

# COMPUTE

AUGUST 1991



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URW Sans

Superb

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Software Publisher Excellence in Software  
• Critics Choice  
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• Best New Use of a

## Ensemble™ Redefines PC Performance

Until now, the only way to improve PC performance was to buy new hardware. Not any more. Introducing GeoWorks Ensemble,™ seven productivity applications integrated in an amazing graphical windowing environment called PC/GEOS.™ Software so incredibly small and fast, it will run rings around any other graphical environment. And all on the PC you already own.

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standard dot-matrix printer using GeoWrite™ and GeoDraw,™ two of the applications included in the Ensemble package. Ensemble combines outline fonts and device independent graphics to deliver true WYSIWYG (What You See Is What You Get) on-screen and on your printer.

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With Ensemble, text can be smoothly scaled from 4 pt. (1/6th inch) to 792 pt. (11 inch high characters). Additionally, text and graphics can be stretched to any size or rotated to any angle. And Ensemble is precisely tuned to the maximum printing resolution of over 350 printers, so chances are you'll be producing dazzling typeset-looking documents in minutes.

Better still, you can keep right on working while you print. Ensemble's multi-tasking system lets you start the



EASY "WHAT YOU SEE IS WHAT YOU GET" (WYSIWYG) ON-SCREEN AND ON PAPER WITH ANY PC, AND ANY PRINTER.

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puter



...A technically impressive product regardless of hardware platform. [GeoWorks] Ensemble provides snappy performance on any hard disk-equipped PC, even an 8088.

**PC Computing**

[GeoWorks] has produced a GUI capable of making the PC a more friendly and powerful creature to the millions of people Windows and OS/2 have left behind...

**FIRST LOOKS, PC Magazine**

[PC/GEOS] thrives in a 640K 286, and even performs respectably on an 8088. On a run-of-the-mill 386, [PC/GEOS] performs crisply in a way that Windows only dreams of...

**PC Magazine**

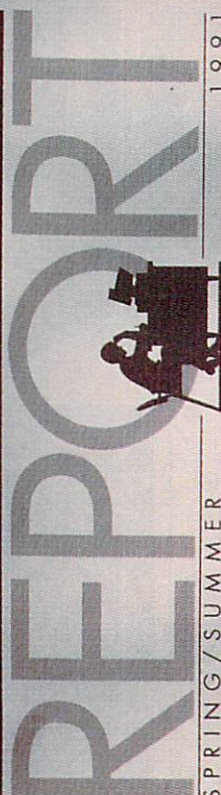
GeoWorks PC/GEOS: What Windows 3.0 Should Have Been.

**INFO WORLD**

The Geos environment sports a simplified (but sharper-looking) Windows-like interface with many of the same features, comes with Ensemble (a bigger and more capable suite of applications), and runs lickety-split on 80286s and XTs.

**PC WORLD**

The Small Office



1991  
SPRING/SUMMER

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# ce, Starting With The Way You Print.

next creation while the first smoothly prints in the background. Or you might check out one of the many other applications included in Ensemble, like GeoManager™ a graphical file manager, GeoDex™ an electronic address book, Geo-Planner™ a calendar/scheduler, America Online® an easy to use electronic mail and telecommunications service connecting you to thousands of PC users



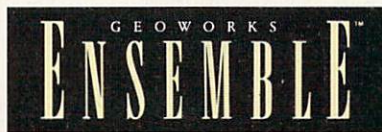
and a wide variety of information services; or the calculator, notepad, banner maker, and solitaire game, all included in the Ensemble package.

Hard to believe, right? State-of-the-art performance on your

existing PC? Maybe that's why Ensemble has won so many awards in its first few months. But don't take our word for it, check out what the industry experts

are saying (we printed a few quotes above). Or take us up on our Working Model offer, so you can be the judge.

GeoWorks Ensemble, because performance is defined as much by the software in the PC as the hardware it runs on.



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Circle Reader Service Number 185

# COMPUTE

AUGUST 1991

VOLUME 13 • NO. 8 • ISSUE 132

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PETER SCISCO

If you make your living out on the road, the current surfeit of small, light, powerful computer products offers a distinct advantage over the tools of five years ago.

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ALAN R. BECHTOLD

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Euro awards for topnotch computer products, and top MS-DOS games here in the States. Did your favorite program make the list? Turn to the back of the book to find out.

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RICHARD O. MANN

Just when you thought it was safe to use your computer, just when you were getting comfortable with its cantankerous ways, just when you felt like you knew your way around its drives, device drivers, and software, you're faced with a new challenge—taming a laptop.

### SharePak 26

RICHARD C. LEINECKER

This month's *SharePak* disk contains three powerful applications—a paint program, a math tutor for adventurous kids, and a way to track the earth and moon through their cycles. This is handpicked software from our staff.

### Power in Your Pocket 28

SCOTT LEIBS

The kind of power you need to manage your time and resources may be sitting in the palm of your hand. A recent explosion in hand-held electronic organizers now puts reams of data and powerful applications in your pocket.



## ON THE COVER

The art on this month's cover was created by Barbara Nessim using an Amiga 1000 computer and *DeluxePaint* software. As yet untitled, the work was an experiment born of the artist's interest in the integration of color and lines. Nessim's work has been shown in museums and galleries worldwide.

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## TEST LAB

### We Put Input Devices Through Their Paces in Our Lab This Month 33

In this issue's Test Lab we benchmark and review a wide range of input devices, from the traditional mouse to the newest in portable trackballs and pens. As human-computer interfaces advance, so do the tools we use to control them. Check out these devices for your home and for the road.

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TONY ROBERTS

There are millions of PCs out there for which *Windows 3.0* is not a practical option. But don't despair. You don't have to lose the interface war. With a little work, a little creativity, and a handful of utilities from this issue's *COMPUTE's PC Disk*, you can put some snap in your DOS interface and make your PC system easier for you and your whole family to use.

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TONY ROBERTS

Learning your way around your PC can be a daunting task, but if you take it one step at a time, you'll be up and running in no time.

### On Disk 73

TONY ROBERTS

This issue's MS-DOS disk is a grab bag of utilities that will help you with batch file programming, documentation printing, and disk maintenance.

### Hardware Clinic 75

MARK MINASI

You want to turn your 286 into a 386 screamer? If your machine uses a standard-size motherboard and you

# Think small.



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COM

# COMPUTE

can get your hands on some memory, you're on your way to real computing power.

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DENNY ATKIN

If you have trouble navigating the telecommunication waters, here are some helpful hints.

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DANIEL JANAL

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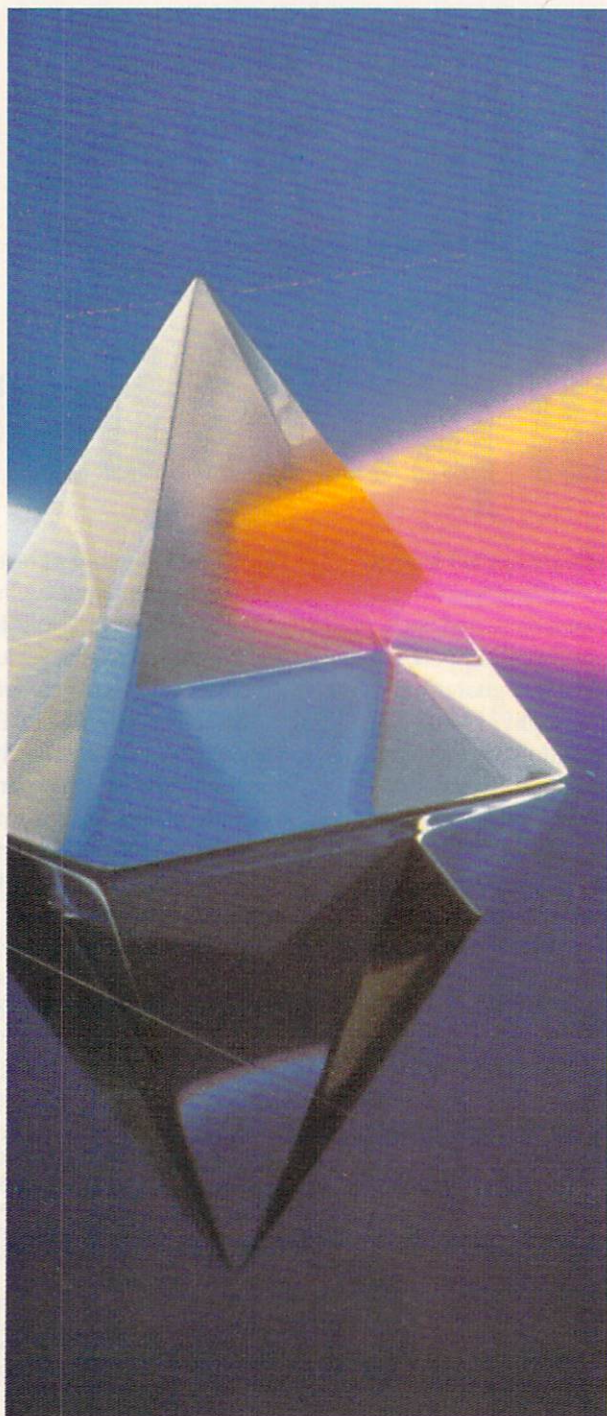
STEVEN ANZOVIN

Science teacher Vinnie Cusimano, a 25-year veteran of the New York City public school system, has a different idea of what high school science education should be. And PCs are a big part of it.

### Space Shuttle Technology 92

PHILIP CHIEN

The phrase *space shuttle computer system* probably brings visions of a high-tech, state-of-the-art computer command system to mind. Surprisingly, each of the shuttle's five on-board computers has the equivalent of only 400K—less than most micros! Here's a look on board America's flag-bearing voyager to space.



## ENTERTAINMENT

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ORSON SCOTT CARD

There's good software to be found on full-service information networks like Delphi, GEnie, and CompuServe. Best of all, some of it is free.

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GREGG KEIZER

Modern life's too much like the military: Hurry up and wait. But now you can carry big-time computer entertainment in your pocket.

## REVIEWS

Reviews and analysis of software, books, and accessory products in the areas of games, productivity, and learning. Complete with our experts' COMPUTE Choice recommendations.

