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THE FINGERTIP ARCADE

BY GREGG KEIZER



Modern life's too much like the military: Hurry up and wait. Get to the airport early for a flight that's always late. Fume at the endless columns of cars in a traffic jam. Spend hours watching the clock in some doctor's waiting room.

Cellular phones, laptop computers, and countless other minutiae of modern life struggle to make that downtime productive. But who wants to work every moment? The mobile office can quickly become a mobile prison, with work *always* at your fingertips. But what if you just want to relax?

Sure, you can wile away the hours with a magazine or book—time well spent. But for a generation born to television and weaned on video, electronic games draw leisure time like filings to a magnet. You can't cart a TV and game system across the country, of course, so if you want fun on the move, you need something miniature. Fortunately, a quartet of videogame makers figured this out and would like nothing better than to put a machine in your hand and make an instant arcade.

Familiar names like Nintendo, Sega, NEC, and Atari label the hand-held games. You can find machines priced for the impulse buyer willing to exchange a few dollars for a few minutes of entertainment. Other game machines are serious investments, complete with prices some may find shocking.

No matter what your condition—video junkie or game dabbler—just remember this: Nothing's better for killing time than killing aliens.

Boy, What a Game!

If you've seen someone playing a hand-held videogame, you've probably seen Nintendo's Game Boy. The giant of home videogames is also the king of the hand-helds.

Even among these shrunken systems, Game Boy is tiny. It fits snugly in one hand and is light and rugged enough to stand up to a six-year-old. Battery life is excellent, easily the best of any portable arcade machine. It's not uncommon to play 24 or more hours before you need to replace the four AA cell batteries.

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Game Boy's biggest problem is its black-and-white 2½-inch LCD screen. Because it isn't backlit, Game Boy's screen is hard to see under all but the best lighting. The blocky resolution doesn't help, either. Game Boy games look rough, and the characters are sometimes tough to make out. Don't expect anything close to the clarity of a Nintendo game when you flip the switch on a Game Boy.

Three things sold over 3 million Game Boys in its first 18 months in the U.S.: its \$90 street price, a flood of

game cartridges, and millions of kids hooked on the Nintendo name.

It's no surprise then that classic Nintendo characters like Mario made it to the small screen in cartridges like *Super Mario Land* and *Dr. Mario*. Sports games like *Baseball*, action movie spin-offs like *Robocop*, and arcade games like *Pipe Dream* help fill out Game Boy's roster of over 60 titles (double that by the end of the year, Nintendo claims). Puzzle games like *Tetris* (included with Game Boy) and *Ishido* arguably make the best use of the machine, since they don't depend on fast-moving targets or detail, two things Game Boy's screen has trouble delivering.

But because Game Boy games span a larger, more diverse audience than the other portables—from children's choices such as *DuckTales* to adult entertainment such as *Chessmaster*—it's good for all-around family fun. Both Game Boy and its games are inexpensive (games generally sell for around \$20), a real consideration for these frugal financial times.

Nintendo estimates 10 percent of American households will own a Game Boy by the end of this year. They must be doing something right.

Lynx Up

An electronic eon ago, a company called Epyx published great games and caught the ambition bug. The disease ran its course; the first color hand-held videogame was the result. Unfortunately, the toll was too high, and Epyx's machine ended up at Atari, renamed the Lynx.

Lynx still struggles for respect. Overshadowed by newcomers like

NEC's TurboExpress and Sega's Game Gear, Lynx fights for recognition and a reputation. Many thought it on its deathbed until Atari got smart and dropped the price to \$100. That's only ten bucks more than Game Boy.

For that extra Hamilton, you get a color screen and 16-bit gameplay. The box is bigger, too. You use both hands to run the Lynx's convenient controls, with the cursor pad on the left and fire buttons on the right.

Lynx games look good, too. Not great—just good. Though the machine touts a 4096-color palette, the screen looks washed out. Even in a darkened airplane, Lynx's screen can't match that of Game Gear or TurboExpress.

But Lynx's real Achilles heel is its shallow play list. You'd think a system sold since 1989 would offer more than 16 games.

Still, some good titles play on the Lynx. *Blue Lightning* is an excellent jet fighter game, complete with missiles, cannons, and swarms of enemies. *Klax*, an intriguing puzzle game that puts you under as much pressure as *Tetris*, and *Shanghai*, a more thoughtful solitaire game, are great entertainment for the older set. And if you like wasting aliens, try *Xenophobe* or *Zarlor Mercenary*.

Atari promises another 25–30 games by year's end, including the don't-miss-it race game, *Hard Drivin'*, and the WWI flight simulation, *Warbirds*. *Bill and Ted's Excellent Adventure* and *Fidelity Ultimate Chess Challenge* are two more to watch for.

If Lynx delivers a collection of 40+ games by New Year's, it'll be a contender, even if those games play best to action addicts.

For only \$10 more than Game Boy (without a bundled cartridge), it's a good alternative if you can live with the smaller software library.

Still, with Atari's track record, you'd be wise to adopt Missouri's slogan, "Show me."



COURTESY OF NINTENDO OF AMERICA

Game Boy, king of the hand-helds, sold over 3 million units its first 18 months.



COURTESY OF ATARI ENTERTAINMENT

The Atari Lynx offers convenient two-hand control and a 4096-color palette.



COURTESY OF SEGA OF AMERICA

Game Gear shows Lynx-like traits with a wide body and a 4096-color palette.

Gear Up for Gameplay

Sega made news last year when it grabbed a bigger piece of the home videogame market with its Genesis system. Hot on the heels of that success comes Game Gear, Sega's new hand-held game machine.

Released in limited markets in April and available nationwide only this summer, Game Gear shows some Lynx-like traits, including a wide body and a 4096-color palette. But Game Gear goes one up on the Lynx in several key areas: Its screen is sharper and brighter under more varied light conditions, an important consideration if you plan to play anywhere you can. It fits better and more comfortably in your hands, and it pinches battery power to get longer life from its six AAs. Sounds better, too, especially when you jack in headphones (all the hand-helds let you listen with headphones).

Most important, though, is Sega's place in the videogame world. The company wants to push Nintendo hard and has the marketing money and muscle to do that far better than Atari. Like Atari, Sega promises a bounty of game cartridges by year's end. Sega seems more likely to keep the promise.

At press time (April), Sega had only two games ready for Game Gear. *Columns*, which comes with the machine, is a puzzle game tougher than *Tetris*. You line up shapes and colors in rows, columns, and diagonals as they fall from the sky. *Super Monaco GP* puts you at the wheel of a Formula One racecar, changing gears and stomping the accelerator as you zip around 16 Grand Prix courses. It's the best racing game yet for a hand-held.

Another 20 titles are due by Christmas, including Game Gear's versions of such Genesis games as *Joe Montana Football* and *Leaderboard Golf*. With more than 100 Genesis titles logged in, Game Gear shouldn't lack good carts.

Priced at \$160, with games ranging from \$25 to \$35, Game Gear sucks more from your wallet than Lynx, but in the long run, it's probably a safer purchase. Sega has more developers in its stable, which means more games, which means more variety for everyone in the family. This year may be a bit touch-and-go for cartridges, but if you like to look ahead and want your video dollars to last, check out Game Gear first.

Arcade Express

NEC's TurboExpress looks like Game Boy with a thyroid condition. The only color hand-held that fits in one hand (you still need two to play), it has a Darth Vader veneer. Maybe it's the hood that juts out over the screen.

TurboExpress breathes quality and has a price to match. At \$300, it's nearly double the cost of the next most expensive hand-held. No, it's not gold plated; in fact, its screen is smaller than Game Gear's and

Hand-held Game Machines

	Game Boy	Lynx	Game Gear	TurboExpress
Size	3.5 × 5.8 × 1.3	4.25 × 11 × 1.2	4.1 × 8.25 × 1.5	4.3 × 7.25 × 1.8
Batteries	4 AA	6 AA	6 AA	6 AA
Battery Life*	24 hours	3 hours	4 hours	2.5 hours
Screen Size	2.5-inch	3.5-inch	3.5-inch	2.7-inch
Resolution	160 × 144	160 × 142	160 × 146	238 × 312
Colors Available	4 (gray scale)	4096	4096	512
Colors Onscreen	4 (gray scale)	16	32	512
Backlit	No	Yes	Yes	Yes
Sound	Mono	Mono	Stereo	Stereo
Processor	6502	65C02	Z80A	C6280
Speed	1.8 MHz	4 MHz	3.6 MHz	7.16 MHz
Current Library	60+	16+	2+	50+
Expanded Library**	120+	32–40	20–22	60+

* Average lifespan during tests of several alkaline battery sets

** As projected by manufacturer for January 2, 1992

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The unthinkable has happened — a renegade from the Temporal Corps has stolen a time travel machine and gone into the past to alter critical events in human history. Only you can prevent this madman from rewriting history and destroying current civilization.

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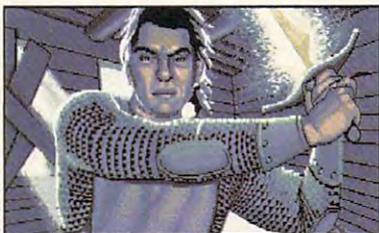
Written by Bob Bates, author of *Sherlock: The Riddle of the Crown Jewels* and *Arthur: The Quest for Excalibur*, TIMEQUEST is the latest from Legend Entertainment, the company that brought you the hit game *Spellcasting 101: Sorcerers Get All the Girls*. A treat for science-fiction fans and adventure enthusiasts alike, the game features:

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- unique Legend screen design with pushbutton options
- menu driven parser

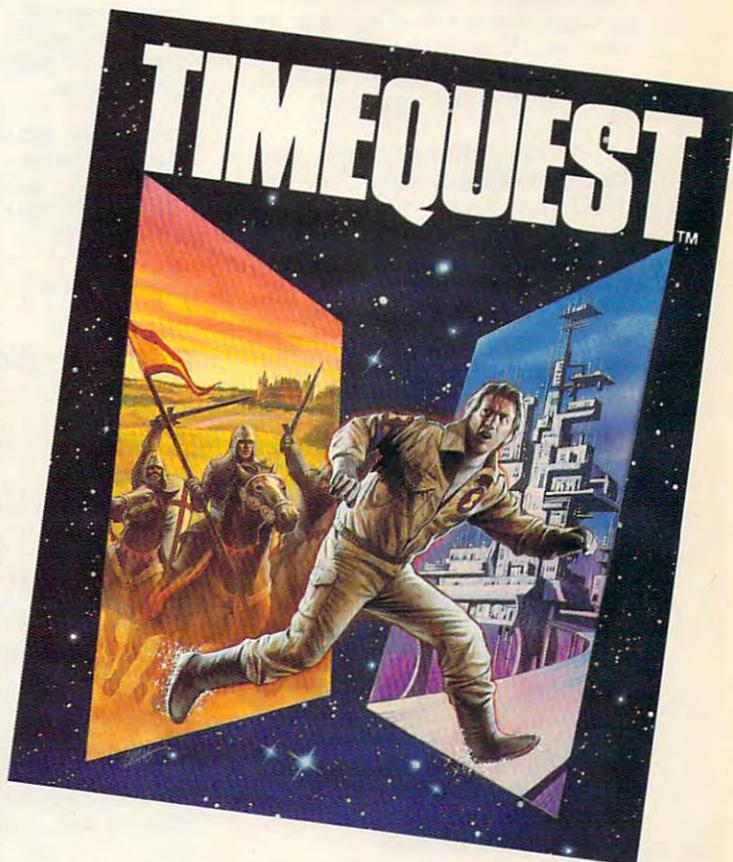
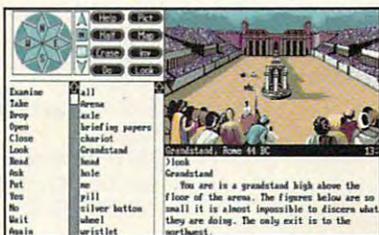
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COURTESY OF NEC TECHNOLOGIES

TurboExpress is the most expensive of the hand-helds and the highest quality.

Lynx's, and its battery appetite is like Godzilla's taste for Tokyo. So what's the deal? The TurboExpress screen may be barely bigger than Game Boy's, but it's the clearest, crispest, and most colorful of any hand-held.

More pixels and more colors simultaneously on the screen make it a joy to look at in almost any light. An optional TV tuner turns the TurboExpress into a miniature television perfect for airport and commuter viewing.

But TurboExpress plays a bigger card than that; cartridges that slip into NEC's TurboGrafx-16 home system run on the company's hand-held. If you pop for a TurboGrafx at home and a TurboExpress for the road, you don't have to buy an entirely new game library.

TurboExpress plays some great games. *Bonk's Adventure*, a hilarious bop and jump game, and *Jack Nicklaus Turbo Golf*, a realistic and graphically dazzling sports game, top the list. Not far behind are such notable games as *TV Sports Football*, *Super Star Soldier*, and *Devil's Crush* (no, it's not a Satanic tutorial; it's a terrific pinball machine you hold in one hand).

More than 50 games fit TurboExpress, a selection nearly as deep as Game Boy's. Teens and adults will find plenty on the list—action, arcade, and sports games dominate—but there's only one young children's game scheduled for the year (*TaleSpin*). At \$300, who wants the kids playing with it, anyway?

Fun at Your Fingertips

You can bring your electronic fun with you, wherever you go. As long as you've got AA batteries, you can zap monsters from space, sink an incredible putt, race the streets of Monaco, or make Mario a hero.

Game Boy fills the bottom of the hand-held food chain, but its low price, low-cost cartridges, and sturdy

construction make it a perfect portable for the kids. The whole family can take turns at the Game Boy because its deep software list includes something for everyone. It's the pick if money's tight and you don't mind black-and-white.

Lynx and Game Gear are close competitors. Lynx has the price edge and, at least until 1992, the larger library. Game Gear's screen is sharper. Even so, my best-buy vote goes to Game Gear. Lynx has languished too long with only a handful of games to instill much confidence. Sega, on the other hand, is a major player in video-games and should deliver a steady flow of new games.

TurboExpress is in a class by itself. No other system lets you swap games between home and road. If you already have a TurboGrafx-16 or you're thinking about buying one, the TurboExpress should be your choice. The higher price is a stumbling block to everyone else, though. That price, as well as a lack of kids' games, also rules out much familywide use.

If the bottom line is fun at any price, take TurboExpress. More thrifty consumers should snap up a Game Gear. Lynx and Game Boy save you money, but for avid players, the trade-offs are hard to swallow.

Hurry up and wait? Not anymore. Now it's hurry up and play. □

Product List

GAME BOY

Game Boy (with Tetris) \$89.95

Baseball \$19.95

Dr. Mario \$19.95

Super Mario Land \$19.95

Nintendo of America
4820 150th Ave., NE
Redmond, WA 98052
(206) 882-2040

Chessmaster \$29.95

Hi Tech Expressions
584 Broadway, Ste. 509
New York, NY 10012
(212) 941-1224

DuckTales \$29.95

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3303 Scott Blvd.
Santa Clara, CA 95054
(408) 727-0400

Ishido \$29.95

Nexoft
11105 Dana Cir.
Cypress, CA 90630
(714) 373-2072

Pipe Dream \$29.95

Bullet-Proof Software
8337 154th Ave., NE
Redmond, WA 98052
(206) 861-9200

Robocop \$29.95

Ocean of America
1855 O'Toole Ave., Ste. D-102
San Jose, CA 95131
(408) 954-0201

LYNX

Lynx (color system) \$99.95

Bill and Ted's Excellent Adventure
\$39.95 (available 9/91)

Blue Lightning \$34.99

Hard Drivin'
\$39.95 (available 8/91)

Klax \$39.99

Shanghai \$39.99

Warbirds \$34.99

Xenophobe \$34.95

Zarlor Mercenary \$34.99

Atari Entertainment
330 N. Eisenhower Ln.
Lombard, IL 60148
(708) 629-6500

Fidelity Ultimate Chess Challenge \$39.95

Telegames
222 W. First St.
Lancaster, TX 75146
214-227-7694

GAME GEAR

Game Gear (with Columns) \$159.95

Joe Montana Football

\$29.95-\$34.95 (available fall 1991)

Leaderboard Golf

\$29.95-\$34.95 (available fall 1991)

Super Monaco GP

\$29.95-\$34.95 (available fall 1991)

Sega of America

573 Forbes Blvd.
S. San Francisco, CA 94080
(415) 742-9300

TURBOEXPRESS

TurboExpress \$299.99

TurboVision TV Tuner \$99.95

Bonk's Adventure \$49.95

Devil's Crush \$61.99

Super Star Soldier \$61.99

TaleSpin

\$61.99 (available summer 1991)

TV Sports Football \$61.99

NEC Technologies

1255 Michael Dr.
Wood Dale, IL 60191
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(708) 860-9500

Jack Nicklaus Turbo Golf \$54.95

Accolade

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64/128 VIEW

T O M N E T S E L

If you read this column with any regularity, you'll recall that a couple of months ago I said Gazette would no longer be available on U.S. newsstands. It would be available in this country by subscription only.

I had visions of seedy characters loitering outside U.S. computer stores. They would approach customers, flash a Canadian *COMPUTE*, and ask, "Psst! Wanna buy a hot newsstand Gazette?"

Along the Rio Grande, at crossings formerly used by people trying to enter the U.S. without benefit of passport or visa, customs and immigration officials would encounter furtive figures struggling under heavy loads of plastic-wrapped magazines. Gazette-sniffing dogs would alert their handlers, and another illegal shipment of bootlegged *COMPUTES* would be confiscated at the border.

Even if these unpleasant sights were only figments of my imagination, the letters we received were real. "Have you stopped publishing?" readers asked. "Where's my Gazette?"

In case you missed my April editorial, which explained about Gazette's being pulled from U.S. newsstands, don't dig through your back issues trying to find it. That's all changed anyway. Gazette is back!

Effective with the July issue, the full Gazette and Amiga sections are scheduled to appear once again in thousands of newsstand copies of *COMPUTE*. By the time you read this, the change should already be in effect—but not at all locations.

Look for Gazette in *COMPUTE* on sale at Software Boutiques, Software Etc., and Babbage's. These computer stores should have the Gazette newsstand editions first. We'll announce additional locations as they become available.

As most 64 and 128 enthusiasts know, they aren't alone in the world. Millions of 8-bit Commodores are in use from Belgium to Brazil and from Puerto Rico to Pakistan. From the publications and user group newsletters we receive from around the

world, we realize that there's a great deal of 64/128 activity going on that the average user never learns about. There are computer shows in England, new software releases in Australia, programming techniques developed in Germany, and more.

In our effort to bring you the best from the 8-bit Commodore world, we want to increase our international coverage. What's happening in your country that might interest 64 owners elsewhere? What's hot in software?

Each month I'd like to print "Column from Abroad," featuring the 64/128 activities in different countries. If you're a writer with your finger on the Commodore pulse in your country, I'd like to hear from you. Perhaps you know of a writer or columnist in your local newspaper or computer magazine who could prepare a 1000-word column. If you can recommend someone, have him or her get in touch with me at our Greensboro, North Carolina, office.

This month, we feature a partial listing of Commodore user groups in America. Next month we'll complete the listing and include the names and addresses of overseas groups that have returned our survey. As you'll see, there are quite a few of them.

Programmers from around the globe supply many of the type-in programs we feature in Gazette. In this issue, *Simulvideo*, an outstanding graphics-conversion utility, was submitted by Richard Penn, who lives in Montreal, Quebec.

Gazette Disk subscribers will enjoy *Sector Patrol*, a fast-paced arcade game that's this month's bonus program. Grant Young is the author and lives in Christchurch, New Zealand.

To give more recognition to all of our programmers, both international and domestic, next month we'll start publishing biographical information about them at the end of each program's documentation. So if you submit a program to Gazette, include information about your occupation, hobbies, or any personal information you'd like to share with our readers. ☐

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NEWS & NOTES

Tee Off

Play the most infamous courses of the U.S. Open with a new add-on disk from Jack Nicklaus and *Accolade* (550 South Winchester Boulevard, San Jose, California 95128). *Jack Nicklaus Presents the Great Courses of the U.S. Open* (\$14.95) is the fourth in a series of course disks for use with Nicklaus's *Unlimited Golf & Course Design* and *Greatest 18 Holes of Major Championship Golf*.

The new disk contains three of the most challenging and popular courses to play host to the U.S. Open: Pebble Beach Golf Links, Oakmont Country Club, and Baltusrol Golf Club. These three courses (in California, Pennsylvania, and New Jersey, respectively) have been the sites for 11 U.S. Open championships, and Nicklaus has won at least one championship on each of them.

From the Grapevine

Need a new SID chip, upgraded ROM for your 1571, or Z80A CPU for your 128? If you're looking for spare parts, integrated circuits, chips, cables, or other items for your Commodore products—including your Amiga—look for them in the new free catalog from the Grapevine Group (3 Chestnut Street, Suffern, New York 10901; 800-292-7445).

Grapevine stocks service manuals, replacement printer heads, power supplies, diagnostic and alignment tools, and tutorials. Its catalog is a great resource for end users and repair centers.

Go Mobile

If you occasionally like to lean back in your chair with your keyboard in your lap but you hate to hassle with the 64's power cord, disk drive, and monitor cables, there's finally a cure. With a Detached Keyboard (\$60, plus \$3 shipping and handling) from SER (P.O. Box 5382, Racine, Wisconsin 53408-5382), you're no longer tied to one spot with your 64.

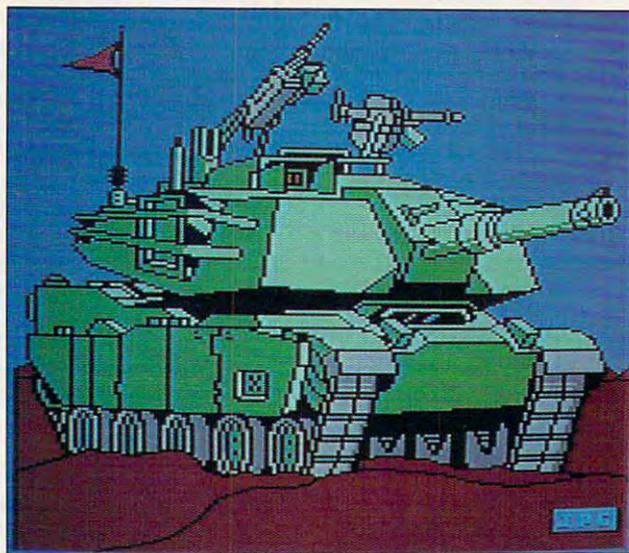
A six-foot cable frees your hands from the desktop, and an ergonomic palm rest saves your hands and wrists from long hours spent at the computer. Its single cable also eliminates the current nest of cables by letting you separate the 64 CPU from this accessible keyboard.

Seek and Destroy

Put on your camouflage fatigues and test your mapping skills with *Metal Gear* (\$14.95), a new release from Ultra Software (900 Deerfield Parkway, Buffalo Grove, Illinois 60089), a subsidiary of Konami.

Wind through five levels as you search for 20 special weapons and equipment to seek and destroy the title character and end the terror spree of the evil CaTaffy. Discover the weapons and equipment in enemy trucks and storehouses, or get them from certain soldiers of fortune.

Your most vital tool is your transceiver, which lets you communicate with Commander South, who is at Fox Hound's headquarters and feeds you crucial information on *Metal Gear*'s location. The mission ends when you destroy *Metal Gear*—or he destroys you. It's as simple as that.



Abrams M-1

Abrams M-1, by John Green of Freeport, New York, is this disk's Picture of the Month.

Each month *Gazette Disk* features a collection of the best 64/128 artwork submitted by our readers. We pay \$50 for each piece of art we accept for "Gazette Gallery" and an extra \$50 for the one selected as Picture of the Month. Send original art to Gazette Gallery, COMPUTE Publications, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408.

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NEWS & NOTES

Great GEOS Graphics

GEOS users now have 16 disks of ready-to-use graphics with the release of *Diskart 13*, *14*, and *15* (\$10.50 each) from Those Designers (3330 Lewis Avenue, Signal Hill, California 90807).

Diskart 13 contains international symbols, hobbies and pastimes, toys, national flags, and mechanical devices. *Diskart 14* has commercial and military aircraft, military vehicles, and sports. Look for plants and flowers, trees and shrubs, furniture silhouettes, and churches on *Diskart 15*.

New at the Zoo

The Electronic Zoo (3431-A Benson Avenue, Baltimore, Maryland 21227) has announced two new games for the 64: *Black Gold* (\$24.95) and *Spherical* (\$24.95).

Join the international power brokers in *Black Gold* and guide your company in a global search for oil. Buy and sell oil fields, build pipelines, study surveys, drill for oil, and sabotage the competition in this multiplayer game.

Move two blocks, point your wand, and add a new wall in *Spherical*. Back up and create some steps to the next platform before the ball starts rolling. There are more than 200 levels in this arcade-style game.

GEOS Fonts

As an introductory offer for its new 80-page *Geo Font Reference Booklet*, Parsec (P.O. Box 111, Salem, Massachusetts 01970) is bundling its font booklet with 12 double-sided disks filled with more than 550 public domain GEOS fonts (\$24.95 plus \$2.90 shipping and handling for the U.S., \$7.50 for Canada).

The booklet contains examples of each font. This makes it very easy for GEOS users to identify the fonts they want to use in a document, see how they look, and then locate them on disk. It's a great reference tool.

Unlimited Life

Want to play your favorite game with unlimited lives? Then try *Strata Gems* (\$5 each, plus \$3.50 shipping and handling) from Silvasoft (P.O. Box 231, Charlotte, Vermont 05445).

Each disk contains parameters for 50 games, including both new and old titles. These parameters are trainers you add to the game to give yourself unlimited lives or a limitless supply of ammunition or energy. Some games have three or more trainers you can add.

Titles on *Strata Gems I* include *Baal*, *Castlevania*, *Frogger*, *Krazy Kong*, *Tongue of the Fatman*, and many more. On *Strata Gems II*, look for *Batman*, *Demon Stalkers*, *Rocky Horror*, *Starfire*, *Test Drive*, and 45 others.

Intergalactic Warfare

Created by the codesigner of the Archon series, *Star Control* (\$39.95) from Accolade (550 South Winchester Avenue, San Jose, California 95128) combines deep strategy with action-arcade tactical combat.

As a veteran commander of an Alliance fleet of battle cruisers, you've been battling the evil Hierarchy for years. Now the aliens are invading interstellar neighbors and enslaving the inhabitants. To save the galaxy from this invading horde, you must construct and deploy your fleet, explore new stars, and build mines, colonies, and fortifications. Target the enemy's home star system, but don't leave yours undefended. Choose from nine scenarios, or build your own in this one- or two-player science-fiction war game. In the one-player game the computer opponent can be assigned one of three levels of skill: standard, good, or awesome. This level will affect the outcome of its tactical and strategic abilities. Choose from 14 ships and let the melee begin.

Windfall from Commodore

What happens when a computer manufacturer drops many of its dealers like so many bad apples? Another manufacturer recognizes their worth, picks them up, and helps them to shine.

That's the idea behind Windfall, a new educational marketing program announced by Commodore Business Machines (1200 Wilson Avenue, West Chester, Pennsylvania 19380). It's targeted at Apple educational dealers, ex-Apple educational dealers, and value-added retailers.

Under Commodore's new program, dealers can become authorized as quickly as one week after being interviewed. They then become eligible to buy demonstration equipment at discounted prices, including the new UNIX workstations.

"We now feel that we are able to appeal to a lot of good dealers who have significant experience in educational sales," said Paul Calkin, director of education and UNIX marketing at Commodore. "This program offers them a way to use their current contacts and expertise in the educational area to generate significant, profitable revenue with what we feel is the most capable and affordable desktop machine in the world."

Users of Commodore equipment should also benefit from Windfall and its new prices. "Commodore's new educational pricing structure makes it easy for educational institutions, teachers, and higher education students to buy at significant discounts off of the list price," said Ron Stanczak, Commodore vice president of sales. "Our new dealer education program has been well thought out, and we believe it to be one of the best in the industry." □

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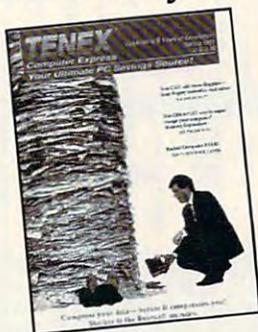
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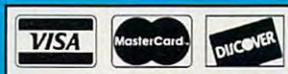


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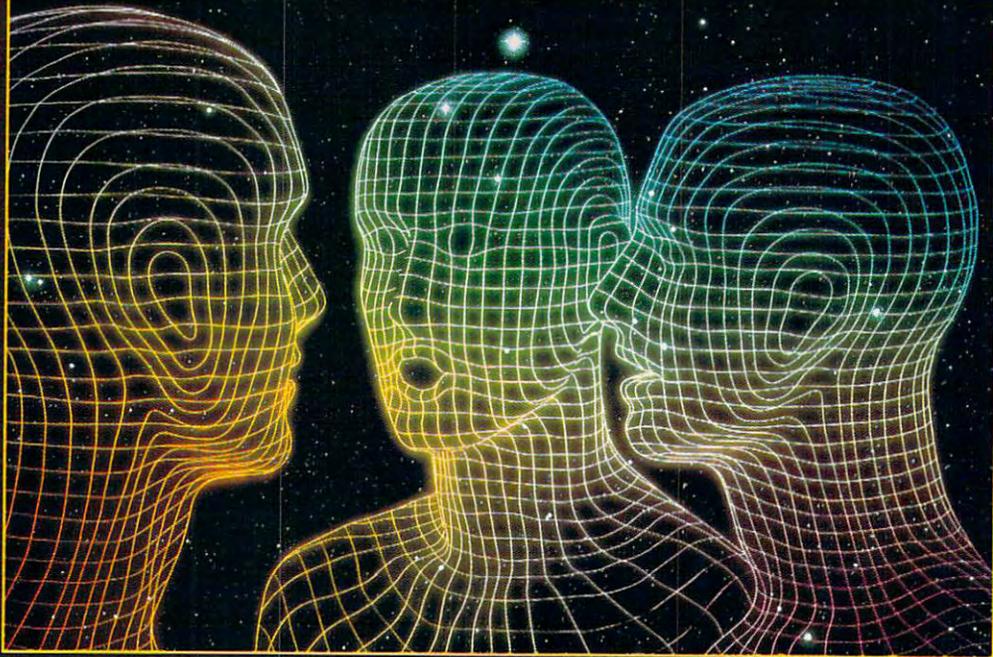
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A GUIDE TO
COMMODORE
USER GROUPS
PART ONE

EDITED BY KANDI SYKES

UNIPHOTO/PICTOR

This annual Gazette feature provides an up-to-date list of user groups across the U.S.A., throughout Canada, and around the world. Part 1 includes states Alabama-New Hampshire. Under each state heading, the groups are listed in order according to ZIP code.

User groups from the remaining states, APO sources, and foreign countries will be listed next month.

ALABAMA

- Birmingham Commodore Club**, P.O. Box 59564, Birmingham, AL 35259
- Valley Commodore Users Group (VCUG)**, P.O. Box 835, Decatur, AL 35602-0835
- Scottsboro Commodore Users Group**, Rte. 5, Box 255, Scottsboro, AL 35768
- Montgomery Area Commodore Komputer Society (MACKS)**, 606 Larkin Ln., Montgomery, AL 36109
- Commodore Mobile Users Group (CMUG)**, P.O. Box 9524, Mobile, AL 36691-0524

ALASKA

- Anchorage Commodore Users Group (ACUG)**, Box 104615, Anchorage, AK 99510 (BBS# 907-349-7467)
- Commodore/Amiga Users Group**, 2597 Boulder Ave., North Pole, AK 99705
- Sitka Commodore User's Group**, P.O. Box 2204, Sitka, AK 99835

ARIZONA

- COUGAR**, P.O. Box 9641, Scottsdale, AZ 85252-9641
- Valley One Twenty Eight (VOTE) User's Group**, P.O. Box 9641, Scottsdale, AZ 85252-9641
- Arizona Commodore Users Group**, P.O. Box 27201, Tempe, AZ 85282
- Gila Hackers**, Rte. 1, Box 34, Globe, AZ 85501
- Prescott Area Commodore Club (P.A.C.C.)**, c/o D. D. Van Kirk, P.O. Box 4019, Prescott, AZ 86301

ARKANSAS

- Triple-D 64**, P.O. Box 301, Reyno, AR 72462
- A: Half/Dos Will Travel**, 503 Kaylynn Dr., Walnut Ridge, AR 72476 (BBS# 501-886-1701)

CALIFORNIA

- South Bay Commodore User's Group**, P.O. Box 1176, Redondo Beach, CA 90278 (Voice# 213-324-8357)
- Commodore Helpers of Long Beach**, c/o Tom Hoy, 3736 Myrtle Ave., Long Beach, CA 90807 (Voice# 213-424-0508)
- The Software Palace**, 8978 Megan Ave., West Hills, CA 91304
- Association for Sharing Commodore Information (ASCI)**, 6160 Malvern Ave., Rancho Cucamonga, CA 91701-3736
- "C128 West" Commodore 128 User Group**, c/o John P. Calhoun, 17047 Devanah St., Covina, CA 91722 (BBS# 714-598-1755)
- California Area Commodore Terminal User Society (C.A.C.T.U.S.)**, 1626 N. Wilson Ave., Upland, CA 91786-1773
- Oceana-64 Commodore User Group**, 1004 Plover Way, Oceanside, CA 92057
- CRA Commodore Computer Club**, General Dynamics Electronics Div., P.O. Box 85310, Mail Zone 7234-A, San Diego, CA 92186-5310
- Barstow Commodore Users Group**, c/o First Congregational Church of Barstow, 220 N. 2nd St., Barstow, CA 92311
- Club-64 (San Bernardino)**, P.O. Box 514, Patton, CA 92369 (BBS#s 714-881-1215 and 714-862-1744)
- Coast Commodore Club (CCC)**, P.O. Box 1497, Costa Mesa, CA 92628 (BBS# 714-979-8333)
- Commodore Technical User Group (CTUG) of Orange County**, P.O. Box 1497, Costa Mesa, CA 92628
- Coastline Commodore Club**, 20311 Ravenwood Ln., Huntington Beach, CA 92646 (Voice# 714-962-9847)
- South Orange Commodore Klub (SOCK)**, 25401 Champlain Rd., Laguna Hills, CA 92653
- Orange County Commodore Club (O.C.C.C.)**, 1517 W. Carriage Dr., Santa Ana, CA 92704
- CIVIC64/128**, P.O. Box 2442, Oxnard, CA 93034-2442 (BBS# 805-382-1125)
- Commodore Owners of Lake Isabella California (COLIC)**, P.O. Box 2332, Lake Isabella, CA 93240
- A Bakersfield Area Commodore Users Society (ABACUS)**, P.O. Box 40334, Bakersfield, CA 93384 (BBS# 805-833-1866 and Voice# 805-832-7928)
- CSUN (Commodore System User Network)**, c/o 3894 Jupiter Ave., Lompoc, CA 93436-1904
- Central Coast Commodore Users Group**, 3643 Lakeview Ct., Santa Maria, CA 93455
- Fresno Commodore User Group/64UM**, P.O. Box 16098, Fresno, CA 93755 (BBS# 209-226-5313)
- PLUG (Plus/4 Users' Group)**, P.O. Box 1001, Monterey, CA 93942 (Voice# 408-883-0818)
- CWest Bay Area Commodore and Amiga Users Group**, 1564 Waller #B, San Francisco, CA 94117 (BBS# 415-552-9320)
- PETCETERA-On-The-Air**, 525 Crestlake Dr., San Francisco, CA 94132
- Commodore Connection Users Group**, P.O. Box 2851, Antioch, CA 94509 (BBS# 415-754-8077)
- Diablo Valley Commodore User Group**, P.O. Box 27155, Concord, CA 94527
- Napa Valley Computer Club**, P.O. Box 2324, Napa, CA 94558
- Commodore Hayward Users Group (CHUG)**, P.O. Box 2072, San Leandro, CA 94577
- Monterey Bay Commodore Users Group**, 921 Tower Pl., Santa Cruz, CA 95062-4118 (BBS# 408-464-8924)
- 64/More Commodore User Group**, P.O. Box 612794, San Jose, CA 95161-2794
- Valley Computer Club**, P.O. Box 310, Denair, CA 95316

Commodore Humboldt User Group, P.O.
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Sacramento Commodore Computer Club,
P.O. Box 13393, Sacramento, CA
95813-3393 (BBS# 916-446-4094)
Hub Area Commodore Club (HACC),
Glen Parker, P.O. Box 398, Campton-
ville, CA 95922 (BBS# 916-674-1703)
The Classic 64 Preservation Society, 660
Walton Dr., Red Bluff, CA 96080

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Colorado Commodore Computer Club,
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Front Range Commodore Club, P.O. Box
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Western Slope Commodore Users Group,
3125-B Lakeside Dr., Grand Junction,
CO 81506

CONNECTICUT

Hartford County Commodore Users
Group, c/o Gary J. Stagliano, 182-J
Homestead St., Manchester, CT
06040-3042 (BBS# 203-649-9057 9
p.m.-9 a.m., voice days)
Capital Region Commodore Computer
Club (CRCCC), P.O. Box 2372, Ver-
non, CT 06066
The New London County Commodore Us-
er's Group (NLCCUG), P.O. Box 697,
Groton, CT 06340 (BBS# 203-823-
1750)

DELAWARE

First State Commodore Club, P.O. Box
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Lower Delaware Computer Club
(L.D.C.C.), P.O. Box 5344, Nassau,
DE 19969 (Voice# 302-945-7224)

FLORIDA

Welaka Commodore Users Group, P.O.
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Commodore User Group of Pensacola,
P.O. Box 36367, Pensacola, FL 32516
(BBS# 904-484-9952)
Commodore Milton User Group
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mock Rd., Milton, FL 32583
Gainesville Commodore User Group, P.O.
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4716
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St., Titusville, FL 32796 (BBS# 407-
269-2169)
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7326 (BBS# 407-291-8730)
Fast Software of Costa Rica, Arturo Arana
Garcia(1573-21), P.O. Box 025216,
Miami, FL 33102-5216
Manasota Commodore Users Group
(MSCUG), P.O. Box 698, Oneco, FL
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Dinosaur 64, c/o Robbin Tate, P.O. Box
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(BBS# 813-584-6040)
Suncoast Commodore Club, P.O. Box
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Club, P.O. Box 721, Elfers, FL 34680
Starcom User's Group of Martin County,
P.O. Box 1446, Port Salerno, FL
34992

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Stone Mountain Users Group (SILUG
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30226 (BBS# 404-925-8829)
Commodore Format User's Group, P.O.
Box 2196, Atlanta, GA 30301 (BBS#
404-659-2606)
Albany Commodore Amateur Computer-
ists Users Group (ACAC), P.O. Box
5461, Albany, GA 31706-5461

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HI 96823-3260 (BBS# 808-672-6483)

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ID 83202 (BBS# 208-237-6935)
Banana Belt Commodore Users Group
(BBCUG), P.O. Box 1272, Lewiston,
ID 83501
PFP 64/Amiga Software Exchange, 860
Sherwood #306, Boise, ID 83706
Treasure Valley/Boise User Group
(TV/BUG), P.O. Box 6853, Boise, ID
83707

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Galesburg, IL 61402-0494 (BBS# 309-
344-5042)
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IL 61455
Canton Area Commodore Users Group,
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Central Illinois Family Assisted Commo-
dore Enthusiasts (C.I.F. A.C.E.) #19,
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Logansport Computer Club, P.O. Box
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Richmond Area Computer Users Group
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Commodore Computer Club, 819 Treelane
Dr., Newburgh, IN 47630
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Moines, IA 50316-9998
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son, Box 552, Jenkins, KY 41537
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dent, P.O. Box 20214, Bowling Green,
KY 42102
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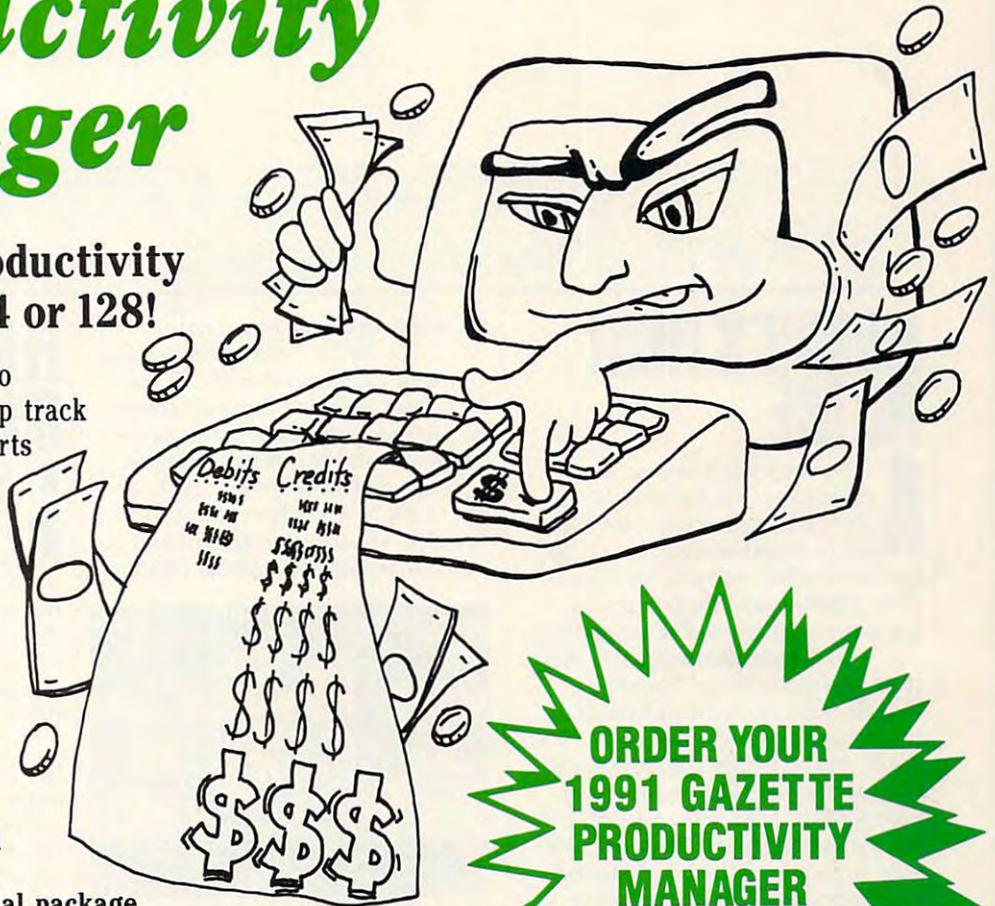
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REVIEWS

FANTASTIC FIGHTS • REALISTIC RACING
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MONDU'S FIGHT PALACE

Although it's not a new game to the software world, *Mondu's Fight Palace* is new for the 64. It was released originally for IBM and compatible machines as *Tongue of the Fatman*, and the 64 version looks every bit as good as the original.

