

While this program is loaded with high-end features, the ability to create process color separations is one of the more significant. With this option, you can import color graphics and photographs into your layouts and separate them on a high-resolution imagesetter. You can then use the resulting cyan, magenta, yellow, and black (CMYK) plates on a four-color printing press to produce full-color documents. You can also create spot color separations, which consist of color elements strategically placed throughout a document, such as a company logo in a newsletter.

Few programs—especially applications in this price range—offer this level of power. Some high-end products, such as FrameMaker and the top Windows word processors (all of which claim DTP prowess) still do not support color separations. And the few that do, such as Ventura Publisher, are not as good at it as PagePlus. Ventura, for example, doesn't separate CMYK TIFFs (TIFF 6.0), which are quickly becoming the industry standard. Not only does PagePlus make color separations easy (just select Process Separations in the Print dialog box), but the entire procedure, including creating PostScript print files for printing at the neighborhood service bureau, is explained in PagePlus's Help files.

Still not convinced? For another \$40 you can buy the PagePlus BumperPack, which includes TypePlus, ArtPack, and FontPack, along with the basic PagePlus program. TypePlus is a font-effects package similar to Adobe TypeAlign and Power Up Software's TextAppeal. It lets

you fit and type text on paths, such as curves, arcs, and circles, as well as accomplish several other special effects. ArtPack is a collection of over 500 full-color clip art images, and FontPack provides 120 TrueType fonts. You can also purchase each utility separately for about \$20 each.

One of the weaknesses of the original PagePlus is its poorly written manual. The manual for version 2.0 has been completely revamped. The Getting Started tutorial is very well done. By the time I finished it, I had almost mastered the program. This is a night-and-day improvement over the documentation included with the previous version. The reference manual is also thorough and helpful. Not only does it cover PagePlus's powerful features, but it also offers many useful DTP and layout tips.

Serif's technical support team has always been great. The folks on the team are usually quick to answer the phone, knowledgeable about the program, and eager to please. The popularity of PagePlus 2.0 is so great, though, that the support lines now are sometimes clogged. However, a few times I've called about 8:00 or 9:00 in the evening, and my calls have almost always been answered quickly.

All this praise is not meant to imply that PagePlus 2.0 is the ultimate DTP solution. But then, no product (not even a \$500+ package) is perfect. Where PagePlus falls short is in its long-document handling. It doesn't support automatic page numbering; you must manually number each page. You cannot combine several chapters to build a

book, catalog, or directory. Nor can you generate tables of contents or indices automatically, as you can in several other programs, including economy packages such as Symantec's Easy Working Desktop Publisher. The program also lacks a spelling checker and a search-and-replace feature. Granted, you're supposed to take care of most editing before you import a file into your DTP package. However, it seldom



works out that way—especially if more than one person works on or contributes to your documents. Not having a spelling checker and search-and-replace means that your text-intensive documents must be proofed thoroughly—which those of us spoiled by computers resist.

What PagePlus 2.0 does, it does extremely well, and to a greater degree of proficiency and with more ease than its competitors. It provides almost all the power of PageMaker at a fraction of the cost, and it's far easier to use and learn. With all its features and its low price, this package will be hard to beat. □

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# PERSONAL PRODUCTIVITY

Bradley M. Small

## AN END USER'S LOOK AT OS/2 2.1

OS/2 has arrived as a full-fledged, widely supported operating system. But many people wonder whether they're safe giving up Windows and DOS in favor of this much-heralded entry from IBM.

Technically, there's a lot to talk about in OS/2 2.1. But if you're like most people, you probably don't care to hear about operating systems, device drivers, and other low-level techie esoterica. So I will do my best to avoid such discussion and cut to the chase. I'll begin by discussing how OS/2 can affect your productivity.

Can the right operating system increase productivity? It can—if it meets the following criteria. It must allow you to retain current systems that already work properly. It must be relatively simple to implement. And it must provide faster or more efficient ways to solve your current problems while allowing for growth.

OS/2 2.1 allows you to retain current systems. If you have it, you can run most of your existing MS-DOS, Windows, and OS/2 1.x applications. Under OS/2 you can run a specific DOS session (which is the equivalent of running a specific version of DOS). If all else fails, you can have DOS on your hard drive and boot from it using either Boot Manager or Dual Boot. So even in the worst-case scenario, you can still maintain your current systems until you've completely changed over to OS/2 and found more efficient ways to service those systems you intend to keep.

I found OS/2 2.1 relatively simple to implement. Installation was straightforward (by simply following the manual, I was able to install it without a

hitch). It comes on either floppy disks or CD-ROM. Both versions install easily, but after going through the 20-odd disks in the set, I considered the CD-ROM version (which comes with a 2-disk boot set) to be a godsend!

The manual has an interesting feature: On the inside of the front cover in bold black print is the phone number for free technical support. I called it several times both during business hours and during the evening, and each time, after a cheerful greeting, my problem was solved—either immediately or in a callback within 24 hours. In these times when companies are either offering no technical support or charging exorbitant fees for it, free, high-quality technical support is much appreciated.

Once OS/2 is installed, you'll need about 15 minutes to an hour to get used to the Workplace Shell, depending on your experience with graphical user interfaces (GUIs). In my opinion, OS/2 is much easier to use than Windows, and it behaves more like a real-world desktop.

OS/2 2.1 provides faster and more efficient ways to solve your problems. Think how many times you've said, "I can't look up that phone number right now because I'm recalculating this spreadsheet" or "I'm formatting a disk; you'll have to wait." If you've ever had to wait while a program accessed information or while some DOS command was operating, then you've experienced a loss of productivity.

OS/2 is a 32-bit multitasking operating system. That means it can do more than one thing at a time. The fact that it's a 32-bit environment also means that it will use memory much more efficiently. You can format a floppy disk, download a file from your favorite BBS, and work in your word proces-

sor all at the same time (which is what I'm doing right now).

OS/2 has a text mode and a GUI mode; it will run DOS programs, Windows programs, and OS/2 1.x and 2.x programs. That should cover almost all of the software that you're running right now. I say "almost" because there are still some programs that won't run under OS/2 because they use low-level hardware or non-standard memory access. However, OS/2 does provide methods for running some troublesome programs (as well as a listing of the programs that just won't run).

OS/2 claims to be a "better DOS than DOS." I thought that meant that it should run every DOS program ever written, but after I thought about it, I realized that was unrealistic. There are many DOS programs that I can't run from DOS without creating a special boot disk or different AUTOEXEC.BAT and CONFIG.SYS files.

What makes OS/2 a "better DOS than DOS" is that DOS programs run faster under OS/2 than they do under DOS. More than one program can be run at once, and each program can have its session adjusted to run as efficiently as possible.

OS/2 can rightly be called a better Windows than Windows also. The Windows applications that I ran were noticeably faster under OS/2, although they seemed to load more slowly. I found out that once you have a Windows session going, the loading time is reduced, so the advantage is still OS/2's.

Whole suites of applications are being ported to OS/2. In next month's "Personal Productivity" column, we'll take a look at the third-party support for OS/2 and the potential for growth of this ingenious operating system. □

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### Sokoball

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### Jigsaw 1.0

This is the best jigsaw puzzle program we've seen. The pieces are shaped like those in a real jigsaw puzzle (not blinking squares). You can save and load puzzles you're working on and sort pieces by shape or color. Jigsaw comes with three puzzles, and registered users can create their own puzzles.

### Gobman 1.0

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# ART WORKS

Robert Bixby

## NEW ART

Two of the most useful products that have crossed my desk in the past couple of months are DynoPage and the new Harvard Graphics for Windows (in beta release). I've also had the chance to review the DigitArt woodcut collection (number 25 in the series) from Image Club.

To be fair, I have to admit that Harvard Graphics was never strictly a charting program. It was also one of the most full-featured vector drawing programs for DOS. When it made the big move to Windows about a year and a half ago, it stepped into the lion's den. There are more drawing programs for Windows than you can shake a T square at, and most of them are excellent, including one of the very first Windows applications—a drawing program from Micrografx.

You might recall that at approximately the same time Harvard Graphics for Windows appeared, a drawing program with a similar interface called Harvard Draw was released. Now much of Harvard Draw is a part of Harvard Graphics, with a lot of added effects, and it's known as Harvard FX. It's full of useful drawing tools like Extrude and Blend. Harvard Graphics with Harvard

FX may have all the drawing tools most people need—particularly if those people create charts—because that's the main business of Harvard Graphics. The 2.0 version makes charting easier than ever with a friendly tutorial that helps you pick the right chart, enter the proper data in the right place, and come up with a professional-looking chart from the very first time out.

DynoPage is a printing utility that you can use (under Windows) to get more control over your printer. Using it allows you to specially format printouts for your printer for booklets, note cards, and so forth. Once you have made the settings in the print setup utility, printing through DynoPage is just like using the Print Manager that comes with Windows, except that you have many more options for configuring the page.

Image Club has released a woodcut clip art collection. It's composed of vector (EPS-format) monochrome graphics that can be incorporated into most vector drawing programs. The graphics are specially created to look as if they were produced from woodcuts—products of that early printing technology which required an artist to gouge a block of wood to generate graphics for the printed page (most of this sort of art is now done with linoleum blocks). I found the collection to be utilitarian rather than imaginative, but perhaps I'm expecting too much from my clip art collections. It provides excellent graphics for many uses, and the roughly wrought look of the drawings makes them distinctive. This collection would make an excellent addition for anyone doing professional work that requires a home-made appearance.

I guess that means desktop publishing has come full cir-

cle—the standard output from a desktop looks so professional that now people are reacting against the perfection of line that's so easy to produce with a vector graphics program and a laser printer.

The graphics in this collection inspired me to create some woodcuts of my own using CoreIDRAW!. The Powerlines and simple autotrace built into CoreIDRAW! make creating woodcuts a snap.

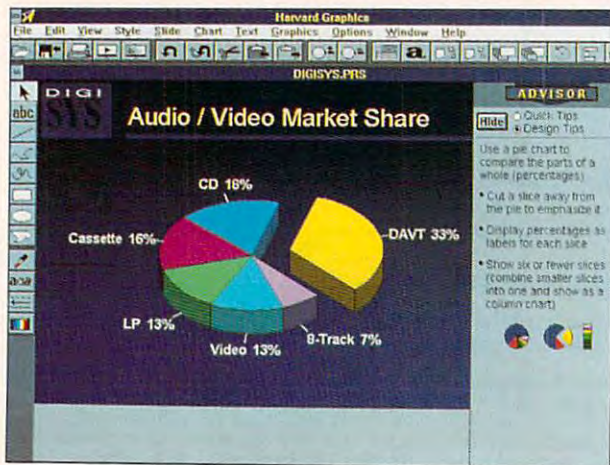
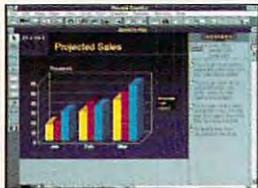
Gaea and James Merrick wrote recently to ask how a logo created in a paint program could be made to appear smoother on a page printed with a laser printer.

There are two basic solutions. You can trace the logo in a vector drawing program (1st Design and Graphics Tools have autotrace built in) and then use the traced image, which will be printed at the resolution of the printer rather than at the resolution of the paint program (around 72 dpi). If this isn't realistic, you can create the logo as large as possible and then reduce it for printout. By reducing a 72-dpi raster drawing to 25 percent of its original size, you have effectively turned it into a 300-dpi painting.

Thank you for writing, and thank you for the sample magazine you sent. It looks very thought-provoking. Good luck with your publishing venture.

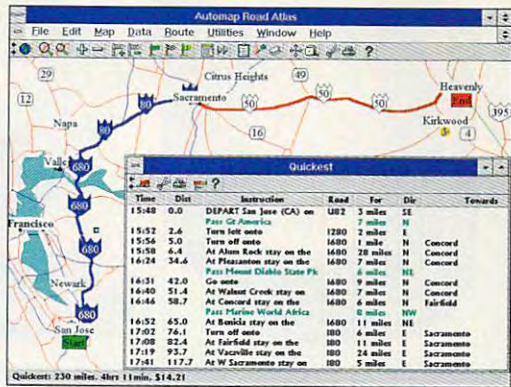
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A new generation of Harvard Graphics for Windows





VS.

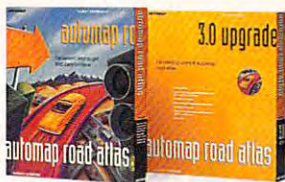


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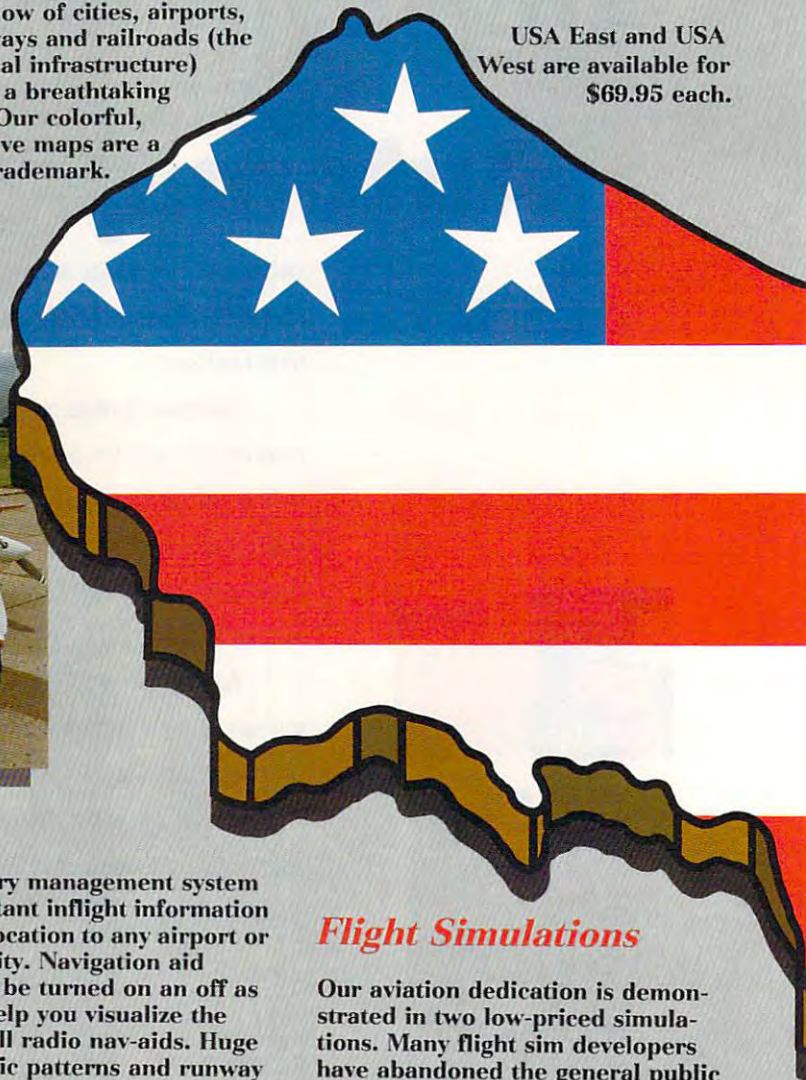
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# DISCOVERY CHOICE

*Children team up with a special pal as they learn about the world and develop their problem-solving skills in this cleverly designed mystery game.*

Clayton Walnum

## EAGLE EYE MYSTERIES

When it comes to sneaking education in with fun, Eagle Eye Mysteries is ingenious indeed. In this new educational game from Electronic Arts, children learn about everything from bats and caves to U.S. presidents while they solve a series of clever mysteries. The educational element is integrated so smoothly into gameplay that it's almost invisible. Add 256-color graphics and digitized sound, and you have an educational game that few children can resist.

The first thing Eagle Eye asks your child to do is to register his or her name with the program. This enables Eagle Eye to track the progress of many players, letting the entire family get in on the fun. After registering, your child chooses a partner (either Jake or Jennifer Eagle, the founders of the Eagle Eye Detective Agency), who will act as a town guide as well as a helper when it comes to discovering and recording clues.

Your child then sets to work solving the many cases available in the casebook. All told, there are almost 75 mysteries organized into three casebooks. Children may choose to solve any mystery in the current casebook, but they can't move on to the next book until they've solved all the mysteries in the current book. Although the mysteries in each book have the same names, they feature unique clues and different outcomes.

After having chosen a mystery, your child joins Jake and Jennifer Eagle in their tree house headquarters, where the three of them receive the



background for the selected adventure. For example, in the Case of the Missing Skateboard, the Eagle Eye Detective Agency gets a phone call from Willy Barr, a local kid who says that his skateboard has been stolen from Shredd's Bike and Skate Shop.

It's your child's task, along with help from Jennifer or Jake, to travel around the town, questioning people and gathering clues. To do this, your child simply clicks on a location on the town map, which brings the chosen location up on the screen. The logical first step in the skateboard mystery, for example, is to go to Shredd's Shop, where your child can question Steve Shredd and his customers, as well as examine the workroom from which the skateboard disappeared.

In each location, rectangles indicate areas that your child should examine or people that should be questioned. Clicking on a rectangle displays a portrait of the person or the object along with a text balloon containing dialogue for the scene. Often,

Jennifer or Jake jumps in with a comment like "Look at that!" and points the child toward a particularly valuable clue.

Jennifer or Jake also helps by recording the clues on TRAVIS (Text Retrieval And Video Input System), a sort of combination video recorder and minicomputer that can be used to review and solve a case. After visiting all locations marked on the map, talking to all suspects, and examining all evidence, your child can click on TRAVIS and sort through the clues, choosing the ones that best solve the case.

It's the process of examining clues that really puts your child's mind to work. Over the course of a case, your child discovers many clues, but only the five that seem to best identify the culprit may be used to solve the case. Sorting through the clues is a challenging task, forcing your child to actually solve a case rather than just guess at the culprit. To add to the challenge, many mysteries have several suspects; only careful examination of the clues can



reveal the guilty party.

Of course, while evaluating the clues, your child also reviews the educational facts gathered during the investigation. Because the facts are pertinent to the case at hand, they blend in nicely with the other clues. Again, the educational element is seamlessly integrated into the game.

If your child fails to choose the correct clues or cannot identify the guilty party, no penalty is given; instead, the program gently suggests that the clues need more careful consideration. Your child is allowed unlimited guesses, but the correct five clues must be chosen and the culprit identified before your child successfully solves the mystery and closes the case.

At the end of a mystery, your child's partner reviews the case, presenting all the clues and describing how they incriminate the culprit. Often, after a case has been solved, children will discover information during this review that they overlooked during the investigation. As a reward for solving the case, children receive a newspaper clipping about the case or a thank-you note from the victim. These rewards are added to the electronic scrapbook, which can be viewed at any time.

Another nice feature is that, whenever players view the map screen, the Eagle Eye control panel is accessible. This enables children to perform such tasks as switching partners, turning sound on or off, registering a new player, viewing a scrapbook, saving a case, starting a new case, or quitting the program.

If all Eagle Eye had to offer were its clever melding of mystery and education, it would

be a worthwhile investment. But the detailed 256-color graphics, original musical score, and digitized sounds and voices make this a guaranteed winner. Throughout each mystery, your child views various scenes about the town of Richview, with most scenes featuring simple animation effects. For example, after a fire in the Case of the Angry Arsonist, the interior of Grime's Novelty Shop drips water from the rafters; in Swank's Hotel, your child can watch a desk clerk fill out forms and the lobby elevators rise and fall. Digitized sound effects include ringing phones, a police-band radio, and various voices.

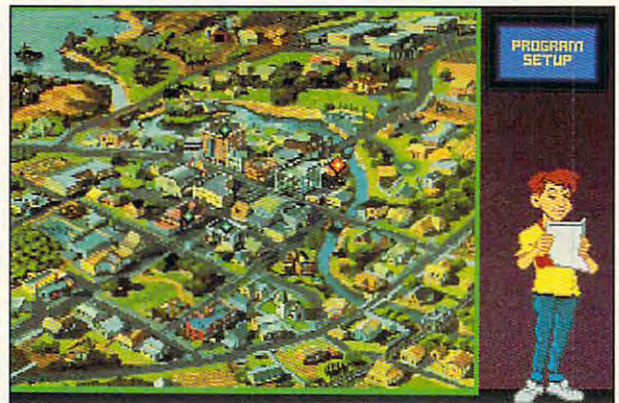
Although Eagle Eye targets the eight-and-older crowd, children under ten may have a difficult time following the logic of even the easiest cases. This is because children must select only the clues that best prove who the culprit is. Clues that don't directly point out the culprit, although they may play an important part in solving the mystery, cannot be selected when the player is about to accuse a suspect. In the tougher cases, sorting through the clues can be challenging even for an adult. Younger folks will require parental help in order to work through each mystery's logic.

Along with the software, Eagle Eye includes an activity book that contains dozens of puzzles. These puzzles, which feature cryptograms, word searches, rebuses, crossword puzzles, and others, all involve Jake and Jennifer in another mystery story. Moreover, the puzzles' solutions go together to complete a final puzzle that your child can sub-

mit as a contest entry. The contest winner will have his or her face featured in the next version of Eagle Eye.

Also included with the package is Electronic Arts' EA\*Kids Theater, a graphical menu system. When installed, EA\*Kids Theater enables children to start Eagle Eye, to view demonstrations of other games in the EA\*Kids series, to get help, or to exit to DOS. If you purchase additional EA\*Kids programs, you can add them to the EA\*Kids The-

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ater, giving your children access to all games from a single screen. The Theater also allows you to create a boot disk, select a Theater music score, delete previews or programs, and specify your hardware configuration.

If Eagle Eye is any indication, Electronic Arts is on its way to putting together an impressive collection of educational software for children. Eagle Eye is as cleverly designed (albeit aimed at a younger age group) as Brøderbund's Carmen Sandiego series, and we can only hope that, like the Carmen series, Eagle Eye Mysteries will have a long run of sequels. □

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# GAME INSIDER

Shay Addams

## HOLIDAY GRAB BAG

Tackled by a steroid-punchy linebacker, I teleported to safety in the mist-enshrouded land of Zona, only to be blasted out of the sky by a screaming F-16. Christmas approaches—the time of year when I rip through an onslaught of new games on my eternal quest for the best. Here are quick looks at the latest releases that have passed the Fun Test so far this season.

**Adventures.** Return to Zork brings Infocom's classic adventure up-to-date in a new story featuring digitized actors and an hour of spoken dialogue. SSI's Dungeon Hack is a 3-D role-playing quest with a random dungeon generator, extending replay value. Companions of Xanth takes place in the fantasy universe of Piers Anthony, whose books have sold over 7 million copies. The interface is easier to use than in previous Legend Entertainment games, even providing an undo button. Also look for Leisure Suit Larry VI from Sierra for the raciest adult entertainment (this may be a CD-ROM-only release) and The Legend of Kyrandia II, scheduled for CD-ROM and floppy.

**Simulations.** Accolade put a couple of titles into play in time for Christmas. Keep an eye out for Speed Racer. Based on a popular Japanese cartoon character, it's a fast-paced motorcycle simulation with an emphasis on arcade action. But don't look for the previously announced Mike Ditka Football II. Ditka was apparently ditched, and Accolade's latest football simulation, with a fresh string of gridiron features and effects, is called Savage Sunday.

Dynamix brings Sid and Al's Incredible Toons, an animated cartoon-style game

based on the same concept as The Incredible Machine. If you've ever watched Wile E. Coyote build one of those complicated traps for the Roadrunner, you'll get the idea behind Toons. Graue Wölfe, the Dynamix sub simulation, has been renamed Aces of the Deep (turns out the original name is also used by a terrorist group!) and rescheduled for early 1994. EA's SSM/21 Seawolf, the sequel to 688 Attack Sub, should hit around Thanksgiving, featuring full support for 16-bit General MIDI sound. The more than 100 digitized sounds are often used strategically; you must learn to distinguish sonar signatures of whales and different types of submarines, for instance.

Star Wars fans can find excitement in two LucasArts titles. TIE Fighter is the Empire's answer to X-Wing. It's a stand-alone space combat simulation in which you fight for the Empire instead of the Rebel Alliance. LucasArts also has a CD-ROM-only action game, Rebel Assault, based on the Star Wars story. (Besides IBM CD-ROM, it's also available for Sega CD and CD-I.) SimCity 2000, available for IBM and Macintosh, is an entirely new program, not just an upgrade. Maxis delivers 3-D graphics, a map you can rotate and zoom in on, and countless new elements suggested by SimCity enthusiasts, including subways, hospitals, and even a functioning water system. SimFarm is another hot simulation from Maxis.

**Edutainment.** Best known for gambling simulations, Villa Crespo may soon be famous for The Cookie Break Series, high-quality software at budget prices (\$12.95). The first titles are Adventure Math and Flags of Every Nation. Adventure Math uses a very graphic design to teach subtraction, division, multiplication, and ad-

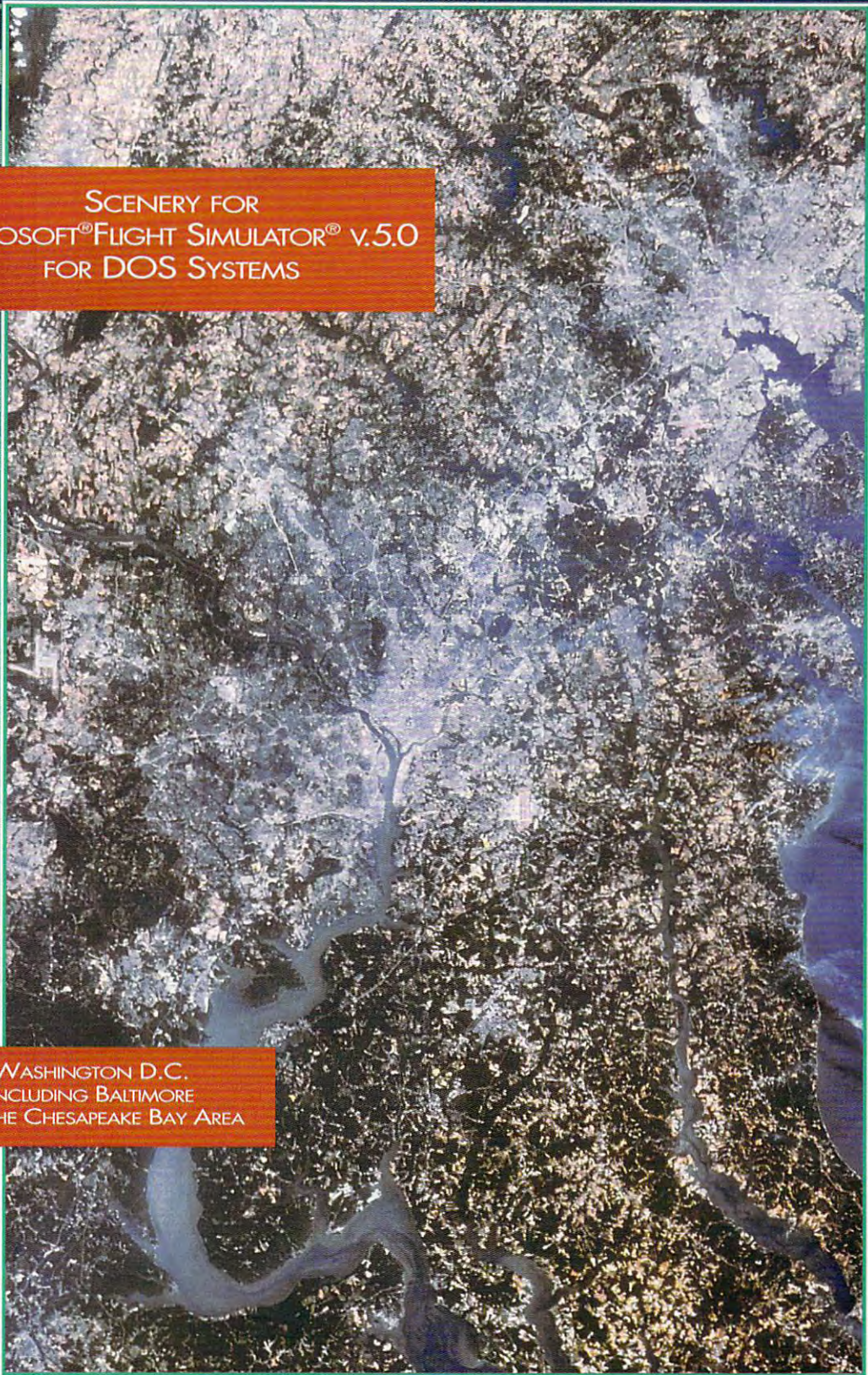
dition. Flags of Every Nation is a one-of-a-kind program with illustrations of over 600 flags; when one is displayed, you can click on it to get details about the flag's nation or its historical significance. The program includes a trivia game that incorporates these facts.

**Money savers.** Besides new games, look for great deals on collections such as Legend Entertainment's Spellcasting Party Pak, with all three of Steve Meretzky's wacky adventures (a CD-ROM version may follow the floppy). Villa Crespo has a bundle with some of its best gambling games, including Jack's Plus Video Poker, Mini-Blackjack, and three more.

**CD-ROMs.** Sir-Tech has two new CD-ROM collections for the PC: The Wizardry Trilogy, Part II contains Heart of the Maelstrom, Bane of the Cosmic Forge, and Crusaders of the Dark Savant. Another collection offers these three, the first four Wizardrys, and a history of Sir-Tech and the Wizardry series. Adventurous gamers should also check out Origin's Ultima Underworld 1 & 2 CD-ROM collection. The Coffee Break Series CD-ROM Collection puts 21 of Villa Crespo's games on one CD-ROM for only \$79. Villa Crespo also has one of the most intriguing new CD-ROM titles in Rosemary West's House of Fortunes, which uses tarot cards, astrology, and three other methods to tell your fortune.

**Video games.** Need something to keep the kids off your computer so you can play a *real* game? If you've got a Genesis, try Mutant League Hockey, EA's comic-style interpretation of hockey that stars cartoon characters in a hockey game with no rules. Inspired by the "Young Indiana Jones" TV series, Westwood's Young Merlin is a SNES quest aimed at young adventurers. □

A look at some holiday game releases that have high fun factors.

An aerial photograph of a river delta, likely the Chesapeake Bay area, showing a complex network of waterways and surrounding land. A red rectangular text box is overlaid on the upper portion of the image.

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An aerial photograph of a river delta, likely the Chesapeake Bay area, showing a complex network of waterways and surrounding land. A red rectangular text box is overlaid on the lower portion of the image.

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# ENTERTAINMENT CHOICE

*Enjoy new levels of realism when you explore this nonlinear fantasy world full of rich characters who learn and change as you play.*

Scott A. May

## BETRAYAL AT KRONDOR

One of the dangers in embracing new technology lies not in blindly forging ahead, but in losing sight of what's being left behind. In the booming business of entertainment software, where flash often rates higher than substance, it's easy to put presentation before gameplay—it's like building the perfect beast, yet neglecting to give it a heart and soul. That's why *Betrayal at Krondor* is such an exciting arrival: Its captivating story line provides the game's heart; the fantastic graphics and special effects are extras. It's amazing that this game, Dynamix's first attempt at fantasy role-playing, towers above the genre.

*Betrayal's* quality won't surprise fans of veteran designer John Cutter, best known for his mid-1980s sports titles at Gamestar and Cinemaware. Cutter based *Betrayal* on the popular *Riftwar* fantasy series created by Raymond E. Feist. The story picks up where Feist's latest book, *Darkness at Sethanon*, ends. It uses many recurring characters and locations from the series, so those familiar with the series will immediately and comfortably fall into the action. Newcomers can get into the game by reading the brief synopsis of this saga, although the synopsis may not provide all the information they need to succeed in the game.

The setting for *Betrayal* is the Kingdom of the Isles, a vast fantasy world that's divided into several geographical and political realms and is populated not only by humans but also by elves, dwarves,

trolls, and many other strange creatures. Just below a large, jagged mountain range, Seigneur Locklear and his young magician companion are escorting an elf prisoner named Gorath to the southern city of Krondor. Gorath, a half-breed traitor to the Moredhel tribe, bears an urgent message for the prince, one warning him of an assassination plot. As the three tread quietly through dangerous territory a long way from home, Locklear unshackles Gorath, realizing that in the event of an attack, the elf's fierce fighting ability far outweighs any need for security. Thus begins the story of this unlikely trio of adventurers.

This complex, character-rich story unfolds as a series of nine individual chapters, the plot advancing only upon completion of specific goals in each one. These mini-quests vary in size, difficulty, and clarity of mission. Segmenting the story this way gives great range to the gameplay—it's as if you're getting nine adventures in one.

This game differs from traditional role-playing games in that there's no creation of in-

stant characters or an omniscient power rolling dice to determine a character's attributes. Instead, you inherit full-bodied characters with unique personalities, rich pasts, and hopefully, prosperous futures. Rather than control every fiber of their beings, you merely make decisions—their overall strength of character determines the results of their actions. Likewise, the outcome of your decisions helps mold each character. There's a subtle distinction between this and traditional character determination, but it's important enough to place *Betrayal* far beyond the average hack-and-slash fantasy.

There's also an important distinction between this game and run-of-the-mill graphic adventures, in which you merely turn the page on a set story board. Playing *Betrayal* is like participating in the creation of a novel. Totally nonlinear in design and unconfined by time limits or spatial boundaries, it can be enjoyed in various ways: straight through, for the less



adventuresome; or in a meandering fashion, for dedicated explorers who are compelled to examine every nook and cranny. No two games are exactly alike, as each is influenced by random events and learned behavior.

There are plenty of other unusual aspects to *Betrayal*, including an uncommon blend of graphic modes. Wilderness areas are rendered in textured 3-D polygons, the same 3Space technology *Dynamix* employs in such flight simulations as *Red Baron* and *Aces over Europe*. Players are free to roam this virtual fantasy world—224 million square feet of trails, rivers, mountains, lakes, islands, and towns, not to mention convoluted sewers and abandoned mines. The three-dimensional terrain rises and falls as you move, with multi-plane background scrolling and ambient sound effects providing a remarkable illusion of real time and space.

You can view wilderness and underground travel from an adjustable top-down perspective, helpful for both quick passage through familiar territory and a bird's-eye scan of surrounding lands. In tunnels, this option doubles as an automapping device.