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DAVID ENGLISH and PETER SCISCO

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*B.A.T.*, *PageMaker*, and *Dance of the Planets* get our nod as Choice products for entertainment, productivity, and learning, respectively. In other stories, we look at *McGee at the Fun Fair*, *My Paint*, *Where in the World Is Carmen Sandiego? Deluxe Edition*, *For the Record*, *Outside In*, Lester the Cordless Mouse, *Spell-a-Saurus*, *Mickey and Minnie's Fun Time Print Kit*, *Micro-League Baseball Field Guide and Disk*, *Type from the Desktop*, *Overlord*, *Berenstain Bears Junior Jigsaw*, *My-Invoices*, *SideTalk II*, *Typist*, *Wonderland*, *LHX Attack Chopper*, *Death Knights of Krynn*, and more.

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

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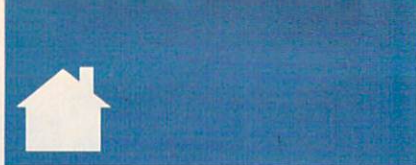
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P E T E R S C I S C O

If you make your living out on the road, the current surfeit of small, light, powerful computer products offers a distinct advantage over the tools of five years ago. Then, computers powerful enough to include hard disks and state-of-the-art displays were called *portables* without any sense of irony whatsoever.

The last five years have brought marked improvements to the world of portable computers. Each iteration makes use of new technologies and draws upon new engineering designs, both aesthetic and practical.

We have moved rapidly along the scale from transportables and lug-gables to notebooks and palmtops. In each case, our computing power has grown with steady insistence. This increase in power isn't merely an increase in the functionality of the computer's processor chip; it's also an increase in the computer's practical use.

When we take our computers with us, we have access to facts that serve to enlighten our choices. Those data range from workaday files to net-

work access to electronic mail—the possibilities are nearly endless.

Time is one of our most precious commodities—easily squandered, jealously guarded, bitterly regretted. Portable computers can help people make the most of their time, a fact not lost on a public that's snatching up these machines at a furious clip.

No longer does the office stop at the parking lot exit or at the end of the driveway. With the latest in portable computers, you can time-shift your daily workload to create quality time for your family.

If you're a gung-ho home-based entrepreneur looking for an edge, these small computers can make you competitive with the big boys down the freeway.

And what of the rest of the consumer public? What about those people who aren't involved on the executive level in business, who aren't running a business from their homes? What role will portables play in their lives?

The engineering feats that have brought computers down to the size of

paperback books ripple out over the technolandscape to influence the shape of life in the coming years. Electronic organizers, confined now to the executive market, will no doubt become commonplace among the rest of the public once they become easier to use and are less expensive.

In a classic repeat of the generational pattern, it is our children—with their enthusiastic adoption of handheld videogames—that indicate where we are going.

It's not too hard to imagine, given recent developments in various technological areas, living in an electronically linked world that is as routine as the world of television and telephones we live in today.

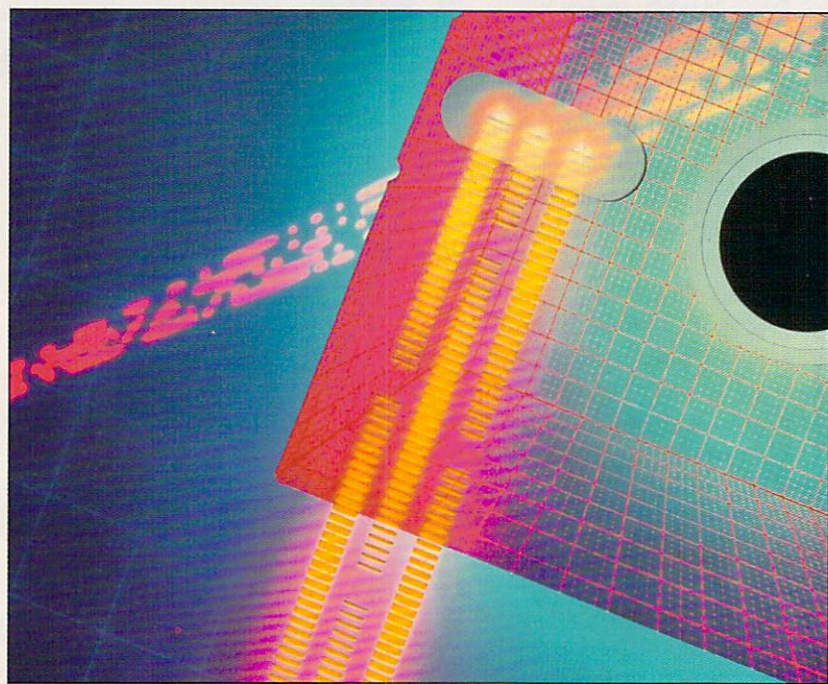
If Alexander Graham Bell envisioned such a world 150 years ago, it's hard to guess what shape it held in his mind and whether his vision resembled the communication networks we accept today. We have come to expect instant access—by airwaves, cables, and wires—to global and personal events.

Advances in user interfaces promise to make portable computers—in whatever shape—more palatable to the public at large and more effective in the hands of the technoworker.

Advances in cellular technology will make today's pocket pagers and mobile phones seem quaint compared with the portable info stations of tomorrow.

Flat panel displays and portable CD readers may finally usher in the age of the "docking station," as yet an ungainly collection of multiple peripherals.

Recently, during a late night spate of bleary-eyed video grazing, I came across a show that portrayed the future as a world where solitude had been traded for total access. That cheerless world view is but one description of how our tools can define our selves. Still, it poses a large question that rightfully accompanies all technological developments—no matter how small the package. □

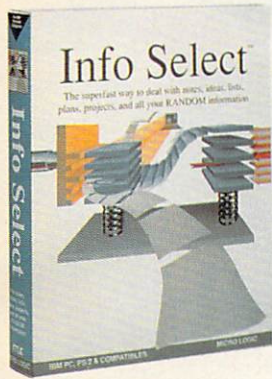




# How this \$149 software will:

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- 3) Help you make brilliant decisions ...

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## Photographic memory

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## Telephone notes

When Harry calls you on the phone, you'll display the six windows on Harry before he finishes his first sentence! No more embarrassing pauses or scrambling for information.



INFO SELECT is easy to use - yet powerful.

INFO SELECT also includes the world's first "3-D" word processor. You'll be amazed at how it works.

Instead of one window or

ten, imagine up to 64,000! The uses are endless.

## Are you forgetful?

Were you born with a memory situated squarely on the tip of your tongue? Do you forget things like which day you placed an order or important numbers? If you are forgetful you especially need INFO SELECT - the software that remembers almost everything for you.

## Thinking tool

Have you ever worked on a complex project and felt lost? With INFO SELECT you'll group, scan, and cross search through all your notes so fast you'll see the big picture in seconds.

Will I be better off doing this now or that later? Keeping priorities straight can make or break your career or your business. INFO SELECT lets you keep on top of what's hot.

Should you use an east or west coast supplier? To make decisions you need facts. Now you can view the facts any way you like ... as fast as you can think. You'll make the best decisions ever -- and fewer expensive mistakes.



Phone notes



Client info



Decisions



Management

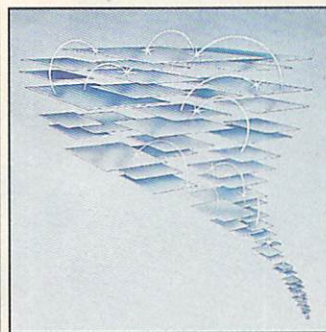
## The #1 PIM

What's all the fuss about PIMs (Personal Information Managers)?

Simple - you probably have more RANDOM information than any other type and you need a PIM to properly handle this kind of information. The right PIM will save you time and make everything you do go smoothly.

Why is Info Select the #1 PIM? Because Info Select is based on ideas you can identify with - like stacks of paper. And it's free-form too. You

won't waste days or weeks learning complex structures. Instead you'll be up and running in minutes. Info Select also does more and costs less than other PIMs.



Owners of our TORNADO software (symbolized by the famous "blue tornado") can trade up to the second-generation Info Select under our special offer. There are over 200 improvements.

## Feature packed

INFO SELECT is memory resident (if you choose), so you can quickly jump in from other programs. Info Select windows can hold: notes, plans, lists, facts, letters, contacts, and much more. You can search for a window or a group of windows related by a word or phrase. There are five ways to see overviews; hypertext, a fast sort, and line drawing. Save time with the dialer, date tickler; and searching by text or date ranges.



If you have notes, ideas, contacts or other unorganized RANDOM information, you need Info Select.

Info Select allows you to: add columns of numbers; store data in EMS; use template or free-form windows; import and export files, screens, and databases; move, join, and duplicate windows and much more.

## LAN option

The new LAN version allows integrated E-mail, sharing company rolodexes and distributing company policies. You can share any kind of information. It's your first step into the exciting new world of groupware! Ask about the five node LAN starter pack.

## Easy power

Info Select is easy to use yet offers the power you need with infobases up to 10 megabytes; text searches up to 700kb/sec; up to 32,000 characters per window; and up to 64,000 windows per infobase. Even better, Info Select can swap down to as little as 7K memory!

## TORNADO owners

INFO SELECT is based on the pioneering TORNADO™ software PC World called "Excellent, Excellent, Excellent, Excellent" and PC Magazine awarded Editor's Choice - twice. Call about our special trade-up offer.

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Steve Gibson, InfoWorld

## Endless uses

Info Select can do much more than manage all your RANDOM information. Use it to manage business correspondence, sales leads, orders, and client notes. Track facts, plan projects, or interrelate all your ideas. You can catalogue parts, documents, and inventory items. Match buyers and sellers or doctors and patients. Setup an information desk. Edit E-mail. Store notes on magazine articles, software operation techniques, or just names and addresses. Whether you are a lawyer tracking court cases or a zoologist collecting feeding habits you'll find countless uses for Info Select.