This bizarre fighting game takes place in the domain of Mondu the Fat. He watches over combatants in his arena. They must fight to the death, and he delights in the contest. In *Mondu's Fight Palace*, you have been thrown into a pit to battle the Fatman's contenders. There are two ways to escape: defeat all of Mondu's cronies and the Fatman himself or die. I don't think it's hard to choose.

Although fight games are a dime a dozen, *Fight Palace* goes beyond the norm and breaks the mold. In addition to dazzling your opponents with your acrobatic moves, power-packed punches, and high kicks, you can choose weapons and bet on your fight. These additional options make *Mondu's Fight Palace* more challenging and entertaining. Not only are you playing against a computer-based opponent or second player, but you are also playing against the bet you made on yourself.

You start the game with 1000 credits. Use part of this money to buy weapons from Doctor Kadaver's Weapons Store and part to bet on how long it will take you to finish off the other creature. Only the first opponent is a humanoid. All of the rest are members of intergalactic races, and they each have unusual fighting traits and styles.

To help even the odds, you can buy weapons to use in the arena. You can only buy those that cost less than your current number of credits, and

Dr. Kadaver doesn't give credit.

Fight Palace is played from a side view and with a number of different backgrounds. Below the main screen are pictures of the opponents, weapons boxes, and bars representing success, life, and attack power. Hitting one of the function keys activates a weapon. All other movements and actions are performed with the joystick.



It takes three or four games to get used to *Fight Palace*, after which you can actually try to defeat the creatures. After another few games, you should know some of the opponents well enough to beat them in a short amount of time. Before long, you'll be racking up the credits and gearing up to beat the Fatman.

The graphics in *Fight Palace* are detailed and colorful. Particularly noticeable are the strange movements and unique appearances of each of the ten creatures in the game, from Colonooid and Behemoth to Rubic and Freezer. The different creatures give the game its personality. Sounds are minimal and unnecessary in this game. You won't miss them because you'll be too busy trying to survive.

RUSS CECCOLA

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FERRARI FORMULA ONE

Imagine yourself behind the wheel of a Ferrari, cruising down a Grand Prix racetrack at 175 mph. Electronic Arts' *Ferrari Formula One* is the next best thing to actually driving this powerful machine. It brings all the action and thrill of Grand Prix racing right to your computer. And you don't have to be an expert race driver to play!

There are two playing options in this game. You can simply drive the Ferrari around the racetrack without worrying about things like schedules or season standings. This option is the easier one to learn, since it requires that you read only a short set of instructions. As the game starts, there's a short demo to help you get acquainted quickly with the game. The minute you feel comfortable, just move your joystick, and off you go!

For those of you who want a real challenge, there's the second option. This is just like real Grand Prix racing. You design, modify, and test your own Ferrari. There are deadlines and schedules to keep. You tell the pit crew what to do to your Ferrari. Even though there are numerous rules concerning designing and setting specifications for your car, don't worry about accidentally modifying a parameter that would violate Grand Prix racing's rules. The software won't let you.

I found the manual to be well written, and the steps are easy to follow for the second play option. If you do select this challenging second option, be prepared to learn the track in limited time. You must also find the best settings for your Ferrari's peak performance and the best way to conserve fuel for the actual race.

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Circle Reader Service Number 129

REVIEWS

the program isn't a single race but a whole series. Each race is at a different track and consists of several practice sessions before the actual race.

The manual helps you design and set all the specifications on your Ferrari. I found the manual's panel diagrams to be extremely helpful in designing and setting the car's specifications for the big race. Fiorano is the main base for setting up and modifying your Ferrari. Here, you set the controls for the race, such as skill level and the race's length. From this point, you can go to the garage to set major system components, such as the engine or suspension, or to the wind tunnel to adjust the Ferrari's wings. You can also fine-tune suspension and wing adjustments at the pit.

If you know little about setting up a racing Ferrari, don't worry. The program has a character named Mauro to assist you in making these decisions. His suggestions will always appear in the panels. It's up to you whether to accept his suggestions or to come up with your own ideas after reading the manual's detailed descriptions on each setting.

After you've tested your Ferrari and made all the necessary modifications, it's time for the big race. With a



push of a joystick, you're off to your first race! Just use the joystick to steer, accelerate, and brake. The engine's roar makes you feel as though you're actually at a Grand Prix, sitting behind the wheel of a high-speed racer.

Overall, this software program is entertaining and challenging. Even though I have yet to become the series champion, I still have a lot of fun driving in *Ferrari Formula One*.

CHRIS STAWASZ

Commodore 64 or 128, joystick—\$29.95

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Circle Reader Service Number 311

BIG BLUE READER

While back, there was a rumor circulating that someone was developing an interface that would allow the 1581 to be used with a PC—a feasible but rather expensive proposition when you consider that most built-in 3½-inch drives cost less than half the street price of the 1581.

The February 1988 issue of *COMPUTE!* featured a BASIC program that allowed the 1571 disk drive to read and write PC disks. This program worked well, but it did have some drawbacks. Among its most troubling foibles was the fact that it seemed to choke on large files.

I discovered this last fall as my wife was typing her grandfather's memoirs on my 64 and I was then typesetting them on my PC. Long chapters caused the program to crash or to become twitchy. Three chapters simply refused to be translated, no matter what I did.

I decided to turn to SOGWAP's *Big Blue Reader* to see what it could do. Having spoken to the software's developer on the phone and knowing he was a capable programmer, it came as no surprise that *Big Blue Reader*

solved the whole problem, providing rapid conversion between formats with no apparent problems.

More and more Commodore fans own both PCs and 64s or 128s. Using a program like *Big Blue Reader* turns this motley collection of operating systems and hardware into an efficient productivity machine.

The latest version of *Big Blue* can operate with the 1581 drive, translating files from 720K 3½-inch PC disks to 1581-compatible disks.

All this talk about translating files between formats can lead to some confusion, so let me explain that *Big Blue Reader* is not an emulator. The ability to convert a file from a PC disk to a Commodore disk doesn't mean that you'll be able to run *WordPerfect* on your Commodore. However, you can save a *WordPerfect* file on a PC disk as pure ASCII and transfer it to a Commodore disk for editing or printing with any Commodore word processor of your choice.

The ability to translate files from one disk format to another is the most important task of this software, but it's not the only useful feature. It will display the directory of a Commodore or a PC disk, format either type of disk, and display or print files in either format. It can convert files between Commodore ASCII and the ASCII that the rest of the world uses.

Although *Big Blue Reader 128* comes with a version for the 64, 128 users should use the 128 version because it supports CP/M and Commodore RAM expansion units and operates with one or two disk drives (one of which must be a 1571 or a 1581). Also, it works in 40- or 80-column mode. In 80-column mode, it operates at the full 2-MHz clock speed.

When *Big Blue Reader 128* copies, it loads files into memory and then copies them to the new disk. This feature eliminates all unnecessary disk swapping. Furthermore, it

uses burst mode to enhance the speed of the file-transfer process.

ROBERT BIXBY

Commodore 128, 1571 or 1581 disk drive—\$44.95
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REAL FAST 64 BASIC

The 64's resident BASIC is easy to learn and use, but it has its drawbacks. BASIC provides the programmer with few tools to develop compact, powerful code.

In addition, BASIC programs tend to run slowly because they're in-

GAZETTE COMMODORE 64/128



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terpreted. That means before an instruction can be executed, it must first be figured out by additional low-level software. Compiling a program—converting it to machine code for speed—creates an awkward additional step. It means keeping track of at least one additional file and may increase the program size. Writing in machine code combats the sparseness of commands and slow runtimes, but it leads to even more difficulties during the debugging and revising processes.

For years attempts have been made to redress BASIC's speed deficiencies. One of the latest is *Real Fast 64 BASIC (RFB)* from Real R & D. It is interpreted, like the resident BASIC 2.0, but it precompiles GOSUBs and GOTOs for speed. It adds more than 90 new commands, allows labels to take the place of line numbers, provides the user with the option to create custom commands, doesn't interfere with BASIC 2.0, and is even compatible with *COMPUTE's Meta-BASIC* enhancement.

RFB includes a powerful syntax for machine language-like control of memory registers and control of bit settings within registers. For brevity, there are single-character commands. Error trapping is available to guard against results that might otherwise crash your program. *RFB* is also smart enough to be extensible, which means that the programmer can piece together preexisting commands and functions to build new commands.

On the downside, *RFB* is almost generic in design, with no provision made for 64 graphics (other than sprite commands) or sound. Also, some parts of the documentation make readers stop and review what they've just read. Lack of clarity isn't a major problem, however, and programming examples do much to make up for any gaps in immediate comprehension.

On balance, I was mightily impressed; I recommend *Real Fast 64 BASIC* as a sophisticated alternative language for serious 64 programmers.

BRUCE BOWDEN

Commodore 64 or 128—\$30.95

REAL R & D
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Circle Reader Service Number 313

WAR OF THE LANCE

SSI's latest addition to the Advanced Dungeons & Dragons (AD & D) series is a war game set in the Dragonlance world. *War of the Lance* is the perfect combination of an original war game system and a detailed scenario to keep it fun to play and exciting.



The game system has many unique features such as diplomacy, side quests for champions, and magical items such as dragon orbs to aid your armies. The setting and background of the game far outweigh its technical aspects.

War of the Lance is set on the continent of Ansalon in the year 348, and evil dragons have returned. Players control the Whitestone forces, who are the good guys. The computer or another player controls the Highlord armies, which consist mostly of dragons and Draconians. The action starts just as the Highlord armies are invading Silvanestri.

Highlord starts with an advantage over Whitestone, since it consists of four nations to Whitestone's two. To make matters worse, Whitestone's dragons don't enter the game until it's more than half over. This makes the game more than a challenge, even for experienced war gamers.

The game's history goes back to an earlier time, however. It goes back a millennium, when dragons were banished from Ansalon. During that time, magical artifacts were created to defeat the dragons. After the dragons disappeared, the artifacts were lost and the magical secrets forgotten. When the game begins, the Whitestone and Highlord champions are

out to find these lost artifacts and learn how to use them. If an army can find a dragon orb, for example, it can use it to make dragons retreat from the battlefield.

The appearance of reinforcements during certain phases of the game is a feature that adds suspense. Units may be activated at random. For example, the Highlord armies receive more Draconian units at almost every turn. Anytime toward the end of the game, undead infantry and flying cities, called *citadels*, will appear. On the Whitestone side, good dragons and Solamnic knights are some of the units that might join its forces.

A more direct way of gaining units is through alliances. The Whitestones and Highlords have unique methods of diplomacy. The Whitestones send diplomats to the countries and use gentle persuasion; the Highlords declare war on a country if it isn't an ally. Such a declaration is usually sufficient to make a country join the Highlords.

Movement and combat phases are similar to those of other war games. The side that has the initiative moves all of its troops either by ground, aerial, or naval transport. Attack orders are given, and the combat begins. When one side's attacks are finished, the other side starts its turn. There are some interesting twists, though—dwarves are the only soldiers who can go through mountains, and elves fight better in forests.

Not only is *War of the Lance* a war game, but it's a role-playing game. It's also a lot of fun. The extensive background adds spice that's missing in many games. The graphics are decent, and there's some animation. The instruction book is also very clear and precise. The game is fairly complicated, though, and it can be slow-moving at times. But considering how much fun it is to play, once you've finally mastered *War of the Lance*, you'll realize it was worth the effort.

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FEEDBACK

QUESTIONS FROM OUR READERS

What's the Score?

I'm trying to write a machine language game. I have everything worked out except for the score, which could be as high as 900. How do I print this out to the screen? What I've done with single characters is to load the accumulator with the ASCII value and JSR to CHROUT. But how do you decode a number that's stored in low-byte/high-byte format?

DAVID HOLT
RICHMOND, VA

Commodore BASIC has provisions for printing two-byte numbers in ASCII (a major purpose is for line numbers). From 64 machine code, simply store the low byte in the X register and the high byte in the A register (Accumulator); then JSR to \$BDCD (48589). On the 128, select a bank with BASIC ROM switched in, load the same registers, and JSR to \$8E32 (36402). The decimal equivalent will be printed at the cursor. On the 64, to get the address of the ASCII string without printing, start with .X and .A loaded as above and use this code:

```
STA $62 ;STORE THE HIGH BYTE
STX $63 ;STORE THE LOW BYTE
LDX #900
SEC
JSR $BC49 ;CONVERT TO A
          FLOATING-POINT
          NUMBER IS FACI
JSR $BDDF ;CONVERT TO AN ASCII
          STRING
```

On the 128, with BASIC switched in, use

```
STA $64 ;STORE THE HIGH BYTE
STX $65 ;STORE THE LOW BYTE
LDX #900
SEC
JSR $8C75 ;CONVERT TO A
          FLOATING-POINT
          NUMBER IS FACI
JSR $8E44 ;CONVERT TO AN ASCII
          STRING
```

In both cases, the low byte of the address of the ASCII string is returned in

.A; the high byte, in .Y. At the end of the string is a zero byte.

Which 128?

I've been thinking about buying a 128, but I notice that there were two models produced: the original 128 and the 128-D. What's the difference between the two?

Also, the sound on my 64 seems to have gone kaput. It was working fine before I moved it to another room. I've checked out the wires and the monitor, and everything seems fine. Do you think the sound chips have died?

JOHN J. REIMER
WILLIAMS LAKE, BC
CANADA

The 128-D differs from the original 128 in that it has an internally mounted disk drive. The 128-D also has a separate keyboard at the end of a very short cable and an upgraded 80-column display chip with more video memory. (It has twice the vertical resolution of the standard 128, which is not a big advantage for most users.) Neither of the 128 models is in production, but a few dealers still have 128-Ds in stock. (See recent ads in this magazine.) Used and reconditioned ones can be found, but with a built-in 1571 disk drive included, expect to pay more for a 128-D.

As for your second question, it's most likely that your SID (Sound Interface Device) chip has gone to that big socket in the sky. But since it happened during a move, it might have come loose from its socket if the computer got bumped. Get a technician to look at it or, if you want to check it yourself, open the case, remove the RF shield, and firmly seat the chip in its socket. It should be the chip marked 6581.

Write It In

It's hard to find COMPUTE with the Gazette section in it. Since my main interest is the Commodore 128, I am entering a subscription to Gazette. As the order form doesn't ask me to specify which section I want, I'm going to

write in that I want Gazette. I look forward to getting COMPUTE, as it's an excellent magazine.

But COMPUTE is more than just a magazine. It's a large part of any computer user's support network. As other support for the 64 and 128 wanes, I hope that COMPUTE will continue to be an important part of the Commodore information network. Your format is great, and I enjoy learning about other computer systems.

PAUL ARMSTRONG
CITRUS HEIGHTS, CA

Thanks for the kind words, and we'll do our best to continue supplying readers with information about 8-bit Commodore computers and other systems as well. In case you didn't know, Gazette is now back in COMPUTE on many newsstands. To ensure that you get the Gazette edition that includes the type-in programs when you subscribe to COMPUTE, write Gazette across the subscription card.

ROM Upgrades

I've noticed several ads for ROM upgrades for the 1571 and the 128. What do they do? Also, how do I go about submitting programs to your magazine?

GARY R. PAYNTER
PUTNAM VALLEY, NY

Just as computer software often contains errors, the same holds true for the programs stored in ROM that make a computer or disk drive work. One of the first bugs discovered in the 128 was the infamous Shift Lock Q problem. It printed a lowercase Q whenever the Shift Lock key was depressed. There have been other problems, though less frequently encountered. Apart from the annoyance of a 1571's sputtering for minutes while trying to decide whether a disk is single or double sided, it also inherited the infamous Save-with-Replace bug. Volumes have been written about how the use of SAVE "@:filename",8, originally intended for replacing files without going through the longer process of scratch-



FEEDBACK

ing first and then saving, will sometimes trash programs. (Note: Placing a 0 after the @ sign usually corrects this problem.) ROM upgrades supply fixes to these and other problems. Upgrades usually are for the better, but often we discover that upgrades introduce their own problems.

Now to answer your second question. When submitting a program for publication, save it twice to disk along with two copies of the documentation in either SpeedScript or PET ASCII format. Enclose a printout of the documentation and mail it to Gazette Submissions Reviewer, COMPUTE Publications, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408. We encourage submissions of original games, utilities, and productivity programs for the 64 and 128, and we pay competitive rates for those we publish. If a program is too large to offer as a type-in program, we possibly can use it as a Gazette Disk bonus.

Empty Socket

I've noticed several ads for ROM upgrades for the 1571 and the 128. I've also noticed an empty socket inside my 128. What are these for? I am also interested in EPROM programming. I would appreciate any information you have on these subjects.

GARY R. PAYNTER
PUTNAM VALLEY, NY

That spare 28-pin socket which you noticed in the 128 can hold a custom EPROM (Erasable Programmable Read Only Memory) chip programmed with your own software. However, getting at it means voiding your warranty (if still in effect) and unsoldering the metal heat-sink/RFI shield. The socket can hold either a 16K or a 32K chip. If you insert a chip there, it will be recognized by the computer and treated like an external cartridge. Here are a few details.

There are two areas of 128 memory in which cartridges appear. They

are the mid-space (\$8000-\$BFFF) and the high-space (\$C000-\$FFFF). So up to 32K of cartridge memory can be switched into 128 memory space simultaneously.

Cartridge memory can be banked in through simple manipulation of the Memory Management Unit. (See your Commodore 128 Programmer's Reference Guide for details.) You can also program in a power-up autostart sequence.

To check for cartridges when the computer powers up, the system conducts a poll of all possible cartridge areas (internal or external, mid-space or high-space). This is done during the system RESET routine using a sub-routine called POLL, which is located at \$E242-E2BB in the Kernal (version 318020-03). In each of the cartridge areas, POLL checks for a special cartridge key string that begins seven bytes from the start of the area. For example, in the mid-space (\$8000-\$BFFF), POLL will start checking at

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FEEDBACK

\$8007. The cartridge key string on the 128 consists of the letters CBM. (The 64 checks for CBM80.)

In addition, the cartridge key contains cold and warm start entry points and a cartridge ID. If the CBM string is found, the POLL routine "logs in" the cartridge by recording its ID byte in a special table. This table is called the Physical Address Table, and it is located at \$0AC1-\$0AC4.

After storing an ID in the Physical Address Table and before checking the next area, POLL checks to see if the cartridge ID equals \$01. Any cartridge with this ID is considered to be an autostart cartridge. If this ID is detected, POLL immediately switches in the cartridge area and jumps to a subroutine (JSR) for the cold start entry in the cartridge key.

The cold start entry is an entry point, not a vector. POLL JSRs directly to the cold start entry point, expecting to encounter executable machine code there. Normally this will be a jump (JMP) to the actual start of the cartridge code. The warm start entry is supposed to be set up the same way, but it's never used by the system.

Since POLL does a JSR to an autostart cartridge rather than jumping to it, the cartridge has a choice of whether it wants to return to POLL or not. If all the cartridge needs to do at this point is some initialization, it can do so and then return to POLL via an RTS command. If the cartridge wants to take over completely, it can do so by simply never returning to POLL.

The details of EPROM/cartridge use on the 128 are more involved than those for the 64, but they allow for more versatility.

Defunct Fonts

For the past three months I have been trying without success to obtain a copy of *Fontmaster* for my 128. I have approached U.K. suppliers without success. I have been told it is a U.S. product and used to be advertised regularly in *Gazette*. Can you help me locate a copy, or has the software been withdrawn?

GEORGE H. WEST
STOCKPORT, CHESHIRE
ENGLAND

Fontmaster II and *Fontmaster 128* were produced by Xetec in Salina, Kansas, but a company spokesperson says the products are no longer available. If you use GEOS and want to create fonts for your 128, you might try GEOS Font Editor (*Comm-Plex Software*, 6782 Junction Road, Pavilion, New York 14525; \$21.50). This program lets you create a new place size of any existing font and places 49 different fonts at your fingertips when writing a geoWrite document.

Another good font program is *Ultrafont+*, 1 of 14 utilities on the *Gazette Power Tools* disk (\$9.95).

ML for Beginners

I have recently started programming and have moved from BASIC to machine language. *Commodore 64 Programmer's Reference Guide* is the only book I have for ML programming. Is there a good book that helps beginners? Could you give me the name of a good assembler? Are there other languages available for the 64? If so, which ones?

Finally, I have noticed a few unfinished programs in *Programmer's Guide*. On page 111, I cannot find the

end of the last program on the page. Is there something I'm not doing, or has it been left out?

THOMAS UNDERHILL
SELANGOR, MALAYSIA

COMPUTE Books sells several beginner machine language books for the 64 and 128. Look for *Machine Language for Beginners* (\$16.95) and *The Second Book of Machine Language* (\$16.95). Both of these contain listings for machine language assemblers. *COMPUTE Books* also has valuable tools and references such as *Mapping the Commodore 64* (\$18.95) by Sheldon Leemon, *Mapping the Commodore 128* (\$19.95) by Ottis R. Cowper, and *Machine Language Routines for the Commodore 64/128* (\$18.95) by Todd D. Heimarck and Patrick Parish. To order, write to *COMPUTE Books*, c/o CCC, 2500 McClellan Avenue, Pennsauken, New Jersey 08109. Please add \$2.00 shipping and handling charges for U.S. orders, \$4.00 for Canadian orders, and \$6.00 for all others. Also, watch for special book offers in *COMPUTE*.

All of the major computer languages are available for the 64 and 128. A partial list includes C, Pascal, COBOL, Fort, FORTRAN, Lisp, and Logo. One source of good-quality languages for the 8-bit Commodore line is *Abacus Software*, P.O. Box 7211, Grand Rapids, Michigan 49510.

The little program at the bottom of page 111 of *Commodore 64 Programmer's Reference Guide* redefines the character associated with the letter T, but only after you've moved your character set according to the longer program on the previous page. □



GEOS

S T E V E V A N D E R A R K

Commodore owners who use *GEOS* have a real advantage when the name of the game is graphics. They can call up two star players, *geoPaint*, one of the better bitmap manipulation applications, and *geoPublish*, probably the best of the desktop publishing packages.

There is very little that these two programs can't accomplish toward turning a document into a winner. From cut and paste to closed splines and scaled fonts, the results can be impressive. Documents can even be dumped to a laser printer for results that will score a hit every time.

Of course, every program strikes out once in a while, and the *GEOS* team has its holes in the lineup as well. The graphics objects created in *geoPublish* are not actually stored as bitmaps and are essentially unalterable at the pixel level, a convenience taken for granted in *geoPaint*. With *Paint Pages*, you can convert a *geoPublish* page into a *geoPaint* bitmap where pixel editing can be done. But there's no way to reverse the journey except by creating relatively small photo scraps and importing them one at a time back into *geoPublish*.

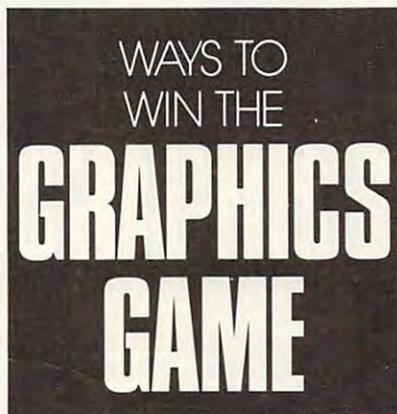
Even with the page-wide screen of *geoPaint 128*, this process will quickly run out the clock, and you'll still be left with the task of fitting the scraps back together. Sometimes it's easier just to patch an offending graphic with opaque, borderless white boxes and hope no one will notice.

It would also be nice if there were a way to copy a graphics object from one location to another on the *geoPublish* page. If you've ever tried to draw three identical curves using the spline tool, you'll know what I mean. While you can use the group select tool to move even a fairly complicated set of objects, there's no copy function built in. Your only recourse again is to convert the whole business into *geoPaint*.

GEOS users have a great second string to call on, though. There are a growing number of talented, imaginative programmers ready in the bullpen

to save the game. They've written utilities and desk accessories to fill in the gaps in the Berkeley lineup, programs that all *GEOS* users should have working for them. Some of these are available on QuantumLink or other BBSs, while one of the best showed up in this column a year and a half ago.

The small size of photo scraps is annoying with the limitations of a 40-column screen. Even with *GEOS 128's* 80-column version of the photo manager and *geoPaint*, the scraps are often too small for the job at hand. Terry Van Camp of Strongsville,



Ohio, has created *Scrap It*, a utility which neatly pinch-hits for the edit function in *geoPaint*. It lets you clip any size scrap you want from a *geoPaint* document. *Scrap It* displays a preview-style representation of a page from either drive and provides you with a set of brackets to set off any portion of it to be copied.

Need a full-page-wide letterhead for *geoWrite* but use the 40-column screen? No problem for *Scrap It*. Want to clip a usable chunk out of the middle of a ComputerEyes bitmap? It may overfill the *geoPaint* window, but it can't escape *Scrap It!*

There is no limit to the size of the scrap you create—the whole page can be grabbed this way. The only application that will accept a scrap that large, however, is *geoPublish*. But you can now create a graphics object using all

those great tools in *geoPublish*, use *Paint Pages* to convert it to *geoPaint*, detail and clean up the bitmap, and then use *Scrap It* to port it back into *geoPublish*. *Scrap It* is available from QuantumLink; it's shareware, so you should send a user fee of \$5 to Van Camp if you find his program useful. This utility is well worth that small amount of money.

Copying an object or group of objects in *geoPublish* is made possible by a clever little desk accessory published in this column last year (January 1990). It's called *Screen Grabber*, and with it any part of the screen is available for copying to a photo scrap. While there is only a limited need for bitmaps of sections of the deskTop or the ruler in *geoWrite*, bitmap copies of graphics objects in *geoPublish* allow you to import any number of duplicates all over the page. A graphics construction you've layered together from various tools and fonts might be too complex for the group select function, but *Screen Grabber* simply copies the resulting hi-res image on your screen and turns the whole thing into a photo scrap that you can move around, scale up or down, or copy at will. *Screen Grabber* was written by Richard A. Rardin and appeared in the *GEOS* column in the January 1990 issue of *COMPUTE!'s Gazette*.

Anyone who plays the graphics game with *GEOS* needs these two files in the game plan. In my desktop publishing projects, I've found them to be invaluable. There are plenty of other great utilities out there, programs which offer the *GEOS* user new capabilities with the system. If you've found one that really hits a home run for you, let us know, and we'll pass the word along. In order for a program to be discussed, however, we must have complete information about the author and whether it's public domain, shareware, or available for sale. Write to me in care of this column.

Steve Vander Ark can also be reached on QuantumLink by sending E-mail to him. His handle is SteveV14. □



MACHINE LANGUAGE

J I M B U T T E R F I E L D

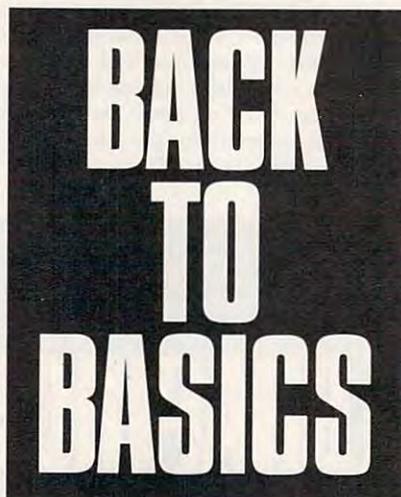
If I have a group of users interested in machine language, I sometimes publicly write a simple program. Beginners might not follow all the details of coding, but they will be presented with a few simple ideas: writing in machine language is a logical process no different from writing in another language, no magic is involved, knowledge of hexadecimal numbers and machine language monitors is required, and machine language programs can be dazzling.

If you are on the Commodore 128, use the built-in machine language monitor (MLM). Invoke it by pressing Shift-f8. Most other machines will need to load *Supermon+64*. Either way, we're invoking a new way of communicating with the computer. Instead of POKE and PEEK, we now can access more efficient commands.

If we were writing in BASIC, a place would be set aside for the program automatically. But with ML we'll have to choose a spot. This will be a short program, so it will fit almost anywhere. This time, I'll pick address 8192 (decimal).

Enter A +8192 . . . but don't press Return yet. We have said to the computer, "We wish to write (assemble) an instruction, to be located at decimal address 8192." The computer prefers a different style of number, hexadecimal, but it will accept the decimal value if you prefix it with a plus sign. Continue the line so that it reads A +8192 JSR . . . without pressing the Return key. We can now explain that JSR is the abbreviation (or mnemonic) for *Jump SubRoutine*, an instruction much like BASIC's GOSUB. It will call a subroutine, which will do some work for you, and then return to allow your program to continue. The subroutine we want is the one that will read a character from the keyboard. This routine is located at address \$FFE4 (hexadecimal). The character will be stored in the processor chip in an area called the *A register*, or the *Accumulator*. The dollar sign signifies a hexadecimal number.

Complete the line to read A +8192 JSR \$FFE4 but don't press Return yet. Note that we have asked the MLM to generate an instruction to go and fetch a character. Take a good look at this line; when you press Return, it will change dramatically.



Press Return. The line now says A 2000 20 E4 FF JSR \$FFE4. That's more or less what we entered, with some extra material. The decimal address 8192 has been changed to hexadecimal 2000, which the computer prefers. The translated instruction has become the three (hex) bytes 20 E4 FF, with the original printed at right.

The computer has calculated where the next instruction should go and has generated the first part of the line: A 2003. We've taken a character from the keyboard buffer. What should we do with it? We'll print it several times. We'll also need to count how many times we print the character. We'll use an area in the chip called the *X register* to do the counting. Start by setting the X register to zero with LDX (Load X): A 2003 LDX #0.

We use the # symbol to indicate that the zero is an actual value rather than an address. Programmers call this *immediate mode*. We'll print the character in the A register by calling an output subroutine with JSR

\$FFD2, and then we'll count by adding one to the X register with INX (INcrement X). In a moment, we'll want to go back and print (and count) again, providing our count (in X) has not yet reached 40.

A 2005 JSR \$FFD2
A 2008 INX
A 2009 CPX #+40

CPX is the instruction to ComPare X. We want to compare with the value 40, not the contents of address 40, so we use the # symbol again. The +40 means decimal 40; when you press Return, you'll see this converted to hexadecimal 28. By the way, if you're doing this on an 80-column machine, change the 40 to 80; on the VIC-20, use the value 22.

Since you have compared your count in X with a limit value, you can now say, "If it's not equal, go back and print again." That would be the BNE (Branch Not Equal) instruction.

A 200B BNE \$2005

Our character has now been printed 40, 80, or 22 times. Let's go back and do it again unless the character is an asterisk (\$2A, decimal 42). A CMP (CoMPare A) followed by a BNE will do the trick. (Always include a command to end the program).

A 200D CMP #\$2A
A 200F BNE \$2000
A 2011 RTS

Finally, RTS (ReTurn from Subroutine) signals the end of the program. If the machine language program was called from BASIC, it will return to BASIC. Press the X key and Return to return to BASIC from the MLM. Now invoke the program with SYS 8192.

As quickly as you can, type a message like *NOW IS THE TIME*. The message fills the screen at dazzling speed. Conclude by pressing the asterisk key, and the program will return to BASIC. □



BEGINNER BASIC

L A R R Y C O T T O N

We're going to do something a little different this month. First I'll present a program; then we'll discuss it. This one quickly solves any right triangle.

