distributors showed a number of new Amiga games, including KarmaSoft's new *Power Pinball,* the first pinball-construction simulator for the Amiga, and a preview of FTL's *Dungeon Master II*.

New Horizons Software previewed *Graphics Designer,* an object-oriented color drawing program. It looked great, and it's very fast.

Oxxi/Aegis's huge display was bulging with new products, including *AudioMaster III,* now with sequencing and a simulated CD-player; *SpectraColor* from *Photon Paint*'s authors, which adds HAM brush and key-frame animation; Martin Tailleffer's new *TurboText* editor and Modula-2 compiler; and some new entertainment titles, including *Fast Eddie's Pool, Capitalism,* and *Visionary,* an adventure-game construction kit.

Pelican Software's *Pelican Press* is billed as a publishing program for the entire family. It's capable of creating and printing posters, comic books, and signs and looked like a lot of fun.

Progressive Peripherals & Software showed *Doubletalk,* an AppleTalk-compatible network system for Amigas and Macs.

Right Answers Group demonstrated the long-awaited *Director* 2.0, now with an integrated script editor, Workbench operation, SMUS score syncing, and more.

Virtual Reality Lab's astounding *Vista* software, which generates photorealistic landscapes based on U.S.G.S. Data Elevation Map files, gave a sneak peek at *Vista* 2.0, with a ton of new features, including Goraud shading, support for all graphic resolutions, 24-bit file output, and more.

Zardoz displayed *ImageFinder,* a program that scans all IFF images on your disks and builds a visual index from them—postage-stamp-sized pictures to aid you in finding just the right image you need without having to plow through disk directories.

—HARV LASER ⊡

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JUST FOR FUN

SHAY ADDAMS

WHAT'S UP FOR 1991

Copperman goes country-and-western. This is just one of many surprising, yet bound to come true, predictions of what 1991 has in store for Commodore and the Amiga.

These predictions were made possible by the latest program from Psychic Software (yes, the same software wizards who brought us last year's *Mystic Term* for telecommunicating with the deceased). An innovative program with countless capabilities, the *Amiga Mage* can forecast anything from the weather to the final point spread on the Lakers' next game. And for people who don't know what they want to know, *Mage* offers the most user-friendly feature yet—a special Intuition mode that reads your mind so it can reveal what you unconsciously want to know. All this, and icons too!

But enough hype. As most of you have figured out by now, I've never even seen the *Amiga Mage*. I'm just doing what lazy software reviewers do: rewriting the press release that accompanied the program. (With dozens of packages arriving daily, who has time to open them all? If it doesn't have lurid pictures of half-naked slave girls on the cover, I won't give it a second look.) And according to the press release, this is what the *Mage* says about the Amiga in 1991.

The Amiga will finally get an operating system. According to game designers, AmigaDOS (which they often refer to as AmigaDOG) will actually work this time, and they won't have to disable it and write their own operating system from scratch! This could cut development time in half, leading to twice as many new Amiga games by 1992 (unless the designers spend that extra time looking for another excuse to bad rap the Amiga, or even more unlikely, finding reasons to bad rap the IBM).

Commodore president Harry Copperman will give up the corporate mantle and go on the road with Willie Nelson's band. His first live gig will be Farm Aid 1991, where Copperman will play squeezebox and sing harmony with Johnny Paycheck on "Take This CDTV and Shove It."

Because of an obscure subparagraph in United States copyright laws, all commercial software will be recategorized as public domain software by June 30, 1991, thus ending all those frustrating "look up the keyword" sessions, along with all other forms of copy protection. As a result, all USA-based programmers will relocate to Bimini and devise the even more frustrating "Biminese copy-protection scheme."

Imported from Japan, C64 clones will outsell the Amiga, IBM, Nintendo, and Sega combined, forcing software companies to send their designers to Remedial Sprites 101 class in Cupertino.

Jack Tramiel will take over Commodore, but not till he's run Atari even deeper into the ground than he did Commodore. His first official act will be a Jack Attack in which he'll bomb IBM plants in Florida and Texas with tons of unsold CDTV units. He'll then go on to develop the Commodore Plus/68, a 68000-based machine with *TextCraft, GraphiCraft,* and two other applications built in that's completely incompatible with the Amiga.

The new, improved *.info Magazine* will publish its first issue that doesn't take a cheap shot at a single Amiga program, peripheral, or even Commodore itself. But a bar-code read error at the post office will send every copy to software developers in Bimini, so no one else will ever know it happened.

Commodore stock will skyrocket when the United States finally takes the lead in the microchip market, but only after Japan is hit by a massive earthquake and sinks to the bottom of the Pacific.

Thanks to innovations in microminiaturization, desktop publishing will be replaced by desk-drawer publishing. All desktop publishers who refuse to purchase the necessary upgrades will be deported to Bimini. (In a related prediction, desktop video will be replaced by desktop radio.)

And now for my own predictions: We'll see many more Amiga conversions of MS-DOS games in 1991 as well as more "Amiga-first" titles from USA-based developers. MicroProse has already changed its mind and decided to convert *Railroad Tycoon,* my favorite simulation last year, and others are bound to follow suit. This is especially true since this is essentially a follow-the-leader industry anyway, and Sierra, one of the strongest Amiga supporters in terms of conversions, is perceived as the leader by many.

The flow of European Amiga software into the U.S. will increase as the Atari ST's popularity wanes over there. As a result, we can look forward to a greater variety of entertainment software this year.

How about hardware, you ask? The Amiga 3000 will gradually garner a bigger share of the multimedia market, mainly because of Microsoft's decision to base its related project on the slow but firmly entrenched 286 chip rather than the zippier 386. As the Apple II, Apple IIGS, and Atari ST die slow but painful deaths, their former owners who don't go MS-DOS will get Amiga 500s, so the 500 will outperform the CDTV and the 3000 in 1991. Naturally, Commodore will decide to kill the machine just about that time. And I will move to Bimini, where the living is easy and the cotton is high. ⊡

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ART GALLERY

KATMANDU

Saveen Reddy

Man, WV

Artist Saveen Reddy created this colorful hand-drawn (or should we say, mouse-drawn) image using MicroIllusions' *Photon Paint* on an Amiga 500 in 320 × 400 HAM mode. In regard to the $100 fee we pay for the right to publish Amiga art, Saveen says, "Any monetary gain from the use of the pictures will, you can be sure, go to the purchase of an Amiga 3000."

RICK

John Perkins

Corsicana, TX

This picture was digitized and then touched up using a paint program found on the Amiga Appetizer disk that came free with John Perkins's computer. Although John has owned his Amiga 500 for only a few months, he's been programming and drawing on a Commodore 64 for five years.

WORKSTATION

William Christjaener

St. Paul, MN

Workstation was created with *Sculpt Animate 4-D*. Artist William Christjaener says, "I've been using several ray-tracing programs for about three years, *Sculpt 3-D* being the first one I purchased. I just recently upgraded to 2.5 megs, which allows much more freedom to render complex models."

If you'd like to see your art in these pages, send it to us on disk at the address below. We pay $100 for each piece of art we accept. Rejected submissions are returned only to artists who enclose a self-addressed, stamped envelope.

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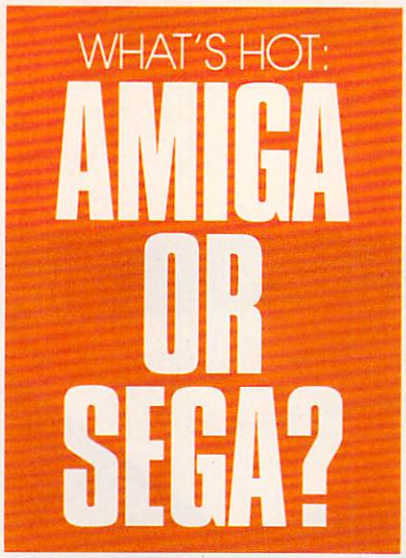
TAKING SIDES

RHETT ANDERSON vs. RANDY THOMPSON

SEGA! Almost seven years ago, Amiga Corporation started work on the ultimate game machine. But the videogame market faded, and the game machine was released as a computer. This schizophrenic birth has always been the pride and embarrassment of the Amiga community. While its heritage made it the most powerful home computer, the Amiga has always been seen as a game system by computer users and a computer by game players.

Still, Amiga owners could take consolation in the fact that their system played the best games around. But that's no longer the case. Three new videogame systems—the Sega Genesis, NEC TurboGrafix, and SNK's NeoGeo—have surpassed the Amiga as a game machine. Another up-and-comer, the Nintendo SFX (known in Japan as the SuperFamicom), will blow it away. Meanwhile, after seven years the Amiga still has the same palette, the same eight sprites, and the same four audio voices.



Let's take the case of the Sega Genesis. It has a 68000 microprocessor, running at about the same speed as the Amiga 500's 68000. Like the Amiga, it has a dual-playfield mode and hardware fine scrolling. It can display 64 colors at once on a screen with a 320 × 224 resolution. Like the Amiga, the Sega supports overscan.

But the Sega has more. Nine sound channels, so that you can hear, for example, four channels of music and five sound effects, all at the same time. A game controller with three buttons instead of the Amiga's one-button joystick. Cartridge games that load instantly. Unit sales that make it worthwhile to invest time and money in the development of the game. And a price tag less than $200.

But it's Sega's sprite engine that makes the Amiga seem dated. The Sega supports eighty 15-color sprites at 32 × 32 pixels each. Compare that with the Amiga's eight 3-color sprites at 8 pixels wide.

Electronic Arts has shown that even computer-style games like *Populous* are just as good on the Sega as they are on the Amiga. And for arcade-style games, the Amiga doesn't even come close.

Looking over at Mr. Thompson's side, I hear the prototypical Amiga apologist. He will still be saying the Amiga is the best game machine ten years from now.

No, the Genesis won't have genlock or MIDI support. Surprise. What counts in games is color and action, and the Amiga's custom chips just don't measure up. In short, the Genesis has better game hardware, better game software, and better game programmers.

AMIGA! Unlike Mr. Anderson, I don't own a Sega Genesis. Sure, I've used one—I've even used his. As far as dedicated game machines go, the Genesis is tops. But does that make it better at playing games than the Amiga? Hardly.

Yes, technically the Genesis has superior sprite capabilities (they're larger, and there are more of them), comparable color (nothing comparable to 4096-color HAM mode, however), and arguably better sound features (although I've yet to hear a Genesis game match the sound and music found in most Amiga game software). Sega has also persuaded most of the best game developers to write software for its new machine. So at first glance, the Sega may appear to be the game player's choice. However, this $199 Toys 'R' Us wonder lacks one very important feature: interactivity.

The Amiga doesn't just have a joystick; it has a mouse, a keyboard, and even a disk drive. These items may not be considered standard equipment for gamesters, but they go a long way toward making entertainment software more entertaining.

Take adventure games, for example. How do you save a game in progress on the Genesis? Answer: You don't. How do you add additional courses to your favorite golf game if you can't insert a course disk? Cartridges just don't cut it here. And can you imagine trying to control a flight simulator with one of those tiny controllers? Of course, with the Amiga, you can choose from a wide variety of input devices—the keyboard, the mouse, a light gun, and any of several types of joysticks.

While the Genesis may eventually gain such amenities as a light gun or keyboard, I'll bet my hard drive that it'll never have genlock support for combining video with computer graphics or MIDI support for controlling synthesizers in the creation of music. Why do you think companies such as Mastertronic and Battletech are using Amigas as the basis for stand-alone arcade machines? Because if you're looking for more than shoot-'em-ups, the Amiga blows the Genesis away.

Looking over at Mr. Anderson's side, I notice he conveniently left out a few facts while laboriously extolling the virtues of his favorite new toy. Has he forgotten about the Amiga's blitter, which blasts graphics across the screen at incredible speed; the copper, which allows the Amiga to switch video modes in midscreen; and the severe memory limitations of Genesis cartridges, which keep the graphics and sound quality to a minimum? The Sega Genesis is great for the price, but it's no match for an Amiga. ⊡

64/128 VIEW

TOM NETSEL

During the past month, a number of us at COMPUTE have attended computer shows in the Philadelphia and Chicago areas. The Commodore Users Fair in Valley Forge, Pennsylvania, gave us a chance to introduce the new *COMPUTE* to the public and gauge the reactions.

Many subscribers stopped by our booth during the two-day show to say hello and to voice their opinions about the magazine's new format. After people had a chance to see the magazine, most had favorable comments. There were exceptions, though, and after a while we could almost spot a negative review coming by reading a person's body language. When one man came to our booth, crossed his arms, leaned against a table, and let out a big sigh, we knew we were in for scathing monologue before he said a word.

After voicing their opinions, most people did give us the chance for a rebuttal, especially if they hadn't seen the October issue. After we showed them the new *COMPUTE,* explained how we had merged the different sections under one cover, and assured them that we were not abandoning the 64 and 128, many people said that their preconceived notions about the magazine were wrong and that they liked the look of it.

In this issue we're running a Gazette Readership Survey, asking all of our readers to give us their reactions to the new format. We also want to know how you feel about different columns and features and what you would like for us to cover in future issues. Also, how do you use your 64 or 128? This is an open-ended question, and we encourage you to use additional paper if necessary to give us some idea of how you put your computer to work or play. Your responses to these questions will help us provide you with the magazine you want.

Although the number of exhibitors was down this year at the Valley Forge show, many attendees were enthusiastic about their Commodores. One man from Chicago, A. H. Guzzo Jr., was in town on business but took time out to stop by the show and say hello. He was especially interested in the special we were running on COMPUTE books for the 64.

A few weeks later at the World of Amiga in Rosemont, Illinois, Mr. Guzzo showed up again. This time he brought his wife and two teenaged daughters with him. Even though it was an Amiga show, he and many other people took advantage of the books we were offering for the 64 and 128. Most of the people who bought books ordered 2 or 3 of the 15 we had on sale. After examining the titles for several minutes, the Guzzos put their heads together and had a discussion. When I asked them which ones they wanted, Mr. Guzzo said, "All of them!" That's dedication.

Another dedicated 64 owner showed up at the show in Valley Forge. Sandy Carter, a legal secretary in Philadelphia, owns a 64 and is proud of it. That fact was obvious just by looking at her. She came to the show dressed in a white jogging suit, with a large colorful Commodore logo printed on the front of her sweatshirt. While some 64 and 128 owners are upgrading to Amigas, Mrs. Carter isn't one of them. On the arms of her shirt she'd printed, "An Amiga? What's that?" and "An Amiga? Who needs it?"

Mrs. Carter really has nothing against Amigas; she's just content with her 64. It does what she wants. She uses it for word processing and playing games, and she says it handles those chores very well. She sees no reason to abandon her 8-bit computer.

Mrs. Carter does have one complaint, though. It seems the postal carrier who delivers her mail insists on shoving her 5¼-inch *Gazette Disk* through the 4½-inch mail slot in her front door. The disk doesn't always survive the final leg of its journey.

Despite her quarrel with her postal carrier, Mrs. Carter is a very upbeat person with an infectious smile. She's pleased with her computer, and she's delighted to talk about it with others. I think there are a lot of 64 owners out there who feel the same way about their 8-bit Commodores. ⊡

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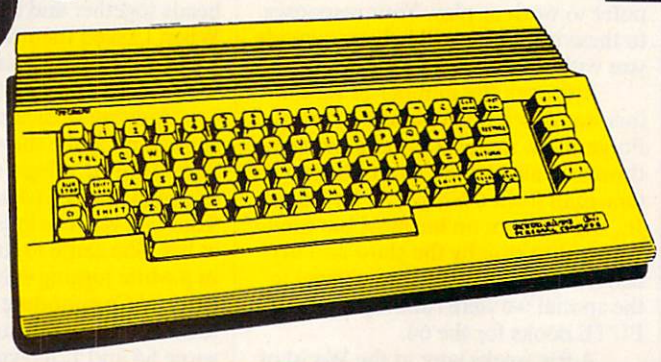

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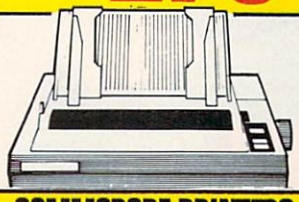

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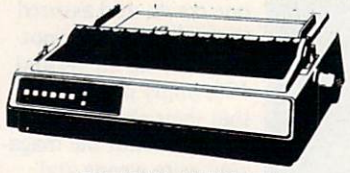

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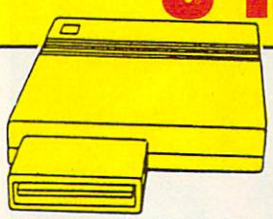

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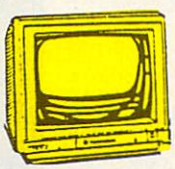

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NEWS & NOTES

Don't Get Puffed Out

Enter the Alien World and face one challenge after another in *Puffy's Saga* ($29.95), a multilevel arcade-style maze from Ubi Soft (distributed by Electronic Arts, 1820 Gateway Drive, San Mateo, California 94404).

As Puffy or Puffyn, your goal is to advance from one level of a maze to another by collecting Power Goms (power dots). You can also search for Magic Goms that will increase your abilities and speed and give you the option of changing from Puffy to Puffyn.

Race through 20 different levels or explore each one thoroughly, accumulating weapons, energy, and points. Secret passageways may hold keys to hidden treasure chests or acid puddles, one of the many types of enemies you must avoid.

How Fast?

Real R & D (12137 96 Street, Edmonton, Alberta, Canada T5G 1V9) has developed a new BASIC enhancement called *Realfast 64 BASIC (RFB)*. *RFB* ($30.95) adds more than 90 unsigned integer commands to the 64.

Speed increases of 2–15 times can be expected for 64 software written using *RFB*. All other BASIC commands can be used without changes, and its structure commands allow you to create new programming words. *RFB* occupies only 4K of RAM and can be used with other software such as *MetaBasic*.

Hey, Dudes!

Those outrageous guys who took you on a wacky travel through time and history now star in the latest release from Capstone Entertainment (14160 SW 139th Court, Miami, Florida 33186) in *Bill and Ted's Excellent Adventure—The Computer Game* ($39.95). Based on the hit movie, this arcade/adventure game is available for the 64.

Bill and Ted are failing history class, and only an awesome final report can save them. At the Circle K you meet an ultracool messenger named Rufus and his time-traveling phone booth. Just step in, dial a year, and take off in time. You're on a most excellent adventure to find some famous dudes. Your goal is to bring them back to school for the most bodacious history report of all time. You'll need to find at least 6 of the 12 famous figures to earn a passing grade, or it's work at the burger joint and off to military school for the two of you.