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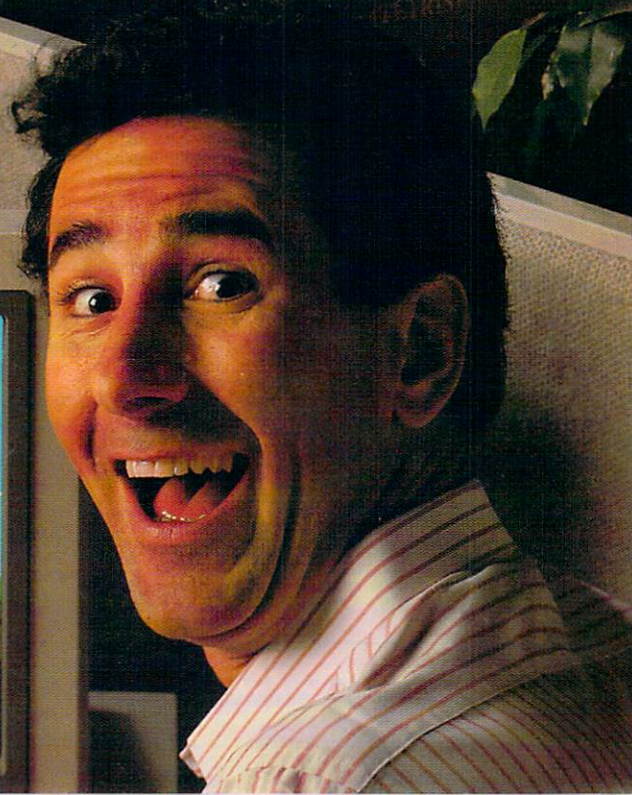
Patrick Marshall  
"As easy as remembering your own name."  
Patrick Marshall,  
Info World



Editor's Choice  
"First rate"  
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ТЕТРИС  
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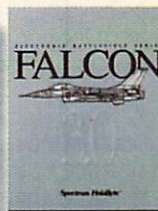
By using a network, a direct cable link or a modem, you can compete with people from across the office — or across the country. And you'll do battle in real time!

Imagine yourself in a supercharged 'Vette, racing down the streets of San Francisco against a real opponent! Or be a speed-burning Stunt Driver smashing your friends off the track. How about commanding an M-1 Tank and firing on someone... in New Jersey? Or climb into an F-16 cockpit and smoke your enemy in Falcon 3.0, the latest of the Falcon games — games so realistic they're used in actual flight training simulations.

So if you're up for fast-paced, action-packed competition you have only one choice: Spectrum HoloByte head-to-head games.



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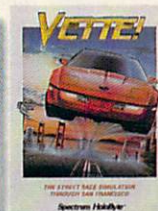
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Available at your local software retailer or, for Visa/MasterCard orders only, call:

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(1-800-695-4263/24hrs. a day/7 days a week)

For availability or customer support 415-522-1164.

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Circle Reader Service Number 118



# NEWS & NOTES

## Fewer IBM Workers

In light of its recent disclosure of significantly lower-than-expected 1991 earnings, IBM revealed plans to reduce its worldwide workforce this year by more than 14,000 employees. About 4000 jobs have been cut through the sale of the company's typewriter, computer keyboard, and low-end printers division. Attrition and voluntary incentive programs are expected to take care of the rest. IBM employs about 373,000 people worldwide, and these cuts are considered significant. Perhaps the new IBM laptop PC will help bring some of those workers back on the job.

## Smudged Windows?

U.S. district court judge Walker Vaughn ruled that Apple Computer's lawsuit against Microsoft and Hewlett-Packard, alleging infringement of its graphical user interface, has merit. The ruling states that Apple's claims to copyright on the Macintosh graphical interface are valid and clears the way for Apple to take its copyright infringement suit to trial.

Microsoft, meanwhile, says it's satisfied with Judge Vaughn's order because it affirms the analytical framework of the case as recommended by Microsoft. Even though the ruling supported some of Apple's claims, it effectively rejects Apple's claim that the "total concept and feel" of the Macintosh graphical user interface is protectable under copyright. It also defines 179 elements of the display that will not be considered in the infringement case, leaving only 10 elements of the original Macintosh that will be considered when the case comes to trial.

## Multiplying Mice . . .

Computer mice were aptly named for more than one reason. Not only do they resemble real mice, they *multiply* like real mice. Microsoft reports it's now sold more than 6 million computer mice worldwide. Sales more than doubled following the release of *Windows 3.0*. Of course, the graphical user interface almost demands the use of a mouse, so the little guys are now scurrying across the desks of computer users everywhere.

Microsoft's mouse is available with either a serial PS/2 interface, which attaches to a 9-pin serial, 25-pin serial, or 6-pin PS/2-style port, or a bus interface, with a variety of software options. It sells for a suggested retail price of \$125. A special bundle containing *Windows 3.0* lists for \$225.

## . . . And They're More Portable, Too!

Now that mice are running all over the place in the millions, Microsoft has created a new breed that's more portable. The new BallPoint mouse is designed especially for use with laptop and notebook PC-compatible computers. Actually, for this device the word *mouse* is a bit of a misnomer. It's really a miniature trackball device that clips onto the keyboards of most popular laptop and notebook computers.

More than 2½ years in the making, the new BallPoint mouse could be just the thing laptop and notebook PC power users have been looking for. It will make using *Windows* and other graphics-based applications and interfaces easier to run on small computers. A universal clamp fits on the keyboard, and a positioner allows you to adjust the angle of the mouse relative to the keyboard. The BallPoint can also be removed from the clamp and used as a desktop trackball or held in the hand for presentations.

The Microsoft BallPoint mouse works with MS-DOS, *Microsoft Windows*, and OS/2 on laptop, portable, and desktop computers. It requires DOS 2.0 or higher with one double-sided 3½-inch drive and 20K available RAM. Alternatively, it will work with OS/2 version 1.1 or version 1.2, one double-sided 3½-inch drive, and a 9-pin serial port or PS/2 mouse port. Suggested retail price is \$175.

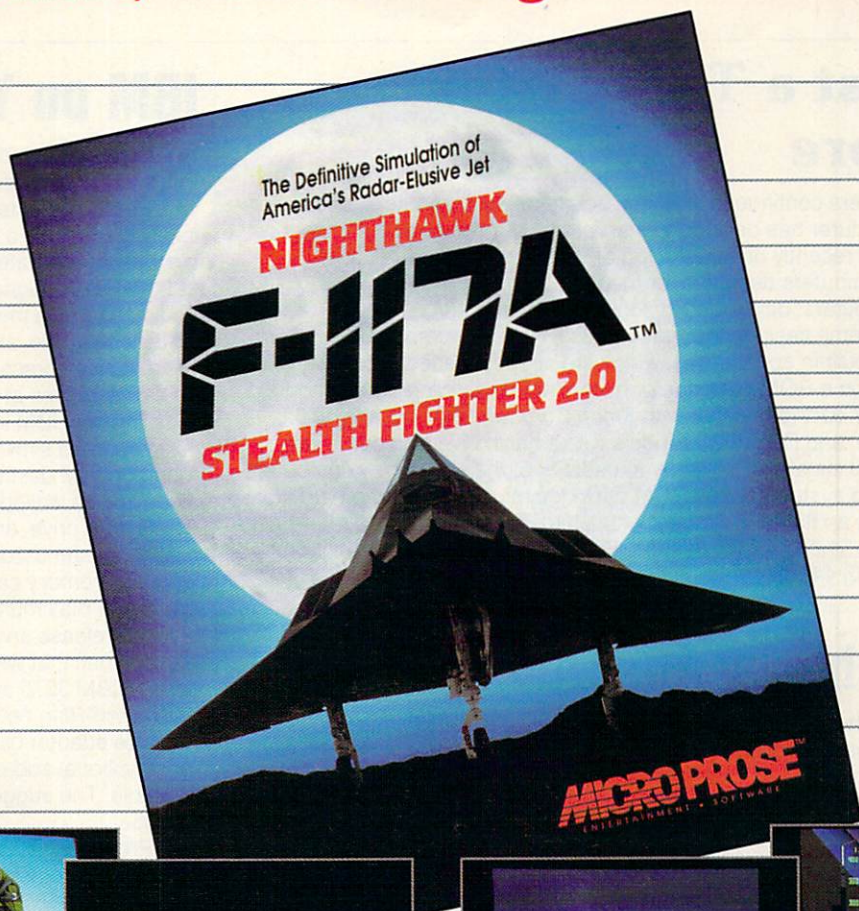
## Tandy's Home Organizer Goes It Alone

Tandy's popular *DeskMate Home Organizer* companion, originally sold only with the Tandy 1000 RL home computer, is busting out on its own. Flooded with requests to sell the collection of home management software programs as a separate product, Radio Shack decided to go for it.

*DeskMate Home Organizer* consists of 15 easy-to-use home management applications, including financial, personal, kitchen, and math programs, and an Information Center program. The package runs on any Tandy, IBM, or compatible computer and retails for \$99.95 at Radio Shack Computer Centers, Radio Shack technology stores, and dealers nationwide.

# Air Superiority...

**“Mr. President, We Have A Target-Rich Environment.”**



IBM-PC screens shown.



Fly the plane that baffled Baghdad radar systems and air defenses during the Persian Gulf War, the plane specifically designed for dangerous solo missions behind enemy lines.

*F-117A Nighthawk Stealth Fighter 2.0* is a dramatic advancement of *F-19 Stealth Fighter*, MicroProse's critically acclaimed simulation of the radar-elusive jet, named Best Simulation of the Year in 1989. With **more worlds, more action, better and bolder graphics** and MicroProse's legendary dedication to authenticity and excitement, *F-117A* represents a new breed of combat flight simulator.

For IBM-PC/Tandy/compatibles. For the latest information on release dates and availabilities, call MicroProse Customer Service at 301-771-1151, 9 am to 5 pm EST, weekdays. © 1991 MicroProse Software, Inc., 180 Lakefront Drive, Hunt Valley, MD 21030.

- Dramatic sprite explosions and smoke.
- New, more accurate cockpit and in-plane graphics.
- Graduated horizons, landscapes, and seascapes in VGA.
- Spectacular night graphics with special night HUD features.
- Authentic graphic representation of the F-117A, in 3-D with more polygons and detail.
- Improved mission generation with brand new challenges and scenarios.
- Nine worlds in which to fly, including Cuba, North Korea, the Kuwaiti Theatre of Operations, Central Europe, Vietnam and the Middle East.
- Improved, more challenging enemy Artificial Intelligence.
- Totally updated sound package including original new music and digitized speech.

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Circle Reader Service Number 108



# NEWS & NOTES

## Not Just a Typewriter Anymore

As electric typewriters continue to look and act more like computers, one major typewriter manufacturer has decided to start producing personal computers. Smith Corona Acer recently unveiled a line of seven "simply smart" IBM PC-compatible computers designed for the home market.