To avoid typing errors, use *The Automatic Proofreader* to enter this program. Remember, the up arrow with the line beneath it indicates you should press the Shift key and the up arrow simultaneously. This prints pi.

```

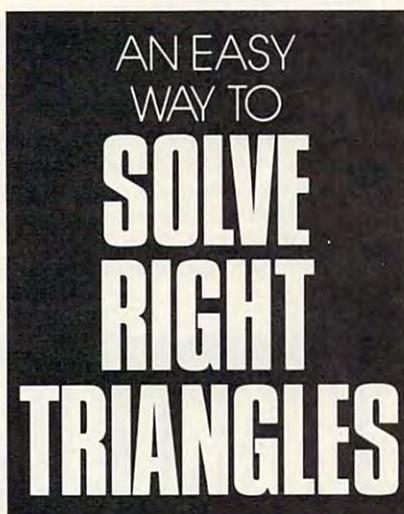
AM 10 PRINTCHR$(147)
HS 20 POKE53280,12:POKE53281,1
      5:POKE646,1
DJ 30 PRINTTAB(28)"{2 DOWN}
      {GRN}RIGHT
HC 40 PRINTTAB(28)"TRIANGLE
KE 50 PRINTTAB(28)"SOLVER
JR 60 PRINTTAB(28)"-----
      {6 UP}{WHT}
DE 70 FORT=1TO14:PRINTTAB(11)C
      HR$(170):NEXT
HP 80 PRINT"{HOME}"
CQ 90 FORT=12TO25:PRINTTAB(T)C
      HR$(205):NEXT
GK 100 POKE214,14:PRINT
BE 110 FORT=12TO25:PRINTTAB(T)
      CHR$(183):NEXT
RE 120 FORT=1TO3:READY,X,A$
KG 130 POKE214,Y:PRINT:POKE211
      ,X:PRINT"{RED}"A$:NEXT
FG 140 FORT=1TO3:READY,X,A$
ES 150 POKE214,Y:PRINT:POKE211
      ,X:PRINT"{BLU}"A$:NEXT
BE 160 DATA3,13,A,12,13,C,12,2
      2,B,7,9,BB,6,21,CC,15,1
      7,AA
HJ 170 C=90:REM ALWAYS RIGHT A
      NGLE
KD 180 INPUT"{DOWN}{RED}
      {2 SPACES}ANGLE A";A:IF
      A>89ORA<0THENRUN
RB 190 IFAATHENB=180-C-A:N=N+1:
      GOTO220
QG 200 INPUT"{2 SPACES}ANGLE B
      ";B:IFB>89ORB<0THENRUN
CB 210 IFBTHENA=180-C-B:N=N+1
RQ 220 POKE214,20:PRINT
RQ 230 INPUT"{BLU}{2 SPACES}SI
      DE AA";AA:IFAATHENN=N+1
      :IFAATHEN300
HM 240 INPUT"{BLU}{2 SPACES}SI
      DE BB";BB:IFBBTHENN=N+1
      :IFAATHEN300
HB 250 IFAATHENIFBBTHEN300
MF 260 IFN<1THENRUN
PB 270 INPUT"{BLU}
      {SHIFT-SPACE}SIDE CC";C
      C:IFCCTHENN=N+1
DG 280 IFCC<BBORCC<AATHENRUN
GJ 290 IFN<2THENRUN
RH 300 IFAATHENIFBBTHENCC=SQR(
      AA^2+BB^2):GOTO360

```

```

GS 310 IFAATHENIFCCTHENBB=SQR(
      CC^2-AA^2):GOTO360
MB 320 IFBBTHENIFCCTHENAA=SQR(
      CC^2-BB^2):GOTO360
KX 330 IFAATHENCC=AA/SIN(A^PI/1
      80):BB=SQR(CC^2-AA^2):G
      OTO370

```



```

XX 340 IFBBTHENCC=BB/COS(A^PI/1
      80):AA=SQR(CC^2-BB^2):G
      OTO370
CQ 350 IFCCTHENAA=CC*SIN(A^PI/1
      80):BB=SQR(CC^2-AA^2):G
      OTO370
MF 360 A=ATN(AA/BB)*180/PI:B=18
      0-C-A
SR 370 POKE214,17:PRINT
QM 380 TB=22
BQ 390 N=A:GOSUB470:PRINTTAB(T
      B)"{RED}ANGLE A ="T
PK 400 N=B:GOSUB470:PRINTTAB(T
      B)"ANGLE B ="T
RE 410 N=C:GOSUB470:PRINTTAB(T
      B)"ANGLE C ="T
AB 420 N=AA:GOSUB470:PRINTTAB(
      TB)"{BLU}SIDE AA ="T
FA 430 N=BB:GOSUB470:PRINTTAB(
      TB)"SIDE BB ="T
GS 440 N=CC:GOSUB470:PRINTTAB(
      TB)"SIDE CC ="T
KG 450 GETA$:IFA$<>CHR$(13)THE
      N450
GQ 460 RUN
HR 470 T=INT(N*100+.5)/100:RET
      URN

```

You don't have to know a thing about trigonometry to use this program. Simply enter values at the prompts. Angles must be in degrees. Sides may be in any unit (feet, inches,

millimeters) as long as they are the same units. If you don't know a value, press Return. The computer will ask for enough information to solve the triangle and then print to the screen all three angles and sides. Press Return to solve another triangle.

Lines 180 and 200 look for legitimate angles and line 280 checks to see that side lengths make sense. It doesn't matter whether side AA or BB is larger, but make sure that CC (the hypotenuse) is the longest side. Be sure you don't enter letters when the computer is expecting numbers. If a value doesn't make sense or too little information is presented, the program just starts over. An IF-THEN statement is used quite a bit to check whether information has actually been entered. For instance, in line 190, IF A THEN . . . simply checks to see whether angle A is anything other than 0. In other words, IF A now has a value, THEN do something.

A counter (N) is used to ensure that enough information has been entered to solve the triangle. N is first encountered in line 190. As information is entered, N is incremented and then checked in line 260 and/or line 290. Two pieces of data must be entered to solve a triangle.

I think you can figure out what most of the other lines do, but there are two functions that we haven't covered lately: COS (line 340) and ATN (line 360).

COS (cosine) is similar to SIN (sine), except that it works with a triangle's adjacent side and hypotenuse. In line 340, COS calculates side CC when BB and angle A are known.

Think of ATN (arc tangent) as the opposite of TAN (tangent). The tangent of an angle is the angle's opposite side divided by its adjacent side. ATN is used to determine an angle when the opposite and adjacent sides are known. In line 360, ATN is used to calculate angle A when AA and BB are known.

Finally, line 470 is a simple subroutine which rounds numbers to two decimal places. □



PROGRAMMER'S PAGE

R A N D Y T H O M P S O N

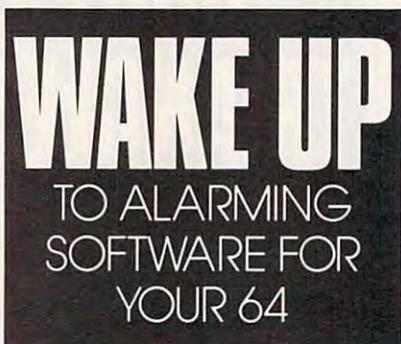
The 64 has not one, not two, not three, but six different hardware timers. And thanks to these timers, graciously provided by the computer's two Complex Interface Adapter (CIA) chips, the 64 is guaranteed punctual operation.

Among the most useful of the CIA chip timers is the Time of Day (TOD) clock. Besides keeping an accurate account of the time of day, this clock has an alarm function that operates very much like the alarm found in your clock radio. To exploit the TOD clock's abilities and to demonstrate its ease of use, I created a short alarm clock program to keep the computer's biological peripheral—that's you!—running on schedule.

As with a normal alarm clock, the following program allows you to set both the TOD clock's current time and alarm time. After that, the clock runs in the background while you are free to continue writing programs, playing computer games, or napping in your computer chair waiting for the alarm to go off. When alarm time comes around, the computer halts what it is doing, and the screen's border appears to come alive. Press the back-arrow key located in the upper left corner of the keyboard to turn the alarm off. The border will stop strobing, and the computer will continue where it left off.

When you run the program, it prompts you for the current time and the time you want the alarm to sound. Enter these times in HHMMSS (Hours, Minutes, Seconds) format. For example, if it is 2:35 and 10 seconds, enter 023510. After entering each time, the program asks you to press the A key for a.m. or the P key for p.m. Once both times have been entered, you can erase this BASIC program and use the computer for almost any purpose without disabling the alarm. The alarm is vulnerable to programs that steal the computer's IRQ vector or use memory in the range 828-889. In effect, such programs will place your alarm clock into permanent "snooze" mode.

I discovered a couple of bugs in the TOD clock's alarm function while developing this program. If the current time is between 12:00 and 1:00 (a.m. or p.m.), you must give the computer the incorrect a.m. or p.m. designation when setting an alarm time that is within the same hour. So if it's 12:05 p.m. and you want the alarm to sound in 25 minutes at 12:30, you must set the alarm for 12:30 a.m. If you don't, your alarm will be 12 hours off. Also, the a.m. and p.m. setting is completely ignored on alarms that are set for 12:00 exactly. In other words, an alarm set for 12:00 will go off at noon or midnight, whichever is sooner.



Memory locations 56328-56331 (\$DC08-\$DC0B) are the TOD clock's registers. These registers store the time in the following format:

Register	Purpose
56328 (\$DC08)	Tenths of seconds
56329 (\$DC09)	Seconds
56330 (\$DC0A)	Minutes
56331 (\$DC0B)	Hours

The time is kept in binary code decimal (BCD). In BCD, a byte is divided into two groups of four bits, known as a *nybble*. Each nybble represents one decimal digit. For example, at 12:00, the hours register (memory location 56331) contains a binary value of 00010010. Dividing this byte into nybbles, we get 0001 and 0010, representing the decimal digits 1 and 2 for 12. All of the TOD clock regis-

ters work this way. The high bit (the leftmost binary digit) of the hours register indicates either a.m. or p.m. This bit is equal to 1 if it's afternoon or 0 if it's morning.

These registers have a unique latching feature. When you read the hours register with a BASIC PEEK command or a machine language load instruction, all of the registers freeze (hold on to their current value) until you read the tenths-of-seconds register. This prevents you from receiving an inaccurate reading. For example, if you read the hours register at 11:59 and the time changes to 12:00 just before you read the minutes register, the latching feature prevents you from reading the time as 11:00 instead of 11:59. Although the registers' values freeze, the CIA chip's internal TOD clock keeps ticking away. So the moment you read the tenths-of-seconds register, all the registers are updated to reflect the proper time.

By writing to the TOD clock registers, you accomplish one of two tasks—you either set the clock or the alarm time. To specify which time you set, you manipulate the high bit of memory location 56335 (\$DC0F). If you set the high bit equal to 1, writing to the clock registers sets the alarm time. To set the time of day, you clear the high bit. Lines 110 and 130 of the program above perform this duty using BASIC's AND and OR operators.

The subroutine located in lines 180-270 sets both the clock time and alarm time. Lines 190-200 receive and verify your input. Line 210 stores this input into a numeric array of single digits. Lines 250-260 use this array to poke the time into the TOD registers in BCD format. The *AP* variable signifies a.m. or p.m.

Once the program sets the TOD clock, line 150 turns on the alarm using the command POKÉ 56333,4.

TOD clock alarms generate an interrupt request, which normally forces the computer to execute the interrupt routine located in ROM at memory location 59953 (\$EA31). In order for



PROGRAMMER'S PAGE

the alarm program to know that an interrupt occurred, I use a short machine language routine to intercept the normal interrupt routine. This machine language routine is stored in the DATA statements in lines 340-370.

It's the job of the new interrupt routine to determine why the computer has disturbed its otherwise peaceful existence. (Interrupts, which normally occur at least 60 times a second, can be caused by several events.) If the TOD clock alarm is not the cause of the interrupt, then program control is passed along to the 64's normal interrupt routine. If the TOD clock alarm is the culprit, then the border is placed into a psychedelic frenzy until the back-arrow key is pressed or the computer's power is cut off—a rude but effective technique for terminating obnoxious computer behavior.

ALARM

```
GM 100 SA=828:GOSUB 280
CH 110 POKE 56335,PEEK(56335)
```

```
{SPACE}AND 127:REM GET
{SPACE}READY TO SET TIME
E
KX 120 PRINT "{CLR}ENTER TIME (
HHMMSS) ":GOSUB 180
MX 130 POKE 56335,PEEK(56335)
{SPACE}OR 128:REM READY
TO SET ALARM
AC 140 PRINT "{CLR}SET ALARM TIME
(HHMMSS) ":GOSUB 180
XA 150 POKE 56333,4:REM TURN ALARM ON
FB 160 SYS SA:PRINT "{CLR}ALARM SET"
RA 170 END
MA 180 REM ENTER AND SET TIME
BC 190 PRINT "{HOME}"TAB(26);:
INPUT T$:IF LEN(T$)<>6
{SPACE}OR VAL(LEFT(T$,
2))<1 THEN 190
GH 200 IF VAL(T$)>129999 OR VAL
(MID$(T$,3,2))>59 OR VAL
(AL(RIGHT$(T$,2))>59 THEN
N 190
PE 210 FOR I=1 TO 6:T(I)=VAL(MID$(T$,I,1)):NEXT
KB 220 PRINT "AM OR PM (A/P)?"
;
AG 230 GET K$:IF K$<>"A" AND K$<>"P" THEN 230
RC 240 PRINT K$:AP=0:IF K$="P" THEN AP=128
CG 250 POKE 56331,(T(1)*16+T(2
```

```
) OR AP:POKE 56330,T(3)*16+T(4)
JP 260 POKE 56329,T(5)*16+T(6):POKE 56328,0
GH 270 RETURN
FQ 280 REM STORE MACHINE LANGUAGE DATA
BF 290 CK=0:FOR I=SA TO SA+61:READ D:POKE I,D:CK=CK+D:NEXT
MX 300 IF CK<>7121 THEN PRINT {SPACE}"ERROR IN DATA STATEMENTS":END
XF 310 HB=INT((SA+13)/256):LB=SA+13-HB*256:POKE SA+2,LB:POKE SA+7,HB
XM 320 RETURN
XM 330 REM MACHINE LANGUAGE DATA
DS 340 DATA 120,169,060,141,020,003,169,003,141,021,003,088,096
CM 350 DATA 173,013,220,041,004,240,039,141,013,220,173,032,208,072,238,032,208
AD 360 DATA 032,159,255,165,197,201,057,208,244,104,141,032,208,169,000,133,198
BF 370 DATA 120,169,049,141,020,003,169,234,141,021,003,088,076,049,234
```

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D'IVERSIONS

F R E D D ' I G N A Z I O

We are what we dream. Our dreams of "futures past" now seem wholesome and desirable compared to today's sometimes cockeyed present.

In the 1950s when I was growing up, kids dreamed about the hot new toys of technology: TV sets, space-ships, monster computers, and transistor radios. We tuned in to family programs every night like "Dennis the Menace," "Father Knows Best," "Ozzie and Harriet," and "Lassie." We identified with the kids on the programs—kids like Bud, Frank, Ricky, Dennis, Margaret, Timmy, and Betty. We dreamed of a fantastic future—a George Jetson future where families would be just like those we saw on our favorite TV programs. Life would be a lot the same—comfortable, loving, funny, and so on. But in the future we'd also have tons of high-tech toys, just like Judy and Elroy Jetson had.

We'd have a robot. We'd have a jet car. We'd have picture phones and cosmic baseball. And we'd never have to do any work because we'd have homework machines, machines to take out the trash, machines to wash the dirty dishes and pick up our bedrooms. In the future, life would be grand!

Then something sad happened. Somewhere between 1950 and 1990, we kids wandered off the yellow brick road to the Jetson future, and we never found our way back. The TV families of the 1950s were replaced by the TV families of the 1990s—"Rosanne," "Married with Children," "The Simpsons." Families fragmented into latchkey kids, liberated women, and workaholic dads. In place of Donna Reed, kids came home to revolving-door parents and Nintendo babysitters.

Welcome to the postmodern world. A world beyond Walt Disney and George Jetson. A world of AIDS, Madonna, MTV, Ninja Turtles, WrestleMania, and *Nightmare on Elm Street*. In place of Jetson jet cars and robots, the landscape is dotted with cellular phones, Game Boys,

palmcorders, DAT Man, and CDTV.

The Jetsons movie came out recently. If you saw the film, didn't you think it seemed a little odd, a little quaint? That's because the Jetsons movie is a leftover, warmed-over dream. It's a vision of a future past. The truth is that somewhere between 1950 and 1990 the real George Jetson walked out on his kids, his dog Astro, his gadgets, his wife Jane—and he never returned.

In the 1950s we pulled up to a Texaco station, and the man who wore the star rushed out with a great big smile and served us and serviced our car. In the 1990s we roll into a

new oven. We were sure that all that glowing white enamel was just the tip of a technological iceberg. Our high-tech home of the future would be clean, sleek, and, and cozy. And above all, American!

Cancel that dream. Technology tomorrow turned out to be tiny black boxes from Japan and Korea. The easy street to the future turned into a shortcut to the salt mines.

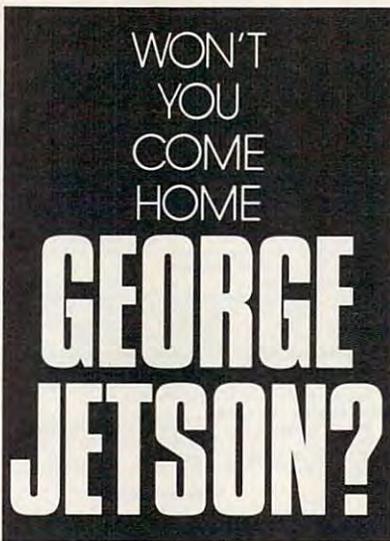
In the 1950s we looked forward to a future in which machines did most of the work. We were told to expect more leisure time, shorter work weeks, and a carefree existence. The George Jetson easy street was just around the corner. Technology would save us so much work that we'd have time on our hands.

Now we're in the 1990s, the decade of time deprivation. Husbands and wives both work full-time jobs. Life is a rat race. The streets and the skies are gridlocked by too many vehicles trying to travel to too many places. Technology has turned from slave to taskmaster. With fax machines, cellular phones, E-Mail, phone mail, overnight delivery services, video conferencing, and computers, we are never out of touch. We are never offline. We must never stop, slack off, or daydream. We are plugged into a network that never sleeps. We feel unrelenting pressure to work all the time. Our machines quietly goad us to work harder, faster, longer. Puff! Puff! Puff!

Our present is not necessarily better or worse than the old Jetson future. It's definitely different.

Editor's note: Don't forget to enter Fred D'Ignazio's Design-a-Robot contest. See last month's "D'Iversions" for a complete list of the rules.

All entries must be received by August 31, 1991. The first-place winner will receive a model robot valued at \$200; five runners-up will each receive a smaller robot valued at \$30. Send entries to Design-a-Robot Contest, COMPUTE Publications, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408. □



stark gasoline fortress and see hulking vandal-proof pump-it-yourself vending machines. We pay our money to a shadowy presence hidden behind protective layers of bulletproof glass, and we pump our gas through an accordion vapor-control hose that looks like an appendage of Robbie the Robot in *Forbidden Planet*.

In the 1950s kids and their parents went ga-ga over the shiny white appliances that poured out of America's postwar factories and into America's homes. There were new refrigerators, new washing machines, and



PROGRAMS

B I L L F I S H E R

If you enjoy solving cryptogram puzzles that appear in many newspapers, you'll find *Crypto-64* a very useful and entertaining program. Amateur code breakers can use it to practice solving letter-substitution ciphers.

Crypto-64 doesn't actually solve the puzzle for you. Instead, it provides a convenient display of both the original cryptogram and the resulting decoded version as you enter various character substitutions.

Getting Started

Crypto-64 is written entirely in BASIC. To help prevent typing errors, use *The Automatic Proofreader* to type it in; see "Typing Aids" elsewhere in this section. Be sure to save a copy of the program when you've finished typing.

Solving Puzzles

Load and run the program. At the prompt enter a cryptogram in up to four one-line parts. Be sure to press the Return key before moving to a new line. You'll then be prompted to continue with the next part. It's necessary to limit each part of the cryptogram to one line in order to provide for proper onscreen presentation. If your cryptogram occupies less than four lines, merely press the Return key to skip the unused part(s).

Your cryptogram will then be displayed with an asterisk (*) below each letter. You'll be prompted to select CHAR, RESTART, or QUIT by pressing C, R, or Q, respectively. When you decide to substitute a new character for one in the cryptogram, press C, enter the letter you want to change, and press Return. At the next prompt, SUB, enter the letter you wish to try as a substitute. Press Return, and the screen will then redisplay the original cryptogram with the substituted letter printed below the line in the appropriate location.

If you wish to change one of your substituted letters after you see the display, merely reenter the original cryptogram letter at the CHAR

prompt and try your new substitution at the SUB prompt. If you enter an asterisk as the substitute character, you can effectively erase any previous substitution.

If at some point you wish to start again with the same cryptogram, select R (for RESTART) at the prompt. The original cryptogram will be displayed with no substituted letters. To quit, select Q at the prompt.

Because INPUT statements pro-

CRYPTO-64

CRACK CODES
AND SOLVE
CRYPTOGRAMS WITH
THE HELP OF THIS
SHORT UTILITY FOR
THE 64

hibit entering a comma or a colon, do not use either of these punctuation marks. If they do appear in the original cryptogram, they should be omitted. If you wish, however, you may replace commas and colons with alternative characters.

Here's a sample cipher to get you started. After you run the program, enter the four lines of scrambled text. When you're ready to solve the puzzle, substitute the letter *T* for the letter *Z* as shown below. Now try substituting *E* for *T* and *A* for *Q*.

DQKN IQR Q SOZZST SQDW OZL
**** * * * *T** * * * *T*

YSTTET VQL VIOZT QL LFGV
***** * * * *T* * * * *T*

QFR TCTKNVITKT ZIQZ DQKN VTFZ
* * * * * * * * * *T**T * * * * *T*

ZIT SQDW VQL LXKT ZG UG
T** * * * * * * * * *T* **

CRYPTO-64

```
BE 1 REM COPYRIGHT 1991 - COMP
UTE PUBLICATIONS INTL LTD
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QM 10 C$=CHR$(147):R$=CHR$(29)
:U$=CHR$(145):DIML$(145)
MS 20 PRINTC$:FORQ=32TO64:L$(Q
)=CHR$(Q):NEXT:L$(91)=CH
R$(91):L$(145)=CHR$(145)
BF 30 PRINT:PRINT"CRYPTOGRAM L
INE 1:" :PRINT:INPUTW$:LW
=LEN(W$):IFLW=0THENW$=U$
RA 40 PRINT:PRINT"CRYPTOGRAM L
INE 2:" :PRINT:INPUTX$:LX
=LEN(X$):IFLX=0THENX$=U$
MX 50 PRINT:PRINT"CRYPTOGRAM L
INE 3:" :PRINT:INPUTY$:LY
=LEN(Y$):IFLY=0THENY$=U$
AJ 60 PRINT:PRINT"CRYPTOGRAM L
INE 4:" :PRINT:INPUTZ$:LZ
=LEN(Z$):IFLZ=0THENZ$=U$
FG 70 PRINTC$:FORQ=65TO90:L$(Q
)="*":NEXT:IFW$=U$THEN20
DK 80 PRINT:PRINT:PRINT:K$=W$:
P=LW:GOSUB250
EJ 90 K$=X$:P=LX:GOSUB250
JA 100 K$=Y$:P=LY:GOSUB250
JC 110 K$=Z$:P=LZ:GOSUB250
HF 120 GOSUB270:GOTO220
FP 130 PRINT:AS$="":PRINT" CHAR
";:INPUTA$:IFA$=" "THEN
{SPACE}PRINTC$:GOTO160
FH 140 B$="":PRINT"{2 SPACES}S
UB";:INPUT B$:IFB$=" "TH
ENA$="":PRINTC$:GOTO160
BR 150 N=ASC(A$):L$(N)=B$
XX 160 PRINTC$:PRINT:PRINT:PRI
NT
CP 170 K$=W$:PRINTR$+K$:P=LW:G
OSUB260
XR 180 K$=X$:PRINTR$+K$:P=LX:G
OSUB260
JS 190 K$=Y$:PRINTR$+K$:P=LY:G
OSUB260
AA 200 K$=Z$:PRINTR$+K$:P=LZ:G
OSUB260
MX 210 GOSUB270
JD 220 IFSS$="R"THEN GOSUB280:P
RINT:GOTO70
CB 230 IFSS$="Q"THEN GOSUB280:P
RINTC$:END
PB 240 GOTO130
FS 250 PRINTR$+K$
KH 260 PRINTR$;:FORN=1TOP:A=AS
C(MID$(K$,N,1)):PRINTL$(
A);:NEXT:PRINT:PRINT:R
ETURN
GQ 270 POKE198,0:PRINT:PRINT:P
RINT" CHAR,RESTART,QUIT
(C/R/Q)";:INPUT S$:RET
URN
AA 280 POKE198,0:PRINT:PRINT"
{SPACE}ARE YOU SURE (Y/
N)";:INPUT S$
AE 290 IFSS$<>"Y"THENPRINTC$:GO
TO160
HJ 300 RETURN
```



PROGRAMS

R I C H A R D P E N N

For an effective video presentation, good graphics alone are not enough. To catch a viewer's attention, you must present your images with style—move them on and off a screen with flair and imagination.

Television news is packed with visually exciting wipes, overlays, and fades. *Simulvideo* brings the power of such video manipulation to the 64.

This utility supports a multitude of smooth and fast graphics effects. Large dual bitmaps can converge from opposite directions, interlace, blend together, and then reverse the effect. Two different bitmaps, such as a logo and a slate, can merge over each other. Bitmaps can be wiped on and off. Once onscreen, they can be made to wave in different ways, and text can be displayed in front of or behind them. A backdrop can also fade in and out.

With a new overlay mode, a bitmap is not limited to being over or under different graphics; it can be layered in between. A demonstration and a short supporting utility for converting hi-res graphics to *Simulvideo* format round out this video package.

Getting Started

Simulvideo consists of three programs. The main program is written entirely in machine language. To enter it, you'll need to use *MLX*, our machine language entry program; see "Typing Aids" elsewhere in this section. When *MLX* prompts you, respond with the values given below.

Starting address: C000

Ending address: CB7F

When you've finished typing, be sure to save the program to disk as *SIMULVIDEO.OBJ* before exiting *MLX*.

The second program demonstrates *Simulvideo* effects and is written in BASIC. Type it in using *The Automatic Proofreader*; see "Typing Aids" again. When you've finished typing, save this program as *SIMUL-*

VIDEO.DEMO to the disk with *SIMULVIDEO.OBJ*. To see some of the effects possible with *Simulvideo*, load and run the demo program. It automatically calls *SIMULVIDEO.OBJ*. After it demonstrates several effects, press the space bar to see others.

The third program, *IMPORT*, is a BASIC utility for importing multicolor graphics from paint programs to *Simulvideo*. Type it in with *The Automatic Proofreader* as well, and save it to the disk with *SIMULVIDEO.OBJ* and *SIMULVIDEO.DEMO*.

To use *Simulvideo* in your own programs, add line 50 of the demo to the beginning of your program.

SIMULVIDEO

ADD WIPES,
OVERLAYS, FADES,
AND OTHER SPECIAL
EFFECTS TO YOUR
64'S GRAPHIC
PRESENTATIONS

Program Commands

Simulvideo uses raster interrupts and sprites to simulate two multicolor bitmaps 48 pixels wide and 168 pixels down. These two bitmaps work in tandem with special memory manipulation to create the special effects.

Usually such interlacing animation requires extensive memory moving, something the 64 is too slow to do on the fly. However, because the bitmaps are actually sprites—and sprites are directly supported by hardware—the video can be processed quickly and smoothly.

Simulvideo incorporates 17 video commands, many of which have several options. To access them, use the

SYS commands described below. They are available in direct mode or from within a program.

SYS 51071, c1, c2, c3

This command, which must be called before any others, activates *Simulvideo* and selects the three bitmap colors (0-15). Be careful not to recall this command once *Simulvideo* is enabled, or the computer will crash.

SYS 51589, "filename", location

This command loads a bitmap from disk into the specified memory location 0-7 (stored under ROM). A maximum of eight bitmaps can be stored in memory at any time, but new bitmaps can be loaded to overwrite existing ones as required.

SYS 51388, type, left bitmap, [right bitmap]

This command, which must be called before any of the bitmap manipulation commands, selects the bitmap to use. The type parameter is 0 for interlace effects or 1 for solid effects. The bitmap parameter is the location where the bitmap was loaded (0-7). For interlace effects use only one bitmap, such as *SYS 51388, 0, 1*. For solid effects, the left and right bitmap panels can be different, so you must select the graphics for both bitmaps (*SYS 51388, 1, 5, 6*). The bitmap commands below will indicate which type they are and how many bitmaps they need.

SYS 50740, merge type

This performs an interlaced bitmap merge, where the merge type is 0 for a horizontal interlace and 1 for a vertical interlace. One bitmap must be specified for this command (*SYS 51388, 0, bitmap*).

SYS 50746, spread type

This performs an interlaced bitmap spread, where the spread type is 0 for a horizontal interlace and 1 for a vertical interlace. One bitmap must be specified for this command (*SYS 51388, 0, bitmap*).



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SYS 51569

This simultaneously slides two solid bitmaps together without interlacing them so that the left panel appears on top of the right one. This effect is good for sliding a large logo over a slate or text over a backdrop. Alternately, if the left bitmap has a picture in the upper half and the right bitmap has a picture in the lower half, this command can make two separate pictures slide onscreen one above the other (similarly, pictures can slide side by side if they are narrow). Two bitmaps must be specified for this command (SYS 51388, 1, *left bitmap*, *right bitmap*).

SYS 51579

This command simultaneously slides two solid bitmaps apart without interlacing them. Two bitmaps must be specified for this command (SYS 51388, 1, *left bitmap*, *right bitmap*).

SYS 51725, *direction*

This wipes a single bitmap onto the screen. The bitmap can scroll on from the left side (direction 0) or from the right side (direction 1). One bitmap must be specified for this command (SYS 51388, 0, *bitmap*).

SYS 51750, *direction*

This wipes a single bitmap off the screen. The bitmap can scroll off to the right (direction 0) or to the left (direction 1). One bitmap must be specified for this command (SYS 51388, 0, *bitmap*).

SYS 50752, *size, exit*

This creates a wave effect over the bitmap. There are four wave sizes, which range from small to large (0-3). To exit the effect, press the space bar or the fire button on a joystick plugged into port 1. The end parameter selects whether the bitmap will remain onscreen after it is stopped (exit 0) or will spread apart with the last used interlace pattern (exit 1). This command will only work following an interlaced bitmap merge (SYS 51071, *merge type*).

SYS 50916

This toggles the bitmap priority so it appears either in front of or behind text. By default, a bitmap is displayed in front of text whenever *Simulvideo* is activated.

SYS 50930

This toggles the entire screen on and off. The border and screen must be the same color. This command is invaluable when setting up new screens. By turning off the video, a new screen can be printed without the user's seeing it. When the video is restored, only the completed screen is seen.

SYS 51879

This fades a diagonally lined backdrop into view. For a pleasing effect, the screen and border must both be black.

SYS 52024

This fades out the backdrop. As above, the screen and border must be black.

SYS 50946, *c1, c2, c3*

This turns on overlay mode and determines the three colors to use (0-15). Its basis is the extended background color mode, so graphics must be designed with reversed spaces.

In overlay mode, a shifted space character prints in color 1, a reversed space in color 2, and a reversed shifted space in color 3. These characters make up layer 2 graphics.

The @ character is redefined to print solid spaces and can be printed in any of the 16 available colors by including color codes within a print statement as usual, such as PRINT "[WHT]@". This character makes up layer 1 graphics.

The bitmap always appears in front of layer 1 graphics (the extended background color mode made up of reversed spaces). Layer 2 graphics (@ characters) are special. Depending on the bitmap priority, the bitmap can either appear in front of or behind these characters. To see this in practice, the red flag in the demo is printed with reversed spaces, and the blue flag with @ characters.

SYS 50980

This turns off overlay mode.

SYS 50986

This command disables *Simulvideo*. Always use this command to exit. Do not use Run/Stop-Restore.

Video Considerations

The PRINT command works slightly differently with *Simulvideo*. It's slow-

er, and the TAB and SPC commands do not work (use cursor right controls instead). Also, the screen cannot scroll. Although you can print from anywhere within a program, in direct mode your typing will only be visible in a small strip near the top of the screen.

To design *Simulvideo* graphics, use a multicolor paint program and draw in three colors in the upper left area of the screen (48 pixels across by 168 pixels down). Save this screen to disk; then load and run the bitmap importer utility and answer the prompts as requested. It will create a separate graphics file on disk which can be loaded with *Simulvideo's* graphics load command (SYS 51589, "filename", loc 0-7) and used in your programs. Note that converted graphics will be twice as wide as the original ones.

Although you don't have to worry about memory locations with *Simulvideo*, programmers should note that all of Bank 1 (16384-32767) is used by the VIC-II chip. The ML routine is stored at locations 49152-52088, and the bitmaps loaded from disk are stored under Basic and Kernel ROM.

By today's video standards, how you display something is almost as important as what you display. With *Simulvideo*, this is no longer a problem.

SIMULVIDEO.OBJ

```
C000:78 A9 7F 8D 0D DC A9 01 21
C008:8D 1A D0 A9 28 8D 12 D0 F7
C010:A9 1B 8D 11 D0 A9 21 8D EC
C018:14 03 A9 C0 8D 15 03 58 C4
C020:60 A9 01 8D 19 D0 A5 02 8E
C028:18 69 05 A2 10 9D FF CF A1
C030:CA CA D0 F9 AE EA C9 BD F5
C038:EB C9 AA EA CA D0 FC 4C 06
C040:42 C0 AE EA C9 BD F3 C9 8E
C048:8D 18 D0 EE EA C9 A5 02 6B
C050:18 69 15 C9 D3 B0 0B 8D 7C
C058:12 D0 85 02 68 A8 68 AA 49
C060:68 40 A9 3E 8D 12 D0 85 1B
C068:02 A9 00 8D EA C9 A5 FB F3
C070:F0 EA 4C 31 EA A9 00 85 45
C078:FB A9 58 8D 00 D0 8D 08 AC
C080:D0 A9 88 8D 02 D0 8D 0A 37
C088:D0 A9 B8 8D 04 D0 8D 0C 57
C090:D0 A9 E8 8D 06 D0 8D 0E 77
C098:D0 A9 FF 8D 10 D0 8D 01 3B
C0A0:CB EA EA A9 FF 8D 15 D0 EB
C0A8:AD 11 D0 10 FB EE 00 D0 CC
C0B0:EE 02 D0 EE 04 D0 EE 06 7A
C0B8:D0 CE 08 D0 CE 0A D0 CE 73
C0C0:0C D0 CE 0E D0 AE 00 D0 49
C0C8:E0 70 D0 08 AD 10 D0 29 E9
C0D0:F7 8D 10 D0 E0 A0 D0 08 F3
```