Time for a Word or Five

Timeworks (444 Lake Cook Road, Deerfield, Illinois 60015-4919) has released *Word Writer 5* for the 64. The updated version of this popular word processor allows you to add graphics to your documents with a built-in art library. You can link files to print out long documents, specify page breaks, and mix single-, double-, or triple-line spacing. You can also read, crop, flip, or invert GEOS or Doodle pictures.

And you get all the features *Word Writer* has offered before, including an 85,000-word spelling checker, an integrated thesaurus, a built-in outliner, and an 80-column preview mode.

Fly

***Fly*, by Jerry A. Shaver and Clifton B. Ryan of Cambridge, Ohio, is this disk's Picture of the Month.**

Welcome to "Gazette Gallery." Each month the *Gazette Disk* features a collection of the best 64/128 artwork submitted by our readers. We pay $50 for each piece of art we accept and an additional $50 for the one selected as Picture of the Month.

Send your original 64/128 art in Doodle, Koala, or any other popular format to Gazette Gallery, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408.. ⊡

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GEORAM (requires GEOS) 88604 $124.95

1750 Clone

$199.95

The 1750 Clone offers 512K, and works with all software that is 1750 compatible (e.g., GEOS, Paperclip III, and Maverick). Furthermore, you can use it to create a RAM disk to store files or programs for lightning-fast access. (Unlike GEORAM, the 1750 Clone works with non-GEOS software. Some computers may require power supply.)

1750 Clone 89517 $199.95

Super Mouse Bargain!

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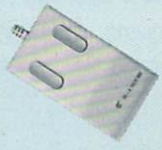

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Now For Amiga, Too!

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Both the Minimodem-C and C24 are completely Hayes compatible (not just partially compatible like the 1670 and some Avatex models) **and** 1670 compatible. This means they'll work with ALL communications software for the 64, 64C, and 128. Key features include seven status indicators, Busy Detect, DTR signal support, High Speed Detect Line, and Auto Answer/Auto Dial. Includes Multiterm 64 and 128 software so you can start communicating right away, plus a free trial hour on CompuServe! Full-year warranty.

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The Amiga versions of the Minimodems are equipped with a female connector to plug directly into the Amiga 500 or 2000. They need no external wall plug for power, and they use the Amiga's audio output for maximum fidelity.

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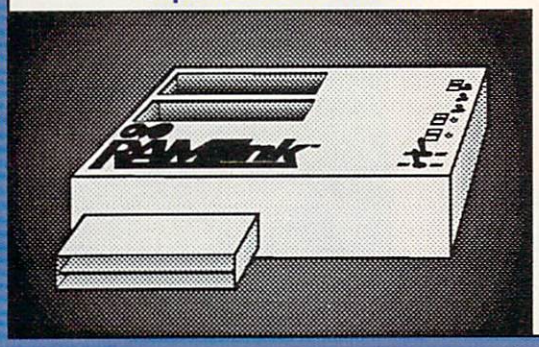

What is RAMLink?

RAMLink is a multi-purpose hardware interface designed to overcome the limitations of existing RAM expansion units (REUs). RAMLink delivers the performance and compatibility lacking in past REU's by incorporating CMD's proprietary RL-DOS and advanced features into a compact unit which allows most software to utilize Commodore 1700 series REU's, GEORAM, PPI's RAMDrive, and CMD's RAMCard as if it were a disk drive. Optional RAMCard installs internally and can be used alone or in combination with the storage of an external REU for a maximum capacity of 16 Megabytes.

- **Supports Commodore 1700, 1764, 1750, Berkeley Softworks GEORAM and PPI's RAMDrive.**
- **Optional RAMCard allows RAMLink to be used as a RAM Disk with or without a separate REU. User Expandable from 1 Mb to 16 Mb using standard SIMMs.**
- **Pass-thru connector allows use of cartridge port peripherals such as utility cartridges.**
- **Reset, Disable, Direct Access mode and SWAP functions are all standard features.**
- **RAM port provides power back-up to REU's.**
- **Parallel port provides ultra-fast data transfer when connected to CMD HD series hard drives.**
- **Includes separate power supply - optional battery available to protect against power failure.**

RAMLink (w/out internal RAM)	$149.95	RAMCard w/ (1 Mb)	$149.95
RAMLink w/ RAMCard (1 Mb)	$259.95	RAMCard w/(2 Mb)	$239.95
RAMLink w/ RAMCard (2 Mb)	$349.95	RAMCard w/ (3 Mb)	$329.95
RAMLink w/ RAMCard (3 Mb)	$439.95	RAMCard w/ (4 Mb)	$419.95
RAMLink w/ RAMCard (4 Mb)	$529.95	1 Mb SIMM (User Installed)	$100.00
RAMLink Battery back-up unit	$24.95	Parallel Cable for CMD HD	$14.95

Shipping: US: **$10.00** (UPS), **$18.00** (2nd day), COD add **$4.00** Canada **$20.00**

BOTH RAMLINK AND RAMDRIVE INCLUDE RL-DOS

- Allows vast amounts of commercial software, including GEOS, to access all available RAM as a high-performance RAM Disk.
- RL DOS performs up to 20 times faster than Commodore RAMDOS, up to 400 times faster than a stock 1541 and provides full DOS command compatibility.
- Up to 32 1541/1571/1581 emulation or Native mode partitions, plus true subdirectories.
- Includes built-in JiffyDOS Kernal for high-speed access to JiffyDOS equipped disk drives.
- Software for copying files (FCOPY) and complete disks (MCOPY) included.
- Many other features, including CMD's exclusive device number SWAP functions.

WHICH ONE IS RIGHT FOR YOU?

Both RAMLink and RAMDrive give Commodore users powerful features never before available in a RAM expander. RAMDrive is intended mainly for those who do not require the high RAM capacity of RAMLink (up to 16 Mb), RAMLink's Pass-Thru port or the parallel port for communicating with the CMD HD Series of hard drives. RAMDrive is an excellent choice for those who desire portability since the internal battery pack can keep the contents of RAMDrive intact for several days. RAMLink is the perfect choice for geoRAM owners who want the ability to use that device with programs other than GEOS. RAMLink has a built-in RAM port for easy use with a geoRAM or Commodore REU. No matter which CMD RAM device you select, you'll benefit from fantastic capabilities of having a high speed RAMDisk equipped with RL-DOS and the outstanding value of CMD support.

What is RAMDrive?

RAMDrive is a fresh new approach to RAM expansion for the Commodore 64 and 128. RAMDrive is a self contained battery backed cartridge with capacities of 512K, 1 Mb and 2 Mb. RAMDrive incorporates RL-DOS, an ultra-fast, easy-to-use operating system similar to the HD-DOS found in CMD HD series hard drives. This proprietary DOS allows various types of partitioning along with compatibility and speed unsurpassed by previous RAM Expansion systems.

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- **RL-DOS operates up to 20 times faster than Commodores RAMDOS.**
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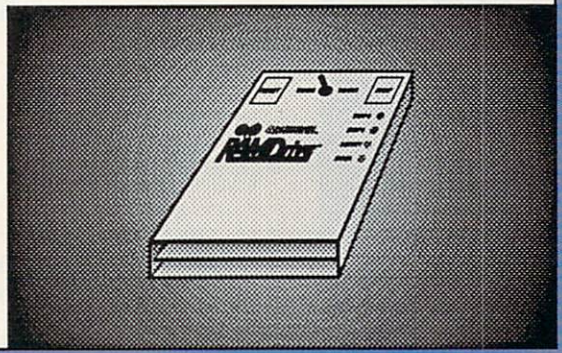

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REVIEWER'S CHOICE

Everybody has a favorite game, and Gazette reviewers are no different. During the past year they've seen practically every major product released for the 64 or 128—and a lot of the smaller ones, too. Since they've had the opportunity to evaluate so many new games, we wanted to know which ones have impressed them most.

During the past year, we've printed reviews of most of these favorites, and some of the just-released products mentioned will be covered more thoroughly in upcoming issues of *COMPUTE.* While the top choices of our reviewers may not be everyone's favorites, you're sure to find some outstanding games on the next few pages that you'll want to try yourself.

RUSS CECCOLA

SECRET OF THE SILVER BLADES

The latest in the SSI line of AD & D games, this role-playing epic is the best of the gold-box games so far. Your goal is to defeat the monsters emanating from a mine shaft that leads to a city frozen long ago and eliminate the source of these monstrosities.

The early games in this series were too difficult to play because of the many battles you had to fight. *Champions of Krynn* corrected this problem, and *Secret* continues what *Champions* started and adds several outstanding features of its own.

In particular, there are new monsters like Umber Hulks and Golems in the game. *Secret* also has the largest 3-D area of all the AD & D games from SSI. There are many new spells, too, and characters can rise to the 15th level (18th for thieves). Put this all together with great graphics and documentation, and you can see why it's the best of the year.

Strategic Simulations
Distributed by Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404
$39.95

★ ★ ★ ★ ★ ★ ★ HONORABLE MENTIONS ★ ★ ★ ★ ★ ★ ★

GRAVE YARDAGE

How can you not like a game that uses zombies, ghouls, and monsters as players for a football team and a giant eye as the ball? That's what *Grave Yardage* has to offer and more, including play selections, lineup choices, and numerous options found in more conventional football games. Graphics and sounds are great and make this one a perfect choice. Here's a tip for you: Use the Elvis Lives play!

Activision/Mediagenic
3885 Bohannon Dr.
Menlo Park, CA 94025
$24.95

PUFFY'S SAGA

This game comes from Europe's UBI Soft and is the most addictive level game since *Zoom!* hit the shelves. Choose Puffy or Puffyn as your character, and travel through mazes to find weapons that will help you to escape. With excellent graphics, digitized sounds, and a lot of levels, *Puffy's Saga* is great fun. It's also the best European import of 1990.

UBI Soft
Distributed by Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404
$29.95

WHERE IN TIME IS CARMEN SANDIEGO?

Continuing the popular series of educational games that are a hit with children and adults alike, Brøderbund has armed Carmen with a time-travel machine. To help you track down Carmen and her gang and find clues, *The New American Desk Encyclopedia* is included with the game. Colorful graphics and an easy-to-use interface make this a fun mystery game. Plus, it has great educational value. ▷

Brøderbund
17 Paul Dr.
San Rafael, CA 94903
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- Simple Operation: Just press the button at any point and make a complete back-up of any* memory-resident program to tape or disk.
- Turbo Reload: All back-ups reload completely independent of the cartridge at Turbo speed.
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- Sprite Killer: Effective on most programs — make yourself invincible. Disable Sprite/Sprite/Background collisions.
- Unique Picture Save: Freeze and save any Hires Screen to tape or disk. Saved in Koala, Blazing paddles format.
- Compactor: Efficient compacting techniques — 3 programs per disk — 6 if you use both sides.
- Single File: All programs saved as a single file for maximum compatibility.
- Utility Commands: Many additional commands: Autonum, Append, Old, Delete, Linesaver, etc.
- Screen Dump: Print out any screen in 16 Gray Scales, Double size print options.
- Unstoppable Reset: Reset button to Retrieve System and Reset even so called Unstoppable Programs.
- Fully Compatible: Works with 1541/C/II, 1581, 1571 and with C64, 128, or 128D (in 64 Mode).
- Disk Utilities: Fast Format, Directory, List, Run and many other key commands are operated by Function Keys.
- Unique Restart: Remember all of these utilities are available at one time from an intergrated operating system. A running program can be Frozen to enter any Utility and the program is restarted at the touch of a key — without corruption.
- LSI Logic Processor: This is where Action Replay V gets its power. A special custom LSI chip designed to process the logic necessary for this unmatched Freeze/Restart power. No other cartridge has this power!

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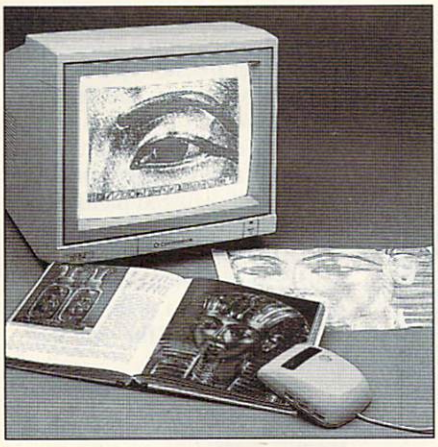

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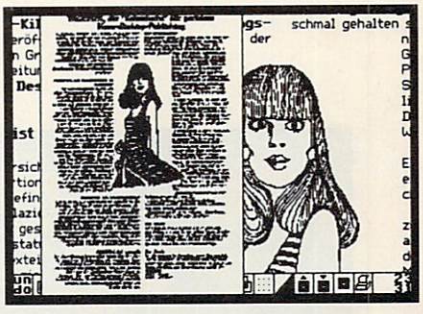

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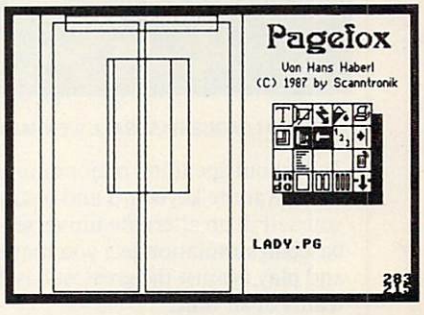

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STEVE HEDRICK

Give me a game that takes months to complete, and I'm a happy guy. Call it getting value for your buck or perhaps just wanting to ponder over complex situations. *Search for the Titanic* offers those of us who enjoy taking weeks to mull over long-range strategies an involved and involving role-playing adventure/ simulation.

Finding the elusive 46,000-ton *Titanic* deep in the Atlantic is the culmination of many hours of exploration, beginning with smaller and easier-to-find wrecks. A player accumulates

SEARCH FOR THE TITANIC

and must maintain a reputation as a master treasure hunter by locating, salvaging, and delivering to his or her investors smaller booty in order to earn the clout to finance bigger operations.

Actual digitized pictures of the *Titanic* wreck, taken by the Bob Ballard expedition, are your reward for locating her, plus knowing you're the baddest salvaging dude on the high seas.

Capstone Software
Distributed by IntraCorp
14160 SW 139th Ct.
Miami, FL 33186
$29.95

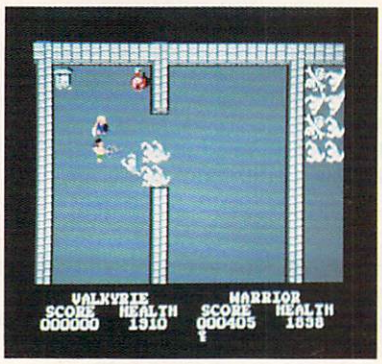
★ ★ ★ ★ ★ ★ ★ HONORABLE MENTIONS ★ ★ ★ ★ ★ ★ ★

MICRO LEAGUE BASEBALL II ENHANCED

Talk about spending major amounts of time at the keyboard and losing yourself in an alternate universe—this baseball simulation lets you manage and play against the greatest baseball teams of all time.

Have you ever wondered how the great Yankee teams of legend would fare against today's "boys of summer"? Change the rosters, keep stats, trade players, and create series that could only take place in your imagination—or in an Iowa cornfield.

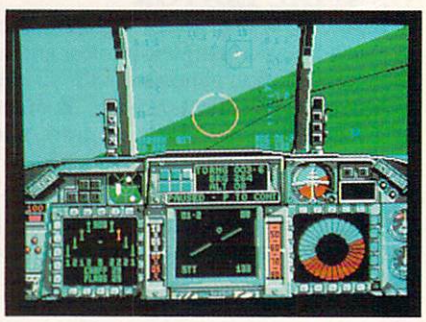
Micro League Sports Association
2201 Drummond Plaza
Newark, DE 19711-5711
$39.95



GAUNTLET II

Seven types of mutants spring from monster-generating machines, acid puddles surround you, and deadly traps and force fields confound your every move. This could ruin your whole day if you could not assume the role and abilities of Thor the Warrior, Thyra the Valkyrie, Questor the Elf, or Merlin the Wizard. Two players have the option of selecting the heroes they wish to be and then seek out glory and treasure within the 100 mazes.

Mindscape
Distributed by Software Toolworks
60 Leveroni Ct.
Novato, CA 94949
$29.95



F-16 COMBAT PILOT

Any nation that can muster an air force wants to buy the General Dynamics F-16 Falcon fighter. It is the most complex and deadly machine in the sky, and so is the simulation.

After training, a player takes to the air on five different missions, from tank busting to bogey interception. The final and most challenging multimission, Operation Conquest, is assigned only to those successful pilots who have mastered all the others.

Digital Integration
Distributed by Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404
$34.95

DAVID & ROBIN MINNICK

At first glance it would appear strange to choose a board-game crossover as the top game rather than an action-packed racing program or flight simulation. The choice wasn't easy, but Leisure Genius put the same cut-throat attitude that most competitive sports programs feature into its official version of *Scrabble.*

Faced with up to three computer opponents that know no mercy, all of whom are armed with word lists taken from *The Official Scrabble Player's Dictionary* and *Chamber's Words,* even the most mild-mannered player will learn to come to the computer armed with a dictionary and a military assault rifle.

Scrabble is a great game to bring home, whether you play against your friends or use it to hone your skills. In no time, through the practice of competition alone, you'll be ready to take your rightful place in the *Scrabble* Hall of Fame, right next to Leisure Genius.

SCRABBLE

Leisure Genius
Distributed by Virgin Mastertronic
711 W. 17th St., Ste. G9
Costa Mesa, CA 92627
$29.99

★ ★ ★ ★ ★ ★ ★ HONORABLE MENTIONS ★ ★ ★ ★ ★ ★ ★

STRIKE ACES

This program is one more in an ever-growing list of simulation games that set Accolade apart. Participate in SAC's annual Bombing and Navigation Competition to see just how well you can handle any of four fighter/bombers. Accept your mission, load your munitions, and pilot your aircraft over realistic 3-D scrolling landscapes of the South Dakota Badlands. Sweaty-palm entertaining to sweaty-palm educational—that's what we call this excellent adventure!

Accolade
550 S. Winchester Blvd.
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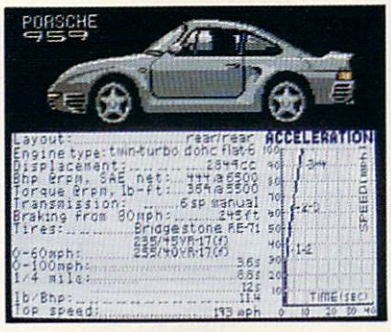

THE DUEL: TEST DRIVE II

Checking out a sports car was never so much fun! Sitting behind your realistic dashboard, pitting your car against another car or against the clock, traversing tremendous graphic scenery, eluding road hazards and police, and parrying clever jibes from the computer are all part of this tension-filled, adrenaline-pumping road run called *The Duel.* Grab this slick package of programming that supports multiple-car and scenery disks.