The new computers, developed in conjunction with the Acer Group, are "plug and go" systems designed for ease of use. A menu screen guides users through the many built-in applications, which are already loaded, along with the operating system, on a ROM cartridge or hard drive, depending on the model. Models with a ROM cartridge come with *Smith Corona Word Processing 6.0*, *Desktop Reference*, and DOS 4.01. Models with a hard drive also come with *Microsoft Works 2.0* installed and ready to use. Six of the seven new computers will be 80286-based systems (three ROM cartridge models and three hard drive models), and one is an 80386 SX model with a hard drive. Suggested retail prices range from \$999 to \$1,899 for the system. For more information, contact Smith Corona Acer at (800) 443-5748.

## A Microchip by Any Other Name

Intel lost a recent attempt to prevent other companies from using the number 386 to signify 386-based computers if they use 386 microprocessors not manufactured by Intel. The ruling by U.S. district court judge Walter Ingram stated that 386 is a term as generic in the computer industry as *automatic transmission* is in the automobile industry. Judge Ingram pointed out that Intel waited too long before attempting to claim the copyright—more than 2½ years after it began selling the product.

Now to differentiate its 386 chips from those of other manufacturers, Intel says it will refer to them as the *i386* or *Intel386 chips*. It's fair to say that a claim for patent and copyright on this designation is probably already in the works.

## RoboLaptops

Police in Fremont, California, and other cities are now going high-tech with a combination of laptop computers and mobile packet radio modems. In Fremont, GRiDcase 1530 laptops are mounted near the dash in patrol cars next to the manual radio, not far from the upright shotgun visible in the front seat. Radio modems from Dataradio allow police officers to transmit and receive data on the computer via radio signals. Fremont police official David Jensen explained that a license plate number, for example, can be typed into the laptop computer and then transmitted to the department's main computer for an almost instant check of police and FBI files.

"After the officer requests a report on a driver or vehicle, a report flashes back on whether the car is possibly stolen or the driver has outstanding warrants or is wanted for some misdemeanor or felony crime," Jensen said. "We get much faster response than talking on the radio because officers don't have to wait for busy dispatchers to take down information and have someone feed it into a computer."

The laptop is based on an 80386 processor and also can be used to write crime and accident reports right in the car. It enables officers and dispatchers to communicate securely between police cars and headquarters without having conversations monitored by individuals with scanners. It also allows officers to quickly access information such as directions to addresses. Someday, police officials say, graphics, mug shots, and even fingerprints will be sent over the in-car computers. Modems attached to scanners can't be far behind.

## IBM on Your Lap

IBM finally released its first real laptop PC, and the wait was worthwhile. The new Personal System/2 L40 SX is definitely loaded. It's a lightweight, durable, battery-operated 386SX that runs at 20 MHz. It weighs just 7.7 pounds and measures a mere 2.1 inches high, 12.8 inches wide, and 10.7 inches deep. It also comes with a leather slip-on carrying case at no extra cost.

The new IBM laptop has a full-size keyboard similar to the ones found on IBM desktop computers. It also packs a walloping 2MB of RAM, a 60MB hard drive, and a ten-inch VGA display as standard equipment. The laptop's memory can also be expanded up to a maximum of 18MB. IBM plans to release an AC-powered expansion unit that will provide connections to IBM 3270 and 5250 systems, and Token-Ring networks using AT half-size adapter cards. An array of other optional add-ons will also be available. The suggested retail price is \$5,995.

Prospective buyers can call (800) IBM-2468 to locate the nearest dealer.

## Toward a Better Understanding

If you've worn out your printed version of the *WordPerfect 5.1* manual or just hate to thumb through printed pages to find what you need to know, Larson-Davis has a possible solution for you. The company has just introduced an electronic text version of the *WordPerfect 5.1* manual. Dubbed *InfoQue*, the new electronic version is compatible with networks, *WordPerfect* shells, and mice, and it allows you to search by word or phrase. Full-text pages are displayed. You can also page back and forth from any point of reference within the manual. The company is selling the electronic manual for an introductory price of \$25 and plans to bring more manuals for other popular software to market soon. For more information, contact Larson-Davis Information Systems at 1681 West 820 North, Provo, Utah 84601; (801) 375-8855.

## Big Deal!

Imagine a VGA display of a beautiful rose. Imagine having the ability to instantly double the size of the display with virtually no erosion of its composition. According to Bill Salyers, director of programs at the National Easter Seals Society in Chicago, that's just what *MAGic*, a new memory-resident screen-magnification utility from Microsystems Software does.

The program magnifies a VGA screen by two times width and two times height in both text and graphics applications—even while running *Windows 3.0*. *MAGic* can be helpful for the visually impaired and for anyone who squints at tiny characters on laptop screens. It also helps when reading those pesky word processor page previews. "This is one product that must be seen to be truly appreciated," Salyers said.

*MAGic*, which retails for \$79, also provides complete type-through access and follow-the-cursor, follow-the-mouse, and attribute-tracking modes all in less than 8K of RAM. *MAGic Deluxe*, which retails for \$195, offers even more magnification capabilities and includes a bookmarking function that allows you to mark up to ten different areas of your screen and a magnification locator display that shows you which area of your screen is currently being magnified.

For more information contact Microsystems Software, 600 Worcester Road, Framingham, Massachusetts 01701; (508) 626-8511.

## Super Debut

Nintendo's 16-bit Super NES game machine made its debut at the summer CES in Chicago this June. Sales are expected to exceed 2 million units by year's end once Super NES, packaged with *Super Mario World*, is released in September. A software library of 10 to 12 games will be available as well and will expand to include more than 60 titles by 1992. Super NES will have enhanced graphics, multiple scrolling screens, digital stereo sound, 3-D capabilities, and better, faster gameplay to set it apart from Nintendo's current 8-bit machine.

## Growing Support

The current market acceptance of *Windows* has helped not only mouse sales but software sales as well. Sales of software applications for *Windows 3.0* have skyrocketed in the past year. Both market analysts and independent software vendors have documented major increases in sales of *Windows*-based applications, and continuing gains are predicted as developers create new programs for the fast-growing *Windows* market.

According to Ken Wasch, director of the Software Publishers Association, the *Windows* applications market is currently the fastest growing segment of the software market. Independent market research from International Data Corporation (IDC) projects the number of copies of *Windows*-based applications shipped in 1991 will reach 3.8 million units—a 150-percent increase over the 1.5 million units shipped in 1990. More than 700 software developers are writing new *Windows*-based applications at a fast clip, evidenced by the 48,000 copies of the *Microsoft Windows Software Development Kit* version 3.0 sold worldwide in the past nine months.

## A Sound Investment

With the new SoundByte audio recording and playback unit hooked up to your PC, your CD player won't be the only thing in your house playing rich digital music. From Meridian Data, SoundByte can take audio input from any standard high-fidelity equipment, compress files in realtime, and store them on the computer's hard drive or on a network server. Playback can be from a floppy disk, a hard disk, a CD-ROM disc, or a network. SoundByte also supports MIDI-driven synthesizer functions.

The small, inexpensive processor plugs right into the computer's parallel port and can be used to attach very high-quality sound files to different applications like educational programs, multimedia programs, business applications, and games. Based on a single-chip, digital-signal processing (DSP) design, SoundByte's open architecture provides developers with an affordable, fully programmable audio technology for applications development.

SoundByte is fully compatible with MS-DOS and *Windows* platforms, supports the *Windows Multimedia* extensions protocol, and is priced at \$249.95. For more information, contact Meridian Data at 5615 Scotts Valley Drive, Scotts Valley, California 95066; (408) 438-3100.

## A Thousand Ways to Find Software

Looking for some good software? How about a detailed index of more than 19,000 packages to help you with your research? The *Datapro Software Finder* is a new CD-ROM-based service program that provides a comprehensive reference guide to business and professional programs for micro-, mini-, and mainframe computers by allowing instant access to information on more than 19,000 applications programs. More than 130 types of software products are covered. Based on the *Datapro Directory of Software* and the *Datapro Directory of Microcomputer Software* print services, it provides the equivalent of 4500 pages of information on a single CD-ROM disc.

An annual subscription to *Datapro's Software Finder* (Complete Edition) with quarterly releases is available for \$1,770. Individual micro and midrange/mainframe edition subscriptions are \$995 each. For more information, contact Datapro at 600 Delran Parkway, Delran, New Jersey 08075; (800) 328-2776.

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



# FEEDBACK

## QUESTIONS FROM OUR READERS

### Two Err Is Human

On page 20 of your April issue, you listed our number incorrectly. It's (714) 994-7400.

DARIANA TECHNOLOGY GROUP  
BUENA PARK, CA

On page 97 of your April issue, an incorrect number is listed for our company. Customers should call (800) 334-6572 for sales and (302) 368-9990 for inquiries. Thanks for setting the record straight.

MICROLEAGUE SPORTS  
NEWARK, DE

### TeleVGA

I'm searching for a way to play a computer game on my VGA monitor and have output go to a standard TV at the same time. My family and I are avid game players and miss the days when we could sit around the TV set and watch each other play. When we upgraded to a 386SX with VGA, the family could no longer participate in the solving of mystery and role-playing computer games.

ROBERT E. PITCOCK  
FLORENCE, AL

*What you need is VGA-TV from Willow Peripherals. It's a VGA card with an output for a VGA monitor and an output for NTSC video (also known as composite color). The NTSC connector can be attached to any television with a monitor jack.*

*If you have an older television that has only antenna connections, you'll also need an RF modulator, which can be purchased from Radio Shack for around \$30. A 512K version of VGA-TV costs \$599. It provides a maximum resolution of 800 × 600 with 256 colors.*

*The 256K version costs \$499. With this unit, you can get a maximum resolution of 640 × 480 with 16 colors. The card is shipped with drivers for WordPerfect, Lotus 1-2-3, Windows 3.0, AutoCAD, and Ventura Publisher.*

*Willow also offers a product known as VGA-TV GE/O (GE/O*

*stands for GENlock Overlay). This unit allows the VGA signal to be mixed with a normal television signal to create effects such as titling for videotapes. It costs \$895. You can write Willow Peripherals at 190 Willow Avenue, Bronx, New York 10454, or call (800) 444-1585.*

### Battery Drain

How do I determine when the internal battery in my AT needs to be replaced, and what problems will occur if it goes dead before I'm able to replace it?