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C0D8:AD	10	D0	29	FB	8D	10	D0	E8	C340:C9	A9	03	8D	EC	C9	A9	03	35	C5A8:A9	00	91	FD	C8	91	FD	C8	6C
C0E0:E0	D0	D0	08	AD	10	D0	29	1A	C348:8D	ED	C9	A9	09	8D	EE	C9	0C	C5B0:91	FD	C8	C8	C8	C8	C0	3C	51
C0E8:FD	8D	10	D0	E0	00	D0	08	8C	C350:A9	03	8D	EF	C9	A9	03	8D	A6	C5B8:D0	F0	EE	FB	C9	E8	E0	04	3E
C0F0:AD	10	D0	29	FE	8D	10	D0	19	C358:F0	C9	A9	09	8D	F1	C9	A9	02	C5C0:D0	CE	EE	FB	C9	EE	FB	C9	D1
C0F8:AE	08	D0	E0	FF	D0	08	AD	FC	C360:C3	8D	F2	C9	4C	00	C0	8E	3A	C5C8:EE	FB	C9	EE	FB	C9	AD	FB	51
C100:10	D0	29	EF	8D	10	D0	E0	13	C368:F8	43	E8	8E	F9	43	E8	8E	80	C5D0:C9	C9	DD	90	B9	60	A9	00	1B
C108:CF	D0	08	AD	10	D0	29	DF	79	C370:FA	43	E8	8E	FB	43	E8	8E	99	C5D8:85	FD	A9	68	85	FE	A0	00	CB
C110:8D	10	D0	E0	9F	D0	08	AD	84	C378:F8	47	E8	8E	F9	47	E8	8E	A1	C5E0:B1	FD	29	33	91	FD	E6	FD	6D
C118:10	D0	29	BF	8D	10	D0	E0	28	C380:FA	47	E8	8E	FB	47	E8	8E	BA	C5E8:D0	02	E6	FE	A5	FE	C9	70	57
C120:6F	D0	08	AD	10	D0	29	7F	01	C388:F8	4B	E8	8E	F9	4B	E8	8E	C2	C5F0:D0	EE	A5	FD	C9	00	D0	E8	0E
C128:8D	10	D0	AD	00	D0	C9	58	9A	C390:FA	4B	E8	8E	FB	4B	E8	8E	DB	C5F8:A9	00	85	FD	A9	70	85	FE	03
C130:F0	08	A2	02	CA	D0	FD	4C	84	C398:F8	4F	E8	8E	F9	4F	E8	8E	E3	C600:A0	00	B1	FD	29	CC	91	FD	91
C138:A8	C0	A9	01	85	FB	60	A9	C0	C3A0:FA	4F	E8	8E	FB	4F	E8	8E	FC	C608:E6	FD	D0	02	E6	FE	A5	FE	40
C140:00	85	FB	A9	58	8D	00	D0	09	C3A8:F8	53	E8	8E	F9	53	E8	8E	05	C610:C9	78	D0	EE	A5	FD	C9	00	62
C148:8D	08	D0	A9	88	8D	02	D0	98	C3B0:FA	53	E8	8E	FB	53	E8	8E	1E	C618:D0	E8	60	8A	48	A2	40	18	62
C150:8D	0A	D0	A9	B8	8D	04	D0	A6	C3B8:F8	57	E8	8E	F9	57	E8	8E	2F	C620:A5	FD	6D	FC	C9	85	FD	A5	83
C158:8D	0C	D0	A9	E8	8D	06	D0	B4	C3C0:FA	57	E8	8E	FB	57	E8	8E	36	C628:FE	6D	FD	C9	85	FE	CA	D0	7B
C160:8D	0E	D0	A9	00	8D	10	D0	0A	C3C8:F8	5B	E8	8E	F9	5B	E8	8E	47	C630:EE	68	AA	60	20	66	C4	4C	1B
C168:20	71	CB	EA	EA	A9	FF	8D	0C	C3D0:FA	5B	E8	8E	FB	5B	E8	8E	60	C638:75	C0	20	66	C4	4C	3F	C1	B2
C170:15	D0	AD	11	D0	10	FB	CE	07	C3D8:F8	5F	E8	8E	F9	5F	E8	8E	68	C640:A2	80	A0	80	20	67	C3	20	A1
C178:00	D0	CE	02	D0	CE	04	D0	C4	C3E0:FA	5F	E8	8E	FB	5F	8C	FC	37	C648:F1	B7	86	FC	20	F1	B7	A4	3A
C180:CE	06	D0	EE	08	D0	EE	0A	61	C3E8:43	C8	8C	FD	43	C8	8C	FE	0B	C650:FC	C0	00	D0	15	A9	09	8D	88
C188:D0	EE	0C	D0	EE	0C	D0	AE	BE	C3F0:43	C8	8C	FF	43	C8	8C	FC	31	C658:63	C2	A9	58	8D	53	C2	A9	EB
C190:00	D0	E0	FF	D0	08	AD	10	76	C3F8:47	C8	8C	FD	47	C8	8C	FE	3D	C660:60	8D	31	C2	20	09	C2	4C	CA
C198:D0	09	01	8D	10	D0	E0	CF	15	C400:47	C8	8C	FF	47	C8	8C	FC	64	C668:AE	C6	C0	01	D0	15	A9	25	7A
C1A0:D0	08	AD	10	D0	09	02	8D	81	C408:4B	C8	8C	FD	4B	C8	8C	FE	70	C670:8D	63	C2	A9	58	8D	53	C2	F2
C1A8:10	D0	E0	9F	D0	08	AD	10	90	C410:4B	C8	8C	FF	4B	C8	8C	FC	96	C678:A9	60	8D	31	C2	20	09	C2	23
C1B0:D0	09	04	8D	10	D0	E0	6F	2D	C418:4F	C8	8C	FD	4F	C8	8C	FE	A2	C680:4C	AE	C6	C0	02	D0	15	A9	EB
C1B8:D0	08	AD	10	D0	09	08	8D	A5	C420:4F	C8	8C	FF	4F	C8	8C	FC	C8	C688:06	8D	63	C2	A9	50	8D	53	12
C1C0:10	D0	AE	08	D0	E0	6F	D0	90	C428:53	C8	8C	FD	53	C8	8C	FE	D4	C690:C2	A9	68	8D	31	C2	20	09	AD
C1C8:08	AD	10	D0	09	80	8D	10	40	C430:53	C8	8C	FF	53	C8	8C	FC	FA	C698:C2	4C	AE	C6	A9	15	8D	63	FC
C1D0:D0	E0	9F	D0	08	AD	10	D0	DD	C438:57	C8	8C	FD	57	C8	8C	FE	07	C6A0:C2	A9	50	8D	53	C2	A9	68	3E
C1D8:09	40	8D	10	D0	E0	CF	D0	1E	C440:57	C8	8C	FF	57	C8	8C	FC	2D	C6A8:8D	31	C2	20	09	C2	E0	00	B8
C1E0:08	AD	10	D0	09	20	8D	10	D6	C448:5B	C8	8C	FD	5B	C8	8C	FE	39	C6B0:F0	0A	A2	A0	A0	C0	20	67	47
C1E8:00	E0	FF	D0	08	AD	10	D0	02	C450:5B	C8	8C	FF	5B	C8	8C	FC	5F	C6B8:C3	4C	F3	C1	AD	12	D0	C9	60
C1F0:09	10	8D	10	D0	AD	00	D0	BD	C458:5F	C8	8C	FD	5F	C8	8C	FE	6B	C6C0:32	D0	09	A9	58	8D	00	D0	3F
C1F8:C9	58	F0	08	A2	02	CA	D0	99	C460:5F	C8	8C	FF	5F	60	A2	A0	BF	C6C8:8D	08	D0	A9	88	8D	02	D0	23
C200:FD	4C	72	C1	A9	01	85	FB	5A	C468:A0	C0	20	67	C3	A2	08	A0	46	C6D0:8D	0A	D0	A9	B8	8D	04	D0	31
C208:60	A9	00	85	FB	AD	11	D0	0A	C470:FF	A9	00	85	A9	67	85	8A	C6D8:8D	0C	D0	A9	E8	8D	06	D0	00	3F
C210:10	FB	EE	00	D0	EE	02	D0	91	C478:5B	A9	00	85	58	A9	6F	85	40	C6E0:8D	0E	D0	60	AD	11	D0	10	3C
C218:EE	04	D0	EE	06	D0	EE	08	78	C480:59	20	EC	A3	A2	08	A5	FF	0D	C6E8:FB	AD	1B	D0	49	FF	8D	1B	D0
C220:D0	EE	0A	D0	EE	0C	D0	EE	50	C488:A9	00	85	A9	67	85	5B	8E	C6F0:D0	60	AD	12	D0	C9	26	D0	A0	00
C228:0E	D0	20	62	C2	AD	00	D0	B0	C490:A9	00	85	58	A9	77	85	59	B4	C6F8:F9	AD	11	D0	49	10	8D	11	D4
C230:C9	68	D0	DE	CE	00	D0	CE	A3	C498:20	EC	A3	20	F1	B7	E0	00	14	C700:D0	60	20	F1	B7	8E	22	D0	40
C238:02	D0	CE	04	D0	CE	06	D0	AB	C4A0:F0	03	4C	D6	C5	A9	A0	8D	FD	C708:20	F1	B7	8E	23	D0	20	F1	92
C240:CE	08	D0	CE	0A	D0	CE	0C	73	C4A8:FB	C9	A2	00	A0	A9	03	52	C710:B7	8E	24	D0	A9	FF	A2	08	4B	
C248:D0	CE	0E	D0	20	62	C2	AD	76	C4B0:85	FD	A9	40	85	FE	AD	FB	35	C718:9D	FF	77	CA	D0	FA	A9	5B	33
C250:00	D0	C9	50	D0	D0	DE	AD	01	C4B8:C9	8D	FC	C9	A9	00	8D	FD	2D	C720:8D	11	D0	60	A9	1B	8D	11	C0
C258:DC	C9	EF	D0	B5	A9	01	85	A5	C4C0:C9	20	1B	C6	A9	00	91	FD	75	C728:D0	60	AD	12	D0	C9	26	D0	D9
C260:FB	60	A0	06	88	EA	D0	FC	FE	C4C8:C8	91	FD	C8	91	FD	C8	C8	46	C730:F9	78	A9	00	8D	15	D0	A9	1C
C268:60	AD	12	D0	C9	FA	D0	F9	AE	C4D0:C8	C8	C0	3C	D0	F0	EE	FB	F0	C738:15	8D	18	D0	A9	97	8D	00	8C
C270:A9	00	8D	15	D0	8D	17	D0	89	C4D8:C9	E8	E0	04	D0	CE	EE	FB	79	C740:DD	A9	04	8D	88	02	A9	31	53
C278:A9	FF	8D	10	D0	8D	1B	D0	49	C4E0:C9	EE	FB	C9	EE	FB	C9	EE	11	C748:8D	14	03	A9	EA	8D	15	03	59
C280:8D	1D	D0	EA	A2	FF	8E	1C	2B	C4E8:FB	C9	AD	FB	C9	B9	90	D1	C750:A9	F0	8D	1A	D0	A9	81	8D	02	
C288:D0	20	F1	B7	8E	25	D0	20	03	C4F0:B9	A9	A4	8D	FB	C9	A2	00	7B	C758:0D	DC	A9	1B	8D	11	D0	A9	88
C290:F1	B7	8E	26	D0	20	F1	B7	D3	C4F8:A0	00	A9	00	85	FD	A9	40	BF	C760:CA	8D	26	03	A9	F1	8D	27	05
C298:8A	A2	08	9D	26	D0	CA	D0	C1	C500:85	FE	AD	FB	C9	8D	FC	C9	CB	C768:03	A9	83	8D	02	03	A9	A4	41
C2A0:FA	A9	32	A2	10	9D	FF	CF	45	C508:A9	00	8D	FD	C9	20	1B	C6	C5	C770:8D	03	03	A9	47	8D	18	03	26
C2A8:CA	CA	D0	F9	A9	01	85	FB	58	C510:A9	00	91	FD	C8	91	FD	C8	D3	C778:A9	FE	8D	19	03	58	60	A9	C3
C2B0:A9	00	8D	0E	DC	A9	33	85	17	C518:91	FD	C8	C8	C8	C0	42	BE	C780:40	8D	88	02	A9	93	20	D2	73	
C2B8:01	A2	08	A0	FF	A9	00	85	9E	C520:D0	F0	EE	FB	C9	E8	E0	04	A5	C788:FF	A9	8B	8D	26	03	A9	C7	29
C2C0:5A	A9	D7	85	5B	A9	00	85	38	C528:D0	CE	EE	FB	C9	EE	FB	C9	39	C790:8D	27	03	A9	9E	8D	18	03	0A
C2C8:58	A9	7F	85	59	20	EC	A3	F5	C530:EE	FB	C9	EE	FB	C9	AD	FB	B8	C798:A9	C8	8D	19	03	A9	AE	8D	1C
C2D0:A9	37	85	01	A9	01	8E	0E	34	C538:C9	C9	BD	90	B9	A9	C0	8D										



PROGRAMS

GAZETTE COMMODORE 64/128

<pre> {9 SHIFT-SPACE}{RVS} {SHIFT-SPACE}{3 SPACES} {SHIFT-SPACE}{OFF} {9 SHIFT-SPACE}";:NEXT QJ 560 PRINT"{17 RIGHT}{RVS} {10 SHIFT-SPACE} {3 SPACES} {10 SHIFT-SPACE}"; GH 570 FORT=1TO3:PRINT" {17 RIGHT}{RVS} {23 SPACES}";:NEXT EF 580 PRINT"{17 RIGHT}{RVS} {10 SHIFT-SPACE} {3 SPACES} {10 SHIFT-SPACE}"; QC 590 FORT=1TO3:PRINT" {17 RIGHT}{OFF} {9 SHIFT-SPACE}{RVS} {SHIFT-SPACE}{3 SPACES} {SHIFT-SPACE}{OFF} {9 SHIFT-SPACE}";:NEXT SJ 600 PRINT:PRINT:PRINT PK 610 FORT=1TO3:PRINT"{BLU}@@ @@@@@{7}{@{YEL}@@@{7}{@ {BLU}@@@@@":NEXT BJ 620 PRINT"{7}{@@@@@ {YEL}@@@{7}{@{@@@@@ @" FG 630 FORT=1TO3:PRINT"{YEL}@@ @@@@@@@@@@@@@@@@@@@@": NEXT HJ 640 PRINT"{7}{@@@@@ {YEL}@@@{7}{@@@@@ HP 650 FORT=1TO2:PRINT"{BLU}@@ @@@@@{7}{@{YEL}@@@{7}{@ {BLU}@@@@@":NEXT SB 660 PRINT"{BLU}@@@@@{7}{ @{YEL}@@@{7}{@{BLU}@@@@ @@@@{HOME}":SYS50930 BC 670 SYS51388,0,6 KM 680 SYS50916:SYS51725,0:SYS 50746,0:SYS50916:SYS517 25,1:SYS50746,0 FX 690 SYS50916:SYS50740,0:SYS 50752,2,1 </pre>	<pre> HF 700 SYS51388,0,6:SYS50916:S YS50740,0:FORDL=1TO100: NEXT:SYS50746,0 FB 710 SYS50916:GOTO330 GM 720 L=E-S:EN=L+N AJ 730 A%=L/256:A=L-256*A%:B%= (EN-A)/256:B=EN-256*B%- A:C%=(E-A)/256:C=E-256* C%-A JK 740 POKE781,A%+1:POKE782,A: POKE90,C:POKE91,C%:POKE 88,B:POKE89,B%:SYS41964 KE 750 RETURN FS 760 DATA170,170,170,149,85, 87,149,85 FP 770 DATA87,154,90,87,154,21 8,215,154 KS 780 DATA218,215,154,218,215 ,154,218,215 ME 790 DATA154,170,215,154,170 ,215,154,170 DE 800 DATA215,154,170,215,154 ,250,215,154 MB 810 DATA218,215,154,218,215 ,154,218,215 JH 820 DATA154,218,215,151,215 ,215,149,85 BJ 830 DATA87,149,85,87,191,25 5,255,42 XQ 840 DATA170,170,170,149,85, 87,154,170 BK 850 DATA87,154,170,215,154, 170,215,154 FG 860 DATA170,215,154,255,215 ,154,213,87 KG 870 DATA154,169,087,154,171 ,87,154,171 HQ 880 DATA87,154,171,87,154,2 55,87,154 KD 890 DATA213,87,154,170,87,1 54,170,215 RX 900 DATA154,170,215,154,170 ,215,151,255 JF 910 DATA215,149,85,87,191,2 55,255,42 </pre>	<p>IMPORT</p> <pre> BE 1 REM COPYRIGHT 1991 - COMP UTE PUBLICATIONS INTL LTD - ALL RIGHTS RESERVED QJ 10 POKE53280,0:POKE53281,0: PRINT"{CLR}{WHT}"TAB(7)" SIMULVIDEO BITMAP GRABBE R{2 DOWN}" XG 20 DIMSC(11):PRINT"ENTER MU LTICOLOR BITMAP":INPUT"FI LENAME";M\$:M\$=M\$+"P,R" SR 30 PRINT"{DOWN}ENTER FILENA ME TO SAVE SIMULVIDEO":I NPUT"GRAPHICS UNDER";CS EJ 40 PRINT"{2 DOWN}LOADING... " KP 50 OPEN1,8,1,M\$:POKE185,0:P OKE780,0:POKE781,0:POKE7 82,64:SYS65493:CLOSE1 BM 60 PRINT"{DOWN}CONVERTING.. .TAKES 2 MIN 26 SEC..." QB 70 S=24576:M=16384:A=21:B=2 56:C=2:D=8:E=3:F=64:G=24 8:H=40:I=7:J=504 CG 80 Z=0:FORT=0TO11:SC(T)=Z:Z =Z+1:IFZ>2THENZ=0 AQ 90 NEXT:FORX=0TO167:FORX=0T O47STEP4 XX 100 M%=S+(INT(Y/A)*B)+(INT(X*C/D/E)*F)+(E*(INT(Y)- (INT(Y/A))*A))+SC(INT(X *C/D)) HJ 110 POKEM%,PEEK(M+(YANDG)*H +(YANDI)+(C*XANDJ)):NEX T:NEXT SE 120 PRINT"{2 DOWN}SAVING... ":SYS57812C\$,8,1:POKE19 3,0:POKE194,96 QE 130 POKE174,0:POKE175,104:S YS62957 </pre>
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O R R I C K H A M P T O N J R .

Teachers, get out your favorite riddle book and use it with this program to spice up your homework assignments or quizzes. *Riddle* prints a quiz that reveals the answer to your riddle when students correctly answer the assigned questions.

Following your list of questions are two columns of possible answers, with a letter printed in front of each answer. When students cross off the letters corresponding to the correct answers, the remaining letters, reading from left to right and top to bottom, spell out the answer to your riddle.

Typing It In
Riddle is written entirely in BASIC. To avoid typing errors, use *The Automatic Proofreader* to enter the program; see "Typing Aids" elsewhere in

RIDDLE

TEACHERS CAN SPICE UP QUIZZES WITH THIS WORK SHEET GENERATOR FOR THE 64

this section. When you have finished typing, be sure that you save a copy of the program before you exit the *Automatic Proofreader*.

Ask Me a Riddle
 When you run the program, you'll be presented with a menu with the following choices.

- 1 GET FROM DISK
- 2 CREATE NEW RIDDLE
- 3 CORRECT
- 4 SAVE TO DISK
- 5 PRINT
- 6 PRINT ANSWERS
- 7 DISK DIRECTORY
- 8 CLEAR MEMORY
- 9 QUIT

Choice 1 enables you to retrieve any work sheet you have previously saved to disk. Just enter the filename and hit Return. If you select this option or any option by mistake, just press the back-arrow key to return to



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the main menu.

Choice 2 enables you to create a new riddle work sheet. Your first task will be to enter a riddle. The only limitation on the question is that it contain 254 characters or less.

Next, enter the answer to your riddle in lowercase characters, leaving no spaces between words. The answer must contain no more than 254 characters. You may want to keep your answer relatively short, as its length is related to the number of distractor answers you'll have to provide. More about that later.

At this point you may enter any instructions you want printed on the sheet. Again you are restricted to 254 characters.

Now enter the number of questions or problems you want to include and then the questions or problems themselves. Here you are restricted to 70 characters per question. If you are using *Riddle* as an answer sheet, you can enter page numbers and/or problem numbers at this point. After each question or problem enter the correct answer. As with the questions, you are restricted to 70 characters.

Next, enter one distractor answer for every character in your riddle's answer. Distractors are incorrect answers from among which the students must select the correct ones. Think of them as the wrong answers on a multiple choice quiz. Just be sure that none of the distractor answers are the same as any of the correct answers. The computer will check for an exact string match, but it will not catch duplicate answers like 2.5 and 2.50, 1/2 and 4/8, or alternate spellings of the same word. You are restricted to 70 characters here. This may sound confusing, but it will become clear after you prepare your first sheet.

If at any point in this process you want to go back and change something or make corrections, just keep pressing the back arrow until you return to the desired spot. Then reenter the correct information. When finished, keep pressing Return until you get back to where you were. The input routine in this program has been changed to allow you to enter commas; however, you can't insert or type over characters. You can only use the Delete key to erase characters.

Choice 3 enables you to correct any mistakes you discover after you

return to the main menu. This option takes you back through the create-new-riddle sequence, displaying what you have previously entered. Just keep pressing Return until you reach the place where you want to change any information. Then keep pressing Return until you get back to the main menu.

Choice 4 enables you to save your work sheet to disk. Just enter the filename.

Choice 5 prints your work sheet. It will ask you to press Return when the printer is ready. Then enter the number of copies you want and press Return again. The printing routine is not printer specific. It formats the page by assuming 80 characters per line and 66 lines per page. If you change the definition of keys to print special characters, be sure that they are the same width as normal characters.

Choice 6 prints a duplicate of the problem sheet, but with the correct answers on it. In front of each correct answer, the program will print the corresponding question number and a letter which is part of the riddle answer. Distractor answers will have only a letter in front of them.

You may want to have the students write the problem number before every answer they cross out to be sure they actually worked the problems. Their answers could differ from those on this answer sheet if more than one problem had the same correct answer.

Choice 7 is disk directory. It gives you a two-column listing of the directory.

Choice 8 clears the computer's memory. If you create a new riddle without first clearing the memory of the old information, the previous riddle will still be there. There are times you might want to do this.

Choice 9 lets you quit. Use this option to exit the program.

You don't have to remember all the restrictions on entering your data; *Riddle* is a fairly user-friendly program, and the computer will inform you if you make a mistake. The one restriction you will have to remember, though, is to make sure that none of your distractors are equivalent to a right answer. The computer will only check for identical answers. An identical distractor could slip through.

RIDDLE

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BE 1 REM COPYRIGHT 1991 - COMP
    UTE PUBLICATIONS INTL LTD
    - ALL RIGHTS RESERVED
SR 10 DIMA$(99),G$(99),Q(99),C
    (99),N(99),O(99),D$(99),
    DS(99),QS(99)
MM 20 GOSUB 1940:GOSUB2560
DM 30 PA$="":ZR$="":PRINT"
    {CLR}"CHR$(158);:POKE532
    72,23:PRINTCHR$(8)
CS 40 GOSUB1960
HB 50 GETP$:IFP$=""THEN50
AQ 60 H=VAL(P$):IF H<1 OR H>9
    {SPACE}THEN 50
QM 70 ON H GOTO 1420,110,110,1
    250,700,2160,2170,1540,1
    830
QF 80 GOTO20
SB 90 GOTO2130
JB 100 IF P$="Y"THEN30
KC 110 GOSUB1560:IFRQ$<>""THEN
    PRINT"CURRENT
    {SHIFT-SPACE}QUESTION":
    PRINT"{RVS}"RQ$"{OFF}"
XH 120 PRINT"ENTER
    {SHIFT-SPACE}RIDDLE
    {SHIFT-SPACE}QUESTION":
    GOSUB1650
SK 130 IFIP$<>""ANDP$<>""<"THEN
    RQ$=IP$
QJ 140 IF P$=""<"THEN30
SD 150 IF RQ$=""<"THEN110
EG 160 GOSUB1560:PRINT"CURRENT
    {SHIFT-SPACE}QUESTION":
    PRINT"{RVS}"RQ$"{OFF}":
    PRINT
MD 170 IF RA$<>""THENPRINT"CUR
    RENT{SHIFT-SPACE}ANSWER
    ":PRINT"{RVS}"RA$"{OFF}
    "
SD 180 PRINT"ENTER
    {SHIFT-SPACE}RIDDLE
    {SHIFT-SPACE}ANSWER":GO
    SUB1650
PQ 190 IF IP$<>"" AND P$<>""<"
    {SPACE}THEN RA$=IP$:LR=
    LEN(RA$)
GA 200 IF P$=""<" THEN 110
JB 210 IF RA$="" THEN 160
HR 220 FORI=1TOLR:IFASC(MID$(R
    A$,I,1))=32THENPRINT"NO
    {SHIFT-SPACE}SPACES"
SF 230 IFASC(MID$(RA$,I,1))=32
    THENPRINT:GOTO180
KF 240 A=ASC(MID$(RA$,I,1))
CA 250 IFA>90 OR A<64 THENPRIN
    T"LOWERCASE
    {SHIFT-SPACE}LETTERS
    {SHIFT-SPACE}ONLY":PRIN
    T:GOTO180
QG 260 NEXTI
SE 270 GOSUB1560:IFI$<>""THENP
    RINT"CURRENT
    {SHIFT-SPACE}INSTRUCTIO
    NS":PRINT"{RVS}"I$"
    {OFF}":PRINT
CF 280 PRINT"ENTER
    {SHIFT-SPACE}INSTRUCTIO
    NS":GOSUB1650
FF 290 IFIP$<>"" AND P$<>""<" T
    HEN I$=IP$

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AQ 300 IF P$="<" THEN 160
JG 310 IF I$="" THEN 270
ER 320 LR = LEN(RA$)
DC 330 GOSUB1560:PRINTLR;" DIS
TRACTORS":PRINT
HK 340 IF N<>0 THEN PRINT"CURR
ENT{SHIFT-SPACE}NUMBER
{SHIFT-SPACE}OF
{SHIFT-SPACE}PROBLEMS":
PRINT{RVS}"N"{OFF}":PR
INT
QB 350 PRINT"ENTER
{SHIFT-SPACE}NUMBER
{SHIFT-SPACE}OF
{SHIFT-SPACE}PROBLEMS "
:GOSUB1650
XF 360 IF IP$<>"ANDP$<>"<"THE
NN=VAL(IP$)
EH 370 IF P$="<" THEN 270
MR 380 IF N = 0 THEN 330
AD 390 I=1
DH 400 GOSUB1560:PRINTN;" QUES
TIONS":PRINT
FQ 410 IF Q$(I)<>" THENPRINT"C
URRENT{SHIFT-SPACE}QUES
TION":PRINT{RVS}"Q$(I
)"{OFF}":PRINT
AX 420 PRINT"ENTER
{SHIFT-SPACE}QUESTION "
;I:GOSUB1650
RP 430 IFIP$<>"ANDP$<>"<"THEN
Q$(I)=IP$
PC 440 IF LEN(Q$(I))>70 THENPR
INT"NO{SHIFT-SPACE}MORE
{SHIFT-SPACE}THAN 70
{SHIFT-SPACE}CHARACTERS
"
CQ 450 IF LEN(Q$(I))>70 THENPR
INT:GOTO420
CH 460 IF P$="<" THEN IF I=1 TH
EN 330
XG 470 IF P$="<" THEN IF I>1 TH
EN I=I-1:GOTO400
DE 480 IF A$(I)<>" THENPRINT"C
URRENT{SHIFT-SPACE}RIGH
T{SHIFT-SPACE}ANSWER":P
RINT{RVS}"A$(I)"{OFF}"
JS 490 PRINT:PRINT"ENTER
{SHIFT-SPACE}RIGHT
{SHIFT-SPACE}ANSWER":GO
SUB1650
SC 500 IFIP$<>"ANDP$<>"<"THEN
A$(I)=IP$
DM 510 IF P$="<" THEN 400
SF 520 IF A$(I)=" THEN480
PG 530 IF LEN(A$(I))>70 THEN P
RINT:PRINT"NO
{SHIFT-SPACE}MORE
{SHIFT-SPACE}THAN 70 CH
ARACTERS"
FJ 540 IF LEN(A$(I))>70 THEN P
RINT:GOTO420
GG 550 I=I+1:IF I<=N THEN 400
MR 560 I=1
RB 570 GOSUB1560:PRINTLEN(RA$)
;" DISTRACTORS":PRINT
EM 580 IFD$(I)<>" THENPRINT"CU
RRENT{SHIFT-SPACE}DISTR
ACTOR":I:PRINT{RVS}"D$(
I)"{OFF}":PRINT
EA 590 PRINT"ENTER DISTRACTOR"
;I:GOSUB1650
HS 600 IFIP$<>"ANDP$<>"<"THEN
D$(I)=IP$

```

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GG 610 IF LEN(D$(I))>70 THEN P
RINT"NO{SHIFT-SPACE}MOR
E{SHIFT-SPACE}THAN
{SHIFT-SPACE}70
{SHIFT-SPACE}CHARACTERS
":PRINT:GOTO590
PC 620 IF P$="<" THEN I=I-1:IF
I>0 THEN GOTO570
BH 630 IFI<=0 THEN I=N:GOTO400
QQ 640 IF D$(I)=" THEN570
XJ 650 FORJ=1TON:A=VAL(A$(J)):
IFD$(I)=A$(J) THEN670
BE 660 NEXTJ:GOTO680
CM 670 PRINT"DUPLICATES AN
{SHIFT-SPACE}ANSWER":PR
INT:GOTO590
ER 680 I=I+1:IFI<=LEN(RA$) THE
N 570
HX 690 GOTO30
CS 700 GOSUB1580:INPUT"HIT
{SHIFT-SPACE}RETURN
{SHIFT-SPACE}WHEN
{SHIFT-SPACE}PRINTER
{SHIFT-SPACE}IS
{SHIFT-SPACE}READY";ZR$
IFZR$="<"ORRA$=" THEN30
CK 705 GOSUB 1580
PE 710 INPUT"NUMBER
JE 720 {SHIFT-SPACE}OF
{SHIFT-SPACE}COPIES";N$
:NC=VAL(N$):IFN$="" OR
{SPACE}N$="<" THEN 30
RB 730 OPEN1,4,7:FORPG=1TONC
PQ 740 FORRS=139TO143:POKERS,A
SC(RA$):NEXTRS:GOSUB139
0
EP 750 X=0:FORI=1TON:IFX<LEN(Q
$(I)) THENX=LEN(Q$(I))
RG 760 NEXTI
RC 770 IT=X+9:CN=INT(80/IT):QC
=CN
KJ 780 LQ=0:ZS=1:ZE=76:LL=LEN(
RQ$):IFZE>LLTHENZE=LL:
GOTO820
XK 790 IFMID$(RQ$,ZE,1)<>" "AN
DZE<>1THENZE=ZE-1:GOTO7
90
PX 800 PRINT#1,MID$(RQ$,ZS,ZE-
ZS+1):ZS=ZE+1:ZE=ZE+76:
LQ=LQ+1
DJ 805 IFZE>LLTHENZE=LL:GOTO
{SPACE}820
FM 810 GOTO790
GR 820 N5=12+LQ+LI
SD 830 PRINT#1,RIGHT$(RQ$,LL-Z
S+1):PRINT#1:LQ=LQ+1
KC 840 ZS=1:ZE=76:LI=0:LL=LEN(
I$):IFZE>LLTHENZE=11:G
OTO880
EX 850 IFMID$(I$,ZE,1)<>" "AND
ZE<>1THENZE=ZE-1:GOTO85
0
MJ 860 PRINT#1,MID$(I$,ZS,ZE-Z
S+1):ZS=ZE+1:ZE=ZE+76
DH 865 IFZE>LLTHENZE=LL:LI=LI
+1:GOTO880
BX 870 GOTO850
AR 880 PRINT#1,RIGHT$(I$,LL-ZS
+1):LI=LI+1
CF 890 T=CN:PRINT#1:PRINT#1:FO
RI=1TON
PB 900 PRINT#1,STR$(I);". ";Q$
(I);SPC(IT-LEN(Q$(I)))-L
EN(STR$(I))-2);

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GF 910 T=T-1:IFT<=0THEM=CN:PR
INT#1:PRINT#1:N5=N5+2:G
OSUB2130
GS 920 NEXTI:PRINT#1
QE 930 FORI=1TON
JC 940 J=INT(1+N*NRND(1)):IFC(J
)=1THEN940
CP 950 C(J)=1:O(I)=J:NEXTI:FOR
I=1TON:C(I)=0:NEXTI
RC 960 X=0:FORI=1TON:IFX<LEN(A
$(I)) THENX=LEN(A$(I))
JD 970 NEXTI
SC 980 ND=LEN(RA$):FORI=1TOND
KH 990 FORI=1TOND:IFX<LEN(D$(I
)) THENX=LEN(D$(I))
SK 1000 :NEXTI:IT=X+6:CN=INT(8
0/IT):FORI=1TOND
PQ 1010 J=INT(1+ND*NRND(1)):IFC
(J)=1THEN1010
QB 1020 DS(I)=J:C(J)=1:NEXTI:F
ORI=1TOND:C(I)=0:NEXTI
GG 1030 FORI=1TOLEN(RA$):IFX<L
EN(D$(I)) THENX=LEN(D$(
I)):NEXTI
CJ 1040 IFPA$="A" THENPRINT#1:P
RINT#1,RA$:PRINT#1:I=1
:J=1:T=CN
RJ 1050 IFPA$<>"A" THENPRINT#1:
PRINT#1:PRINT#1:I=1:J=
1:T=CN
PK 1060 FQ=LEN(RA$)/(N+LEN(RA$
))
HM 1070 K=RND(1)
BC 1080 IFK>FQ THENM=INT(1+26*
RND(1))
KS 1090 LO=LEN(STR$(O(I)))-3:R
O=LO+2:Z=O(I):Z$=RIGHT
$(STR$(Z),RO)
HR 1095 IFPA$<>"A" THEN1130
CQ 1100 IFK>FQ ANDI<=N AND PA$
="A" THENPRINT#1,Z$:CH
R$(64+M);"=";A$(Z);
SE 1110 IFK>FQ ANDI<=N THENPRI
NT#1,SPC(IT-(LEN(CHR$(
64+M))+3+LEN(A$(O(I))
))-LO);
KH 1120 IFK>FQ ANDI<=N AND PA$
="A" THEN GOTO 1150
BS 1130 IFK>FQ ANDI<=N THENPRI
NT#1,CHR$(64+M);"=";
A$(O(I));
JR 1140 IFK>FQ ANDI<=N THENPRI
NT#1,SPC(IT-(LEN(CHR$(
64+M))+3+LEN(A$(O(I))
)));
QH 1150 IFK>FQ ANDI<=N THENI=I
+1:T=T-1
QA 1160 IFT<=0THEM=CN:PRINT#1
:PRINT#1:N5=N5+2:GOSUB
2130
EJ 1170 IF K>FQ THEN1220
KF 1180 IFJ<=LEN(RA$) THENPRINT
#1,MID$(RA$,J,1);"=";
D$(D$(J));
PG 1190 IFJ<=LEN(RA$) THENPRINT
#1,SPC(IT-4-LEN(D$(D$(
J))));
JM 1200 C=0
EJ 1210 IFJ>LEN(RA$) THEN1220
CJ 1215 J=J+1:T=T-1:IFT<=0 THE
M=CN:PRINT#1:PRINT#1:
N5=N5+2:GOSUB90
BC 1220 IFI>N AND J>LEN(RA$) TH
EN GOSUB1600

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RF 1230	IFI>N AND J>LEN(RA\$)TH EN NEXTPG:CLOSE1:GOTO3 0	BS 1560	PRINT"{CLR}{RVS} {11 SPACES}HIT {SHIFT-SPACE}< {SHIFT-SPACE}TO {SHIFT-SPACE}GO {SHIFT-SPACE}BACK {3 SPACES} {10 SHIFT-SPACE}{OFF}"		+INT (LEN (I\$) / 80) + 2 * INT (N / QC)
HB 1240	GOTO1070	MC 1570	RETURN	FC 1890	NL=8+INT (LEN (RQ\$) / 80) + INT (LEN (I\$) / 80) + 2 * INT (N / QC)
XK 1250	GOSUB1580:N\$="":INPUT" FILENAME";N\$:IFN\$="<" {SPACE}OR N\$=" " OR RA\$ =" " THEN 30	FS 1580	PRINT"{CLR}{RVS} {10 SPACES}ENTER {SHIFT-SPACE}< {SHIFT-SPACE}TO {SHIFT-SPACE}GO {SHIFT-SPACE}BACK {3 SPACES} {9 SHIFT-SPACE}{OFF}"	FH 1900	PRINT#1:PRINT#1,RQ\$:PR INT#1:T=CN:PRINT#1,I\$: PRINT#1:PRINT#1:FORI=1 TON
JG 1260	N\$=N\$+",S,W":OPEN5,8,5 N\$:ND=LEN(RA\$)	AE 1590	RETURN	KR 1910	PRINT#1,I;". ";Q\$(I);S PC(IT-LEN(Q\$(I))-LEN(S TR\$(I))-3);
JG 1270	OPEN15,8,15:INPUT#15,E ,E\$,C,D	QG 1600	NL=12+LQ+LI+2*INT(N/QC)	BA 1920	T=T-1:IFT=<0THENT=CN:P RINT#1:PRINT#1
DH 1280	IF E<>63 THEN GOTO1310	CM 1610	N2=NL	XQ 1930	NEXTI:PRINT#1:RETURN
DE 1290	PRINTE\$;" ,OK TO OVERWR ITE (Y/N)";:INPUTYN\$	BQ 1620	NL=NL+2*(INT((LEN(RA\$) +N)/CN))	SC 1940	POKE40503,128:POKE4050 4,128:POKE53280,6:POKE 53281,0:POKE646,1
FB 1300	IF LEFT\$(YN\$,1)<>"Y" T HEN CLOSE5:CLOSE15:GOT O30	EK 1630	IFNL>63THENNL=NL-63:GO TO1630	AG 1950	FORI=1TO15:CLOSEI:NE XTI:RETURN
EQ 1310	CLOSE5:PRINT#15,"S0:" N\$:CLOSE15:OPEN5,8,5,N \$	XF 1640	FORI=NLTO66:PRINT#1:NE XTI:RETURN	XG 1960	PRINT"{CLR}"TAB(8)" {RVS}{6 SPACES}RIDDLE {SHIFT-SPACE}MENU {7 SPACES}{OFF}"
RC 1320	PRINT#5,RQ\$:PRINT#5,RA \$:PRINT#5,N:FORI=1TON: PRINT#5,Q\$(I):NEXTI	ED 1650	IP\$=""	GP 1970	PRINTTAB(8)XS\$TAB(32)X S\$
FQ 1330	FORI=1TON:PRINT#5,A\$(I <td>BJ 1660</td> <td>PRINT"{RVS} {OFF} {LEFT} {LEFT}{RVS} {OFF}{LEFT} {LEFT}";</td> <td>KE 1980</td> <td>PRINTTAB(8)XS\$TAB(10)" 1 = GET{SHIFT-SPACE}ER OM{SHIFT-SPACE}DISK"TAB B(32)XS\$</td>	BJ 1660	PRINT"{RVS} {OFF} {LEFT} {LEFT}{RVS} {OFF}{LEFT} {LEFT}";	KE 1980	PRINTTAB(8)XS\$TAB(10)" 1 = GET{SHIFT-SPACE}ER OM{SHIFT-SPACE}DISK"TAB B(32)XS\$
FE 1340	FORI=1TOND:PRINT#5,D\$(I):NEXTI:PRINT#5,I\$:PR INTCHR\$(147);	RX 1670	IFLEN(IP\$)>254THEN GOT O 1790	PC 1990	PRINTTAB(8)XS\$TAB(10)" 2 = CREATE {SHIFT-SPACE}NEW {SHIFT-SPACE}RIDDLE"TAB B(32)XS\$
FE 1350	CLOSE5:I=N+1:J=LEN(RA\$) + 1:C=0:GOTO30	SH 1680	GETP\$:IFP\$=" "THEN1660	GA 2000	PRINTTAB(8)XS\$TAB(10)" 3 = CORRECT"TAB(32)XS\$
AS 1360	IFC=3 THENRUN	XP 1690	IFASC(P\$)=19ORASC(P\$)= 147THENGOTO1660	FR 2010	PRINTTAB(8)XS\$TAB(10)" 4 = SAVE{SHIFT-SPACE}T O{SHIFT-SPACE}DISK"TAB (32)XS\$
BQ 1370	IFC=4 THENCLOSE1:PRINT CHR\$(147);:END	SK 1700	IFP\$="<"THENRETURN	XH 2020	PRINTTAB(8)XS\$TAB(10)" 5 = PRINT"TAB(32)XS\$
RJ 1380	GOTO1070	PP 1710	IF P\$="{DOWN}" OR P\$=" {UP}" OR P\$="{RIGHT}" {SPACE}OR P\$="{LEFT}" {SPACE}THEN 1660	PA 2030	PRINTTAB(8)XS\$TAB(10)" 6 = PRINT{SHIFT-SPACE} ANSWERS"TAB(32)XS\$
GX 1390	PRINT#1,"CROSS OUT THE LETTERS THAT GO WITH {SPACE}THE RIGHT ANSW ERS."	RQ 1720	PRINTP\$;"{RVS} {OFF} {LEFT} {LEFT}";	XF 2040	PRINTTAB(8)XS\$TAB(10)" 7 = DISK{SHIFT-SPACE}D IRECTORY"TAB(32)XS\$
AG 1400	PRINT#1,"THE LETTERS L EFT WILL SPELL THE ANS WER TO THE FOLLOWING."	AA 1730	IFASC(P\$)<>20ANDASC(P\$) <>130ANDASC(P\$)<>13TH ENIP\$=IP\$+P\$:GOTO1660	DF 2050	PRINTTAB(8)XS\$TAB(10)" 8 = CLEAR{SHIFT-SPACE} MEMORY"TAB(32)XS\$
GS 1410	PRINT#1:PRINT#1:RETURN	HR 1740	IFASC(P\$)=13THENRETURN	AM 2060	PRINTTAB(8)XS\$TAB(10)" 9 = QUIT"TAB(32)XS\$
GM 1420	GOSUB1580:N\$="":INPUT" FILENAME";N\$:IFN\$="<"O RNS\$=" "THEN30	XA 1750	IF LEN(IP\$)<1 AND (ASC (P\$)=20ORASC(P\$)=157)T HENPRINT"{RIGHT}";:GOT O1650	JF 2070	PRINTTAB(8)XS\$TAB(32)X S\$
GE 1430	N\$="0:"N\$+",S,R":OPEN 5,8,5,N\$	BE 1760	IF LEN(IP\$)=1 AND (ASC (P\$)=20ORASC(P\$)=157)T HENGOTO1650	CX 2080	PRINTTAB(8)"{RVS} {7 SPACES}HIT {SHIFT-SPACE}CHOICE {SHIFT-SPACE} {7 SPACES}{OFF}"
EB 1440	OPEN15,8,15:INPUT#15,E ,E\$,C,D	QB 1770	IFASC(P\$)=20ORASC(P\$)= 157THENIP\$=LEFT\$(IP\$,L EN(IP\$)-1):GOTO1660	KF 2090	RETURN
HC 1450	IF E<>62 THEN GOTO1470	MH 1780	GOTO1660	DH 2100	Z\$=""
BX 1460	PRINTE\$;" ,HIT <RETURN> ";:INPUTYN\$:CLOSE5:CLO SE15:GOTO30	JQ 1790	PRINT:PRINT"NO {SHIFT-SPACE}MORE {SHIFT-SPACE}THAN {SHIFT-SPACE}254 CHARA CTERS":PRINT	JQ 2110	GET#5,Z\$:IFASC(Z\$)<>13 THENZZ\$=ZZ\$+Z\$:GOTO211 0
SK 1470	CLOSE5:CLOSE15:OPEN5,8 ,5,N\$	DD 1840	REM PRINT QUESTIONS	EF 2120	RETURN
CE 1480	GOSUB2100:RQ\$=ZZ\$:GOSU B2100:RA\$=ZZ\$:GOSUB210 0:N=VAL(ZZ\$):FORI=1TON	QQ 1850	X=0:FORI=1TON:IFX<LEN(Q\$(I))THENX=LEN(Q\$(I))	PC 2130	IF N5>63 THEN PRINT#1: PRINT#1:PRINT#1
MA 1490	GOSUB2100	AB 1860	NEXTI	HM 2140	IF N5>63 THEN N5=N5-63 :RETURN
CP 1500	Q\$(I)=ZZ\$:NEXTI	SF 1870	IT=X+9:CN=INT(80/IT):Q C=CN	PG 2150	RETURN
RQ 1510	FORI=1TON:GOSUB2100:A\$(I)=ZZ\$:NEXTI:FORI=1TO LEN(RA\$):GOSUB2100:D\$(I)=ZZ\$	RJ 1880	N5=14+INT (LEN (RQ\$) / 80)	GB 2160	PA\$="A":H=5:GOTO70
QJ 1520	NEXTI			KJ 2170	C=1
RE 1530	GOSUB2100:I\$=ZZ\$:CLOSE 5:GOTO30				
JP 1540	RUN				
BS 1550	QQ\$="ENTER {SHIFT-SPACE}NUMBER {SHIFT-SPACE}OF {SHIFT-SPACE}PROBLEMS" :RETURN				



PROGRAMS

BH 2180 S\$=" ":FORBL=0TO18:S\$=S\$+" ":NEXT	KF 2360 GET#8,B\$:IFB\$<>" "THEN2360	2250
SS 2190 OPEN8,8,0,"\$"	BK 2370 NEXT:C=C+1	BK 2490 XL=ASC(H\$+CHR\$(0)):XL\$=STR\$(XL+256*ASC(XB\$+CHR\$(0)))
JP 2200 PRINT"{CLR}";	JF 2380 IF C=2 THEN PRINT CHR\$(19)+"{DOWN}";:GOTO2250	SE 2500 POKE214,23:POKE211,10:PRINT CHR\$(145);"{PUR}";XL\$;" BLOCKS FREE ":CLOSE8:XC=1
PH 2210 GET#8,B\$:IFB\$<>CHR\$(34)THEN2210	HG 2390 PRINT"{HOME}{23 DOWN}"CHR\$(158)"{6 SPACES}{RVS}SPACE{OFF} = MORE{SHIFT-SPACE}";	RA 2510 PRINT "{12 SPACES}{RVS}";CHR\$(158);"HIT{SPACE}SPACE BAR";
FM 2220 PRINTSPC(8)"{RVS}";"{GRN}";B\$;	RJ 2400 PRINT"{4 SPACES}{RVS}M{OFF} = MENU";	GK 2520 GETA\$:IFA\$=" "THEN2520
FR 2230 GET#8,B\$:IFB\$<>" "THENPRINTB\$;:GOTO2230	DP 2410 GETJ\$:IFJ\$=" "THEN2410	QK 2530 IFA\$<>" "THEN2520
EJ 2240 PRINT	QA 2420 IFJ\$<>" "ANDJ\$<>"M"THEN2410	SR 2540 PRINTCHR\$(5)+CHR\$(147):GOTO30
SG 2250 FOR E=0 TO 19	CF 2430 PRINT"{HOME}{23 DOWN}{37 SPACES}";	DQ 2550 DATA 128,112,207,250,195
FR 2260 GET#8,B\$,B\$:GET#8,H\$,L\$	QD 2440 IFJ\$="M"THENCLOSE8:GOTO30	GS 2560 RESTORE:FORRI=139TO143:READRN:POKERI,RN:NEXT:POKE649,1:XS\$="{RVS}{SPACE}{OFF}"
JH 2270 GET#8,B\$:IFB\$<>" "THEN2490	KB 2450 PRINT"{HOME}"+"{DOWN}";	QR 2570 BS\$="{CLR}{24 DOWN}"
QM 2280 GET#8,B\$:IFB\$<>CHR\$(34)THEN 2280	JM 2460 IF C/2<>INT(C/2)THENFORXL=0TO19:PRINTS\$:NEXT:GOTO2480	KQ 2580 BL\$="{40 SPACES}"
AB 2290 IF C/2=INT(C/2) THEN PRINTTAB(19)" ";	GH 2470 FORXL=0TO19:PRINTTAB(19);S\$:NEXT	HG 2590 HN\$="{RVS}< TO{SHIFT-SPACE}GO{SHIFT-SPACE}BACK{OFF}{HOME}"
MM 2300 FORXL=1TO16:GET#8,B\$	AC 2480 PRINT"{DOWN}"; S\$;S\$;"{HOME}";"{DOWN}";:GOTO	MC 2600 RETURN
BM 2310 IFB\$=" " OR B\$=CHR\$(34)THEN B\$=" "		
PP 2320 PRINT "{WHT}"B\$;:NEXT		
XP 2330 GET#8,B\$		
SR 2340 GET#8,B\$:IFB\$=" "THEN2340		
RG 2350 PRINT",";B\$;" "		

M I L T O N J O H N S O N

If you are a *GEOS* user, how would you like to replace that program's plain pointer with something more lively? *Magic Mouse* is an animated replacement. It changes the shape of your pointer from an arrow to a mouse whose tail moves back and forth.

Now, instead of using an arrow to make your selections with *GEOS* applications, you can make a tail-wagging mouse scurry across the screen. Next to the mouse's head in the upper left corner of the sprite, you'll notice a small arrow. This is the pointer's hot spot. Use this area to select menus and icons.

Getting Started

Magic Mouse is written entirely in BASIC. To help prevent typing errors, use *The Automatic Proofreader* to type it in; see "Typing Aids" elsewhere in this section. When you've finished typing, be sure to save a copy of the program.

Note: The listing following this article is for *GEOS* version 2.0; if you are using *GEOS* version 1.2, enter line 560 as follows.

560 DATA 141, 49, 227, 169, 1, 141, 50, 227

When you are ready to use *Magic*

MAGIC MOUSE

CHANGE YOUR 64'S
GEOS POINTER TO A
FRIENDLY MOUSE
THAT WAGS ITS TAIL

Mouse for the first time, have a blank disk handy. When you run the program, you will be prompted to insert a blank disk in drive 8. *Magic Mouse* formats the disk and then writes the header/icon block, application file, and *GEOS* directory entry to the disk using direct access commands. When the program has finished creating the new pointer, you're ready to use it.

Boot *GEOS*, open your new *Magic Mouse* disk, and click on the mouse icon. The program will load

and put the interrupt request (irq) routine and data in place and then exit back to the deskTop.

Mouse Mechanics

Magic Mouse runs in the background of a *GEOS* application by wedging into the *GEOS* irq routine. Every time an irq is executed, *Magic Mouse* adds a number to a counter. After a certain number is reached, the program redraws the mouse's tail in another position, making it appear to move.

If you've ever changed the shape of your pointer with *GEOS*'s preference manager, you know that *GEOS* will load the new shape data whenever a disk that contains the preference manager is read. *Magic Mouse*, however, overrides this new data. The program resides at the bottom of the hardware stack at \$0100, and the graphics data resides at \$0291.

MAGIC MOUSE