When speed is an important consideration, you can lock your party onto the path. Of course, by sticking strictly to the path or navigating from a high angle, you can easily miss some interesting or potentially helpful objects because they are outside your field of vision. Likewise, locking onto a path is an easy way to stumble right into a trap.

Combat transpires with yet another unusual strategic point of view. Opposing char-

acters square off on a make-shift battle grid; each is allowed a preset number of squares to move and strike. You can fight this turn-based battle by controlling individual actions (advisable when you're using magic, using special weapons, or facing especially challenging opponents) or by letting the computer play it automatically (when the outcome will clearly be in your favor).

Combat features fully developed, digitized characters, with more than 2500 frames of rotoscoped animation and crisp sampled sound effects. Using magic or modified weaponry also triggers special visual effects.

Static artwork (transitional scenes of castles, for example) features beautifully scanned 256-color paintings. The lush character interface is also thoughtfully styled, with well-designed treatment of standard role-playing mechanics such as a drag-and-drop inventory system. Four levels of graphic detail help keep wilderness movement fluid and realistic (although by their nature, polygon-based graphics animate well at even minimum system requirements). Other graphic highlights include the texture-mapped tunnels and magic temple portals, which you can use to zap your party over great distances.

Weaknesses include an overreliance on digitized, color-enhanced photos to represent every character in the game. It's unclear whether these are pictures of hired actors or merely snapshots from a *Dynamix* office party. It's an attempt to create atmosphere, but the glued-on beards and plastic elf ears on-

ly threaten the game's overall impression of grandeur. Also, the game suffers in some areas from the blockiness associated with 320 × 200 low-resolution VGA.

One final, minor complaint: Those who are unacquainted with Feist's complex fantasy world—face it; this is strictly a niche market—will have some trouble following the flood of characters, race names, and locations. The story's political

**IBM PC or compatible (80386SX compatible); 2MB RAM, 1MB EMS; DOS 5.0 or later; 256-color VGA; hard drive with 15MB free; mouse recommended; supports Sound**



and social history alone weaves a tapestry so rich that many will find it difficult to understand. References to obscure names and events, obviously important to the story's development, will often pass by unrecognized. The otherwise excellent manual helps, but Feist's prose is so thick with atmosphere and imagination that jumping headfirst into the fray can be quite overwhelming.

But after you understand the background, you can really appreciate this game. Fired by literary passion and uncommon intelligence, *Betrayal at Krondor* approaches a new level of realism and enjoyment for computer fantasy role-playing games. □

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# GAMEPLAY

Denny Atkin

## BETA GAMES

This is not your father's "GamePlay" column. Starting with this issue, "GamePlay" will be the spot where you can find hands-on looks at the newest games for your PC.

Until recently I was editor of COMPUTE's special Amiga section. When the Amiga edition shut down, my bosses noticed that I played games on nearly every electronic platform out there (I'd be a gourmet chef if they'd invent a flight simulator I could play on my microwave oven) and decided to make me entertainment editor. My mission with this column is to snoop out prerelease copies (called betas in the industry) of new games so that you can find out what's new and hot at your local software emporium. The games I'm seeing a cou-



**IndyCar Racing uses 3-D Super Texture technology for ultrarealistic graphic effects.**



ple of months before they're released will often have just reached the shelves of your dealer by the time you see this column.

**Waving the checkered flag.** One of the hottest games for the holidays is sure to be IndyCar Racing, designed by Papyrus and distributed by Virgin Games. Papyrus designed the 1989 Electronic Arts hit Indianapolis 500: The Simulation, and if you liked that game, you'll love this one.

You'll drive 800-horsepower IndyCars around tracks ranging from the oval at Michigan International Speedway to the corkscrew curves at Laguna Seca.

You can just hop in the car and start driving, or you can stop by the garage first and adjust your car's handling characteristics by changing the suspension stiffness, wing angles, gearing, tire hardness and pressure, camber, and more. There's even a dyno room where you can customize your car's engine.

From there it's off to 1 of 12 tracks to qualify and race. When you first hop in the cockpit, you'll likely get run over by the other drivers because you'll be sitting there gawking at the amazing scenery. Although IndyCar Racing uses flight simulator-style polygon graphics, Papyrus texture-maps the objects with realistic bitmaps. The track is replete with skid marks and grooves, and the cars are covered with authentic sponsor stickers. You'll find yourself slowing down on the curves just to read the advertising billboards! When you scrape the walls or wreck, realistic smoke whiffs from your car. I recognized buildings that I'd driven past in real life when I was driving the Long Beach Grand Prix course—IndyCar Racing has some of the best-looking, most realistic graphics in PC-game history. When watching replays of your race, complete with camera cuts, you'll feel like you're watching the race live on TV.

Driving is a blast with a joystick, but it's especially fun with CH Products' yoke controller. There are varying realism levels: On the easy levels you can pretty much just worry about steering and braking, but with realism active, you'll find that rain, wind, and temperatures all affect car han-

dling. There's more here than I have room to talk about, but suffice it to say that this is *the* game to come home and play after a frustrating afternoon in stop-and-go traffic.

**Golden oldie.** If you were around for the birth of the personal computer industry, you may remember the incredible batch of games that Electronic Arts entered the market with. These classics, such as M.U.L.E., Pinball Construction Set, Archon, and Seven Cities of Gold, may not have been as sophisticated as today's PC games, but they were eminently playable and good for months of fun.

Now two of those classics have been updated for today's PCs. Archon is coming soon from SSI, promising SVGA graphics and new play options. EA has taken a more preservationist approach with its Seven Cities of Gold Commemorative Edition for the PC. The game now brandishes enhanced sepia-toned VGA graphics and smoother gameplay (you no longer kill natives just by bumping into them), but otherwise, it remains faithful to Dani Buntin's Commodore 64/Atari 800 classic.

You're a fifteenth-century Spanish explorer out to conquer the New World. You explore territory in search of gold and New World goods, which you can take back to Europe and use to bring back an even larger and more powerful expedition. You can trade with the natives or conquer them—it's up to you. But if you take the violent approach, word will spread, and your explorations may become increasingly bloody. Once you've conquered the Americas, Seven Cities can generate new, random worlds for you to explore. The game is simple to learn and play, and it's great fun. Kudos to EA for bringing back a classic. □

# 64/128 VIEW

Look for major changes in Gazette, starting with the next issue.

Tom Netsel

This issue marks a turning point in the history of Gazette. This is the last issue that will be printed on paper. Next month, Gazette moves entirely to disk.

While the shift from ink to pixels means a new format for Gazette, its content will reflect little change. The columns and features that you've come to expect in the magazine will now be on disk. Jim Butterfield, Fred D'Ignazio, Larry Cotton, and Steve Vander Ark will continue to share their ideas, comments, and expertise in their usual columns.

Look for feature articles, reviews of software and hardware, and "Feedback," too. All the text that was in the magazine will be on the new double-sided Gazette Disk. You'll be able to read these articles onscreen or send them to your printer.

Those of you already familiar with Gazette Disk know how convenient it is to have all the monthly programs ready to load and run. There's nothing to type in. Until now, there was no documentation on disk; you needed the magazine to make full use of the programs. Now, each disk will include full documentation. As with the articles and columns, you'll have the option either to read the instructions onscreen or to print out a hard copy.

For some time now, we've added bonus programs on disk that were not listed in the magazine. These programs were often too large to offer as type-ins. In our new format, we can now provide you with more programs and larger ones. With no more tedious type-

ins, we don't have to worry about the size of the program listings.

Our programs may be larger, but don't expect quality to suffer. We'll keep our high software standards. We have some exciting programs coming up. On the disk next month, look for a SpeedScript patch from Frank Gordon that combines a RAM disk/dual drive option with a word-count feature. Frank's original program let SpeedScript users access two drives, but it wasn't compatible with an earlier word-count program. Now you can have both great features in one.

I want to encourage programmers to keep submitting games, utilities, and productivity and educational programs. Gazette is still in the market to purchase outstanding software.

The price of the new double-sided Gazette Disk will be \$49.95 for 12 monthly issues. Those of you who already subscribe to the disk will receive the new Gazette, commencing with the January disk. We think you'll be pleased with the extra value that you'll be getting.

If you subscribe to the Gazette edition of COMPUTE, you'll have this one-time opportunity to convert your subscription for only \$29.95. Look for a pull-out card in this section for full details. If you decide not to convert, then you'll continue to receive COMPUTE for the balance of your subscription.

I know this is a major change for Gazette, but I hope you'll take advantage of the upgraded Gazette Disk with its new look, fresh format, and added features. □

## GAZETTE

### 64/128 VIEW

G-1

Major changes on tap for Gazette.  
By Tom Netsel.

### THE 64 GOES TO PRESS

G-2

Read how a 64 helped redesign a newspaper.  
By Harold Stevens Jr.

### REVIEWS

G-8

Wrath of the Demon.

### FEEDBACK

G-10

Questions, answers, and comments.

### PD PICKS

G-14

Rebellion and Mah-Jongg.  
By Steve Vander Ark.

### BEGINNER BASIC

G-16

Three challenges for the holiday season.  
By Larry Cotton.

### D'IVERSIONS

G-18

Seeing isn't always believing with digital video.  
By Fred D'Ignazio.

### PROGRAMMER'S PAGE

G-20

Four tips from the new author of "Programmer's Page."  
By David Pankhurst.

### GEOS

G-22

Ultimate GEOS for folks on a budget.  
By Steve Vander Ark.

### MACHINE LANGUAGE

G-24

Branches, jumps, and subroutine calls.  
By Jim Butterfield.

### PROGRAMS

Chain Reaction (64)	G-25
Custom Character Screen Designer (64)	G-28
Right/Side II (64)	G-31
Jigsaw 128	G-35
Splast (64)	G-38

# The 64 Go

**WRITTEN BY  
HAROLD STEVENS JR.**

People are always amazed when I tell them about the things that my Commodore 64 can do. They are usually blown away when I tell them how I use the 8-bit computer in a professional environment as part of my job as a journalist.

I edit a suburban weekly newspaper in Columbus, Ohio. My 64 played a major role in helping me redesign and create a whole new set of graphic devices that we in the newspaper industry call standing headlines—or standing heds for short. Standing heds are the visual elements that identify special areas of newspaper copy, such as

personal opinion columns, letters to the editor, community news and events, obituaries, weddings and engagements notices, and business news.

My 64 was the answer to a problem we had a few years ago when we decided to streamline our standing heds. Our mainframe typesetting computer, a Compugraphic MCS-100, was unable to do so without our having to shell out hundreds of dollars for software to help us get what we wanted.

We were looking for ways to spice up the standing heds of our newspapers in a way that would set us apart from our competition in the Colum-

bus area. We wanted something to indicate that the five editions of the Columbus Messenger Newspapers were on the move and were progressive enough to take advantage of contemporary newspaper design, while being cost effective at the same time. Like many small businesses, we don't have a whole lot of money to spend in our pursuit of innovation unless it returns a profit.

## *business briefs*

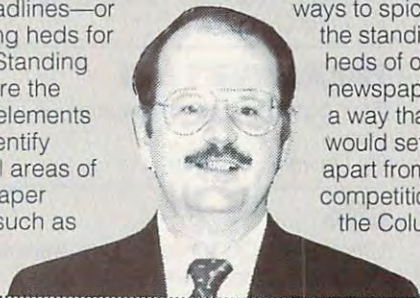
### **A New Look**

We wanted to create new and radically designed standing heds that would be streamlined and would utilize a dot-screen background with white, or reverse, lettering. Since we were unable to do this with the Compugraphic MCS-100 without the expensive special software, we thought we would try to create these headlines with the

equipment we already had. We tried printing them in black with white, or reverse, type facings and then shooting them with a gray screen on the PMT camera in our production department. This didn't work. The results were muddy, and we didn't get the nice clean copy that we wanted.

My publisher was toying with the idea of buying the software for the Compugraphic when I hit upon the idea of using my 64 to do the task. If it worked, it would cost us nothing. About that time, our company bought an Apple LaserWriter II-NX laser printer for use by our classified advertising department to go with its new IBM clone. That computer was purchased to print our classified ads and to keep accounting records for that department.

Since the PC didn't have any desktop publishing software with it and the LaserWriter was a PostScript-driven printer, I was sure I could publish what we



*It's my turn...*  
**by Harold Stevens, Jr.**



# es to Press

needed on the printer with the 64 and PostScript-compatible geoPublish. I volunteered to do a couple of samples to see how they would fly.

stores that I could purchase an interface to hook up the laser printer to my modem port for about \$100. "No thanks," I said. That's when I turned to the

set up shop not too far from the laser printer. When I hooked up my spare amber monitor, geoRAM expansion unit, and 1541 and 1581 disk drives to the computer, I was ready to go. All I had to do now was plug in the interface to the 64's user port and run the RS-232 cable between it and the laser printer. I then booted GEOS to print the samples that I had created earlier and printed on my 9-pin dot-matrix printer.

Once in GEOS, I moved the cursor to the geoPublaser icon and double-clicked it. The screen went blank, and a menu then dropped down on the screen asking me to choose the RS-232 serial transfer rate of either 9600 bps or 1200 bps to print the geoPublish files. Since I knew 9600 was eight times faster than 1200, I naturally clicked on it. Now I was becoming excited. I was taking the first steps toward using my Commodore for what I really wanted it to do—desktop publishing.

After setting the bps rate, the file dialog menu dropped down for me to select the file that I wanted to print. I moved the pointer to the name of the standing heds sample that I had previously created and clicked it to open the file. Next came the print option menu asking me the number of pages and copies that I wanted to print and which smoothing setting to use for the graphics. Since nothing needed to be changed, I clicked and sent the file to the printer.

I held my breath as the monitor went blank and the print indicator light on the LaserWriter started blinking. A few minutes later the file dialog menu reapp-

## On the home front



### GEOS to the Rescue

The first thing I did was to go home to boot up GEOS. I created samples of the standing heds with geoPublish and printed out a rough draft of what these special graphics would look like on my Star NX-1000C dot-matrix printer. This was enough proof to management that my 64 could do the work. I was asked to start working on the standing heds as soon as possible. All that I required now was an RS-232 interface to connect to the printer.

Finding such an interface in the Columbus area was almost impossible, and the ones I located were expensive. I was told by a couple of computer

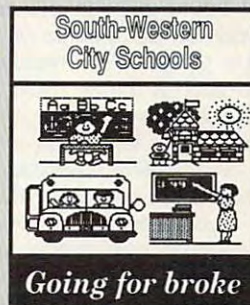
Tenex catalog for help.

What I did find was an Arotek Universal RS-232 Expansion Interface for about \$40. Immediately I ordered the interface and received it a couple of weeks later. The Arotek interface was exactly what I was looking for. It's designed so I can connect between a printer with an RS-232 port and a Commodore-style modem.

The second thing I bought was a six-foot RS-232 extension cord from Radio Shack. This let me set up my computer near the newspaper's laser printer.

### Trial Run

On the following day, I hauled my computer and peripherals to work and



**business  
briefs**

*business  
briefs*

**letters to the editor**

*letters to the editor*

*These are the before and after illustrations of what the standing headlines looked like then and now. Before we changed the standing headlines using the Commodore 64C and geoPublish, they were just boxes with rounded corners with the type centered inside the boxes. The top left standing hed was how our boxes were before we changed to the current appearance of the one on the top right. As you can see the newer headlines created on the Commodore look more streamlined in the new format when we changed from the round boxes to the screened bars.*

italic style to give it the feeling of being in a forward motion. Once this was done, I printed new samples and showed them to the publisher and managing editor. We all agreed that this was how it was to be done.

I then sent out a memo to the other editors on the staff asking them to list the names of all the columns and features that appeared in their respective newspapers. Since all five of us share common standing heds for local events, military news, school news, and so on, we created these first.

Next came the standing heds that were customized for each individually zoned paper. For example, I run columns submitted by the high schools in my area while another editor runs a feature on saving money with coupons, and a third editor has a poetry column.

### **Days at the Keyboard**

For the next few days, including the weekend, most of my spare time was spent creating headlines in various sizes to fit in the editorial copy section of the paper. First, I set the headlines to go across the entire width of the newspaper page. An 11-x17-inch page consists of eight columns that are each 7 picas (1.25 inches) wide. This meant that the heds had to be 63 picas or about 10.5 inches long, which is the length of a geoPublish page.

The headline bars had to be one-half inch tall with the type set in 24-point GEOS font LW Cal. This type style is also known as Helvetica to the rest of the printing industry. The text was also set up at one-eighth inch from the left edge of the screen bars. Previously, the standing hed bars were one-inch boxes with rounded corners and type set in upright Helvetica of 30 points.

peared, and the laser printer started whirring. Out came a printed page. I was excited as I picked up the first print-quality document created by my very own 64. At last, my dream of being able to print professional-quality documents on it had come true.

When my wife gave me the 64 for Christmas in 1987, never did I think that I would be able to do professional-quality desktop publishing on it. She had purchased the computer for me to use as a word processor. I would write stories on it and then store them to floppy disks to eliminate the piles of paper that accumulated around my old electric typewriter.

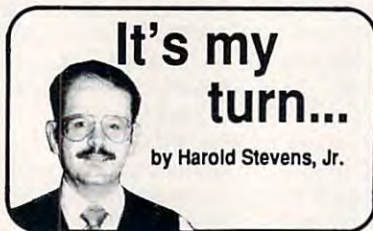
bars and boxes should be. Since 50 percent and above printed too dark, we settled on a 25-percent screen. We had to make the dot screen as light as possible to keep the printing process from blotting out the white type facing and muddling the dot screen. Ink has a tendency to bleed into the fibers of newsprint paper.

I began to play around with the design of the type facing so that we could produce white lettering with black shadows behind it. We felt that the shadow effect would allow the white type to stand out more clearly against the 25-percent dot screen background. Then I put the type in

### **Dreams to Reality**

When I discovered geoPublish, I learned that I could publish professional-quality printed documents on a PostScript laser printer. All I needed was access to such a printer. Buying one was out of the question because I didn't have the money to pay for one on my salary as a weekly newspaper editor. All I could do was to dream that someday I would be able to print professional-looking documents on my 8-bit Commodore. Once the laser samples were printed, the dream had become a reality.

Once we saw the samples, we started refining the standing heds. We had a few technical problems to work out. First, we had to decide the best percentage that the dot screen for the



*Using my personal opinion column as an example, you can see how we improved the looks of our editorial page by going from a rounded corner box to a screened one. Also, changing the type style to italics with white lettering and "shadows" makes the standing hed appear more exciting than before.*

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*To determine what kind of screened background we wanted for the standing headlines, I tried white type against different percentages of the screen. On top is 90 percent screen, followed by 85 percent, then 75 percent, 50 percent and finally 25 percent, which was what we settled on. We decided to add the "shadows" to highlight the white type facing to give it a more fuller look.*

I created these standing heds so that they could be trimmed down to six, five, four, three, and two columns in width. For the personal opinion columns, such as those written by the editors to appear on the opinion-editorial page, I created screened boxes that were three quarters of an inch tall and two columns wide with the name of the column in 18- or 24-point size and the author's name in 15 points. The only difference between these standing heds and the others was that the author's name was set in black type.

The personal opinion columns weren't the only items set in the two-column screened boxes. There were some standing heds whose words were too long to fit into the half-inch by two-column format. For these headlines I had to create a two-column by three-quarter-inch screened box and place the names of the feature in two lines of type, with the words printed in 18-point type. Creating these thicker two-column headlines also gave us a variety of designs to choose from when we laid out the pages.

After creating the screen bars, I placed the black type, which was to become the shadow of the words, about one-eighth of an inch from the top and left edge. Setting the white type over the black one-eighth of an

inch from the top and left edge of the half-inch screened bars in opaque mode produced the shadow effect that I wanted. In the two-column boxes, I placed the shadows and white type the same distance from the top and left edge. Both the shadows and overlying white type were set in italics.

After I corrected small placement errors and ran out the headlines on the laser printer, we had them shot on the PMT camera. This converted them to photographic paper and made them more durable so that they could be reused every week. Shooting the headlines on photo paper also sharpened the resolution of the dot screen, the white letters, and the black shadows. The final results looked as though we had used the Compugraphic typesetter to create them. This process took the 300-dots-per-inch resolution of the laser printer and enhanced it to make the heds appear as if they were 600 dpi or greater.

### Start the Presses

Production day rolled around. The standing heds were shot on paper and waxed to be pasted onto the page with the stories, photographs, and other copy. The pasted-up pages were then shipped to the printer. Two days later, our sample copies of the papers came back. We turned to the pages that had

the standing heds, and they looked great. To tell you the truth, looking at the resolution on the newsprint page, we couldn't tell the difference between them and anything printed by the typesetting machine.

Later, I purchased a second computer and a 1581 drive to keep at work so that I wouldn't have to lug my 64 back and forth when it was needed. I also added an amber monitor for better onscreen resolution.

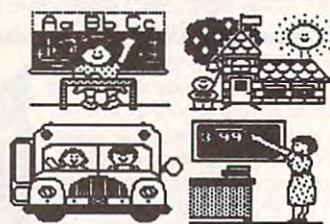
The 64 with a 1764 RAM Expansion Unit and a second 1581 sits on a desk of its own in the office. Since I installed the computer and created the standing heds, I have used this system to create other graphics to be used with stories in our newspaper. I am most proud of the one created during the Persian Gulf War that signified stories about local people who supported the troops overseas.

As an added bonus, I was able to use the system at work to publish an eight-page newsletter for my user group, the Central Ohio Commodore Users Group. For three years now I've been able to use my 64 in a professional manner. The icing on the cake came the following year when the company gave me a nice pay raise for doing the impossible on the 64. □

On the  
home front



South-Western  
City Schools



Going for broke

*Above are samples of other graphics and art work that was produced on the Commodore 64C using geoPublish. The bottom graphic was used as line art to draw peoples' attention to a story on a school district's financial woes, while the one on the top was used to signify stories about local people involved in the Persian Gulf War in 1991-1992. The stars in the flag are the letter "H" in LW\_Shattuck font.*



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## WRATH OF THE DEMON

Are you bored with the games that are available for the Commodore? Do you get discouraged by programs that promise a lot but deliver little? Do you think you'll have to upgrade to a PC in order to get full screen graphics and true multilevel action? Then Wrath of the Demon by ReadySoft has some delightful surprises in store for you.

The creative wizards of the Abstrax research team have come up with a phenomenal program in Wrath of the Demon. This game offers the scope, graphics, multilevel scrolling, and sound track that previously had been available only to PC owners.

The game itself is a challenging quest that pits a demon and his host of minions against our hero, an unassuming stranger who happens to be in the wrong place at the right time. The hero (you) is entrusted with the mission of finding and saving the princess and riding the kingdom of the evil demon. If he succeeds, the king has promised the hand of the princess. If he fails, all is lost.

The game opens with an impressive musical score. It's just one of nine musical selections you'll hear throughout the game. The title graphic tells the story. It shows a bullish demon holding a sphere with the lovely princess imprisoned inside. Off to one side, our handsome Conan-like hero rushes to the rescue, brandishing his sword.

Sure, a lot of games have impressive title graphics, but then the games don't live up to the promise. The graphics in those games end up being either too small or uninspiring. You know the kind I mean—the ones where a character who looks like a minuscule stick man moves along the bottom inch of the screen and the rest of the screen is a solid blue that I can only assume is supposed to represent the sky. If that's what you've been seeing, you aren't going to believe your eyes when you load Wrath of the Demon!

The Abstrax team originally designed Wrath of the Demon to take advantage of the sophisticated hardware in the Amiga computer system. When they converted the program for the Commodore, they were determined to push that hardware to its limits. They

succeeded admirably. The game has over 600 screens of action; smooth, high-tech parallax scrolling; and richly detailed graphics that utilize more than 100 colors.

The animation is superb. There are over 1400 frames in the game. The frames scroll smoothly across the screen without jumpiness or distortion. For example, the opening level fea-



*The animation in Wrath of the Demon is superb, with more than 1400 frames.*

tures our hero riding a galloping white charger. The mountains, shrubs, and clouds scroll by flawlessly. In addition, there are rocks to be hurdled, skeletons to be avoided, and small bottles (potions) to be collected for later use.

The characters have a wide range of movement. They jump, walk, roll, duck, and fight. In the opening scene, the hero must lean down from his saddle and scoop up items while his steed thunders forward at full speed. He must also hurdle rocks and other obstacles that get in his way. In fact, the horse will balk rather comically and refuse to go further if the hero doesn't guide him over an obstacle.

Meanwhile, the hero also has to watch what he is scooping up. Small bottles represent potions, but skulls, rocks, and other items will drain the hero's energy if he touches them. Don't be fooled into thinking it would be easier to just gallop forward without attempting to gather objects. He'll need the potions later if he hopes to have success against the various monsters he'll meet along the way.

The game's monsters are large, intelligent, and deadly—120 different varieties in all. Low-flying birds try to knock you from your horse. Gnomelike creatures attack you with pickaxes and throw rocks at you. (Their aim is dead-

ly.) Dragons breathe fire at you. As for the demon himself, well, suffice it to say he is an awesome creature more than half a screen tall.

In order to defeat the monsters, you'll have to develop a different strategy for dealing with each one. Whatever approach you adopt, try to keep your hero as far away from the monsters as possible. Never let them back him into a corner. In fact, sometimes, it's better to try to avoid a monster rather than attack it. However, killing the monsters has some advantages—sometimes they carry potions that your hero can collect for later use.

The three potions that are most helpful are Shield potions, Zap potions, and Heal potions. The Shield potion makes the hero immortal, but only for three seconds. Zap potions will kill the monsters around the hero or at least take away some of their power. Because of their constitution, some monsters have some immunity to the Zap potion. It's interesting trying to figure out which monsters are which.

The Healing potion is the most helpful. It will cure all your hero's wounds and restore his energy to the maximum. He'll need it. There are more monsters waiting on the next level.

Onscreen graphics help you keep track of the hero's energy level and the number and type of potions he has remaining. Unfortunately, there is no indicator for the monsters' strength, so you're never sure how close to death they are. You'll have to keep hitting, jumping, running, and punching until you defeat them. This is made more difficult by the fact that the monsters seldom attack alone. Sometimes your hero will be outnumbered two or three to one. So use those potions carefully! The game will really put your joystick skills to the test.

You'll need more than just dexterity to master this one. The exploration levels of the game will take the hero through murky caves, pagan temples, and elaborate castles. You'll need to make good maps of some of these levels, or you'll never get our hero out of the labyrinth of passages.

The game isn't perfect; there are some flaws in it. One is the lack of a feature to save your game or position. This feature is available for other sys-

tems but not for the Commodore version. Another drawback is the manual. It's sketchy at best and was written to encompass all versions of the game. The manual tells you more of what the Commodore version can't do than what it can.

The biggest drawback I found was the loading time both to start the game and between scenes. Even using my Epyx FastLoad cartridge, the loading time ran anywhere from 30 seconds to a minute. At the rate I was dying and having to restart the game, I wished it would reload faster.

However, I have never seen a Commodore game that has offered such superb graphics, intricate plotting, and fast action. It shows what the 64 can do with the right programming. Let's hope more such games are headed our way.

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JiffyDOS C64-System \$49.95	Silent Service \$16.00	Commodore 64 Tricks and Tips \$12.00	January/February March/April
JiffyDOS SX-64 System \$49.95	Skate or Die \$13.00	Graphics Book for the C-64 \$12.00	May/June July/August
JiffyDOS C-128 System \$59.95	The Amazing Spider-Man \$15.00	Printer Book for the C64 \$12.00	September/October Nov/Dec
JiffyDOS 128-D System \$59.95	The President is Missing! \$10.00	Ideas for Use on Your C-64 \$10.00	- 1990 -
Additional Drive ICs \$24.95	The Three Stooges \$10.00	<b>Telecommunications</b>	January/February March/April
<b>CMD Software</b>	Tie Break Tennis \$16.00	Dialogue 128 \$29.00	May/June July/August
gateWay 64 or 128 (GEOS Desktop) \$29.95	Total Eclipse \$10.00	SpeedTerm (Abacus) \$25.00	September/October Nov/Dec
Collette Utilities (Handy Geos Utilities) \$19.95	Ultima III, IV, V (Please Specify) \$17.00	SwiftLink RS-232 Cartridge (Up to 38.4K baud) \$39.95	- 1991 -
Perfect Print LQ for GEOS (Laser-like output) \$49.95	Wizardry V \$24.00	SwiftLink Modem Cable (DB9-DB25) \$9.95	January/February March/April
geoMakeBoot (Makes Bootable copies) \$12.95	<b>Productivity</b>	Commodore 1680 Modem (300 baud) \$110.00	May/June July/August
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<b>GEOS</b>	Super Script 64 (Precision) \$15.00	BOCA 14.4K Baud Modem \$249.00	January/February March/April
GEOS 64 v2.0 \$44.00	Super Script 128 (Precision) \$20.00	BOCA 14.4K w/SwiftLink and Cable \$279.00	May/June July/August
GEOS 128 v2.0 \$49.00	Data Manager 2 (Timeworks) \$16.00	<b>Misc. Hardware</b>	September/October Nov/Dec
geoCalc 64 \$45.00	Suberbase 64 Version 3.01 (Precision) \$35.00	SID Symphony Stereo Cartridge \$39.95	- 1988 -
geoCalc 128 \$45.00	Superbase 128 Version 3.01 (Precision) \$35.00	GeoCable Compatible Print Cable \$20.00	January/February March, April, May
geoFile 64 \$40.00	PowerPlan 64 (Abacus) \$16.00	Xetec Super Graphix Jr. \$45.00	June, July, August
geoFile 128 \$45.00	SwiCalc 64 (Timeworks) \$16.00	Xetec Super Graphix Sr. \$60.00	- 1989 -
geoProgrammer \$45.00	<b>Other Productivity</b>	2+1 Cartridge Port Expander \$45.00	January/February March, May, June
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geoChart \$29.00	Cadpak 128 (Abacus) \$25.00	SilverSilver 128 IEEE Interface \$120.00	- 1990 -
Desk Pack Plus \$29.00	Chantpak 64 (Abacus) \$17.00	C-1351 Mouse \$36.00	January, May, June, July, December
FONTPACK \$25.00	Chantpak 128 (Abacus) \$25.00	C-64, C-64C Power Supply (Repairable) \$39.00	- 1991 -
International FONTPACK \$25.00	RUN Productivity Pak I, II, or III (Specify) \$15.00	C-128 Power Supply (Repairable) \$45.00	Jan/Feb, June/July, Sept/Oct
geoBASIC \$20.00	RUN Super Starter Pak 1541 \$20.00	1581/1541-II Power Supply \$25.00	- 1992 -
BeckerBASIC \$20.00	RUN Super Starter Pak 1581 \$20.00	January/February, March/April, May	June/July/August, September/October
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<b>Creative Micro Designs, Inc.</b>			

Circle Reader Service Number 139

# FEEDBACK

## Bug-Swatter

TurboDOS (June 1993) doesn't work on 1541-II drives. Author Hong Pham offers the following suggestion to fix the problem. First, load and run TurboDOS. Then after the startup message appears, enter the following line in immediate mode.

**POKE 4508, 234: POKE 4509, 234:  
POKE 4510, 234**

To save this modified version of the program, type *BSAVE "TURBODOS.MOD",8,2049,10493*.

## In Scarce Supply

What's the word on the 64? Does Commodore still support it or not?

RAYMOND MAY  
PALATKA, FL

*Commodore still supports the 64 in Europe, but not in the U.S., according to Fred Bowen, a senior engineer at Commodore. The company has entered into an agreement with Software Hut (800-932-6442) to sell new and refurbished 64s, drives, and other equipment, and The Software Management Group (410-992-9975) will offer post-sale support to Commodore resellers, various dealers, and end users. Service centers will work with SMG for all warranty-related activities. SMG has its headquarters in Columbia, Maryland, but plans to open offices in West Chester, Pennsylvania, and Memphis, Tennessee.*

## Appending Programs

I have a couple of financial programs that I have created over the years that I would like to combine into one larger program. I'd like to use a menu subroutine to run whichever program I desire. A couple of these programs are fairly long, and I'd rather not

have to type them in again. Isn't there some way I can merge these without having to retype them?

DARRELL HUNLEY  
WACO, TX

*The easiest way to combine several programs is to append one to the other. This means that you'll have to change the line numbers of the second program so that its lowest number is higher than the highest number of the first program. This simply means that the programs with high line numbers are tacked onto the end of programs with low line numbers. If the line numbers overlap, you'll have a problem.*

*The easiest way to append programs is to load the first program and then in direct mode type POKE 43, PEEK (45)-2: POKE 44, PEEK (46) and press Return. Then load the second program and type POKE 43, 1: POKE 44, 8 and press Return.*

*List the program, and you should see that the second program has been appended to the first. Save this new program. If you wish to append another, repeat the process.*

*If PEEK(45) should happen to be a 0 or 1, you'll get an error message. If this happens, you have to change your instructions by typing POKE 43, PEEK(45)+256-2: POKE 44, PEEK(46)-1 and then continuing as before.*

*Merging two programs into a single program with lines sorted correctly requires something else. This is different from appending one program onto another. You might have a subroutine that you've written, and you'd like to enter it without having to rewrite it. You can use the following program to merge two programs. Just make sure that neither program contains the same line number as the other.*

```
SC 59000 FOR J=40960 TO 49151:
POKEJ,PEEK(J):NEXT
AQ 59010 POKE42231,56:POKE4228
8,96:POKE42585,96
BK 59020 FOR J=830 TO 900:READ
V:POKEJ,V:NEXT
MJ 60000 DATA 162,8,32,198,255
,32,207,255,32,207,25
5,165
GM 60010 DATA 1,41,254,133,1,1
60,0,32,207,255,32,20
7
AP 60020 DATA 255,240,32,32,20
7,255,133,20,32,207,2
55,133
PS 60030 DATA 21,32,207,255,15
3,0,2,240,3,200,208,2
45
XQ 60040 DATA 152,24,105,5,168
,32,162,164,76,79,3,1
65
BF 60050 DATA 1,9,1,133,1,32,8
9,166,76,128,164
```

*To use this merge routine, load it, run it, and then type NEW. Be patient; it will take almost a minute after you type RUN before the computer will be ready again.*

*Then type in or load a BASIC program. Merge additional programs on disk by typing OPEN 8,8,8,"FILENAME": SYS 830. Filename is whatever program you have on disk that you want merged with the one already in memory. Be sure to save the newly merged program. You can turn off the blinking light on the disk drive by typing OPEN 15,8,15,"I": CLOSE 15.*

## Author Information

You should publish the addresses of your authors so we can write to them. Also, you should include more biographical information such as age, sex, hobbies, and nationality.