H.W. CHRISTOPHER  
FLORISSANT, MO

*The internal battery used in AT-class computers supplies power to the CMOS RAM which retains the date, time, and configuration information about the system. (In XT-class computers, dip switches on the motherboard are used to store system configuration information.)*

*An inconsistent clock can signal a weakening battery. If you notice the clock losing a few hours a night, your battery needs replacing. If the battery is allowed to fail completely, you'll see a message on boot-up indicating that there's been a CMOS RAM failure. You'll be directed to run SETUP.*

*At this point, you must reformat the system about the memory, monitor, and disk drives that are being used. After that, you'll be able to compute normally until you turn the system off and the CMOS RAM loses its memory again.*

*The largest hurdle in this process is knowing the type number of the hard disk in your system. The type number is a code that tells the controller how many heads, platters, and cylinders your hard drive has, and without the correct code, you can't access the hard disk.*

*To avoid this problem and the fear that all your data is lost forever, run your system's SETUP program today and make note of the type number for your hard disk. Write this number on a disk label and stick it to the back*

*or bottom of your machine. When your battery does give out, you'll have the information you need to quickly get back to work.*

### MIDI Interference

I read the article in the Reviews section of the February 1991 issue of *COMPUTE* on *Basic Composer 4.3*, only to find a glitch. I'm interested in purchasing the program, but Mr. Latiemer failed to list the MIDI-compatible devices it supports. He said that it's "a powerful . . . alternative to costly and confusing MIDI-based . . . processors" and that it's unfortunate to hear only "one note at a time" because of hardware limitations. What's the hardware he's referring to?

WILLIAM YODLOWSKY  
LINDEN, NJ

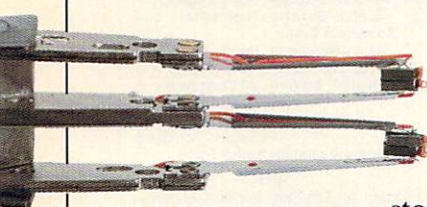
*Version 5.0 of Basic Composer (which is expected in the late spring or summer) will support the Sound Blaster and the Ad Lib music synthesizer cards, providing polyphonic playback with orchestral instrument timbres. However, version 4.3, the reviewed version, doesn't support MIDI input or sound cards; it plays back solely through the monophonic PC internal speaker. That's why it can play only one note at a time.*

*A spokesman for Education Software Consultants, the publisher of Basic Composer, says the company has aimed its product at individuals who want a powerful music editor but aren't interested in making a large investment in music software and hardware. Because of this, the company made the decision not to support MIDI input.*

*The spokesman warns that if you're interested in purchasing MIDI software, you should avoid the low-end music notation and printing programs (meaning anything less than \$300). Education Software Consultants recommends Music Printer Plus, Score, Personal Composer, or Theme. The spokesman also says that Basic Composer has features that aren't found in these expensive programs.*



# Hard Disks Die.



Hard disk manufacturers want us to believe that hard disk technology is absolutely reliable ... but experience teaches otherwise. We depend upon data storage to be flawless, but hard disk technology isn't. Surface defects, head alignment drift, and low-level format aging cause hard disks to fail.

A hard disk drive's low-level format fades with use. The drive's read/write heads lose their delicate alignment and move away from the original low-level format information. These new data track locations intersect unseen surface defects that were once harmlessly located between tracks. DOS's chilling "Abort, Retry, or Fail?" message inevitably results. Precious data is soon lost.

If left unchecked, data storage becomes more an act of hope and faith than one of science.

**A return to science.** The problem is known and understood, and the solution is clear. While a drive's data can still be read, the drive must be given a new, realigned and strong low-level format. Then all current surface defects must be located and managed.

This process prevents hard disk data loss.



**An act of prevention.** Gibson Research Corporation's SpinRite™ software program reads hard-to-read and impossible-to-read data from a DOS hard disk, nondestructively low-level reformats the drive's surface while optimizing the sector interleave factor, analyzes and scrubs each track of the drive for surface defects, and relocates any endangered data to safety. SpinRite easily restores hard disk drives to better-than-new condition with their data intact. Before any data is lost, SpinRite detects that a drive is "softening"

then determines and eliminates the cause. SpinRite readily recovers data that the system cannot read.

SpinRite won Byte Magazine's prestigious Award of Distinction and

continues to win computer industry praise and acclaim. It has proven itself to be effective in preventing hard disk failure. SpinRite will work for you.

SpinRite II features a detailed technical log, as well as support for DOS 4 and large device driver partitions. It is available immediately from local software retailers or directly from Gibson Research with a 30-day satisfaction guarantee.

Suggested retail price: \$89.

To receive additional literature or to purchase SpinRite II, call toll-free:



**SpinRite II.**  
A return to science.  
An act of prevention.

(800) 736-0637.



# FEEDBACK

## A Fate Worse than DeskMate

I bought a Tandy 1000, complete with DeskMate. When I turn on the computer, I go directly into the DeskMate menu, which speaks to me in plain English. Computer books and COMPUTE magazine seem to be totally involved in the peculiar foreign language of DOS. Am I missing out on something important? Should I be trying to learn a foreign language (DOS) or just relax and concentrate on trying to master the many facets of DeskMate?

ALBERT E. NELSON  
SECHELT, BC, CANADA

DeskMate may be all you need. It certainly provides a complete array of useful built-in programs. Other programs, such as First Publisher, Quick-En, and Lotus Spreadsheet for DeskMate, make it even more versatile. DeskMate may look like a completely different language from DOS, but it uses DOS to perform its functions.

You may eventually want to move out of DeskMate and see what else your computer offers. There are some books available on DeskMate, including The First Book of DeskMate by Jack Nimersheim (Howard W. Sams) and Getting the Most Out of DeskMate 3 by Michael A. Banks (Brady Books), which will be sold in Radio Shack stores.

## CAD Quest

I want to know if there are any CAD (Computer-Aided Design) magazines. I've been looking for a computer-aided design magazine for 1 1/2 years.

ROYLANCE C. WIESSNER  
BLOOMINGDALE, MI

CAD is only half of a complex of hardware and software whose end product is formed metal, the result of computer-aided manufacturing. Most publications in the area of CAD actually deal with the engineering and metal-working end of the process rather than the design process. You might be interested in CADence (P.O. Box 23350, Austin, Texas 78702-3550; 512-250-1700) or CADalyst (1727 West Broadway, 4th Floor, Vancouver, British Columbia, Canada V6J4W6; 604-737-1088). Both specialize in AutoCAD.

CAD/CAM East (P.O. Box 4803, Troy, Michigan 48099-4803; 313-552-

8583) is a magazine that covers CAD software used for metal working. CAD/CAM Publishing publishes the Computer-Aided Design Report, a monthly 16-page newsletter, as well as books on CAD, CAM, and CAE (computer-aided engineering) with an emphasis on engineering. You can reach CAD/CAM at 841 Turquoise, Suite D, San Diego, California 92109; (619) 488-0533.

Finally, CAD/CAM Systems (395 Matheson Boulevard East, Mississauga, Ontario, Canada L4Z2H2; 416-890-1846) is a bimonthly written for mechanical engineers who use CAD software.

It covers both metal-working hardware and CAD software. COMPUTE magazine is taking a strong interest in computer-aided design and will cover graphics and design software in features and reviews. Autodesk, publisher of AutoCAD, was the source of this information.

## It's the Law

In the March "News & Notes" column, Alan Bechtold mentioned that software rentals are now illegal. Could you give me the bill number of that legislation? In the same column, he talked about a software buyer's guide and merchandising service called InfoMaster. How can I find out more about it?

JEAN YEN  
ADDRESS UNKNOWN

The Software Rental Amendments Act of 1989 is part of public law PL650, which took effect December 1, 1990. This law prohibits "the rental, leasing, or lending of commercial software without the express permission of the copyright holder."

InfoMaster is a product of Sellectek, 2452 Watson Court, Palo Alto, California 94303; (415) 859-1100.

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

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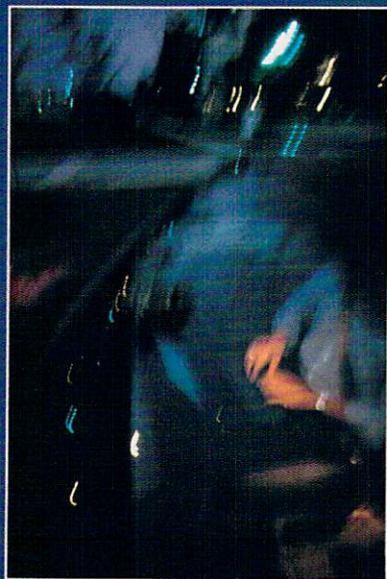
Sure, it's still DOS (although it may have special quirks), and sure, it runs standard software. But it has unique demands that come with its small size, its odd little flat monochrome screen, and its smaller-than-you're-used-to hard disk. And the need to carry it with you as you travel and to somehow lug all its essential and near-essential paraphernalia complicates things further.

No doubt about it: When you move to a laptop, you're entering brand new territory. But never fear. We'll help you learn the important things you'll need to know. Travel like a veteran, from your very first computerized trip.

#### **Preparing for the Trip**

Plan the computer side of your trip by customizing a packing list. I've made a fairly extensive one; create your own by picking the elements you'll need and adding the few special things your sys-

# THE MOVEABLE BEAST



**IS IT TIME  
TO GET YOUR ACT  
TOGETHER  
AND TAKE IT ON  
THE ROAD?**

**BY RICHARD O. MANN**





MARK WAGONER © 1991

tem needs. Prepare your list on the computer and save the file. Voilà! You'll have an instant packing list for your next trip.

Be sure to take everything you'll need, but don't take one ounce more. Balance your potential requirements against the cost of not having each item. This packing list contains just about everything you could conceivably need, but if you take all of it, your suitcase may not have room for your second change of underwear.

### Setting Up the Computer

Surging laptop sales have brought a wealth of new products designed to overcome the inherent limitations of laptop computers. You'll want to consider them as you ready your computer for the road.

Setting up the computer will be a big job the first time; after that, it can become fairly routine. Using these laptop-specific products can ease the pains associated with portable computing.

**Screen enhancers.** Laptops have less-than-ideal screens. Your friends may start calling you "Squint Eastwood" behind your back. Fortunately, the screens can be improved by several ingenious but simple programs. You've probably noticed that it can be quite difficult to find the cursor at times, especially with word-processing programs. The blinking underline gets lost in a sea of low-contrast monochrome text.