```
BE 1 REM COPYRIGHT 1991 - COMP
    UTE PUBLICATIONS INTL LTD
    - ALL RIGHTS RESERVED
AG 100 PRINT "{CLR}INSERT A BL
    ANK DISK IN DRIVE 8"
SR 110 PRINT "{DOWN}{YEL}(WARN
    ING! DISK WILL BE FORMA
    TTED){7}"
FS 120 PRINT:PRINT"PRESS SPACE
    TO BEGIN"
DJ 130 GET AN$:IF AN$<>" " THE
```



PROGRAMS

N 130	DA 320 DATA 193,131,255,193,131,255,193,129	AS 550 DATA 4,150,2,63,0,120,169,0
BB 140 PRINT:PRINT:PRINT"WORKING";:WOS="*"	AP 330 DATA 255,129,128,255,1,128,126,1	FB 560 DATA 141,246,250,169,1,141,247,250
CE 150 OPEN 15,8,15,"N0:MAGIC,91"	RM 340 DATA 128,8,1,128,8,1,128,144	CH 570 DATA 88,76,44,194,32,183,193,150
RF 160 FOR T = 1 TO 177:READ DA:A:D1\$=D1\$+CHR\$(DA):NEXT:PRINT WOS;	QQ 350 DATA 1,255,255,255,131,6,0,0	XG 580 DATA 2,193,132,51,0,238,82,1
MB 170 FOR T = 1 TO 32:READ DA:D2\$=D2\$+CHR\$(DA):NEXT:PRINT WOS;	RK 360 DATA 4,0,4,0,4,77,97,103	RR 590 DATA 160,0,173,82,1,201,30,208
CA 180 FOR T = 1 TO 181:READ DA:D3\$=D3\$+CHR\$(DA):NEXT:PRINT WOS;	MH 370 DATA 105,99,32,77,111,117,115,101	DE 600 DATA 4,162,205,160,2,201,42,208
CP 190 OPEN 2,8,2,"#":PRINT WOS;	GS 380 DATA 32,118,49,46,48,0,0,0	DM 610 DATA 4,162,209,160,2,201,72,208
BA 200 PRINT#15,"U1 2 0 17 0":PRINT#2,D3\$:PRINT#15,"U2 2 0 17 0":PRINT WOS;	AB 390 DATA 0,77,105,108,116,111,110,32	BJ 620 DATA 4,162,205,160,2,201,84,208
MG 210 PRINT#15,"U1 2 0 17 1":PRINT#2,D1\$:PRINT#15,"U2 2 0 17 1":PRINT WOS;	MG 400 DATA 74,111,104,110,115,111,110,32	RE 630 DATA 9,162,201,160,2,169,0,141
PS 220 PRINT#15,"U1 2 0 18 1":PRINT#2,D2\$:PRINT#15,"U2 2 0 18 1":PRINT WOS;	SC 410 DATA 32,32,32,32,0,0,0,0	HC 640 DATA 82,1,192,0,240,21,134,2
DQ 230 PRINT#15,"B-A 0 17 00"	RF 420 DATA 0,0,0,0,0,0,0,0	SM 650 DATA 132,3,160,0,162,0,177,2
QB 240 PRINT#15,"B-A 0 17 01"	KE 430 DATA 0,0,0,0,0,0,0,0	GB 660 DATA 157,245,132,232,232,232,200,192
BP 250 CLOSE2:CLOSE15	FP 440 DATA 0,0,0,0,0,0,0,0	GF 670 DATA 4,208,243,108,157,132,0,192
SF 260 PRINT:PRINT:PRINT"DONE!"	BM 450 DATA 0,0,0,0,0,0,0,0	HJ 680 DATA 0,0,128,0,0,0,0,0
MJ 270 DATA 0,255,3,21,191,255,255,255	RM 460 DATA 0,0,0,0,0,0,0,0	EB 690 DATA 0,24,0,0,60,0,0,126
FK 280 DATA 128,0,1,128,0,1,128,8,24	SD 470 DATA 65,110,105,109,97,116,101,100	AM 700 DATA 0,0,60,0,0,126,0,0
BF 290 DATA 1,128,60,1,128,126,1,128	PD 480 DATA 32,80,111,105,110,116,101,114	XJ 710 DATA 255,0,1,255,128,3,255,192
SH 300 DATA 60,1,128,126,1,128,255,1	HB 490 DATA 0,0,255,131,17,0,77,97	HE 720 DATA 3,255,192,3,255,192,3,255
PG 310 DATA 129,255,129,131,255,193,131,255	HD 500 DATA 103,105,99,32,77,111,117,115	DF 730 DATA 192,1,255,128,0,255,0,0
	ER 510 DATA 101,160,160,160,160,160,17,1	BS 740 DATA 126,0,8,8,144,96,8,8
	DQ 520 DATA 0,6,91,3,3,10,48,1	DJ 750 DATA 8,8,16,16,9,6
	SC 530 DATA 0,0,255,32,183,193,33,4	
	GR 540 DATA 0,1,83,0,32,183,193,116	

B R A D B I S H O P

This program is a combination of several disk utility routines which allows easy tracing of files and editing of disk sectors on both single- and double-sided Commodore disks. *T/E 80* is for the 128 in 80-column mode with a single 1571 disk drive designated as device 8.

The program consists of a disk sector editor, file tracer, block allocation map display, sequential file lister, routines for freeing and allocating sectors in the disk BAM, and a disk directory listing routine.

Typing It In

T/E 80 is written entirely in BASIC but includes machine language sub-routines. To avoid typing errors, use *The Automatic Proofreader* to enter the program; see "Typing Aids" elsewhere in this section. When you have finished typing, be sure to save a copy of the program to disk before you try to run it.

T/E 80

THIS UTILITY
COMBINES A DISK
SECTOR EDITOR, FILE
TRACER, SEQUENTIAL
LISTER, AND MORE
FOR THE 128 IN 80-
COLUMN MODE

How to Use the Program

After you load and run *T/E 80*, there will be a short pause for setup before the main menu screen appears. From

the menu select any of the following routines by pressing the key that is highlighted in red.

Editor Press E to enter the editor routine. You will be prompted for the track and sector to load. Enter the desired numbers in decimal. The program will load and display the data contents of the entered sector, and the editor menu will appear. Use the cursor keys to move through the displayed data. From the editor menu several choices are available.

N N loads and displays the contents of the next linked sector in the file, shown after *link* at the bottom of the screen display. If there is no link, an error message will be displayed, and you'll be returned to the main menu.

J J loads and displays the sector defined by the value under the editor cursor (track) and the value to the



PROGRAMS

right of the cursor (sector). This is useful for jumping to the first sector of a file from a directory sector.

L L clears the editor menu screen and prompts for a track and sector to load. The program then loads and displays the entered sector data and redisplay the editor menu.

Shift + and **Shift -** These key combinations load and display the sector one track above or below the currently displayed sector. For example, from track 4, sector 15, **SHIFT +** will load and display track 5, sector 15; **SHIFT -** will go to track 3, sector 15.

+ and **-** These load and display one sector above or below the sector currently displayed. For example, from track 4, sector 15, press **+** to move to track 4, sector 16; press **-** to move to track 4, sector 14.

S S stores the currently displayed sector data to a memory buffer.

P P pulls the data stored in the memory buffer and displays it on the screen. The data will not be written to disk until **W** is selected.

C C allows you to change the value of the data byte under the editor cursor. You will be prompted to enter the desired data value. Values should be in decimal form. The new value will not be written to disk until **W** is selected.

T T allows you to enter text in the sector data display, starting at the location of the editor cursor. The Return key must be pressed when text entry is complete. The new data will not be written to disk until **W** is selected.

W W writes the currently displayed data to disk at the current track and sector, indicated at the bottom left of the screen display. **W** must be selected before any changes made to displayed data will be saved to disk.

Z Z fills the current data display with zero bytes. You will then be asked whether to write the zero data to disk. **Y** will write the zeros; **N** will not.

Q Q exits the editor and returns you to the main menu.

BAM Map Press **B** from the main menu to select the BAM display routine. You will be prompted to insert the disk whose BAM you want displayed and then press Return. The program will then read and display the disk BAM for both single- and double-sided disks. Press the Return key for the main menu.

Tracer Press **T** from the main menu to access the tracer routine. You will be prompted to enter the name of the file to be traced, after which the program traces the entered file through the disk. When the trace is complete, a listing will be displayed on the screen in linked order of all sectors occupied by the file. The load address for program files and the directory sector containing the selected filename will also be displayed.

If the sector listing is longer than can be displayed on one screen, you will be prompted to press the Return key to continue the listing. When the screen listing is complete, you will be asked whether you want a hardcopy printout of the sector listing.

Sequential File Lister Press **S** from the main menu to select the sequential file lister routine. You will be prompted to enter the name of the file to list. The program will then list the file to the screen. Press the No Scroll key during the listing to pause. When the listing is complete, press Return to go back to the main menu.

Allocate Sector Press **A** from the main menu to enter the sector allocation routine. You will be prompted to enter the track and sector numbers of the sector you wish to allocate, at which time the program will allocate the sector in the disk BAM. You will then be asked whether you want to continue. Press **Y** to return to the allocate prompt; **N** returns you to the main menu.

Free Sector Press **F** from the main menu for the sector free routine. This routine works in the same manner as the sector allocate routine, freeing sectors in the BAM instead of allocating them.

Directory Press **D** from the main menu to display the directory of the disk currently in the drive. Press **No**

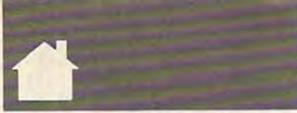
Scroll to pause the listing if necessary. When the listing is complete, you will be prompted to press the Return key to go back to the main menu.

Quit Press **Q** from the main menu to clear the screen and exit the program.

T/E 80