Accolade
550 S. Winchester Blvd.
San Jose, CA 95128
$29.95

WORLD OF GEOGRAPHY

An odd choice, to be sure, but who said games can't be educational? *World Geography* is an elegant package that appears simple but represents hard work and some fine programming. Superb eye-catching graphics of maps and globes and flags; snatches of music that entertain and stimulate; and facts about capitals, language, currency, and population make learning geography a challenge and a pleasure instead of a dull and boring chore. ▷

Bobco
200 Seventh Ave., Ste. 111
Santa Cruz, CA 95062
$24.95

LEN POGGIALI

From the land down under come six sports that will never make the Summer Olympics. These offbeat but entertaining events do, however, make for a lot of fun.

In the Belly Whack, your overweight diver needs as many good breaths as possible so he can spring off the board, go into a horizontal position, and land flat on his tummy.

Equally zany are the Dry River Race, in which you and a friend run with a boat over your heads down a dry river bed, and the Beer Shoot (a.k.a. the Soda Shoot), in which your buddies toss empty bottles from your jeep while you pick them off midair with your trusty shotgun.

Less bizarre—but also entertaining—are the Boomerang Throw, Marlin Fishing, and Beach Footy, a kickball game played with two-man teams.

Aussie Games provides attractive graphics, tuneful music, appropriate sound effects, a lot of variety, plenty of challenge, and a tongue-in-cheek attitude that's infectious.

AUSSIE GAMES

Mindscape
Distributed by Software Toolworks
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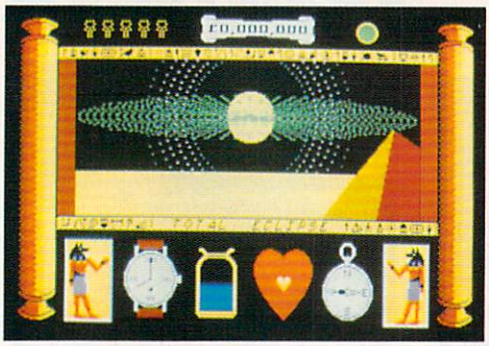
Novato, CA 94949
$29.95

★ ★ ★ ★ ★ ★ ★ HONORABLE MENTIONS ★ ★ ★ ★ ★ ★ ★



MACARTHUR'S WAR

MacArthur's War presents eight varied, entertaining, and historically accurate battles from the Korean War. As field commander, you issue orders to regiments, whose battalions carry out your directives.

You can modify existing scenarios or create new ones by using Warplan, SSG's war-game construction set, and the WarPaint graphics editor.

An easy-to-learn menu system guarantees that you'll be up and playing in no time. Defeating a tough and resourceful enemy won't be as easy.

Strategic Studies Group
1747 Orleans Ct.
Walnut Grove, CA 94598
$39.95

TOTAL ECLIPSE

Hidden in an Egyptian pyramid is a sacred shrine that carries a deadly curse. To save the world, you must destroy the shrine before the next eclipse of the sun.

Avoiding pitfalls and traps, maintaining your health, replenishing your water supply, defeating enemies, solving puzzles, discovering hidden rooms, negotiating illogical mazes, traversing multitiered chambers, and locating the shrine will keep computer Egyptologists busy for quite some time. You'll have some fun, too.

Spotlight Software
Distributed by Cinemaware
4165 Thousand Oaks Blvd.
Westlake Village, CA 91362
$29.95

CENTAURI ALLIANCE

As a member of the Centauri Alliance, you tackle a series of missions that entail traveling to twenty-third-century worlds, combating aliens, avoiding deadly traps, and negotiating mazes.

Success requires that your party of eight become expert in wielding weapons, maintaining mechanical and biological systems, changing shapes, and focusing brainwaves.

Entirely menu-controlled, *Centauri Alliance* features a helpful automapping feature and attractive 3-D graphics. Check this one out.

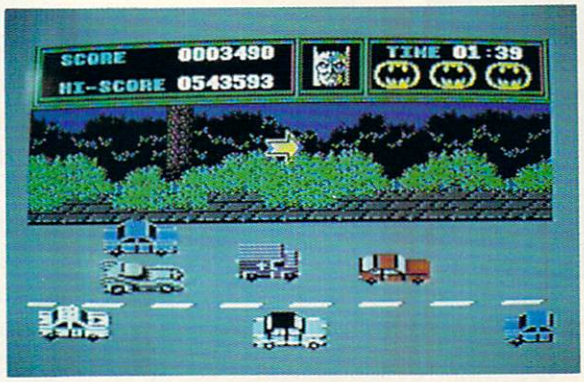
Brøderbund Software
17 Paul Dr.
San Rafael, CA 94903
$29.95

E R V I N B O B O

BATMAN, THE MOVIE

Of all the computer games published as tie-ins with popular movies, *Batman* comes closer to following the actual plot line than any other I can remember.

Divided into several episodes, which can also be considered as levels of difficulty, the game takes you through the vertical maze of the chemical warehouse, lets you race the Batmobile though city streets, and builds toward the final confrontation with the Joker.



This action-adventure game is the best of a long line of movie-related computer products from Data East. Don't confuse this game with *Batman, The Caped Crusader,* an earlier release from the same company. Jumping Joker, computer gamers, this one's a winner!

Data East USA
470 Needles Dr.
San Jose, CA 95112
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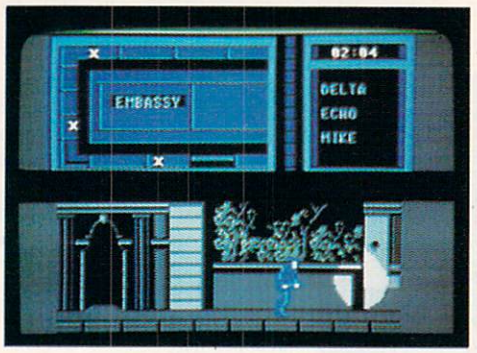

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ONLY ON DISK

There's something new on the *Gazette Disk.* In addition to the type-in programs found in each issue of the magazine, we offer additional features and programs every month on the *Gazette Disk.* Check out the original 64 and 128 artwork on display in "Gazette Gallery," and look for our bonus programs as well. These programs and their instructions appear only on disk. Here's a description of this month's bonus program.

BAM Aid

Short of accidentally performing a full-format operation, the worst thing you can do to a disk that contains valuable programs and data is to accidentally corrupt its BAM blocks or directory track. If files merely have been deleted or if a short NEW command has been given, then the directory entries are still intact, and the programs can be salvaged. If the directory itself has been corrupted, however, the information is lost.

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FEEDBACK

QUESTIONS FROM OUR READERS

Pictures and Text

I am a great fan of role-playing games for the 64 and have been wanting to write my own for quite some time. I have written a few, but they need graphics. I have made some scenes for my games, but I have only been able to show the whole screen in multibitmap mode. A friend of mine said there is some way to display a picture and then have text printed at the same time. He thinks it was done by setting rasters, but he doesn't know exactly how it's done. Can you help me out?

JOHN GREEN
FREEPORT, NY

You might try using a split-screen technique for combining graphics with text. Screen splitting takes advantage of the fact that a certain finite time is required for your monitor's electron beam, or raster, *to "paint" a picture on the screen. During the time it takes to paint an image on the monitor, the process can be given a different source for its display information, thus combining two display modes such as text and graphics.*

On the 128, screen splitting can be handled from BASIC 7.0. On the 64, it can only be done by writing a machine language program for that purpose. Details of the architecture available for this purpose are included in the Commodore 64 Programmer's Reference Guide, *pages 150–152. For the code, check out* Screen Splitter *(*COMPUTE!'s Gazette, *August 1989). It's a terrific utility for screen splitting.*

Datasette Blues

Please let me know how I can get any of your combination BASIC/machine language programs to load properly on my 64 using the Commodore datasette. I've typed in some of your programs, and I get an error message. I've tried changing the loading numbers to indicate the datasette, but I get the same message.

JEFF KRANTZ
LAS VEGAS, NV

Since you didn't specify which error message you're getting, we can't be certain what the problem is. More than likely, the program uses the 64's cassette buffer and other memory locations that make its use with the tape system incompatible. This problem may occur in other programs. Since the vast majority of our readers use a disk drive, we no longer support the datasette.

Frustrating Function

As I was typing in *SynthPlayer* (*COMPUTE!'s Gazette,* April 1990), I came to a line that said K$="{f7}". The trouble is that my 128 has programmed function keys, and if I press f7, it shows LIST. What can I do to correct this?

JOHN E. POTTER
NEW LEXINGTON, OH

SynthPlayer *is designed to run on a 64 or on a 128 in 64 mode. You appear to have been entering it in 128 mode. If, however, you are translating from 64 software and need normal function-key usage, redefine the keys as follows.*

```
KEY1, CHR$(133) KEY2, CHR$(137)
KEY3, CHR$(134) KEY4, CHR$(138)
KEY5, CHR$(135) KEY6, CHR$(139)
KEY7, CHR$(136) KEY8, CHR$(140)
```

Array Delay

I have written some fairly long BASIC programs that use many and/or large arrays. The same problem seems to arise in each program. While the program is running, the computer will stop and lock up for up to 20 seconds. Do you know what's wrong and how to fix it?

WALTER J. STEGEMILLER
LAWRENCEBURG, IN

Since your computer returns to life after a few seconds, it's not really locked up. The delay could be caused by a couple of things. First, the array may be so large and/or multidimensional that processing by the program itself may be lengthy. Second, if the BASIC program and its numerical variables occupy a great deal of memory, it may be necessary for the operating system to perform frequent garbage collections—that is, clearing away old string values from the top of memory. During garbage collection other tasks are suspended.

Where Have All the Type-Ins Gone?

I have been a subscriber to both *COMPUTE!* and *COMPUTE!'s Gazette* since 1984. On Monday I received the first issue of your new and improved edition. I can't begin to tell you how disappointed I am with it. You have gone the way of *COMPUTE!* and dropped the type-ins. There were 16 pages devoted to the 64/128, but no projects, games, or programs. The closest thing to programming was something on page 24 referring to *The Automatic Proofreader.*

I had just renewed my subscription through June 1993, but unless I see a radical change in your format, you can count on a cancellation.

THOMAS A. SCHAEFER
ST. PETERSBURG, FL

Some readers who subscribed to both the old COMPUTE! *and* COMPUTE!'s Gazette *inadvertently were sent the new* COMPUTE *subscription edition that does not contain the 16 pages of type-in programs for the 64/128. We believe that mixup has been rectified. If you are a Gazette subscriber and your edition of the magazine does not contain the type-ins, please let our subscription department know.*

Setting Up a BBS

I am an elementary teacher with a 64 in the classroom. I have been trying to work out an arrangement with another teacher about 30 miles away who also has a 64. We have experimented communicating with each other using the software that came with the 64

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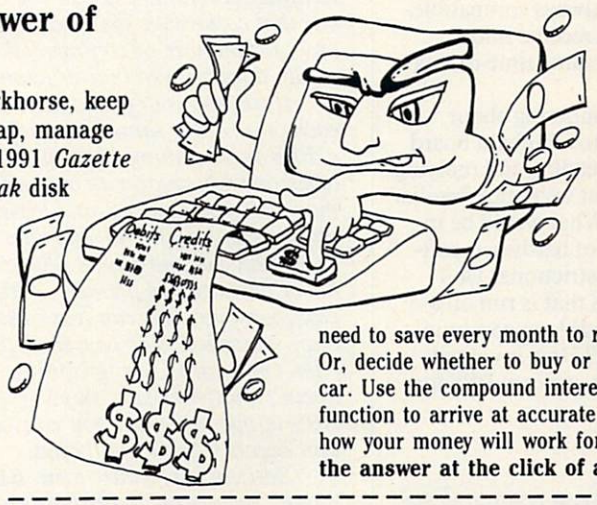

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FEEDBACK *continued from page G-18*

modem. We sent messages to each other during the summer, but our schedules are not always compatible. We can't send and receive information during the same time during the school day.

We're now wondering about sending messages to a bulletin board system (BBS) for reading and replying at another time, but we're not familiar with the process. What would be involved in the way of hardware, software, costs, and restrictions? Do I need to find a BBS that is run on a Commodore to be able to communicate on the system? How involved would it be to start our own BBS for classroom use?

KATHY DOCTOR
YARDVILLE, NJ

If the two of you can communicate directly via computer, modem, and telephone lines, then contacting a BBS should be a breeze. As you already know, to communicate with someone by computer, the only extra hardware you need is a modem, a device that converts your 64's signal into audio tones that can be transmitted by telephone lines. The necessary software is a telecommunications program, often called a terminal program. *You can use the one that came with your modem or any of a number of commercial or public domain terminal programs.*

If you and your friend can't call each other at the same time, calling a BBS is something like leaving a telephone message on an answering machine. You can call and leave a message for your friend, and then he or she can call and read it whenever his or her schedule permits. With a BBS, however, you can leave more than messages. You can send text files, programs, or graphics. It doesn't matter what computer the BBS is operating on; you can call and access it with any brand.

Setting up your own BBS doesn't require any more hardware, but it does take additional software made especially for the purpose. It also ties up a telephone line. For someone to call in, your line would have to be accessible directly from the outside. Going through the school's switchboard would be impractical. Access to your own BBS could be limited to whomever you wanted. You could give the number to just a few friends or colleagues for your private use, or you might want to set the BBS up for students to use as well.

For more information on what it takes to set up and run a BBS, be sure to read Gazette in March. Richard Lembrée has been the system operator of his own BBS in Maine since 1984, and he'll share his knowledge and experience with our readers.

Perfectly Puzzling

I would very much like to buy a copy of *Perfect Calc.* Commodore tells me that it is no longer available. I would like to hear from anyone who knows where I can buy this program.

GERALD GOULD
P.O. BOX 1488
APO, NY 09293

Do you have a question, comment, or problem? Have you discovered something that could help other Commodore users? Write to Gazette Feedback, 324 West Wendover Avenue, Greensboro, North Carolina 27408. Due to the volume of mail received, we cannot respond individually to questions. ⊡

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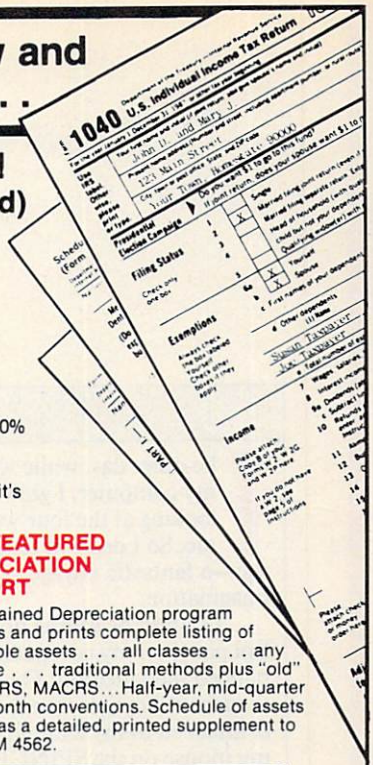

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D'IVERSIONS

FRED D'IGNAZIO

The other day, while working at my computer, I grew tired of looking at the four walls around me. So I decided to take a voyage—a fantastic voyage of the imagination.

I started by calling up a laser control panel on my computer screen. I popped the videodisc *For All Mankind* from Voyager into the laser player attached to my computer. I clicked my mouse on the SPINUP button on the control panel, and suddenly it was 1961, and there was John F. Kennedy telling the world that America was going to the moon. A few moments later it was 1969, and Neil Armstrong was climbing out of the Apollo spaceship saying, "One small step for man, one giant leap for mankind."

I was on the moon with Neil! (That's how my imagination works, folks!)

For a while I watched my astronaut buddies clowning around on the moon; hopping like bunnies; planting stiff, no-wrinkle flags in the moon's cratered surface; and bouncing around the moon's dunes on their lunar rover. Then I saw the moon picture I wanted and froze it—ZAP!—with one click of my mouse button.

I captured the image with my computer's frame-grabber card and imported it into my favorite paint program. I switched the moon to a second page while I smiled in front of my camcorder. (I always have the camera lens pointed toward my face so I can digitize myself in a flash.)

I digitized a mug shot of myself looking insanely proud (just like the other astronauts). I called up a clip-art image of an astronaut in a spacesuit and placed my grinning face atop the canned, cartoony image.

There I was: a smiling, happy guy in a spacesuit. I needed a moon.

I cut out the entire image of me inside the spacesuit and transferred it back to the page with the moon on it. I looked around the moon and finally decided to put myself partly inside a crater. I chopped off the lower half of my body, discarded it into computer-bit limbo, and lowered the top part of my torso into the crater.

Voilà! Man on the moon! It had taken America almost a decade to accomplish this feat, but it took me only 20 minutes. In a world of digital cutting and pasting—where new virtual realities can be crafted in under an hour—almost anything is possible. Even the sky is no longer the limit.

As with many exotic locations, virtual reality is a fun place to visit, but I'm not sure I'd like to live there.

DIGITAL SMOKE AND MIRRORS

In virtual reality, distance is only a state of mind. Proof of this occurs every time the phone rings. You press a little crescent-shaped piece of plastic compulsively to your ear. The reality of this is absurd. Anyone from just a hundred or so years ago who saw this would swear you were a swami communing with spirits or some idiot swapping jokes with a carved stick.

But you are oblivious to reality as we know it. You are in virtual reality—talking intimately, arguing, telling jokes, whispering sweet nothings to someone who might be hundreds or thousands of miles away. But there is no distance between you. During your phone conversation (once you rev up and the room around you grows fuzzy and indistinct), you are in Ma Bell's Transporter Room. You and your phone companion are practically sitting in each other's lap.

It's already possible to take any photograph and digitally retouch it so artfully, so sneakily, that no one could tell whether it was a picture of the real world or a fantasy snapshot.

Take the recent cover of *TV Guide* with the picture of Oprah Winfrey's head on Ann-Margret's body. When the photographer for the story was asked why he had committed such a heinous act (at least, according to Ann-Margret's press agent), he shrugged his shoulders and said, "Because it was so easy I didn't give it a second thought."

Or take the cover of *National Geographic* with the picture of the Sphinx sitting proudly in front of Egypt's great pyramids. This is one beautiful cover. It makes you want to visit Egypt and go there yourself. Except for one thing: *There* isn't really there at all. You couldn't take your Canon Zapshot to the same spot and snap a similar picture, because that spot doesn't exist. To get the Sphinx next to the pyramids, the photographer digitally moved it and plopped it down just where he wanted it.