The solution is SkiSoft's *No-Squint II*, which turns the cursor into a large blinking block. You set the blink rate on a scale from 1 (no blink) to 9 (very fast). The program is absolute simplicity itself, yet it makes a major-league difference in your ability to enjoy your laptop. (Laptop makers are beginning to catch on to this problem. The Texas Instruments TravelMate 2000 notebook computer I'm using to test products for this article comes with a similar cursor-fixing program built in.)

If your laptop has an EGA or VGA screen, there's even more help available. Personics' *Laptop Ultra-Vision* gives you not only a block cursor but a choice of beautiful, slightly larger, and more openly spaced screen text fonts. You also select reverse video or smaller type, as small as 60 lines per screen (normal is 25 lines per screen). Once you've seen these elegant typefaces on your laptop, you'll never want to go back.

**Disk compression software.** Because working with a laptop means that you're probably working with a rather small hard disk, getting the most out of that storage space should be high on your list of priorities. Start

by going through the disk with a sleek file manager such as *QDOS II* to remove any extraneous files. EDLIN (the clunky text editor that comes with DOS) and some word processors leave behind unwanted backup files with a BAK extension, for instance. You can usually delete them without harm. Remove the data files for completed projects and, if space is still tight, consider removing software you know you won't need on the trip.

There are some ingenious software packages that utilize hard disk space more efficiently than DOS. The simplest but least convenient is *PKZIP*, a shareware file compressor. You can't run files that have been zipped (compressed) without unzipping them to full size, but you can save a lot of disk space by storing inactive files in zipped format. You can also get a lot more onto a disk if you zip the files first. You can always save time and money by zipping files before transmitting them by modem. Just be sure the recipient has *PKUNZIP* to unzip the files.

An excellent new program, *Stacker*, can almost double your disk capacity. Using realtime lossless compression technology, *Stacker's* software compresses and decompresses your data on the fly. Once it's installed—an easy process—your hard disk is suddenly up to twice as big (because some files compress more than others, the exact amount of extra capacity depends on the nature of your data). On my TI TravelMate 2000 test unit, *Stacker* converted its 20MB hard disk with about 1MB available to a 40MB drive with 21MB available. I immediately loaded three large games that wouldn't have fit before and added *GeoWorks Ensemble*, and I still had almost 13MB open. It also worked beautifully with a half-dozen TSR programs, some odd device drivers, and a disk-locking program.

**File transfer programs.** Buy a good file transfer program that comes with a special cable to connect your laptop with any other computer and lets you copy files back and forth. Traveling Software's LapLink III and Rupp's *FastLynx* are two of the best. Install the program on the laptop and bring along a disk with the software for installing on potential host computers. (Bring it on a 5/4-inch disk, too, so you can rely on getting it onto any computer.)

You can usually install these programs on remote computers just by connecting the cable, but don't count on this working every time. Test the software by hooking up to another computer; be sure you know how it's done before you hit the road.

The TI TravelMate 2000 comes

### Packing List

Here's a sample packing list that helps me maintain my sanity on business trips. Add to it or take away from it as your needs dictate.

- Computer
- Power cord
- External units: disk drives, batteries, power cord, port adapters
- Computer manual
- Printer cord
- LapLink cord
- Mouse/mouse substitute and adapters
- Mouse pad
- Surge protector
- Extension cord
- Road Warrior Toolkit or equivalent:
  - Screwdrivers
  - Multiple RJ-11 adapter
  - Phone cord
  - Pliers
  - Alligator clips
- Modem or fax/modem
- Extra batteries
- Software manuals, templates, quick reference cards
- Software books
- Laptop book
- Extra disks and sturdy disk carrier
- Disk labels and a felt-tip pen
- Portable printer
- Paper
- Copy-protection documentation for games
- Voltage converter for foreign travel
- Three-prong grounded outlet adapter
- DOS disk
- Auto power adapter
- List of phone numbers of online services in destination cities
- List of software and hardware customer support phone numbers
- Small but strong light source
- Aspirin or Tylenol
- Alka-Seltzer

with a special version of LapLink in firmware and a transfer cable. I had to load my standard LapLink III, however, because I couldn't stand the limited set of LapLink features available in the firmware version.

**Security.** Laptops are the new darling of sneak thieves. Where else can you get \$5,000 worth of readily marketable electronics so easily? You'd have to steal 20-30 VCRs to make that kind of haul. People carry laptops around like purses, set them on chairs in airport concourses, and leave them on the floor while they make phone calls. They're easy pickings.

Eternal vigilance is the best defense, but software aids are available as well. They won't deter a thief, but they will frustrate him and foil any attempt to steal your data. Rupp's *Fast-Lock* locks your hard disk so that the computer simply will not run without the password you have assigned. You

can boot it with a DOS disk, but you still can't access the hard disk without the password. Give it three bad passwords consecutively, and it sings out like an air-raid siren—or as much like an air-raid siren as a laptop speaker can sound.

You can also protect your data using the file-encryption feature of *PC Tools* and other programs or by using file passwords offered by many application software packages.

Tape your business card to the bottom of the computer. You never know when this may help. You can also offer a reward for the return of the unit on your business card and put such a message in your AUTOEXEC .BAT file, so that it will be on the screen every time the computer is booted.

#### **Battery-monitoring programs.**

Traveling Software's *Battery Watch* is designed to precisely determine the amount of battery capacity remaining. It also offers a deep discharge feature that beats the battery's shadow memory problem. Nickel-cadmium (ni-cad) batteries have a tendency to remember the point at which they were recharged and assume that this point is total discharge, even when there is plenty of capacity left. (A recent research report from a Florida battery maker concluded that the shadow memory problem is a myth and that deteriorating behavior of ni-cad batteries simply results from their slowly wearing out. The jury is still out on this controversial matter.)

**RAM disk.** A RAM disk is a simulated disk created in the computer's working RAM. Because it isn't a disk at all, but rather high-speed memory, it is many times faster than reading and writing to disks. There is a significant downside to using a RAM disk, however; if you lose power, you've lost what was on the RAM disk.

An important benefit of a RAM disk is that it doesn't drain the battery the way a real disk drive does.

#### **Peripherals**

Now that the computer is set up with all that special software, it's time to consider what additional equipment you may want to bring along.

**Mice or mouse substitutes.** There are some great new pointing devices designed for laptop users from Ap-point, Suncom, Microsoft, and Logitech (see the product list).

**Modems and fax modems.** Being on the road usually brings out a need to communicate by telephone with other computers. You will need to have a modem for that. You could even buy a fax modem, which adds the ability to send and receive faxes directly from the computer.

You can buy your laptop with an internal modem, or you can buy an external portable unit such as the Worldport 2496 Fax Modem from Touchbase Systems. Portable units add to the clutter of things to take, but they also work with any computer (not just laptops). One portable modem is all you need for any computer you may be using.

The Worldport 2496 is about the size of a deck of cards. It houses a 2400-baud modem for use with online services or computer-to-computer communications. It also includes a 9600-baud fax machine that sends images of computer files to any fax machine anywhere. It can also receive faxes, converting them to computer files that you can then read or print.

**Batteries and extra batteries.** Depending on how much time you plan to put in with your machine away from AC power, you may need extra batteries. If you need extras and haven't yet bought a laptop, investigate the prices of extra batteries and external chargers as part of your buying decision. There's nothing worse than traveling with an expensive computer that won't run because the batteries are dead. The price of battery packs varies greatly from machine to machine. Always leave home with fully charged batteries.

**Printers.** Believe it or not, there are some tiny, lightweight portable printers that aren't unreasonable to carry around with your laptop. Your mobile printing needs would definitely have to be beyond the normal to justify buying a portable printer, but truly portable printers are available. The Canon BJ-10e portable bubble-jet printer, for example, is amazingly little—the size of a notebook computer—and it produces near laser quality print.

#### **Documentation**

The next problem you will face in moving your computer is carrying sufficient documentation for your hardware and software. If you take the manuals for every program you use and for your computer and all its peripherals, in no time you'll have a three-foot bookshelf of volumes to lug around. Some of that documentation is necessary, and you'll have to take it (like the manual for the computer itself), but there are some good alternatives for the rest of it.

After you are familiar with a program, you may be able to get along with just a keyboard template, quick reference card, or just the online help. The lightest solution for other programs may be one of the series of small quick reference books that major publishers like COMPUTE, Que,

Osborne/McGraw-Hill, and Sybex put out for major software titles. These small books contain operating information boiled down to the essentials. In any case, carry a list of the customer support phone numbers for all the software and hardware you'll be taking.

Taking this parsimony one step further, look for special books for laptop owners. Sebastian Rupley's *Portable Computing Official Laptop Field Manual* (IDG) and H. J. Liesert's *The Laptop User's Guide* (Abacus) both contain highly condensed but useful instructions for the most popular software programs so you can leave all the other manuals at home. Liesert includes advice on hooking up printers and mice and offers general laptop advice. Rupley includes essential information on the most popular computers.

David H. Rothman's *The Complete Laptop Computer Guide* (St. Martin's Press) is full of common-sense advice, tips for successful laptop use, and information on various countries' customs requirements. The chapter on hooking your modem to phones under every conceivable circumstance is in itself worth the price of the book.

Proper preparation is the key to a successful laptop trip. If you've outfitted the computer with some of the above helps and thought through your packing list, your trip will be a breeze.

#### **On the Road**

One of the first obstacles on your trip is the airport security check. Is the security check hazardous to your computer and software? Opinions vary, as do official pronouncements, but if you're the play-it-safe type, insist they hand-check your computer and not run it through the x-ray machine. If you're a little more trusting—as I am—go ahead and run it through the x-ray. Although they may affect film, x-ray machines probably will not hurt the computer or disk. My computers have been x-rayed dozens of times without harm. On the other hand, metal detectors may tend to corrupt data stored on magnetic disks because the metal-detecting process involves electromagnetic fields.

Be prepared to unpack and boot your computer to prove to the security guard that it is indeed a computer and not a bomb. Allow plenty of time for this. Don't be stuck showing your computer to the security staff as your plane pulls away from the gate.