Also, are you guys going to sell any more disk products? I notice that you have a few different disk indexes. Why don't you combine them into one?

If you have public domain programs on your disk but don't pay the authors, then your corporation is freeloading off of them. Is your disk still going to publish bonus programs that are too large to type? What about graphics? Do you still want them?

HENRY WILLIAMS  
CANADA

Questions and  
answers  
about TurboDOS,  
Commodore's  
support for the 64,  
and more



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D-128 Potpourri UPEGT	5+2	Q-ClaesMU Bach-Haydn+	7+2	
E-PLUS/4 Combo UPEGT	5+2	R-PETS 347 PSG domes.	10+2	
F-Bks-Inet. Activities	1+2	S-SPORTS 419 PSC Mixed	10+2	
G-ED Pak-A MSEG etc.	13+2	T-CARTOON Char 202 PSC	5+2	
H-ED Pak-B MSEG etc.	70+7	U-COMPTA PARADE 255PSG	5+2	
I-Bks Amazing C64or128	3+2	V-FASTCAD V1--Enhanced		
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JH06-UT+4., Prnt, Crpt+	12+3	JH15-Graphics+Prge +4	7+1	
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*Gazette forwards mail to its authors whenever a reader writes with a question about a program that our staff cannot answer. We also forward any mail that's sent to an author in care of the magazine. We include biographical information whenever an author supplies it, but it's not required. (As a matter of fact, you didn't include your city or province in your letter, but we identified the country from the stamp on the envelope.)*

*Like many other companies that offer Commodore products, we too have noticed sluggish sales. That is one reason that there are no plans to update the Gazette Index. The Index was a cumulative one, however. That is, we updated it each year, adding on to the previous contents. The Index includes programs and articles from 1991 back to 1983. At this time, there are no plans to update it again.*

*While SpeedScript itself hasn't changed since its last disk, we have published a number of enhancement programs. We have thought of offering a disk of those products. We have also thought of offering a two-disk set of Larry Cotton's "Beginner BASIC" columns and programs. At this time, we doubt if there is enough interest in these products to make them economically feasible. If we're wrong, we welcome your comments.*

*If you've read Tom Netsel's comments in this issue's "64/128 View," you know that there are major changes coming to Gazette. The decision to go to an all-disk product means several benefits to our readers. Since you no longer have to type in our programs, we don't have the same limits on program size. We also won't have the 16-page restriction that we've had in print. We can now offer more programs as well as larger ones.*

*Steve Vander Ark has found some very good public domain and shareware programs for our disk. We plan to continue with his "PD Picks." As for ripping off those authors, we do our best to contact them before publication. We offer a contract that grants us the one-time use of their programs, and we also pay an honorarium for that use. Whenever we include a shareware program, we hope that you'll do your part by sending the authors a few dollars for the programs that you find useful.*

*While we still receive a large number of program submissions, we get almost no graphics these days. We can only assume the number of active Commodore artists has declined. Also, since we received no feedback about our dropping "Gazette Gallery" from the disk, we assumed that you readers didn't miss that feature either.*

## Directory Lister

Here is a directory lister for the 64 that I use all the time in my programs, and I find it quite helpful. Other readers who program may find it useful as well. This program will read the directory of drive 8, 9, or whichever one you specify without interrupting or losing the program that currently is in memory.

```
10 PRINTCHR$(147):
  INPUT"DRIVE 8 OR 9";DN
20 PRINTCHR$(147):
  PRINTTAB(6)"DISK
  DIRECTORY";DN
30 SYS57812 "$",DN: POKE 43,1:
  POKE44, 192: POKE768, 174:
  POKE 769, 167: SYS47003,1
40 POKE782,192: SYS65493:
  SYS42291:LIST:POKE 44,
  8: POKE 768, 139: POKE 769,
  227
50 PRINT: PRINTTAB(6)" HIT ANY
  KEY"
60 GETAS: IF AS$="" THEN 60
```

## 70 RETURN

Remember the routine to fit anywhere within your program, and be aware that line 70 will need a GOSUB in order to work properly.

DAVE WASENDORF  
DENVER, CO

## Where's SpeedCalc?

I the June issue there's a notice about a bonus template for use with SpeedCalc for tracking stock holdings. Before I ordered the disk, I checked to see if I had SpeedCalc. When I couldn't find it, I booted the Gazette Index to see when the program was published. I didn't find any mention of it. I could use this template if I had SpeedCalc. When was it published?

RAY MUSICK  
OKLAHOMA CITY, OK

*The reason you couldn't find SpeedCalc on the Gazette Index disk is because SpeedCalc was never published in Gazette. It appeared in the January 1986 edition of COMPUTE. (Remember the good old days when COMPUTE published type-in programs for the Commodore, Apple, IBM, and Atari?) It was also available on disk.*

*A few years later, we issued the Gazette Productivity Manager disk (\$14.95). In addition to a financial planner, and data base, this disk contained GemCalc, a spreadsheet based on SpeedCalc but much larger and powerful. Files and templates for these two programs are compatible, however. If you don't already have a spreadsheet, you might want to consider GemCalc. It's a great buy, and the disk is still available.*

*Since SpeedCalc was never published in Gazette, maybe it's time to correct that oversight. Look for it in an upcoming issue of Gazette.* □

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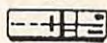
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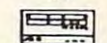
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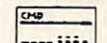
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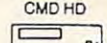
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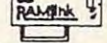
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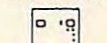
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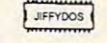
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HPGAB

# PD PICKS

Steve Vander Ark

## SLEEP STEALERS

I'm still on a games kick this month. As you might recall, last month I was trying to beat Super Rockfall and Zix. Now, I've added two more great new games to my "sleep-stealer" disk. Both of these games are excellent. They're the kind that keep me staring at the monitor until my eyes start to creak. These aren't joystick breakers; they're strategy games. They're the kind that keep you up until 3:00 a.m.

Now, here's this month's pair of winning programs. For those of you on CompuServe, I'll include the game's filename whenever I can find it. Whether you get these games on Q-Link, GEnie, CompuServe, or Gazette Disk, don't count on getting too much sleep once you start to play.

### Rebellion V2.

Q-Link filename: REBELLION V2. Uploaded by Ravenweird. GEnie file number: 12546.

This game bears a passing resemblance to Risk, the board game in which you try to conquer the world using little colored markers for armies. You are given a random map made up of hexagonal territories which come with villages and a contingent of soldiers loyal to the king. Of course, as you might guess from the name of the program, you aren't loyal to the king at all. In fact, your goal is to wipe out the royal troops entirely and proclaim yourself king.

The game consists of your maneuvering your armies, challenging neighboring territories, and trying to hoist your own flag over the territories. In the process, you can hire more soldiers and build towers and villages to extend your influence.

That by itself would make for a pretty neat game. But Rebellion also offers tidbits of color and style that make all this

simulated mayhem a lot of fun. Every time there's a battle, for example, a window appears showing two or more little guys armed with swords who proceed to duke it out. This action is accompanied by thunks and clangs and martial music. There are no blood or explosions (this is a strategy game, remember?), and you really can't do anything to help your side win. But these kinds of frills add a lot to the overall enjoyment of Rebellion.

There are other nifty touches. You can customize the game extensively at the start. You can edit the map and select your own color and coat of arms, and they then appear on your battle flags and in your conquered territories.

You can permit random events to occur, such as fire destroying one of your villages or your troops capturing some outlaws and gaining some extra gold. You can also (and I need options like this) make the king's men into real wimps or give the king extra advantages such as a brother to charge to his rescue. Rebellion will suit just about any kind of challenge you want to set up, and it'll keep you busy a long, long time.

If you do happen to tire of treachery and bloodshed, you might want to load the other program for this month, a wonderful re-creation of an ancient but still popular game.

**Mah-Jongg** by Kurt Tappe. Q-Link filename: MAH.JONGG V2.SDA. Uploaded by KurtTappe. GEnie file number: 7584. CompuServe filename: MAHJON.BIN. Contributed by user #73040,504.

According to the nice bit of historical background Kurt Tappe has included with this game, people have been addicted to mah-jongg for thousands of years. Now in the computer age, the deceptively simple game is still keeping peo-

ple like me from getting any work done. This version, for the 128 in 40-column mode, is a masterpiece.

In case you're not familiar with the original board game, here's a brief idea of what it's like. You are presented with a number of little tiles with pictures on them, stacked up in a random arrangement, with extra pieces in the middle. Your job is to remove matching tiles from those that are visible. The trick is that you can take only tiles that have a free edge. In other words, you can't remove those that have other tiles touching all four sides. Computer versions of mah-jongg automatically set up the tiles in a random arrangement to start you off and then let you select matching pairs with a pointer.

Kurt has gone out of his way to make his mah-jongg the best around. He has included a mouse driver. Since you have to move the cursor all over the screen, the game benefits from the mouse's quick pointer control. Kurt has also provided an option that makes guys like me happy: the chance to take back moves and try another tack. You can even ask the computer to suggest moves for you.

One feature that I don't dare use is the autoboot creator, included as a separate utility program. I play mah-jongg too often as it is without having it there every time I start my system!

You probably won't really need the documentation which is available from within the program, but read it over anyway to get the historical goodies on mah-jongg. That's just one more example of the level of user friendliness that you'll find in this game. Kurt has gone the extra mile to ensure that this program becomes one of your favorites; it definitely is one of mine. □

**Don't count on getting much sleep when you boot either of these great PD games.**

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HRDB5

# BEGINNER BASIC

Larry Cotton

## THREE CHALLENGES

Merry Christmas, happy Chanukah, or season's greetings. Here are a few BASIC programming challenges that I'd like for you to consider while Gazette makes the change from paper to disk. Give them some thought and see if you can program a solution of two. Last weekend my seven-year-old second cousin Hunter showed me a game which I had never seen before. It's called Sets. In case you're not familiar with this game, I'll tell you about it. It's a fiendishly simple game in which a deck of special cards is shuffled, and 12 cards are displayed face up in a 3 by 4 grid. Each player takes turns identifying and collecting sets of three cards. More cards are added to the grid to replace the sets as they're removed.

A set is defined as any three cards which share certain characteristics. For instance, one solid red diamond, one solid blue diamond, and one solid green diamond would qualify as a set. Similarly, one shaded green oval, two shaded green ovals, and three shaded green ovals would make a set. Less easy to spot are sets which might consist of one solid red diamond, two green shaded diamonds, and three blue open diamonds.

If only two cards in a group share a certain characteristic, the group isn't a set. This isn't a set: two shaded green ovals, two solid green diamonds, and two open red squiggles. (One way to legalize that set would be for the green diamonds to be blue.) The variables in a set are color (red, green, or blue), quantity (one, two, or three shapes), fill (open, shaded, or solid), and the shape itself (squiggly,

oval, or diamond).

Needless to say, Hunter beat me soundly most of the time. So what's the programming challenge that I mentioned earlier?

As you sit around the house on these long cool nights, see if you can write a computer program that plays a Sets-like game. (Is there already one out there?) Ideally, the computer would randomly present the 12 cards, the player would attempt to identify a set, and the computer would decide whether or not the set is legal.

An alternative could be that the computer presents groups of three cards, the player decides whether the group is a legal set or not, and the computer checks the answer. Either way, I would like to see how you would begin programming a game such as this in BASIC.

Feel free to come up with your own variation. Send me the game (finished or not) in care of COMPUTE's Gazette, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408. I'll try to decipher your programming and present some of your best techniques in a future column. Meanwhile, I'll attempt to come up with a version of my own, and we can compare programming strategies later.

Here's another challenge for you: Write a short BASIC program that will play the Westminster chimes. These are the familiar chimes heard in large clocks that ring on the quarter-hour. It's not sufficient to let the SID chip just play the notes; rather, SID should really chime! In other words, this program should use the ring mode feature of the SID chip to add the harmonics necessary to sound like real bells. Even better would be a clock which chimes four notes on the quarter-hour, eight on the

half-hour, and so on until the hour. (Hint: try poking a 21 to one of SID's control registers.)

Incidentally, some other well-known chimes are Winchester (not actually played in that city), Canterbury (not actually played at Canterbury Cathedral), Trinity, Guildford, St. Michaels, Cairo, and Notre Dame. As a bonus, you could include them all with a menu screen. Hit T for Trinity, G for Guildford, and so on!

OK, here's the third challenge, one which fits the real spirit of "Beginner BASIC." Send me a short BASIC program that rounds numbers. One might let a user enter any number that included unlimited decimal places. The user could then choose the number of decimal places to round off to.

I would also like to see any programs which round money calculations to two places, preferably with the ability to line up decimals vertically. I'll look at any program that computes averages, golf scores, lottery winnings, calories, grades, or whatever else you want to count!

Way back in the August 1988 issue of COMPUTE's Gazette, I showed how to use the following general formula to round numbers.

$$R = \text{INT}(N * 10^{\uparrow} D + .5) / 10^{\uparrow} D$$

R is the rounded number that you seek, N is the number to round, and D is the number of decimal places you'd like to round off to. The up-arrow key (next to Restore) raises a number to a power.

If D were 2, 10 would be raised to the second power, or squared. Feel free to adapt this formula to any new program you're inspired to write. And keep those cards and letters (and programs) coming. Be sure to include your name and address with all submissions. □

**Here are three programming challenges to keep you busy during the holiday season.**

# D'IVERSIONS

Fred D'Ignazio

## I DON'T THINK THIS IS CLEVELAND EITHER, TOTO!

In *Rising Sun*, the movie based on Michael Crichton's best-selling novel, actor Wesley Snipes, playing a police detective, watches a computer screen in wonder. He sees his head and the head of his partner (played by Sean Connery) cut from their own bodies and pasted onto each other's shoulders. Following this demonstration, Snipes is cautioned by a computer technician not to trust videotaped events as evidence of something that has actually taken place in the real world.

Moviemakers have used special effects for years to make us believe the events that we see on the silver screen, or at least to make them seem believable. Of course, it usually takes a hefty budget and a team of artists to create this video magic.

This kind of virtual reality—the appearance of being real without being an accurate reflection of physical reality—is rapidly becoming easier and less expensive to create. This is because all media, including television, photography, music, and telephony, are swiftly being converted to a digital format. With simple media manipulation programs, any artist, production editor, musician—or kid!—can alter a digitally recorded event into something fictional which nevertheless looks and sounds as real as the original. With the digital format there is no "generation loss" that makes copies look inferior or doctored.

Many of us, outfitted with power gloves, stereo computer goggles, bodysuits, and ultra-high-speed computers, eagerly await the dawn of virtual reality. But a simpler form of vir-

tual reality has already dawned, and you are liable to stumble across it in the check-out lines of your local supermarket or convenience store.

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"TREE GROWS FROM BOY'S MOUTH—LAD REMEMBERS SWALLOWING ACORN ON FOURTH BIRTHDAY"

Thousands of stories similar to these appear each week in America's supermarket tabloids. Many of them are accompanied by photographs depicting the event they describe. You might see the groom holding his diminutive bride in the palm of his hand or an oak tree growing out of a boy's mouth. The photographs are used to "prove" that the fantastic events did occur and were not concocted by an editor with a bizarre imagination.

Don't count on it. These photos can be quickly and easily created by digitally manipulating the original photographs on computer workstations.

For three years I worked with Sharon Goth-Tew in the Teacher Explorer Center, a multimedia demonstration center sponsored by the State of Michigan to show educators some

of the exciting advances in instructional technology. Sharon and I delighted in showing the headlines from grocery story newspapers to educators and then demonstrating how the pictures could be digitally created.

For example, Sharon had a digitized image of her son Tyler which she called up on the big four-foot Sony monitor at the front of the room. She loaded Tyler's image into a paint program and proceeded to shrink him, stretch him, invert him, rotate him, and colorize him. She showed how she could digitally add an earring on Tyler's left ear, give him a case of the measles, or change the color of his hair or his eyes. She also showed how she could shrink his entire face and place it inside his mouth or stretch his mouth so that it could cover the TV screen. Since Tyler would not be pleased with the things his mom was doing to his face, Sharon always asked the teachers to keep her tricks secret.

Each morning we greeted a fresh crop of educators from Michigan and around the country. Our first warm-up activity was to divide the educators into five teams and to capture their images digitally on their workstation computer. We used a video camera connected to a computer frame-grabber board. Since we were on a network, as soon as the images were captured, we displayed them in an instant computerized slide show on the classroom TV.

Then the fun began! The class giggled, shrieked, and roared as we took men's heads and placed them on female bodies and as we added clip art backgrounds and placed teachers on the moon, at the bottom of the ocean, or in a fifteenth-century castle.

We changed hairstyles, added hair to bald heads, and

With simple media manipulation programs, anyone can alter a digitally recorded event into a work of fiction.



drew clown hats. When we replicated arms, legs, and other body parts, we attached them to people's bodies like cut-out paper dolls. We then added mock headlines and published the text and pictures on the classroom printer to create our own imitation tabloids.

One morning, Deb Small, the number two technology official in the Michigan Department of Education, came to the center to see what we were up to. We told Deb we were digital magicians who had the ability to transport her to star in her favorite movie. After looking through our collection of laser discs, Deb decided that she wanted to swap places with Judy Garland and become Dorothy in

*The Wizard of Oz.*

Sharon did all the digital surgery while Deb selected images. First they captured keyframes from the laser disc. These formed a storyboard of the movie. Next, they digitized a picture of Deb as she sat in front of one of the video cameras in our laboratory.

Sharon cut the head off Deb's picture and pasted it onto Dorothy's shoulders in *The Wizard of Oz*. By just cutting the oval of Deb's face and scaling it appropriately for each picture, Sharon was able to fit Deb's face onto Dorothy's without mussing a single one of Dorothy's hairs. Then Sharon went into fat bits mode and smoothed the pixels around the oval to

make the transition from Deb's face to Dorothy's face subtle and natural.

To complete the effect, Sharon and Deb composed a digital slide show that included all the photographs from the storyboard. They added the song "Somewhere Over the Rainbow" from the movie as background music and dialogue such as "Toto! I don't think we're in Cleveland anymore!" (Deb and her family come from Cleveland.)

They copied the computer slide show onto videotape and created a customized label. Deb carried the finished product out of the center after only a morning's worth of work. Deb was so pleased with the video that she sent

it to her mom and dad back in Ohio!

So, the next time you hear a sound, see a photograph, watch a news documentary, or listen to someone's voice, ask yourself, Is it real or is it virtual reality? We live in a society saturated by electronic media.

In the past this media accurately reflected the real world—or at least we could tell when it didn't. But the digital revolution is changing that. Almost everything visible through media windows may soon be something pasted together with digital smoke and mirrors. What effect will this have on the facts? What effect will it have on our perception of reality? Most important, will we care? □

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# PROGRAMMER'S PAGE

David Pankhurst

## FAB FOUR

All the tips this month come from the computer of David Pankhurst. Look for more information about him at the end of this article.

### Line Delete

In October's "Feedback" column, Roger Howard of Los Angeles asked about a program to delete a number of lines from a program. Here's a program to delete a number of lines from a BASIC program just by typing in five lines. It's handy when you want to erase lines but don't want to load in a complete system (like MetaBASIC). Feel free to use different line numbers. Just be sure to change the references in line 3 and line 4.

```
1 INPUT "WHAT ARE LOW, HIGH LINE NOS. ";A,B:
  Y=PEEK(43)+256*PEEK(44)
2 X=PEEK(Y)+256*PEEK(Y+1): L=PEEK(Y+2)+
  256*PEEK(Y+3): IFX=
  0 THEN END
3 IFL<ATHENY=X:GOTO2
4 IFL<=BTHEN
  PRINT"[CLR][3 DOWN]"L"
  [DOWN]Y="Y": B="B":
  GOTO2:(HOME)"
5 POKE198,2:POKE631,13:
  POKE632,13:END
```

### Run Counter

This trick is a one-liner to embed a counter in a program. I find this line is useful to note the version of programs I'm developing. Every time I run the program, it passes this line, incrementing the counter. Later versions will have higher numbers.

The first line shows how it looks in BASIC; the second shows how you can type it so it will fit on one line. The second version uses the Commodore technique of two-letter abbreviations. This consists of entering the first letter and

holding down the Shift key while entering the second.

```
1 R$="0000":FORI=7TO
  10: POKEI+PEEK(61)+256*PEEK
  (62)-20,ASC(MID$(STR$(VAL
  (R$)+1+1E8),I,1)):NEXT
```

```
1 r$="0000":f0i=7to10:
  p0i+pE(61)+256*pE(62)-20,
  aS(ml(stR(vA(r$)+1+1e8),
  i,1)):nE
```

### It's a Call 4 U

This routine takes a telephone number and gives letter combinations that can be used for it (such as 555-JOJO instead of 555-5656). What makes this one worth typing in is that it does all combinations, not just a random sampling. Also, it's only five lines, which is enough for something as trivial as this. You can enter any nonnumeric characters you want, and they will be included in the output. Note that line 50 has all the letters in the alphabet except Q and Z.

```
10 INPUT "NUMBER";A$:B=
  LEN(A$):DIM C(B):
  FORD= 1TOB:C(D)=0:
  NEXT: C(B)=1:PRINT,,
20 E=B:PRINT,
30 C(E)=C(E)+1:IF C(E)>2
  THEN C(E)=0: E=E-1: ON
  SGN(E) GOTO 30:END
40 FORD=1TOB:F$=MID$(
  A$,D,1):G=3*VAL(F$)-5:
  IF G<1 THEN PRINT
  F$: C(D)=5:NEXT: GOTO
  20
50 G=G+C(D):PRINT MID$(
  ("ABCDEFGHIJKLMNO
  PRSTUVWXY",G,1)):NEXT:
  GOTO 20
```

### Master This

This little program provides a quick version of the popular guessing game called Mastermind. Here, you guess at the digits in a four-digit number (digits 1-6), and the results are displayed with B (black) for the number of digits that are correct and in the correct

position and W (white) for digits that are correct but in the wrong position.

If you want to try different variations, adjust line 10. L is the number of digits in the puzzle (4), and R is the range (from 1 to 6 in this case).

```
10 L=4:R=6:FOR I=1TOL:
  D(I)=INT(RND(0)*R+1):
  D=D*10+D(I): NEXT:Z=1:
  GOTO30
20 Z=Z+1: PRINT"B="B"W="W
30 PRINT"GUESS="Z:INPUT X:
  PRINT"[UP]";: FOR I=LTO1
  STEP-1: Y=INT(X/10): G(I)=
  X-Y*10:X=Y
40 NEXT:W=0:B=0: FOR I=1TOL:
  F(I)=D(I): IF G(I)=F(I)THEN
  F(I)=0: G(I)--1: B=B+1
50 NEXT: FOR J=1TOL: FOR
  I=1TOL: IF F(J)=G(I)THEN
  F(J)=0:G(I)--1: W=W+1
60 NEXT:NEXT:IF B<L THEN 20
70 PRINT"CORRECT!":END
```

*Editor's note: For many years Randy Thompson has compiled the material for "Programmer's Page," and he's done an outstanding job. His work load as a programmer for a major software firm, however, has forced him to give up this column. We wish Randy well and want to convey to him our thanks for his many great programming tips and ideas.*

*Although Gazette is changing, "Programmer's Page" will continue to be a vital part of it. David Pankhurst, a talented programmer from Montreal, Canada, provided the tips for this issue, and he will be compiling the column from now on. Look for more information about David next month.*

*Remember, Gazette still wants your programming tips and hints. We pay \$25-\$50 for each tip that we publish. Send your tips to Programmer's Page, COMPUTE's Gazette, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408. □*

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# GEOS

Steve Vander Ark

## ULTIMATE GEOS ON A BUDGET

About a year ago in this column, I described what I considered to be the ultimate GEOS setup. The total price was several thousand dollars. Later, I received letters from people who asked about a system for regular folks. Fancy equipment is wonderful, but is it necessary? So here's another, more realistic, list of what I consider to be the best choices for a GEOS system.

**Computer and monitor.** I recommend a 128 for its 80-column screen. The ease of use in 80 columns, especially with geoWrite, is well worth the extra money. That means you need an 80-column monitor, too, but you can get by with monochrome. I'd also recommend a small color TV to display your 40-column screen. I speak from experience here; I have that exact setup.

**Drives.** To really use GEOS effectively, you need at least two drives. I'm going to go the extra mile and say that you have to have a RAM expansion unit for one of them. I'll talk a bit more about RAM in a moment. For now, let's assume at least a 512K REU along with your 1541 or 1571 real drive.

Many users also add a 1581 drive. Since I've never owned one, I can't say much about it except that it would be nice. Some other users have a hard drive on their systems. If you can afford one, go for it! I can't afford one of those, either, but from everything I've heard and read, the hard drive of choice is one from Creative Micro Designs (CMD). If it comes down to a choice, though, definitely get a RAM device before a hard drive.

**RAM devices.** As I have often said, I consider a RAM de-

vice to be essential to running GEOS. It is the single most important piece of hardware you can buy. A RAM device is more important than a second disk drive, a hard drive, a fancy monitor, or anything else.

I wouldn't hesitate to say that it's better to run GEOS on a 64 with a RAM device than on a 128 without. And while a 1750 or geoRAM may be considered a minimum level of RAM, I highly recommend getting RAMLink from CMD. Order it packed with as much RAM as you can afford, a battery backup, and (if you feel like splurging) a Real-Time Clock. While you're at it, order a copy of Gateway, even if you don't plan to run your system under it. I'll explain more about that later.

**Input devices.** A mouse—period.

**Software.** For a file manager, you'll do fine with the deskTop that comes with GEOS, but I recommend Gateway. I wouldn't want you to be stuck with RAMLink without Gateway to make full use of it. You'll want Gateway if you plan to use DualTop or geoSHELL, too.

By starting with Gateway, you allow DualTop and geoSHELL to access native mode partitions on RAMLink. What that means is that you can create a RAM disk without having to match the size and structure of another drive type, such as a 1571 or 1581. If you stay in Gateway, you can even use subdirectories, which are a very convenient way to organize your files.

You can usually fill your application needs with actual GEOS products: geoPublish, geoFile, and so on. All GEOS software is now available through CMD. There is a multitude of essential public domain or shareware programs, so a subscription to Quantum-Link or GENie is also a good

idea. This gives you access to those file libraries. If you want suggestions on which public domain files are good, check out some of my columns over the past few years. I'll put a new list of the best GEOS downloads in an upcoming column as well.

There are a number of third-party products which you should consider, although the ones you buy depend on how you plan to use GEOS. If you want great printouts from geoWrite, for example, you need Perfect Print. Perfect Print won't help you a whole lot for desktop publishing with geoPublish, though.

No matter how you spend your GEOS time, you'll want geoWizard and the other utilities on the Collette Utilities Disk. All of these programs are available through CMD, which is now the source for all the official GEOS products.

**Printer.** Get an Epson-compatible, and make it a 24-pin. Oh, I know that you can make do perfectly well with a 9-pin printer, but the better printouts with the 24-pin model make it worth the extra dollars. Remember, a lot of your work in GEOS will be geared toward some kind of printed document. I like the Epson LQ series myself, but I've heard a lot of great things about the Panasonic line as well.

**Extras.** Do you have any money left? Besides the Real-Time Clock I mentioned for your RAMLink, there are plenty of other ways to spend your GEOS dollars. If you're a graphics fan, you'll want to purchase geoCanvas (CMD) and Dave Ferguson's Dweezil Disks (Quincy Softworks, 9479 East Whitmore Avenue, Hughson, California 95326-9745). The games and utilities on the *RUN* magazine GEOS Companion and Power Pack disks are wonderful, and CMD now sells them as well. □

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# MACHINE LANGUAGE

Jim Butterfield

## BRANCHES AND JUMPS

A machine language program executes instructions sequentially. Three ways to change this flow are branches, jumps, and subroutine calls.

Branch instructions have a limited reach, jumping forward or backward up to 128 bytes or so. Branch instructions are conditional, which means the branch takes place only when certain conditions are met.

The jump instruction (JMP) can take you to any address in memory (absolute addressing). It's unconditional; the jump always takes you there.

The jump-subroutine instruction (JSR) also uses absolute addressing. A link address will be left on the stack. When the subroutine has done its job, it can come back with a Return (RTS) command.

The eight branch instructions can be classified by what they test. Branch instructions test flags left when previous instructions were executed. There are four flags.

The Z (zero) flag is affected whenever a register (A, X, or Y) has been modified or after comparisons have been made. If a register ends with 0 as its contents, the Z flag switches on; with something other than 0, the Z flag is cleared. After a comparison, the Z flag is turned on if an equality is found. Branch-equal (BEQ) will make the branch if the Z flag is on. Branch-not-equal (BNE) will branch if the Z flag is off.

The N (negative) flag is affected whenever a register (A, X, or Y) has been modified or after comparisons have been made. The N flag will match the highest bit of the modified register. After a comparison instruction, the N flag is affected, but its meaning is complex. So it is seldom used in

this way. Branch-minus (BMI) will make the branch if the Z flag is found to be on. Branch-plus (BPL) will branch if the Z flag is found to be off. Keep in mind that the highest bit of a byte is sometimes thought of as the sign bit. When the bit is on, the byte is negative.

The C (carry) flag is affected by arithmetic or shift instructions and after comparisons. The arithmetic and shift operations use this flag in its usual carry sense, meaning a bit has flowed out of the byte that's being manipulated. After a comparison instruction, the C flag is turned on if the register contains an equal or greater unsigned value. Branch-carry-set (BCS) branches if the C flag is on. Branch-carry-clear (BCC) branches if it is off.

The V (overflow) flag is affected by arithmetic instructions, add-with-carry (ADC), and subtract (SBC). Branch-overflow-set (BVS) and branch-overflow-clear (BVC) are the related instructions.

Let's write a short program to print X a number of times on a screen row. BASIC will poke the desired number into address \$2100 (decimal 8448), and then put it into the X register, our counter. Here's the code, starting at address hexadecimal 2000.

### 2000 LDX \$2100

The load X instruction changes a register; so the Z and N flags will be affected. We don't care, however, so we'll ignore the flags for the moment. Next, load A with hexadecimal 58, the ASCII value for X.

### 2003 LDA #\$58

Again, Z and N are affected. Z will be off (nonzero value), and flag N will be off (high bit of A is off). Instructions BEQ and BMI wouldn't branch if we used them at this point.

BNE or BPL would branch, but we don't use them yet.

### 2005 CPX #\$00 2007 BEQ \$200F

The compare X instruction will set up the Z flag. If the value in X is equal to 0, BEQ will cause the program to hop ahead. Why? Because no X's are to be printed.

The code for the above BEQ instruction will be two bytes \$F0 and 06. F0 means BEQ, and 06 means skip six bytes if the branch is taken.

### 2009 JSR \$FFD2 200C DEX 200D BNE \$2009

Our loop jumps to the print subroutine at \$FFD2 and decrements the X value by 1. The DEX instruction modifies the Z flag according to whether the result in X is 0 or not. If not, BNE takes us back around the loop. If X is 0, we've finished printing this line.

### 200F LDA #\$0D 2011 JMP \$FFD2

We end the line of X's by printing a Return character (\$0D). This time we jump (JMP) to the printing subroutine, rather than using JSR. When printing ends, we return to whatever called our ML program—in this case, it was BASIC.

Here's the code in BASIC. It draws a graph of  $Y=X^X$ .

```
100 DATA 174,0,33,169,88,  
224,0,240,6,32,210  
110 DATA 255,202,208,250  
120 DATA 169,13,76,210,255  
200 FOR J=8192 TO 8211  
210 READ X:T=T+X  
220 POKE J,X  
230 NEXT J  
240 IF T<>2814 THEN STOP  
300 FOR J=-6 TO 6  
310 POKE 8448,J*X  
320 SYS 8192  
330 NEXT J
```

Three ways to change the flow of a machine language program are through branches, jumps, and subroutine calls.

## CHAIN REACTION

By Graham Fyffe

You're in charge of a nuclear reactor, and it's malfunctioning. It's up to you to prevent a meltdown. The radioactive atoms keep spewing out of the reactor, but you can contain them in a lead-lined vessel. But watch out! If the vessel overflows, it'll destroy the reactor!

### Getting Started

Chain Reaction is made up of four programs: a BASIC boot program or loader, a machine language program, graphics, and the main BASIC program. To help avoid typing errors, use The Automatic Proofreader to enter the BASIC programs; see "Typing Aids" elsewhere in this section. Be sure to save the programs on the same disk and with the proper filenames because the boot program loads those programs automatically. Also, you may want to use BASIC abbreviations for some of the commands when you enter lines 80, 140, and 150 of the main program. These lines fill two entire screen lines.

CHAIN.ML and CHAIN.CHARS are written in machine language. To enter these programs, use MLX, COMPUTE's machine language entry program; again, see "Typing Aids." Enter the following addresses for CHAIN.ML when MLX prompts.

**Starting address: C000**

**Ending address: C1FF**

Enter the following addresses for CHAIN.CHARS when MLX prompts.

**Starting address: 8200**

**Ending address: 84F7**

Be sure to save these programs before you exit MLX.

### Playing the Game

To start Chain Reaction, load and run CHAIN.BOOT. After a few seconds, the screen should turn black, and then you should see the message *LOADING CHAIN REACTION*. You'll then see the title screen, the level of gameplay, and a bunch of colorful dancing atoms.

To change the level of gameplay,

press f1. To start the game, press Return. To pause the game at any time except during a reaction, press the up-arrow key that's next to the Restore key. Press this key again to resume play. To quit during a game, hold down the Shift key and press Clr/Home.

At the start of the game, a colored atom will wobble out of the reactor onto a bar that extends over the containment vessel. You have a limited time to move the atom left or right with the joystick before the atom drops into the vessel. You can press the joystick button to make the atom drop ahead of time. Any atoms touching atoms of their own color will explode, making additional room in the vessel. If an atom explodes beneath another, the top atom will drop down. If you plan out a careful strategy, you may get dozens of atoms to explode with a single drop. The object of the game is to prevent the vessel from overflowing.