This sort of feat once cost hundreds of slaves blood, sweat, tears, and dozens of years to accomplish. Now it takes a dozen minutes.

I know a bunch of high-school kids who hang out in virtual reality. One day they decided to play a trick on their principal. They took a tape of some of his speeches to their computer, digitized several of his remarks, and then cut and pasted the individual words into a new speech that the principal had never made. They recorded a copy of this "virtual" speech and carried it proudly into the principal's office and played it for him.

His reaction was priceless. He was dumbfounded! He recognized his voice, he knew he must have said what he was hearing, but what a speech! Had he suffered a micro attack of amnesia, a short burst of dementia?

No, folks. It was far worse. He had entered the Virtual Zone. ⊡

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Circle Reader Service Number 203

BEGINNER BASIC

LARRY COTTON

MULTIPLE SPRITES ON THE MOVE

Happy New Year! My first New Year's resolution is to finish our multiple-sprite program that we began in December's column. Load that program, and we'll continue by positioning all eight sprites.

```
100 FORT=0TO14STEP2:POKEV+T,X
    :NEXT
```

V and X were defined in line 90. Since the sprites' horizontal memory registers are V, V+2, V+4, and so on, we use STEP 2 in the FOR-NEXT loop, which causes every other memory register to be poked. The same goes for the sprites' vertical registers (V+1, V+3, V+5, and so on).

```
110 FORT=1TO15STEP2:POKEV+T,
    Y:NEXT
```

Memory registers V+23 (53248+23=53271) and V+29 (53248+29=53277) control sprite height and width, respectively.

For sprite 0, if you POKE V+23,1 and POKE V+29,0, the sprite will be tall and narrow; poking both V+23 and V+29 with a 1 will cause sprite 0 to be tall and wide.

The two sprite-size registers (V+23 and V+29) must be poked very carefully with numbers from 0 to 255. Look at the following chart.

Bit No.	7	6	5	4	3	2	1	0
Values	128	64	32	16	8	4	2	1
On/Off	0	0	0	0	0	0	0	1

Poking 1 to a memory register turns on only bit 0. Poking 4 would turn on only bit 2. Poking a sum of 8 and 16, or 24, turns on bits 3 and 4.

Bit No.	7	6	5	4	3	2	1	0
Values	128	64	32	16	8	4	2	1
On/Off	0	0	0	1	1	0	0	0

Poking a 255 (or K, as defined in line 90) turns on all the bits. The sprites are conventionally numbered the same as the bits. Therefore, poking 1 to V+23 or V+29 controls the size of sprite 0 only. Poking 24 controls sprites 3 and 4. Poking 255 (or K) controls all the sprites. To make all eight as tall and wide as possible, poke V+23 and V+29 with 255 (K).

```
120 POKEV+23,K:POKEV+29,K
```

Memory register V+21 (53269) turns sprites on or off (makes them visible or invisible). To turn all eight sprites on, use POKE V+21,255. (While we're at it, turn the sound on by poking V1 with 23, a funky combination of voice 1, ring mod, and sync.)

```
130 POKEV+21,K:POKEV1,23
```

Now define a few variables.

```
140 J=1:Q=1:F1=1
```

Line 140 is the beginning of a repeatable loop. J starts as 1. Later it will change to −1. Q is the number of pixels the sprites will be displaced from their original locations. F1 is the frequency of voice 1. Now let's make all the sprites green.

```
150 FORT=39TO46:POKEV+T,5:
    NEXT
```

Registers V+39 through V+46 control the sprites' colors. Thus, the FOR-NEXT loop assigns color 5 (green) to all eight sprites. Now we need to make a couple of IF-THEN checks to see if the sprites have moved to the extremes of their travel.

```
160 IFQ>MTHENJ=-1:M$="[RED]
    MERRY CHRISTMAS":GOSUB300
170 IFQ<0THENM$="(15 spaces)":
    GOSUB300:GOTO140
```

Recall that Q is the number of pixels each sprite moves from its original position. M was defined as 79.

When Q becomes greater than M, we want the sprites to reverse direction; thus J becomes −1. Conversely, if Q becomes less than 0, the sprites have returned to their original position, and we begin a new loop at 140.

```
180 Q=Q+J
```

Remember that J can be either 1 or −1. Thus Q will either increase or decrease by 1. Line 190 is reserved for a REMark that explains lines 200–220. Those lines move the sprites by increasing or decreasing their horizontal and vertical locations.

```
200 POKEV,X+Q:POKEV+2,X−Q:
    POKEV+5,Y+Q:POKEV+7,Y−Q:
    POKEV+8,X+Q:POKEV+9,Y−Q
210 POKEV+10,X−Q:POKEV+11,Y
    −Q:POKEV+12,X−Q:POKEV
    +13,Y+Q:POKEV+14,X+Q
220 POKEV+15,Y+Q
```

As Q's value increases (J=+1), the sprites move away from each other. As Q decreases (J=−1), the sprites move toward each other.

```
230 POKEVF,F1:F1=F1+J
```

All this does is poke a frequency value to control voice 1's pitch.

```
240 GOTO160
```

We need a subroutine that positions the cursor, prints the message, and causes a short delay.

```
300 POKE214,11:PRINT:POKE211,12:
    PRINTM$:FORD=1TO500:NEXT:
    RETURN
```

To use sprites of your own creation, change the data in lines 50–70. ⊡

PROGRAMS

PAUL COMSTOCK

LANDER

DELIVER NEEDED SUPPLIES TO DESPERATE SPACE COLONIES IN THIS ARCADE-STYLE GAME FOR THE 64. JOYSTICK REQUIRED.

In the year 2450, the universe is an unfriendly place. Planets are at war. Many outlying planets have been colonized, but the inhabitants need goods and supplies from the other colonies. Warring factions have set up blockades to stop these necessary supplies from arriving. It's your job as one of the few brave blockade runners to get the goods through.

Interspacial treaties guarantee your safety once you've landed, but landing at a space port is the problem. You must maneuver your craft through the unfriendly fire of the blockaders, avoid the dangerous mountains that surround the landing sites, and keep an eye on your dwindling fuel supply.

Typing It In

Lander is written entirely in machine language. Enter the program with *MLX*, the machine language entry program; see "Typing Aids" elsewhere in this section. When *MLX* prompts you, respond with the values given below.

Starting address: 0801
Ending address: 2230

Before exiting *MLX*, save a copy of the program to disk.

Fire Retro Rockets

Plug your joystick into port 2 and then load and run *Lander* just as you would a BASIC program. After the title screen appears, hit any key to begin play. The playing screen is a two-dimensional image of a planet's landing site. The planet itself is black, buildings and cities appear bright yellow, and the landing pad and your ship are white. Your score, amount of fuel remaining, and number of remaining ships are posted at the bottom of the screen. You start with five ships and 1000 units of fuel.

The joystick controls the engine thrust. Pushing it up engages the main thrust and moves the ship up. Pushing the joystick left or right moves the ship in those directions, respectively. Once a ship starts moving in a particular direction, it continues in that direction until opposite thrust is applied. All maneuvers consume fuel, so keep an eye on your gauge.

There are ten different planets that you must resupply, and each has a unique landing approach. Once you've successfully landed, your score is increased by the amount of fuel you have remaining. You then move immediately to another planet, so be prepared.

If you crash, get shot, or land too hard, your ship will be destroyed. If you have more ships, you'll start on the same planet with the same amount of fuel as when you were destroyed. If your fuel supply was below 500 units, however, you'll start with 500 units. After your last ship has been destroyed, press the fire button to start a new game.

Master the Blaster

Do not overcontrol. It takes time to overcome inertia and change direction. Take advantage of gravity, and plot a deliberate course to your goal. Don't rush. Speed only wastes fuel.

Note that a blockader will not fire until the first shot leaves the screen or hits something. Pay attention to the timing of shots. Happy landings!