Once you're aboard the aircraft, you may want to use the computer. Because there is a potential for disruption of the sensitive electronic instrumentation of the aircraft, it is considered polite to check with the

## Entertaining Yourself on the Road

One of the great disappointments of laptop computing arises when it's time for fun. Today's computer games feature fabulous 256-color VGA graphics and sound board support—which simply won't work with laptops. Many laptops have Stone Age CGA screens—and almost all are monochrome. And newer games don't even support CGA anymore.

A few games, more by a fortuitous accident in choice of contrasting colors than by design, provide recognizable monochrome screens. I've searched diligently for games compatible with laptops, finding among them these standouts:

**Silpheed.** This classic shoot-'em-up space game is primarily black-and-white even on a VGA color screen. It looks so good on a laptop that it might have been written for one. Imagine blasting away at alien ships from your airplane seat in the skies over Kansas.

**Manhattan Software Card Games.** Manhattan has nine excellent card games that provide only the simplest of graphics. The outstanding gameplay, however, more than makes up for the plain-Jane look, which, after all, is what makes the games work so well on laptops. My day isn't complete without a few hands of *Cutthroat Pinochle*, which is a guaranteed delight.

**Hoyle's Book of Games I and II, Laptop Editions.** These two Sierra games are the only laptop-specific games I've

seen. By stripping out the color and sound and limiting the video to CGA, Sierra can sell these games for a pittance. Volume I includes eight popular card games including Hearts and Gin Rummy. Volume II includes 28 solitaire games—all the traditional ones and a few making their first showing here. These visually stimulating games provide animated opponents, including characters from Sierra's King's Quest games.

**GameTek's TV Game Shows.** These inexpensive games, *Jeopardy!* and *Wheel of Fortune*, are both graphically simple and brain-ticklingly fun enough to earn a place in your travel kit.

Other games well suited to the laptop environment include *Tetris*, *Welltris*, *Solitaire Royale*, the early Accolade driving games (*The Cycles*, *Grand Prix Circuit*, and *Test Drive*), *Chessmaster 2100*, *Microsoft Flight Simulator 4.0*, *Qix*, *Empire*, *Action Stations*, *World Class Leader Board*, and *Tracon*. *Sim City* fans will find that it's possible to continue their addiction on a laptop, particularly with the newer VGA machines. Unfortunately, I have yet to find a fantasy role-playing game that is much fun on a laptop.

Take a few of these gems with you, and you won't be bored. But be prepared for odd looks from fellow airline passengers when you tell Princess Rosella to shut up and deal. And try not to growl imprecations at Xacalite, the evil enemy in *Silpheed*, until you get to a more private place.

stewardess before firing up your laptop, especially on foreign airlines.

One last airline hint: Aisle seats give you more elbow room for the sometimes difficult feat of lapping on an airline food tray.

### Computing in the Hotel

Hotels present their own challenges to laptop users. The one you hear the most about is the difficulty of tapping into the phone lines with your modem, which can be a nightmare. If you are taking an extended trip and need access to the phones, you can call ahead and find a hotel that promises access to RJ-11 jacks (the standard modular phone plug), but don't expect hotel desk clerks to be knowledgeable about telephone equipment. They may know, however, when the hotel was built. Oddly enough, the older the hotel, the more likely you can use its telephone equipment without major problems.

Hotels built in the 1970s and 1980s purposely made it difficult to get at any kind of phone connectors—the worst situation being when they have wired directly from the wall to the receiver with no plugs anywhere along the line.

Use the Road Warrior Toolkit from Computer Products Plus in

these situations to alligator-clip onto wires in the unscrewed mouthpiece end of the handset. You can find jury-rigging equipment similar to those in the Road Warrior Toolkit at Radio Shack and similar stores. If you're assembling your own kit, don't forget pliers, screwdrivers, alligator-clip leads, RJ-11 jack doublers, and other adapters and converters. An easier but more expensive solution is an acoustic coupler, such as the Telecoupler from Computer Products Plus, which straps onto any telephone handset to feed the computer signals into the phone without a direct-wire hookup.

Another problem with doing your computer work in a hotel room is less obvious. Many of us travel, planning to work several hours in the hotel in the evenings. By the time the trip is nearly over, it's obvious that we've failed to meet our productivity goals. Why? Well, consider: Does your office have cable TV, including HBO? Does it have an inviting bed? Is there an interesting new city just outside, asking to be explored? Probably not. Add these distractions to the irritation of essential information you forgot to bring, and it's little wonder productivity plummets on the road, despite our best intentions. Just because you now have a computer available

around the clock, that doesn't mean you should expect to attain super-human production levels on a trip.

### Online Services

The online services such as CompuServe and GEnie can be lifesavers when you're on the road. Be sure to take the local access phone numbers for your destination cities.

These international computer networks give you access to almost unlimited communication facilities. Need to send a fax quickly from your hotel room? Dial up your online service, and with a few simple commands the fax is sent. There's a charge for this, but it's quite reasonable.

Electronic mail, or E-mail, is extremely handy as well. If your office or home has a computer and modem, you can leave private messages for the folks you left behind through the phone. You can even transmit whole computer data files through E-mail. E-mailing files makes them immediately available to the addressee from anywhere in the world.

The networks can also be an auxiliary file storage area. Important files can be uploaded and saved online until you download them upon your return. If your laptop dies or is stolen or if the airlines lose your luggage and all your floppy disks, your data file is still safely stored on the network.

Extensive databases of almost every kind are available through the online services, freeing you from the need to carry reference materials with you. And finally, the various special interest groups in the online services give you access to people who can help you with any kind of problem, computer or otherwise. (When I needed interviews for a magazine article I was writing at night on a business trip in Hawaii, I posted a notice on GEnie. Within a few hours, I had all the people I needed, complete with quotations I could use without transcribing a tape.)

### Running Your Computer

While running the computer on batteries, do everything you can to keep from accessing the hard or floppy disk drives unnecessarily. Most laptops save energy by turning off the disk drive motors when you haven't accessed the drives for a few minutes. Some require you to turn them off when you don't need them. As soon as you request data from the disk, the computer restarts the motor, spins the disk, and retrieves or writes the data. Any time the disk is spinning, you're eating away your battery power.

This is one of the benefits of the RAM disk we discussed above; it involves no spinning of disks. ▸



## Product List

### Battery Watch Pro

\$49.95  
**LapLink III**  
\$149.95  
Traveling Software  
18702 N. Creek Pkwy.  
Bothell, WA 98011  
(800) 343-8080  
(206) 483-8088

### Canon BJ-10e

\$499.00  
Canon U.S.A.  
One Canon Plaza  
Lake Success, NY 11042  
(516) 488-6700

### The Complete Laptop Computer Guide

ISBN 0-312-050623  
\$18.95  
St. Martin's Press  
175 Fifth Ave.  
New York, NY 10010  
(212) 674-5151

### Cutthroat Pinochle

\$35.00  
Manhattan Software  
P.O. Box 148  
Peterborough, NH 03458  
(800) 432-5656

### FastLynx

\$149.95  
**FastLock Plus**  
\$84.95  
Rupp  
7285 Franklin Ave.  
Los Angeles, CA 90046  
(800) 852-7877

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Niles, IL 60648  
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**Wheel of Fortune Junior Edition**  
\$16.95 each

### Wheel of Fortune Vol. I

### Wheel of Fortune Vol. II

### Wheel of Fortune Vol. III

\$11.95 each  
GameTek  
2999 NE 191st St., Ste. 800  
N. Miami Beach, FL 33180  
(305) 935-3995

### Laptop UltraVision

\$69.95  
Personics  
63 Great Rd.  
Maynard, MA 01754  
(800) 445-3311

### The Laptop User's Guide

ISBN 1-55755-083-2  
\$19.95  
Abacus  
5370 52nd St. SE  
Grand Rapids, MI 49512  
(800) 451-4319  
(616) 698-0330

### Logitech Trackman Portable

\$169.00  
Logitech  
6505 Kaiser Dr.  
Fremont, CA 94555  
(800) 231-7717  
(415) 795-8500

### Microsoft BallPoint Mouse

\$175.00  
Microsoft  
One Microsoft Way  
Redmond, WA 98052-6399  
(800) 426-9400

### MousePen Professional PC

\$109.00  
Appoint  
1332 Vendels Cir.  
Paso Robles, CA 93446  
(800) 448-1184

### No-Squint II

\$49.95  
SkiSoft Publishing  
1644 Massachusetts Ave., Ste. 79  
Lexington, MA 02173  
(800) 662-3622  
(617) 863-1876

### PKZIP

\$47.00  
PKware  
9025 N. Deerwood Dr.  
Brown Deer, WI 53223  
(414) 354-8699

### Portable Computing Official Laptop Field Manual

ISBN 1-878058-10-X  
\$14.95  
IDG Books Worldwide  
155 Bovet Rd., Ste. 730  
San Mateo, CA 94402  
(415) 358-1250

### Road Warrior Toolkit

\$49.95  
**Telecoupler**  
\$149.95  
Computer Products Plus  
16351 Gothard St.  
Huntington Beach, CA 92647  
(800) 274-4277

### Silpheed

\$34.95  
**Hoyle's Book of Games I and II**  
\$34.95 each  
Sierra On-Line  
P.O. Box 485  
Coarsegold, CA 93614  
(800) 326-6654

### Stacker

\$149.00  
Stac Electronics  
5993 Avenida Encinas  
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(800) 522-7822  
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### TravelMate 2000

\$3,199.00  
Texas Instruments  
P.O. Box 202230  
Austin, TX 78720-2230  
(800) 527-3500

### Worldport 2496 Fax Modem

\$699.00  
Touchbase Systems  
160 Laurel Ave.  
Northport, NY 11768  
(800) 541-0345

A disk defragmenter (such as *Optune* or *Spinwrite II*) will make your disk accesses faster and more efficient and, over time, save a little battery juice.

Be aware that your laptop with its dependence on batteries and its exposure to unknown perils as you travel makes your data much less secure than it would be on a desktop unit. Back your data up frequently. Make floppy disk copies of files as you create them, just to be sure.

## When You Get Home

When you get home, there are only a few essential things left to do. Download your network-stored files to your home or office computer. Upload your data files from the laptop to your desktop computer using LapLink or a similar product, or transfer them by floppy disk if there aren't too many. Clean up your hard disk and rerun your disk optimizer to defragment and pack your files again.

In this process of transferring the files back to your desktop computer, be wary of confusing older versions of files with newer ones. Concentrate and be sure that you are transferring the files in the right direction. More than one travel-weary computerist has absent-mindedly written the pretrip versions of his files over the newer ones generated on the trip.