### The Levels

On the practice level, there are no obstacles in your way. On the easy level, a green accelerator beam streaks across the vessel after each drop. If it comes in contact with anything, it will change whatever it hits into an atom of a random color.

On the moderate level, a blue block appears in the vessel after each drop, but the green beam will sometimes clear them out of the way. The beam never clears out the second row from the top, so it can fill up with blocks.

On the hard level, there are no green beams, only blue blocks. The vessel fills up fast, but you'll always have the top row to work with because blocks never land on it.

### Scoring

When an atom explodes, your score increases by the number of atoms in a row that have exploded so far. Scoring also depends on the level of play. You get no points for practice rounds. Easy rounds earn you regular points. Moderate rounds earn you three times as many points as easy, and hard rounds earn you five times as many points as easy rounds.

The game keeps track of your score, how many atoms have exploded,

and the high score of the day. These scores are kept to the right of the containment vessel.

### CHAIN.BOOT

```
PK 5 REM COPYRIGHT 1993 - COMP
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RX 10 B=B+1
EK 20 IFB=1THENFORT=0T07:POKE3
    2768+T,0
DX 30 IFB=1THENLOAD"CHAIN.CHAR
    S",8,1
DR 40 IFB=2THENLOAD"CHAIN.ML",
    8,1
JX 50 POKE53281,0:POKE53280,15
    :PRINT"{BLK}{CLR}";
DD 60 POKE52,128:POKE56,128:CLR
    R
KF 70 POKE56576,(PEEK(56576) A
    ND 252) OR 1
DP 80 POKE53272,32
XC 90 POKE648,136
PE 100 POKE56334,PEEK(56334) A
    ND 254
RB 110 POKE1,PEEK(1) AND 251
QS 120 FORT=8T0512:POKE32768+T
    ,PEEK(53248+T):NEXTT
DS 130 POKE1,PEEK(1) OR 4
BR 140 POKE56334,PEEK(56334) O
    R 1
AM 150 POKE53270,PEEK(53270)OR
    16
DM 160 PRINT"{CLR}{WHT}LOADING
    {CYN}CHAIN REACTION"
KB 170 A$=CHR$(34):PRINT"{BLK}
    NEW"
KX 180 A$=CHR$(34):PRINT"
    {DOWN}LOAD";A$;"CHAIN.B
    AS";A$;"",8"
PS 190 PRINT"{4 DOWN}RUN{7 UP}
    ";:POKE198,0
EJ 200 FORT=631T0633:POKET,13:
    NEXTT
FH 210 POKE198,3
```

### CHAIN.BAS

```
PK 5 REM COPYRIGHT 1993 - COMP
    UTE PUBLICATIONS INTL LTD
    - ALL RIGHTS RESERVED
JM 10 REM SETUP
QR 20 POKE53281,0:POKE53280,0:
    POKE53282,11:POKE53283,1
    :GETA$:GETA$
XP 30 DIMAG(8,9):PRINTCHR$(8)
QB 40 S=54272:FORT=STOS+24:POK
    ET,.:NEXTT:POKES+5,9
ES 50 ZA$="CCCCCCCCCCCC":ZB$=
    "{HOME}{5 DOWN}":ZC$="
    {DOWN}{5 LEFT}":ZD$="
    {6 RIGHT}":ZE$="
    {7 SPACES}"
GA 60 ZF$="000000":ZG$="
    {5 SPACES}{4}A*****
    *****A":AT$="NO{DOWN}
    {2 LEFT}PO{OFF}{WHT}{UP}
```

```

":BL$="{7}{N}{Q}{DOWN}
{2 LEFT}{D}{Z}{UP}"
GE 70 COS(1)="{2}":COS(2)="{3}
":COS(3)="{4}":COS(4)="{
5}":COS(5)="{6}":COS(6)
="{8}"
EP 80 SC=0:AT=0:FORT=1TO7:FORI
=1TO8:AG(T,I)=.:NEXTI:NE
XTT:DI=1:DS=0:BA$="{OFF}
{2 SPACES}{DOWN}{2 LEFT}
{2 SPACES}{UP}"
KK 90 DI$(1)="PRACTICE":DI$(2)
="EASY":DI$(3)="MODERATE
":DI$(4)="HARD"
DH 100 R=0:V=0:C=2:DE$="N":XPS
="{RVS}{4}LM{DOWN}
{2 LEFT}NO"
QJ 110 REM DRAW SCREEN
KM 120 PRINT"{CLR}{4}{OFF}
{3 DOWN}"SPC(22)"IJK"Z
C$"FLMMH"ZC$G {3}NO{4}
H"ZC$G {3}PQ{4}H"
GD 130 PRINTZG$ZAS"CCCCC";
XJ 140 FORT=1TO16:PRINT"
{5 SPACES}B"SPC(14)"B":
NEXTT:PRINT"{5 SPACES}D
"ZAS"E{HOME}"SPC(30)"
{4}{OFF}RTV";
KS 150 PRINT"XZ"ZC$SUWY+"ZC$"
{2 LEFT}{-}{*}
{SHIFT-SPACE}{K}{I}{T}
{E}{DOWN}"ZC$"{2 LEFT}
{E}E{DOWN}{G}{+}{M}
{5 DOWN}":PRINTSPC(22)"
{F}{C}{X}{J}{2 DOWN}";
KQ 160 PRINT"{DOWN}{4 LEFT}{E}
{R}{U}{H}{J}{2 DOWN}"ZC
$"{L}{Y}{U}{O}{E}"ZB$"
{7 DOWN}"ZD$;:FORT=1TO6
:FORI=1TO7
XS 170 PRINTCOS(INT(RND(0)*6)+
1)AT$;:NEXTI:PRINT:PRIN
TZD$"{DOWN}";:NEXTT
GE 180 REM START
EQ 190 POKES3247,0:SYS49323:PO
KES+24,15
BC 200 PRINTZB$"{6 DOWN}"SPC(2
8)"{WHT}"ZF$"{2 DOWN}"Z
C$"{LEFT}"ZF$"{2 DOWN}"
ZC$"{LEFT}"ZF$:GOSUB280
GJ 210 PRINTZB$"{3 DOWN}"ZD$"
{CYN}F1-{WHT}GAMEPLAY:"
:PRINTZD$ZSZE$;"{UP}"
RF 220 PRINTZD$SPC(7-LEN(DI$(D
I))/2)DI$(DI):IFDI=1THE
NDS=0
MS 230 PRINTZD$"{CYN} PRESS RE
TURN":PRINTZD$"
{3 SPACES}TO START"
XE 240 IFAS$=""THENGOSUB960:GOT
O240
EG 250 IFAS$="{F1}"THENDI=DI+1:
IFDI=5THENDI=1
CB 260 IFAS$=CHR$(13)THEN310
GC 270 AS$=""DS=2*DI-3:GOTO210
EE 280 REM PRINT SCORE
FP 290 PRINTZB$"{2 DOWN}":JJ=H
S:GOSUB300:JJ=SC*DS:GOS
UB300:JJ=AT:GOSUB300:RE
TURN
HB 300 PRINT"{2 DOWN}{WHT}"SPC
(35-LEN(STRS(JJ)))MID$(
STRS(JJ),2,10):RETURN
FG 310 REM CLEAR AREA
KA 320 PRINTZB$"{3 DOWN}";:FOR
T=1TO16:PRINTZD$"{OFF}"
ZE$ZE$:NEXTT
FS 330 REM NEW ATOM
XD 340 PRINTZB$"{2 DOWN}"ZG$:C
O=C:D$="N"
QH 350 FORT=22TO18STEP-1:PRINT
ZB$SPC(T)COS(CO)AT$;:IF
T=19THENPRINT"G{DOWN}
{LEFT}G":GOTO370
MK 360 PRINT"{DOWN}{LEFT}"":G
OSUB960:V=0:R=7:TM=10:R
E=0
HP 370 GOSUB960:NEXTT:C=INT(RN
D(0)*6)+1:PRINTZB$SPC(2
3)COS(C)"PQ{DOWN}
{2 LEFT}{2 SPACES}":GOS
UB960
MP 380 PRINTZB$SPC(23)COS(C);A
T$:GOSUB960
AM 390 REM INPUT FROM JOYSTICK
KX 400 JV=PEEK(56320):FR=JVAND
16:JV=15-(JVAND15):A=R:
V=0:B=V
KD 410 IFJV=4THENR=R-1:IFR=0TH
ENR=1
HK 420 IFJV=4THEN460
HR 430 IFJV=8THENR=R+1:IFR=8TH
ENR=7
DR 440 IFJV=8THEN460
QR 450 IFFR<16THEN490
PH 460 IFA<>RTHENGOSUB1090
AG 470 TM=TM-1:IFTM=0THEN490
PX 480 GOSUB1120:GOSUB960:GOTO
400
GX 490 REM DROP ATOM
ER 500 PRINTZB$"{2 DOWN}
{5 SPACES}{4}A"ZE$ZE$
HS 510 A=R:B=V:V=V+1:IFAG(R,V)
<>0ORV=9THENV=V-1:GOTO5
40
SK 520 GOSUB1090:GOSUB1120:GOS
UB960
KE 530 GOTO510
XK 540 AG(R,V)=CO:IFV=0THEN101
0
AE 550 REM REACTION
BA 560 F$="N":FORT=1TO8:FORI=1
TO7:IFAG(I,T)=0ORAG(I,T
)=10THEN610
HB 570 IFAG(I,T+1)=0ANDT<8THEN
AG(I,T+1)=AG(I,T):AG(I,
T)=0:F$="1":GOSUB630:GO
TO610
QR 580 IFAG(I,T+1)=AG(I,T)ANDT
<8THENA=I:B=T+1:F$="2":
GOSUB890
PG 590 IFAG(I-1,T)=AG(I,T)ANDI
>1THENA=I-1:B=T:F$="2":
GOSUB890
QK 600 IFFS$="2"THENA=I:B=T:F$=
"1":GOSUB890:F$="1"
BG 610 NEXTI:NEXTT:IFFS$="N"THE
N660
QQ 620 GOTO550
FJ 630 REM PULL ATOM DOWN
HF 640 PRINTZB$"{DOWN}"SPC(I*2
+4);:FORJ=1TOT:PRINT"
{2 DOWN}";:NEXTJ:PRINTB
AS$:PRINTZB$"{DOWN}";
GJ 650 PRINTSPC(I*2+4);:FORJ=1
TOT+1:PRINT"{2 DOWN}";:
NEXTJ:PRINTCOS(AG(I,T+1
))AT$:RETURN
JJ 660 REM DIFFICULTY CHECK
QH 670 IFDI=2ANDD$="N"THEN750
BB 680 IFDI=3ANDD$="N"THEN750
QA 690 IFDI>2THEN710
BS 700 GOTO330
FR 710 REM DRAW BLOCK
HD 720 I=INT(RND(0)*7)+1:T=INT
(RND(0)*7)+2:AG(I,T)=10
:PRINTZB$"{DOWN}"SPC(4+
I*2);
RB 730 FORZ=1TOT:PRINT"
{2 DOWN}";:NEXTZ:PRINTB
LS
CM 740 FORZ=10TO1STEP-.5:POKES
+4,32:POKES+1,Z:POKES,1
0:POKES+4,33:NEXTZ:GOTO
330
FA 750 REM DRAW ZAPPER
SJ 760 A=INT(RND(0)*8)+1:IFA=2
THEN760
FD 770 IFDI=2THENA=INT(RND(0)*
5)+4
DE 780 PRINTZB$"{DOWN}"SPC(6);
:FORT=1TOA:PRINT"
{2 DOWN}";:NEXTT:FORT=1
TO7:PRINT"{6}{S}{P}";
HG 790 FORZ=1TO100STEP50:POKES
+4,33:POKES+1,Z:POKES,1
0:POKES+4,32:NEXTZ
RF 800 IFAG(T,A)>0THENAG(T,A)
=INT(RND(0)*6)+1
DX 810 NEXTT:D$="Y":GOSUB820:G
OTO550
KP 820 REM REDRAW AREA
BD 830 PRINTZB$"{3 DOWN}"SPC(6
);:FORT=1TO8:FORI=1TO7
JR 840 IFAG(I,T)=0THENPRINTBAS
;:GOTO870
GJ 850 IFAG(I,T)=10THENPRINTBL
$;:GOTO870
DH 860 PRINTCOS(AG(I,T))AT$;
XS 870 NEXTI:PRINT:PRINTSPC(6)
"{DOWN}";:NEXTT:RETURN
RQ 880 POKES+4,128:POKES+1,10:
POKES,10:POKES+4,129
XB 890 IFA=I AND B=T AND AG(I,
T+1)=AG(I,T)THENRETURN
QF 900 IFA=I AND B=T AND AG(I+
1,T)=AG(I,T)THENRETURN
JM 910 REM DRAW EXPLOSION
MB 920 PRINTZB$"{DOWN}";:FORZ=
1TOB:PRINT"{2 DOWN}";:N
EXTZ:PRINTSPC(4+A*2)XPS

```



DG 930 FORZ=10T020:POKES+4,33:POKES+1,Z:POKES,10:POKE S+4,32:NEXTZ

QK 940 PRINTZBS{"DOWN"}";:FORZ=1TOB:PRINT{"2 DOWN"}";:N EXTZ:PRINTSPC(4+A\*2)BA\$

EQ 950 AG(A,B)=0:RE=RE+1:AT=AT +1:SC=SC+RE:GOSUB280:RE TURN

JD 960 GETB\$:IFB\$=CHR\$(147)THE N1140

FS 970 IFB\$<>"<"THENAS=B\$:RETU RN

SP 980 PRINT{"HOME"}{WHT}{OFF}" SPC(10)"PAUSED"

FF 990 GETB\$:IFB\$<>"<"THENPRINT {"HOME"}{WHT}{OFF}"SPC(1 0)ZES:RETURN

BA 1000 GOTO990

RB 1010 REM NUCLEAR MELTDOWN

SG 1020 PRINTZBS{"3 DOWN"}"SPC( 6);:FORT=1TO8:FORI=1TO 7:PRINTXP\${"UP"}";

FC 1030 POKES+4,129:POKES+1,T\* 10+I\*10:POKES,50:POKES +4,128

JG 1040 NEXTI:PRINT:PRINTSPC(6 ){"DOWN"}";:NEXTT

XS 1050 FORT=1TO50:POKES3281,0 :POKE53281,1

KF 1060 POKES+4,129:POKES+1,T: POKES,50:POKES+4,128:N EXT:POKE53281,0:POKES +24,0

MC 1070 FORT=1TO1000:NEXTT:IFS C\*DS>HSTHENHS=SC\*DS

HE 1080 GOTO1140

MJ 1090 REM REDRAW ATOM

AC 1100 PRINT{"HOME"}{4 DOWN}": IFB=0THENPRINTSPC(4+A\* 2)BA\$:RETURN

GX 1110 PRINT{"DOWN"}";:FORT=1T OB:PRINT{"2 DOWN"}";:NE XTT:PRINTSPC(4+A\*2)BA\$ :RETURN

DK 1120 PRINT{"HOME"}{4 DOWN}": IFV=0THENPRINTSPC(4+R\* 2)CO\$(CO)AT\$:RETURN

KA 1130 PRINT{"DOWN"}";:FORT=1T OV:PRINT{"2 DOWN"}";:NE XTT:PRINTSPC(4+R\*2)CO\$ (CO)AT\$:RETURN

CQ 1140 REM RESET

BG 1150 POKE36866,HS/256:POKE3 6867,HS-INT(HS/256)\*25 6:POKES+24,0:CLR

AG 1160 HS=PEEK(36866)\*256+PEE K(36867):S=54272:GOTO2 0

### CHAIN.ML

C000:A0 E0 B9 20 83 99 90 81 68  
 C008:C8 F0 03 4C 02 C0 60 A0 C3  
 C010:E0 B9 40 83 99 90 81 C8 8B  
 C018:F0 03 4C 11 C0 60 A0 E0 17  
 C020:B9 60 83 99 90 81 C8 F0 AD  
 C028:03 4C 20 C0 60 A0 E0 B9 4F  
 C030:80 83 99 90 81 C8 F0 03 23

C038:4C 2F C0 60 AE FF CF A9 88  
 C040:20 8D 04 D4 BD C8 C0 8D 23  
 C048:01 D4 BD 08 C1 4C A2 C0 FC  
 C050:02 21 8D 04 D4 60 20 3C B1  
 C058:C0 E8 E0 40 D0 02 A2 00 68  
 C060:8E FF CF AE FE CF 18 CA 40  
 C068:F0 0F CA F0 13 CA F0 17 4B  
 C070:20 0F C0 A2 01 8E FE CF 18  
 C078:60 20 00 C0 EE FE CF 60 B1  
 C080:20 0F C0 EE FE CF 60 20 F4  
 C088:1E C0 EE FE CF 60 18 CE 16  
 C090:FD CF F0 01 4C 31 EA A9 D9  
 C098:0A 8D FD CF 20 56 C0 4C 67  
 C0A0:31 EA 8D 00 D4 A9 21 8D 44  
 C0A8:04 D4 60 58 A9 8E 8D 14 A9  
 C0B0:03 58 A9 C0 8D 15 03 58 2A  
 C0B8:A9 00 8D FF CF A9 01 8D 75  
 C0C0:FE CF A9 05 8D FD CF 60 9F  
 C0C8:19 1C 19 19 19 1C 20 19 25  
 C0D0:1C 13 13 13 15 18 19 18 0C  
 C0D8:19 1C 19 19 19 1C 20 19 35  
 C0E0:1C 13 13 13 15 18 19 00 04  
 C0E8:1C 1C 20 19 1C 1C 20 19 BF  
 C0F0:1C 13 13 13 15 18 19 00 14  
 C0F8:1C 1C 20 19 1C 1C 20 19 CF  
 C100:1C 13 13 13 15 18 19 00 25  
 C108:B1 D6 B1 B1 B1 D6 5E B1 C2  
 C110:D6 3F 3F 3F 9A 3F B1 3F 1F  
 C118:B1 D6 B1 B1 B1 D6 5E B1 D2  
 C120:D6 3F 3F 3F 9A 3F B1 00 EF  
 C128:D6 D6 5E B1 D6 D6 5E B1 34  
 C130:D6 3F 3F 3F 9A 3F B1 00 FF  
 C138:D6 D6 5E B1 D6 D6 5E B1 44  
 C140:D6 3F 3F 3F 9A 3F B1 00 10  
 C148:0D 0D 0D 0D 0D 0D 0D 0D CB  
 C150:0D 0D 0D 0D 0D 0D 0D 0D D3  
 C158:0D 0D 0D 0D 0D 0D 0D 0D DB  
 C160:0D 0D 0D 0D 0D 0D 0D 0D E3  
 C168:0D 0D 0D 0D 0D 0D 0D 0D EB  
 C170:0D 0D 0D 0D 0D 0D 0D 0D F3  
 C178:0D 0D 0D 0D 0D 0D 0D 0D FB  
 C180:0D 0D 0D 0D 0D 0D 0D 0D 04  
 C188:0D 0D 0D 0D 0D 0D 0D 0D 0C  
 C190:0D 0D 0D 0D 0D 0D 0D 0D 14  
 C198:0D 0D 0D 0D 0D 0D 0D 0D 1C  
 C1A0:0D 0D 0D 0D 0D 0D 0D 0D 24  
 C1A8:0D 0D 0D 0D 0D 0D 0D 0D 2C  
 C1B0:0D 0D 0D 0D 0D 0D 0D 0D 34  
 C1B8:0D 0D 0D 0D 0D 0D 0D 0D 3C  
 C1C0:0D 0D 0D 0D 0D 0D 0D 0D 44  
 C1C8:0D 0D 0D 0D 0D 0D 0D 0D 4C  
 C1D0:0D 0D 0D 0D 0D 0D 0D 0D 54  
 C1D8:0D 0D 0D 0D 0D 0D 0D 0D 5C  
 C1E0:0D 0D 0D 0D 0D 0D 0D 0D 64  
 C1E8:0D 0D 0D 0D 0D 0D 0D 0D 6C  
 C1F0:0D 0D 0D 0D 0D 0D 0D 0D 74  
 C1F8:0D 0D 0D 0D 0D 0D 0D 0D 46

### CHAIN.CHARS

8200:00 55 FF AA AA FF 55 00 05  
 8208:AA BD BD BD BD BD BD BD 83  
 8210:BD BD BD BD BD BD BD 15  
 8218:AA FF FF FF FF FF FF 55 C7  
 8220:BE BF BF BF BF BF BF 95 7A  
 8228:BD FD FD FD FD FD FD 55 64  
 8230:00 00 14 69 56 41 40 DD  
 8238:40 40 40 40 40 40 40 3D  
 8240:D0 D0 D0 D0 D0 D0 D0 45  
 8248:05 1F 1E 1E 7B 7B 7B 7B 79  
 8250:55 FF AF FF FF FF FF FF F5

8258:00 40 40 40 D0 D0 D0 D0 B5  
 8260:7B 7B 7B 7B 7F BF 7F 15 38  
 8268:FF FF FF FF FF FF FF 55 C2  
 8270:00 00 00 00 01 07 1F 3F 17  
 8278:00 00 00 00 40 D0 F4 FC A9  
 8280:73 F3 FF FF FF FF 7F 1F 5A  
 8288:CD CF FF FF FF FF FD F4 59  
 8290:55 68 D0 80 80 80 80 04  
 8298:80 80 80 80 D0 68 55 83  
 82A0:55 C3 82 82 82 82 AA 82 AF  
 82A8:82 82 82 82 82 82 C3 55 03  
 82B0:55 0F 1A 35 20 20 2A 20 B0  
 82B8:20 20 20 20 20 20 30 55 13  
 82C0:55 0C 48 C8 88 88 88 88 09  
 82C8:88 88 88 88 88 88 CC 55 23  
 82D0:55 C3 82 92 92 B2 B6 B6 6E  
 82D8:9E 9E 8E 86 86 82 C3 55 2A  
 82E0:3D 33 33 7F 7D C7 C3 41 83  
 82E8:07 0D 0C 1F 1C 34 3F 15 6D  
 82F0:C7 0D 0C 1F 1C 34 34 10 BA  
 82F8:41 C3 C7 C7 CD CD C7 41 7B  
 8300:F3 40 00 01 01 03 C3 41 FD  
 8308:FC D0 D0 C1 C1 43 0F 05 36  
 8310:FD 77 D3 C7 CD 4C C7 41 5B  
 8318:0E 5C 0C 1D 35 33 D3 41 61  
 8320:73 73 F7 DF DD 4D 0C 04 FA  
 8328:00 54 C0 80 B8 CC 54 00 06  
 8330:00 40 C0 80 80 C0 54 00 17  
 8338:00 54 C0 A0 80 C0 40 00 FD  
 8340:0C 1C 3D 73 D3 FD 00 00 C9  
 8348:00 00 33 73 37 1D 4C F4 A8  
 8350:15 7A 7B 6F 6F 6F 6F 6F 6E  
 8358:54 AD FD FD FD FD FD 7E 7F  
 8360:6F 6F 7F 6F 7F 7F 15 6E  
 8368:FD FD FD FD FD FD 54 C5  
 8370:1C 78 1D 37 22 91 D0 40 F3  
 8378:00 00 19 F7 63 11 00 80  
 8380:40 D0 90 C0 50 B0 D0 40 21  
 8388:00 00 1F 34 3C 1C F4 00 F2  
 8390:00 00 3C 70 D1 C3 F3 00 7B  
 8398:00 00 74 DC DD 77 D3 00 AB  
 83A0:00 00 F4 DC DD 73 33 00 37  
 83A8:00 00 FC D0 E0 40 E0 00 C6  
 83B0:00 00 3C 7C FC CC CC 00 BB  
 83B8:00 00 FC 70 71 D3 C3 00 C8  
 83C0:00 00 74 DC DD 77 D3 00 98  
 83C8:00 00 CC DC FC 4C 0F 00 6E  
 83D0:00 00 7C D0 E0 70 D0 00 5F  
 83D8:00 00 33 33 7D CC CC 00 32  
 83E0:00 00 3D 1C 34 30 F4 00 9D  
 83E8:00 00 3C 70 D0 CC F4 00 22  
 83F0:00 00 33 33 7D CC CC 00 4A  
 83F8:00 00 00 00 00 00 00 00 FF  
 8400:00 00 00 01 03 07 0C 1C 81  
 8408:00 00 50 F4 FD FD FF CF 22  
 8410:1F 3F 3F 1F 1F 0F 07 01 96  
 8418:CF FF FF FF FF FF FD F4 F9  
 8420:00 00 00 00 01 07 1F 3F CA  
 8428:00 00 00 00 40 D0 F4 FC 5D  
 8430:73 F3 FF FF FF FF 7F 1F 0E  
 8438:CD CF FF FF FF FF FD F4 0E  
 8440:00 00 05 1F 7F 7F FF F3 C9  
 8448:00 00 00 40 C0 D0 30 34 33  
 8450:F3 FF FF FF FF 7F 1F 71  
 8458:F4 FC FC F4 F4 F0 D0 40 57  
 8460:00 00 00 00 00 01 07 7A E9  
 8468:00 C0 C0 80 80 80 90 90 99  
 8470:06 06 02 02 02 03 03 01 81  
 8478:AD 40 40 00 00 00 00 00 70  
 8480:0D 0D 0D 0D 0D 0D 0D 89

```
8488:0D 0D 0D 0D 0D 0D 0D 0D 91
8490:0D 0D 0D 0D 0D 0D 0D 0D 99
8498:0D 0D 0D 0D 0D 0D 0D 0D A1
84A0:0D 0D 0D 0D 0D 0D 0D 0D A9
84A8:0D 0D 0D 0D 0D 0D 0D 0D B1
84B0:0D 0D 0D 0D 0D 0D 0D 0D B9
84B8:0D 0D 0D 0D 0D 0D 0D 0D C1
84C0:0D 0D 0D 0D 0D 0D 0D 0D C9
84C8:0D 0D 0D 0D 0D 0D 0D 0D D1
84D0:0D 0D 0D 0D 0D 0D 0D 0D D9
84D8:0D 0D 0D 0D 0D 0D 0D 0D E1
84E0:0D 0D 0D 0D 0D 0D 0D 0D E9
84E8:0D 0D 0D 0D 0D 0D 0D 0D F1
84F0:0D 0D 0D 0D 0D 0D 0D 0D F9
```

*Graham Fyffe, 15, has been programming in BASIC for eight years. He enjoys comics and graphics and likes drawing and painting. He lives in Fredericton, New Brunswick, Canada.*

## CUSTOM CHARACTER SCREEN DESIGNER

By Daniel English

Advanced programmers commonly work with custom characters on the 64. With a tool such as Ultrafont + (July 1984 and September 1986 issues and on The 1992 Best of Gazette Utilities Disk), you can easily transform characters into your own custom graphics. Using these graphics in your own programs was not so easy—until now. Custom Character Screen Designer allows you to create multiple character screens easily and save them on disk for use in your own programs. A BASIC display program is included in the package. You may want to keep CCSD on a disk with Ultrafont +.

### Getting Started

The CCSD package consists of three programs. The main program is the screen editor. When MLX prompts, respond with the following addresses.

**Starting address: C000**

**Ending address: CDFE**

Be sure to save a copy of the program before exiting MLX.

The next two programs are used for displaying your screens from within your own BASIC programs. The main CCSD program does not require these two display files, however.

To help avoid typing errors, enter Display.BASIC with The Automatic Proofreader. See "Typing Aids" elsewhere in

this section. Remember to save the program before you attempt to run it.

Enter DISPLAY.ML with MLX, our machine language entry program. Again, see "Typing Aids." When MLX prompts, respond with the following addresses.

**Starting address: CF00**

**Ending address: CF77**

Be sure to save these two display programs on the same disk for later use.

### Functions

To begin, load CCSD with the ,8,1 extension and type NEW and then SYS 49152. A menu screen will appear. The upper portion of the screen is the menu of commands, and the lower portion displays your character set. You may use the default ROM character set if you do not want to create your own. To load a character set, press F. The character set will always load into 12288 (\$3000 hex). If you wish to save your character set at this location for use in your own programs, press N.

When a character set is loaded, you are ready to choose colors. If your character set was created in multicolor mode, press M. Pressing keys 1 through 4 will change the four colors. These keys correspond to the same color keys used in Ultrafont +. If your character set is not in multicolor mode, only keys 1 and 4 will apply.

The current color you are changing will be indicated by the arrow below the color palette. Notice that when you're in multicolor mode, color 4 must be set on the right side of the palette. If you want color memory stored with your screen data, press C.

Next, you must choose an address for your screen. The default address is 32768. To change this, press A. You will be prompted to enter a new address. You can have up to 24 screens in memory (12 with color) at one time. Remember that each screen uses 1000 bytes (2000 if color is saved). If you stored one screen at 32768, then the next one could start at 33768 (35768 if color is saved).

### Copying Characters

The lower section of the screen contains your character set. A flashing rec-

tangle encloses the character(s) you have selected to use while drawing your screen. Position the cursor with your joystick in port 2, and use the cursor keys to change the size of the cursor into a window that can copy up to six characters at a time. Press the button to choose the character(s) you wish to copy onto your screen. Press f7 to switch between the editor and drawing screen.

In the drawing screen, the window will appear in the upper left corner of the screen. Use the cursor keys or joystick to move the window. Press the fire button to copy the characters onto the screen. CCSD lets you type data onto the screen also.

All colors and screen functions are available to you while you're in the editor. For example, pressing Shift-Clr/Home will clear the screen, and Ctrl-2 will turn the character color to white. Notice the window doesn't advance automatically when you type. The cursor keys are the easiest way to move the window if you wish to type in text.

A copy feature is built into the drawing screen mode. To copy characters already on the screen, simply move the window over the character(s) you wish to copy and press f1. Now when you draw with the joystick, the copied character(s) will appear. This eliminates frequent screen swapping.

To store the screen and return to the Editor menu, press f7. If you do not want to store the changes, press f8. Pressing f8 can be used as an undo feature.

### Screens on Disk

When your screen design is complete, press S from the Editor menu to save it. You'll be asked for a filename, and your screen will be saved to disk.

If you want to load a previously saved screen, press L. A screen is always loaded into the address specified at the top of the screen, regardless of its saved address.

When your character set and screen(s) have been saved to disk, you are ready to use them in your own program. The BASIC display program was designed to be a subroutine. First, have your BASIC program load the DISPLAY.ML file, your saved screen(s), and your saved character

set. Next, alter the values in the BASIC display program to match those chosen in CCSD. Remember to change the value of AD in line 63050 to the address of the screen you wish to display.

Machine language programmers will have no problem using CCSD screens. You may use the code in the DISPLAY.ML file or use your own screen copier routine.

CCSD can create many commercial quality effects quickly and efficiently. From a BASIC menu to a complex game background, CCSD will make the task enjoyable.