LANDER

```
0801:0B 08 0A 00 9E 37 39 37 55
0809:36 00 00 00 00 00 8D 34 83
0811:03 A9 05 85 FA A9 68 85 DA
0819:F9 38 AD 34 03 E9 14 8D A2
0821:34 03 90 10 18 A5 F9 69 D3
0829:50 85 F9 A5 FA 69 00 85 5F
0831:FA 4C 1A 08 18 AD 34 03 78
0839:69 14 0A 18 65 F9 85 F9 DD
0841:A5 FA 69 00 85 FA 60 8D 76
0849:35 03 A5 F9 85 FB 18 A5 FA
0851:FA 69 D4 85 FC AD 35 03 38
0859:C9 1B D0 06 A9 07 8D 36 4A
0861:03 60 38 E9 11 90 06 A9 31
0869:07 8D 36 03 60 A9 00 8D 8E
0871:36 03 60 AD 35 03 A0 29 64
0879:91 F9 60 AD 35 03 0A 0A 8B
0881:18 69 80 8D 35 03 A0 00 D7
0889:AD 35 03 91 F9 AD 36 03 2D
0891:91 FB EE 35 03 AD 35 03 D6
0899:A0 01 91 F9 AD 36 03 91 E9
08A1:FB EE 35 03 AD 35 03 A0 2B
08A9:28 91 F9 AD 36 03 91 FB 29
08B1:EE 35 03 AD 35 03 A0 29 E1
08B9:91 F9 AD 36 03 91 FB 60 E0
08C1:0A A8 B9 CF 08 85 FD C8 50
08C9:B9 CF 08 85 FE 60 17 15 C0
08D1:B7 15 57 16 F7 16 97 17 AD
08D9:37 18 D7 18 77 19 17 1A 70
08E1:B7 1A 20 C1 08 A2 00 8A C9
08E9:20 0F 08 8A A8 B1 FD 20 9F
08F1:48 08 20 7C 08 E8 E0 A0 3A
08F9:D0 ED 60 AD 00 DC 29 01 9B
0901:C9 01 F0 0C 20 3A 09 20 33
0909:D9 0A EA EA EA 4C 14 09 50
0911:20 71 09 AD 00 DC 29 04 55
0919:C9 04 F0 0A 20 A8 09 20 A5
0921:D0 0A EA EA EA 60 AD 00 5E
0929:DC 29 08 C9 08 F0 09 20 C7
0931:DF 09 20 C7 0A EA EA EA B2
0939:60 AD 3B 03 C9 00 F0 1D CB
0941:38 AD 3B 03 ED 3E 03 90 71
0949:04 8D 3B 03 60 38 AD 3E D5
0951:03 ED 3B 03 8D 3C 03 A9 05
0959:00 8D 3B 03 60 18 AD 3C 61
0961:03 6D 3E 03 B0 04 8D 3C 35
0969:03 60 A9 FF 8D 3C 03 60 0E
0971:AD 3C 03 C9 00 F0 1D 38 9C
0979:AD 3C 03 ED 3F 03 90 04 DB
0981:8D 3C 03 60 38 AD 3F 03 C9
0989:ED 3C 03 8D 3B 03 A9 00 14
0991:8D 3C 03 60 18 AD 3B 03 D0
0999:6D 3F 03 B0 04 8D 3B 03 6D
09A1:60 A9 FF 8D 3B 03 60 AD 7B
09A9:39 03 C9 00 F0 1D 38 AD 6C
09B1:39 03 ED 3D 03 90 04 8D A2
09B9:39 03 60 38 AD 3D 03 ED 0F
09C1:39 03 8D 3A 03 A9 00 8D D2
09C9:39 03 60 18 AD 3A 03 6D 90
09D1:3D 03 B0 04 8D 3A 03 60 55
09D9:A9 FF 8D 3A 03 60 AD 3A 45
09E1:03 C9 00 F0 1D 38 AD 3A 56
09E9:03 ED 3D 03 90 04 8D 3A BA
09F1:03 60 38 AD 3D 03 ED 3A 8B
09F9:03 8D 39 03 A9 00 8D 3A EA
0A01:03 60 18 AD 39 03 6D 3D 7A
```

```
0A09:03 B0 04 8D 39 03 60 A9 64
0A11:FF 8D 39 03 60 18 AD 37 D5
0A19:03 6D 39 03 8D 37 03 90 41
0A21:04 20 77 0A EA 38 AD 37 99
0A29:03 ED 3A 03 8D 37 03 B0 B1
0A31:04 20 9F 0A EA 18 AD 38 2F
0A39:03 6D 3B 03 8D 38 03 90 A5
0A41:04 20 6A 0A EA 38 AD 38 19
0A49:03 ED 3C 03 8D 38 03 B0 16
0A51:03 20 56 0A 60 AD 01 D0 E6
0A59:C9 22 F0 0C CE 01 D0 CE A4
0A61:03 D0 CE 05 D0 CE 07 D0 F5
0A69:60 EE 01 D0 EE 03 D0 EE AA
0A71:05 D0 EE 07 D0 60 AD 10 FD
0A79:D0 29 0F C9 0F D0 07 AD 36
0A81:00 D0 C9 48 F0 17 18 EE 8A
0A89:00 D0 EE 02 D0 EE 04 D0 EA
0A91:EE 06 D0 D0 08 AD 10 D0 AD
0A99:09 0F 8D 10 D0 60 AD 10 1C
0AA1:D0 29 0F C9 0F F0 07 AD DE
0AA9:00 D0 C9 10 F0 17 38 CE 4F
0AB1:00 D0 CE 02 D0 CE 04 D0 8E
0AB9:CE 06 D0 10 08 AD 10 D0 B9
0AC1:29 F0 8D 10 D0 60 AD 15 D1
0AC9:D0 09 02 8D 15 D0 60 AD FB
0AD1:15 D0 09 04 8D 15 D0 60 C8
0AD9:AD 15 D0 09 08 8D 15 D0 26
0AE1:60 20 99 11 A9 C5 8D F8 EA
0AE9:07 A2 00 A0 00 C8 C0 FF D8
0AF1:D0 FB E8 E0 F0 D0 F4 A9 F6
0AF9:C6 8D F8 07 A2 00 A0 00 BA
0B01:C8 C0 FF D0 FB E8 E0 F0 EE
0B09:D0 F4 A9 C7 8D F8 07 A2 77
0B11:00 A0 00 C8 C0 FF D0 FB 7F
0B19:E8 E0 F0 D0 F4 60 EA EA F0
0B21:EA A9 C6 8D FD 07 60 EA 80
0B29:EA EA A9 C6 8D FE 07 60 E7
0B31:EA EA EA A9 C6 8D FF 07 E2
0B39:60 A9 FF 8D 0E D4 8D 0F B0
0B41:D4 A9 11 8D 12 D4 60 0A D5
0B49:0A A8 A9 6E 85 F9 A9 0B 1D
0B51:85 FA B1 F9 8D 0A D0 C8 BD
0B59:B1 F9 8D 0B D0 C8 B1 F9 30
0B61:4D 10 D0 8D 10 D0 C8 B1 1C
0B69:F9 8D 41 03 60 54 C3 00 14
0B71:03 84 83 00 03 94 C3 00 8C
0B79:02 44 73 00 03 44 83 00 40
0B81:03 84 93 00 03 54 73 00 FC
0B89:03 44 83 00 03 44 73 00 B2
0B91:03 34 73 00 03 0A 0A A8 A1
0B99:A9 BC 85 F9 A9 0B 85 FA 83
0BA1:B1 F9 8D 0C D0 C8 B1 F9 88
0BA9:8D 0D D0 C8 B1 F9 4D 10 90
0BB1:D0 8D 10 D0 C8 B1 F9 8D 31
0BB9:42 03 60 24 D3 00 03 B4 59
0BC1:A3 00 03 A4 A3 00 02 C4 3A
0BC9:73 00 01 C4 73 00 01 14 B7
0BD1:73 40 01 F4 83 00 01 E4 24
0BD9:83 00 01 C4 73 00 01 74 30
0BE1:73 00 01 0A 0A A8 A9 0A C2
0BE9:85 F9 A9 0C 85 FA B1 F9 AC
0BF1:8D 0E D0 C8 B1 F9 8D 0F 98
0BF9:D0 C8 B1 F9 4D 10 D0 8D 5A
0C01:10 D0 C8 B1 F9 8D 43 03 19
0C09:60 D4 C3 00 01 04 C3 80 1F
0C11:01 B4 83 00 02 B4 C3 00 B1
0C19:01 74 D3 00 03 E4 C3 00 7C
0C21:03 54 C3 00 03 D4 C3 00 3B
0C29:01 94 C3 00 02 34 D3 00 E7
0C31:03 AD 0B D0 C9 20 F0 26 7B
0C39:CE 0B D0 AD 10 D0 29 20 A6
0C41:C9 20 F0 0B AD 0A D0 C9 16
0C49:00 F0 13 CE 0A D0 60 18 59
0C51:CE 0A D0 10 08 AD 10 D0 56
0C59:29 DF 8D 10 D0 60 20 CA C3
0C61:0C 60 AD 0B D0 C9 20 F0 DC
0C69:04 CE 0B D0 60 20 CA 0C CA
0C71:60 AD 0B D0 C9 20 F0 25 69
0C79:CE 0B D0 AD 10 D0 29 20 E6
0C81:C9 20 D0 0B AD 0A D0 C9 52
0C89:48 F0 12 EE 0A D0 60 EE 76
0C91:0A D0 D0 08 AD 10 D0 09 D5
0C99:20 8D 10 D0 60 20 CA 0C 59
0CA1:60 AD 41 03 C9 00 D0 0D AA
0CA9:AD 1B D4 4A 4A 4A 4A 4A F8
0CB1:4A 8D 41 03 60 C9 01 D0 A7
0CB9:04 20 32 0C 60 C9 02 D0 E1
0CC1:04 20 63 0C 60 20 72 0C 85
0CC9:60 20 A4 11 20 48 0B 60 58
0CD1:AD 0D D0 C9 20 F0 26 CE 9A
0CD9:0D D0 AD 10 D0 29 40 C9 D8
0CE1:40 F0 0B AD 0C D0 C9 00 C9
0CE9:F0 13 CE 0C D0 60 18 CE E0
0CF1:0C D0 10 08 AD 10 D0 29 3F
0CF9:BF 8D 10 D0 60 20 69 0D C7
0D01:60 AD 0D D0 C9 20 F0 04 1A
0D09:CE 0D D0 60 20 69 0D 60 0F
0D11:AD 0D D0 C9 20 F0 25 CE D9
0D19:0D D0 AD 10 D0 29 40 C9 1A
0D21:40 D0 0B AD 0C D0 C9 48 4B
0D29:F0 12 EE 0C D0 60 EE 0C D0
0D31:D0 D0 08 AD 10 D0 09 40 D9
0D39:8D 10 D0 60 20 69 0D 60 5F
0D41:AD 42 03 C9 00 D0 0D AD CA
0D49:1B D4 4A 4A 4A 4A 4A 4A 6E
0D51:8D 42 03 60 C9 01 D0 04 21
0D59:20 D1 0C 60 C9 02 D0 04 7B
0D61:20 02 0D 60 20 11 0D 60 73
0D69:20 AD 11 20 96 0B 60 AD 72
0D71:0F D0 C9 20 F0 26 CE 0F 4F
0D79:D0 AD 10 D0 29 80 C9 80 D5
0D81:F0 0B AD 0E D0 C9 00 F0 0C
0D89:13 CE 0E D0 60 18 CE 0E BE
0D91:D0 10 08 AD 10 D0 29 7F 89
0D99:8D 10 D0 60 20 08 0E 60 3C
0DA1:AD 0F D0 C9 20 F0 04 CE A8
0DA9:0F D0 60 20 08 0E 60 AD 74
0DB1:0F D0 C9 20 F0 25 CE 0F 8B
0DB9:D0 AD 10 D0 29 80 C9 80 16
0DC1:D0 0B AD 0E D0 C9 48 F0 CC
0DC9:12 EE 0E D0 60 EE 0E D0 23
0DD1:D0 08 AD 10 D0 09 80 8D 46
0DD9:10 D0 60 20 08 0E 60 AD 25
0DE1:43 03 C9 00 D0 0D AD 1B C8
0DE9:D4 4A 4A 4A 4A 4A 4A 8D 8C
0DF1:43 03 60 C9 01 D0 04 20 8A
0DF9:70 0D 60 C9 02 D0 04 20 B3
0E01:A1 0D 60 20 B0 0D 60 20 D9
0E09:B6 11 20 E4 0B 60 A9 32 76
0E11:85 F9 A9 0E 85 FA AD 40 38
0E19:03 0A 0A A8 B1 F9 8D 08 9D
0E21:D0 C8 B1 F9 8D 09 D0 C8 A8
0E29:B1 F9 0D 10 D0 8D 10 D0 EC
0E31:60 94 D8 00 00 DC D8 00 E2
0E39:00 6C D8 00 00 A0 D8 00 BF
0E41:00 DC D8 00 00 0C D8 10 A1
0E49:00 68 D8 00 00 9C D8 00 BE
0E51:00 7C D8 00 00 34 D8 10 3A
0E59:00 AD 10 D0 29 DF 8D 10 E3
0E61:D0 AD 40 03 60 AD 10 D0 34
0E69:29 BF 8D 10 D0 AD 40 03 7D
0E71:60 AD 10 D0 29 7F 8D 10 AA
0E79:D0 AD 40 03 60 AD 1F D0 6A
0E81:8D 34 03 29 20 C9 20 D0 9D
0E89:0E 20 1F 0B A9 C5 8D FD C6
0E91:07 20 CA 0C AD 1F D0 AD 8C
0E99:34 03 29 40 C9 40 D0 0E B8
0EA1:20 28 0B A9 C5 8D FE 07 3D
0EA9:20 69 0D AD 1F D0 AD 34 78
0EB1:03 29 80 C9 80 D0 0E 20 C9
0EB9:31 0B A9 C5 8D FF 07 20 5D
0EC1:08 0E AD 1F D0 AD 34 03 B5
0EC9:29 01 C9 01 D0 08 A9 01 FE
0ED1:8D 44 03 4C 12 13 60 AD 36
0ED9:1E D0 8D 34 03 29 11 C9 D6
0EE1:11 D0 09 A9 01 8D 45 03 42
0EE9:4C ED 12 60 AD 34 03 29 5D
0EF1:01 C9 01 D0 08 A9 01 8D A4
0EF9:44 03 4C 12 13 60 A9 01 12
0F01:8D 27 D0 A9 01 8D 28 D0 C3
0F09:8D 29 D0 8D 2A D0 A9 01 14
0F11:8D 2C D0 8D 2D D0 8D 2E E9
0F19:D0 A9 01 8D 2B D0 A9 C0 B3
0F21:8D F8 07 A9 C1 8D F9 07 FE
0F29:A9 C2 8D FA 07 A9 C3 8D 22
0F31:FB 07 A9 C4 8D FC 07 A9 A8
0F39:C5 8D FD 07 A9 C5 8D FE 4C
0F41:07 A9 C5 8D FF 07 A9 80 CE
0F49:8D 37 03 8D 38 03 A9 0A 60
0F51:8D 3D 03 A9 0A 8D 3E 03 86
0F59:A9 05 8D 3F 03 A9 00 8D 7F
0F61:39 03 8D 3A 03 8D 3B 03 F9
0F69:8D 3C 03 60 AD 46 03 C9 1A
0F71:00 D0 0A AD 47 03 C9 01 BA
0F79:F0 30 4C E0 0F A9 00 8D 60
0F81:46 03 A9 01 8D 47 03 A9 02
0F89:78 8D 4A 03 A9 10 8D 4B B4
0F91:03 A9 0C 8D 05 D4 A9 18 DC
0F99:8D 06 D4 A9 00 8D 00 D4 40
0FA1:A9 18 8D 01 D4 A9 81 8D 3A
0FA9:04 D4 AD 47 03 C9 02 F0 5D
0FB1:12 CE 4A 03 D0 26 A9 80 F8
0FB9:8D 04 D4 A9 02 8D 47 03 AC
0FC1:4C DD 0F CE 4B 03 D0 14 68
0FC9:A9 00 8D 47 03 8D 00 D4 06
0FD1:8D 01 D4 8D 04 D4 8D 05 FD
0FD9:D4 8D 06 D4 4C 1C 10 AD 74
0FE1:54 03 C9 01 D0 21 A9 40 D2
0FE9:8D 05 D4 A9 F0 8D 06 D4 E3
0FF1:A9 00 8D 00 D4 A9 18 8D A1
0FF9:01 D4 A9 81 8D 04 D4 A9 EA
1001:00 8D 54 03 4C 1C 10 A9 DB
1009:00 8D 00 D4 8D 01 D4 8D 81
1011:05 D4 8D 06 D4 8D 04 D4 B4
1019:8D 54 03 AD 48 03 C9 00 32
1021:D0 0A AD 49 03 C9 01 F0 A8
1029:30 4C 31 EA A9 00 8D 48 F9
1031:03 A9 01 8D 49 03 A9 02 E1
1039:8D 4C 03 A9 10 8D 4D 03 82
1041:A9 04 8D 0C D4 A9 14 8D AC
1049:0D D4 A9 84 8D 07 D4 A9 7E
1051:3D 8D 08 D4 A9 81 8D 0B 3B
1059:D4 AD 49 03 C9 02 F0 12 F2
1061:CE 4C 03 D0 26 A9 80 8D CF
1069:0B D4 A9 02 8D 49 03 4C 7D
1071:31 EA CE 4D 03 D0 14 A9 C0
1079:00 8D 49 03 8D 07 D4 8D 16
1081:08 D4 8D 0B D4 8D 0C D4 07
1089:8D 0D D4 4C 31 EA A0 00 89
1091:B9 9D 10 99 C0 07 C8 C0 06
1099:28 D0 F5 60 20 13 03 0F 29
10A1:12 05 20 3D 20 20 20 20 C5
10A9:20 20 20 20 06 15 05 0C 82
10B1:20 3D 20 20 20 20 20 20 19
10B9:20 13 08 09 10 13 20 3D 8A
10C1:20 20 20 20 18 A2 18 A0 1C
10C9:09 20 F0 FF AE 4E 03 AD F6
10D1:4F 03 20 CD BD 18 A2 18 E6
10D9:A0 17 20 F0 FF AE 50 03 81
10E1:AD 51 03 20 CD BD 18 A2 C7
10E9:18 A0 25 20 F0 FF AE 52 1C
10F1:03 AD 53 03 20 CD BD 60 AD
10F9:AD 50 03 C9 00 D0 0C AD 0B
1101:51 03 C9 00 D0 01 60 38 49
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11F1:D0 8D 06 D0 AD 01 D0 8D 4E
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12B9:69 F4 8D 50 03 AD 51 03 FA
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2061:60 00 00 50 00 00 28 00 27
2069:00 14 A5 00 00 00 00 00 63
2071:00 00 AA 00 00 55 00 00 5C
2079:55 00 00 AA 00 00 55 00 B9
2081:00 55 00 00 2A 00 00 00 68
2089:00 00 00 00 00 00 00 00 C9
2091:00 00 00 00 00 00 00 00 D1
2099:00 00 00 00 00 00 00 00 D9
20A1:00 00 00 00 00 00 00 00 E1
20A9:00 00 80 00 00 00 00 00 F9
20B1:00 00 00 00 00 00 00 00 F1
20B9:00 00 00 00 00 00 00 00 F9
20C1:00 00 00 00 00 00 00 00 02
20C9:00 00 00 00 00 00 00 00 0A
20D1:00 00 00 00 00 00 00 00 12
20D9:00 00 00 00 00 00 FF FF 1A
20E1:FF FF FF FF FF FF FF FF 22
20E9:FF FF 5A 00 00 00 00 00 75
20F1:00 00 00 00 00 00 00 00 32
20F9:00 00 00 00 00 00 00 00 3A
2101:00 00 00 00 00 00 00 18 5B
2109:00 00 18 00 00 00 00 00 4E
2111:00 00 00 00 00 00 00 00 53
2119:00 00 00 00 00 00 00 00 5B
2121:00 00 00 00 00 00 00 00 63
2129:00 00 00 00 00 00 00 00 6B
2131:00 00 00 00 00 00 00 00 73
2139:00 00 00 00 00 00 4A 00 10
2141:00 11 00 01 44 00 00 29 23
2149:00 00 88 00 00 65 00 00 32
2151:08 00 00 00 00 00 00 00 97
2159:00 00 00 00 00 00 00 00 9B
2161:00 00 00 00 00 00 00 00 A3
2169:00 00 DA 00 00 00 00 00 07
2171:00 00 00 00 00 00 00 00 B3
2179:24 00 01 00 00 00 25 00 38
2181:04 80 40 00 04 00 04 90 A6
2189:40 00 01 00 00 88 00 04 32
2191:24 80 01 02 00 00 50 00 E6
2199:00 00 00 00 00 00 00 00 DB
21A1:00 00 00 00 00 00 00 00 E3
21A9:00 00 00 00 00 00 00 00 EB
21B1:00 00 00 00 00 00 00 00 F3
21B9:00 00 00 00 00 00 00 00 FB
21C1:00 00 4A 00 00 11 00 01 92
21C9:44 00 00 29 00 00 88 00 D1
21D1:00 65 00 00 08 00 00 00 AD
21D9:00 00 00 00 00 00 00 00 1C
21E1:00 00 00 00 00 00 00 00 24
21E9:00 00 00 00 00 00 DA 00 E1
21F1:00 00 00 00 00 00 00 00 34
21F9:00 00 00 00 24 00 01 00 5F
2201:00 00 25 00 04 80 40 00 8C
2209:04 00 04 90 40 00 01 00 DC
2211:00 88 00 04 24 80 01 02 DE
2219:00 00 50 00 00 00 00 00 67
2221:00 00 00 00 00 00 00 00 65
2229:00 00 00 00 00 00 00 00 6D
```

⊡

LIST FORMATTER

MAKE PROGRAM LISTINGS EASIER TO READ WITH THIS UTILITY FOR THE 64 OR 128

DAVID W. MARTIN

Here's a utility that will greatly increase the readability of your BASIC programs. *List Formatter* makes 64 or 128 program listings easier to comprehend.

If you have a 128, you're probably aware of your computer's larger input buffer that allows you to enter lines in a BASIC program as long as 160 characters. This is considered a big improvement over the 64's capacity of 80 characters per line.

The 128's larger buffer means that BASIC programmers can pack twice as many commands on one line. By doing so, they end up with a program that runs faster (since it has fewer line numbers) but is harder to read. Until now programmers had to decide between a program that was faster yet harder to read or one that was slower but easier to read. Now you can have the best of both worlds with *List Formatter.*

Getting Started

List Formatter is a small machine language program in the form of a BASIC loader. Since it's written in BASIC, enter the program by using *The Automatic Proofreader;* see "Typing Aids" elsewhere in this section. When you've finished entering *List Formatter,* be sure to save a copy to disk.

A unique aspect about *List Formatter* is that it automatically determines which system it's being run on (64 or 128) and configures itself to work within that system. This means you'll only need one copy of the program at any time and you'll never have to worry about which version to load. Load and run the program just as you would any BASIC program.

When *List Formatter* executes, it prints information about how to toggle the program on or off with a SYS call followed by a READY message.

You're then ready to load and list any BASIC program. At this point you can also list *List Formatter* to see how the program works. *List Formatter* patches itself into the IQPLOP vector at 774–775 ($0306–$0307), which handles the listing of BASIC text.

The list command itself has not been changed. *List Formatter* looks for a colon on a BASIC program line and formats the line based on the location of this character. A colon is often used to separate multiple statements on a line. Once a colon has been found, *List Formatter* prints each statement on its own line with the proper amount of indenting for uniform output. But that's not all.

List Formatter also highlights remarks (REM statements) in reverse video, making them easier to spot and read. As an example, consider the following BASIC line.

```
500 FORI=0TO100:PRINTI:
   NEXTI:REMARKS IN
   REVERSE VIDEO
```

Using the standard listing, the line would list as above, but with *List Formatter* the line appears as follows.

```
500 FORI=0TO1
    :PRINTI
    :NEXTI
    :REMARKS IN REVERSE
VIDEO
```

List Formatter is ideal for reading your programs or for printing out copies. Attempting to edit lines in this format, however, is not recommended because the length of the statement in the new format usually far exceeds the line's normal input length. If you must edit a line, first turn *List Formatter* off with the SYS address given when the program first runs.

Also note that the variable S used in the program can be changed to different addresses in memory. This makes the program easy to relocate if it interferes with another program. Once you use *List Formatter* and discover how readable it makes your BASIC listings, you'll probably find it a welcome addition to your utility library.

LIST FORMATTER

```
BP 100 REM COPYRIGHT 1990 - CO
       MPUTE PUBLICATIONS INTL
        LTD - ALL RIGHTS RESER
       VED
RX 105 IFPEEK(40960)<>148ANDPE
       EK(45056)<>191THEN110
GX 106 PRINT"{CLR}{DOWN}SETTIN
       G UP C64 MODE...":S=828
       :GOTO120
XA 110 S=2816:REM RELOCATABLE
       {SPACE}PROGRAM
KM 111 PRINT"{CLR}{DOWN}SETTIN
       G UP C128 MODE..."
BP 120 PRINT"{DOWN}LIST FORMAT
       TER "
EX 130 REM LIST FORMATTER MACH
       INE LANGUAGE
CQ 140 DATA 173,7,3,201,81,144
       ,6,169
RR 150 DATA 203,162,21,208,4,1
       69,81,162
PP 160 DATA 81,141,6,3,142,7,3
       ,96
DC 170 DATA 8,201,58,208,26,36
       ,17,48
DQ 180 DATA 22,169,13,32,12,86
       ,162,0
QG 190 DATA 189,0,1,240,8,169,
       32,32
JJ 200 DATA 12,86,232,208,243,
       169,58,201
XA 210 DATA 143,208,2,133,243,
       40,234,76
EB 230 REM POKE ML STARTING AT
        ADDR = S
MF 231 FOR D=S TO S+63:READ Y:
       POKE D,Y:T=T+Y:NEXT:REM
       ARKS ARE HIGHLIGHTED
RE 290 L=PEEK(774):POKED,L:POK
       ES+14,L
JR 300 H=PEEK(775):POKED+1,H:P
       OKES+16,H
XC 310 M=S+24:L%=M/256
GH 320 POKES+10,L%:POKES+8,M-2
       56*L%
GX 325 IFPEEK(40960)=148ANDPEE
       K(45056)=191THENGOSUB37
       0
HD 330 PRINT:PRINT"ON/OFF: SYS
       "S
BA 335 SYS(S):PRINT:PRINT"ENGA
       GED":PRINT:LIST231
PP 350 END
RF 360 REM PATCH C128 CODE FOR
        C64
CR 370 POKE828+4,167:POKES+36,
       71:POKES+37,171:POKES+4
       8,71:POKES+49,171
GB 380 POKES+60,199:POKES+30,1
       5
PX 390 RETURN                  ⊡
```

JESUS MENDOZA ESCALONA

DISSOLVER

ADD DRAMA TO YOUR 64 TEXT SCREENS BY MAKING CHARACTERS DISSOLVE AND MATERIALIZE

To add some zest to your game instructions, messages, or any other text, try this short machine language routine that causes words to dissolve. You can also reverse the process with *Dissolver* and have words slowly appear.

Dissolver hides out of the way of your BASIC programs, ready to be called at any time. It uses one or several collections of 255 characters that may either be defined by you or taken from the 64's standard set.

Typing It In

Dissolver is written in machine language. Enter the program with *MLX*, our machine language entry program; see "Typing Aids" elsewhere in this section. When *MLX* prompts you, respond with the values given below.

Starting address: CE90
Ending address: CFFF

When you've finished typing, be sure to save the program to disk with the name DISSOLVER.OBJ. A demonstration program that shows how to use *Dissolver* loads the program and looks for it by that name.

The demonstration program is written entirely in BASIC. To ensure accurate entry, use *The Automatic Proofreader;* see "Typing Aids" elsewhere in this section.

The Commands

To use *Dissolver* in your own programs, make the call SYS 52880, *swcopy, chrset1, chrset2*—where *swcopy, chrset1*, and *chrset2* represent numbers that specify how the program will work. If *swcopy* is 1, the program copies the standard 64 character set from ROM. If *swcopy* is 0, the program alternates between any of possibly several character sets that you may have in memory. It reads character data from the set stored at *chrset2* and copies them to the *chrset1* address.

The characters at *chrset1* are copies of the source character set and are visible on the screen. These copies are the characters actually used during the dissolving process.

As a practical example, suppose that your character set is located at memory address 43088 and your copy is to be at address 14336. In this case the character set is to be a copy of that in ROM. Therefore, the program call would be SYS 52880,1,14336,43088. If the character set were to be your own, you would need to poke the characters in starting at 43088 and use 0 in place of 1 as the first parameter in the above call.

Although any values from 0 through 65535 may be used as character set addresses, addresses under Kernal ROM, from 57344 on, are not accessible. Calls from this area will result in garbage.