```

BE 1 REM COPYRIGHT 1991 - COMP
    UTE PUBLICATIONS INTL LTD
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PK 10 IFPEEK(215)<>128THENPRIN
    T"{CLR}{3 DOWN}SWITCH MO
    NITOR TO 80 COLUMNS-PRES
    S A KEY":GETKEYA$:GRAPHI
    C5
GJ 20 PRINT"{CLR}{3 DOWN}
    {5 RIGHT}SETTING UP T/E
    {SPACE}80 . . ."
JB 30 FAST:COLOR6,1:DCLOSE:GOS
    UB2720
DS 40 PRINT"{CLR}{BLU}"SPC(27)
    "{A}CCCCCCCCCCCCCCCCCCC
    CCCCC{S}"
SC 50 PRINTSPC(27)"B{A}CCCCCC
    CCCCCCCCCCCCCCCC{S}B"
PD 60 PRINTSPC(27)"BB
    {9 SPACES}{6}T/E 80
    {9 SPACES}{BLU}BB"
XJ 70 PRINTSPC(27)"BB {22 U} B
    B"
KJ 80 PRINTSPC(27)"BB
    {7 SPACES}{6}MAIN
    {2 SPACES}MENU{7 SPACES}
    {BLU}BB"
MP 90 PRINTSPC(27)"B{Z}CCCCCC
    CCCCCCCCCCCCCCCC{X}B"
HC 100 PRINTSPC(21)"{A}CCCC
    {E}CCCCCCC{10 SPACES}C
    CCCCC{E}CCCC{S}"
CJ 110 PRINTSPC(21)"B{A}CCCC
    CCCCCCCCCCCCCCCC{S}B"
    CCCCC{S}B"
KF 120 FORN=1TO7:PRINTSPC(21)"
    BB"SPC(36)"BB":NEXT
KG 130 PRINTSPC(21)"B{Z}CCCC
    CCCCCCCCCCCCCCCC{S}B"
    CCCCC{X}B"
GA 140 PRINTSPC(21)"{Z}CCCC
    CCCCCCCCCCCCCCCC{S}B"
    CCCCC{X}B"
DX 150 PRINTGB$ET$G2$M2$G3$M3$
    G4$M4$G5$M5$CHR$(27)"L"
SD 160 GETKEYA$:GOSUB1060
SH 170 IFA$="D"THENGOSUB2350:G
    OTO40
PR 180 IFA$="A"THENAS$=AL$:B$=S
    A$:C$=AG$:D$="B-A":GOTO
    2260
HX 190 IFA$="F"THENAS$=SF$:B$=F
    R$:C$=FG$:D$="B-F":GOTO
    2260
FD 200 IFA$="T"THEN1300
QE 210 IFA$="E"THEN280
HG 220 IFA$="S"THEN2130
PQ 230 IFA$="B"THEN2430
GJ 240 IFA$="Q"THENPRINT"{CLR}
    {CYN}":END
RD 250 GOTO150
KB 260 :
  
```



PROGRAMS

BR 270	REM EDITOR	RM 570	IFAS="Q"THEN40	AF 980	WINDOW9,17,72,20,1:PRIN
RJ 280	PRINTGASIES:SYS49176,0,	AR 580	IFAS="L"THEN340	T">{WHT}"CHR\$(14)CHR\$(27	)"M";:SYS6690
SM 290	SYS49176,0,16,8:PRINT"	RS 590	IFAS="J"THENT=PEEK(M+I)	BQ 990	WINDOW0,0,79,24:PRINTCH
	{BLU}{A}CCCCCCCCCCCC{E}		:S=PEEK(M+I+1):GOTO370	R\$(142)CHR\$(27)"L";	
	CCCCCCCCCCCCCCCCCCCC	HJ 600	IFAS="W"THEN1010	MP 1000	PRINTGB\$"{RED} WRITE?
	CCCCCCCCCCCCCCCCCCCC	BQ 610	IFAS="N"THENT=TN:S=SN:G	{SPACE}{6}:GETKEYA\$:I	
	CCCCCCC{S}"		OTO360	FA\$<"Y"THEN450	
PK 300	FORN=17TO20:SYS49176,0,	EQ 620	IFAS="+"THENT=T+1:GOTO3	EG 1010	GOSUB1060:PRINTG4\$00\$G
	N,8:PRINT"B"SPC(64)"B":		70	BSCS\$:GETKEYA\$:IFAS<>C	
	NEXT	CJ 630	IFAS="_"THENT=T-1:GOTO3	HR\$(13)THEN1010	
EA 310	SYS49176,0,21,8:PRINT"		70	FR 1020	PRINTGB\$"{6}WRITING:"G
	{Q}CCCCCCCCCCCC{R}CCCCC	XK 640	IFAS="-"THENS=S-1:GOTO3	4\$CM\$G3\$MT\$	
	CCCC{R}CCCCCCCCCCCCCCCC		70	XJ 1030	PRINTG5\$"{6 SPACES}"T"
	CC{R}CCCCCCCCCCCC{R}CCCC	RM 650	IFAS="+"THENS=S+1:GOTO3	{12 SPACES}"S:GOSUB266	
	CCCCC{W}"		70	0	
QC 320	SYS49176,0,22,8:PRINT"B	JJ 660	IFAS="P"THENPRINTGB\$"	RG 1040	SYS6673:PRINT#5,CHR\$(P
	{2 SPACES}{6}TRK:{BLU}		{RED}PULLING-{6}:FORN=	EK(6144));:PRINT#15,"	
	{5 SPACES}B {6}SCT:		6144TO6399:POKEN,PEEK(N	U2";5;0;T;S	
	{BLU}{5 SPACES}B {6}LIN	HJ 670	IFAS="S"THENPRINTGB\$"	BJ 1050	GOSUB2670:GOSUB1060:GO
	K: T{4 SPACES}S{BLU}		{RED}STORING-{6}:FORN=	TO450	
	{5 SPACES}B {6}POS:		6144TO6399:POKEN+256,PE	MR 1060	PRINTG1\$CM\$G2\$CM\$G3\$CM
	{BLU}{6 SPACES}B {6}VAL		EK(N):NEXT:GOTO450	\$G4\$CM\$G5\$CM\$G6\$CM\$G7\$	
	:{BLU}{5 SPACES}B"	SA 680	GOTO480	CM\$GB\$CS\$:RETURN	
JA 330	SYS49176,0,23,8:PRINT"	XC 690	I=I-64:K=K-1	SF 1070	SYS49176,0,22,16:PRINT
	{Z}CCCCCCCCCCCC{E}CCCCC	HS 700	IFK=16THENK=20	"{WHT}"T	
	CCCC{E}CCCCCCCCCCCCCCCC	HB 710	GOTO800	ED 1080	SYS49176,0,22,27:PRINT
	CC{E}CCCCCCCCCCCC{E}CCCC	GA 720	I=I+64:K=K+1	S	
	CCCCC{X}"	QB 730	IFK=21THENK=17	BR 1090	WINDOW9,17,72,20,1:PRI
SE 340	GOSUB1060:PRINTGB\$SET\$G4	PD 740	GOTO800	NTCHR\$(14)CHR\$(27)"M";	
	\$EE\$	DX 750	I=-1:J=J-1	RB 1100	SYS6690
AE 350	WINDOW33,11,38,12:INPUT	DP 760	IFJ=8THENJ=72:K=K-1:IFK	HS 1110	WINDOW0,0,79,24:PRINTC
	T:WINDOW48,11,53,12:INP		=16THENK=20	HR\$(142)CHR\$(27)"L";	
	UTS	XF 770	GOTO800	QB 1120	SYS49176,0,0,0:PRINT"
HH 360	WINDOW0,0,79,24:IFT=0TH	XX 780	I=I+1:J=J+1	{WHT}"	
	ENGOSUB1060:PRINTG4\$ZRS	AM 790	IFJ=73THENJ=9:K=K+1:IFK	CR 1130	SYS49176,0,22,40:PRINT
	:SLEEP2:GOTO40		=21THENK=17	TN	
EB 370	GOSUB1160:SYS49176,0,22,	GC 800	IFI<0THENI=I+256	FG 1140	SYS49176,0,22,45:PRINT
	17:PRINT"{2 SPACES}":S	MR 810	IFI>255THENI=I-256	SN	
	YS49176,0,22,27:PRINT"	JG 820	SYS49176,0,22,58:PRINT"	SK 1150	RETURN
	{3 SPACES}""		{3 SPACES}":SYS49176,0,	GQ 1160	IFT<1THENT=1:RETURN
AX 380	SYS49176,0,22,41:PRINT"		22,69:PRINT"{4 SPACES}""	QS 1170	IFT>70THENT=70:RETURN
	{3 SPACES}":SYS49176,0,	DP 830	GOTO470	CR 1180	IFS<0THENS=0:RETURN
	22,46:PRINT"{3 SPACES}""	DD 840	GOSUB1060:PRINTG4\$NV\$	GS 1190	IFT<18ANDS>20THENS=20:
HB 390	SYS49176,0,22,58:PRINT"	CH 850	WINDOW67,22,72,22:INPUT	RETURN	
	{3 SPACES}":SYS49176,0,		X:PRINT"{HOME}":;:WINDO	MH 1200	IFT>17ANDT<25ANDS>18TH
	22,69:PRINT"{4 SPACES}""		W0,0,79,24	ENS=18:RETURN	
AA 400	GOSUB2660:SYS49176,0,22,	HD 860	POKE(M+I),X:GOSUB930	GX 1210	IFT>24ANDT<31ANDS>17TH
	16:PRINT"{WHT}"T:SYS49	SR 870	GOTO920	ENS=17:RETURN	
	176,0,22,27:PRINTS	FP 880	GOSUB1060:PRINTG4\$TX\$:D	BS 1220	IFT>30ANDT<36ANDS>16TH
BH 410	PRINT#15,"U1";5;0;T;S:P		O:GETKEYA\$:IFAS=CHR\$(13	ENS=16:RETURN	
	RINTCHR\$(14)CHR\$(27)"M"		)THENEXIT	QK 1230	IFT>35ANDT<53ANDS>20TH
MF 420	WINDOW9,17,72,20,1:SYS6	CJ 890	POKE(M+I),ASC(A\$):SYS49	ENS=20:RETURN	
	710:TN=PEEK(6144):SN=PE		176,0,K,J:SYS49155,PEEK	PG 1240	IFT>52ANDT<60ANDS>18TH
	EK(6145)		(M+I),143	ENS=18:RETURN	
GB 430	PRINTCHR\$(142);:WINDOW0	JE 900	I=I+1:J=J+1:IFJ=73THENJ	RS 1250	IFT>59ANDT<66ANDS>17TH
	,0,79,24:PRINTCHR\$(27)"		=9:K=K+1:IFK=21THENK=17	ENS=17:RETURN	
	L";	DG 910	GOSUB930:LOOP	RH 1260	IFT>65ANDT<71ANDS>16TH
EQ 440	GOSUB2670:GOSUB1120			ENS=16:RETURN	
FG 450	PRINTGB\$SET\$G2\$Q2\$G3\$Q3\$	DA 930	IF(PEEK(M+I))+128>255TH	XB 1270	RETURN
	G4\$Q4\$G5\$Q5\$G6\$Q6\$G7\$Q7		ENSYS49176,0,K,J:SYS491	HB 1280	:
	\$:IFPTHENP=0:GOTO470		55,(PEEK(M+I))-128,143:	SM 1290	REM TRACER
AP 460	I=0:K=17:J=9:M=6144		GOTO950	FH 1300	PRINTG4\$TL\$GB\$SET\$G2\$CM
AJ 470	SYS49176,0,0,0:GOSUB930	KA 940	SYS49176,0,K,J:SYS49155	\$G4\$CM\$G6\$CM\$G3\$F\$F\$	
XX 480	GETKEYA\$		,(PEEK(M+I))+128,143	PM 1310	WINDOW35,12,54,12,1:IN
XP 490	IFAS="C"THEN840	HP 950	SYS49176,0,22,57:PRINT"	PUTF\$:IFF\$=""THENWINDO	
HF 500	IFAS="T"THEN880		{WHT}"I:SYS49176,0,22,6	W0,0,79,24:GOTO40	
XD 510	SYS49176,0,K,J:SYS49155		8:PRINT"{4 SPACES}	QF 1320	DOUNTILLEN(FS)=16:F\$=F
	,PEEK(M+I),143		{4 LEFT}"PEEK(M+I)	\$+CHR\$(160):LOOP:WINDO	
EQ 520	IFAS="{UP}"THEN690	SD 960	RETURN	W0,0,79,24	
MM 530	IFAS="{DOWN}"THEN720	CE 970	PRINTGB\$"{RED}ZEROING-	JF 1330	PRINTGB\$CS\$G3\$CM\$G5\$CM
KG 540	IFAS="{LEFT}"THEN750		{6}":FORN=6144TO6399:PO	\$G4\$00\$:GETKEYA\$:IFAS<	
PM 550	IFAS="{RIGHT}"THEN780		KEN,0:NEXT	>CHR\$(13)THEN1330	
PC 560	IFAS="Z"THEN970			XA 1340	PRINTG4\$TJ\$



PROGRAMS

KX 1350 X=6767:SD=1:GOSUB2660	B{6}SECTOR:{BLU}BB{6}B	0,60,22,1:WINDOW0,0,79
SR 1360 PRINT#15,"U1";5;0;18;S	LK:{BLU}B{6}SECTOR:	,24
D:GOSUB2680:SYS6656	{BLU}BB{6}BLK:{BLU}B	HB 1900 MN=MN+1:RETURN
HQ 1370 G\$=F\$:FORN=0TO15:A\$=LE	{6}SECTOR:{BLU}B"	EF 1910 SYS49176,0,24,19:PRINT
FT\$(G\$,1):POKEX+N,ASC(A	PRINTAT\$"B{6}CCCC{BLU}	"LISTING COMPLETE - PR
A\$):G\$=RIGHT\$(G\$,15-N)	B{6}CCCCCCC{BLU}BB{6}C	ESS RETURN TO CONTINUE
:NEXTN	CCC{BLU}B{6}CCCCCCC	"
JP 1380 SYS6738:A=PEEK(254):IF	{BLU}BB{6}CCCC{BLU}B	KE 1920 GETKEYA\$:IFAS<>CHR\$(13
ATHEN1400	{6}CCCCCCC{BLU}B"	)THEN1920
PE 1390 SD=PEEK(6145):GOTO1360	DE 1680 FORN=1TO13:PRINTAT\$"B	BA 1930 SYS49176,0,24,19:PRINT
MC 1400 LT(0)=PEEK(6127+A):LS(	{4 SPACES}B	"{8 SPACES}PRINT SECTO
0)=PEEK(6128+A):FT=PEE	{3 SHIFT-SPACE}	R LISTING? (Y/N)
K(6126+A)	{3 SHIFT-SPACE}BB	{9 SPACES}"
FK 1410 PRINT#15,"U1";5;0;LT(0	{SHIFT-SPACE}	MJ 1940 GETKEYA\$:IFAS="N"THEN4
);LS(0)	{2 SHIFT-SPACE}B	0
CR 1420 GET#5,A\$:GET#5,B\$:LS(1	{4 SPACES}	ME 1950 IFAS<>"Y"THEN1940
)=ASC(B\$):LT(1)=ASC(A\$	{3 SHIFT-SPACE}BB	EE 1960 SYS49176,0,24,19:PRINT
):AD=0	{3 SHIFT-SPACE}B	"{13 SPACES}PRINTING S
BX 1430 IFFT=129THENAD\$="SEQ":	{2 SHIFT-SPACE}	ECTORS..{6 SPACES}"
GOTO1470	{2 SPACES}	CK 1970 OPEN4,4,4:PRINT#4,CHR\$(
SD 1440 IFFT=133THENAD\$="REL":	{3 SHIFT-SPACE}B":NEXT	(27)CHR\$(14)"
GOTO1470	PRINTAT\$"Z}CCCC{E}CCC	{5 SPACES}"F\$
KE 1450 IFFT=132THENAD\$="USER"	CCCC{X}{Z}CCCC{E}CCCC	BR 1980 PRINT#4,"{10 SPACES}DI
:GOTO1470	CC{X}{Z}CCCC{E}CCCCCC	RECTORY: 18 -"SD
DD 1460 GET#5,A\$:GET#5,B\$:A=AS	{X}"	FB 1990 PRINT#4,"{10 SPACES}TO
C(A\$):B=ASC(B\$):AD=B*2	EQ 1700 PRINT"{GRN}":SYS49176,	TAL BLOCKS:"YE
56+A:AD\$=HEX\$(AD)	0,0,0:SYS49176,0,1,27:	JC 2000 PRINT#4,"{10 SPACES}LD
XJ 1470 TN=LT(1):SN=LS(1)	PRINTF\$:SYS49176,0,5,3	ADR: HEX - "AD\$
RK 1480 PRINT#15,"U1";5;0;TN;S	9:PRINTSD	BA 2010 PRINT#4,"{18 SPACES}DE
N	BF 1710 SYS49176,0,1,57:PRINTY	C -"AD
KX 1490 PRINTG4STR\$:Y=2	E:SYS49176,0,3,35:PRIN	QD 2020 PRINT#4,"{10 SPACES}BL
XX 1500 DO	TLT(0)	OCK{8 SPACES}SECTOR"
PE 1510 GET#5,A\$:GET#5,B\$:LS(Y	MS 1720 SYS49176,0,3,39:PRINTL	QG 2030 PRINT#4,"{10 SPACES}--
)=ASC(B\$):LT(Y)=ASC(A\$	S(0):SYS49176,0,4,54:P	---{8 SPACES}-----"
)	RINTAD\$:SYS49176,0,5,5	DF 2040 FORN=1TOYE
MK 1520 IFLT(Y)=0THENEXIT	3:PRINTAD	AP 2050 IFN<10THENPRINT#4," ";
EF 1530 PRINT#15,"U1";5;0;LT(Y	DH 1730 MN=0:FORN=1TOYE	MR 2060 PRINT#4,"{11 SPACES}"N
);LS(Y)	BG 1740 M=MN*39:IFN<14+MTHENK=	"{7 SPACES}"LT(N-1)"-"
BJ 1540 Y=Y+1:IFY=255THENEXIT	9+N-M:A=N1:B=N2:C=N3:G	LS(N-1)
HB 1550 LOOP	OTO1780	MJ 2070 NEXTN:PRINT#4,CHR\$(27)
XA 1560 YE=Y:GOSUB2670	RK 1750 IFN<27+MTHENK=N-4-M:A=	"@":CLOSE4
RH 1570 PRINTCHR\$(27)"M";	N4:B=N5:C=N6:GOTO1780	DR 2080 SYS49176,0,24,19:PRINT
KP 1580 PRINT"{CLR}"AT\$"{BLU}	CF 1760 IFN<40+MTHENK=N-17-M:A	"911 COMPLETE - PRE
{A}CCCCCCCCCCCCCCCCCCCC	=N7:B=N8:C=N9:GOTO1780	SS RETURN TO CONTINUE"
CCC{R}CCCCCCCCCCCCCCCC	RA 1770 IFN=40+MTHENGOSUB1870:	RX 2090 GETKEYA\$:IFAS<>CHR\$(13
C{S}"	GOTO1740	)THEN2090
MA 1590 PRINTAT\$"B{6}FILE:	FA 1780 SYS49176,0,0,0:PRINT:S	JR 2100 GOTO40
{17 SPACES}{BLU}B{6}TO	YS49176,0,K,A:PRINTN	QE 2110 :
TAL BLOCKS:{4 SPACES}	EK 1790 SYS49176,0,K,B:PRINTLT	SG 2120 REM SEQ LISTER
{BLU}B"	(N-1)	BP 2130 PRINTGAST\$G4\$CM\$G3\$TF
RA 1600 PRINTAT\$"{Q}CCCCCCCC	CJ 1800 SYS49176,0,K,C:PRINTLS	\$
CCCCCCCCCCCCCCCCCCCC	(N-1)	CK 2140 WINDOW25,12,55,12:INPU
CCCCCCCC{W}"	JG 1810 IFN=254THENBEGIN	T"{4 SPACES}? END
KD 1610 PRINTAT\$"B{6}FIRST SEC	SM 1820 :SYS49176,0,24,15:PRIN	{5 LEFT}";F\$
TOR:{9 SPACES}{BLU}B	T"MAXIMUM ENTRIES REAC	HA 2150 WINDOW0,0,79,24:IFF\$="
{6}LOAD ADDRESS:	HED - PRESS RETURN TO	END"THEN40
{4 SPACES}{BLU}B"	{SPACE}CONTINUE"	XR 2160 PRINTG3\$CM\$G5\$CM\$G4\$00
HB 1620 PRINTAT\$"{Q}CCCCCCCC	HJ 1830 :GETKEYA\$:IFAS<>CHR\$(1	\$:GETKEYA\$:IFAS<>CHR\$(
CCCCCCCCCCCC{W}	3)THEN1830	13)THEN2160
CCCCCCCCCCCC{W}	KP 1840 :SYS49176,0,24,15:PRIN	FP 2170 PRINTG4\$CM\$:G\$=F\$:M=67
{3 SPACES}{6}HEX -	TSPC(59)	67:X=0:FORN=1TOLEN(G\$)
{9 SPACES}{BLU}B"	EH 1850 BEND	:POKEM+X,ASC(LEFT\$(G\$,
KX 1630 PRINTAT\$"B{6}DIRECTORY	SS 1860 NEXTN:GOTO1910	1))
:{5 SPACES}{GRN}18	CP 1870 SYS49176,0,24,25:PRINT	G\$=RIGHT\$(G\$,LEN(G\$)-1
{5 SPACES}{BLU}B	"MORE - PRESS RETURN T	):X=X+1:NEXTN:PRINT"
{3 SPACES}{6}DEC -	O CONTINUE":GETKEYA\$	{CLR}{DOWN}"SPC(40-LEN
{9 SPACES}{BLU}B"	DB 1880 SYS49176,0,24,25:PRINT	(F\$)/2)"{RVS}{GRN}"F\$"
RJ 1640 PRINTAT\$"{Z}CCCCCCCC	CHR\$(27)"Q":IFAS<>CHR\$(	{OFF}"
CCCCCCCCCCCC{E}CCCCCC	(13)THEN1870	CH 2190 PRINT"{HOME}{RVS}{RED}
CCCCCCCC{X}"	DX 1890 WINDOW21,10,24,22,1:WI	'NO SCROLL' TO PAUSE L
XH 1650 PRINTAT\$"{A}CCCC{R}CCC	NDOW26,10,32,22,1:WIND	ISTING{OFF}{CYN}"CHR\$(
CCCC{S}{A}CCCC{R}CCCC	OW35,10,38,22,1:WINDOW	14)
CC{S}{A}CCCC{R}CCCC	40,10,46,22,1:WINDOW49	AE 2200 WINDOW0,3,79,24:SYS678
CC{S}"	,10,52,22,1:WINDOW54,1	3,LEN(F\$)
KJ 1660 PRINTAT\$"B{6}BLK:{BLU}		



PROGRAMS

XE 2210	GOSUB2680:WINDOW0,0,79,24	HE 2530	1920{6}" WINDOW0,0,79,24:C=5:FORX=5TO141STEP4:IFX>71T HENPOKE6958,0	SE 2840	Q7\$="{6} (Z)-ZERO SECT OR{2 SPACES}/ {2 SPACES}(Q) - QUIT "
DE 2220	PRINT"{HOME}"CHR\$(27) " Q"SPC(60)CHR\$(142) " {RVS}{RED}RETURN TO CO NTINUE{OFF}":GETKEYAS	JS 2540	IFX>99THENPOKE6957,0	CP 2850	ZR\$="{RED}{5 SPACES}TR ACK CANNOT BE ZERO {6 SPACES}"
QE 2230	GOTO40	BP 2550	IFX>123THENPOKE6956,0	SC 2860	EE\$="{6}{3 SPACES}TRAC K{9 SPACES}SECTOR {9 SPACES}"
XR 2240	:	BD 2560	SYS49176,0,0,0:SYS4917 6,0,3,C:POKE250,X:SYS6 833:C=C+1:NEXTX:IFSSTH EN2620	AF 2870	TF\$="{6}{3 SPACES}FILE NAME TO LIST (OR END) {3 SPACES}"
GF 2250	REM ALLOCATE / FREE	PG 2570	GOSUB2660:PRINT#15,"U1 ";5;0;53;0:SYS6656:GOS UB2670:FORX=0TO10STEP 3	BH 2880	TR\$="{6} -- LOADING LI NK INFORMATION -- "
SQ 2260	PRINTGASASGB\$SETSG2\$B\$G 4\$EES	ER 2580	IFX>50THENPOKE6958,0	SX 2890	TJ\$="{6} ----- SEARCHI NG FOR FILE ----- "
MP 2270	WINDOW33,11,38,12:INPU TT:WINDOW48,11,53,12:I NPUTS	DQ 2590	IFX>70THENPOKE6957,0	CC 2900	SA\$="{6}{7 SPACES}SECT OR TO ALLOCATE {7 SPACES}"
EG 2280	WINDOW0,0,79,24:IFT=0T HENPRINTG4\$ZR\$:SLEEP2: GOTO40	RK 2600	IFX>89THENPOKE6956,0	KC 2910	FR\$="{6}{9 SPACES}SECT OR TO FREE{9 SPACES}"
SE 2290	PRINTGB\$CS\$G2\$C\$G4\$EES G4\$"{9 RIGHT}"T" {12 RIGHT}"S	EA 2610	SYS49176,0,0,0:SYS4917 6,0,3,C:POKE250,X:SYS6 833:C=C+1:NEXTX	PS 2920	AG\$="{6}{11 SPACES}ALL OCATING:{10 SPACES}"
EF 2300	GOSUB2660:PRINT#15,D\$; 0;T;S:PRINT#15,"U1";5; 0;18;0:GOSUB2670	JC 2620	WINDOW0,0,79,24:SYS491 76,0,0,0	CC 2930	FG\$="{6}{12 SPACES}FRE EING:{12 SPACES}"
AH 2310	PRINTG2\$CM\$G4\$CAS:GETK EYAS:IFA\$="Y"THEN2260 GOTO40	JJ 2630	SYS49176,0,24,65:PRINT "{RED}{RVS}RETURN TO E XIT{OFF}":GETKEYAS:IFA S<>CHR\$(13)THEN2630 GOTO40	HD 2940	FE\$="{6}{12 SPACES}FIL ENAME:{11 SPACES}"
FM 2320	GOTO40	JS 2640	:	MS 2950	IE\$="{6} EDITOR - TRAC KS 1-70 "
BC 2330	:	EH 2650	:	PH 2960	TL\$="{6}{5 SPACES}FILE {2 SPACES}TRACER {5 SPACES}"
SG 2340	REM DIRECTORY	DR 2660	OPEN15,8,15:OPEN5,8,5, "#":GOSUB2680:RETURN	MG 2970	TS\$="{6}SEQUENTIAL FIL E LISTER"
GG 2350	PRINT"{CLR}{CYN}":WIND OW29,0,79,24:SLOW	SQ 2670	DCLOSE:GOSUB2680:RETUR N	PR 2980	AL\$="{6}{3 SPACES}SECT OR{2 SPACES}ALLOCATE {3 SPACES}"
CX 2360	DIRECTORY:FAST	RA 2680	IFDS>1THENGOSUB1060:PR INTG4\$FU\$G6\$D\$S:DCLOSE :SLEEP3:GOTO40	EB 2990	SF\$="{6}{5 SPACES}SECT OR{2 SPACES}FREE {5 SPACES}"
DJ 2370	PRINT"{2 DOWN} {2 SPACES}PRESS ANY KE Y FOR MENU"	XP 2690	RETURN	MF 3000	BA\$="{6}{3 SPACES}DISK BAM DISPLAY{3 SPACES} "
CA 2380	WINDOW0,0,79,24	DK 2700	:	CC 3010	ET\$="{6} ENTER : "
RH 2390	GETKEYAS	BP 2710	REM SETUP	MX 3020	M2\$="{2 SPACES}{RED}E {6}DITOR{11 SPACES} {RED}B{6}AM MAP{BLU} {6 SPACES}"
RH 2400	RETURN	FQ 2720	N1=21:N2=26:N3=29:N4=3 5:N5=40:N6=43:N7=49:N8 =54:N9=57	RK 3030	M3\$="{2 SPACES}{RED}T {6}RACER{11 SPACES} {RED}S{6}EQ LISTER {BLU}{3 SPACES}"
FH 2410	:	DX 2730	MT\$="{6}{6 SPACES}TRAC K{10 SPACES}SECTOR {5 SPACES}"	RS 3040	M4\$="{2 SPACES}{RED}A {6}LLOCATE SECTOR {2 SPACES}{RED}F{6}REE SECTOR{BLU}{2 SPACES} "
MA 2420	REM BAM	EG 2740	CA\$="{6}{8 SPACES}CONT INUE?{2 SPACES}(Y/N) {8 SPACES}"	FD 3050	M5\$="{2 SPACES}{RED}D {6}IRECTORY{8 SPACES} {RED}Q{6}UIT {10 SPACES}"
BQ 2430	PRINTGASB\$G4\$00\$	HQ 2750	FU\$="{6}{5 SPACES}DISK ERROR - TRY AGAIN {5 SPACES}"	EK 3060	CM\$="{33 SPACES}"
PA 2440	GETKEYAS:IFA\$<>CHR\$(13)THEN2440	PQ 2760	OO\$="{6}{3 SPACES}INSE RT DISK - PRESS RETURN {3 SPACES}"	XE 3070	AT\$="{20 SPACES}"
MG 2450	PRINTG4\$CM\$GB\$"{6}LOAD ING":M=6144:GOSUB2660 :PRINT#15,"U1";5;0;18; 0:SYS6656:GOSUB2670:A\$ =CHR\$(PEEK(M+3)):IFA\$< >CHR\$(128)THENS=-1:EL SESS=0	CP 2770	NVS\$="{6}{9 SPACES}ENTE R NEW VALUE{8 SPACES}"	PB 3080	CS\$="{8 SPACES}"
GS 2460	N\$="":N=144:DOUNTILAS= CHR\$(160):A\$=CHR\$(PEEK (M+N)):N\$=N\$+A\$:N=N+1: LOOP	CD 2780	TX\$="{6}{3 SPACES}ENTE R TEXT-RETURN WHEN DON E{3 SPACES}"	KR 3090	GA\$="{HOME}{4 DOWN} {30 RIGHT}"
AS 2470	A\$=CHR\$(PEEK(M+162)):B \$=CHR\$(PEEK(M+163)):I\$ =A\$+B\$	DK 2790	Q2\$="{6} (N)-NEXT / (J)-JUMP / (L)-LOAD "	BP 3100	GB\$="{HOME}{6 DOWN} {37 RIGHT}"
QJ 2480	PRINT"{CLR}{GRN}"SPC(3 5)"{RVS}"N\$"{2 SPACES} "IS"{OFF}"	RC 2800	Q3\$="{6}SHIFT (+) OR (-){2 SPACES}- {2 SPACES}CHANGE TRACK "	JP 3110	GL\$="{HOME}{8 DOWN} {25 RIGHT}"
JK 2490	PRINTCHR\$(27)"M"SPC(14)"{YEL}11111111122222 22222333333";	AB 2810	Q4\$="{6}{2 SPACES}(+) {SPACE}OR (-) {2 SPACES}-{2 SPACES}C HANGE SECTOR{2 SPACES} "	AH 3120	G2\$="{HOME}{9 DOWN} {25 RIGHT}"
BS 2500	IFSS=0THENPRINT"333344 44444444555555556666 66666667":ELSEPRINT	EB 2820	Q5\$="{6}{3 SPACES}(S)- STORE / (P)-PULL DATA {4 SPACES}"	SS 3130	G3\$="{HOME}{10 DOWN} {25 RIGHT}"
KE 2510	PRINTSPC(5)"1234567890 1234567890123456789012 345";:IFSS=0THENPRINT" 6789012345678901234567 8901234567890":ELSEPRI NT	CE 2830	Q6\$="{6}(C)-CHANGE / (T)-TEXT / (W)-WRITE"		
KH 2520	WINDOW2,3,3,24:PRINT" {SPACE}0 1 2 3 4 5 6 7 8 9101112131415161718				



PROGRAMS

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PF 3140 G4$="{HOME}{11 DOWN}
      {25 RIGHT}"
AR 3150 G5$="{HOME}{12 DOWN}
      {25 RIGHT}"
RH 3160 G6$="{HOME}{13 DOWN}
      {25 RIGHT}"
MB 3170 G7$="{HOME}{14 DOWN}
      {25 RIGHT}"
AC 3180 DIMLT (255), LS (255)
HS 3190 FORX=0TO304:READC:POKE
      6656+X,C:NEXT:RETURN
HA 3200 DATA162,5,32,198,255,1
      60,0,32,207,255,153,0,
      24,200,208,247,96,162,
      5,32
BJ 3210 DATA201,255,160,1,185,
      0,24,32,210,255,200,20
      8,247,96,169,0,133,250
      ,164
CK 3220 DATA250,185,0,24,32,47
      ,204,32,237,203,230,25
      0,208,241,96,169,0,133
      ,250
MS 3230 DATA162,5,32,198,255,1
      64,250,32,207,255,153,
      0,24,32,47,204,32,237,
      203
AM 3240 DATA230,250,208,238,96
      ,160,0,162,0,185,0,24,
      221,111,26,240,8,162,0
      ,200
HE 3250 DATA208,243,134,254,96
      ,200,232,224,15,208,23
      4,132,254,96,0,0,0,0,0
      ,0
GS 3260 DATA0,0,0,0,0,0,0,0,0,
      0,162,111,160,26,32,18
      9,255,169,5,162,8,160,
      5,32
BR 3270 DATA186,255,169,0,162,
      0,32,104,255,32,192,25
      5,162,5,32,198,255,32,
      207
AX 3280 DATA255,32,210,255,165
      ,144,240,246,169,5,32,
      195,255,32,204,255,96,
      164
QQ 3290 DATA250,185,0,24,160,8
      ,24,10,144,3,32,18,27,
      136,208,246,230,250,16
      4,250
SP 3300 DATA185,0,24,160,16,24
      ,10,144,3,32,18,27,136
      ,192,8,208,244,230,250
      ,164
KF 3310 DATA250,185,0,24,10,10
      ,10,160,21,24,10,144,3
      ,32,18,27,136,192,16,2
      08
HR 3320 DATA244,169,1,133,250,
      164,250,185,26,27,240,
      11,32,47,204,32,90,200
      ,230
EB 3330 DATA250,76,243,26,160,
      1,169,81,153,26,27,200
      ,192,22,208,248,96,170
      ,169
AD 3340 DATA45,153,26,27,138,9
      6,0,81,81,81,81,81,81,
      81,81,81,81,81,81,81,8
      1,81
KH 3350 DATA81,81,81,81,81,81,
      0
RC 3360 :

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ONLY ON DISK

In addition to the type-in programs found in each issue of the magazine, we offer additional features and programs every month on *Gazette Disk*. Disks may be purchased for \$9.95 plus \$2.00 shipping and handling. The address is *Gazette Disk*, COMPUTE Publications, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408. Here's a description of this month's bonus.

Mega-Adventure

David M. Williams
Charlestown, NSW, Australia

In this text-based adventure game, you control a teenaged hacker in his quest to add zeros to the pitiful sum in his bank account. Discover what part his archaeologist parents play in this story. Is it true that his foul-tempered grandmother almost became dictator of Cuba before she gave up Marxism and relinquished power to Castro? And how about that policeman who always winks at him at Woolworth's? Can he be trusted?

The game opens in your bedroom. It's a relatively small room, containing more electrical equipment than a NASA tracking station. A stereo on a table next to your unmade bed plays music by Jean-Michel Jarre. Your bookshelf contains exciting titles such as *The Fractal Geometry of Nature*, *68000 Programmers Reference Manual*, and *The Stainless Steel Rat's Revenge*.

On a pizza-stained table rests your Amiga A9000 computer system. A modem connects it to a telephone. Things that may interest you are a leather jacket and a disk with *HackTerm V3.2* on the label. The rest is up to you.

Typing Aids Attention, New Subscribers!

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. These labor-saving utilities are on each *Gazette Disk* and printed in 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 copies of both these handy utilities. We'll also include instructions on how to type in *Gazette* programs. Please enclose a self-addressed, stamped envelope.

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

PROGRAMMERS

Gazette is looking for utilities, games, applications, educational programs, and tutorial articles. If you've created a program that you think other readers might enjoy or find useful, send it on disk to

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REVIEWS

SNEAK PEEKS

SOUND BLASTER PRO

In just two years, the Sound Blaster has become one of the the most widely-supported PC sound cards. It's easy to see why. The Sound Blaster contains an 11-voice FM synthesizer that makes it fully compatible with the popular Ad Lib Music Card. The day it hit store shelves, the Sound Blaster could be used with hundreds of Ad Lib compatible games and educational programs. To add even more value, the original Sound Blaster included a DAC (Digital to Analog Converter) for digitized voice and sound effects, a microphone jack for voice input, a built-in game port, a built-in 4-watt amplifier, and an optional MIDI interface.

Creative Labs is now turning up the volume with the Sound Blaster Pro. It's basically two Sound Blasters on a single card with additional multimedia features thrown in. It has twin FM chips capable of creating 22 individual voices, two DACs for stereo voice and sound-effects playback, a stereo microphone jack, and a built-in stereo mixer that can adjust the volume of all your Sound Blaster audio sources (stereo DAC, stereo FM, microphone, stereo line-in, CD-Audio, and PC internal speaker).

The built-in mixer makes the Sound Blaster Pro fully compliant with Microsoft's Multimedia Level 1 Extensions to *Windows*. Multimedia software will be able to fade-in, fade-out, and pan the various audio sources to create elaborate sound montages.

The Sound Blaster Pro includes a CD-ROM interface for either an internal or external CD-ROM player.

There's also an internal connector for CD-Audio. The MIDI interface is compatible with the original Sound Blaster's MIDI interface, but adds the MIDI time-stamp that's part of Microsoft's new multimedia standard.

All in all, the Sound Blaster Pro is chock-full of new features, yet it's fully compatible with its younger brother.

DAVID ENGLISH

Scheduled Release: September 1991
For IBM PC and compatibles—\$299.95

CREATIVE LABS
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(408) 986-1461

WHERE IN AMERICA'S PAST IS CARMEN SANDIEGO?

Once again, one of America's most infamous scoundrels is on the loose. And, just like the last time and the times before that, it's up to you to seek her and her accomplices out and bring them to justice. You're an operative for the Acme Detective Agency. You're familiar with the MO. You're an old hand with the SOP. So how are you with time travel and American history?

As with Brøderbund's last Carmen release, *Where in the World Is Carmen Sandiego? Deluxe Edition*—an update, actually, to the classic—*Where in America's Past* takes full advantage of your computer's VGA graphics adapter and monitor, provided you're using that state-of-the-art display. As you move through the game from scene to scene, you'll see beautifully rendered pictures and graphics in 256 colors, and finely detailed photographs in black-and-white from our nation's past.

What's more, the game supports



From the Wild West to Cape Canaveral, Carmen leads a merry chase.

Sound Blaster, Ad Lib, and Roland sound devices, as well as the Tandy digital and 3-voice sound chip. The sound effects and ambient music add a dimension to the game that's not to be missed. Even if you don't have a sound card, the sound effects for the internal PC speaker are quite acceptable.

One of the most innovative and interesting facets of the Carmen series has been its insistence on using tools other than the computer for solving puzzles and winning the game. It's a true multimedia experience, and it reinforces the idea that books are full of interesting facts that, if well presented, can be fun to browse through. It also posits the idea that research can be rewarding on its own merits. If either of those ideas catches fire in a child's mind, stand back and watch the sparks fly.

PETER SCISCO

Scheduled Release: June 1991
For IBM PC and compatibles—\$59.95

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

What Are Sneak Peeks?

Sneak Peeks are advance reviews of upcoming software and hardware products. Every effort is made to ensure that the information contained in these reviews is accurate at the time they are published. *COMPUTE* will review the final edition when it becomes available.



The greatest hero for the Hyborean Age was a fierce barbarian born of the harsh northlands,

CONAN THE CIMMERIAN



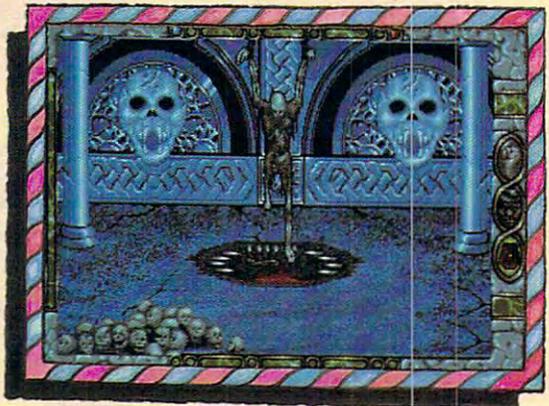
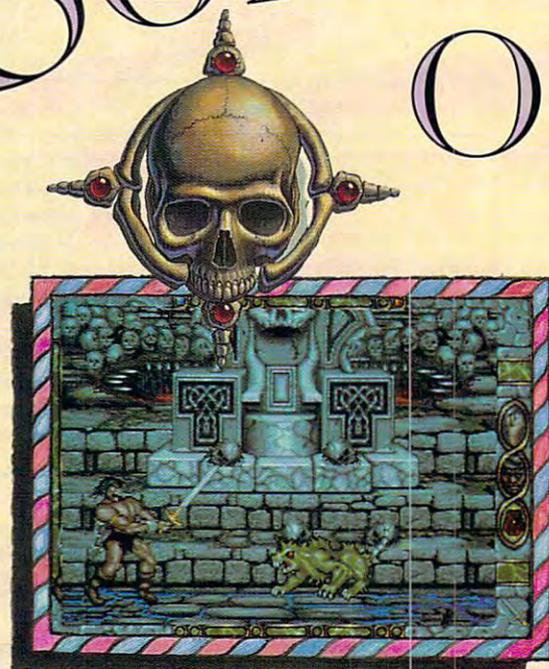
ou have heard the tales of Conan's adventures. Only now will you have the opportunity to live the life of this fierce barbarian from the land of Hyborea.

Our odyssey begins with murder most foul. When Conan's village is massacred by the ravaging hordes of Thoth Amon, high priest of the vile cult of Set, Conan vows to avenge the death of his family and friends.

In your search for vengeance, you as Conan, will explore Hyborea to seek out its hidden secrets and learn of its powers. Visit over 200 locations – taverns and inns, crypts and dungeons, temples and tombs, lavish homes and poor hovels – to learn the mysteries of Hyborea's sorceries to help Conan overcome its many natural and supernatural perils.

Only with luck, courage and constant struggle will Conan have the chance to force a reckoning with the powerful Thoth Amon.

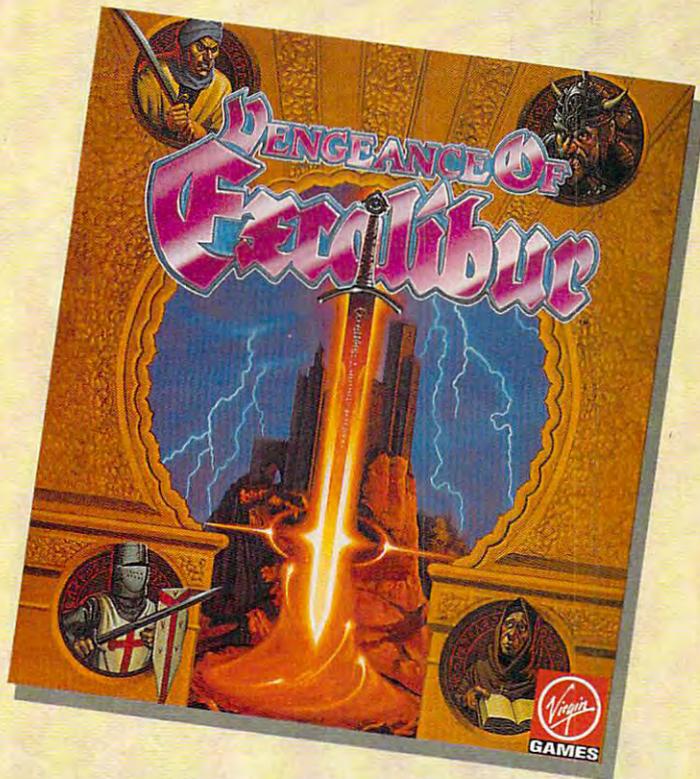
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THING LD



In Spirit of Excalibur, the Knights of the Round Table fought to defend medieval Britain from the evil sorceress, Morgan Le Fay. Morgan, dabbling in dark arts beyond even her ability to control, had summoned a great Lord of Demons, the Shadowmaster.

With Morgan's death, the Shadowmaster was freed to work his evil will against the unprepared folk of Britain. Striking in the night, he imprisoned the King with a spell, stole the greatest treasures of the realm and kidnapped Nineve, the court enchantress. With the loss of the sword Excalibur and the newly recovered Holy Grail, Britain begins to sicken and die. The Shadowmaster must be stopped!

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SOME NE

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ARE YOU TOUGH ENOUGH TO TAKE ON THE 21st CENTURY AND SAVE MANKIND FROM HIS UNTIMELY DESTRUCTION BY A GENETICALLY ENGINEERED WAR MACHINE?!?

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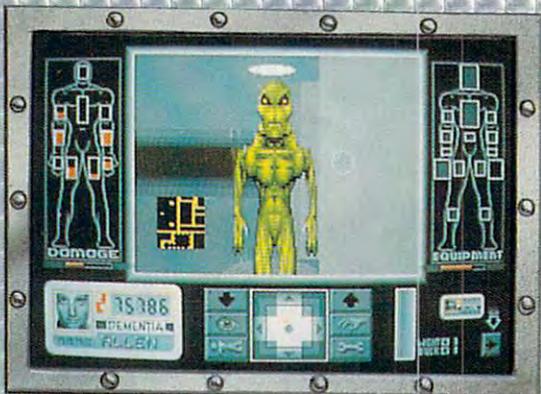
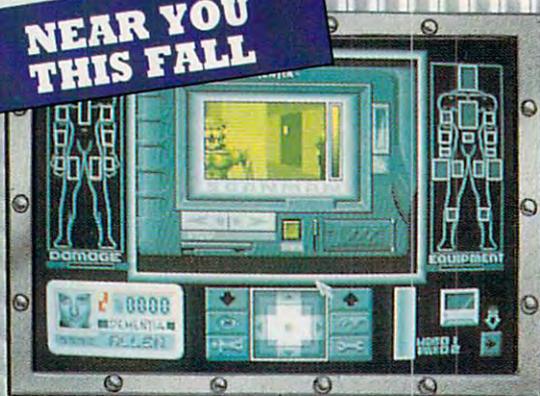
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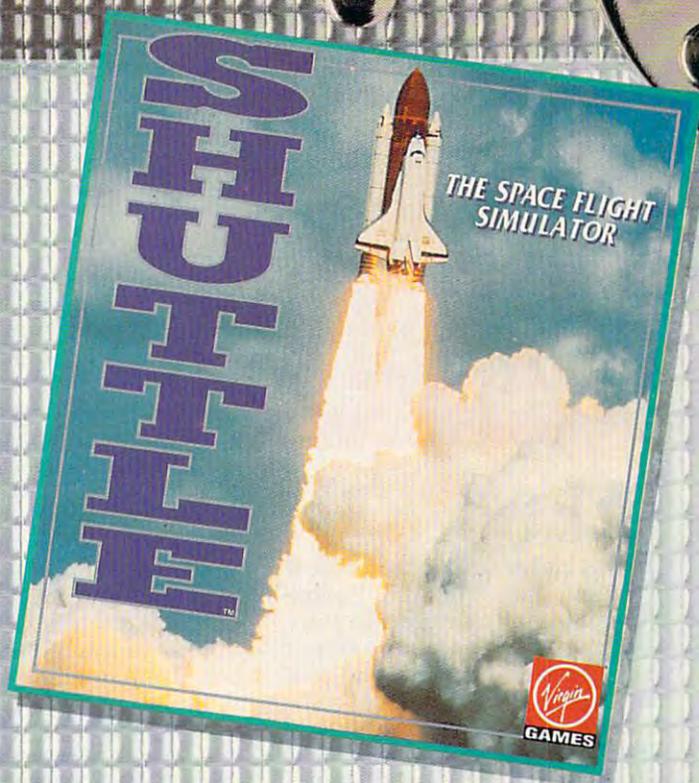
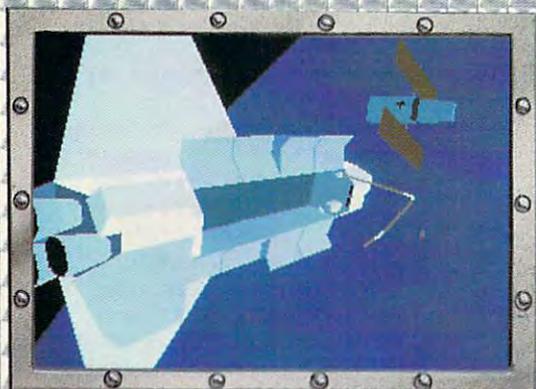
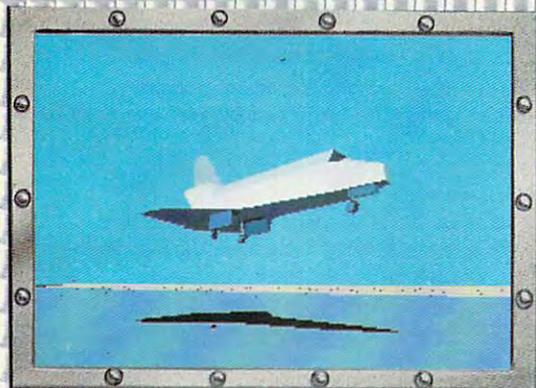
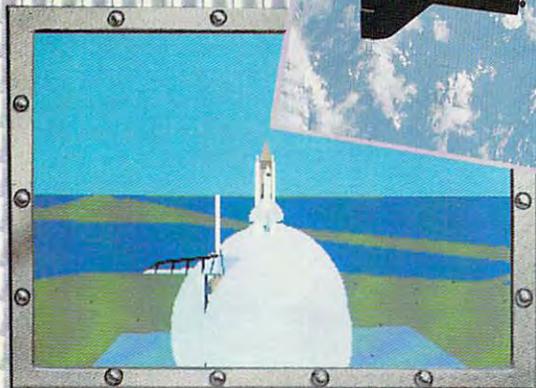
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SHING W



She space flight simulator to end all simulators, SHUTTLE is the most accurate and comprehensive simulation of NASA's Space Shuttle ever produced for the home computer.

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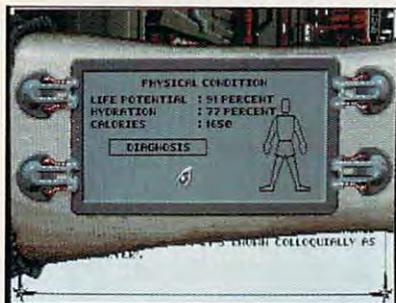
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GAMES

C H O I C E

B.A.T.

Gritty and dangerous, the world of *B.A.T.* (Bureau of Astral Troubleshooters) offers intrigue on every street corner and peril on every block. The game's story line and stunning graphics evoke the feel of the movie *Blade Runner*, and like that film's Los Angeles of the year 2020, the cityscape of *B.A.T.* is dark, crime-ridden, and replete with tarnished techno-glitz. As an urban waste dump of eternal night and a real silicon jungle, the city of Selenia will demand your full attention and offer little cooperation.



B.O.B. reports your physical status.

Making an already unsafe place even more menacing, Vrangor, a sophisticated criminal with a scientific bent, has just escaped from prison. Psychopathic and infamous for his expertise in explosives and his brilliance, he plans to seize control of Selenia by using terrorist tactics.

As an agent of *B.A.T.*, expect ten days of living dangerously, desperately seeking Vrangor. If you fail to track and eliminate him, he will murder scores of innocent people and hold the entire city hostage.

On your own, as you roam the city's mean streets questioning informants, checking out leads, and looking for clues, you'll appreciate *B.A.T.*'s attention to detail. The city offers diversions, including a museum, a movie house, and a hospital—useful

should you sustain injuries (and you probably will). Like most cities, Selenia bristles with places to eat and local watering holes filled with interesting characters.

Purchase a weapon for defense, and then proceed with caution as you converse with various aliens, humanoids, and androids. Many will not appreciate your probing questions. Speak softly, and carry a big gun.

The northeast section of town plays host to a series of exclusive nightclubs and bars where you may make important contacts. You may even find yourself dancing the night away at a local disco. *B.A.T.* features a gambling hall with a game that tests your memory. For a wager, you must correctly recall a series of geometric shapes flashed before your eyes. This segment is a mind-numbing challenge.

Part of the game takes you underground to an intricate labyrinth. Fantasy role-playing fans will feel right at home mapping out the vast maze. Last of all, you will pilot a vehicle across the city in a flight simulator sequence.

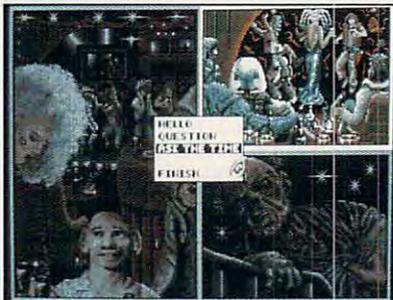
Equipped with a Biodirectional Organic Bioputer (B.O.B.), a computer implant in your forearm that is essentially one of your body's organs, you'll look and feel the part of a high-tech secret agent. Through B.O.B. you can monitor your health, check your personal status, and set a translator to let you instantly understand alien and robotic languages.

Interestingly, you can customize and write programs for B.O.B. using commands from the game. For example, you may write a short program to automatically ingest food when you're hungry, and that's important—*B.A.T.* considers your health. If you're not eating enough food, drinking enough fluids, or getting enough sleep, your character becomes sluggish and sometimes even starves to death.

B.A.T.'s mouse-based interface sets it apart from many other futuristic and fantasy role-playing games. The game's authors call this ingenious interface the *Dynorama*. In *B.A.T.*, each part of the city is re-created in a detailed graphic screen depicting paths, doors, objects, and characters. Move your mouse around, and the icon changes, indicating what you may do with an object or person. Touch a door, and an arrow appears.

Click on that arrow, and you enter the next room or scene. Touch an alien creature, and a talking icon may appear. Click on that icon, and you can converse with the alien, asking for advice and clues.

For all practical purposes, *B.A.T.*'s interface is a graphical user interface (GUI, pronounced *goeey*), similar in some respects to the *Microsoft Windows* environment. Because everything is done with the mouse, the interface is very efficient and saves keystrokes. Since you have to talk with a lot of characters, as in any role-playing game, the mouse-assisted parser replacement makes conversation simpler and less tedious.



The flash and patrons of a disco in *B.A.T.* pull you in, perhaps a bit over your head.

The detailed graphics recall the lavish illustrations in quality children's books, and each scene tells a story. Where other adventure games look more like cartoons, *B.A.T.*'s graphics create a mood and feeling on a par with the best games on the market.

Chronologically elastic rather than linear, *B.A.T.* encourages exploration. You needn't complete segments in a specific order to reach Vrangor. Yes, there are certain tasks to accomplish, but you set your own itinerary.

Throughout the game, battles inevitably occur. Sometimes you're attacked from out of nowhere by the local citizenry; at other times you may be the aggressor and provoke the altercation. When you're attacked, your opponent appears without warning, his weapons blazing, and an almost realtime battle ensues. Quickly retaliate by pulling out your weapon, lining up crosshairs on the enemy, and firing away.

In battle there's little animation,

GAMES

and the gunfight consists of you and your enemy standing toe to toe and firing away until one of you drops. Not elegant, but because of the speed with which the fights take place, the sequence works. You never know when someone will attack you, and combat often comes as an absolute surprise. At times, I stopped playing momentarily to check the documentation. I had barely enough time to get my hand back on the mouse before my character was obliterated. As in any role-playing game, save, save, save.

So what's so special about *B.A.T.*? The plot may sound typical of futuristic role-playing games (you are the world's only hope . . .). I admit that before I actually played *B.A.T.*, I wasn't expecting the fine game that I discovered. With its name and the batlike creature featured on its cover, I thought *B.A.T.* might be an arcade game or a space simulation about nocturnal flying mammals with modified forelimbs. But after I started the game, I found stunning 256-color graphics, Ad Lib-supported sound, and an excellent user interface. No mistake, this is a first-rate role-playing game.

Unlike the game, however, the documentation is unexceptional. The history of the planet seems irrelevant and rambles. While I appreciate the creative effort required to put this together, I'm not sure that it enhances the overall play of the game. However, once you get to the technical section dealing with playing the game, you'll be quickly up and running with *B.A.T.*'s interface.

Hardware requirements run rather steep. You'll need VGA to run the program, and a mouse is recommended. I found using the keyboard clumsy in comparison to using the mouse. And, of course, those of you with sound boards should enjoy the catchy soundtrack.

Although the plot is commonplace, the game immerses the player in another world. And while the game may not have enough challenge for diehard role-playing fans, the program is definitely worth a look, particularly by those who want to try something new and different.

Don't judge software by its cover. Once you see *B.A.T.* in action, you'll be bitten. Ubi Soft is one of Europe's

premier software companies, and if *B.A.T.* is representative of its work, we know why. Let's hope for more.

WAYNE KAWAMOTO

IBM PC and compatibles, 512K RAM, VGA; supports Ad Lib and Sound Blaster sound cards—\$49.95

Also available for Amiga—\$49.95 and C64/128—\$39.95

UBI SOFT
Distributed by Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404
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Circle Reader Service Number 302

OVERLORD

For generations your family, the Dynasty of Mark, has reigned as the absolute rulers of the galaxy of Epsilon, a galaxy now under siege from other-dimensional beings. A mishap during an experiment in hyperdimensional propulsion has permanently linked your world to four others, worlds inhabited by heavily armed, warlike races. In a desperate bid to protect your rule and your world, you decide to strike before being struck. You can only hope you have acted in time.



Overlord challenges you to become conqueror and administrator of planets.

So begins the saga of *Overlord*, an intriguing new strategy game from Virgin Mastertronic. As the dictatorial ruler of Epsilon, you have total control over the economic and military resources of your world, and you will need all of those resources, plus a good sense of strategy, to overcome your four adversaries. To defeat them requires nothing short of total conquest; you must capture every planet in the disputed solar system while preventing your opponent from doing the same—no mean feat.

The difficulty of your campaign depends upon which opponent you choose to challenge. Wotok is the weakest of your foes, while Rorn is nearly invincible. In addition, the number of planets in each system increases with the strength of your opponent; Wotok's system contains only 6 neutral planets, while Rorn's contains 32. The wise player will follow the game manual's advice to make frequent use of the save-game facility, especially in longer games.

Unlike adventure games, where you scrounge for necessary clues, *Overlord* deluges you with information. The challenge becomes picking out the facts relevant to the current situation. With so many factors to be considered, it can be quite a complex task.

The game designers have done an excellent job of creating an interface which allows you to manage such complexity. Almost totally graphical, with an icon to represent every possible action you can take, the interface rarely calls for typing. The only time you touch the keyboard is when you name a ship or planet. Though at first intimidating because of the many options available, the interface is mastered with a little practice, and soon the focus shifts from remembering what all the icons do to deciding how to use them most effectively.

Overlord's graphics are well drawn and effectively used. Animation abounds in this game; almost every screen contains animation of some kind, and it both entertains and conveys necessary information. In the 256-color VGA mode, some of *Overlord*'s graphics are just short of stunning.

Sound card support has not been overlooked in *Overlord*. The game supports Ad Lib, Sound Blaster, and Roland sound boards, and uses them frequently. Many objects and actions in the game have a particular sound associated with them, and all major plot developments are accompanied by an appropriate sound or piece of music.

Very much like a fusion of *SimCity* and *Risk*, *Overlord* gives you the economic balancing act of the former and the strategic considerations of the latter. Moreover, it does this without being just a rehash of either of those games; *Overlord* has a style all its own.

GAMES

Random events add excitement and complicate your best-laid plans, while your relentless computer opponent seeks to destroy your holdings.

The creators should be congratulated on their superb attention to detail: *Overlord* is a marvel. No major flaws mar this game. Its structure gives you the greatest number of options with the least amount of complexity, its dramatic pacing draws you into the game, and its excellent graphics and sound provide a feast for the eyes and ears. The only inconsistency I could find is that when you finish preparing a ship for flight on the cargo bay screen and switch to the navigation screen to launch it, the game doesn't assume that the ship you just outfitted is the one you want to launch. In every other part of the game, the last object accessed becomes the default for future actions; this approach can save several clicks of the mouse button, an important consideration in a game requiring as much time as *Overlord*. And when Rorn's beating down the door to your home world, you want as few steps between thought and action as possible.