### CCSD

```

C000:4C 84 C1 FF 00 00 81 00 04
C008:00 81 00 00 81 00 00 81 77
C010:00 00 81 00 00 81 00 00 C7
C018:FF 00 00 00 00 00 00 00 99
C020:00 00 00 00 00 00 00 00 A1
C028:00 00 00 00 00 00 00 00 A9
C030:00 00 00 00 00 00 00 00 B1
C038:00 00 00 00 00 00 00 00 B9
C040:00 00 84 FF FF 00 80 01 54
C048:00 80 01 00 80 01 00 80 92
C050:01 00 80 01 00 80 01 00 76
C058:FF FF 00 00 00 00 00 00 D9
C060:00 00 00 00 00 00 00 00 E1
C068:00 00 00 00 00 00 00 00 E9
C070:00 00 00 00 00 00 00 00 F1
C078:00 00 00 00 00 00 00 00 F9
C080:00 00 84 FF FF 80 00 93
C088:01 80 00 01 80 00 01 80 41
C090:00 01 80 00 01 80 00 01 6D
C098:FF FF FF 00 00 00 00 00 1A
C0A0:00 00 00 00 00 00 00 00 22
C0A8:00 00 00 00 00 00 00 00 2A
C0B0:00 00 00 00 00 00 00 00 32
C0B8:00 00 00 00 00 00 00 00 3A
C0C0:00 00 84 FF 00 00 81 00 D5
C0C8:00 81 00 00 81 00 00 81 38
C0D0:00 00 81 00 00 81 00 00 88
C0D8:81 00 00 81 00 00 81 00 36
C0E0:00 81 00 00 81 00 00 81 50
C0E8:00 00 81 00 00 81 00 00 A0
C0F0:FF 00 00 00 00 00 00 00 72
C0F8:00 00 00 00 00 00 00 00 7A
C100:00 00 84 FF FF 00 80 01 16
C108:00 80 01 00 80 01 00 80 54
C110:01 00 80 01 00 80 01 00 38
C118:80 01 00 80 01 00 80 01 2E
C120:00 80 01 00 80 01 00 80 6C
C128:01 00 80 01 00 80 01 00 50
C130:FF FF 00 00 00 00 00 00 B3
C138:00 00 00 00 00 00 00 00 BB
C140:00 00 84 FF FF 00 80 00 55
C148:01 80 00 01 80 00 01 80 03
C150:00 01 80 00 01 80 00 01 2F
C158:80 00 01 80 00 01 80 00 49
C160:01 80 00 01 80 00 01 80 1B
C168:00 01 80 00 01 80 00 01 47
C170:FF FF FF 00 00 00 00 00 F3
C178:00 00 84 FF 00 00 00 00 FB
C180:00 00 84 FF 4C 19 CA 2A 1B

```

```

C188:2A 2A 2A 2A 2A 2A 2A 0C
C190:2A 2A 2A 2A 2A 2A 00 E9
C198:A9 01 8D 19 D0 AD 18 D0 B2
C1A0:C9 15 F0 1A A9 AC 8D 12 3B
C1A8:D0 A9 15 8D 18 D0 A9 C8 9A
C1B0:8D 16 D0 A9 0B 8D 20 D0 D4
C1B8:8D 21 D0 4C E3 C1 A9 0A AD
C1C0:8D 12 D0 A9 1D 8D 18 D0 64
C1C8:AD 64 C6 8D 20 D0 8D 21 6E
C1D0:D0 AD 65 C6 8D 22 D0 AD 85
C1D8:66 C6 8D 23 D0 AD 67 C6 F7
C1E0:8D 16 D0 AD 0D DC 29 01 D4
C1E8:F0 03 4C 31 EA 4C BC FE 43
C1F0:78 A9 1B 8D 11 D0 A9 F1 68
C1F8:8D 1A D0 A9 98 8D 14 03 A4
C200:A9 C1 8D 15 03 A9 7F 8D 19
C208:0D DC 58 60 A9 00 8D 1A DE
C210:D0 A9 31 8D 14 03 A9 EA 52
C218:8D 15 03 A9 81 8D 0D DC DD
C220:58 A9 15 8D 18 D0 A9 C8 D7
C228:8D 16 D0 A9 0B 8D 20 D0 4E
C230:A9 00 8D 21 D0 60 A0 04 9B
C238:A2 00 86 FA 84 FB AE 59 5A
C240:C6 AC 5A C6 86 FC 84 FD 3B
C248:20 A3 C2 AD 68 C6 C9 01 EC
C250:F0 01 60 A0 D8 A2 00 86 7C
C258:FA 84 FB AE 5B C6 AC 5C 92
C260:C6 86 FC 84 FD 4C A3 C2 FD
C268:A9 36 85 01 A0 04 A2 00 6B
C270:86 FC 84 FD AE 59 C6 AC FD
C278:5A C6 86 FA 84 FB 20 A3 55
C280:C2 AD 68 C6 C9 01 F0 01 81
C288:60 A0 D8 A2 00 86 FC 84 44
C290:FD AE 5B C6 AC 5C C6 86 83
C298:FA 84 FB 20 A3 C2 A9 37 F0
C2A0:85 01 60 A9 00 85 FE 85 69
C2A8:FF A0 00 B1 FA 91 FC A5 2F
C2B0:F0 18 69 01 85 FC A5 FD 61
C2B8:6C 00 85 FD A5 FA 18 69 36
C2C0:01 85 FA A5 FB 69 00 85 EC
C2C8:FB A5 FE 18 69 01 85 FE 70
C2D0:A5 FF 69 00 85 FF A5 FF CD
C2D8:C9 03 D0 CF A5 FE C9 E8 C0
C2E0:D0 C9 60 8D FF CF A2 00 AA
C2E8:CA D0 FD CE FF CF D0 F8 8E
C2F0:6A 00 FD A9 00 8D F1 C2 1E
C2F8:8D F2 C2 20 51 C3 20 E4 1B
C300:FF C9 00 F0 F6 C9 14 F0 01
C308:2B C9 0D F0 59 C9 1F B0 29
C310:03 4C FB C2 C9 5B 90 03 B7
C318:4C FB C2 AE F1 C2 E0 10 74
C328:99 87 C1 20 D2 FF EE F1 FE
C330:C2 4C FB C2 AD F1 C2 C9 5C
C338:00 D0 03 4C FB C2 A9 20 77
C340:AC F1 C2 99 0A 04 CE F1 7C
C348:C2 A9 14 20 D2 FF 4C FB 4B
C350:C2 A9 12 20 D2 FF A9 20 F1
C358:20 D2 FF A9 92 20 D2 FF F9
C360:A9 9D 20 D2 FF 60 AD F1 24
C368:C2 C9 00 F0 10 AD F1 C2 B0
C370:8D 97 C1 A9 20 20 D2 FF 9E
C378:A9 0D 4C D2 FF A9 01 8D 05
C380:F2 C2 A9 20 20 D2 FF A9 5F
C388:0D 4C D2 FF 93 11 92 9F A9
C390:20 20 20 20 43 55 53 54 A0
C398:4F 4D 20 43 48 41 52 2E 6D
C3A0:20 53 43 52 45 45 4E 20 96
C3A8:44 45 53 49 47 4E 45 52 F2
C3B0:20 56 31 2E 30 0D 1F 20 FA

```

```

C3B8:20 20 20 A3 A3 A3 A3 A3 2D
C3C0:A3 20 A3 A3 A3 A3 20 20 DC
C3C8:A3 A3 A3 A3 A3 A3 20 A3 49
C3D0:A3 A3 A3 A3 A3 A3 0D C1
C3D8:9E 20 20 20 20 20 43 55 1B
C3E0:52 52 45 4E 54 20 41 44 9D
C3E8:44 52 45 53 53 3A 20 05 CD
C3F0:33 32 37 36 38 20 20 98 04
C3F8:43 4F 4C 4F 52 3A 4F 46 D4
C400:46 0D 11 20 20 20 05 53 F2
C408:1E 20 53 41 56 45 20 53 82
C410:43 52 45 45 4E 20 20 20 20
C418:05 4C 1E 20 4C 4F 41 44 63
C420:20 53 43 52 45 45 4E 0D 05
C428:20 20 20 05 46 1E 20 4C 55
C430:4F 41 44 20 43 48 41 52 4C
C438:53 45 54 20 20 05 4E 1E 19
C440:20 53 41 56 45 20 43 48 B5
C448:41 52 53 45 54 20 24 33 64
C450:30 30 30 0D 20 20 20 05 9B
C458:31 2D 34 1E 20 43 48 41 0E
C460:4E 47 45 20 43 4F 4C 4F CC
C468:52 53 20 28 05 34 1E 3D E8
C470:44 52 41 57 43 4F 4C 4F 8D
C478:52 29 0D 00 20 20 20 05 DD
C480:41 1E 20 43 48 41 4E 47 95
C488:45 20 41 44 44 52 20 20 F4
C490:20 05 43 1E 20 43 4F 4C AE
C498:4F 52 20 44 41 54 41 20 A4
C4A0:4F 46 46 2F 4F 4E 0D 20 0D
C4A8:20 20 05 46 37 2F 46 38 8A
C4B0:1E 20 53 57 41 50 2F 55 30
C4B8:4E 44 4F 20 05 51 1E 20 30
C4C0:51 55 49 54 0D 20 20 20 FF
C4C8:05 4D 1E 20 4D 55 4C 54 9A
C4D0:49 43 4F 4C 4F 52 20 20 A2
C4D8:20 20 12 90 20 05 20 CE
C4E0:1C 20 9F 20 9C 20 1E 20 38
C4E8:1F 20 9E 20 92 20 90 28 3E
C4F0:4D 2F 43 20 44 52 41 57 9C
C4F8:29 0D 20 20 20 20 20 20 42
C500:20 20 20 20 20 20 12 90 DF
C508:20 05 20 1C 20 9F 20 9C 07
C510:20 1E 20 1F 20 9E 20 81 66
C518:20 95 20 96 20 97 20 98 BE
C520:20 99 20 9A 20 9B 20 92 12
C528:0D 11 20 20 20 20 99 55 8E
C530:53 45 20 4A 4F 59 53 54 3A
C538:49 43 4B 20 54 4F 20 43 08
C540:48 4F 4F 53 45 20 43 48 5C
C548:41 52 41 43 54 45 52 53 15
C550:0D 20 20 20 05 28 43 55 15
C558:52 53 4F 52 20 4B 45 59 03
C560:53 20 43 48 41 4E 47 45 A1
C568:20 53 49 5A 45 20 4F 46 37
C570:20 57 49 4E 44 4F 57 29 27
C578:0D 00 93 11 11 9F 56 41 03
C580:4C 49 44 20 53 43 52 45 A0
C588:45 4E 20 41 44 44 52 45 7F
C590:53 53 3A 20 31 36 33 38 E4
C598:34 2D 34 37 31 35 30 0D 4F
C5A0:11 9A 45 4E 54 45 52 20 65
C5A8:41 44 44 52 45 53 53 3A EB
C5B0:20 05 00 93 11 11 9F 43 16
C5B8:48 41 52 53 45 54 20 46 3A
C5C0:49 4C 45 4E 41 4D 45 3A 95
C5C8:20 05 00 93 11 11 9F 53 3E
C5D0:43 52 45 45 4E 20 46 49 58
C5D8:4C 45 4E 41 4D 45 3A 20 CD
C5E0:05 00 A2 00 A0 00 8A 99 F6

```



```

CC78:C9 00 D0 F5 A9 00 85 C6 8F
CC80:8D 15 D0 A9 64 20 E3 C2 09
CC88:20 F3 C2 AD F1 C2 C9 00 90
CC90:F0 13 AD F1 C2 8D AD CD B1
CC98:A0 30 A2 00 8E AB CD 8C 2E
CCA0:AC CD 20 AE CD 20 B1 C9 0F
CCA8:4C 1F CA 20 0C C2 A0 00 38
CCB0:B9 CB C5 C8 20 D2 FF C9 75
CCB8:00 D0 F5 A9 00 85 C6 8D 11
CCC0:15 D0 A9 64 20 E3 C2 20 CA
CCC8:F3 C2 AD F1 C2 C9 00 F0 10
CCD0:12 8D AD CD AC 5A C6 AE 74
CCD8:59 C6 8E AB CD 8C AC CD 25
CCE0:20 AE CD 20 B1 C9 4C 1F 5E
CCE8:CA 20 C0 C2 A0 00 B9 CB E1
CCF0:C5 C8 20 D2 FF C9 00 C8
CCF8:F5 A9 00 85 C6 8D 15 D0 B7
CD00:A9 64 20 E3 C2 20 F3 C2 0D
CD08:AD F1 C2 C9 00 F0 39 AD CF
CD10:F1 C2 8D AD CD AC 5C C6 82
CD18:AE 5B C6 8E AB CD 8C AC FD
CD20:CD AD 68 C6 C9 01 F0 03 BE
CD28:4C 45 CD AD AC CD 18 69 06
CD30:03 8D AC CD AD AB CD 18 F2
CD38:69 E8 8D AB CD AD AC CD 7B
CD40:69 00 8D AC CD 20 CE CD 67
CD48:20 B1 C9 4C 1F CA 20 0C CE
CD50:C2 A0 00 B9 B3 C5 C8 20 77
CD58:D2 FF C9 00 D0 F5 A9 00 48
CD60:85 C6 8D 15 D0 A9 64 20 89
CD68:E3 C2 20 F3 C2 AD F1 C2 5D
CD70:C9 00 F0 31 AD F1 C2 8D 6A
CD78:AD CD A0 37 A2 FF 8E AB C3
CD80:CD 8C AC CD AD 59 C6 85 7E
CD88:FE AD 5A C6 85 FF A9 00 46
CD90:8D 59 C6 A9 30 8D 5A C6 EF
CD98:20 CE CD A5 FE 8D 59 C6 B3
CDA0:A5 FF 8D 5A C6 20 B1 C9 4A
CDA8:4C 1F CA 00 30 00 AD A6 16
CDB0:CD A2 87 A0 C1 20 BD FF E0
CDB8:A9 00 A2 08 A0 01 20 BA 02
CDC0:FF AE AB CD AC AC CD A9 B7
CDC8:00 85 B9 4C D5 FF A9 36 F9
CDD0:85 01 AD AD CD A2 87 A0 A8
CDD8:C1 20 BD FF A9 00 A2 08 AF
CDE0:A0 01 20 BA FF AE 59 C6 F0
CDE8:AC 5A C6 86 FA 84 FB AE 43
CDF0:AB CD AC AC CD A9 FA 20 61
CDF8:D8 FF A9 37 85 01 60 37 D1

```

## DISPLAY.BASIC

```

SR 63000 REM **** CCSD SCREEN
      {SPACE}DISPLAY ****
QD 63010 REM * DISPLAY ML & SC
      REENS MUST *
DA 63020 REM * CHARSET @ 12288
      MUST ALL{2 SPACES}*
DE 63030 REM *{6 SPACES}BE IN
      {SPACE}MEMORY!
      {8 SPACES}*
RP 63040 REM *****
      *****
EK 63050 AD=32768:REM *SCREEN
      {SPACE}ADDRESS
CF 63060 C=0:REM *1 FOR COLOR
      {SPACE}SCREENS
HE 63070 POKE53272,29:REM *21=
      ROM CHARSET
AD 63080 POKE53270,216:REM *20

```

```

      0=NON-MCOLOR
XP 63090 POKE53281,0:REM *BACK
      GROUND
SC 63100 POKE53282,1:REM *COLO
      R 2
HK 63110 POKE53283,2:REM *COLO
      R 3
KJ 63120 POKE646,13:REM *COLOR
      4
PD 63130 PRINT CHR$(147)
GJ 63140 H=INT(AD/256):L=AD-25
      6*H:POKE53104,C:POKE5
      3105,L:POKE53106,H
PQ 63150 SYS 52992:REM *DISPLA
      Y SCREEN
AM 63160 RETURN

```

## DISPLAY.ML

```

CF00:A9 36 85 01 A0 04 A2 00 1D
CF08:86 FC 84 FD AE 71 CF AC 22
CF10:72 CF 86 FA 84 FB 20 30 E1
CF18:CF AD 70 CF C9 01 D0 0B 15
CF20:A0 D8 A2 00 86 FC 84 FD C9
CF28:20 30 CF A9 37 85 01 60 AA
CF30:A9 00 85 FE 85 FF A0 00 B2
CF38:B1 FA 91 FC A5 FC 18 69 2C
CF40:01 85 FC A5 FD 69 00 85 D6
CF48:FD A5 FA 18 69 01 85 FA 86
CF50:A5 FB 69 00 85 FB A5 FE 55
CF58:18 69 01 85 FE A5 FF 69 CE
CF60:00 85 FF A5 FF C9 03 D0 B9
CF68:CF A5 FE C9 E8 D0 C9 60 54
CF70:00 00 80 E8 83 00 00 CA

```

*Daniel English says he got bored using FOR-NEXT loops to save character screens, so he wrote this utility. He lives in Moreno Valley, California.*

## RIGHT/SIDE II

By Edward A. Gase

Right/Side II is an enhanced version of the original Right/Side program written by Robert B. Cook and published in the November 1990 issue of COMPUTE. It lets you print documents down fanfold paper rather than printing across it.

This version works with Epson-compatible printers in either single- or double-density modes with your interface in transparent mode. More significantly, you can now use a variety of screen character sets as custom fonts for printing. You'll even be able to see what the character set looks like onscreen.

Right/Side II is ideal for those times when you need to print something wider than 80 columns on an 80-column printer and you don't want to switch to condensed type. It's also terrific for making keyboard overlays.

Although Right/Side II was originally

written with SpeedScript in mind, it works well with any word processor that handles PETSCII sequential files. SpeedScript, EasyScript, and The Write Stuff are particularly well suited for use with Right/Side II because they allow you to include the graphics characters accessible with the Commodore logo key.

Right/Side II consists of two programs, one in BASIC and one in machine language. To help avoid typing errors, enter the BASIC program with The Automatic Proofreader. See "Typing Aids" elsewhere in this section. When you've finished, be sure to save a copy to disk. The second program is written in machine language. To enter it, you'll need to use MLX, COMPUTE's machine language entry program; see "Typing Aids" again. When MLX prompts, enter the following values.

**Starting address: C000**

**Ending address: C4E7**

When you've finished typing, be sure to save a copy of the program with the filename RIGHT/SIDE.ML before you leave MLX. When you're ready to use Right/Side II, simply load and run the BASIC portion. It will automatically load the machine language file.

## Printing Sideways

When creating a sequential file for Right/Side II, remember that the right margin of the text will be printed at what's normally the top of the paper. Set your right margin for any width up to 255 characters and your left margin to 0. If you are using EasyScript, specify the column width at the startup screen. If you have chosen a length that is longer than your longest line, spaces will be added to the top of the page.

Right/Side would print 80 lines per page according to the original article. With my system, I can get only about 60 lines with 9-10 characters per inch. That would produce a maximum length of 25.5-28.3 inches. The results you get will depend on your printer/interface combination and whether you choose Epson or Commodore mode. The Epson printouts will be longer, but there will be more separation between characters.

Your original file must be a PETSCII

sequential file. Some word processors can save in that format. If you're using SpeedScript, the easiest way to create such a file is to press Shift-Ctrl-P and then press D to print your document to disk as a sequential file. Then you're ready to run Right/Side II. If you produce a file that is too long, Right/Side II will print the excess over the top of the text on the left side of the paper. If the printout looks strange, reduce the length of your file.

## Menu Options

When you run Right/Side II and the menu appears, press f1 to select Create Right/Side File. This option converts the sequential file into a Right/Side II file. Enter the name of your sequential file and then the name of the file you'll be creating. The letters R/S are added automatically as a prefix to indicate to the program that this is a Right/Side II document. Press Return on a blank line to return to the main menu.

To print your file sideways, simply press f3 and then enter the name of the newly created Right/Side II file. You don't have to include the R/S prefix; it's added automatically. Next, choose between Commodore or Epson. If you choose Epson, you'll be given the choice of printing in single or double density. Then press any key to start printing. To stop printing, press and hold the space bar.

Press f2 to load a custom character set that you may wish to use. You'll be asked the name of the character set. The onscreen display will change to reflect the new characters. If you don't like what you see on the screen, you can change the character set before you print your file.

Any nine-block character set, such as those created with Ultrafont+, should work just fine. I have also used three-block character sets successfully. Normally, you will use Right/Side II with uppercase and lowercase characters, including the graphics characters accessed with the Commodore logo key. You could, of course, use an uppercase/graphics set. As there are dozens of character sets that have been created for the Commodore 64, you should be able to get just the look you want or your printouts.

## RIGHT/SIDE II

```

XA 100 REM COPYRIGHT 1993 COMP
      UTE PUBLICATIONS, INTL.
      , LTD. - ALL RIGHTS RES
      ERVED
BC 110 GOSUB1310:REM INITIALIZ
      E
HD 120 GOSUB990:REM MAIN SCREE
      N
RG 130 POKE198,0:WAIT198,1:GET
      G$:G=ASC(G$)-132:IFG<10
      RG>5THEN130
EK 140 ONGGOSUB180,400,700,150
      ,1180:GOTO120
GD 150 POKE53280,14:POKE53281,
      6:POKE53272,(PEEK(53272
      )AND240)OR4
BS 160 PRINT"{7}{CLR}":END
MS 170 REM{2 SPACES}CREATE FIL
      E
PB 180 PS=1:GOSUB1000:PS=0
JQ 190 PRINTTAB(7)"{2 DOWN}
      {RVS}{RED}'#####
      #####"
FM 200 PRINTTAB(7)"{RVS}'{OFF}
      {GRN}CREATE {RVS}{BLK}
      R{OFF}IGHT/{RVS}S{OFF}I
      DE {GRN}FILE {RVS}{RED}
      {BLK} "
PH 210 PRINTTAB(7)"{RVS}{RED}'
      $$$$$$$$$$$$$$$$$$$$$$
      $BLK} "
JS 220 PRINTTAB(9)"{RVS}{BLK}
      {24 SPACES}"
XC 230 POKE214,10:PRINT"{DOWN}
      {2 SPACES}{RVS}{BLU}F
      {OFF}ILE TO BE READ?
      {GRN}"BF$;
RG 240 LN=16:GOSUB760:FL$=IN$:
      IFF1$=""THENRETURN
EJ 250 DE=63:GOSUB830:IFEN<>63
      THEN230
XS 260 DE=0:GOSUB840:IFEN>19TH
      EN230
GR 270 POKE214,13:PRINT"{DOWN}
      {2 SPACES}{RVS}{BLU}F
      {OFF}ILE TO BE CREATED?
      {GRN}R/S."MID$(BF$,5,2
      4);
DP 280 LN=12:GOSUB760:IN$="R/S
      ."IN$:F2$=IN$:IFF2$="R
      /S."THENRETURN
CJ 290 DE=62:GOSUB830:IFF2$=F1
      $THEN270
QX 300 IFDE=ENTHEN340
SH 310 PRINT"{UP}{2 SPACES}
      {RVS}{RED}O{OFF}VERWRIT
      E FILE? [{GRN}Y/N{RED}]
      {GRN} ";:IN=1:GOSUB760
HG 320 IFIN$<>"Y"THENPRINT"
      {UP}"BL$:GOTO270
AG 330 OPEN15,8,15,"S0:"+F2$:C
      LOSE15
HC 340 POKE214,19:PRINTTAB(7)"
      {DOWN}{PUR}{5 Q} CREATI
      NG{2 SPACES}FILE {5 Q}
      {HOME}"
RS 350 SA=49152:FORL=1TO2
JQ 360 OPEN8,8,8,FL$+"S,R":SY
      S SA:SA=49194:CLOSE8:NE
      XT:REM READ & CONVERT
DP 370 OPEN8,8,8,F2$+"S,W":SY
      S49285:CLOSE8:REM WRITE
      TO DISK
HS 380 RETURN
HH 390 REM PRINT FILE
ER 400 PS=1:GOSUB1000:PS=0:NP=
      0
SE 410 PRINTTAB(7)"{2 DOWN}
      {RVS}{RED}'#####
      #####"
DG 420 PRINTTAB(7)"{RVS}'{OFF}
      {GRN}PRINT {RVS}{BLK}R
      {OFF}IGHT/{RVS}S{OFF}ID
      E {GRN}FILE {RVS}{RED}
      {BLK} "
KF 430 PRINTTAB(7)"{RVS}{RED}'
      $$$$$$$$$$$$$$$$$$$$$$
      {BLK} "
QJ 440 PRINTTAB(9)"{RVS}{BLK}
      {23 SPACES}"
MB 450 POKE214,10:PRINT"{DOWN}
      {2 SPACES}{RVS}{BLU}F
      {OFF}ILE TO BE PRINTED?
      {GRN}R/S."MID$(BF$,5,2
      4);
BF 460 LN=12:GOSUB760:IN$="R/S
      ."IN$:FL$=IN$:IFF1$="R
      /S."THENRETURN
FS 470 DE=63:GOSUB830:IFEN<>63
      THEN450
GK 480 DE=0:GOSUB840:IFEN>19TH
      EN450
QD 490 POKE214,13:PRINT"{DOWN}
      {2 SPACES}{RVS}{BLU}E
      {OFF}PSON OR {RVS}C
      {OFF}OMMODORE ? [{GRN}E
      /C{BLU}]{GRN} ";
QX 500 IN=1:LN=1:GOSUB760:MO$=
      IN$:POKE49499,1
MH 510 IFIN$=""THENRETURN
KH 520 IFMO$="E"THENPRINT"
      {DOWN}{2 SPACES}{RVS}
      {BLU}N{OFF}ORMAL OR
      {RVS}H{OFF}I {RVS}D
      {OFF}ENSITY ? [{GRN}N/H
      {BLU}]{GRN} ";
EF 530 IFMO$="E"THENGOSUB760:D
      E$=IN$:IFDE$="H"THENPOK
      E49499,2
SB 540 IFIN$=""THENRETURN
QB 550 OPEN15,4,15:CLOSE15:ON-
      (ST=0)GOTO590:IFNP=1THE
      NRETURN
AB 560 OPEN15,4,15:CLOSE15:ON-
      (ST=0)GOTO590:IFNP=1THE
      NRETURN
MC 570 POKE214,16:PRINT"{DOWN}
      {2 SPACES}{RVS}{RED}C
      {OFF}ONNECT PRINTER THE
      N PRESS A KEY":GOSUB960
      :NP=1
AP 580 POKE198,0:WAIT198,1:GET
      Q$:GOTO550
  
```



# PROGRAMS

```

HARACTER SET TO LOAD?
{GRN} "BF$;:LN=16:GOSU
B760
QX 1240 IFIN$=""THENRETURN
XX 1250 IN$=LEFT$(IN$,16):GOSU
B850:IFEN>19THEN1230
EH 1260 POKE780,0:POKE781,8:PO
KE782,0:SYS65466
FE 1270 FORL=1TOLN(IN$):POKE8
49+L,ASC(MID$(IN$,L,1)
):NEXT
BP 1280 POKE780,LEN(IN$):POKE7
81,850AND255:POKE782,8
50/256:SYS65469
AK 1290 POKE780,0:POKE781,0:PO
KE782,40:SYS65493:SYS4
9677:RETURN
GB 1300 REM INITIALIZE
KE 1310 IFB=0THENB=1:DIMK(168)
PP 1320 IFPEEK(10240)+PEEK(491
52)=222THEN1390
HF 1330 IFA=0THENA=1:LOAD"RIGH
T/SIDE.ML",8,1
BA 1340 PRINT"CLR">{2 DOWN}SET
TING UP..."
KM 1350 POKE56334,0:POKE1,51
XX 1360 POKE781,9:POKE782,1:PO
KE88,0:POKE89,48:POKE9
0,0:POKE91,224
BR 1370 SYS41964:POKE1,55:POKE
56334,1
DB 1380 SYS 49677
CJ 1390 LF=54272:HF=54273:WV=5
4276:AT=54277:SR=54278
:VL=54296:POKEVL,15
FR 1400 BL$="{38 SPACES}"
BQ 1410 BF$="{16 SPACES}
{16 LEFT}"
AJ 1420 RETURN

```

## RIGHT/SIDE.ML

```

C000:A2 00 A0 00 84 FC A2 08 4C
C008:20 C6 FF 00 B7 FF D0 67 14
C010:C8 20 CF FF C9 0D D0 0A 26
C018:C4 FC 90 02 84 FC A0 00 C6
C020:A2 00 20 E1 FF D0 E4 4C 6E
C028:77 C0 A2 08 20 C6 FF A9 30
C030:00 85 F7 A9 30 85 F8 A2 D8
C038:00 A0 00 84 FD 20 B7 FF 0A
C040:D0 35 E8 20 CF FF C9 0D B5
C048:D0 1A E4 FC F0 09 A9 20 44
C050:20 6F C0 E8 4C 4A C0 A2 14
C058:00 E6 FD A5 FD C9 50 90 F5
C060:DC 4C 77 C0 20 6F C0 20 BE
C068:E1 FF D0 D1 4C 77 C0 91 65
C070:F7 C8 D0 02 E6 F8 60 20 56
C078:CC FF A9 08 20 C3 FF A9 CF
C080:04 20 C3 FF 60 A2 08 20 42
C088:C9 FF 20 B7 FF D0 E8 C6 4A
C090:FC A5 FC 85 FE 18 A9 FF 9D
C098:65 FC 85 F7 A9 2F 69 00 19
C0A0:85 F8 A6 FD A0 00 B1 F7 38
C0A8:20 D2 FF 18 A5 F7 65 FE 47
C0B0:85 F7 A5 F8 69 00 85 F8 86
C0B8:CA D0 EB A9 0D 20 D2 FF 7A
C0C0:C6 FC F0 B3 20 E1 FF D0 97
C0C8:CC 4C 77 C0 A9 00 85 FB 13
C0D0:85 02 A2 08 20 C6 FF 20 A6

```

```

C0D8:E4 FF AA 20 B7 FF D0 0E 91
C0E0:8A C9 0D F0 0D A4 FB 99 57
C0E8:00 30 E6 FB D0 E9 A9 02 96
C0F0:85 02 A0 00 88 D0 FD 20 6D
C0F8:CC FF 88 D0 FD A2 04 20 A1
C100:C9 FF A9 00 85 FC A2 08 0B
C108:A4 FC B9 00 30 85 FD A9 91
C110:00 85 F7 A9 28 85 F8 18 EF
C118:A5 F7 65 FD 85 F7 A5 F8 49
C120:69 00 85 F8 CA D0 F0 A0 B4
C128:00 B1 F7 30 03 18 69 80 E5
C130:20 D2 FF C8 C0 08 D0 F1 BE
C138:E6 FC A5 FC C5 FB D0 C6 79
C140:A9 0D 20 D2 FF 20 CC FF 27
C148:A5 02 D0 09 A5 C5 C9 3C DD
C150:F0 03 4C CC C0 4C 77 C0 4A
C158:1B 4B 4C 02 00 A9 00 85 12
C160:FB 85 02 A2 08 20 C6 FF FB
C168:20 E4 FF AA 20 B7 FF D0 90
C170:0E 8A C9 0D F0 0D A4 FB A8
C178:99 00 30 E6 FB D0 E9 A9 DD
C180:02 85 02 A0 00 88 D0 FD 72
C188:20 CC FF 88 D0 FD A2 04 9F
C190:20 C9 FF A9 00 85 FC A2 E3
C198:08 A4 FC B9 00 30 85 FD 4E
C1A0:A9 00 85 F7 A9 28 85 F8 1B
C1A8:18 A5 F7 65 FD 85 F7 A5 92
C1B0:F8 69 00 85 F8 CA D0 F0 E8
C1B8:A0 00 B1 F7 AA BD 3C C2 C9
C1C0:48 AD 58 C1 20 D2 FF AE F5
C1C8:5B C1 BD 58 C1 20 D2 FF DB
C1D0:AD 5B C1 20 D2 FF A0 00 26
C1D8:20 D2 FF 68 AE 5B C1 CA D8
C1E0:F0 03 20 D2 FF 20 D2 FF F4
C1E8:C8 C0 08 D0 CD E6 FC A5 B8
C1F0:FC C5 FB D0 A2 A9 0D 20 E6
C1F8:D2 FF 20 CC FF A5 02 D0 22
C200:09 A5 C5 C9 3C F0 03 4C C0
C208:5D C1 4C 77 C0 A2 00 BD FB
C210:00 2A 9D 00 2E E8 E0 00 AA
C218:D0 F5 BD 00 28 9D 00 2A 1D
C220:E8 E0 00 D0 F5 BD E4 C3 93
C228:9D 00 2D E8 E0 00 D0 F5 4F
C230:BD 3C C3 9D 00 2B E8 E0 55
C238:A7 D0 F5 60 00 80 40 C0 CD
C240:20 A0 60 E0 10 90 50 D0 4C
C248:30 B0 70 F0 08 88 48 C8 EA
C250:28 A8 68 E8 18 98 58 D8 5C
C258:38 B8 78 F8 04 84 44 C4 46
C260:24 A4 64 E4 14 94 54 D4 6C
C268:34 B4 74 F4 0C 8C 4C CC 0B
C270:2C AC 6C FC 1C 9C 5C DC 7C
C278:3C BC 7C FC 02 82 42 C2 0C
C280:22 A2 62 E2 12 92 52 D2 8C
C288:32 B2 72 F2 0A 8A 4A CA 2B
C290:2A AA 6A EA 1A 9A 5A DA 9C
C298:3A BA 7A FA 06 86 46 C6 86
C2A0:26 A6 66 E6 16 96 56 D6 AC
C2A8:36 B6 76 F6 0E 8E 4E CE 4B
C2B0:2E AE 6E EE 1E 9E 5E DE BC
C2B8:3E BE 7E FE 01 81 41 C1 1F
C2C0:2E A1 61 E1 11 91 51 D1 CC
C2C8:31 B1 71 F1 09 89 49 C9 6B
C2D0:29 A9 69 E9 19 99 59 D9 DC
C2D8:39 B9 79 F9 05 85 45 C5 CE
C2E0:25 A5 65 E5 15 95 55 D5 EC
C2E8:35 B5 75 F5 0D 8D 4D CD 8B
C2F0:2D AD 6D ED 1D 9D 5D DD FC
C2F8:3D BD 7D FD 03 83 43 C3 8C
C300:23 A3 63 E3 13 93 53 D3 0E

```

```

C308:33 B3 73 F3 0B 8B 4B CB AC
C310:2B AB 6B EB 1B 9B 5B DB 1E
C318:3B BB 7B FB 07 87 47 C7 08
C320:27 A7 67 E7 17 97 57 D7 2E
C328:37 B7 77 F7 0F 8F 4F CF CC
C330:2F AF 6F EF 1F 9F 5F DF 3E
C338:3F BF 7F FF 03 07 07 07 88
C340:03 00 00 00 C0 E0 E0 E0 75
C348:C0 00 00 00 00 00 00 03 33
C350:07 07 07 03 00 00 00 C0 EE
C358:E0 E0 E0 C0 00 00 00 B0
C360:7E 00 00 00 AA AA AA A2 27
C368:AA AA AA AA 55 55 55 EF
C370:55 55 55 55 FF 80 BF A0 1A
C378:AF A8 AB AA FF 00 FF 00 22
C380:FF 00 FF 00 FF 01 FD 05 0D
C388:F5 15 D5 55 AA AB A8 AF 65
C390:A0 BF 80 FF 00 FF 00 FF 68
C398:00 FF 00 FF 55 D5 15 F5 42
C3A0:05 FD 01 FF 00 00 00 0F 59
C3A8:18 14 13 13 00 00 00 FF D4
C3B0:00 00 FF 00 00 00 00 F0 29
C3B8:18 38 F8 F8 12 12 12 12 18
C3C0:12 12 12 12 78 78 78 78 48
C3C8:78 78 78 13 13 17 17 73
C3D0:0F 00 00 00 00 FF FF FF DF
C3D8:FF 00 00 00 F8 B8 D8 F8 B5
C3E0:F0 00 00 00 FF FF FF E0
C3E8:FF FF FF FF F0 F0 F0 8E
C3F0:F0 F0 F0 00 00 00 00 5A
C3F8:FF FF FF FF 00 00 00 00 80
C400:00 00 00 00 00 00 00 00 89
C408:00 00 00 FF C0 C0 C0 C0 DC
C410:CC C0 C0 C0 CC CC 33 33 81
C418:CC CC 33 33 03 03 03 03 02
C420:03 03 03 03 00 00 00 00 7C
C428:CC CC 33 33 CC 99 33 66 7E
C430:CC 99 33 66 03 03 03 03 80
C438:03 03 03 18 18 18 1F 05
C440:1F 18 18 18 00 00 00 00 E3
C448:0F 0F 0F 0F 18 18 1F 60
C450:1F 00 00 00 00 00 00 F8 62
C458:F8 18 18 18 00 00 00 00 E8
C460:00 00 FF FF 00 00 00 1F 09
C468:1F 18 18 18 18 18 1F 5D
C470:FF 00 00 00 00 00 00 FF F9
C478:FF 18 18 18 18 18 18 F8 D6
C480:F8 18 18 18 C0 C0 C0 C0 5C
C488:C0 C0 C0 E0 E0 E0 E0 F3
C490:E0 E0 E0 07 07 07 07 56
C498:07 07 07 07 FF FF 00 00 B8
C4A0:00 00 00 00 FF FF FF 00 2A
C4A8:00 00 00 00 00 00 00 00 32
C4B0:00 FF FF FF 01 03 06 6C C6
C4B8:78 70 60 00 00 00 00 00 A6
C4C0:F0 F0 F0 F0 F0 F0 F0 F0 0E
C4C8:00 00 00 00 18 18 18 F8 9C
C4D0:F8 00 00 00 F0 F0 F0 F0 F4
C4D8:00 00 00 00 F0 F0 F0 F0 80
C4E0:0F 0F 0F 0F 00 00 C0 FF 0A

```

Edward A. Gase of Fairfield, Ohio, is an earth science teacher and president of the Cincinnati Commodore Computer Club. He is married and has four children between the ages of 4 and 20. He uses R/S II to design keyboard overlays similar to Leroy's Cheatsheets.