Now you can start having fun by dissolving characters. The dissolving process can also be used in reverse, with characters slowly materializing on the screen. To dissolve characters, use SYS 52963, *swdiss, start, end*—where *swdiss, start,* and *end* represent more special parameters. The value of *swdiss* must be 0 or 1. Use 0 if you want characters to dissolve and 1 if you want them to materialize. The numbers *start* and *end* may take on any values from 0 to 255 and tell the program what range of characters within your set is to be treated as dissolvable text.

To better understand *Dissolver,* examine the demonstration program and the REM statements that explain the different calls. Then put the program to work spicing up your own text screens.

DISSOLVER.OBJ

```
CE90:20 9E CF 84 02 20 9E CF C5
CE98:8C AC CF 8D AD CF 20 9E 06
CEA0:CF 8C AE CF 8D AF CF A5 8C
CEA8:02 D0 01 60 A2 05 BD AC F2
CEB0:CF 95 FA CA 10 F8 A9 7F DE
CEB8:8D 0D DC A5 01 29 FB 85 80
CEC0:01 A2 08 A0 00 B1 FE 91 E8
CEC8:FA 91 FC C8 D0 F7 E6 FB A4
CED0:E6 FD E6 FF CA D0 EE A5 5B
CED8:01 09 04 85 01 A9 81 8D 51
CEE0:0D DC 60 20 9E CF 84 02 89
CEE8:20 9E CF 84 03 20 9E CF 26
CEF0:84 04 98 38 E5 03 18 69 3D
CEF8:01 85 23 C9 D2 B0 04 A9 84
CF00:01 D0 02 A9 00 85 24 A2 30
CF08:03 BD AC CF 9D A8 CF CA 25
CF10:10 F7 A4 03 F0 1D 18 A9 50
CF18:08 6D A8 CF 8D A8 CF 18 EF
CF20:A9 08 6D AA CF 8D AA CF C8
CF28:90 06 EE A9 CF EE AB CF 6B
CF30:88 D0 E3 A9 36 85 01 A9 D2
CF38:3F 85 FE A9 07 85 FF A5 47
CF40:23 85 22 A2 03 BD A8 CF 71
CF48:95 FA CA 10 F8 A6 FF BD EB
CF50:B2 CF A8 A6 FE A5 02 F0 40
CF58:05 B1 FC 4C 60 CF B1 FA EB
CF60:3D BA CF F0 04 51 FA 91 43
CF68:FA 18 A9 08 65 FA 85 FA 5E
CF70:18 A9 08 65 FC 85 FC 90 66
CF78:04 E6 FB E6 FD C6 22 D0 E1
CF80:CC A5 24 F0 0A A0 0F A2 17
CF88:00 CA D0 FD 88 D0 FA C6 19
CF90:FE C6 FF 10 AA A5 FE 10 5C
CF98:A2 A9 37 85 01 60 20 FD FA
CFA0:AE 20 8A AD 20 F7 B7 60 7C
CFA8:00 00 00 00 00 30 00 38 41
CFB0:00 D0 05 01 03 06 02 07 70
CFB8:00 04 02 01 02 40 01 20 DC
CFC0:08 10 20 08 40 08 40 01 90
CFC8:04 20 80 02 01 10 08 40 3B
CFD0:20 02 04 40 10 20 02 08 92
CFD8:80 40 08 10 80 04 20 80 9F
CFE0:10 01 01 80 04 80 04 10 2B
CFE8:02 04 40 20 08 02 10 04 01
CFF0:01 80 10 04 20 01 80 02 7B
CFF8:40 08 00 00 00 00 00 00 BA
```

DISSOLVER DEMO

```
AC 10 REM COPYRIGHT 1990 - COM
      PUTE PUBLICATIONS INTL L
      TD - ALL RIGHTS RESERVED
PS 60 PRINT CHR$(147)
CB 70 POKE 53281,0:POKE53280,1
      1
CK 80 PRINT CHR$(8);SPC(244);C
      HR$(152);"LOADING DISSOL
      VER OBJECT CODE..."
SE 90 A=A+1
MH 100 IF A=1 THEN LOAD "DISSO
       LVER.OBJ",8,1
BG 110 REM *** COPY ROM CHARAC
       TER SET ****
HR 120 SYS 52880,1,14336,40960
XK 130 REM ***** ENABLE ON BLO
       CK ZERO ****
RA 140 POKE 53272,30
JG 150 REM *** DISSOLVE ALL CH
       R$ SET *****
PM 160 SYS 52963,0,0,255
EF 170 PRINT CHR$(147)
AH 180 REM *** PRINT 'INVISIBL
       E' LINES ***
SG 190 PRINT SPC(48);CHR$(155)
       ;"DISSOLVER IS A PROGRA
       M"
DJ 200 PRINT SPC(9)" THAT ALLO
```

```
      WS YOU TO
AR 210 REM *** UNDISSOLVE HALF
       SET ******
MJ 220 SYS 52963,1,0,127
PB 230 FOR T=1 TO 1000:NEXT
KP 240 PRINT SPC(84);CHR$(152)
       ;"DISSOLVE ONE CHARACTE
       R AT A TIME"
DA 250 FOR T=1 TO 1000:NEXT
GD 260 PRINT SPC(56);CHR$(158)
       ;"01234"
FP 270 FOR C=48 TO C+4
XF 280 REM *** DISSOLVE A CHAR
       ACTER ******
JJ 290 SYS 52963,0,C,C
FD 300 NEXT
XS 310 REM ** ANOTHER 'INVISIB
       LE' LINES **
CF 320 PRINT SPC(48);CHR$(152)
       ;CHR$(18);"OR WORK WITH
       A GROUP"
XF 330 PRINT SPC(8);CHR$(18);"
       {3 SHIFT-SPACE}OF CHARA
       CTERS{SHIFT-SPACE}
       {2 SHIFT-SPACE}";CHR$(1
       46)
KF 340 REM *** UNDISSOLVE HALF
       SET ******
SX 350 SYS 52963,1,128,255
FR 360 FOR T=1 TO 1500:NEXT
BQ 370 PRINT SPC(56);CHR$(158)
       ;"01234"
HB 380 REM *** UNDISSOLVE FIVE
       NUMBERS **
XP 390 C=48
SR 400 SYS 52963,1,C,C+4
FK 410 PRINT SPC(44);CHR$(152)
       ;"OR WITH A COMPLETE CH
       ARACTER SET"
PD 420 REM *** PRINT 255 CHARA
       CTERS ******
PG 430 FOR C=0 TO 255
PP 440 POKE 1704+C,C
ER 450 NEXT
PG 460 FOR T=1 TO 1500:NEXT
FX 470 REM *** DISSOLVE FULL S
       ET *********
PX 480 SYS 52963,0,0,255
XE 490 FOR T=1 TO 1500:NEXT
DK 500 PRINT CHR$(147)
CP 510 REM *** PRINT 'INVISIBL
       E' LINES ***
AQ 520 PRINT SPC(166);CHR$(155
       );"OR CHANGE BETWEEN DI
       FFERENT"
AE 530 PRINT SPC(52)"CHARACTER
       SETS."
SC 540 REM *** UNDISSOLVE FULL
       SET ******
JA 550 SYS 52963,1,0,255
SJ 560 FOR T=1 TO 1500:NEXT
CK 590 REM *** DISSOLVE OLD SE
       T **********
EB 600 SYS 52963,0,0,255
GC 660 FOR T=1 TO 1500:NEXT
FF 670 PRINT CHR$(147)
PM 680 REM *** START AGAIN ***
       ************
DR 690 GOTO 120                  ⊡
```

MICHAEL J. GIBBONS

MODULE 64

OVERCOME THE 64'S MEMORY LIMITATIONS WITH THIS PROGRAMMING UTILITY

Programmers quickly learn through frustration the memory limitations of the 64 when trying to design and write large programs. When confronted with such a problem, one may be tempted to pack the program with as much BASIC code as possible, but this can leave the program difficult to read and filled with potential bugs. *Module 64* is a better alternative.

Module 64 is a machine language routine that loads BASIC subroutines (modules) from disk and links them as needed to form your main program. With this capability, you are no longer restricted to program size, as you can store sections of your program on disk to be loaded and executed as required.

Unlike chained programs, *Module 64* lets you keep your main controlling program in memory at all times, and program variables are accessible to all modules. With *Module 64,* you'll be able to write much larger programs than before.

Getting Started

Module 64 is written entirely in BASIC. To prevent typing errors, use *The Automatic Proofreader* to type it in. See "Typing Aids" elsewhere in this section. When you've finished typing in the main program, be sure to save a copy of the program.

To help demonstrate the power of *Module 64,* we've included a calendar program that has three modules. This demonstration requests you to enter a day, month, and year. The program then displays a calendar of that month. The main program calls modules 1, 2, and 3. Type in each of the three modules and save them to disk separately. Be sure to save them with the appropriate filenames, as the main program will call them by those names.

When run, the demo program will load and call module 3, which will prompt you for a date. Enter any date between 0 and 2300, using the format shown. The program will then load and run module 1, which prints the month, year, days of the week, and a grid pattern used with the calendar. Finally, the demo loads and calls module 2, which prints the dates to the appropriate squares, highlighting the day chosen.

This demonstration is rather simple, but it shows how *Module 64* works. When writing your own programs, you can write much larger programs, using as many modules as you want. *Module 64* is best suited for programs that call several interrelated functions upon some type of condition, such as menu selections.

Using the Program

Using *Module 64* is fairly simple, but you must follow a few rules. First, your main program, which will reside in memory, must begin with line 1000, even if it's just a REM statement. Second, you must include lines 2000–2040 of *Module 64* in your main program. Then a simple GOSUB 2040 reads the data into memory. Third, all the modules must use line numbers less than 1000 and each must end with line number 999. This is so *Module 64* can link the end of the modules to the beginning of the main program.

Finally, you must save your largest module along the main program to disk. This is required so enough space will be allocated at the beginning of your program for the other modules. Notice that in the demo programs the main program begins with line 1000 and each of the modules ends with 999. The largest module, 2, is included within the main program as required. To find which of your modules is the largest, load a module and type PRINT PEEK(46) * 256 + PEEK(45) − 2048.

This will print the size in bytes of each module. All that your main program needs now to load and run a module is to execute the command SYS 49152,"*module name*" (where *module name* is the disk name of the module you want to load). Once the module has been loaded, you need only GOSUB to the first line to be executed of that module. You may also execute the above command in direct mode, which will simply load the module and link it to your program if it's in memory.

Keep in mind that you should not use constant strings in modules if you want them to be accessible to other modules or the main program. If you must, make it a concatenated string by adding a null string constant to the end (for example, A$ = "HOUSE" + " "). This will make certain the string is stored in memory as

opposed to being embedded within the module BASIC text.

MODULE 64

```
AF 1 REM COPYRIGHT 1990 - COMP
     UTE PUBLICATIONS INTL LTD
     - ALL RIGHTS RESERVED
RK 10 GOTO 1000
MD 20 LY = 0
AE 30 D = VAL(MID$(CC$,INT(YR/
     100)+2,1))
MG 35 L = YR - INT(YR/100)*100
RA 40 D = D+L:D = D + INT(L/4)
      + VAL(MID$(MC$,MN,1))
PD 50 D=D+1:IF (YR/4-INT(YR/4)
     )=0 AND MN<3THEN D=D-1:L
     Y=1
CA 60 D=D-INT(D/7)*7+1:IF D>6
     {SPACE}THEN D=0
KB 70 PRINTCHR$(19):PRINT:PRIN
     T:PRINT:PRINT:C=D:A=0:R$
     =CHR$(13)
JJ 75 M=VAL(MID$(MD$,(MN-1)*2+
     1,2)):IF LY=1 AND MN=2 T
     HEN M=M+1
XC 80 PRINT SPC(2+5*C);:FOR L=
     C TO 6:A=A+1:IF A>M THEN
      L=7:GOTO100
MB 85 IF A>M THEN L=7:GOTO100
AR 87 IF A=DY THEN PRINTCHR$(2
     8);
GC 90 PRINT RIGHT$(" "+STR$(A)
     ,2);SPC(3);
HH 100 PRINT CHR$(5);:NEXT:PRI
     NT R$;R$:C=0:IF A<M THE
     N 80
SF 110 PRINT CHR$(19):FOR L=1
     {SPACE}TO 23:PRINT:NEXT
     :PRINT SPC(13);"PRESS
     {2 SPACES}ANY KEY"
JK 120 GETA$:IF A$="" THEN 120
SS 130 RETURN
GG 999 END
CF 1000 DIM MN$(12)
XA 1010 CC$="01234567898765436
     4206420"
KB 1020 MC$="033614625035":MD$
     ="312831303130313130313
     3031"
BK 1030 MN$(1)="JANUARY":MN$(2
     )="FEBRUARY"
JR 1040 MN$(3)="MARCH":MN$(4)=
     "APRIL"
HA 1050 MN$(5)="MAY":MN$(6)="J
     UNE"
GD 1060 MN$(7)="JULY":MN$(8)="
     AUGUST"
GA 1070 MN$(9)="SEPTEMBER":MN$
     (10)="OCTOBER"
RB 1080 MN$(11)="NOVEMBER":MN$
     (12)="DECEMBER"
BH 1085 POKE53280,14:POKE53281
     ,6
HJ 1090 GOSUB 2040
KC 1100 SYS 49152,"MOD#3":GOSU
     B20 REM GET DATE INPUT
DX 1110 SYS 49152,"MOD#1":GOSU
     B20 REM PRINT GRID
ES 1120 SYS 49152,"MOD#2":GOSU
     B20 REM PRINT DAYS
QF 1130 GOTO1100
AS 2000 DATA 169,3,141,131,192
     ,169,232,141,130,192,3
     2,84,192,165,251,141,1
     32
SG 2005 DATA 192,165,252,141,1
     33,192,32,253,174,169,
     1,166,186,168,32,186,2
     55
HM 2010 DATA 32,158,173,169,13
     ,208,5,162,22,76,55,16
     4,32,166,182,32,189
FS 2015 DATA 255,169,0,32,213,
     255,169,3,141,131,192,
     169,231,141,130,192,32
PA 2020 DATA 84,192,173,132,19
     2,160,0,145,251,173,13
     3,192,200,145,251,96,1
     69
CM 2025 DATA 8,133,252,169,1,1
     33,251,160,2,177,251,2
     05,130,192,208,9,200
RA 2030 DATA 177,251,205,131,1
     92,208,1,96,160,0,177,
     251,72,200,177,251,133
XQ 2035 DATA 252,104,133,251,1
     65,252,201,0,208,219,9
     6,231,3,170,9,0
JB 2040 M=49152:FORL=0TO132:RE
     ADA:POKEM+L,A:NEXT:RET
     URN
```

MOD#1

```
XD 20 REM COPYRIGHT 1990 - COM
      PUTE PUBLICATIONS INTL L
      TD - ALL RIGHTS RESERVED
QR 21 M$=MN$(MN):PRINT CHR$(14
      7);CHR$(5);SPC((40-LEN(M
      $))/2);M$
QC 25 PRINT SPC(17);YR
JP 30 PRINT:PRINT"{3 SPACES}SU
      N{2 SPACES}MON{2 SPACES}
      TUE{2 SPACES}WED
      {2 SPACES}THU{2 SPACES}F
      RI{2 SPACES}SAT"
MX 40 FOR T=1 TO 6
GK 45 L1$=CHR$(167):L2$=CHR$(1
      75):L3$=CHR$(186)
KK 50 PRINT CHR$(144);:GOSUB20
      0:GOSUB210:GOSUB210:NEXT
      :GOSUB200
DF 55 R$=CHR$(13):PRINT CHR$(1
      9);R$;R$;R$
DH 60 FOR L=1 TO 6:PRINT" ";L1
      $:PRINT SPC(36);L1$
BF 70 PRINT SPC(36);L1$:NEXT:P
      RINT" ";L1$
CP 100 RETURN
BF 200 PRINT"{2 SPACES}";:FOR
      {SPACE}L=1 TO 7:PRINT L
      2$;L2$;L2$;L2$;L3$;:NEX
      T:PRINT:RETURN
RD 210 PRINT" ";:FOR L=1 TO 7:
      PRINT L1$;"{4 SPACES}";
      :NEXT:PRINT:RETURN
GG 999 END
```

MOD#2

```
XD 20 REM COPYRIGHT 1990 - COM
      PUTE PUBLICATIONS INTL L
      TD - ALL RIGHTS RESERVED
HE 21 LY=0
AE 30 D= VAL(MID$(CC$,INT(YR/1
      00)+2,1))
MG 35 L= YR - INT(YR/100)*100
RA 40 D=D+L:D= D + INT(L/4)+VA
      L(MID$(MC$,MN,1))
PD 50 D=D+1:IF (YR/4-INT(YR/4)
      )=0 AND MN<3THEN D=D-1:L
      Y=1
CA 60 D=D - INT(D/7)*7+1:IF D>
      6 THEN D=0
KB 70 PRINT CHR$(19):PRINT:PRI
      NT:PRINT:PRINT:C=D:A=0:R
      $=CHR$(13)
JJ 75 M= VAL(MID$(MD$,(MN-1)*2
      +1,2)):IF LY=1 AND MN=2
      {SPACE}THEN M=M+1
XC 80 PRINT SPC(2+5*C);:FOR L=
      C TO 6:A=A+1:IF A>M THEN
       L=7:GOTO100
MB 85 IF A>M THEN L=7:GOTO100
AR 87 IF A=DY THEN PRINTCHR$(2
      8);
GC 90 PRINT RIGHT$(" "+STR$(A)
      ,2);SPC(3);
HH 100 PRINT CHR$(5);:NEXT:PRI
       NT R$;R$:C=0:IF A<M THE
       N 80
JP 110 PRINT CHR$(19):FOR L=1
      {SPACE}TO 22:PRINT:NEXT
      :PRINT SPC(13);"PRESS
      {2 SPACES}ANY KEY"
JK 120 GETA$:IFA$=""THEN120
SS 130 RETURN
GG 999 END
```