In a class by itself, *Overlord* is more than just a war game, though it will certainly appeal to fans of that genre. It is more than just an economic simulation, too, though it's one of the most entertaining simulations that I've seen. Simply put, *Overlord* is a game for those of us who don't want to put our minds on hold just because we're playing a game.

RICHARD RAPP

IBM PC and compatibles; 512K RAM for CGA, EGA, and Tandy 16-color, 640K for VGA; supports Roland, Tandy 3-voice, Ad Lib, and Sound Blaster; mouse optional—\$49.99

Also available for Amiga—\$49.99 and Atari ST—\$49.95

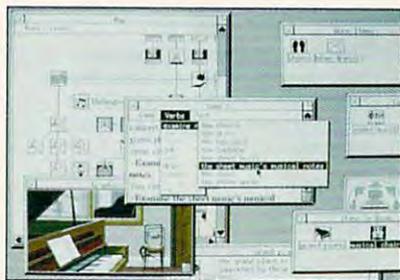
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(714) 833-8710

Circle Reader Service Number 303

WONDERLAND

The computer tells me, *You are getting a tingling sensation*. But it's too late. I grow so large that my head crashes through the roof, and I wake from my dream, only to realize

I was playing *Wonderland*, a new adventure game based on the dream world of Lewis Carroll.



Wonderland's sophisticated options allow precise gameplay tailoring.

When the game begins, you play the part of Alice, who falls asleep as she sits on the bank of a river with her sister, Emily, who is reading. Wandering into a nearby pear grove, you pick a magical pear and then follow a rabbit into a hole. There the pear becomes a lantern and lights your way into a world of puzzles and enchantment.

In *Wonderland*, as in most adventure games, you travel by typing. The comparison with other games ends there, though, as *Wonderland* has newly developed sound, windowing, and memory-management systems to help you hear, see, and keep track of the action with the touch of your mouse button. When you enter a room, for instance, you can set up *Wonderland* to display a detailed animated picture on the screen, play a musical score, describe the scene in a text window, show you a map and a compass—all at the same time! All this data appears in windows that you can size and move around to suit your needs . . . a very magical idea, indeed.

Although it may sound simple, *Wonderland* isn't all fun and games. As I explored *Wonderland*, I found myself in situations where I didn't do things in quite the right order, and I'm afraid that Alice bit the dust and woke up . . . always with that pest Emily, standing by and criticizing.

You don't have to look in a magazine for hints because *Wonderland* has a feature that lets you collect hints as you need them. Unfortunately, I couldn't find a hint to tell me how to get rid of Emily. Beware—the program keeps track of how often you get hints and lowers your score.

The *Wonderland* package comes with nine floppy disks, a 66-page user's guide, quick-reference cards, and a map of Wonderland. I installed *Wonderland* on the hard drives of both a 386SX and a Tandy 1000SX. After playing each system, I noticed that the difference in performance between systems was extreme. The graphics and text on the Tandy 1000SX (Tandy 16-color) came up slow and were harder to make out than the vivid images on the 386SX with VGA. Therefore, for the best results, I highly recommend running *Wonderland* on a fast system (12 MHz or faster) with high-resolution VGA graphics. Also, the addition of an Ad Lib or Roland sound card makes for a great improvement over the tiny speaker built into PCs and compatibles.

Wonderland has shown me that the adventure-game genre is alive and growing. As more powerful hardware becomes available, it's nice to know that Virgin Mastertronic is working on ways to take advantage of that power. The user interface of *Wonderland* (much to the dismay of my family) made it easy to get lost in the story. Now, if I could only figure out which potion to drink, I wouldn't keep bumping my head.

JOEY LATIMER

IBM PC and compatibles, CGA, EGA, VGA, Tandy 16-color, or Hercules; 12 MHz or higher recommended, supports Ad Lib and Roland sound cards, joystick and mouse optional—\$59.95

Also available for Amiga—\$59.95 and Atari ST—\$59.95

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Circle Reader Service Number 304

LHX ATTACK CHOPPER

Jet jockeys who are tired of flying fast metal can get an entirely different experience with this copter simulation from Electronic Arts. This complex flight simulator offers you the experience of flying four different helicopter gunships: the McDonnell-Douglas Apache, the Sikor-

GAMES

sky Black Hawk, the Bell/Boeing Osprey VTOL aircraft, and the still-classified LHX (Light Helicopter Experimental), the DOD's newest and most lethal warbird.



LHX gives you low-profile firepower.

Piloting a chopper is a lot harder than flying a fixed-wing aircraft, as I quickly found out. Getting off the ground was easy, but it took about ten minutes to move forward in a purposeful way. In order to fly, you must develop a sharp sense of three-dimensional movement—especially axial rotations—that you don't need when flying a plane. And, as with most military flight simulators, you have to pay attention not only to avionics, but also to the bogeys on your screen and in your sights. The first few missions will have you sweating bullets as you try to remember the keyboard sequences for activating radar and IR countermeasures and arming your missiles, all the while keeping your bird off the ground and out of range of SAMs, AA batteries, and fire from enemy aircraft.

Besides information on gunship avionics and armament, the *LHX* manual contains a basic course in chopper combat tactics. By the time you've memorized everything in it—and you'll have to memorize it, if you expect to survive the more difficult missions—you'll not only be familiar with the heavy ordnance used by the U.S., NATO, and the Warsaw Pact, but you'll also know how to take out enemy tanks, jets, gunships, and fortified installations. Other missions include POW rescue, medevac, and supply and escort runs; each mission can be attempted in three combat theaters and at five skill levels.

The combat theaters are among the few minor flaws of this otherwise painstakingly detailed simulation (along with the manual's unrelenting-

ly macho tone). The game's scenarios—Libya, Vietnam, and East Germany—reflect outdated political situations. A combat scenario for Iraq would've boosted this game's appeal, but you can hardly fault Brent Iverson and the other *LHX* programmers for being no more perceptive about Saddam Hussein than U.S. military intelligence. Memories of U.S. gunships flying over the sands of Saudi Arabia certainly won't hurt interest in *LHX Attack Chopper*. For a taste of what it's like in the cockpit of a real combat chopper, this game is a call to action.

STEVEN ANZOVIN

IBM PC and compatibles, 640K RAM, CGA, EGA, or VGA; joystick recommended—\$39.95

ELECTRONIC ARTS
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Circle Reader Service Number 305

DEATH KNIGHTS OF KRYNN

Like its predecessor, *Death Knights of Krynn* is set in the legendary Dragonlance game world. Veterans of the first campaign, *Champions of Krynn*, will be happy to learn that its characters may be imported directly to *Death Knights* while retaining most of their worldly possessions and bank accounts. Don't worry if this is your first venture into the Dragonlance world, though; *Death Knights* comes with a prebuilt party of adventurers who are up to the challenge and ready to move out.

If you'd rather, you may assemble your own party entirely from scratch by generating individual characters and banding them together to form a new party. Character creation begins with the selection of race, class, gender, and alignment. The computer then randomly generates the character's ability scores (strength, intelligence, dexterity, and so on). If you're not happy with a character's ability scores, you can have the computer try again or simply modify them yourself.

Lastly, you name your character and choose a battle icon to represent him or her during combat. An adven-

him or her during combat. An adventuring party may consist of up to six player characters and two nonplayer characters (NPCs). This latest fantasy role-playing (FRP) epic picks up one year after the decisive Battle of Kernen at an anniversary celebration.



Your fearsome undead opposition descends in *Death Knights of Krynn*.

Besides being a celebration, the gathering is also a fond memorial to Sir Karl, the former commander of the Gargath Outpost. Unfortunately, Sir Karl has been summoned from the grave by Soth, Lord of the Death Knights, to make a gruesome surprise appearance at the celebration. Riding in on his new Death Dragon, Sir Karl makes it clear to the shocked crowd that he has had a change of heart since his death and no longer considers himself one of the good guys. And you thought it was going to be a dull party!

Death Knights comes with the standard rule book to guide you through its many action menus and a machine-specific player reference card. Also included in the game package is a 60-page Adventurer's Journal that provides a wealth of information on characters and parties, combat, magic, and the numerous treasures, spells, and creatures of Krynn. Sixty-six narrative journal entries supplement the onscreen text at specific points during the story, serving both to enrich the adventure and to copy-protect the game (whenever you start the game, you're asked to enter a word from a specific journal entry).

Finally, the journal concludes with a glossary of AD & D terms and dozens of tables which illustrate some of the number-crunching that governs the mechanics of the Dragonlance game world. Players who are new to the role-playing genre may find this level of detail to be somewhat over-

GAMES

whelming, while diehard FRP fans will appreciate the game's complexity and adherence to official AD & D rules. Whichever category you fit into, you may want to invest in the *Death Knights of Krynn* clue book available directly from SSI.

Although *Death Knights of Krynn* features higher character levels, a slightly modified combat system, and some new spells and monsters not found in *Champions*, its major weakness is that it offers little in the way of graphic realism or sound quality to distinguish it from other AD & D titles. However, gamers who enjoyed *Champions of Krynn* will no doubt be pleased with *Death Knights*. As sequels go, it's better than most, and the option of bringing your favorite characters along for the ride makes *Death Knights of Krynn* worth the trip.

BOB GUERRA

IBM PC and compatibles; 640K RAM; CGA, EGA, or Tandy 16-color; hard drive or two floppy drives; supports Game Blaster, Ad Lib, and Sound Blaster sound boards—\$49.95

Also available for Amiga—\$49.95 and C64/128—\$49.95

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PRODUCTIVITY

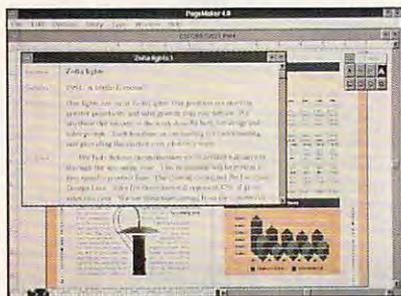
C H O I C E

ALDUS PAGEMAKER

The PC version of *Aldus PageMaker 4.0* carries desktop publishing to another rung on the evolutionary ladder. Enhancements allow experienced desktop publishers to perform more complicated work with less trouble and less experienced users to complete jobs with less frustration, making *PageMaker* a significant achievement.

The upgrade to this popular page

layout program follows the improvements made to the Macintosh version several months ago. In summary, the new *PageMaker* adds Story Editor, a text-only window that functions like a word processor; Table Editor, a utility that eliminates much of the agony of creating and formatting tables; long document management; improved handling of graphics; and more complete style and typographic control. In addition, a version of *Adobe Type Manager* is bundled with *PageMaker 4.0*, providing scalable font technology to those owning non-PostScript printers.



A fully integrated word processor, Story Editor in *PageMaker 4.0* allows for easy editing of imported text files.

Users of previous versions of *PageMaker* will have little difficulty migrating to version 4.0. There are so many new options and commands, though, that some of the keyboard shortcuts had to change; fortunately, the changes are logical and easy to pick up.

Story Editor, a most welcome feature of *PageMaker 4.0*, permits editing and text entry in a clean, easy-to-read window, as well as a spelling checker and search and replace. Story Editor treats each text element in your publication as a separate story. When checking spelling or performing searches, you can limit your work to the current story, or you can expand it to encompass the entire document.

While the search-and-replace function can find *Smith* and change it to *Smyth* as you might expect, it's much more powerful than that. In addition to locating and changing text based on content, the program can make changes based on text attributes. For example, you could search for any occurrence of 10-point underlined Courier type and change it to 12-point

Helvetica italic. You also can search for text formatted in a particular style and change it to another style.

In addition, *PageMaker 4.0* provides special control characters that allow you to search for such crucial elements as carriage returns, tabs, page number markers, nonbreaking spaces, index references, and inline graphics. There's also a wildcard character, permitting you to search for *Sm?th* and come up with both *Smith* and *Smyth*.

For years, the common wisdom about desktop publishing packages has been to use *PageMaker* for short, design-intensive documents and *Ventura Publisher* for longer publications. With *PageMaker 4.0*, the task of putting together a publication that spans several hundred pages becomes less daunting. While it won't do everything *Ventura Publisher* will, the gap between the two has narrowed. For your longer documents, *PageMaker* offers convenient automatic features, such as page numbering and creation of indexes and tables of contents. The Book command creates an ordered list of all the files that should be included in the publication. *PageMaker* then uses that list to number pages throughout the publication, create indexes, and generate tables of contents.

The new *PageMaker* has also beefed up its graphics-handling capabilities. Although the graphics creation tools remain the same, what you can do with them has changed. *PageMaker 4.0* now allows the placement of an inline graphic, or a graphic element that's treated like a text character. The graphic travels along if the text moves during the course of document editing.

Imported graphics handling has been updated as well, with *PageMaker* keeping track of the links with external files. Through its new Link command, *PageMaker* can alert you if an external graphic has been modified since it was placed in the publication. If you desire, *PageMaker* automatically updates any graphics that have changed so you won't have to worry about reimporting graphic elements every time changes are made.

The program also provides an option to change the way graphics are displayed. Choose Normal resolution for regular work, High Resolution for

PRODUCTIVITY

a detailed look at your artwork, or a "grayed out" display that significantly improves screen redraw rates. Finally, *PageMaker* 4.0 imports and displays color images, including 24-bit TIFF and EPS images.

PageMaker 4.0 augments an already impressive array of typographic controls, refining some features and adding several others.



You'll enjoy sophisticated typographic controls in *PageMaker* 4.0.

The creation and management of styles is much improved. A "next style" feature has been added. By using this feature, you can specify that Body Text always follow Subhead. When entering new material, you select Subhead and type the appropriate text. When you press Enter, the next style, Body Text, is automatically engaged, and you can proceed to enter the text without stopping to select a new style.

New options include control of widows and orphans, and a command, Keep, which indicates your desire to keep one text style with a minimum number of lines of the following style. For example, to prevent a subhead from appearing by itself at the bottom of a page, you can specify that you wish to keep the subhead with the next three lines of the following style. *PageMaker* will then move the subhead to the following page to keep it with the text it introduces.

PageMaker 4.0 now enables you to copy styles from one publication to another—a convenience when working with shorter publications and a necessity when compiling longer documents.

PageMaker's type-handling features have grown more elaborate. Type sizes, ranging from 4 to 650 points, can be specified in increments of 1/10th point. Leading can be ad-

justed in 1/10-point increments. Character kerning options have been enhanced. Text rotation allows type to be rotated 90, 180, or 270 degrees, and the Set Width feature allows type to be compressed down to 5 percent or stretched up to 250 percent of its original width. This allows you to simulate condensed or expanded versions of your standard typefaces.

PageMaker 4.0's printing options have also undergone extensive revision. Even/Odd page printing is now permitted, and duplexing, or double-sided printing, is available for printers that support that option. The thumbnail feature for PostScript printers now allows you to specify how many thumbnail page images to print per page. When working with spot-color overlays, you can specify which color pages to print, and you can have *PageMaker* print knockouts—blank spaces on the bottom layer where colors overlap.

With *Table Editor*, a separate program provided with *PageMaker* to simplify the creation of tables and charts, you can easily create rows and columns of information perfectly lined up and properly formatted. *Table Editor* even imports information from spreadsheets and databases.

In *Table Editor*, you control type fonts and sizes and the rules between columns and rows. Once you complete and save your table, place it into your *PageMaker* document as you would any outside graphic element.

Along with all the major innovations described above, *PageMaker* 4.0 includes perhaps hundreds of minor conveniences that make working with the program faster and more pleasurable. For example, when switching from a fit-in-window view to a 100-percent view, *PageMaker* moves you directly to the element you've selected. Furthermore, a quick exit from deeply nested dialog boxes saves time and mouse clicks. The menus have been rearranged to accommodate some of the new features, but in most cases Aldus has provided shorter paths to the most commonly selected options, such as font and type size.

Aldus provides a major documentation package with *PageMaker* 4.0, but it isn't the easiest material to work with. Thankfully, the reference manual is cross-referenced. If you turn to page 212 to read about page

setup, you're told to see also Insert pages . . . 190, Layout grid . . . 12, New . . . 205, Remove pages . . . 247, and Setting up your pages . . . 3. Eventually you can uncover the information you need.



The Book feature can link *PageMaker* files for chain printing and creating indexes and tables of contents.

In addition to the reference manual, there's a Getting Started book, which provides step-by-step tutorials for beginners; a Templates Guide, which shows how to use the supplied templates for calendars, catalogs, brochures, newsletters, and so on; a Table Editor Guide, which documents the Table Editor; and an Introduction to *PageMaker*.

Don't overlook the README files on disk; they contain useful information. Among the tidbits found there is information about the time/date stamp utility, which allows you to place a time/date stamp on your documents to help you avoid the "version confusion" that invariably arises after you've printed a document seven or eight times.

A significant upgrade, *PageMaker* 4.0 meets most professional desktop publishing needs.

TONY ROBERTS

IBM AT and compatibles (386 or higher microprocessor recommended); 2MB RAM (3MB recommended); EGA, VGA, or Hercules; 20MB hard drive with 6-8MB of free space (40MB hard drive recommended); mouse; supports PCL and PostScript laser printers supported by Windows 3.0, PostScript-language imagesetters, and other printers supported by Windows 3.0 printer drivers—\$795

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Circle Reader Service Number 315

BIZ*BASE GOLD

For years I ran my writing, editing, and consulting business entirely out of my head. No lawyer, no accountant, no Filofax, certainly no scheduling software—just a little phone and address database. I rarely even looked at a calendar. But the business grew, and I had a rude awakening a while back when I got an angry call from one of my biggest clients. She wanted to know why I was two weeks late with her rush job—and I couldn't even remember agreeing to do the work!

If your schedule is too complex and your contacts and clients too numerous to be managed informally, you need *Biz*Base*. Billed as a time and information management system (TIMS), *Biz*Base* is a combination of personal database, contact management system, schedule management system, calendar, phone dialer, and letter/report generator. It helps you keep track of your business contacts, organizes your schedule, prioritizes your projects, and reminds you to make important calls and keep vital appointments. It also provides a place for keeping expense account and other information, and even prints out form letters, invoices, envelopes, and labels for new customers. In short, it acts like a secretary that never forgets.

The main *Biz*Base* screen consists of several windows that summarize important categories of information. The Recall window lists calls to make. The Follow-up window tells you to make follow-up calls to clients who have already received letters from you. The Calendar window lists the day's appointments. The Task Scheduler window displays all the tasks you have scheduled, in order of importance. Alert windows can pop up whenever something important occurs on the current date, like an anniversary, birthday, or critical deadline.

Each of the main windows opens to show more information. The full Contact record of the line highlighted in the Recall window can be displayed by hitting Enter. Contact records contain the name, address, number, and all other relevant information about all of your contacts; you can also define up to 50 fields for things like the last order date, type of products the

contact buys or sells, and so forth. Up to a billion Contact records are possible, probably an adequate number unless you have a very successful business. Most of *Biz*Base's* functions depend on information you keep in the Contact records, which can be searched and tagged with simple queries. You can autodial calls from any Contact record; *Biz*Base* even times the calls.

The Calendar window displays a daily appointment list on the left side of the screen, a month calendar on the



Consider *Biz*Base* as a substitute for an infallible personal secretary.

upper right, and appointment memos at the lower right. You can also see a six-month calendar, search for specific appointments in the future or past, and set alarms.

Automatic generation of form and follow-up letters, with labels, is particularly useful. After typing the body of the letter with the simple word processor included in the program, you can create mail-merge letters for any set of tagged records. A week later, *Biz*Base* prompts you to create follow-up letters for the same contacts. You can create invoices for tagged records, too, and the program will keep track of inventory based on invoice activity. Write macros to speed up most data entry and other repetitive tasks.

Well-suited to laptops, *Biz*Base* allows businesspersons to enter new contacts and appointments while on the road. A slimmed-down version of the program, *Biz*Base Silver* (\$39.95), runs on machines with no hard disk and one floppy drive, a configuration common to many laptops. Owners of larger businesses should look at the four-user network version, which costs \$995.00. *Biz*Base* files are *dBase III*-compatible, a big advantage if you already maintain client files in a *dBase*-compatible database.

The documentation is well written, and the reference manual has an above-average index, but using the program requires little reference to the manual. A list of menu choices and function key commands is always available onscreen.

This package offers enough features to satisfy the requirements of nearly any small business, but it doesn't have everything. One of the few things *Biz*Base* lacks is automatic generation of Gantt, CPM, or PERT charts; for managing complex projects, these charts are easier to understand than lists of tasks. Although the keyboard commands are easy to learn, I missed mouse support; it would be helpful to just click on the Calendar window, for example, and have it open to display the full calendar.

There's only one real drawback to *Biz*Base* and it actually has nothing to do with the program itself, but with possible shortcomings in your own working habits. I found, for example, that I had to be much more conscientious about recording important daily events than I was before. If you forget to time that call or enter the results of that last-minute meeting, *Biz*Base* won't be as helpful as it could be. And you ought to have *Biz*Base* running all the time, so it's ready whenever a call comes in. The program has a DOS shell, so you can exit quickly to other programs and then hop back into *Biz*Base* with a keystroke.

If *Biz*Base* sounds like what you need but you find the price tag too hefty, try *Personal Biz*Base* instead. At \$69.95, it's limited to 200 records, still more than enough to keep most of us organized. So, if you need a secretary but can't afford one, the *Biz*Base* family probably offers at least one economical substitute made to order.

STEVEN ANZOVIN

IBM PC and compatibles, 640K RAM, hard disk with 3.5MB free—\$395.00, \$149.00 for competitive upgrade (mail in a page from your current PIM manual with your order), \$995.00 for four-user network version, \$39.95 for *Biz*Base Silver*, \$69.95 for *Personal Biz*Base*

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OUTSIDE IN

The mission: Import text and data into your word processor from other word processor, spreadsheet, or database files. *Outside In* is up to the challenge, and the current version supports over 50 file formats, including all of the most popular ones.

Using *Outside In* is straightforward. Once you've installed the program (requires 70K), simply place your cursor where you want to insert data and press the hot key. From the *Outside In* window, select the file and text or data to be inserted and press the insert key. Instantly *Outside In* begins inserting the data in your word processor. Since *Outside In* actually inserts the data as if it were being entered from the keyboard, the length of time it needs to complete the operation depends on the length of the insert. Inserting a short paragraph or a dozen cells from a spreadsheet takes just a second or two, whereas 300 cells from a spreadsheet can take 10 to 15 seconds, depending on the speed of your computer.

Whether your data comes from a spreadsheet, database, or word processor, *Outside In* will have little trouble recognizing the format. The program even maintains bold, underlined, and italic text through the importation process. Though it's conversion software, it can also be used to view another file's contents without leaving the document you're working on. This can be especially useful if you're writing a report and need to refer to other documents or your spreadsheet without leaving the file you currently have open. Remember, though, that *Outside In* is designed to import data only into word processors, so if you try to import data into your spreadsheet or some other application, the results can be quite unpredictable.

The designers at Systems Compatibility have included some useful and convenient features as part of *Outside In*. For example, when viewing a file, you can search for a series of numbers. Or, when you need to find a specific file within a long directory, you can use a wildcard format to display only those files with a specific extension. You can even customize the set-up parameters to meet special needs.

Outside In is an easy-to-use and

useful program for DOS users (it does not function under *Windows 3.0*) who need to write reports or create other documents requiring the importing of data or text from other files such as a database or spreadsheet. I recommend *Outside In* to non-*Windows 3.0* users who need this type of utility. And if you use any of the more popular word processors, you should have no problem using this software. *Outside In* can make your word processor just a little more powerful.

(Editor's note: *Outside In 1.5*, due out before press time, will require only about 8K RAM and will import into spreadsheets and databases as well as word processors.)

STEPHEN LEVY

IBM PC and compatibles, 70K RAM (20K in extended memory)—\$99; LAN version, five users—\$299

SYSTEMS COMPATIBILITY

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Chicago, IL 60611
(800) 333-1395
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MYINVOICES/ MYCHECKBOOK/ MYBACKUP/ MYPHONEBOOK

MySoftware's recent releases—*MyInvoices*, *MyCheckbook*, *MyBackup*, and *MyPhonebook*—are not kid's stuff. For the owner of a small business—particularly somebody working at home with a basic system—each program offers solid utility for its \$25 price.

MySoftware claims these programs can be learned in five minutes, which is an understatement. Of course, simplicity sometimes means a limit to choices, and that proves true for all of these packages. Those limits, however, should not hamper the modest user for whom this software was written.

The best feature of *MyInvoices* is that it functions as an inexpensive, easy-to-use database of up to 5000

items—more than enough for most small business owners.

Customer names and addresses entered into the system can be retrieved and pasted on invoices. Producing any of five useful reports from the invoice information, including an accounts-receivable report that's broken up by the number of days that accounts are overdue, is a snap. Pull-down menus provide immediate access to the various options.

Probably the weakest feature of *MyInvoices* is the invoice itself. On the computer screen, it looks fine and has an adequate number of fields to insert all kinds of necessary information. When printed, however, the invoice quality is hardly professional because of the limitations of standard dot-matrix printers. To compensate for that shortcoming, MySoftware sells a selection of preprinted invoices and envelopes to be used with the program.

MyCheckbook is the accounts-payable companion to *MyInvoices*. It will produce several useful reports and breakdowns of checks written by category or payee, as well as a cash-flow statement. As with *MyInvoices*, these reports are easily accessed from pull-down menus. For a very small business, this program could be an adequate general ledger. MySoftware also will supply checks that work with the program whether you're using impact or laser printers.

MyBackup is tailor-made for hard-disk paranoids who aren't ready to wrestle with more sophisticated utilities but want something better than the standard DOS backup.

The backup process operates from one screen with basically three partitions: one displays hard drive directories, another displays the files in a particular directory, and the third shows commands, drive selections, and updates of the backup in progress. Other attractive features include an estimate of how many floppies you'll need for a backup and a numbering of disks used.

MyBackup permits backing up anything from the entire drive to a single file. Files within directories or directories within directories may be singled out for backup. Those who regularly back up their hard drives can choose to back up only those files that have changed since the last com-

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plete backup—that's convenient.

For the most part, *MyPhonebook* does what's expected: alphabetically sorting a list of names ostensibly attached to phone numbers. It includes a couple of wrinkles, however, that make it a little better than average. First, in the business phone book (you can pick either a personal or a business phone book), you can alphabetize by company name or by profession as well as by the person's name—not a big deal but definitely useful. And while it doesn't search for specific names, *MyPhonebook* does have a fast-moving index box that makes scrolling for a name a near-instantaneous process.

Don't spend a fortune on features you don't need and will never use. For most, this assortment of to-the-point electronic recordkeepers does a fine job managing your affairs.

LEWIS LORINI

IBM PC and compatibles

MyInvoices: 384K RAM; 3½-inch disk—

\$25; 5¼-inch disk—\$20

MyCheckbook: 384K RAM, 3½-inch

disk—\$25; 5¼-inch disk—\$20

MyBackup: 256K RAM; 3½-inch disk—

\$25; 5¼-inch disk—\$20

MyPhonebook: 256K RAM; 3½-inch

disk—\$15; 5¼-inch disk—\$10

MYSOFTWARE

1259 El Camino Real, Ste. 167

Menlo Park, CA 94025

(415) 325-9372

Circle Reader Service Number 317

PC-KWIK POWER PAK

You've probably heard the saying *You can never be too rich or too thin*. For computer enthusiasts, we could identify with another saying: *Your computer can never be too fast*. With computers, speed is definitely the thing. Most of us would pay dearly for a program that could perk up our sluggish XT or push our speedy 486 even higher into the stratosphere. It may sound too good to be true, but *PC-Kwik Power Pak 2.0* can do just that. And it does it with more intelligence than any other speed-up program.

Power Pak is really a group of five programs that uses your system's

extra memory to accelerate your disk, keyboard, screen, and printer. What's unique about this group of utilities is that they all share the same RAM. The memory you set aside for the disk cache can be used by the screen accelerator, keyboard accelerator, printer spooler, and RAM disk. When these programs are through borrowing the memory, it automatically goes back to the disk-cache program. Even more amazing, this latest version of *Power Pak* can share its memory with other applications, including *Windows 3.0*—so your extra memory is used in the most efficient way.

The centerpiece of the five programs is the disk-cache program. It's virtually identical to Multisoft's stand-alone disk-cache program, *Super PC-Kwik* (\$79.95), which speeds up hard and floppy disk drives by copying frequently used data to RAM. The program actually anticipates which data on the disk you're most likely to need next and moves those sectors into RAM.

Because RAM is considerably faster than any drive, disk-intensive programs run noticeably faster (Multisoft claims two to six times faster). Programs that rarely access the disk will show less-dramatic results. (*Windows* programs already use a cache program, so don't expect a big change there.) The disk-cache program is also useful for laptop computer users who want to extend the life of their batteries (it takes much less electricity to read your computer's RAM than it takes to read your computer's floppy or hard drive).

To show you how many disk accesses you've saved, the disk-cache program includes a handy /M parameter. It measures the actual number of disk transfers saved and the percentage of transfers saved. For a more dynamic indicator, you can use the /* parameter, which places an asterisk in the upper right corner of any text screen. It's called a *cache hit indicator* and flashes each time data comes from the cache buffer instead of the disk.

The four other *Power Pak* programs are just as useful. With the screen-accelerator program, you can increase the speed at which text scrolls across your screen by two to three times. The speed is fully adjustable—as is just about every other speed-up

feature in *Power Pak*. The screen program also includes a handy ReView feature, which lets you scroll back through text data. As if that weren't enough, there's an optional screen blanker that works with all types of monitors (this feature doesn't work in *Windows*).

With *Power Pak*'s keyboard-accelerator program, you can increase DOS's default key-repeat rate of 9 characters per second (cps) to as much as 100 cps. You can also adjust the cursor speed with a hot key from within other applications. And when the ReDOS command line editor is turned on, you can easily call up a list of the DOS commands you've previously typed and quickly select or edit them.

The print-spooler program automatically compresses data sent to your printer and stores it in the cache memory. This frees up your computer and lets you get on with your other work while the print spooler manages the printing for you. A pop-up menu lets you monitor the ongoing print job from within other applications.

As I mentioned before, the four other programs borrow RAM as needed from the memory that you've set aside for the disk-cache program. The print-spooler program grabs cache memory when you're printing, but otherwise requires very little memory of its own. The RAM disk program is dynamic—it expands and contracts as you write files to the RAM disk.

Power Pak can use conventional, extended, or expanded memory—or any combination of the three. And if you have a 386SX, 386, or 486 computer and a memory manager such as *QEMM* or *386MAX* (or a 286 computer with the NEAT chip set), you can load all five programs into upper memory blocks, causing *Power Pak* to take as little as 0K of conventional memory.

As you can see, this is a powerful set of speed-up utilities, optimized to work together in the most effective way. But is this package right for you? If you have no extended or expanded memory, you may not be willing to give up the 30–60K of conventional memory that *Power Pak* needs for its programs. If you spend all your time in *Windows*, you're already using a disk-cache program (SMARTDRV.SYS) with all your programs. Because



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Windows takes over all keyboard and display functions, the screen and keyboard accelerators will have no effect on your *Windows* applications. And if you've running *Windows* in 386-enhanced mode, and you have only two megabytes of RAM, you may not have enough memory to run *Power Pak* and *Windows* at the same time—without having to slip back into standard mode.

On the other hand, if you have some extra memory, you'd be hard-pressed to find a more efficient way to use it. Like a major tuneup, *Power Pak* can transform your tired, old jalyop of a PC into a supercharged hot rod, revved up and ready to race.

DAVID ENGLISH

IBM PC and compatibles, 128K to 16MB of free RAM; extended or expanded memory recommended—\$129.95

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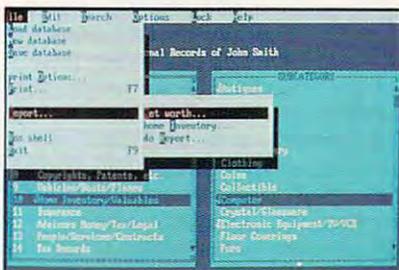