# JIGSAW 128

By Emil Heyrovsky

Jigsaw 128 is a 50-piece jigsaw puzzle game for the 128 in 40-column mode. With it you can scramble and reassemble any Koala- or Doodle-format picture. Unlike the traditional game, Jigsaw 128 uses nice rectangular pieces.

## Typing It In

Jigsaw 128 is written entirely in machine language but loads and runs like a BASIC program. To enter it, use the 128 version of MLX. See "Typing Aids" elsewhere in this section if you need a copy of this program. When MLX prompts, respond with the following values.

Starting address: 1C01

Ending address: 2D08

Be sure to save a copy of the program before exiting MLX.

## Playing the Pieces

To start the game, load it using the DLOAD command and type RUN. A menu screen will appear, and you'll be asked to insert a disk. This means a disk that contains pictures saved in Doodle or Koala format. (These files have DD or a reverse space and PIC at the beginning of their filenames.) If any pictures are found, a list of their names will be displayed.

You can cycle through the list using the cursor keys. If you want to load another picture disk, press D, and you'll be asked to insert a disk. The Stop key gets you back to the current list. Press Q to quit the program.

Once you've selected the picture you want, press Return to load it. A Doodle graphic will load almost instantly. It takes about 24 seconds, however, to set up a Koala picture. The screen will be blank during this time.

Once the picture loads, you'll have a couple of seconds to look at it, and then the screen will scramble. If you need another look at the unscrambled picture, press the 128's Help key.

The object of Jigsaw 128 is to move rectangular portions of the scrambled picture about the screen to reconstruct the original image. To move your rectangular cursor to the desired piece,

use the J, I, K, and L keys to move left, up, down, and right, respectively. To exchange two pieces, mark the first one with the space bar. Move the cursor to the desired location and press the space bar again. If you change your mind about the marked block, cancel your selection by pressing the left-arrow key (the one at the top left corner of your keyboard).

When you think you have all the pieces in their correct location, press C. You'll hear an unpleasant sound if you're wrong or a slightly more pleasant one if your image is correct. If the sound is the better of the two, the cursor frame will disappear. Then, press any key, and you'll have the choice of using the same picture again or trying another.

While playing the game, press Stop to return to the text screen and the picture list. You'll be asked to confirm this choice. All of these commands are listed on the main screen.

## A Few Notes

In a multicolor (Koala) picture, two areas may appear identical, but the bytes that represent them may differ. This fact is important if you want to compare the appearance of the active screen with the one in memory. The routine that standardizes the pictures causes the 24-second delay when setting up a Koala picture. With the Doodle or high-resolution files, this routine is much simpler, and the delay is hardly noticeable.

It is sometimes difficult to complete a picture with many intricate or blank areas. It sometimes helps to look for "dust" or single dots in an area. If you get stuck, just press the Stop key at any time and load another graphic.

If you select Q to quit from the text screen, the function key definitions will be restored, but you'll have to load the program to play again.

Finally, I would like to thank my brother Albert for writing the Koala help routine and for his advice.

## JIGSAW 128

1C01:0F 1C 0A 00 DE 9C 3A 9E 85  
1C09:31 30 38 37 30 00 00 00 E1  
1C11:A9 20 85 FB A9 1C 85 FD 5D  
1C19:A0 00 84 FA 84 FC A0 00 3B  
1C21:B1 FC 29 0F 85 FE B1 FC 10  
1C29:4A 4A 4A 85 FF B1 FA 91

1C31:C9 FF D0 1E C8 C0 08 D0 74  
1C39:F5 A0 00 A5 FF 0A 0A 0A 35  
1C41:0A 05 FF 91 FC 98 91 FA 41  
1C49:C8 C0 08 D0 F9 38 B0 49 7F  
1C51:90 CC A0 00 B1 FA D0 13 47  
1C59:C8 C0 08 D0 F7 A8 A5 FE E0  
1C61:0A 0A 0A 0A 05 FE 91 FC 47  
1C69:38 B0 2E A0 00 A5 FE C5 14  
1C71:FF 90 04 F0 1C D0 22 B1 77  
1C79:FA 49 FF 91 FA C8 C0 08 1F  
1C81:D0 F5 A5 FE 0A 0A 0A DA  
1C89:05 FF A0 00 91 FC 38 B0 F9  
1C91:08 98 91 FA C8 C0 08 D0 FF  
1C99:F9 A5 FA 18 69 08 85 FA 8A  
1CA1:90 02 E6 FB E6 FC D0 02 0E  
1CA9:E6 FD A5 FD C9 1F 90 A0 F5  
1CB1:A5 FC C9 E8 90 9A 60 8D 01  
1CB9:B3 08 8D BB 08 A0 00 BD BB  
1CC1:68 0B 99 00 D4 E8 C8 BD BD  
1CC9:68 0B 99 00 D4 98 18 69 CE  
1CD1:06 A8 E8 C0 15 90 E8 60 7D  
1CD9:8D 04 D4 8D 0B D4 8D 12 26  
1CE1:D4 60 08 A0 00 98 99 00 3D  
1CE9:D4 C8 C0 18 D0 F8 A9 0F 25  
1CF1:8D 18 D4 28 08 90 05 A9 4A  
1CF9:00 8D 15 D0 A9 05 A2 00 EB  
1D01:20 A7 08 A9 00 28 08 B0 32  
1D09:02 A2 0C 20 A7 08 A9 11 32  
1D11:20 C8 08 85 A2 A5 A2 C9 A1  
1D19:30 90 FA A9 10 20 C8 08 24  
1D21:28 B0 03 4C 8D 1A A5 D4 B5  
1D29:C9 58 F0 FA A9 73 85 01 53  
1D31:A9 00 85 D8 8D 20 D0 8D 9A  
1D39:21 D0 20 0A 19 A0 12 B9 06  
1D41:44 B0 99 79 07 88 10 F7 9D  
1D49:84 A2 A5 A2 C9 16 D0 FA 90  
1D51:20 8A 0B C9 19 F0 03 4C 1B  
1D59:2F 1B A9 72 85 01 A0 20 DF  
1D61:A5 C4 C9 1C F0 0A A5 C8 5E  
1D69:8D 20 D0 8D 21 D0 A0 A0 93  
1D71:84 D8 4C 28 1A 49 4E 53 16  
1D79:45 52 54 20 44 49 53 4B B0  
1D81:13 03 17 26 4E 4F 20 4B 86  
1D89:4F 41 4C 41 20 4F 52 20 5C  
1D91:44 4F 4F 44 4C 45 20 46 ED  
1D99:49 4C 45 53 51 55 49 54 30  
1DA1:20 28 59 2F 4E 29 51 55 23  
1DA9:49 54 20 54 48 49 53 20 15  
1DB1:50 49 43 20 28 59 2F 4E 24  
1DB9:29 53 48 55 46 46 4C 45 E4  
1DC1:20 41 47 41 49 49 20 28 45  
1DC9:59 2F 4E 29 09 A9 0E 85 21  
1DD1:9D 8D 00 FF A9 C0 8D 04 AD  
1DD9:0A 4C 16 19 00 28 84 28 52  
1DE1:84 28 84 D1 12 31 1C A2 46  
1DE9:25 68 09 F7 09 E1 08 01 52  
1DF1:03 0E 06 06 0E 03 01 0F DF  
1DF9:0C 0B 0B 0C 0F 01 03 A5 47  
1E01:D4 C9 58 F0 FA C9 3F F0 A2  
1E09:F6 A0 00 84 D0 84 D1 C5 33  
1E11:D4 F0 FC 60 00 A2 02 A0 C8  
1E19:1E 20 A7 16 A9 FD 8D 30 53  
1E21:D0 AD 11 D0 29 EF 8D 11 95  
1E29:D0 A2 00 B5 A7 48 E8 E0 E2  
1E31:04 D0 F8 20 00 0C A9 A0 E8  
1E39:85 D8 A9 FC 8D 30 D0 A2 E4  
1E41:03 68 95 A7 CA 10 FA A2 75  
1E49:03 A0 28 20 A7 16 60 20 AC  
1E51:00 08 A2 02 A0 2D 60 A0 1F  
1E59:00 8C 00 FF B9 80 09 99 34





```

2B81:A9 13 85 FB B1 FC 91 FA 81
2B89:E6 FC D0 02 E6 FD E6 FA C4
2B91:D0 02 E6 FB A5 FB C9 1C 3A
2B99:90 EA A9 65 8D 14 03 A9 EA
2BA1:FA 8D 15 03 58 20 7D FF E9
2BA9:0E 0B 00 A9 00 85 D0 85 A1
2BB1:D1 4C 58 0B 00 0D 4A 49 D1
2BB9:47 53 41 57 20 20 02 19 C4
2BC1:20 45 0D 09 0C 20 48 05 22
2BC9:19 12 0F 16 13 0B 19 00 6B
2BD1:0F 63 63 63 63 63 00 9A
2BD9:15 49 0E 20 14 08 09 13 B6
2BE1:20 13 03 12 05 05 0E 3A 21
2BE9:00 19 03 15 12 13 0F 12 45
2BF1:20 0B 05 19 13 20 01 0E 76
2BF9:04 00 19 D2 C5 D4 D5 D2 A2
2C01:CE 20 14 0F 20 13 05 0C 9F
2C09:05 03 14 2E 00 17 C4 20 10
2C11:0E 05 17 20 04 09 13 0B 0C
2C19:2E 00 1D D1 20 11 15 09 C1
2C21:14 2E 00 21 49 0E 20 4A 2E
2C29:49 47 53 41 57 20 13 03 DA
2C31:12 05 05 0E 3A 00 17 C9 1F
2C39:2C CA 2C CB 2C CC 20 0D 7E
2C41:0F 16 05 08 1C 06 12 01 65
2C49:0D 05 2E 00 22 D3 D0 C1 F2
2C51:C3 C5 20 0D 01 12 0B 20 58
2C59:26 20 13 17 01 10 00 17 FF
2C61:14 17 0F 20 10 09 05 03 1F
2C69:05 13 2E 00 1D 9F 20 15 8B
2C71:0E 0D 01 12 0B 20 01 20 50
2C79:13 05 0C 05 03 14 05 04 E4
2C81:00 15 10 09 05 03 05 2E 1E
2C89:00 22 C8 C5 CC D0 20 08 D1
2C91:05 0C 10 2E 00 1E C3 20 74
2C99:03 0F 0E 06 09 12 0D 2E 32
2CA1:00 1E D3 D4 CF D0 20 02 4D
2CA9:01 03 0B 20 14 0F 20 14 D7
2CB1:08 09 13 00 17 13 03 12 CF
2CB9:05 05 0E 2E 00 00 0E 0D A3
2CC1:07 06 0E 3D 07 0F 0E 41 86
2CC9:03 06 0E 22 03 01 0E 27 68
2CD1:03 01 0E 27 07 11 0E 17 CF
2CD9:03 01 0E 01 03 01 0E 01 FE
2CE1:03 01 0E 01 03 01 0E 49 4F
2CE9:03 05 0E 4B 03 01 0E 4F 03
2CF1:03 04 0E 24 03 01 0E 27 30
2CF9:03 04 0E EC 0D 27 0E 51 D7
2D01:00 00 00 00 00 00 00 5B
    
```

Emil Heyrovsky, 19, is a mathematical engineering student at Prague Polytechnic in the Czech Republic.

## SPLAST

By William F. Snow

Splast is an enjoyable way to practice spelling words. There are a lot of spelling programs around, but Splast has some advantages. It's both fun to play and challenging. Because Splast presents the words in the same format used by some popular standardized tests, it's also great practice for taking tests!

Splast is written in BASIC. To help avoid typing errors, enter the program

with The Automatic Proofreader. See "Typing Aids" elsewhere in this section. Be sure to save a copy of the program before you attempt to run it.

### How to Use the Program

To play Splast, simply load the program and type *RUN*. The first screen gives instructions for playing the game. The player is then asked to give his or her initials and to choose a level of play.

After a level of play is chosen, the game begins. The Splaster, located at the bottom of the screen, is controlled by a joystick in port 2. Three words are flashed on the screen. Two of them are spelled correctly, and one is misspelled. The player must position the Splaster beneath the misspelled word and hit the fire button. Move fast because the words don't stay on the screen for long. The Splaster launches an arrow at the selected word, so be sure your aim is as accurate as your spelling.

The skill levels are 1-3, with 1 being the easiest. As the levels increase, the time given to find and splast the incorrect word decreases, but the points awarded for each Splasted word increase. The program keeps track of the high score achieved during each session so that players can compete with each other.

After all the words have been presented, you get a screen that gives your score and lists both the words you spelled correctly and the ones you missed. You then have the opportunity to play again or quit.

Because Splast is written in BASIC, it's easy to modify. The words used are in data statements in lines 1340-1360. The program is set to use 25 words. If you use a different number of words, you'll have to make a few changes to the program. You'll need to change the dimension statements and the FOR-NEXT loop in line 20, the FOR-NEXT loops in lines 290 and 310, the CT value in lines 350 and 470, the random number generator in lines 370 and 380, the divisor in line 920, and the FOR-NEXT loops in lines 1090 and 1140.

If all the words in a given list are long, there may be a problem with the right-hand word wrapping around the

screen. This shouldn't happen often, however.

In my fifth-grade classroom, I have a disk with 36 versions of Splast, one for each weekly spelling unit. The children really enjoy using it to study the words. After the program itself is typed in, it really doesn't take long to change word lists. A parent or teacher might even have the child or children type in the words.

### SPLAST

```

BM 0 REM COPYRIGHT 1993 - COMP
    UTE PUBLICATIONS INTL LTD
    -ALL RIGHTS RESERVED
RF 10 REM SPLAST BY WILLIAM F.
    SNOW
HD 20 DIMWDS(25),Y(25),R$(25),
    WW$(25),RW$(25):FOR I=1
    {SPACE}TO 25:READ WDS(I)
    :NEXT
GC 30 A$=CHR$(65):E$=CHR$(69):
    I$=CHR$(73):O$=CHR$(79):
    U$=CHR$(85):V=53248:SL=5
    4272
MJ 40 FORS=12288 TO 12351:READ
    SP:POKE S,SP:NEXT
PQ 50 FORS=12352 TO 12415:READ
    SP:POKE S,SP:NEXT
EK 60 POKE53280,1:POKE53281,13
    :PRINT"{BLK}{CLR}
    {3 DOWN}"SPC(17)"{RED}SP
    LAST{BLK}"
EM 70 PRINT:PRINT"{4 RIGHT}THE
    OBJECT OF {RED}SPLAST
    {BLK} IS TO FIND THE MIS
    PELLEDED WORD";
FQ 80 PRINT" AND '{RED}SPLAST
    {BLK}' IT OFF THE
    {2 SPACES}SCREEN.";
DF 90 PRINT" YOU ARE GIVEN THR
    EE WORDS AT A{2 SPACES}T
    IME.";
BF 100 PRINT" TWO OF THEM ARE
    {SPACE}SPELLED CORRECTL
    Y AND ONE IS WRONG.";
KS 110 PRINT" YOU MUST POSITIO
    N";
FA 120 PRINT" YOUR'{RED}SPLAST
    ER{BLK}' UNDER THE MISPE
    ELLED WORD{5 SPACES}(US
    ING A JOYSTICK ";
BG 130 PRINT"IN PORT TWO) AND
    {SPACE}HIT{2 SPACES}THE
    FIRE BUTON.";
CR 140 PRINT:PRINT"{4 RIGHT}TH
    ERE ARE THREE LEVELS.";
KC 150 PRINT"AS THE LEVELSINCR
    EASE YOU ARE GIVEN";
AQ 160 PRINT" LESS TIME TO
    {5 SPACES}FIND THE INCO
    RRECT WORD.
GD 170 PRINTSPC(9)"{4 DOWN}HIT
    ANY KEY TO BEGIN
    
```

```

CS 180 GET WW$:IF WW$=""THEN18
0
AS 190 RC=1:INPUT"{CLR}
{2 DOWN}{3 RIGHT}PLEASE
ENTER YOUR INITIALS";I
N$
XJ 200 RC=1:PRINT"{2 DOWN}
{3 RIGHT}WHAT SKILL LEV
EL?"
SH 210 PRINT:PRINTSPC(10)"1) B
EGINNER":PRINT:PRINTSPC
(10)"2) AVERAGE
EJ 220 PRINT:PRINTSPC(10)"3) E
XPERT
AS 230 GET PLS:IFPLS="1"ORPLS=
"2"ORPLS="3"THEN250
DB 240 GOTO230
MB 250 PL=VAL(PLS)
GQ 260 PRINT"{CLR}{5 DOWN}"SPC
(14)"PLEASE{2 SPACES}WA
IT":PRINT:PRINTSPC(12)"
SCRAMBLING WORDS"
JF 270 POKE2040,192:POKEV+21,1
:POKEV+39,6
GQ 280 POKEV,130:POKEV+1,220
DC 290 FORI=1 TO 25
JP 300 X=INT(RND(.)*25)+1
JC 310 FORCK=1 TO 25:IFX=Y(CK)
THEN300
KC 320 NEXT CK:Y(I)=X
QF 330 RS(X)=WDS(I):NEXTI
DX 340 CT=1
CJ 350 POKEV+31,0:IF CT>25 THE
N920
JB 360 ES=0:XA=130:POKEV,XA:GO
SUB520
QR 370 WG=INT(RND(.)*25)+1:WGS
=R$(WG):IFWGS=R$(CT)THE
N370
GM 380 WH=INT(RND(.)*25)+1:WH$
=R$(WH):IFWH$=WGSORWH$=
R$(CT)THEN380
QE 390 C=INT(RND(.)*3)+1:ON C
{SPACE}GOSUB770,780,790
GA 400 IF PL=1 THEN FOR FL=1TO
25:IF ES=1 THEN460
FM 410 IF PL=2 THEN FOR FL=1TO
20:IF ES=1 THEN460
PB 420 IF PL=3 THEN FOR FL=1TO
15:IFES=1 THEN460
FQ 430 CK=0:PRINT"{CLR}
{7 DOWN}{3 RIGHT}"WOS(1
)SPC(4)WOS(2)SPC(4)WOS(
3)
BK 440 CL=0:GOSUB680
FK 450 IF CL=1 THEN GOSUB870
PQ 460 NEXTFL
GA 470 POKEV+31,0:IF CT>25 THE
N920
JC 480 IF ES=1 THENRW=RW+1:RWS
(RW)=R$(CT):WWS(CT)=""
KS 490 IF ES<1 THEN GOSUB1330
:WW=WW+1:WWS(WW)=R$(CT)
:RN=0
GB 500 CT=CT+1
RE 510 GOTO350
RF 520 WL=LEN(R$(CT)):L=INT(RN
D(.)*WL+1):LES=MIDS(R$(
CT),L,1):LE=ASC(LES)
AQ 530 LT$=CHR$(LE)
GH 540 IFLT$=A$ OR LT$=E$ OR L
T$=I$ OR LT$=O$ OR LT$=
U$ THEN560
JG 550 GOTO520
KJ 560 RV=INT(RND(.)*5)+1:ONRV
GOTO570,580,590,600,61
0
MX 570 V$=A$:GOTO620
DC 580 V$=E$:GOTO620
PA 590 V$=I$:GOTO620
JG 600 V$=O$:GOTO620
RH 610 V$=U$
MK 620 IF V$=LT$ THEN560
AA 630 RW$=LEFT$(R$(CT),L-1)
FG 640 RM=WL-(L):IFRM<1THEN520
DB 650 LW$=RIGHT$(R$(CT),RM)
EP 660 NW$=RW$+V$+LW$
QB 670 RETURN
JQ 680 JY=PEEK(56320)AND15:FB=
PEEK(56320)AND16
FX 690 IF JY=7THEN XA=XA+10:IF
XA>250THEN XA=250
EH 700 IF JY=11 THEN XA=XA-10:
IF XA<30 THEN XA=30
PF 710 POKEV,XA:IF FB=0 THEN G
OSUB730:RETURN
FC 720 RETURN
FC 730 POKEV+31,0:POKE2041,193
:POKEV+21,3:POKEV+2,XA:
POKEV+40,2
GG 740 FOR Y=220 TO 50 STEP-1:
POKEV+3,Y
HJ 750 IF PEEK(V+31)AND2=2THEN
CL=1:RETURN
KG 760 NEXT:RC=0:POKEV+21,PEEK
(V+21)AND(255-2):GOSUB1
300:RETURN
QF 770 WOS(1)=NW$:WOS(2)=WGS:W
OS(3)=WH$:CW=1:RETURN
PR 780 WOS(1)=WGS:WOS(2)=NW$:W
OS(3)=WH$:CW=2:RETURN
MB 790 WOS(1)=WGS:WOS(2)=WH$:W
OS(3)=NW$:CW=3:RETURN
PX 800 PRINT"{CLR}{12 DOWN}
{4 RIGHT}YOU SPLASTED T
HREE IN A ROW"
SC 810 PRINT:PRINT"{8 RIGHT}WI
THOUT A MISTAKE !!!":FO
R RC=1 TO 2500:NEXT
HD 820 RC=0:PRINT"{CLR}":POKE5
3281,1:POKEV+40,0:FORWA
=1 TO 500:NEXT
KM 830 FORI=1TO15:PW=INT(RND(.
)*50):PRINTSPC(PW)"
{BLK}NICE GOING!":NEXT
HE 840 FOR WA=1 TO 2000:NEXT:P
OKE53281,13
BS 850 POKEV+21,PEEK(V+21)AND(
255-2):POKEV+29,0:POKEV
+23,0:CW=0:POKEV+3,0
BM 860 GOSUB1330
PB 870 IFXA<109 AND CW=1 THEN
{SPACE}GOSUB1170:ES=1:R
ETURN
PQ 880 IFXA<205ANDXA>109ANDCW=
2THENGOSUB1170:ES=1:RET
URN
HP 890 IF XA>189 AND CW=3 THEN
GOSUB1170:ES=1:RETURN
EM 900 IF ES=0 THEN GOSUB1300
BD 910 POKEV+21,PEEK(V+21)AND(
255-2):POKEV+3,0:RC=0:R
ETURN
BS 920 RP=INT((RW/25)*100):POK
EV+21,0
SS 930 PRINT"{CLR}{2 DOWN}YOU
{SPACE}SPLASTED "RP"% O
F THE WORDS"
HB 940 PRINT"{DOWN}{2 RIGHT}TH
E WORDS YOU GOT CORRECT
ARE":PRINT
SK 950 FORI=1 TO RW:PRINTRW$(I
),:NEXT
SE 960 PRINT"{HOME}{15 DOWN}
{2 RIGHT}THE WORDS YOU
{SPACE}GOT WRONG ARE":P
RINT
GE 970 FORI=1 TO WW:PRINTWWS(I
),:NEXT
KR 980 PRINT:PRINTSPC(8)"{WHT}
HIT ANY KEY TO CONTINUE
{BLK}"
QK 990 GET WA$:IF WA$=""THEN99
0
CF 1000 PRINT"{CLR}{5 DOWN}"SP
C(13)INS"'S SCORE WAS
{SPACE}"SC
ES 1010 PRINT:PRINT"{3 SPACES}
THE BEST SCORE FOR THI
S SESSION IS"
HR 1020 IFINS=HNS$THEN1040
DC 1030 IFSC=H$THENPRINT"
{4 SPACES}A TIE BETWEE
N "INS" AND "HNS" WITH
"SC:GOTO1060
HB 1040 IFSC>H$THEN HS=SC:HNS=
INS
PR 1050 PRINT:PRINTSPC(15)HNS"
'S{2 SPACES}"HS
GE 1060 PRINT"{5 DOWN}
{3 SPACES}WOULD YOU LI
KE TO TRY AGAIN (Y/N)"
EF 1070 GET PA$:IF PA$="Y"OR P
A$="N"THEN1090
SH 1080 GOTO1070
JE 1090 IF PA$="Y"THENFORER=1T
O25:Y(ER)=0:RWS(ER)=""
:WWS(ER)="" :NEXT
XM 1100 IFPA$="Y" THEN RW=0:WW
=0:SC=0:GOTO200
BE 1110 PRINT"{CLR}{6 DOWN}IS
{SPACE}THERE ANYONE EL
SE WHO WANTS TO PLAY ?
":PRINTSPC(15)"(Y,N)"
JG 1120 GET PB$:IF PB$="Y"OR P
B$="N"THEN1140
GH 1130 GOTO1120
PD 1140 IF PB$="Y"THENFORER=1T
O25:Y(ER)=0:RWS(ER)=""
:WWS(ER)="" :NEXT
EB 1150 IFPB$="Y"THENRW=0:WW=0

```

# PROGRAMS

```

:SC=0:GOTO190
RJ 1160 END
BC 1170 IF PL=1 THEN SC=SC+10
QS 1180 IF PL=2 THEN SC=SC+12
EE 1190 IF PL=3 THEN SC=SC+15
JQ 1200 RN=RN+1:FOR LL=SL TO S
L+24:POKE LL,0:NEXT:PO
KE SL+24,15
XK 1210 POKE SL+5,64:POKE SL+6
,136
RP 1220 POKESL+1,28:POKE SL,49
:POKE SL+4,33:FOR SN=1
TO 750:NEXT
FP 1230 POKESL+1,38:POKESL,38:
POKESL+4,33:FORSN=1TO7
00:NEXT
FM 1240 POKE SL+4,32:FOR T=1 T
O 50:NEXT
EH 1250 POKE SL+1,56:POKE SL,9
9:POKE SL+4,33:FOR SN=
1 TO 700:NEXT
SF 1260 POKE SL+4,32:FOR T=1 T
O 500:NEXT
CB 1270 POKEV+2,PEEK(V+21)AND
(255-2):POKEV+3,0
FD 1280 IF RN=3 THEN GOSUB800:
RN=0
BD 1290 RETURN
AQ 1300 FORLL=SLTOSL+24:POKELL
,0:NEXT:POKESL+24,15:P
OKESL+5,34:POKESL+6,20
0
XD 1310 POKESL+1,8:POKESL,97:P
OKESL+4,33:FORSN=1TO17
00:NEXT:POKESL+4,32
EM 1320 FOR SN=1 TO 50:NEXT:RN
=0:RETURN
MC 1330 PRINT"{CLR}":FORRC=1 T
O 1000:NEXT:ES=1:RETUR
N
DP 1340 DATAGRACE, GRAZE, WHALE,
BRAKE, OPERATE, MISTAKE,
ESCAPE, GRAPES, SAFELY
FR 1350 DATACRAZY, BREAK, GREATE
ST, FARE, SCARE, SQUARE, C
OMPARE, PREPARING, SCARC
E
KM 1360 DATACANARY, RARELY, RELA
TED, RELAXATION, REPUTAT
ION, BARE, RARE
DX 1370 DATA000,000,000,000,00
0,000,000,000
BP 1380 DATA000,000,000,000,00
0,024,000,000
XJ 1390 DATA024,000,000,024,00
0,000,024,000
HJ 1400 DATA000,024,000,062,02
4,124,002,024
HJ 1410 DATA064,002,024,064,00
2,024,064,127
AQ 1420 DATA255,254,064,060,00
2,064,060,002
CB 1430 DATA066,060,066,064,06
0,002,067,255
QB 1440 DATA194,071,255,226,07
9,255,242,000
HC 1450 DATA000,000,000,000,00

```

```

0,000,000,000
MC 1460 DATA000,000,000,000,00
0,000,000,000
HE 1470 DATA000,000,000,008,00
0,000,028,000
KC 1480 DATA000,042,000,000,07
3,000,000,073
MA 1490 DATA000,000,073,000,00
0,008,000,000
EG 1500 DATA008,000,000,008,00
0,000,008,000
AX 1510 DATA000,008,000,000,00
8,000,000,008
GS 1520 DATA000,000,008,000,00
0,008,000,000

```

*William Snow, the author of Scud, is a teacher. He lives in McHenry, Illinois. □*

## ONLY ON DISK

In addition to the type-in programs found in each issue of the magazine, Gazette Disk offers bonus programs. Here's a special program that you'll find only on this month's disk.

### Brush Strokes

By Maurice Yanney  
Lebanon, PA

The object of this arcade-style game for the 64 is to guide a number of randomly moving paint brushes over empty boxes that need painting. With a joystick in port 2 you control a pencil that draws or erases lines on the screen. Since the brushes can't cross a line, you can maneuver them toward the boxes.

Of course, it's not as easy at it sounds. If a brush touches a pencil, the pencil is ruined. You have only so many pencils during a game. Boxes must be painted within a time limit, too, so keep an eye on the clock. When you finish painting one level, you move on to another with an extra brush and set of boxes added each time you advance.

You can have this program, our PD picks, and all the others that appear in this issue by ordering the October Gazette Disk. The U.S. price is \$9.95 plus \$2.00 shipping and handling. Send your order to Gazette Disk, COMPUTE Publications, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408.

## TYPING AIDS

MLX, our machine language entry program for the 64 and 128, and The Automatic Proofreader are utilities that help you type in Gazette programs without making mistakes. To make room for more programs, we no longer include these labor-saving utilities in every issue, but they can be found on each Gazette Disk and are printed in all issues of Gazette through June 1990.

If you don't have access to a back issue or to one of our disks, write to us, and we'll send you free printed copies of both of these handy programs for you to type in. We'll also include instructions on how to type in Gazette programs. Please enclose a self-addressed, stamped envelope. Send a self-addressed disk mailer with postage to receive these programs on disk.

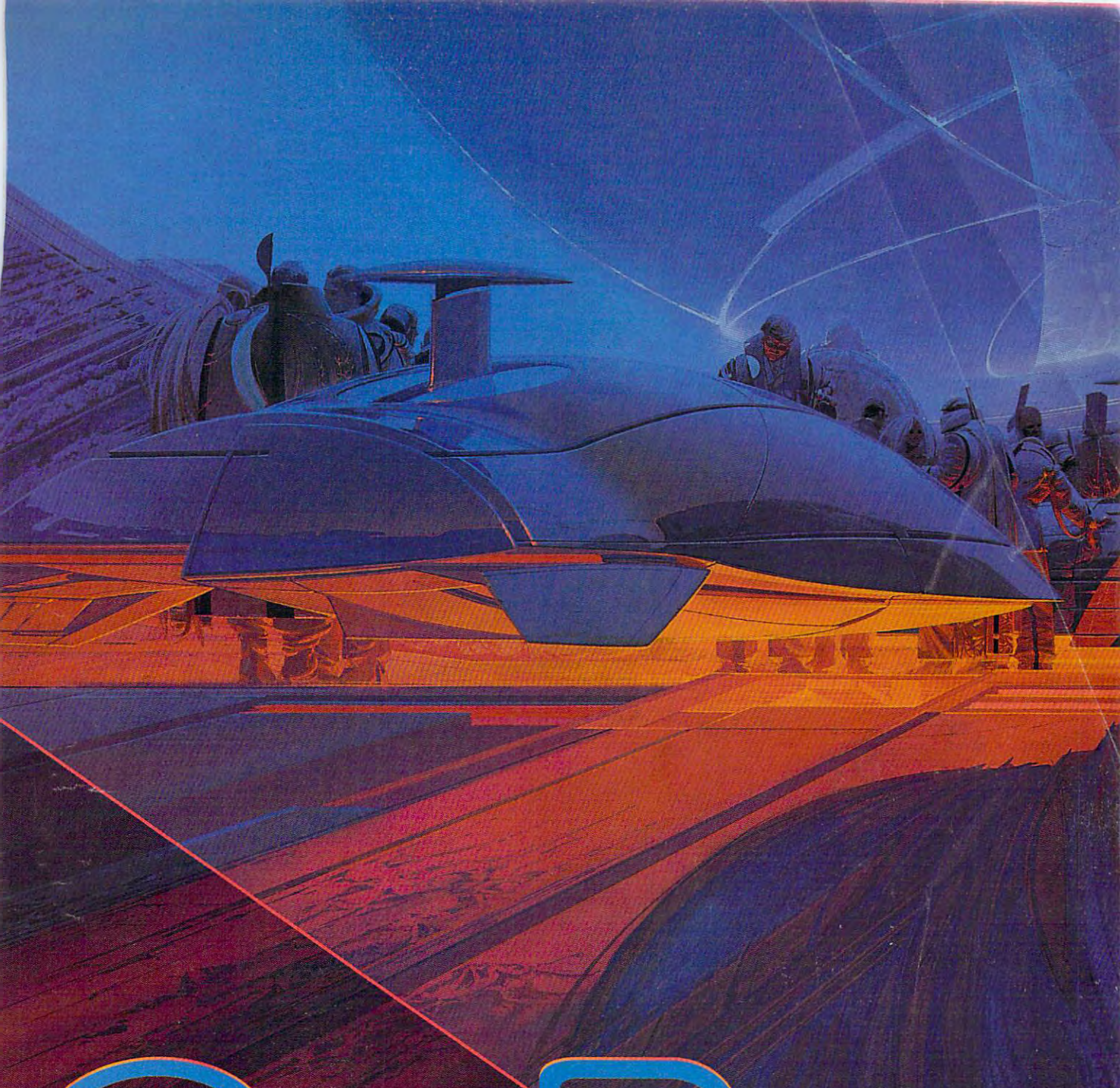
Write to Typing Aids, COMPUTE's Gazette, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408.

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Gazette wants to purchase and publish your utilities, applications, games, educational programs, and tutorial articles. If you've created a program that you think other readers might enjoy or find useful, send it and the documentation on disk to the following address.