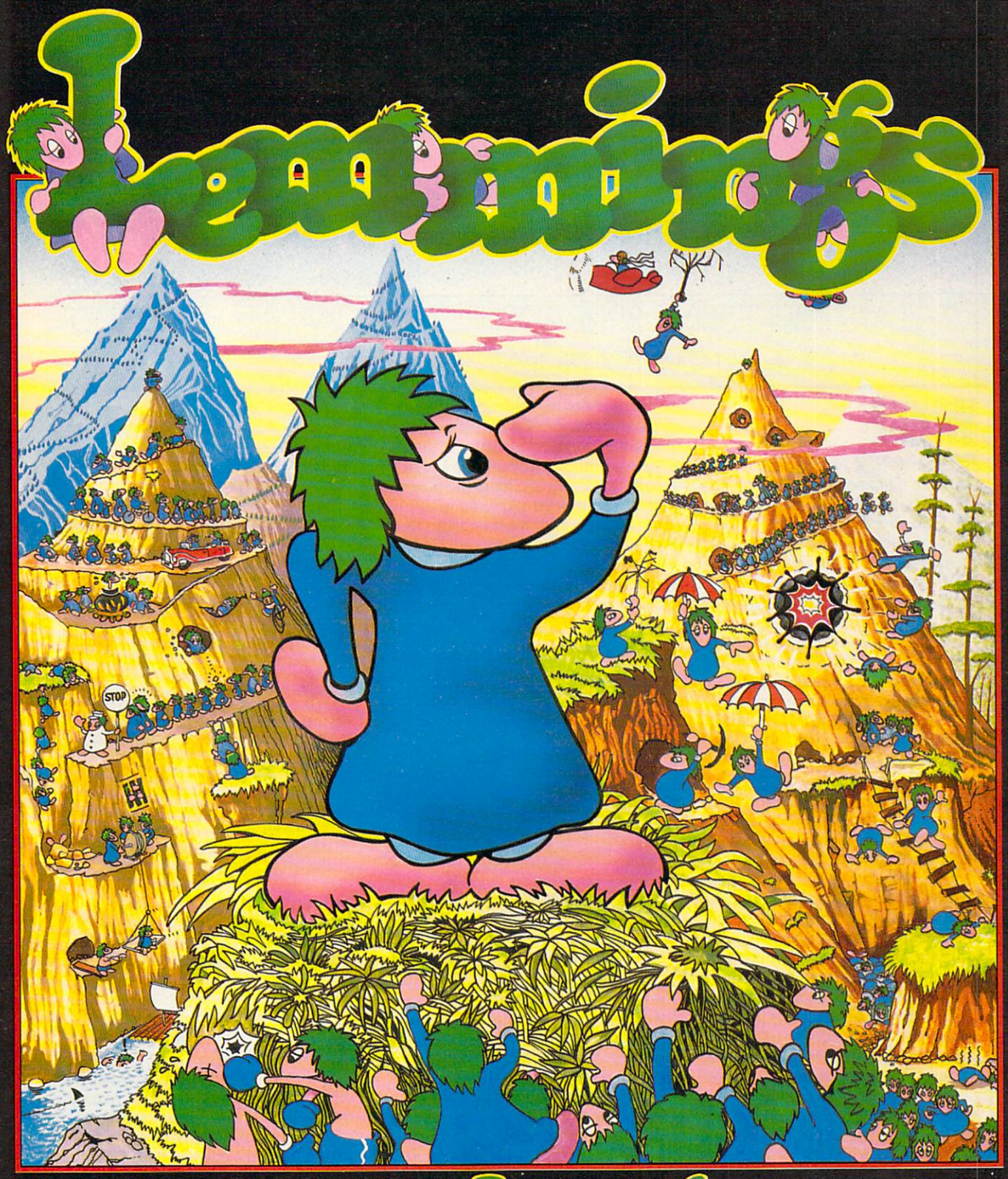
MOD#3

```
XD 20 REM COPYRIGHT 1990 - COM
      PUTE PUBLICATIONS INTL L
      TD - ALL RIGHTS RESERVED
FF 21 PRINT CHR$(147):PRINT:PR
      INT
CQ 30 PRINT"ENTER A DATE (MM/D
      D/YYYY):";:INPUT"";A$
BF 40 MN= VAL(LEFT$(A$,2)):DY=
       VAL(MID$(A$,4,2)):YR= V
      AL(RIGHT$(A$,4))
EQ 50 IF MN<1 OR MN>12 THEN90
GX 60 M= VAL(MID$(MD$,(MN-1)*2
      +1,2))
EH 70 IF DY<1 OR DY>M THEN90
DS 80 IF YR<1 OR YR>2300 THEN
      {SPACE}90
MF 85 RETURN
EH 90 PRINT:PRINT"INVALID DATE
      ":PRINT:GOTO30
GG 999 END
```

COMING NEXT MONTH . . .

Climbing Your Family Tree

No telling whom you'll meet when you start climbing your family tree, but keeping track of all those ancestors can be quite a chore. Most genealogists compile family group sheets and pedigree charts by hand, but in this article you can learn how genealogy software for your 64 or 128 can simplify your recordkeeping and eliminate much of the paperwork.



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Circle Reader Service Number 168

CREATE IMPRESSIVE SPREADSHEETS • SCAN ART BY HAND FOLLOW CARMEN THROUGH TIME

WINGZ

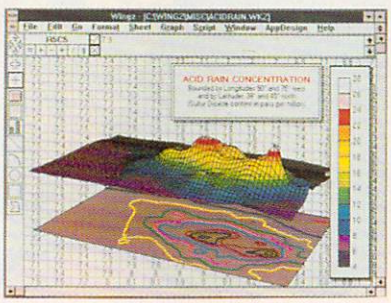
These days, if you're going to introduce a high-end spreadsheet program, it had better be good. In a field already crowded with top-selling applications from the industry giants—Lotus, Microsoft, and Borland—your program would have to hit the ground running and never look back.

Informix has taken up the challenge with its *Windows* spreadsheet program, *Wingz*. While it has the usual array of noteworthy features and functions, *Wingz* adds outstanding three-dimensional graphics and a powerful scripting language.

Wingz has 20 basic types of charts, in both two and three dimensions, with a variety of title, legend, color, and pattern choices. It's almost embarrassingly easy to create a chart in *Wingz*. Simply select the data range by holding down a mouse button, and click on the chart icon. Then define the area on the spreadsheet where you want the chart to go by holding down a mouse button, dragging to define the chart's size, and releasing the button. That's it. You can use the pull-down menus to change the type of chart, move legends or titles, or perform a variety of other chart modifications.

Unlike other spreadsheet programs, *Wingz* lets you create a chart on the screen right next to your data. This is a true WYSIWYG (What You See Is What You Get) spreadsheet. To move the chart, you simply click on the chart and drag it across the page. To resize it, you click on the chart and move the chart's resizing handles. While *Wingz* offers a full-page preview, you probably won't need it—the screen accurately shows how your page will look.

The scripting language for *Wingz*, HyperScript, is equally impressive. You can create custom menus, dialog boxes, slider controls, buttons that call other scripts, and spreadsheet functions not included with the program. The menu system is also a script, so you can modify it. With the Learn command, you can have the program record your keystrokes and mouse movements and translate them into HyperScript commands. And, as if writing and recording scripts weren't enough, *Wingz* lets you enter HyperScript commands directly for immediate execution.



With *Wings* you can easily create eye-catching three-dimensional graphics.

As might be expected with the first version of a major new application, *Wingz* does have some problems. When you change a cell to a larger font, you have to manually adjust the cell's row height. While you can load the data and formulas from most *1-2-3* spreadsheets (WKS and WK1, but not WK3, WRI, or WGI), you have to leave your macros behind. The Learn command translates all cell and mouse movements into absolute addresses—with no option for relative references. And I was able to repeatedly crash the program by creating a simple 3-D chart and selecting Contour from the Gallery menu.

Wingz doesn't offer full compatibility with the industry standard *Lotus 1-2-3*, and it isn't a mature *Windows* spreadsheet program, as is *Microsoft Excel*. But if you dream of creating eye-popping charts or if you love programing, you'll fall head over heels for *Wingz*. It's a groundbreaking program that soars above the competition.

DAVID ENGLISH

Ease of Use	★★★★
Documentation	★★★★
Features	★★★★★
Innovation	★★★★★

IBM PC and compatibles; package includes both *Windows* and OS/2 versions—$499
Windows version requires *Windows* 3.0, 2MB of RAM (3MB or more recommended), 2MB of hard disk space, and EGA, VGA, or 8514/A monitor.
OS/2 version requires OS/2 version 1.2 or higher, 4MB of RAM, 2MB of hard disk space, and EGA, VGA, or 8514/A monitor.

INFORMIX SOFTWARE
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BALANCE OF THE PLANET

As a game, Chris Crawford's *Balance of the Planet* is no great shakes. As a challenging intellectual puzzle, it's quite effective. As an intriguing educational experience, it's unmatched. If managing and understanding the delicate balance of the ecological and economic forces that hold our beloved mother earth together appeals to you, you're in for hours of fascination.

As the United Nations High Commissioner of the Environment, your job is to set global policies. You control ten taxes and 12 ways to use government funds. Change the policies to match your theories, tell the computer to advance five years to evaluate the consequences of your policies, and display the results. You

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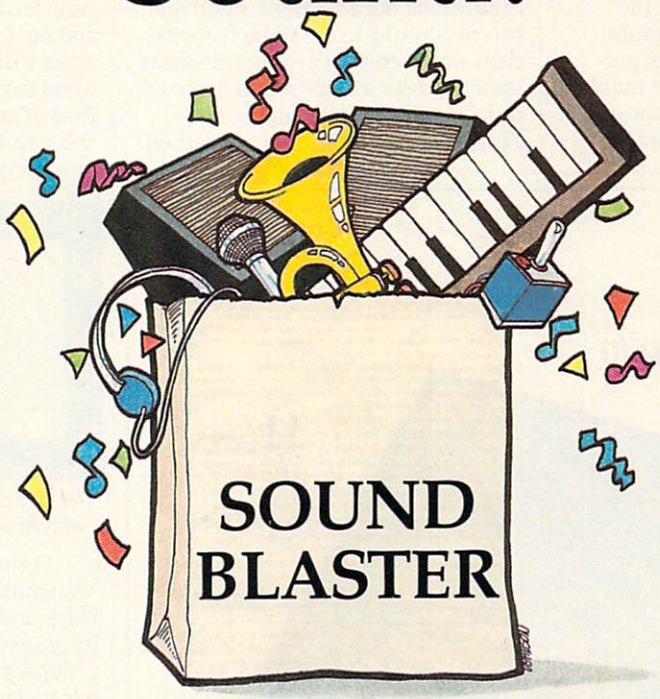

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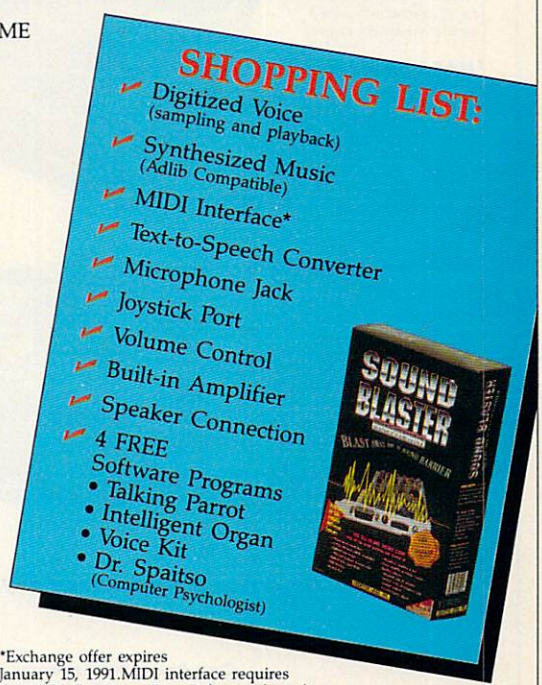

Brown Wagh

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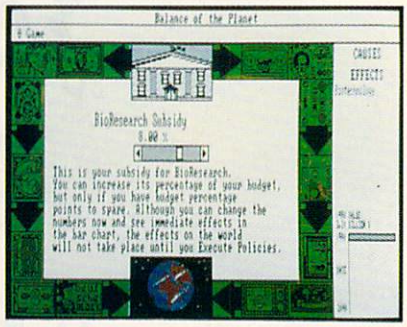
Sounds simple, but lurking beneath that simple surface is a massive set of awesomely complex interrelationships. Take, for example, the wood stove subsidy. You can subsidize poor people's wood stove purchases, thereby increasing the number of wood stoves. As you scan through the screens of this game, jumping from related topic to cause to effect, you find that increased use of wood stoves in third-world countries decreases the use of wood as fuel. Why? Most fuel wood is now used in open fires, which burn far more wood than stoves. Shifting to the more fuel-efficient wood stoves leaves more forests standing, which helps retard desertification and forest clearing. Forest clearing affects the amount of carbon dioxide in the air, which is involved in the greenhouse effect and the global warming trend. Desertification increases soil erosion and reduces food supplies by destroying usable farmland, leading to starvation, and on and on. Clearly, wood stoves can make a difference. And that's just wood stoves. Imagine the ripple effects of tampering with oil supplies and natural gas.



The fate of the world rests in your hands with Accolade's *Balance of the Planet*.

Perhaps because it started on a Macintosh, the game is primarily black-and-white with only CGA-quality graphics, even on a VGA monitor. Color serves only as a background for selected screens. No effort has been made to exploit modern computer graphics.

Don't come to *Balance of the Planet* for an escapist adventure. Come to it for thoughtful consideration of the ultimate puzzle you share with world leaders. And be glad that when your people starve and die of skin cancer as a result of your decisions, it's not permanent. Just start over, try a different mix of policies, and hope to keep more of us alive for a little longer.

RICHARD O. MANN

Educational Value	★★★★★
Documentation	★★★★
Originality	★★★★
Graphics	★★

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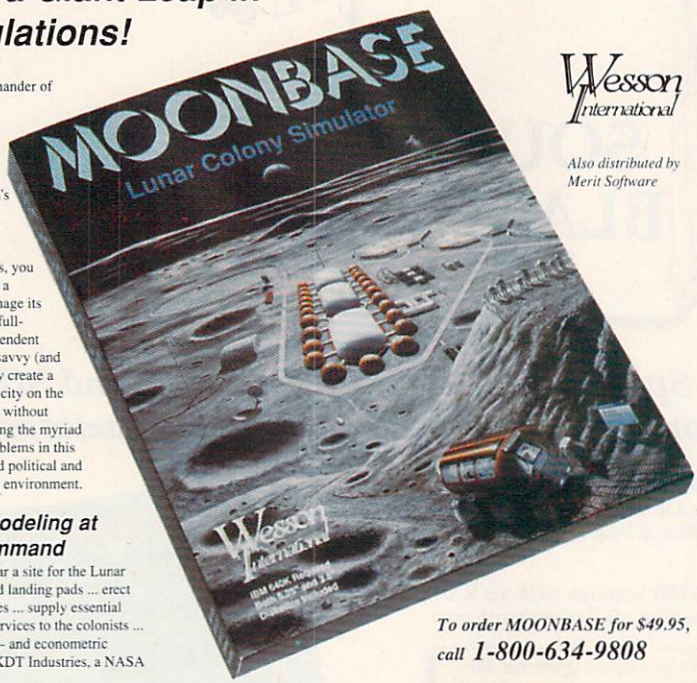

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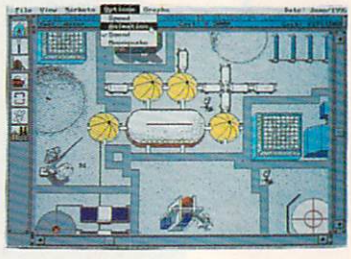

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☐ PC-Jigsaw	959	You see a nice picture, then it's scrambled. Can you put it together?
☐ Pinball	965	Five SUPER pinball games. Realistic sound and action CGA
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☐ EGA Games 1	992	A collection of favorites including SCRABBLE and SOLITAIRE EGA
☐ EGA Golf	995	A game of skill, strategy and reflex. Great graphics and realism EGA
☐ EGA Trek	999	This is the ULTIMATE Star Trek adventure. You're the captain! EGA

VGA GAMES (These games require VGA graphics cards)

☐ VGA Sharks	983	An underwater action arcade game. Avoid sharks as you collect treasures.
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CGA=Requires Color Computer HD=Requires Hard Drive 512K=Requires 512K RAM

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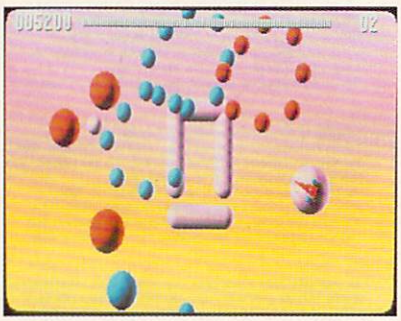
THE GAME OF HARMONY

With a name like *Harmony,* you'd expect this game to be soothing and relaxing, freeing you from the nerve-racking tension and violence of other games. Think again. The challenge is anything but relaxing, and that's what makes it so much fun.

To harmonize the different colored spheres on the screen, you must bump spheres of like color together using a cue ball–like cursor. When the spheres touch, they let out a little musical sigh and disappear happily in harmony. But if spheres of different colors touch, they create a new, smaller sphere of a third color, which can be gobbled up for extra energy. If this smaller sphere is left alone, it will grow into a full-sized sphere also crying to be harmonized. To add to the challenge, the game places walls of various shapes in the way.



It sounds easy, but it's a real challenge to keep your cool as you manipulate the spheres in *Harmony.*

It sounds simple enough, and in Mantra mode it is. There's no time limit, and new spheres aren't created when spheres of different color collide. You just take your time, and eventually you'll find that things work out.

In Normal mode, the challenge increases—and so does the excitement. Here, you're rewarded for calm and deliberate movement. Now the spheres pulsate faster and faster until they just can't stand the discordance any more and explode, costing you a lot of energy. Run out of energy, and you lose a life. Lose all your lives, and the game is over.

Harmony can be as frustrating and tension producing as any other game, especially in Normal mode with spheres pulsating and exploding around you. It can also be very addicting.

It's one of the easiest games to learn that I've seen in quite some time. You can literally master the concepts and gameplay in one or two minutes.

Harmony cries out to be played on a VGA system. With EGA graphics, the game looks good and plays well. On a VGA system, *Harmony*'s graphics are strikingly appealing. Background colors change and merge, and the spheres take on convincing depth. A Roland, CMS, or Ad Lib sound card adds considerably to your enjoyment.

To start the game, you must go through a copy-protection scheme that, unfortunately, uses annoyingly hard-to-read red paper. But at least you can make a backup copy of the disk and load it easily onto your hard drive.

With 50 different screens to harmonize, this is not a game you'll blast through in an afternoon. The real challenge is not only in harmonizing the screen but in doing it in a quick and graceful manner without a whole lot of bumping around. After a few game sessions, you should be able to begin to see patterns in the spheres, and elegant solutions will become more apparent. This is when the real fun begins.