FOR THE RECORD

As you prepare to travel, do you ever stop to worry about the problems your beneficiaries would face if something bad should happen to you? Would they know whom to notify? What your holdings are? Where the records are kept? Is all this information written out for them, and do they know where they can find it? Are you sure?

Keeping such records is not a small task and requires updating from time to time. Many people figure that nothing sudden will happen, and if it should, the family knows where everything is. Maybe. If you would rather be sure, the Nolo Press program *For the Record* 2.0 will make the task a great deal easier and probably remind you of many items you might have overlooked.

The program is entirely menu driven, and the main menu lists 27 categories, ranging from emergency information through sources of income, securities, real estate, insurance, tax records, credit cards, personal documents, and personal information to grim matters such as funeral arrangements and will and es-

tate matters. Each of these categories has subcategories, with 225 subcategories in all, which gives you some idea of the depth of the program.



For the Record prepares for the worst and makes relevant information available in the event that you aren't.

To help you navigate the menu, the program provides mouse support. Whenever you select a subcategory, you bring up a screen specific to the subject, and you are prompted for entry of relevant data. Aware that you may wish to include more extensive information on the form, Nolo Press has provided for individual notes to the record.

Nolo Press is well known for books and programs on legal matters, and the manual of *For the Record* is typical of what we have come to expect. Written clearly, it provides a wealth of background information and advice on the subject matter covered, in addition to guiding you through the program.

Don't be misled. Even with the aid of *For the Record*, you may find the task of personal documentation burdensome. The program cannot provide the data; that's up to you. It took me several days to fill out my own record, possibly because I found that I didn't remember everything needed. The consolation is that without *For the Record* I might never have gotten around to an essential chore.

CHARLES IDOL

IBM PC and compatibles, 384K RAM—\$59.95

Also available for Macintosh 512Ke or higher, System 4.1 or higher—\$59.95

NOLO PRESS
950 Parker St.
Berkeley, CA 94710
(415) 549-1976
Circle Reader Service Number 319

SIDETALK II

With *SideTalk II*, you can stay in your word processor—or most any other program—and use your modem at the same time. *SideTalk II* is a memory-resident communications program with most of the features you'd expect from a big stand-alone program, including a powerful script language, support for XMODEM and YMODEM transfers, and the ability to create keyboard macros. This latest version even includes an MNP driver, which brings the benefits of MNP error-correction to non-MNP modems.

When memory-resident, *SideTalk II* takes up about 100K, or you can run it as a stand-alone application. It's a slick little program that's perfect for laptop computers.

DAVID ENGLISH

IBM PC and compatibles, modem—\$125.00

LATTICE
2500 S. Highland Ave.
Lombard, IL 60148
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Circle Reader Service Number 320

LEARNING

C H O I C E

DANCE OF THE PLANETS

Of the billions who have walked this world and seen its skies, none have failed to look up in wonder. The music of the spheres, man once thought, was the sound made by perfect crystal. We may know now that the only sound in the solar system is a background hiss of long-gone radiation and radio white noise, but we nonetheless continue to put music to the turning of the planets.

It's no surprise then that astronomy captures our imagination. On a

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LEARNING

dark night anyone with eyes can play stargazer, moon watcher, and planet tracker. Anything that gives us a better window on the universe is welcome, whether that means planetariums, telescopes, or recently, personal computers. Good astronomy software for the PC leaves behind the small band of professional astronomers to capture the attention of nearly everyone who's looked at the lights and wished to really *be* there.

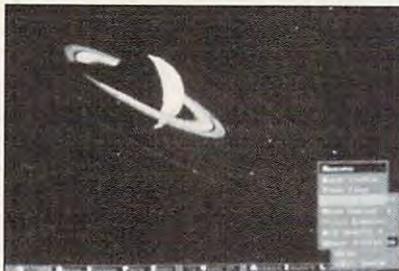
And no other PC program gives you a better sense of the utterly graceful chaos of our solar system than *Dance of the Planets*. Where other stargazing software puts static pinpoints of light on the screen to represent galaxies and worlds, *Dance of the Planets* puts realistic, spinning spheres shepherded by coveys of moons that wax and wane. *Dance of the Planets* is an extraordinary program that should be a fixture of every science classroom and on the hard disk of home computers wherever there are people fascinated with the night skies.

Unlike most astronomy software for the PC, *Dance of the Planets* concentrates on the hometown—the solar system's nine planets, 60-odd moons, 4600+ asteroids, and 1300 or so comets. You'll see plenty of stars in *Dance of the Planets*, but they're really just a backdrop to the real play on the local stage.

Once installed on the more than 1.1 megabytes it demands from your hard drive, *Dance of the Planets* almost immediately turns you into a planetary tourist. On a VGA-equipped, 386SX or 386 PC with at least 640K of memory, the program is stunning. Anything slower—a 286 system or less well-equipped system, a floppy-only computer perhaps—is barely workable. And if you have the good luck, or money, to have a math coprocessor inside your machine, you'll think you've got a tunnel to the sky on your desktop.

Dance of the Planets uses a control bar to command the movement of worlds. Discreetly tucked away at the bottom of the screen, the bar takes instructions via either mouse or keyboard. The former is more convenient, the latter more reliable. Click on a control bar segment, and you can enter viewing coordinates or dates, select viewing magnification and simulation speed, or label the visible

bodies. A pop-up menu leads you to additional choices that pick and lock in on planets, plot asteroids, and draw constellations, while another command accesses a database packed with information about planets, moons, asteroids, and comets. Operating *Dance of the Planets* is relatively easy, though not necessarily simple: There are too many permutations and possibilities for simplicity here.



***Dance of the Planets* generates authentic space views, such as this one of Saturn in January 1991.**

The program's documentation helps immensely. It's not the most attractive manual, but it's eminently readable and reasonably clear even to those who skipped too many science classes. Best of all, it shows you exactly how to take a virtual field trip to the sun, the moon, the asteroid belt, and every planet. If you can follow directions, you'll be quickly soaring out to Jupiter, peering at Mars, and watching Mercury transit the sun.

Dance of the Planets' most significant problem is its rapacious appetite for computational power. Running on something as substantial as a 20-MHz 386SX PC (minus a math coprocessor), *Dance of the Planets* often makes you wait a *long, long* time while a screen redraws. Magnified views of the most detailed planets—Earth, Mars, and Jupiter—are particularly slow in reappearing. This program pushes a home computer's calculating ability to the limit, and beyond. If you're serious about astronomy, plan to use *Dance of the Planets* in a classroom, or find yourself spending hours in front of this program, your best investments are a math coprocessor and a fast, RAM-packed video card.

You can probably pick out a few planets with the naked eye—Venus, Mars, Jupiter, maybe even Saturn on a good night—but unless you have a

telescope, you're only seeing bright lights. You can't find the outer planets, nor can you watch the satellites pirouette around their masters. *Dance of the Planets* gives you a front-row seat to this planetary ballet.

By combining impressive graphics with an accurate orbital simulation that accounts for the dynamics of gravity and precise placement of celestial objects, *Dance of the Planets* effectively squeezes the solar system into your PC. You can take a seat on Earth and view the system from there, or you can spy on the entire solar system or any of its parts from a starship 270 astronomical units (about 25.1 billion miles) from the sun. Depending on your vantage point, you can dial up magnifications as high as 32,000 times normal. With that much viewing power, you can see details as small as the Hawaiian Islands on Earth, watch the seasons change on Mars, and track the Great Red Spot on Jupiter.

And you can follow the dance of the moons in *Dance of the Planets*. At extreme magnifications, you can even see Charon, Pluto's companion. Pull back, and you can watch the entire Jovian system, all 16 moons, weave their complex orbits. Zoom in on Saturn and follow the shepherd moons as they interact with the planet's icy rings. *Dance of the Planets* lets you select not only the magnification of your super telescope but its perspective as well. You can zip far above or below the ecliptic plane (the plane of Earth's orbit, used as a dimensional reference) to see the entire solar system or any of its planets from entirely new angles.

This program has other amazing strengths. It can plot nearly all the known asteroids and comets to show you the depth of the asteroid belt between Mars and Jupiter, and to re-create a comet's path as it plunges toward the sun. You'll learn just by looking, a revelation to anyone who struggled with boring textbooks and their flat charts and illustrations. Did you know that some asteroids congregate near Jupiter's orbit while others are far from the belt, even within Earth's orbit? Ever wonder how near comets come to the Earth? *Dance of the Planets* lets you re-create close encounters of the past and preview future close calls, too.

When you watch from Earth, you can set your seat with longitude and

latitude and pick any date from 4680 B.C. to A.D. 10000. Conjecture says that a conjunction of Jupiter and Venus on June 17, 2 B.C., may have been the Christmas star. Check it out for yourself. Or view famous solar eclipses of history or get a jump on those in the future, without leaving the comfort of home.

Dance of the Planets offers up a slew of extras that make your imaginary voyaging even more enjoyable. A 3-D option puts orbits in stereo on the screen when you put on the included glasses. You can selectively turn bodies on or off to focus your attention and speed up the display. You can spread deep space objects—distant galaxies, pulsars, quasars, globular clusters, and the like—across the sky to add to the more than 9000 stars. And you can save simulations to disk for later replay. You can even send screens to 9- or 24-pin printers or to a LaserJet II-compatible laser printer.

You'll be awed by this onscreen orrery. As it mimics the solar system, *Dance of the Planets* brings to life places most of us will never see, even through a telescope. In the classroom, *Dance of the Planets* not only illustrates the motion and interaction of the system's bodies—something the best textbooks find impossible—but it lets kids visualize everything from Newton's law of gravitation to some aspects of the more modern chaos theory. At home, the program can be used strictly for entertainment—touring the outer planets, replaying Voyager flybys, tracking famous comets—or for more strenuous at-home celestial education.

Though *Dance of the Planets* costs more than twice as much as other PC astronomical software, it's a much better value. You'll get more out of an hour or two with *Dance of the Planets* than you'd get in weeks of staring at the static dots those other programs put on the screen. More important, though, is how *Dance of the Planets* helps you make some sense of the night sky. Your appreciation of stellar bodies grows each time you run this simulation.

Play with *Dance of the Planets*; then walk outside and look up. The spread of lights seems somehow changed. Now you know what goes on around the brightest pinpoints and in the dark and invisible corners of the

solar system. What a perfect ticket to the greatest show on Earth—or any other planet.

GREGG KEIZER

IBM PC and compatibles, 640K RAM, EGA or VGA; hard drive and math co-processor recommended, mouse and printer optional—\$195

A.R.C. SOFTWARE
P.O. Box 1955
Loveland, CO 80539
(800) 759-1642

Circle Reader Service Number 321

SPELL-A-SAURUS

With *Spell-a-Saurus*, your child can shoot down letters from the sky, guess the missing letters in words, and find the mystery word by rearranging letters. Select word lists by grade level (first through eighth) or make your own.



Spell-a-Saurus provides well-crafted word games for kids in grades 1-8.

If you have a Sound Blaster or other supported sound card, the program talks with a strong and clear voice. Without a sound card, the voice is hard to understand on some PCs. Speech quality aside, *Spell-a-Saurus* is an excellent program.

DAVID ENGLISH

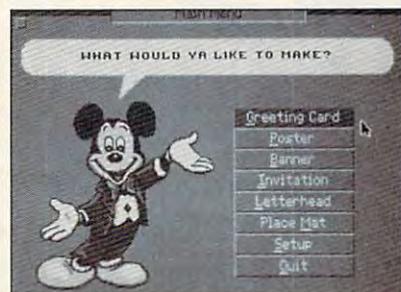
IBM PC and compatibles, 512K RAM, graphics adapter; sound card support includes Tandy TL/SL or 2500, Sound Blaster, Echo, IBM Speech Card, Covox Speech Thing, and Hearsay; mouse optional—\$44.95

FIRST BYTE
Distributed by Davidson & Associates
3135 Kashiwa St.
Torrance, CA 90505
(800) 556-6141
(213) 534-4070

Circle Reader Service Number 311

MICKEY AND MINNIE'S FUN TIME PRINT KIT

Your child's birthday is approaching (what, already?), and you really want it to be unique, not another Barbie bash or Ninja Turtle soiree. *Mickey and Minnie's Fun Time Print Kit* is just the ticket! Your child can personalize invitations, banners, and place mats to make it a birthday party to remember.



Ever helpful, Mickey presents options in *Mickey and Minnie's Fun Time Print Kit*.

The *Print Kit* is an easy-to-use desktop publishing system for elementary-school-age kids. With it, they can select borders, typefaces, and clip art featuring Mickey and Minnie Mouse. Supplied with a variety of formats, your child can simply fill in the blanks to produce quality printouts.

Coordinate the borders and artwork to highlight a particular holiday theme, such as Halloween or Christmas. A helpful printout in the user's manual shows all the art, borders, and typefaces at a glance, making layout easier.

A child will need to be able to read and follow directions to use this program independently, so it should suit the needs of a creative child.

BETH ANN MURRAY

IBM PC and compatibles, 512K RAM, CGA, EGA, MCGA, VGA, Tandy 16-color, or Hercules—\$19.95

WALT DISNEY COMPUTER SOFTWARE
500 S. Buena Vista St.
Burbank, CA 91521
(818) 841-3326

Circle Reader Service Number 330

LEARNING

MCGEE AT THE FUN FAIR

When we last saw McGee, he was making himself at home on Katie's farm, gathering eggs and watching Aunt Thelma milk the cow. But lately, your child may have been asking, "What else can McGee do?"



McGee at the Fun Fair introduces your child to the mouse and to icons.

Lots! McGee is back with a new adventure, this time at a fair that he visits with his parents and his friend Tony. Fans of McGee and his antics will love this new story line, which opens with Tony, McGee, and his parents at a city square, watching an old man sketch. When the man turns his paper around, McGee and Tony see funny pictures of themselves! But if your child clicks on the old man again, a different picture may appear.

It's impossible to select something that doesn't react. Initiate action on the main screen by selecting icons. Move the mouse to highlight an icon, press the mouse button, and—pres-to!—a clown juggles! A lady plays her guitar!

The game's appeal comes in part from its support of sound systems. I used the Covox Speech Thing and was delighted with the authentic-sounding giggles of the children at play, the sound of inflating balloons, and the noisy slurps of McGee and Tony eating Popsicles.

Of course, parents like software for children to have an educational element, and *McGee at the Fun Fair* doesn't let us down. Children will learn to manipulate a mouse and interpret an icon. They'll learn cause and effect and how to maneuver

through a series of commands to reach a desired goal.

One of the beauties of *McGee at the Fun Fair*, and of all the earlier McGee adventures, is that they're truly for children who cannot yet read. Since all action starts with the click of a mouse button on an icon, and because the movement of the cursor is limited to the bottom of the screen, even children with limited dexterity should have little trouble making the program do what they want it to do. The icons can also be selected with the arrow keys, so if your child has a mental block against mice (just like some adults!), this program is a good choice.

Unfortunately, I'm afraid these very advantages may limit the game's appeal over time. My three-year-old, who is fairly computer literate, tired of play fairly quickly. He replayed some of the animations again and again and liked certain sound effects, but after about half an hour, he'd had enough. Luckily, I have a one-year-old coming up behind him who hasn't gone much beyond banging wildly at the keyboard, so we'll just save *McGee* for him.

The beauty of a recurring character like McGee is that he's already familiar, and all parents of young children know how important that can be. Now that there are three different stories, I'm sure that children will eagerly await the next adventure of McGee.

BETH ANN MURRAY

IBM PC and compatibles, 640K RAM; CGA, EGA, MCGA, VGA, or Tandy 16-color; mouse optional; supports Sound Blaster, Covox Speech Thing, and Tandy Digital Sound sound cards; mouse optional—\$39.95

Also available for the Amiga (\$39.95), Apple IIGS (\$39.95), and Macintosh (\$39.95)

LAWRENCE PRODUCTIONS

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MY PAINT

Children love to draw, and *My Paint*—one of the best paint programs for kids—will only encourage the habit. Without a lot of bells and whistles, *My Paint* offers challenge and pleasure by stimulating

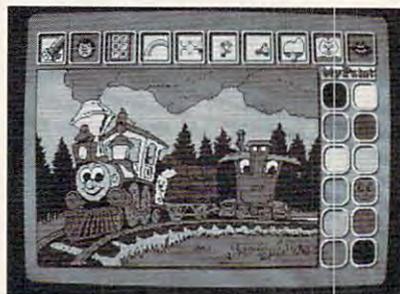
your child's own imagination. As testament, my child, who won't color with crayons, will spend hours drawing and coloring with *My Paint*.

If you've ever doubted that icons are user-friendly, sit down with a child and *My Paint*, and see how quickly they become friends. These icons are animated, a whimsical detail that simply begs kids to try them out to see what they'll do.

Your child can draw by clicking and moving the mouse. Although you can use a joystick to operate *My Paint*, I would highly recommend a mouse for freehand drawing. This is an extremely useful skill that computer-oriented children will use often.

Selection of a fat brush, a thin brush, or the fill option is handled by icons. Both fills and line drawings may be done in any of ten solid colors or with combinations of colors.

One of my son's favorite tricks is



Cultivate your child's artistic ability and teach mouse basics with *My Paint*.

the flashing colors option. After drawing a variety of lines and shapes with the freehand tool, he selected flashing colors. Suddenly the screen resembled a neon sign, flashing and changing every second! Lines drawn with the multicolored option, then set flashing, looked like a crawling worm. My child loved it!

A coloring book option allows you to fill in a variety of predrawn pictures, and, of course, both original art and coloring book pictures can be printed for coloring with crayons. Additional coloring book disks can be purchased separately, and each includes 28 different pictures.

This is certainly a clever program, but the sound accompanying each coloring book picture leaves something to be desired. The dinosaur's roar and the kitten's meow



REVIEWS

LEARNING

sound about the same—like static. There are isolated bits of charm, though, such as the pirate ship's sea chantey and the xylophone playing a tune. *My Paint* lets your child do computer artwork without a lot of distracting options. And because the interface is uncluttered, there's nothing standing between your child and creativity. So if you've got a budding artist in the family, buy *My Paint* and watch the artist blossom.

BETH ANN MURRAY

IBM PC and compatibles, 512K RAM, EGA or VGA, mouse or joystick—\$49.95
Also available for Amiga—\$49.95, Apple IIGs—\$49.95, and CDTV—\$39.95 (over 100 pictures)

SADDLEBACK GRAPHICS
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Circle Reader Service Number 328

WHERE IN THE WORLD IS CARMEN SANDIEGO? DELUXE EDITION

James Bond and Sherlock Holmes, make room—only computerdom's top sleuth (that's you) can thwart the evil schemer Carmen Sandiego. As you travel around the world (not in 80 days, but in 6), you decipher clues that lead you to one of Carmen Sandiego's cohorts who's stolen some treasure. You have to discover the thief's identity and location and arrest the villain.

Here, as in the original *Where in the World* adventure, you can become an armchair world traveler. See the sites, learn interesting facts, and talk to the natives in various countries around the world. But unlike the original version, the deluxe edition offers digitized photographs from the National Geographic Society in 640 × 480 VGA resolution, 62 animated sequences, 15 more countries to explore, digitized sound, and 2500 clues

DANCE OF THE PLANETS™

SPACE TRAVEL FOR THE INQUIRING MIND



Explore the sky and solar system in new depth with orbital simulation, a comprehensive database and outstanding graphics.

- View detailed, rotating planets with all known satellites.
- Watch eclipses, transits, occultations, conjunctions, comet apparitions, past and future.
- Study the asteroid belt in detail.
- Enjoy a realistic starry sky with deep space objects, constellations, grids, and local horizon.
- Witness orbital resonance, chaos, and precession.
- Make original discoveries of cause and circumstance. It's open ended.

Dance is an order of magnitude better than any other solar system simulator on the market.

John Mosley Sky & Telescope

This reviewer has encountered no similarly rich entrant in the existing corpus of programs for the personal computer.

Phil Morrison Scientific American

1-800-759-1642

A.R.C. Science Simulation Software
P.O. Box 1974U, Loveland CO 80539
1-303-667-1168

IBM compatibles, EGA/VGA graphics.
Coprocessor recommended. \$195 + s&h. Lit. available.
Dealer Inquiries Welcomed. Fax 1-303-667-1105

with higher levels of difficulty. To travel using this super version of the game, you'll need more than a low-end system. It requires 640K, high-resolution VGA graphics, and a hard drive with at least 6MB of free disk space.

Where in the World appeals to the curious as well as the analyst. You don't need the analytical skills of James Bond, but you do need basic reasoning abilities. If you like the Clue board game, you'll love *Where in the World*. This game also appeals to those who enjoy word games and puzzles.

What you won't find in this game are lots of shoot-'em-up action sequences. That doesn't mean the graphics are weak. You won't find better graphics in any game that supports VGA. The realism of the background scenery is amazing, and the cartoonlike animated characters that occasionally appear add their own special touch.

Sound-card owners won't be disappointed, either. The digitized voices of the Chief and Warren the Warrant Robot and the musical scores during the game's opening sequences enhance gameplay.

Carmen Sandiego's career began in 1985 with the development of the original *Where in the World* adven-

ture. She created and heads the V.I.L.E. (Villains' International League of Evil) organization. She's rarely if ever involved in the actual crimes, but you can be sure that she's involved in the planning of any big heist.

Starting as a gumshoe (low on the totem pole) investigator, your initial assignment is fairly simple. As you rise through the ranks to super sleuth, your assignments increase in difficulty. Contact the Chief at ACME on your videophone to get your assignment. You'll want to take advantage of the electronic notepad and data-finder to assemble clues and a dossier on your suspect. The Crime Net facility that offers information on your suspects' whereabouts also provides help.

Make sure that you have a warrant for a suspect's arrest, or he can slip through your fingers. As you get closer to the thief's location, suspicious characters appear and begin to ask questions about you. Don't be surprised if you're treated to a sneak attack as you close in on your prey while questioning a witness. If a witness doesn't know anything, you're in the wrong location.

Use *The World Almanac and Book of Facts* included with the game to investigate the clues you find. Dictionaries and encyclopedias come in

LEARNING

handy, too. Write everything down. You never know what bit of information will prove essential.

Where in the World Is Carmen Sandiego? is easy to use and well designed; I'd recommend it for anyone over 12 years old. While playing, I was absorbing knowledge without realizing it. It was fun to search for information on the clues, even at my age, and if both adults and kids can learn and have fun at the same time, Brøderbund has done its job well. As far as I'm concerned, the educational payoff of *Where in the World Is Carmen Sandiego* makes the game well worth the price, whether you choose the original or the deluxe version. Get *Where in the World Is Carmen Sandiego* and get sleuthing.

JOYCE SIDES

IBM PC and compatibles (10MHz 286 or faster), 640K RAM, VGA, hard disk; supports Ad Lib, Sound Blaster, Tandy 3-voice, Roland MT-32; mouse optional—\$79.95

BRØDERBUND SOFTWARE
17 Paul Dr.
San Rafael, CA 94903-2101
(800) 521-6263
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HARDWARE

LESTER THE CORDLESS MOUSE

I've been fighting my mouse cord for years—that is, until Lester the Cordless Mouse arrived. Lester is a terrific solution to the mouse cord problem. No more tangled keyboard and mouse cords, just smooth sailing on my mouse pad with no encumbrances. It gave me an immediate boost in productivity.

The concise, clear manual that came in the package provided helpful hints on nearly every page, pointing out some potential problems and providing ready solutions. I didn't have any trouble installing the new software and attaching the mouse receiver to the computer.

Lester itself is small and ergonomically pleasing. It took some time before my large hands became accustomed to the small, tightly positioned mouse buttons. Still, mastering Lester proved to be no problem.



Lester the Cordless Mouse makes tangles a thing of the past.

Lester worked perfectly in all of the *Windows* applications I ran. *DeluxePaint* and most DOS applications ran great, too. I did, however, experience difficulties with some text- and graphics-based DOS programs since the mouse cursor that the driver maintains and updates is nonstandard (*DeluxePaint* and *Windows* applications do their own mouse-cursor updating).

If you're looking for an alternative to mouse cord tangle and you run mostly *Windows* and DOS programs such as *DeluxePaint*, Lester may be the solution to your mouse problems. It's easy to install and a dream to use.

RICHARD C. LEINECKER

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TYPIST

At first glance, you might think Typist is simply a hand scanner. It's a little wider than a standard hand scanner, but not enough to make much of a difference. But Typist's OCR (Optical Character Recognition) software makes it noteworthy.

The scanner requires at least

2400K of free extended memory in an 80386 or 80486 system. That means you'll need 4MB of RAM to operate Typist. This device comes with a short 8-bit card that takes up a slot in your bus. The installation program takes care of itself, and the manual is very explicit, providing adequate hand holding to comfort all but the rankest neophyte. Once you've installed Typist, you can use it for capturing either images or text. Generate graphics from photographs or line art and then store them in bitmap format (TIF or PCX). You must set the scanner for monochrome with a switch on the body of the hand scanner to use the OCR software, but you can use either monochrome or one of three different levels of dithering for grabbing graphic images.

Typist's OCR software component works in the background as a TSR in DOS or a minimized application in *Windows*. As soon as you press the button on the hand scanner, you activate the software, which buffers the bitmap image and interprets the characters. Once the OCR has figured out all of the letters it can from the scanned image of the printed page, it outputs the information to the keyboard buffer, where (to your application) it looks exactly like text you're typing in.

One of the nicest aspects of the OCR software, since even this slightly wider hand scanner can't quite span the width of a page, is that you can scan sideways, top to bottom, or bottom to top. Just set the OCR software to automatically read the text in the proper direction. Or set it to read text in only one of these directions. If you're scanning text in a columnar format, you can set the OCR to pay attention only to the first, middle, or last column of text. And, as if that were not enough flexibility, the system can zip scans together so you can scan a wide page of text in a series of horizontal bands and let Typist automatically detect the overlap and eliminate the extra lines. Usually.

As your reward for reading this far, here's the Kitty Kelley lowdown on OCR: The truth about OCR software is that Caere and a couple of others are at the forefront of a fledgling technology. One of the reasons Typist demands so much memory is that identifying text characters is next to

HARDWARE

impossible, particularly when you're scanning a variety of typefaces. Typist, and almost every other OCR system, falls to pieces when it runs across italic text (or any other type style slightly out of the ordinary). It can't make out one italic letter in ten. Likewise, if your contrast setting is too dark or too light, your scan is slightly unsteady, or the scanner isn't perfectly straight with the page, Typist will make a lot of errors.

Despite this, I was amazed at the power of Typist. It performed as well as a flat-bed scanner on average, and its software seems to be slightly ahead of *ReadRight* in terms of power (it even reads dot-matrix printouts without a hitch), and it's much friendlier. The price of the Typist unit puts a flat-bed scanner and dedicated OCR package to shame. In spite of all the editing scanned text requires, it's miles ahead of typing in text in terms of speed and convenience.

ROBERT BIXBY

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BOOKS

MICROLEAGUE BASEBALL FIELD GUIDE AND DISK

Picture a version of *The Baseball Encyclopedia* compiled expressly for fans of *MicroLeague Baseball*, and you should get a fairly accurate idea of what *MicroLeague Baseball Field Guide and Disk* is all about. The bulk of the book is devoted to capsule scouting reports and player statistics for the teams included in the three editions of the game. The

guide also supplies short summaries of the squads found on the different franchise history disks, which are sold separately.

The disk part of the package takes the form of a special edition of the new *MicroLeague Baseball* game. Basically a stripped version of the regular program, it lacks the stat compiler, is not compatible with any supplemental disks, and comes with a roster of only six teams. With regards to gameplay, however, the special edition works just like the real thing.

The book and disk package really has only one strike against it: the \$26.95 price tag. Of course, in addition to the guide, you get what amounts to a sneak preview of the new *MicroLeague Baseball*, but at that price you might just as well spend a bit more and buy the complete game. If you already own the new game, it's even harder not to balk at the price, because you're essentially paying extra for a disk of no value to you.

Fortunately, there's one saving grace. A coupon in the back of the book secures you a discount of up to \$15 on the cost of some of the add-on disks. If you shave this amount off the guide's purchase price, its appeal definitely grows.

And money matters aside, the individual player commentaries and overall team analyses contained within the book will, without a doubt, deepen your appreciation of what transpires in your *MicroLeague Baseball* game. It might just make you a superior *MicroLeague* manager, too.

JEFF SEIKEN

Authors: Dave Weiner and Bill Gutman
450 pages—\$26.95

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TYPE FROM THE DESKTOP

With literally thousands of typefaces to choose from, it's hard to get a handle on what makes one typeface different from another. As with fine wines, the sub-

tleties of tone and color are lost on those of us outside the discipline.

If we think of the creation of typefaces at all, we think of it as an arcane science performed by cloistered academics with bad eyesight.

Yet with the growing popularity of desktop publishing and *Windows*-based applications, understanding type is becoming as basic as knowing how to copy a file.

Fortunately for those of us who are new to this area, Clifford Burke has written an excellent introduction to the use of type on the PC. *Type from the Desktop* balances both art and science for a fascinating look at why typeface matters. Burke livens up what is usually a dry subject with bits of historical trivia, many practical tips, and examples of his own favorite typefaces.

He begins by describing the basics of setting text on a page—margins, white space, line length, line spacing, type size, tracking, kerning, and alignment. Much of this material will be familiar to readers involved in desktop publishing, but the author explains it well and always brings it back to the elements that aid the reader.

Burke progresses to a short history of the major trends in typefaces, a lively discussion of the different typeface categories, and a quick tour of some of the great typefaces (which I found to be the most interesting part of the book).

He concludes with a down-to-earth look at various design considerations, the steps you can take to determine the best layout for your material, and advice on how to work—and communicate—with service bureaus.

If you're confused about typefaces or just want to learn more about how to use them on a page, pick up a copy of *Type from the Desktop*. It clearly stands out from the other books on type—like a 72-point Poster Bodoni headline set against a full page of 12-point Times.

DAVID ENGLISH

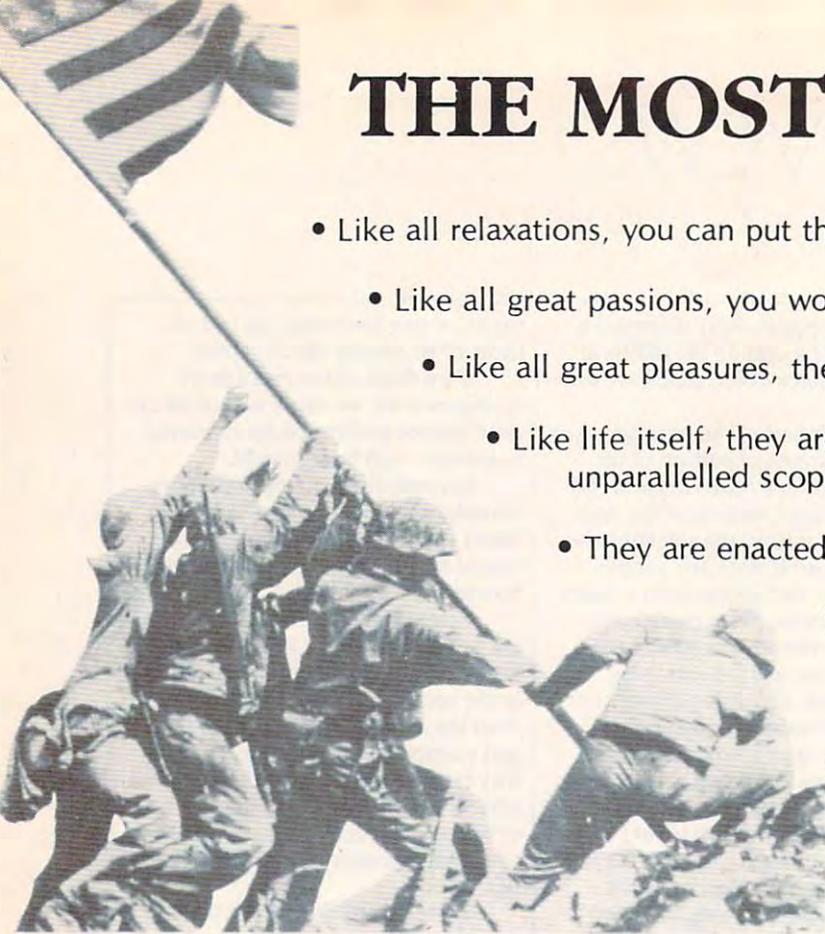
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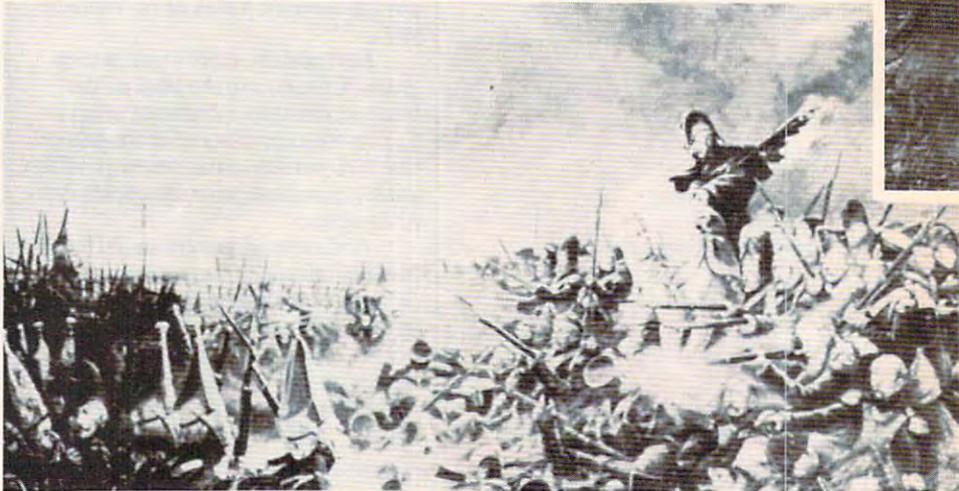
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The tapestry of these struggles was dark to its creators, its final outcome obscure and inevitably the result of a panoply of individual efforts. For example, the French were undone in Spain by *Napoleon's* inability to personally supervise the campaign.

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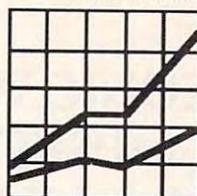
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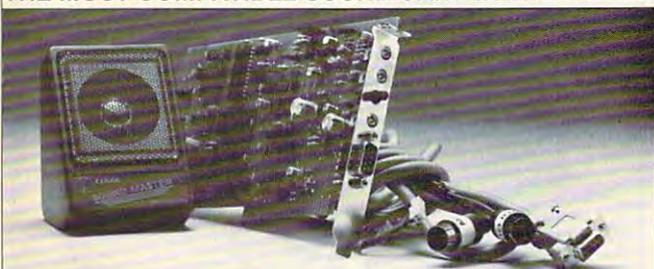
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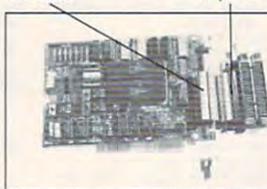
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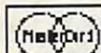
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FAST FACTS

TOP 25 MS-DOS GAMES

This Month	Last Month	Title	Firm
1	*	Eye of the Beholder	Electronic Arts
2	*	Space Quest IV	Sierra On-Line
3	1	King's Quest V	Sierra On-Line
4	5	Wing Commander	Origin
5	*	Death Knights of Krynn	Electronic Arts
6	2	SimEarth	Maxis
7	7	SimCity	Maxis
8	6	Flight Simulator	Microsoft
9	16	Links	Access
10	11	A-10 Tank Killer	Sierra On-Line
11	10	Where in the World Is Carmen Sandiego?	Brøderbund
12	*	Overlord	Mastertronic
13	4	F-19 Stealth Fighter	MicroProse
14	3	Red Baron	Sierra On-Line
15	9	Entertainment Pack for Windows 3.0	Microsoft
16	14	Wing Commander Secret Mission Disk	Origin
17	8	F-15 Strike Eagle II	MicroProse
18	17	Where in the USA Is Carmen Sandiego?	Brøderbund
19	12	Jack Nicklaus' Unlimited Golf & Course Design	Accolade
20	15	Bill Elliott's NASCAR Challenge	Konami
21	*	Test Drive III: The Passion	Accolade
22	18	Where in Time Is Carmen Sandiego?	Brøderbund
23	*	Silent Service II	MicroProse
24	19	Joe Montana Football	Sega
25	21	Leisure Suit Larry III	Sierra On-Line

* First month in Top 25

This month's Hit List of top-selling computer games for IBM PC and compatible computers was compiled by the Software Publishers Association in March 1991 and based on the sales in major software retail stores.

EUROPEAN COMPUTER LEISURE AWARDS 1991

The European Computer Trade Show held in London April 14-16 this year proclaimed several winners for its prestigious European Computer Leisure Awards. Game maker Psygnosis came out on top, gathering six prizes at the show's awards celebration which was held at the famous Hippodrome nightclub. The list of winning products, which reflect Europe's fascination with arcade and fantasy role-playing games, included:

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Psygnosis

Computer Game of the Year
Lemmings

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Shadow of the Beast II

Best Sound
Shadow of the Beast II

Best Action Game
Killing Game Show

Most Original Game
Lemmings

Best Animation
Dragon's Lair II: Time Warp

Best Adventure/Role-Playing Game
Secret of Monkey Island

Best Mind Game
Klax

Best Packaging
Ultima VI

Best Simulation
F-19 Stealth Fighter

Console Game of the Year
Tetris

Console of the Year
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 Macintosh Apple II Commodore 64/128 ¹ ² ³
⁴ ⁵ ⁶
- B. Do you use your computer mostly for playing games
 working in your home office working in office outside home school work
⁷ ⁸ ⁹ ¹⁰
- C. How many hours a week do you use your computer? 5 15 25 35+
¹¹ ¹² ¹³ ¹⁴
- D. Which word processor do you use? WordPerfect Microsoft Word
 PC Write Wordstar DisplayWrite Other
¹⁵ ¹⁶ ¹⁷ ¹⁸ ¹⁹ ²⁰
- E. Which spreadsheet do you use? Lotus 1-2-3 Excel Quattro Pro
²¹ ²² ²³
- F. Which online services do you use? CompuServe GEnie America Online
 Prodigy Q-Link
²⁴ ²⁵ ²⁶ ²⁷ ²⁸
- G. What other computer magazines do you read? PC/Computing Computer Gaming World
 Home Office Computing Computer Shopper PC Sources PC Magazine PC World
²⁹ ³⁰ ³¹ ³² ³³ ³⁴ ³⁵
- H. Do you influence the purchase of PCs where you work? Yes
³⁶
- I. What is your total household income? >\$30,000 >\$40,000 >\$50,000 >\$75,000
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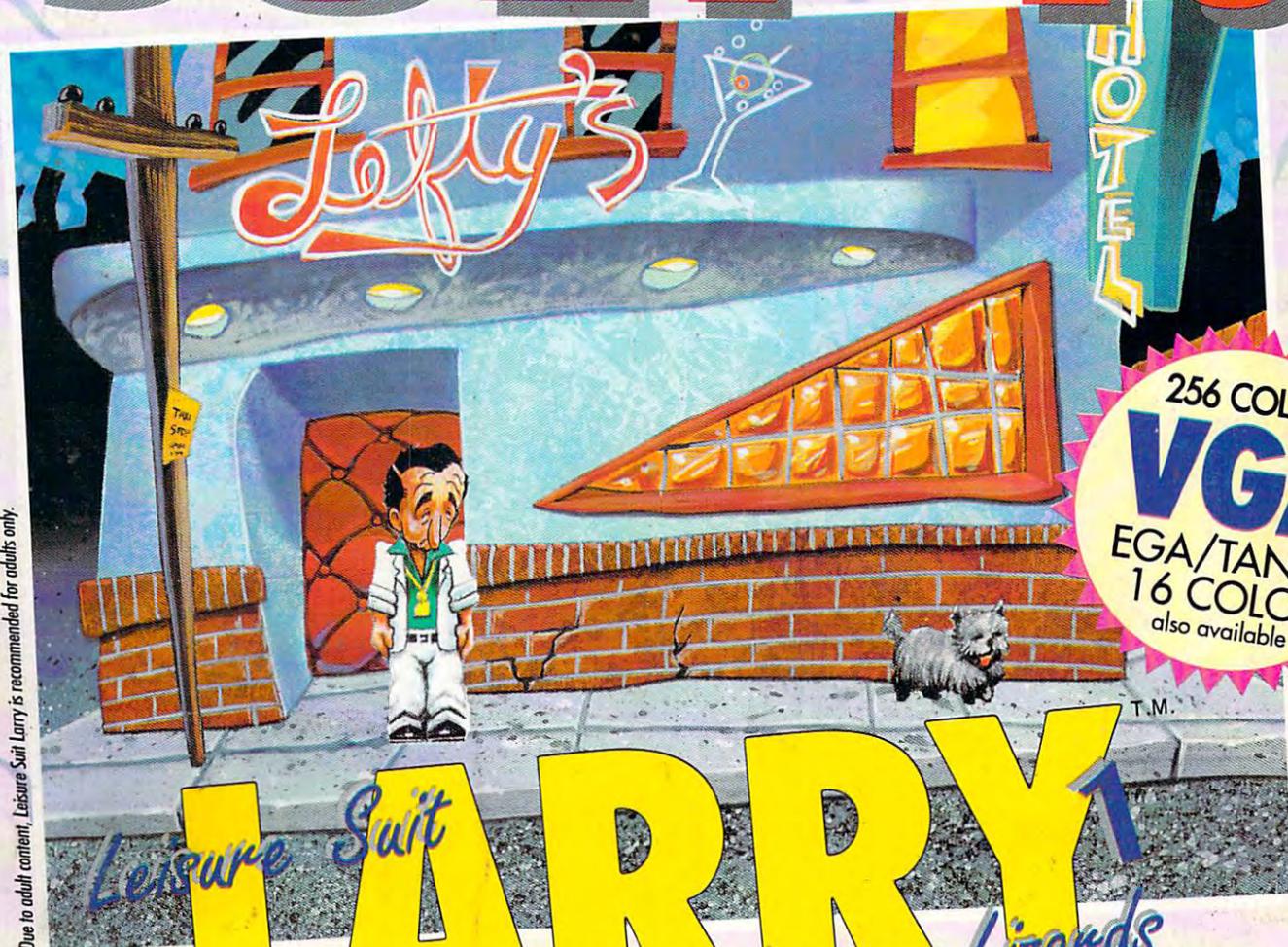
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