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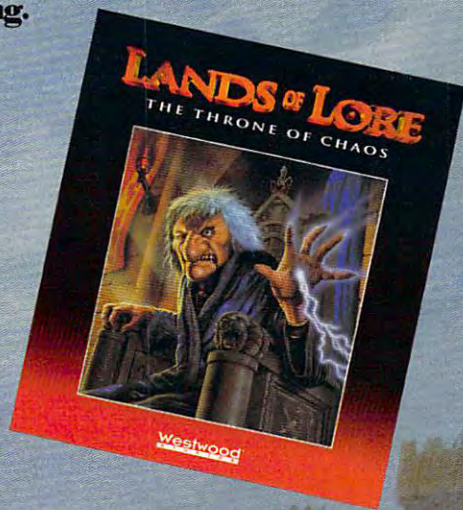
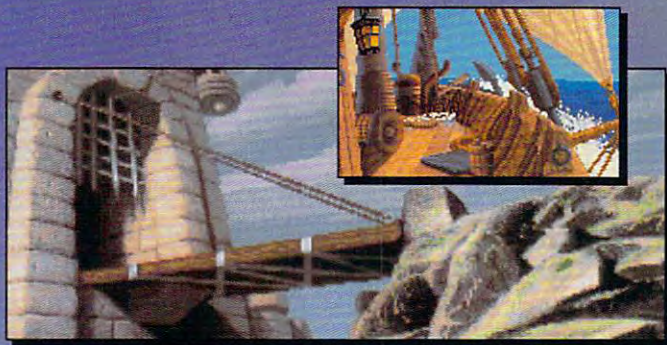
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## NMC UNIVERSAL WINSTATION 433

The Universal Winstation 433 is a pleasant surprise. I've seen many PC systems from small companies over the years, and I'm usually wary of them. Too often, they're designed to sell for the lowest possible price, and they tend to show it—such systems often have flimsy cases, expansion devices that don't work well together, and mushy keyboards. Not so with NMC's Universal Winstation 433. Although this computer comes from a small Utah company that you may never have heard of, it shows all the quality you'd expect from a Dell, Compaq, or IBM machine.

The Winstation I evaluated was configured as a multimedia system, and it meets the new MPC Level 2 specification. No slow, afterthought CD-ROM drive and no-name sound card here—the system sports a Pro AudioSpectrum 16 sound card and a blazingly fast Toshiba CD-ROM drive. The PAS 16 is an impressive board, with 16-bit stereo sound, full Sound Blaster emulation, and software control of all board settings—you can even change the volume from the keyboard while playing a game. The dual-speed Toshiba CD-ROM drive uses a SCSI-2 interface and has a data transfer rate of up to 330K per second and an average access time of 200 ms; it also has a 256K cache that speeds things even more.

The rest of the system exhibits similar quality. The 1MB STB PowerGraph SVGA card uses an S3 accelerator and a VESA local-bus connection to provide exemplary performance in both

Windows and DOS. The board supports 24-bit true color in 640 × 480 mode, 16-bit color at 800 × 600, and 256 colors at 1024 × 768; a handy utility lets you change modes without using Windows Setup. The 200MB Western Digital IDE hard drive is supported

ish as well. More important, it has a solid feel with audible, tactile feedback. The noninterlaced ADI MicroScan 3G monitor has a crisp .28-mm dot pitch and electronic adjustment controls. The multimedia system includes a number of CD-ROMs, including a disc of



*NMC's Universal Winstation 433 exhibits a level of quality you would expect in a more expensive MPC system.*

through an uncached 32-bit local-bus IDE controller. The system has eight slots (two have VLB extensions), five of which are available in the multimedia configuration. The case opens without a screwdriver, making expansion a snap.

With local-bus peripherals and a 256K secondary processor cache, the Winstation's performance is quite perky. (A ZIF socket supports updating to a DX2 or P24T Pentium processor if you ever feel the need for a speed boost.) And in addition to being fast, this system boasts good looks. The case has an attractive molded plastic front, and the space-saver keyboard is styl-

shareware, an encyclopedia, an atlas, games, and a CD-audio classical music sampler.

Documentation for Windows 3.1, DOS 6, the motherboard, and all the expansion cards is included, but NMC didn't stop there. There's a handy 40-page Starter Manual that will get even first-time PC owners up and running; it includes setup, troubleshooting, and technical-support information. This little booklet can make a lot of difference to the wary first-time computer owner; too many companies just toss in the manuals for the components and leave system operation as an exercise for the purchaser.

Best of all, this high quality comes at the price of a low-end clone. NMC provides unlimited toll-free technical support, a one-year warranty on parts, and a two-year warranty on labor. If you're looking for a solid multimedia system at a discount price, I'd suggest you take a close look at NMC's impressive offering.

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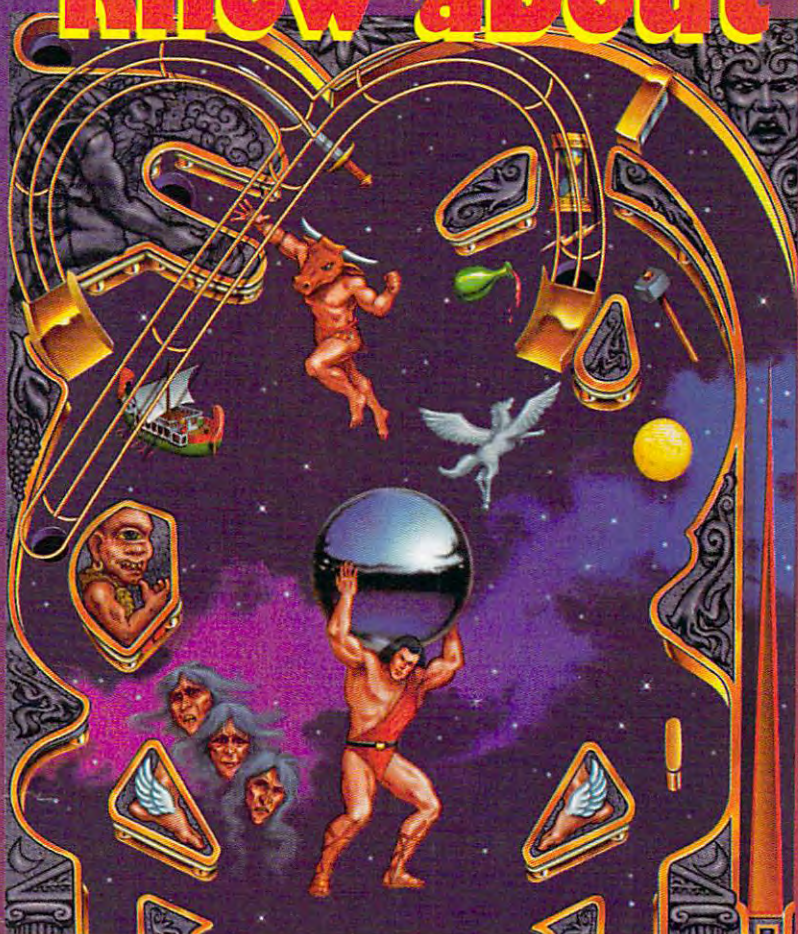
## MICROSOFT WORD 6.0, WORDPERFECT 6.0 FOR DOS

The latest releases of WordPerfect and Microsoft Word are proof that powerful DOS word processing isn't dead. Both programs incorporate features previously found only in Windows applications while retaining the speed of DOS text mode.

The two programs have several similar new features such as drag-and-drop text editing, built-in support for graphic fonts, and optional control bars. Both programs are shipped with dedicated versions of the Grammatik grammar checker.

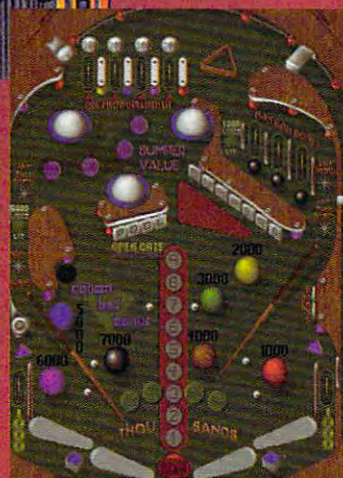
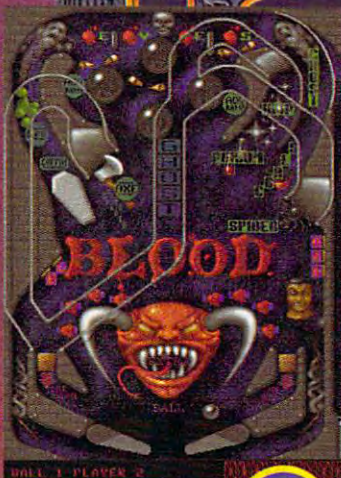
But despite surface similarities, Microsoft Word for MS-DOS 6.0 and WordPerfect 6.0 for DOS aren't as comparable as their predecessors were; they each suit very different needs. For example, if you're using a 286 with a 40MB drive, then Word may be the better choice. The program takes less than 6MB for a full installation, requires only 384K of RAM, and minimally taxes your processor. On the other hand, if you

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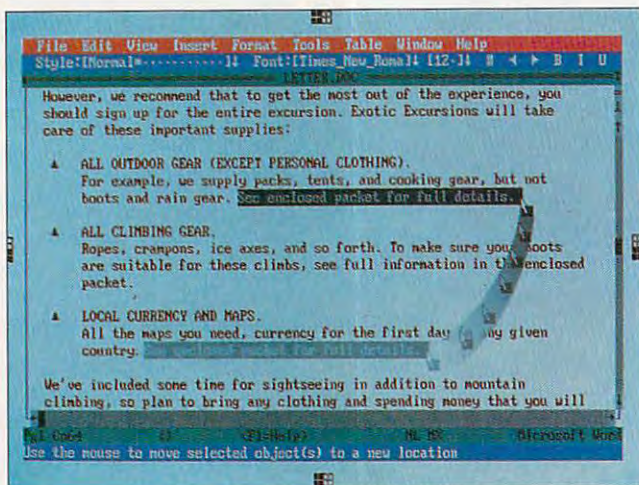
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**MICROLEAGUE**  
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have a fast 386 or better, at least 520K of RAM, and can afford 16MB of hard disk space, WordPerfect is a considerably more flexible program, with impressive spreadsheet, fax, sound, presentation, and desktop publishing capabilities.

WordPerfect 6.0 offers the best of versions 5.1 for DOS and 5.2 for Windows and adds several new features of its own. You can wrap text around irregular graphics, print postal bar codes for bulk mail, and open up to nine documents. This last enhancement was long overdue, and while it's still limited compared to Word—in which you're limited only by available memory—it beats the old two-document limit.

The program lets you switch between text mode and a Windows-like graphical interface at any time. You can compose and edit with the speed of text mode and then switch to VGA graphic mode to place your pictures and make your other layout decisions. The graphic mode, however, is sluggish compared to Windows applications. Screen redraws can be painfully slow when you're using pictures or soft fonts in your document, even on a 33-MHz 486DX with 8MB of memory.

Word 6.0 is a capable DOS program that offers you many (but not all) of the features of Word for Windows 2.0. Its table-creating tool and TrueType fonts are Windows carryovers, as are drag-and-drop editing and automatic bulleting. The program is probably intended to prepare DOS users for the eventual switch to Windows. If you own a 286 or slow 386 but plan to upgrade to faster equipment in the future, you can buy



Among Microsoft Word 6.0's new features is drag-and-drop, which was brought over from its Windows counterpart.



WordPerfect 6.0 for DOS sports a Windows-like interface and the ability to open up to nine documents at once.

Word 6.0 now and upgrade later to Word for Windows 6.0 (Microsoft skipped from 2.0 to 6.0 to bring the version numbers in line) for free under Microsoft's dual-license agreement.

One of the most significant improvements to both Word and WordPerfect is the built-in capability to handle graphic soft fonts. Both support scalable TrueType fonts; WordPerfect also supports Type 1, CG Intellifont,

and Bitstream Speedo fonts. To prevent printer files from becoming too large, Microsoft suggests that you not install more than 5 new fonts at a time and no more than 20 total. WordPerfect's documentation mentions no such limitation.

Unfortunately, "deep architectural problems" prevent Word 6.0 from printing TrueType fonts as text on the popular Hewlett-Packard DeskJet printer. This prob-

lem doesn't exist with other ink-jet printers, and Microsoft says third-party software is available which will allow you to print TrueType as well as other graphic fonts on your DeskJet.

Like WordPerfect, Word allows you to switch between text and graphic modes on the fly. However, there's a big difference between what each program calls graphic. Word can give you bold, underline, and italic screen fonts as well as a preview of special characters, but it's not comparable to WordPerfect's WYSIWYG.

Depending on your word processing needs and hardware, the choice between the latest versions of Word and WordPerfect should be a clear one. If you need maximum speed with minimum hardware, take a good look at Word. If you need more from your word processor than just word processing and have the computing power to back it up, WordPerfect has versatility to spare.

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## DAY OF THE TENTACLE

One's purple, mean, and rubbery; the other's pale, dweebish, and scrawny. Rush Limbaugh and Ross Perot? No, it's the Purple Tentacle and Bernard, stars of LucasArts' magnificent Day of the Tentacle, a B-movie

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## REVIEWS

sci-fi parody that skirts the lunatic fringe of comedy adventure.

Officially, the game is a sequel to 1987's *Maniac Mansion*, but it bears little resemblance to that archaic masterpiece, noted for the debut of LucasArts' SCUMM story system. Graph-



*Day of the Tentacle* is a sequel to the first SCUMM adventure, *Maniac Mansion*.

ics, sound, and storage devices have improved significantly over the past six years. As if to dramatically illustrate exactly how far we've come, the complete *Maniac Mansion*—CGA graphics and PC speaker sounds intact—is cleverly hidden within *Day of the Tentacle*. Whether or not you're familiar with the original, it's a delightful spin down memory lane. Be warned, however: The experience is like falling through a primordial portal of computer gaming. The story remains as clever as ever, but the presentation will make your VGA-loving skin crawl.

Beyond some well-deserved backslapping, the inclusion of *Maniac Mansion* actually fits in with the sequel's wacky premise of time travel. An all-talkie introduction sets the stage: Green and Purple Tentacle, out for a stroll, stumble upon toxic waste discharged from Dr. Fred Edison's secret laboratory. Despite Green's warnings, Purple takes a gulp and is soon transformed into a highly intelligent, super-aggressive appendage, intent on taking over the world.

To prevent further damage, Dr. Fred enlists the help of three kids: Bernard, a well-meaning computer geek; Hoagie, a heavy-metal roadie; and Laverne, a slightly off-center med student and freelance surgeon. The plan is to travel back in time, one day before Purple Tentacle become infected. Unfortunately, Dr. Fred's time machines—retrofitted portable outhouses, called Chron-o-Johns—misfire, zapping our three misadventurers in opposite directions in space and time. Hoagie lands in the era of Benjamin Franklin, while Laverne travels to a future twisted by

the evil Purple Tentacle. Only Bernard returns intact, where he must coordinate joint efforts by his distant friends to halt the Purple threat.

From here, the story takes off into three disparate, but interrelated, sections. Once a link in time is established, you can switch control to each character as needed. The mouse-driven SCUMM interface, refined in the *Monkey Island* and *Indiana Jones* series, remains one of the genre's most intuitive and friendly. Puzzles are object-oriented and relatively nonlinear in nature. Most are of intermediate difficulty, requiring simple manipulation of collected items. The fun part, of course, is simply exploring odd locations and engaging in outrageously funny conversations. Multiple games can be saved and restored for convenience sake. You may get stumped, but unlike other adventures, there's no punishment for wrong actions.

Except for a few short transitional scenes, disk-based users will find the digitized speech ends after the prologue. The CD-ROM version, however, features talking characters throughout. While both versions are identical and equally enjoyable, the full-throated CD edition—containing more than 268MB of sound—is simply fantastic. Professional actors contribute to the success, especially the inspired casting of Richard Sanders, best known as Les Nessman on the TV sitcom *WKRP in Cincinnati*, as Bernard.

Graphics and animation are also excellent, inspired by the Chuck Jones era of Warner Brothers cartoons. Of particular interest is the hilarious opening credit sequence, good enough to sit through several times. Lead artist Peter Chan imparts a wonderfully inventive, almost surreal edge to his wildly exaggerated graphic styling.

Terrific fun from start to finish, *Day of the Tentacle* is one tongue-in-cheek adventure you'll wish would never end.

SCOTT A. MAY

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## SMART ONE 1442FX

Best Data Products' Smart One 1442FX is an external high-speed fax/data modem that's a real bargain. Based on the popular Rockwell modem chip set, the 1442FX provides 14,400-bps transfers in both fax and data mode. It supports all of the popular error correction and data compression modes, such as V.32bis and CCITT

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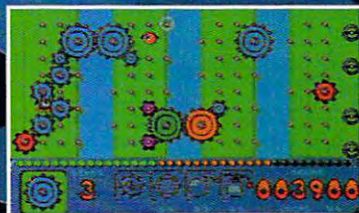
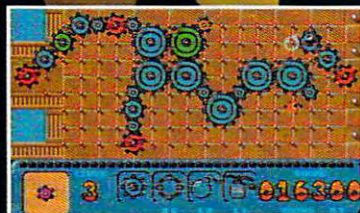
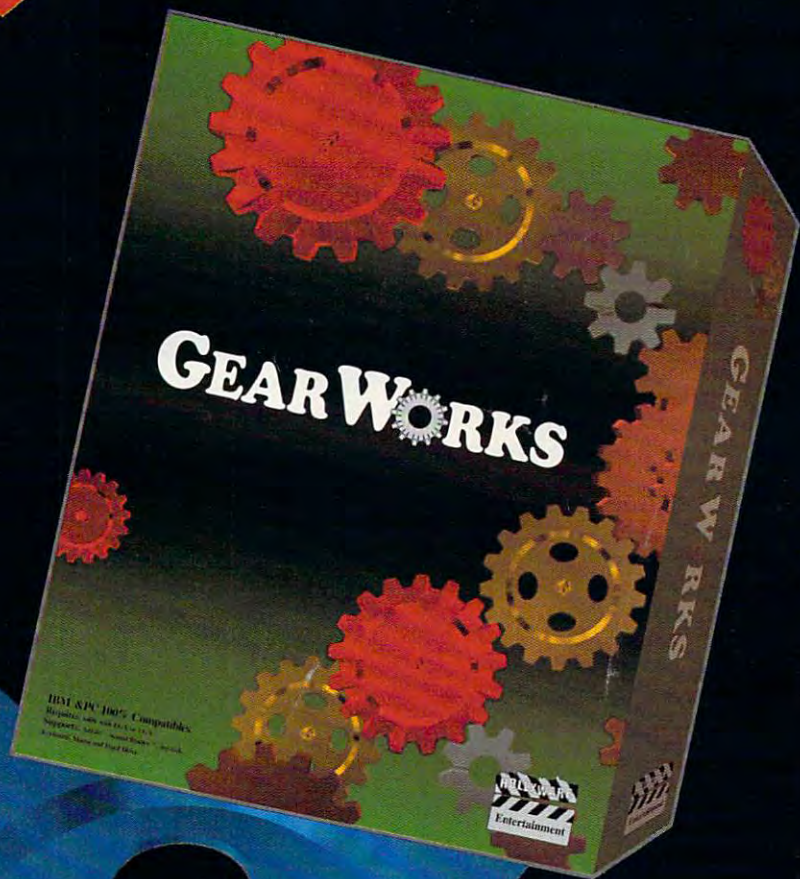
Gear Works is the most unique puzzle game to hit the market in years. In Gear Works you will connect gears of various sizes and colors together in order to transform Twelve Wonders of the Ancient and Modern world into time pieces, while racing against time and friction. Watch out for the Pottins, two gremlin like creatures, that will torment you by rusting the gears and breaking off the mounting pegs.

Game features: Various gear types, over one hundred puzzles to solve, bombs to blow up incorrectly placed gears and a gun to shoot those pesky Pottins off the play area.

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V.17 fax protocol. Connected to a similar modem, the 1442FX can manage transfers of up to 57,600 bps when transferring raw text with compression active. Such speed leaves those of us who remember 300-bps modems almost short of breath.

The sturdy white plastic case is of the "sit under the phone" variety. It sports eight status lights on the front, but unfortunately, the power switch is on the back along with the DB-25 serial connector, power connector, and two phone jacks. At just under two pounds with power connector, it's light enough to pack along with your laptop (and it's much less expensive than battery-powered pocket modems of similar capability). Best Data also sells a less expensive internal version, but the ease of transferring an external modem to another computer and the reassurance of the front-panel status lights make the external model a more attractive choice.

The 1442FX is a solid performer. Many 14,400-bps modems are more finicky about connecting to other brands than the older 2400-bps models, but I had no trouble connecting to many modems ranging in speed from 1200 bps to 14,400 bps. Fax connections were handled flawlessly as well.

The modem I reviewed included the DOS-based QuickLink II fax/data package. Best Data recently announced the Gold Bundle, which includes the 1442FX, a CompuServe introductory membership kit, and the WinCIM terminal program; you may find other bundles at your local retailer as well. Although the modem retails for \$329, it can be found for well under \$200 at discount

retailers. At that price, can you afford not to upgrade to 14,400-bps speed?

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*WinImages:morph gives you the power to create impressive transition-morph animations between pictures.*

## WINIMAGES: MORPH

Did you feel a thrill when T1000 oozed through the bars in *Terminator 2*? Did you record Michael Jackson's "Black or White" video so you could play it for yourself in even heavier rotation? Do you watch "Star Trek: Deep Space Nine" just to see Odo reconstitute himself from a chair or a wine bottle? If so, you're a nut for morphing, the latest fad in computer graphics special effects with, as far as is known, no practical use other than to create startling eye candy.

Morphing comes in two flavors. Transition morphing is the process of smoothly combining two images into a

third that has some of the characteristics of both. Distortion morphing takes an image and radically distorts it to create something weird. For example, if you transition-morph pictures of a lady and a tiger, you get a new image of a tiger-woman. Or you can distortion-mor-

ph animation can take hours to render on even a fast 486. You'll need 4MB of RAM to run the program, but Black Belt recommends 8MB of memory for optimal performance.

WinImages:morph is even easy to use, once you've grasped the basic concepts. (The online manual isn't great, but you'll be able to figure out most features with a little experimentation.) The real skill is in knowing how to choose control points and define boundaries for the best morph effects. You'll gain that skill only through experience. I recommend working with 256-color, single-image output before trying your hand at animation.

One caveat: As a slick special effect, morphing was hot two years ago. Today, even though morphing is new to the PC, people may not be impressed. You'll have to come up with something really spectacular to evoke the same awe *Terminator 2* did back in 1991. But WinImages:morph certainly gives you the tools and the power to do it.

STEVEN ANZOVIN

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composing songs, creating music videos, and experimenting with rhythm and harmony. Accompanied by Edison, their computer companion, your children look, listen, and create as they browse through each room of the studio.

Fluorescent colors flash across your PC's monitor as Rock and Bach Studio's musicians demonstrate rhythms, instruments, and dance moves. Each screen displays options with both words and pictures, allowing children to wander through the program without assistance. The text is casual and friendly in style, so that even a young reader won't feel intimidated.

Kids will encounter a variety of ensembles, ranging from jazz and Latin combos to rock groups to full orchestral sound. Each room in Rock and Bach Studio provides a new musical experience. In The Drum Clinic, children can bang out their own rhythms on their keyboards as they experiment with an assortment of drums, cymbals, and gongs. In The Instrument Room, children discover the history of traditional instruments and the instruments' orchestral value.

Leaping from the traditional to the ultramodern, children can experiment with digitized sound in The Sound Effects Room. As they watch the sound's graphic form, your kids can create their own effects using echo, reverberation, and sound filters.

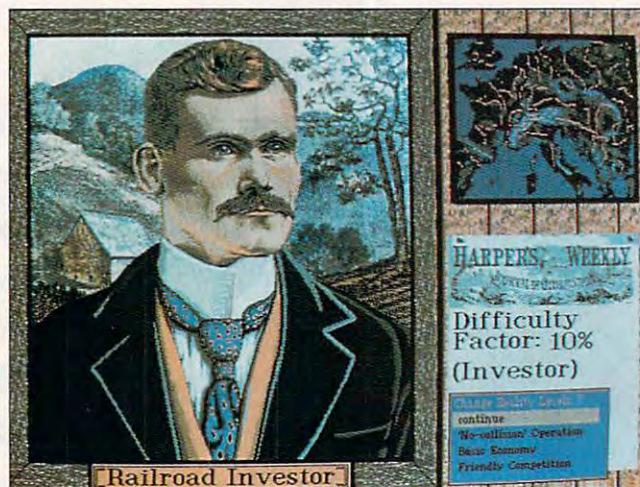
In The Music Room, Rock and Bach Studio uses humor to show that classical music can be interesting. Children learn that Mozart, "the original rock star," began touring Europe at age 7 and that Debussy created

the "original New Age music." Children can also listen to classics by such famous composers as Brahms, Beethoven, and John Philip Sousa.

Once your kids feel comfortable with the fundamentals, they can use this knowledge and their imagination

## RAILROAD TYCOON DELUXE, PIRATES! GOLD

MicroProse has taken two classic Sid Meier games, Railroad Tycoon and Pirates!, and updated them



*Railroad Tycoon Deluxe updates the classic simulation to include SVGA graphics and more locations for your railroad.*

to create a music video. First, they must compose their own song using sections of prerecorded melodies. After mixing their favorite riffs, children can audition musicians to form the band. Then they move to video production to coordinate camera angles, backgrounds, and special effects to complement their music. After they've finished, children can watch their video with Edison or copy it to a disk to share with a friend (the video can be saved in a stand-alone format so your friend doesn't have to own a copy of Rock and Bach Studio to play it).

LISA YOUNG

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for today's PCs. Although the originals still stand as two of the most playable games in the company's history, the Super VGA graphics and more-detailed playing environments of Railroad Tycoon Deluxe and Pirates! Gold make great games even better.

Railroad Tycoon Deluxe is a game of railroad development: You build a rail line from the ground up. You've got to balance economic and logistic considerations while trying to make a large, profitable enterprise grow.

The depth of the economic model and the omnipresent competition from other rail lines make Railroad Tycoon Deluxe an exciting, interesting game that's likely to hold your attention for many hours. You must lay track prudently, build sta-

tions, buy locomotives, and set up schedules which will meet the necessary supply-and-demand requirements of your stations.

Railroad Tycoon Deluxe improves the depth of the economic model (taking into account such things as drastically falling stock prices) and adds several new locations which give you an opportunity to explore not only North America and Europe, but South America and Africa as well.

Unfortunately, the game shows indications that it was rushed into release before some problems were ironed out. It locks up occasionally, and has more than the average share of sound card addressing conflicts. On the map screen, the viewing area sometimes jumps too far away from your mouse clicks. The manual spends an entire chapter taking you through a detailed tutorial railroad which is missing from the Deluxe version's disks. The screen prompts were sloppily done in places, and the copy protection (identifying a locomotive from a picture) presented me with a train which wasn't mentioned in either the manual or the technical supplement.

Railroad Tycoon Deluxe basically puts a pretty face on an otherwise solid game. As far as play goes, the bugs of the new version balance out the enhancements. If you already own Railroad Tycoon, it might not be worth the money to upgrade. But if you never played the original, this is one rail line you'll want to hop aboard.

Pirates! Gold is truly a visual feast, with hand-painted screens that have the feel of Caribbean watercolors. It's off to the seas in a small sloop to seek fame, fortune,

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and many, many dueling scars. Pirates! Gold features three main arenas of action: sword fighting, ocean-faring battles, and land battles. These are connected by a role-playing shell which allows you to court the favor of local politicians, woo beautiful women, and recruit salty dogs in the local pub.

All in all, Pirates! Gold is as addicting a game as you're likely to find. It doesn't take weeks to learn, and it provides hours of fun. In the fencing sequence, you'll find yourself lunging, parrying, and slashing in a duel with an opponent. At first it seems like an exercise in key bashing, but after several duels the madness gives way to method, and you'll discover that there are times when a parry can save your hide and set you up for a low lunge sure to score.

The seafaring battles are a marvel of simplicity. You steer the ship and fire the cannon at your enemy. There are a number of factors to take into account, though, such as the direction of the wind, the fullness of the sails, the cannon reload rates, and the speed of a particular ship. Once an enemy ship has been softened up, you can sail broadside and grapple her, raiding the deck and battling the enemy captain. If you're victorious, you can plunder the ship, then keep the ship or scuttle it.

Pirates! Gold, like Railroad Tycoon Deluxe, does have some problems. For all the beauty of the interaction screens, there isn't much variety (towns of different nationalities should look different). There's no easy way to restore a game (you must exit the game entirely to restart a saved game), and you

can't save a game unless you're in port. Finally, some of the logistical interfaces are a bit clumsy; there's no easy way to switch your command to a newly captured ship until you face combat.

However, Pirates! Gold is a more spectacular upgrade than Railroad Tycoon

able microprocessor speed. But it's not just a pretty face—it's a solid performer backed by excellent product support.

The standard configuration, which I reviewed, has a 33-MHz i486DX, 4MB of memory, a 170MB Quantum hard drive, a 16-bit IDE con-



*Pirates! Gold takes the CGA classic into the Super VGA realm, adding beautiful hand-painted graphics.*

Deluxe: even if you already own the original Pirates!, this new version is certainly worth looking into. In all, both of these games are essential additions to any serious gamer's library.

PAUL C. SCHUYTEMA

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## ARES 486-33DX

The first thing you'll notice about the ARES 486-33DX midtower PC is that it's a very attractive unit, with a smoked-plastic front panel covering the turbo, reset, and power buttons, as well as a bright green LED display which shows the adjust-

troller, dual floppy drives, a 256K external cache, a three-button mouse, a Flash 101 programmable keyboard, a low-radiation SVGA monitor, and a VLB SpeedStar Pro graphics card. Windows 3.1 and MS-DOS 6 are not only included on the hard drive but supplied on disk as well.

ARES provides everything you need to get up and running—and stay running. Along with ample documentation, complete with technical specifications of all components, ARES supplies a system inspection checklist, a CMOS configuration checklist, a printout of the factory diagnostic results, and a lifetime membership card for 24-hour technical support. One unusual service supplied by ARES is remote diagnostics of your system. You can simply use

your modem and the supplied QA Plus software to call the ARES host computer and let the service techs take over and find out exactly what's wrong with your computer.

ARES uses a Micronics MX30 VESA local-bus motherboard, which has a 238-pin ZIF socket for upgrading to a DX2, OverDrive, or P24T Pentium processor. Two 32-bit VL-bus slots and six 16-bit ISA slots provide ample expansion capability. The well-built 19-inch-high midtower case provides easy access to all the system components and card slots.

ARES provides a two-year parts warranty and a lifetime labor warranty with all its systems. With that and the company's remote diagnostics, 24-hour support, and 60-day money-back guarantee, the ARES 486-33DX is a strongly backed, quality system that you can feel secure in buying.

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## REVIEWS

cal and includes sound card support, but it plays only an intermediate-level game. Micro Bridge Companion skips most of the graphics and sound but plays like a bridge expert.

Bridge presents a unique challenge to the computer programmer. Most computer chess games give even good players a challenge; most good bridge players can trounce computer bridge games. Chess deals with straightforward logic, in which standard artificial intelligence techniques excel. Bridge has the added dimensions of probability and statistics (because you're unable to see all the cards).

If you're a competent bridge player, you'll beat Grand Slam more times than not. You'll need to be much better to beat Micro Bridge Companion at the same rate. I had a bit of difficulty evaluating the games' playing strengths during contract bridge matches. The luck of the deal has a lot to do with the final score. It's easy to get carried away with your brilliance after getting several consecutive good hands.

Micro Bridge Companion supports duplicate bridge, and you can pit yourself directly against the computer. I barely managed to keep parity with the computer during duplicate play and succeeded only when I really worked hard.

Besides the usual openings and responses in typical situations, both programs offer a variety of bidding conventions. Weak two-bids and special no-trump bids are among the choices offered. Both programs play using the Stayman convention, but this was only evident in Grand Slam after playing several hands that called for this convention. Its manual, unlike Micro Bridge Companion's, didn't mention this feature explicitly.

Missing from Grand Slam's bidding are the Blackwood and Gerber conventions. These are always present in Micro Bridge Companion's play; in fact, the programmers thought them so important that they can't be turned off, even from the conventions menu. It's almost impossible to bid a slam without these conventions. This is an especially haunting omission that detracts from Grand Slam's playability.

Both games let you load and save deals, so that you can play an especially interesting hand again later, show it to a friend, or challenge someone else to do better than you at playing it.

In either game, you can choose who gets the best hands—either you, your team, or your opponents. Grand Slam will also let you select the deal type,

such as slam, game, no-trump, or a part-score hand. These options let you tailor the games to give you the particular kind of practice you need.

One valuable bonus included with Micro Bridge Companion is a set of 24 deals drawn from *The Bridge World* magazine and designed by Alfred Sheinwold. They're intended to challenge even experienced players, and



*Grand Slam Bridge II has a graphic edge, but plays an intermediate-level game.*

each of the deals tests and illustrates a different concept.

If you like bridge, you'll definitely want to get one of these games. Even if you prefer to play with real people, these games will help keep you in practice. My wife and I use these games to develop our strategy before matches, and they help tremendously. Practicing with these programs may not only help improve your game, but it may also reduce the number of glares you get from your partner.

RICHARD C. LEINECKER

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## MEDLEY PLUS

The Medley Plus multimedia bundle from Cell Micro brings MPC compatibility to your PC in an inexpensive, easy-to-install package. It consists of a sound card, a CD-ROM drive, stereo speakers, and necessary cables. Also included is a starter CD-ROM library consisting of the Toolworks Multimedia Encyclopedia, World Atlas, U.S. Atlas, and Game Pack II.

A small but complete manual guides you through installation. I was able to install the sound card, CD-ROM drive, and all the software in less than an hour. Included on floppy are sound-editing and -digitizing programs, CD-ROM control software, and all the drivers for the CD-ROM and sound card.

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The sound board is compatible with Ad Lib, Sound Blaster Pro II, COVOX, and Disney Sound Source drivers. It has an OPL3 FM stereo synthesizer, which generates 20 voices. The board can produce and play back stereo sounds from four sources at sampling rates ranging from 4 to 44.1 kHz, and it's equipped with an automatic stereo recording level control. You can output to an external amplifier or use the on-board four-watt amplifier, which accommodates two speakers. The CD-ROM drive attaches to a 16-bit interface on the sound card and has a fast 265-ms access time, with a double-speed transfer rate of 300K per second.

Cell Micro gives free phone support during the one-year warranty period.