RICHARD SHEFFIELD

Playability	★★★★
Documentation	★★★
Originality	★★★★
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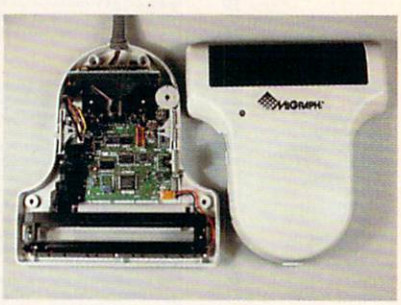
Migraph has teamed the Omron hand-held scanner with its *Touch-Up* software to create an excellent low-cost scanning solution for Amiga users. The scanner can be conveniently operated with either hand, although its activating push button is located on the left side. In fact, based on the size and shape of the scanner, operating it is like handling a large mouse, except that the tail is at the wrong end. The scanner can be positioned prior to the scan, and the object can be viewed during the scan by peering through a green-tinted window at the front of the scanner while the scanner light is on. The scanner light is controlled by Migraph's *Touch-Up* software. The light stays on during the scan and shuts off automatically after the scan buffer has been filled or within ten seconds after the scan button has been released.



Inside Migraph's Scanner: The scanning window and light source are at the bottom, and imaging optics are at the top.

The scanner offers hardware-switchable resolutions of 100, 200, 300 and 400 dots per inch. A second four-position switch lets you choose between Line-Art mode and three photo settings. Since the Line-Art mode generates a pure black-and-white image, it's suitable for text, en-

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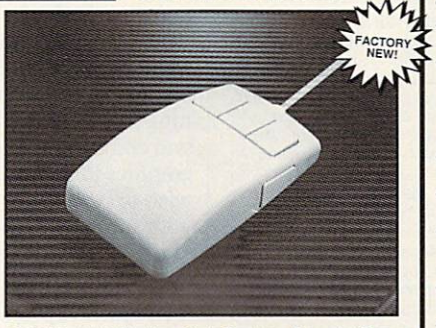

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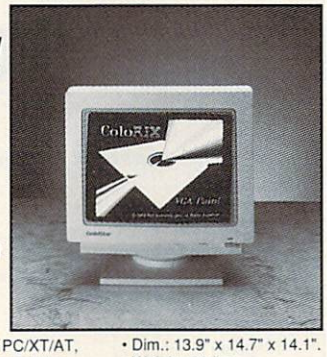

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AMIGA

The *Touch-Up* software included with the Migraph Hand Scanner uses dithering to simulate gray scales in scanned images.

gravings, and, of course, line art. The three photo settings are used when scanning photographs and continuous-tone graphics that you wish to represent with some tonal gradation. The scanner uses a 6 × 6 dot dither pattern to simulate 31 gray levels. As a result, the effective resolution in the Photo mode is about 66 lines per inch. A rotary control lets you set the threshold for the Line-Art mode and the middle gray for the Photo mode.

The active width of the scan head is 4.08 inches, which generates an image with a maximum width of 1632 dots. The length of the scan can be 2, 4, 6, 8, 10, or 14 inches. You connect the scanner to the Amiga's parallel port with a custom interface. The scanner and interface are powered from a power supply that plugs into the interface.

The underside of the scanner has one large roller toward the front and two small rollers toward the rear for sta-

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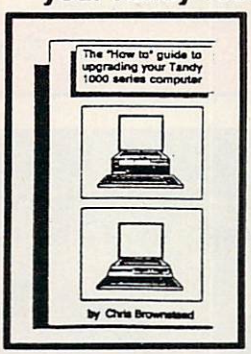

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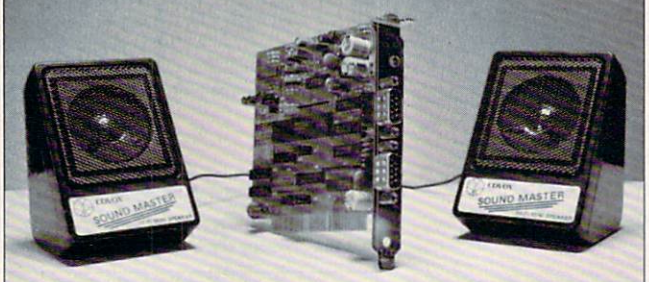

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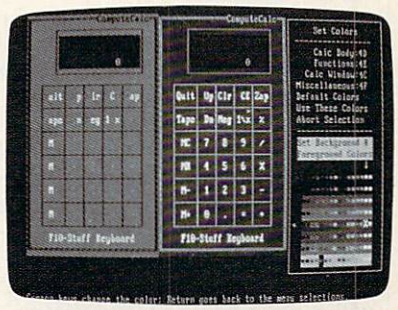

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bility. The forward roller is used to measure the distance and speed the scanner has moved. Since the scanner has limited on-board storage, the scanned data has to be transferred to the computer while the scan is being made. A steadily glowing green light, located on top of the scanner, indicates that all is well during the scan. Scanning speeds range from about three inches per second at 100 dots per inch to a bit less than one inch per second at 400 dots per inch. At these rates, a typical scan takes no more than a few seconds.

The *Touch-Up* software does far more than control the scanner and store the digitized image data. *Touch-Up* is also a full-featured bitmapped paint program. The size of the bitmaps *Touch-Up* can handle is limited only by the available memory. Page sizes can be specified in pixels, inches, or centimeters. As a bitmapped drawing program, *Touch-Up* is limited to black-and-white images or images with a single bit plane. This makes sense because the scanner can only generate single bit-plane image data. Nevertheless, *Touch-Up* can import any color or monochrome IFF image. Color images are converted as they're loaded in. The conversion can be to black-and-white, or it can utilize a variety of dithering modes and patterns to simulate the original colors as a gray scale.

Scanned images tend to be larger than the Amiga's display screen. As a result, *Touch-Up* will look best on a hi-res interlaced screen. Since *Touch-Up* runs on the Workbench screen, you'll have to set Interlace mode from Preferences. An option to have *Touch-Up* run from its own screen would've been more convenient. The Workbench screen will let *Touch-Up* run on a megapixel display device, such as a Viking or 2024 monitor.

Touch-Up operates in one of three modes: Paint, Clip, or Scan. Drawing tools include spray, box, circle, b-spline, and Bezier curves. *Touch-Up* also includes 36 predefined fill patterns, including pure black and pure white, which are used with the drawing tools.

The Clip mode is used to perform operations on the entire image, such as cut, paste, flip, mirror, rotate, stretch, compress, and distort. The Paint mode performs operations at a pixel-by-pixel level.

You use Scan mode to interact with the scanning hardware. You can scan images directly onto the page or into a predefined clip box. This lets you combine a series of scans into one image. *Touch-Up* has four writing modes that determine how subsequent operations will interact with the existing image. In the Replace mode, the latest image or operation takes precedence. In Transparent mode, the white parts of the overlay do not affect the existing image. The XOR (eXclusive OR) mode writes only where one of the images is black; it generates white when both are black. Reverse Transparent is like Transparent with black and white reversed.

Scan mode also lets you convert a dithered photo scan into a true 16-level Amiga gray-scale image. This operation takes each 6 × 6 dot area of the scanned image and converts it into a single pixel of the appropriate shade of gray. The resulting image is 272 dots wide. *Touch-Up* can also generate a 544-pixel-wide image, with 31 gray levels, by dithering image data.

In addition to the Amiga's standard IFF-image file format, *Touch-Up* can also load images in IMG, PCX, TIFF, *MacPaint,* and *PrintMaster* file formats. *Touch-Up* will save files in these formats as well as EPS, *Degas,* and GIF. You'll have to use a program such as *CrossDOS* to exchange files with PCs, or A-Max II or Mac-2-DOS to transfer files to and from Macintosh disks. A modem will work as well.

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The other games in the series took players around the world, teaching them about different lands and cities. The first game included the entire world in its domain. The second and third games concentrated on the United States and Europe, respectively. Although more specialized than the first game, these two were just as enjoyable, and they expanded the audience of users. These three games were based on geographical knowledge. *Where in Time* asks questions about history.

In all of the Carmen titles, you act as a detective for the ACME Detective Agency. Your goal is to find and apprehend Carmen Sandiego or a member of her band of thieves who has made a big heist somewhere within the domain of the game. The starting point of the game is the scene of the crime. Here you pick up clues from people or objects left behind that will point you in the direction of the thief's travels. After you catch the thief, you're promoted to a higher rank, and your status is saved to disk.

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REVIEWS

64/128

a valuable book you use to investigate clues. The first three titles in the series included the *World Almanac* and American and European travel guides. You'll find *The New American Desk Encyclopedia* in *Where in Time.*

Follow Carmen through geography and time in her latest caper.

Every time I received a new Carmen Sandiego game, I sat and played it for hours. Afterward, it felt as if my brain were about to explode with facts, but I found out later that I had actually retained a lot of the information. Ultimately, that's the goal of the Carmen Sandiego games—to teach youngsters and oldsters alike about geography and history while they're having fun solving a crime in a fast-paced game.

Where in Time is my favorite in the series because of the vast base of knowledge from which it draws. I stumbled upon some facts that I had learned in school, but a lot of the information I had never studied. This time around, Carmen and her gang have stolen a time-travel device called a *Chronoskimmer.* This allows them to go anywhere in the world anytime, from the year A.D. 400 to the 1950s. You have a Chronoskimmer of your own for tracking down criminals, but the amount of time that you can use it is limited by the Federal Time Travel Commission. In most cases, you have just enough time to identify the criminals from clues, issue a warrant for their arrest, and catch them.

In order to successfully catch a crook, you have to uncover enough information to single out him or her from Carmen's gang of thieves. Some members share physical characteristics, so you usually have to gather three or four clues that uniquely match the thief. If you issue a warrant for the wrong person, you have to begin a new case. The characteristics are gender (given to you by the Chief at the start), hair color, eye color, favorite author, and favorite artist. Once you have a match, a warrant will automatically be issued.

You gain additional clues about the thief if you're on the right trail. If a member of the V.I.L.E. criminal organization pops up when you try for a clue in a location, you'll know you're headed in the right direction. In some locations, if you choose to talk to an informant or witness, you'll be provided with other characteristics. Soon enough, you'll know the criminal, but you'll still have to corner him or her.

As you can imagine, *Where in Time* can easily have you going in the wrong direction. Don't let that encyclopedia out of your hands if you want to be successful. The game's interface is designed for children and is very easy to use. The left side of the screen contains a picture of the current location, reflecting its time period. On the right are buttons to push below a communication window. These are for time travel, clues, data, and aborting the game.

The graphics in *Where in Time* are simple, but well drawn. The thief and V.I.L.E criminals are animated, as is the ACME building elevator that lets you visit the lab and lounge areas. I can't say enough about *Where in Time.* That's why I selected it as one of my Reviewer's Choices for the 64.

Where in Time Is Carmen Sandiego? is fun. It challenges you with many cases to solve and facts to discover. I recovered such stolen items as Salvador Dali's moustache and the first Santa Claus, and I laughed at other creative heists. *Where in Time* has a practical purpose as well. With all the facts I've learned, I'd like to get on "Jeopardy!" some day. Happy sleuthing!

RUSS CECCOLA

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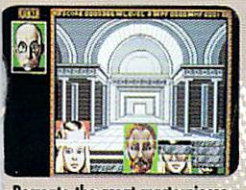

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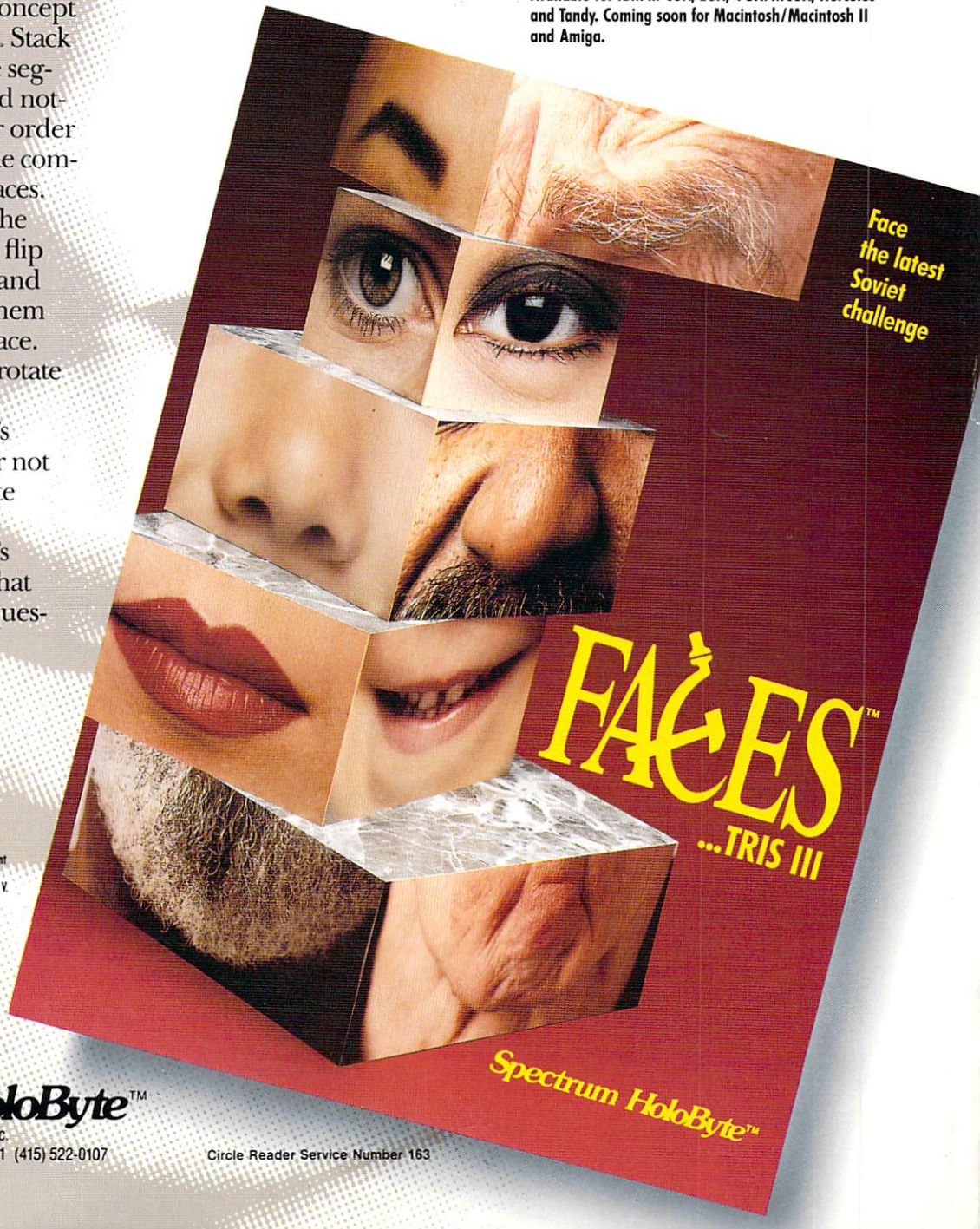

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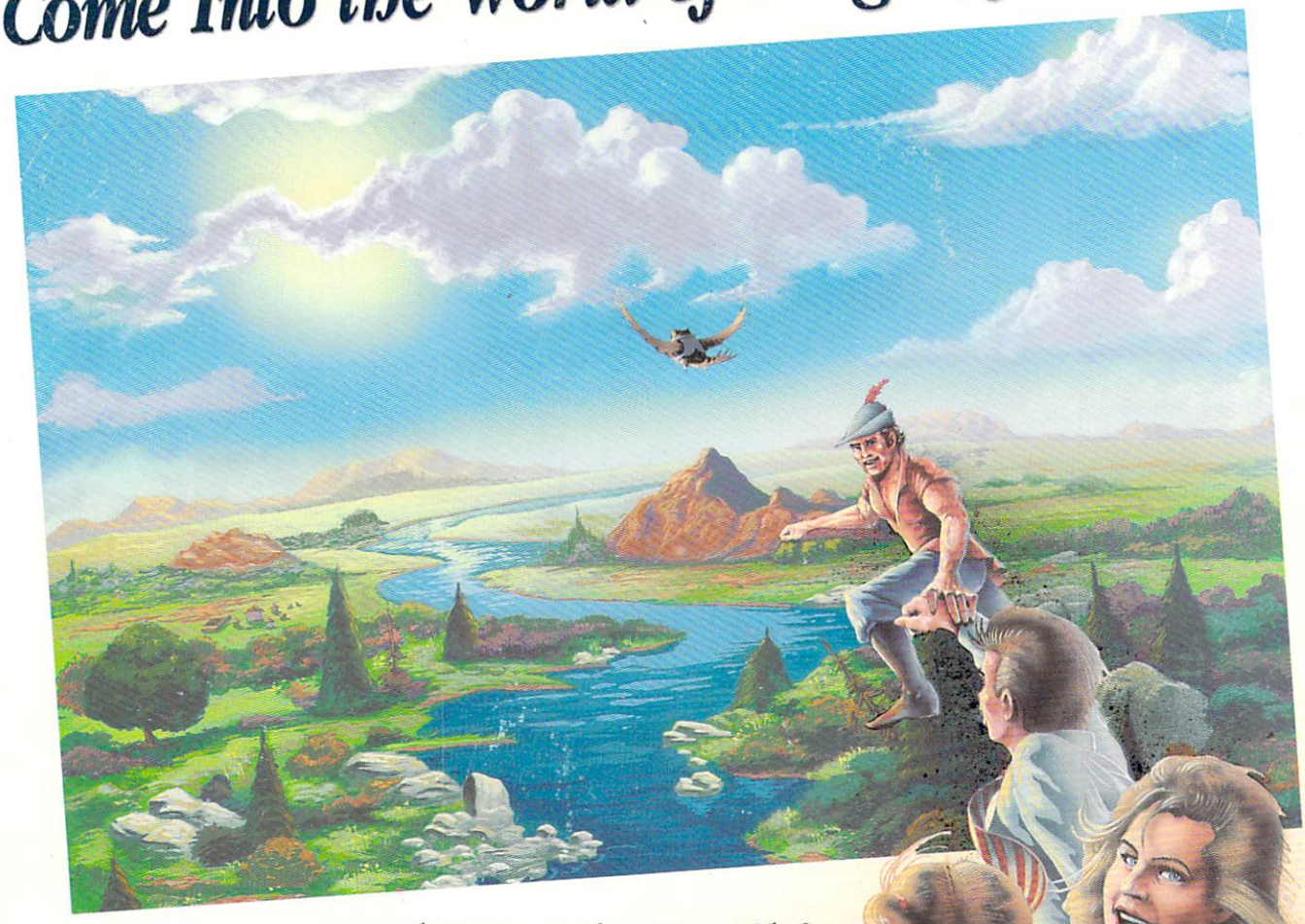

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