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## XTREE FOR WINDOWS 1.5

Why bother with another Windows file and program manager? Doesn't Windows do it all? Well, no. XTree for Windows adds more, while making many operations simpler. The package actually consists of three programs: XTree (the file manager, viewer, and archiver), XTree Command Center (the program manager and macro recorder/language), and XTreeLink (the disk-drive sharing utility).

XTree's file viewer and AutoView window are very useful. They display most word processor, graphic, spreadsheet, and database files without having to launch the original applications, which makes browsing your hard drive much faster and easier.

Double-click on a ZIP (archive) file, and it becomes a volume (like an additional drive) in your directory tree. You'll see the ZIP directory, and you can view each file. XTree handles extracting and compressing transparently. I initially had troubles viewing files in the new ZIP 2 format, but a patch available in XTree's vendor support area on CompuServe solved that problem.

XTree Command Center could be the solution for cluttered Windows desktops. Instead of group windows, you create CommandBars. These are like keypads of buttons (icons and/or text) that you click to launch. You can start Command Center when you load Windows or even replace Program Manager with it. CommandBars are easy to create and modify, and they save lots

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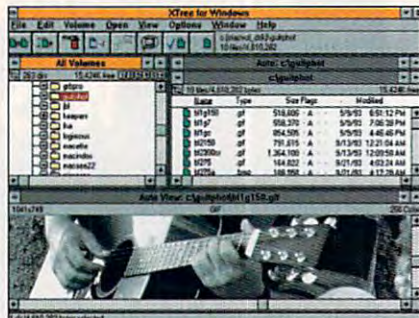
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## REVIEWS

of space on the desktop. You can drag and drop a program or document from XTree onto a CommandBar to make a new button, move buttons from one CommandBar to another, or bring a button into the Event Scheduler to run macros or programs automat-



XTree for Windows has a file viewer that handles graphics as well as text.

ically. You can also have a button display other command bars and assign hot keys to buttons.

Command Center also has a macro recorder, and you can edit and debug these macros using a macro language. The language is simple to learn and provides DDE and Network DDE support.

Finally, XTreeLINK lets you connect two PCs with a serial null-modem cable or a (faster) parallel data transfer cable. All the drives on the remote PC then can be accessed as if they were partitions on the local PC. You can transfer files from your desktop computer to your laptop, and even run programs on the other computer's drive.

XTree for Windows is a fine product and a good value. With its rich feature set, especially the powerful file viewer, this program almost makes me look forward to file management.

J. BLAKE LAMBERT

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## AXONIX LAPSTATION IV

If you've ever priced expansion or docking stations for laptop computers, you know they're expensive and have limited capability. Most cost \$700-\$1,000 and only let you add two or three cards. Few let you add more than a single floppy or hard drive.

Axonix offers five expansion stations that range in price from \$350-\$700. The Viax is a single-slot bus adapter that weighs just two pounds and adds a 2/3-length 16-bit slot. The LapStation

1 has three full-length 16-bit expansion slots, one half-height bay, two third-height bays, and a 60-watt power supply. The LapStation II has four full-length 16-bit expansion slots, one half-height bay, and a 50-watt power supply. The LapStation III has three full-length 16-bit slots, one third-height bay, and a 40-watt power supply. And for the ultimate in laptop expansion,



LapStations are available for most laptops with expansion connectors.

the LapStation IV offers five full-length 16-bit expansion slots, two half-height bays, three third-height bays, and a 150-watt power supply.

All five models can work with a variety of laptops from Toshiba (all models except the Satellite series), Texas Instruments, Compaq (all models except the Contura series), Tandy (486 series), Gateway, Sharp, PC Brand, CompuDyne, Twinhead (Altima series), and many other companies. Each station is customized for your particular brand and model, so you'll need to contact Axonix for availability and price.

I tried a LapStation IV with a Toshiba T6400. It took everything I could throw at it, including a Quantum 240MB Hardcard, an 8-bit network card, a low-end MIDI card, and a VideoSpigot video capture board. The unit is quiet (much quieter than the T6400), and its tower-like case allowed me to place it right beside the T6400. Inside the LapStation IV you'll find the power cables for its five bays and adequate room to install five expansion cards (a sixth slot holds the circuitry that communicates with the computer).

It's hard to find fault with the Axonix expansion stations. With five different models and support for nearly every portable computer with an expansion connector, you can choose just the amount of expansion you need and save a bundle over the manufacturer's own expansion or docking station.

DAVID ENGLISH

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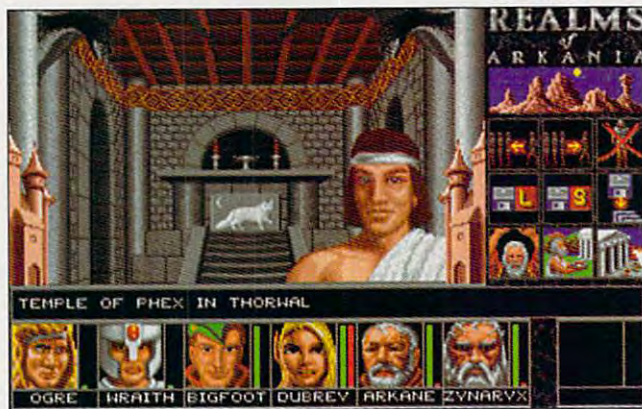
## REALMS OF ARKANIA

Sir-Tech, best known for the antediluvian adventure epic Wizardry and its numerous sequels, has journeyed across the Atlantic to bring U.S. gamers Realms of Arkania, based on the German pencil-and-paper role-playing game Das Schwarz Auge (The Black Eye).

Realms of Arkania uses a typical find-the-magic-item story line to preface the action. The powerful Blade of Destiny has been lost; it must be retrieved by tracking down nine pieces of a map and journeying deep into Orc territory. Some of the map pieces are obtained simply by saying nice things to nonplayer characters (NPCs), but others are earned only after grueling quests.

The character creation process is where Realms of Arkania first and most strongly deviates from a typical adventure game. In addition to such traits as strength and dexterity, characters also suffer from a variety of negative attributes like necrophobia (not good to have when battling against undead creatures) and a violent temper (the root cause of many a dysfunctional adventuring party). If you don't want to bother with creating a party, you don't have to; several saved games with pregenerated parties are included.

Once the party has been created, the adventure begins in the small seaside town of Ragnar. After you've explored the town, talked to various NPCs, and equipped the party, it's time to start the quest proper. A large map of Arkania is displayed on the screen with red dots indicating each lo-



The characters in Realms of Arkania can have negative traits, such as short tempers and necrophobia.



More After Dark provides 25 new screen saver modules, such as butterfly-chasing Boris the kitten.

cation. Traveling to an adjacent town is as simple as clicking the right mouse button and selecting your destination.

If the trip is a long one, the heroes are likely to encounter some not-so-nice creatures and enter the combat sequence. This uses a 3-D isometric perspective of the action similar to that in The Immortal, Electronic Arts' aging action-adventure game. Each character in the

party has a limited number of movement points to move and attack the bad guys, making battles much more a test of brainpower than a test of reflexes. The computer can also fight the battles if you're not up to the task. The more battles you win, the more experience points you receive, and the more powerful your party will become.

The graphics in Realms of Arkania vary from se-

quence to sequence. The town and dungeon graphics are a bit weak, the NPC and character portraits are excellent, and the animation in the battle sequence is limited (the characters and creatures are quite small) but detailed. The sound effects are also a mixed bag; they're best during the battle sequence. And the music is nice at first, but the repetition gets annoying after a while.

The first game of a promised trilogy, Realms of Arkania has plenty of depth and will appeal to fans of Wizardry and Might and Magic (to which the game has more than a passing resemblance). Adventurers expecting the realtime action of an adventure game such as Ultima Underworld won't be as impressed.

ZACH MESTON

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## MORE AFTER DARK

Measured in hours run, screen saver programs would have to be the most popular category of computer programs. If your screen saver is After Dark or Star Trek: The Screen Saver, you're in luck—Berkeley Systems has a terrific package of new screen saver modules for you.

The 25 modules include a man on a riding lawn mower (no matter how much he cuts, the grass keeps growing), Boris the kitten (he playfully chases a butterfly), exploding Boggilins (these strange creatures look like a cross between a dill pickle and Santa Claus), ascending washing machines and



refrigerators (this one's called Om Appliances), and various flocks (these include flying birds, swimming polliwogs, swarming bees, and spinning atoms).

Other modules feature Origami paper folds, dominoes, sunbursts, and fractal forests. To top it off, you get a module that's also a playable space arcade game, called Lunatic Fringe. Many of the screen savers support 256-color Super VGA displays and Windows-compatible sound cards.

If you own After Dark or Star Trek: The Screen Saver, check out More After Dark. It's a great way to liven up a dull computer.

DAVID ENGLISH

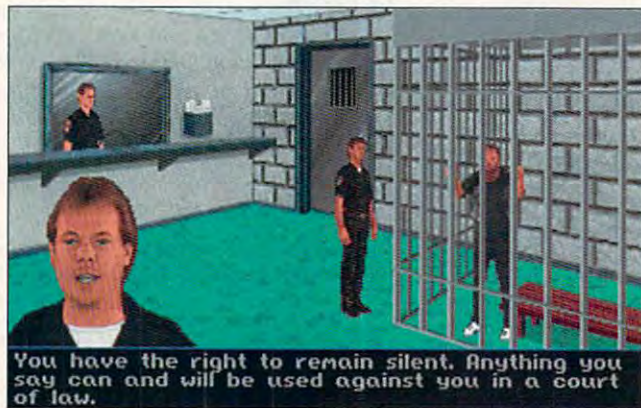
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## BLUE FORCE

Blue Force, Jim Walls' new police game, represents a modest improvement over Tsunami's debut animated adventure, the grim Ringworld, but falls well short of Walls' best work on Sierra's Police Quest series.

You're a motorcycle cop in a small coastal city who's on the trail of gun smugglers—one of whom, coincidentally, is the killer of your parents. The interface (a variation on Ringworld's) is sharp and easy to use, and the sideways scrolling used on occasion is a significant improvement over the static scenes that typically accompany such games. The intercut animations are moody, and the music unobtrusive. Some sharp animated digitized images are used in the closeups for conversation. (However, the conversations are lamentably one-track.)



Blue Force is the newest game from Jim Walls, the police officer who helped create the Police Quest series.

The problem here's the story. It's not as linear as Ringworld, but there's also not much here that doesn't bear directly on the smuggling case (aside from flirting with the bird at the jail's info desk or running Tsunami demos on the computer at home). In Police Quest, Sonny Bonds invariably had a lot to do—much of it enjoyably tied up with police procedure and not strictly related to the central quest. Here, procedure has been reduced to filing evidence, cleaning your gun, and using the appropriate radio codes.

And you don't do even that much in the second half of the game, in which you're sort of an adjunct PI who doesn't use search warrants and is allowed to throw hand grenades. (Once again, you're part of a team but have no control over its other member. And what's the point of a police game in which police don't behave like police?) Happily, there is some variety in the ending—but you may still be trying to swallow the suspect Walls springs on us. I'll let Tsunami off with a warning this time.

PETER OLAFSON

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## ETERNAM

If you played Data East's Drakkhen, you'll recognize Eternam almost instantly. This two-year-old Infogrames adventure—brought over from France by Capstone—gives every evidence of being the promised sequel to that flawed but fascinating game.

To PC users, that may not sound like much of a recommendation. Drakkhen was a delightfully atmospheric game when it originally appeared on the Amiga—distinctly ahead of its time with its four independently controlled characters—but it was translated poorly to the PC.

Eternam, designed expressly for the PC, would seem to be an attempt to get it right. It preserves Drakken's basic structure: a first-person view outdoors, with a polygon ground and bitmapped scenery and monsters, and a third-person graphic adventure inside the various towns and castles you'll explore.

The obvious weaknesses in the original have been corrected. Now you can really talk to these people, and the puzzles aren't hopelessly obtuse. The landscape is now dotted with hills and has irregular shorelines—far more realistic than Drakken's flat rectangular slabs of terrain—and control of combat has been restored to the player.

What's missing, sadly, is the intriguing weirdness of Drakken. You never quite knew what you were going to run into out there on the darkening plain, and that added a deeply addictive effect to the game. Here that weirdness is replaced by a silly sense of humor that's more peculiar than amusing. (Remember: The French revere Jerry Lewis.)

Eternam's certainly more accessible than its predecessor. It's bigger, prettier, more playable, but, alas, it's also less compelling and more conventional. Something gained, but something lost. C'est la vie, eh?

PETER OLAFSON

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## SJ-144

The SJ-144 printer from Star Micronics is a tough creature to categorize. Its upright configuration and the small footprint of its six-inch-deep case suggest an ink-jet or bubble-jet printer. But inside is a conventional-looking printhead and ribbon cartridge like Star's classic dot-matrix printers. The manual's "Specifications" section mentions a "heat fusion printing process," while its front page simply describes it as a laser-quality printer.

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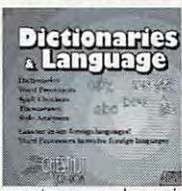
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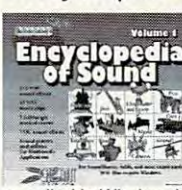
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### Encyclopedia of Sound



Produced by The Music Factory, The Encyclopedia of Sound contains 250 sound files, including sound effects, voices, music clips, and full length original musical scores which may be used royalty-free for a wide variety of applications. The files are supplied in Windows' WAV format, and are (DDD) digitally recorded, mastered, and duplicated in full-range stereo. Also includes a large number of sound utilities.

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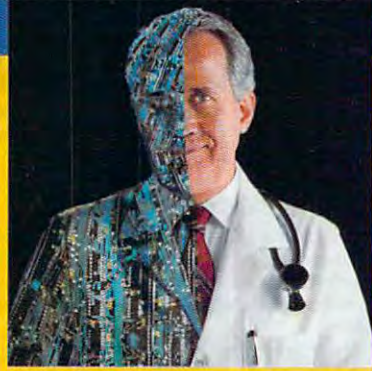
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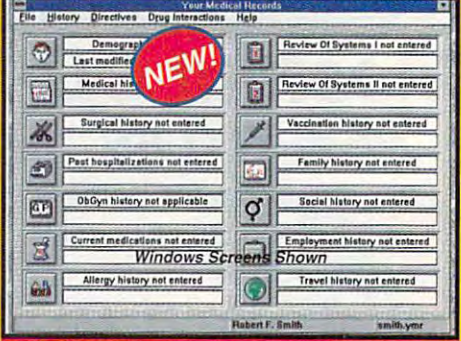


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But there's no question about the quality of the SJ-144's text output. Standard characters have 48-dot-high definitions, doubling the precision of premium 24-pin printers, and the 360 dot-per-inch resolution bests most lasers. The crisp, jet black characters have a slightly glossy surface that makes them practically leap off the page.

With its unique 144-element print-head, the SJ-144 can print two and a half lines of text in a single pass. The result is very quick printing at a rate of 255 characters per second for 10 cpi pica text (equivalent to 2.3 pages per minute, according to Star). Most impressively, the SJ-144 delivers its highest level of quality at this speed. It has no provision for draft-quality printing, nor does it need one.

This printer might be hard to pigeon-hole, but it's a snap to use. The Windows driver installs easily and includes 15 scalable TrueType fonts, usable from nearly all Windows programs. Under DOS, the SJ-144 supports the command sets of popular Epson and IBM printers for wide compatibility.

It's an extremely versatile printer. Overhead projection transparencies and iron-on transfer material are available from Star, as are special strip-label ribbon cartridges, containing 1/2-inch-

wide preprogrammed label material in a variety of colors.

The \$599 suggested retail price seems appropriate for its capabilities, near the top of the dot-matrix range but comfortably below most laser prices. Per-copy costs are modest. Ribbon prices are reasonable, while the built-in sheet feeder avoids the expense of continuous-form paper.

The SJ-144's biggest shortcoming involves graphics printing. Continuous-tone images like photographs are often spoiled by horizontal bands. The manual's "Optimizing Print Quality" describes an adjustment which helped a little, but never completely cured the problem.

Its color capabilities were also somewhat disappointing. Star claims "vibrant, full-color printing," but only solid, saturated colors came out well. And skin tones showed particularly weak reproduction. Color printing is also quite expensive. No matter how much (or little) of a color a row of pixels contains, the SJ-144 makes four passes over the row, using a different-colored segment of ribbon each time. For each pass, it advances the ribbon to find the next color, limiting the color ribbon's life to a scant eight pages.

But, in general, the SJ-144 is an at-

tractive package, well-suited for home or low-volume office use. It isn't quite as fast as a laser printer, and the ribbon costs average out a bit higher than laser printer toner. But the lower initial price and no-compromises printing quality weigh in its favor. The SJ-144 is versatile and easy to use, and it's a good little printer overall.

TIM VICTOR

Star Micronics  
(800) 447-4700  
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Circle Reader Service Number 304

## IMSI PC STYLUS, IMSI MOUSE

Does your old mouse make clicking a drag? International Microcomputer Software, Incorporated (IMSI) has two alternatives for you.

The IMSI PC Stylus has a penlike design for those who find a mouse unwieldy. Artists in particular may find the Stylus easier to draw with than a mouse. The primary (left, on a mouse) button is prominently placed near the base of the Stylus and has a raised knob, making it easy to identify by touch. The center and right buttons are side by side and directly above the



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The PC Stylus can be held like a pen, or flipped over and used as a trackball.

left button—a position I occasionally found awkward.

If you work from a laptop or notebook PC, you'll be delighted that the Stylus doesn't need any desk space at all. You can use the Stylus on almost any surface—and if no surface is available, you can flip it over and use it as a thumb-driven trackball. The only Stylus-resistant surface I've encountered so far is, ironically, a mouse pad—the nonrubberized ball of the Stylus lacks the traction necessary for use on a mouse pad. The Stylus has an adjustable resolution of 400 to 1200 dpi. It comes with a vinyl carrying case and Cursorific, a program that lets you choose from a number of novelty cur-

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sor designs—just the thing for Windows users who are tired of looking at the same old arrow and hourglass.

For those of you who prefer a traditional mouse, the IMSI Mouse has a graceful, yet practical, design. It fits neatly in the hollow of your hand, with three equally sized buttons spaced for your fingers to reach naturally. The tracking speed is easily adjustable, so using the mouse requires minimal hand movement; the 6- x 8-inch pad included in the package provides more room than you'll really need. If you use a pointing device to create graphics, you'll appreciate the IMSI Mouse's resolution range of 290 to 2900 dpi, which allows for finer detail in creating designs onscreen. To take advantage of its high resolution, the IMSI Mouse is packaged with Image72 graphics software. The program supports a hand-held scanner as well as the mouse and can import and export a number of graphics and desktop publishing formats.

Besides the installation software, the IMSI Mouse and the IMSI PC Stylus come with MenuDirect Gold, a menuing program with a file manager, calendar, and calculator. Both packages provide adapters for 9-pin and 25-pin serial ports; the Stylus also includes an adapter for a PS/2 mouse port. And both packages are compatible with Microsoft, Mouse Systems, and Windows drivers.

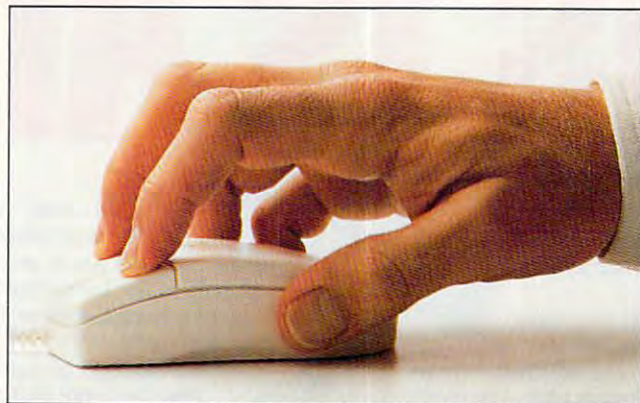
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*The IMSI Mouse has a graceful three-button design, adjustable tracking speed, and a resolution range of 290 to 2900 dpi.*



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In a few short hours, it's Kayla's birthday. Fatty Bear springs to life to prepare a surprise party, with the help of Matilda Rabbit and Gretchen the doll. Your task is to guide Fatty Bear through more than 30 locations and wrap presents, make decorations, and find ingredients to bake a birthday cake. There's plenty to see and do as you explore the four-story house, garage, yard, and tree house.

There are also fun distractions that can keep you from your quest. Practice your math skills as you take

in a few games of lawn bowling. Sit down at the piano to hear one of ten short tunes, or compose and save up to ten original songs. Many more diversions await, if you know where to look.

The title marks the third and best offering from Humongous Entertainment, a company cofounded by Ron Gilbert, creator of LucasArts' popular Secret of Monkey Island series. As you'd expect, Gilbert's influence is readily apparent in the game's singular graphic style and delightfully off-center sense of humor.

When children point and click on almost any object, they're rewarded with extravagant and inventive responses. Birdhouses don't just cheep, they detach from tree limbs and rocket about the yard. Lifeless bathrobes break into tangos, and normally sedate chairs gallop around the room. It's silly, yet quite sophisticated, and not at all condescending to developing intellects.

The designers do a remarkable job in structuring the game to appeal to each stage of its three- to seven-year-old target audience. For the youngest players, it's an attention-keeping, interactive festival of fluid animation, humorous sampled sound effects, and remarkably crisp digitized speech. Older kids will have no trouble reaching the end, and although the game's story line never changes, the sheer diversity of discovery beckons them to join in on Fatty Bear's birthday quest again and again.

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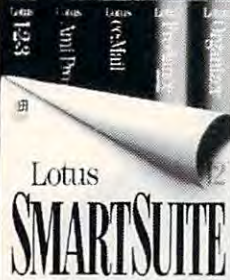
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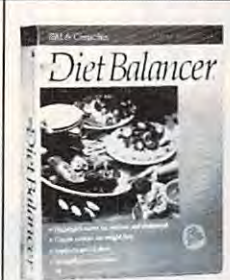
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Battlechess 34	Mayo Clinic 49	Air Bucks 34 <sup>95</sup>	Darkseed 39	Washington DC 29 <sup>95</sup>	Mario is Missing 35 <sup>95</sup>	Ready Set Read 29 <sup>95</sup>	Pinball 29 <sup>95</sup>
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## REVIEWS

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TurboBooks can be used with any computer equipped with Windows 3.0 or higher. They basically look like any other Windows text program. If you're comfortable sitting in front of your PC for hours at a time, reading fiction on the screen may not bother you. Once you're interested in the plot, you forget about the mechanics and just enjoy the story. But if you love to feel the texture of a book, using a mouse or computer keys just isn't the same.

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Another unique feature of TurboBooks is the cruise control, which will automatically turn the pages at any speed you set. This saves you the extra step of clicking the mouse or pressing the Page-Down button, but it can also be frustrating since pages have varying amounts of text. On the longer pages, you have to rush to finish reading before the cruise control turns the page, but on the shorter pages you have to wait for the PC. I found it easier to use the Page-Down button to get a new screen.

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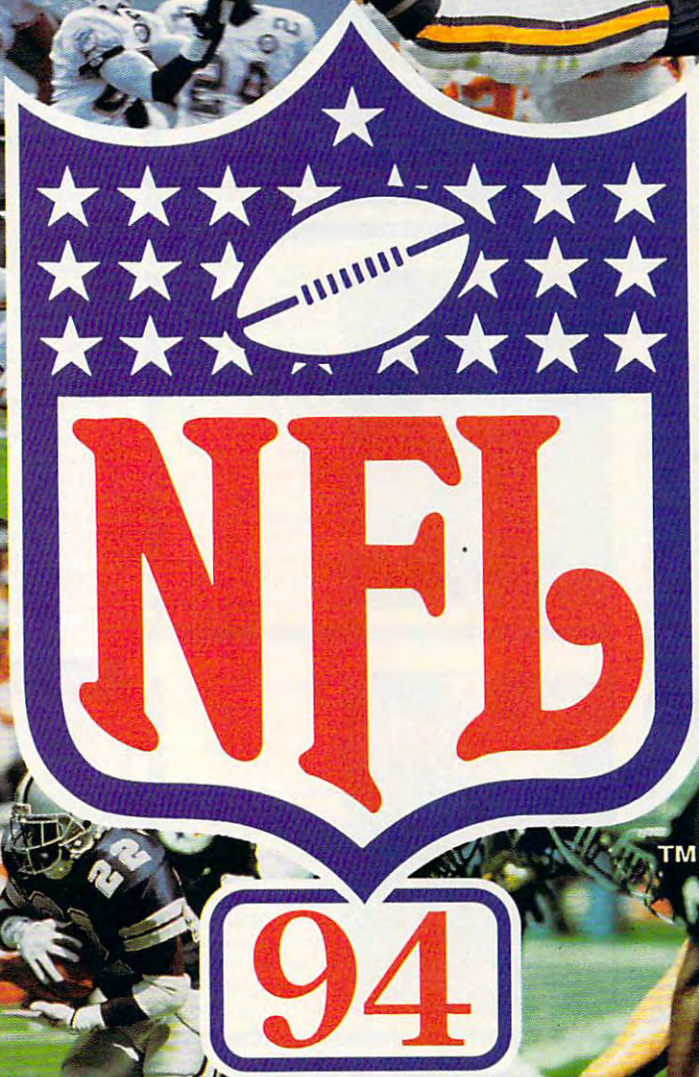
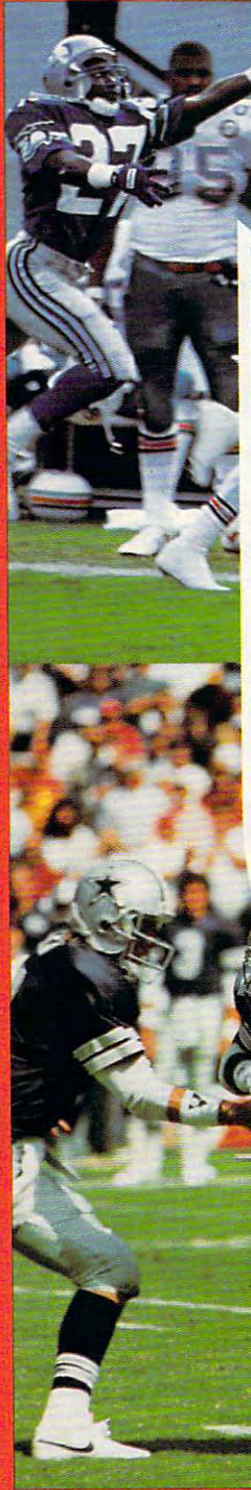
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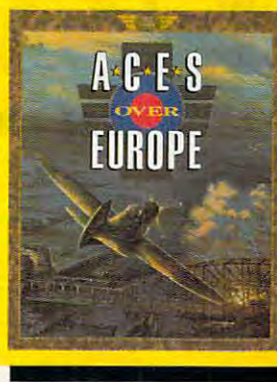
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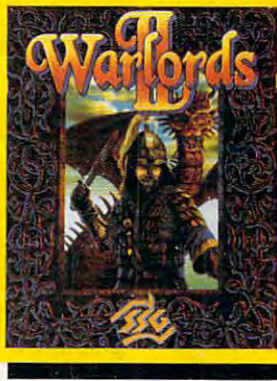
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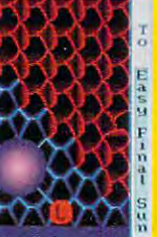
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# Advertisers' Index

Reader Service Number/Advertiser	Page	Reader Service Number/Advertiser	Page	Reader Service Number/Advertiser	Page
162 8-Bit	G-11	129 Hyperlight Enterprises	150	Q Enterprises Software	G-23
194 Abacus	51	IBM	5,33,67	196 Quadra Interactive	45
169 Access Software	74,75	183 Impressions	25	138 Ramco Computer Supplies	156
Adventure LearningWare	150	222 Interplay	131	163 ReadySoft Inc.	127
229 Amish Outlaw Shareware Co.	154	Intuit	71	135 Revell-Monogram, Inc.	97
157 AMTEX Software Corporation	123	232 ISL Software Corporation	156	212 SaleSoft Systems Inc.	150
233 Arnie's Answers	154	186 Jack Daniels	65	182 ScanRom Publications	155
137 Automap Inc.	103	231 Jackson Marking Products Co. Inc.	148	School of Computer Training	148
Bare Bones Software	154	JP PBM Products by Mail	G-21	School of PC Repair	148
152 Bear Technologies	G-23	124 Kaltek Labs	G-23	Serif, Inc.	13
Best Personalized Books	149	197 KF-PD Software	G-11	116 SeXxy	152
173 Blue Valley Software	154	178 LACE	152	140 Sierra OnLine	59
121 B.R. ROMS	152	Landmark Solutions, Inc.	149	148 Sierra OnLine	BC
181 Caloke Industries	G-21	164 Legacy Software	150	Sign Up	148
118 Cell Micro	147	123 Logitech	55	109 Smart Luck Software	152
167 CH Products	139	159 Mad Man Software	G-13	142 SMC/Software of the Month Club	154
175 Chips & Bits	143	199 Mallard Software	109	126 SoftShope Inc.	150
174 Citizen American Corp.	15	158 Maxis	129	210 Software Support International	150
139 CMD/ Creative Micro Designs, Inc.	G-9	113 MECC	17	190 Software Support International	G-5
223 Colorado Spectrum	64	215 MediaVision	79	SOGWAP Software	G-13
209 Compaq	IFC.1	184 Micro Electronics	30,31	145 SOMICH Enterprises	154
150 CompSult	154	211 MicroLeague Sports	117	201 Spectrum Holobyte	34,35
114 CompSult	G-11	143 MicroProse	57	154 Spirit of Discovery	39
240 Compton's NewMedia	87	MicroSoft	60,61	130 Starware Publishing Corp.	153
Computer Business Services	148	MicroSoft	95	179 SubLogic	104,105
225 Computer Friends	154	236 MicroStorm Software	G-23	Sunrise Software	G-21
Comtrad	144	218 Multimedia Software Distributors	146	147 Thrustmaster	151
125 Creative Labs	3	191 Needham's Electronics, Inc.	146	Turner Products	156
238 Creative Pixels Ltd.	G-23	105 New World Computing	125	193 Turtle Beach Systems	137
144 CyberDreams	113	215 Nintendo of America	IBC	242 Tycom	G-21
106 Davidson	41	141 Odyssey OnLine	152	170 UNI-ROM	156
151 Davidson	43	149 Opcode Interactive	55	112 U.S. Robotics	69
161 Delphi	19	205 Origin	63	127 Value Software Inc.	152
131 DemoSource	151	203 Origin	119	219 Viacom New Media	93
239 Disks O'Plenty	G-23	OSCS Software Development	156	195 Virgin Games	80,81
208 Disk-Count Software	140,141	156 Pacific Microelectronics Inc.	146	132 Virgin Games	114,115
192 Dr T's Music Software	129	108 Panasonic	6,7	189 Walnut Creek CDROM	155
136 Dr T's Music Software	128	133 Papyrus	27	172 Wedgwood Rental	154
D&K Enterprises, Inc.	149	220 Parsons Technology	77	128 Windows 900	153
165 Electronic Arts	90,91	168 Parsons Technology	21	Product Mart	146,147,148,149,150,151,152,153,154,155,156
213 Embassy Quality Products	120	221 PC Enterprises	156	Classifieds	157,158,158
230 Fairbrothers	150	237 PC Zone, The	46,47	104 COMPUTE Books	G-19
134 Fantazia Concepts, Inc.	150	235 Pentragon Software Library	156	COMPUTE's Editor 900 Line	142
FGM Connection	G-11	103 Penthouse OnLine	130	COMPUTE's SharePak Disk Subscription	101
115 Free Spirit Software	133,135	107 Penthouse Modem	157	Gazette Disk Index	G-21
216 Fusion Software	151	Penthouse Photographer	137	Gazette Disk Subscription	G-13,G-16
228 Genovation Inc.	146	200 Peoples College	142	Gazette Single Disk	G-40
110 Grapevine Group, The	G-7	153 Performance Peripherals, Inc.	G-21	Gazette Specialty Disk	G-15
187 Grolier Multimedia	11	207 Pixel Perfect	136		
217 Herne Data Systems Ltd.	150	224 Prolit Group, The	153		
117 Hollyware Entertainment	121	227 Psynopsis	82		
234 Horse Feathers Graphics	G-23				
111 Humongous Entertainment	23				

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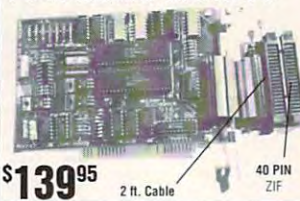
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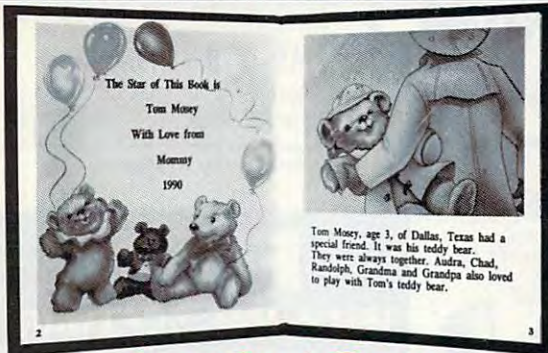
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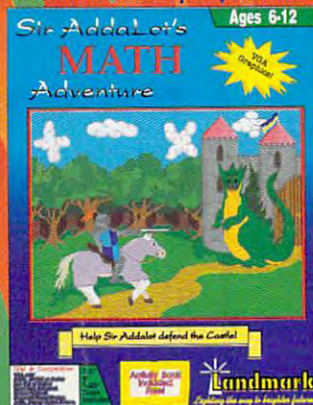
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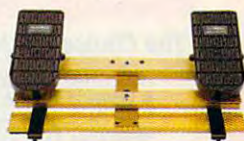
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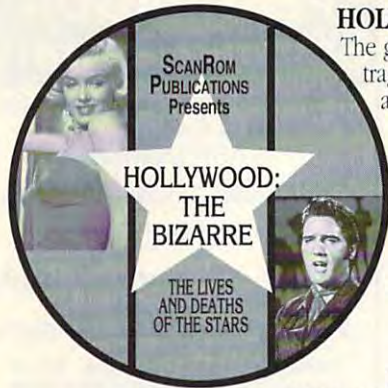
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