Stash away all your travel kit items in good order so that everything will be ready for your next adventure. That way, once you've assembled your travel survival kit, you'll never have to worry about it again except for simple maintenance.

Pull up that packing list file you saved on the laptop before you left and have a critical look at it. What did you take that you didn't use? Delete it from the list. What did you leave home that you needed? Add it to the list. After a few trips, your packing list will be fine-tuned to give you exactly what you need every time.

Finally, if you set new records playing *Tetris* on your trip, copy the high score file from your laptop to your desktop so that the vanity board will reflect your new triumph.

Congratulations! You've made it through your first laptop trip. You'll agree, I'm sure, that your laptop is indeed a different breed of animal from a desktop unit, but you're well on your way to taming it. □

Richard O. Mann, CPA, CIA of Roy, Utah, is an internal auditor for the Church of Jesus Christ of Latter-Day Saints. His job has taken him to Brazil, Hawaii, Samoa, Tahiti, Cincinnati, and other exotic locales, always with a portable computer. Look for him on GENIE as R.MANN3.

# Do you know the incredible learning a foreign

Whether for travel, business or entertainment, conversing in a foreign language will open up whole new worlds to you. And now there's a method that makes learning a foreign language simpler. Painless. And faster than you ever thought possible. The first 15 tapes of this package are the very same tapes used by the U.S. State Department to train career diplomats.

They're tried and proven effective. But it's the second 15 tapes utilizing the latest *European* learning techniques that make this system so special. This marriage of two teaching concepts literally gives you two courses in one... the best of both worlds in language instruction.

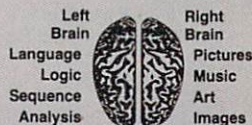
			
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**BREAKTHROUGHS** in language technology by European learning researcher **Dr. Georgi Lozanov** are the basis of the remarkable

"American managers with language skills open more doors."  
*Wall Street Journal Editorial*  
July 25, 1988

Accelerated Learning Language Series. The series is so effective, we guarantee you'll be hearing, reading, understanding and beginning to converse in your new language in 30 days - or your money back.

This unique new system links the left side of the brain (language and logic) with the right side of the brain (music and art) for dramatically increased retention and learning speed. In the same way you remember the words to a song with little or no effort, Accelerated Learning

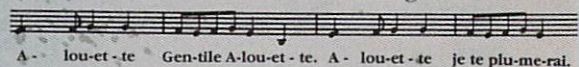


"(the superlearning method is) fascinating... the results are extraordinary."  
Prof. Lawrence Hall  
Harvard University

uses Baroque music to "un-stress" the learning process.

**Boost your memory with music.**

Have you ever wondered why you can remember the words to a song with little or no conscious effort? Music stimulates right brain



activity. Speech is a left brain activity. When the two are combined, as in a song, you have left/right brain linkage. You've used your whole brain, so your memory is much stronger. Accelerated learning uses the same technique. You will learn the language as *stresslessly* as a child does, by hearing new vocabulary and phrases in alternately loud whispered, and emphatic intonations, all accompanied by slow, rhythmic music. The effectiveness of Baroque music as a memory aid is well documented and leaves you feeling alert and rested.

"American ignorance of other tongues has been hurting American business executives in their competition for (overseas) markets."  
*The New York Times*  
September 5, 1988



Better Business...



Smarter Vacation Shopping...



New Career Opportunities...



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# Rewards of language?

			
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## Two language courses in one.

Utilizing these untapped mental capacities of your learning ability is the basis of this unique

"I'm 52 years old, and if someone had told me I would have become articulate in a foreign language in four weeks, I would have said they were wrong."

Joseph A. Kordick  
Ford Motor Company

course. Each language lesson contains a *study* tape and a *memory* tape. The study tape (along with the U.S. State Department text) explains rules and grammar of the new language. These are the tapes used by the **Foreign Service Institute** to train career dip-

lomats. The memory tapes correspond one-on-one with the study tapes — and contain the accelerated learning memory and vocabulary drills that take the boredom and drudgery out of learning.

## Our 'comfort' guarantee.

To correctly converse in a foreign language you must understand the meanings and intent of a native speaker. If after 30 days of listening to the study and memory tapes you are not beginning to comfortably understand, read and converse in your new language, then return them for a *full refund*.

"I decided to concentrate on Spanish around 1965, and after I became proficient in 1967, my business with Spanish-speaking countries increased from nothing to over twenty million dollars yearly."

André Crispin  
Industrialist

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Order your language course now and you'll also receive a triple bonus: An American Express International Traveler's dictionary in the language you choose to study, the 100-page book *How To Learn A Foreign Language* (used by the Peace Corps & CIA), and two extra 90-minute vocabulary tapes. This is in addition to your 15 government study tapes, 15 memory tapes and workbooks — and all for the price you would normally pay for just the 15 basic course tapes. Order now and we'll rush your tapes and bonus to you. Remember, we guarantee you'll be comfortable speaking the language in 30 days!

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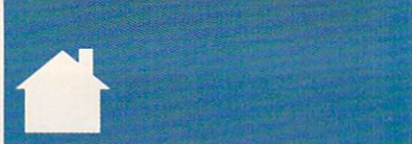


**\*P.S.** Best Value! With a total of 32 cassettes plus study material, this offer represents the best value available today in language instruction. Compared to other programs, the Accelerated Learning series outperforms them with twice the audio and 20 times the study materials.

Another language is a major social and business asset.



\* Bonus Offer!



# SHAREPAK

R I C H A R D C. L E I N E C K E R

**W**ant to create a masterpiece, take a learning voyage through space, or track the movement of the earth, sun, and moon? Then you'll want to get this month's *SharePak* disk, which has something for everyone. *TurboPaint* is a full-blown art program that runs in Hercules, CGA, EGA, Tandy, and VGA. *Math Voyager* is a commercial-quality arcade-style educational game, and *EARTHWATCH* is a program that helps you track the earth's movement with a time-lapse effect.

Each month we download hundreds of programs, screen them, and narrow the field down to a few of the best. The result is our *SharePak* disk—always packed with fine programs for one low price.

After downloading, we decide which programs are best suited for this month's editorial focus and then do one more round of testing to make sure our choices for you are up to snuff. Downloading as many programs as we do would cost you more than twice the price of COMPUTE's *SharePak* disk, so you save time and money by ordering the disk.

## **TurboPaint 1.5**

This full-featured paint program will really surprise you. It has almost all the features of a commercial paint program, yet it's so easy to use. With its well-designed screen and clear pull-down menus, you'll be creating your own computer artwork in no time.

Plenty of different systems are supported, too. Hercules, CGA, EGA, Tandy 16-color, MCGA, and VGA cover the gamut of video modes. You also won't have trouble loading in different files, since PCX, IFF, and GIF picture formats are supported, and you can load in any GEM font, so fancy text is no problem. When you're through, you can print out your creation on any of 193 printers supported.

*TurboPaint* has all the drawing tools you would expect: lines, boxes, circles, ellipses, cut and paste, fills, air-brush, freehand, and ray tools. For

fine-tuning pictures, you can use the zoom feature and draw pixel by pixel.

To effectively run *TurboPaint*, you need 512K of free RAM. If your system has 512K built in, that means you have less than 512K available because DOS and memory-resident utilities use up some of it. Although the program's main control device is a mouse, you can run it without a mouse, since keyboard and joystick drivers are provided.



The registration price is \$20, which includes the latest version of *TurboPaint*, a fonts disk packed with over 80 fonts, a clip art disk, and an art disk.

Get this great program and paint up a masterpiece.

## **Math Voyager**

Take a voyage into deep space. You'll have to be on your toes, though. By answering math problems, you'll guide your starship through the void, and if you're clever and fast, you can zap the aliens and chart a course to the destination star cluster.

This game is great for kids as young as eight years old, but after I finished playing, my own computa-

tional skills were honed razor sharp.

You can set the program for addition, subtraction, multiplication, division, or a combination of the four, and set numbers to whole, decimal, or mixed. You can also set the difficulty level to encounter black holes along the way.

You'll need at least 384K and a CGA graphics card to run this program. Mouse support is included if you have a Microsoft-compatible mouse.

If you decide to order the full-blown version for \$14.95, you'll see the graphics in EGA, Tandy 16-color, MCGA, or VGA modes.

Fine-tune your math skills and have a great time. Not only will this game provide hours of entertainment, but it might help your kids get better grades in school or even help *you* get an edge on your own math skills.

## **EARTHWATCH**

This program graphically displays the earth-moon system's march through time. You'll see the 24-hour day-and-night cycles due to the earth's rotation, the moon's monthly phases, and the earth's annual trip around the sun with the passing of the four seasons.

A map of the world will slowly scroll eastward across the screen as the continents in turn move daily from predawn darkness through sunrise and daylight, and then through sunset back to night.

It's fascinating to watch the shape of the daylight zone change ever so slowly from day to day as the seasons progress.

As an added plus, you can call up a special almanac screen to display additional information such as comparison of sunrise and sunset times with those of the previous day.

For anyone with an interest in weather, astronomy, or time zones—fishermen and wildlife buffs, kids working on science projects, backyard stargazers—*EARTHWATCH* is a real find. It's a lot of fun, and it's a great way to keep track of the earth's natural cycles. Don't pass it up! □



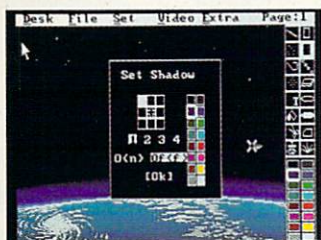
With COMPUTE's *SharePak*, You'll

# Share in the Savings!

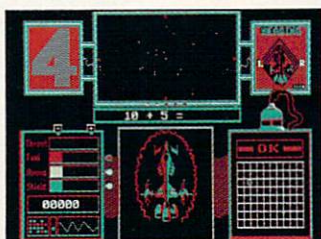
**SAVE TIME**—we carefully select and test all programs for you

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**TurboPaint 1.5**



**Math Voyager**



**EARTHWATCH**

**COMPUTE's SharePak** disk contains the best of shareware—handpicked and tested by our staff—to complement this month's In Focus topic. You'll sample entertainment, learning, or home office software at a great savings. Each *SharePak* disk includes two to five programs plus complete documentation for one low price:

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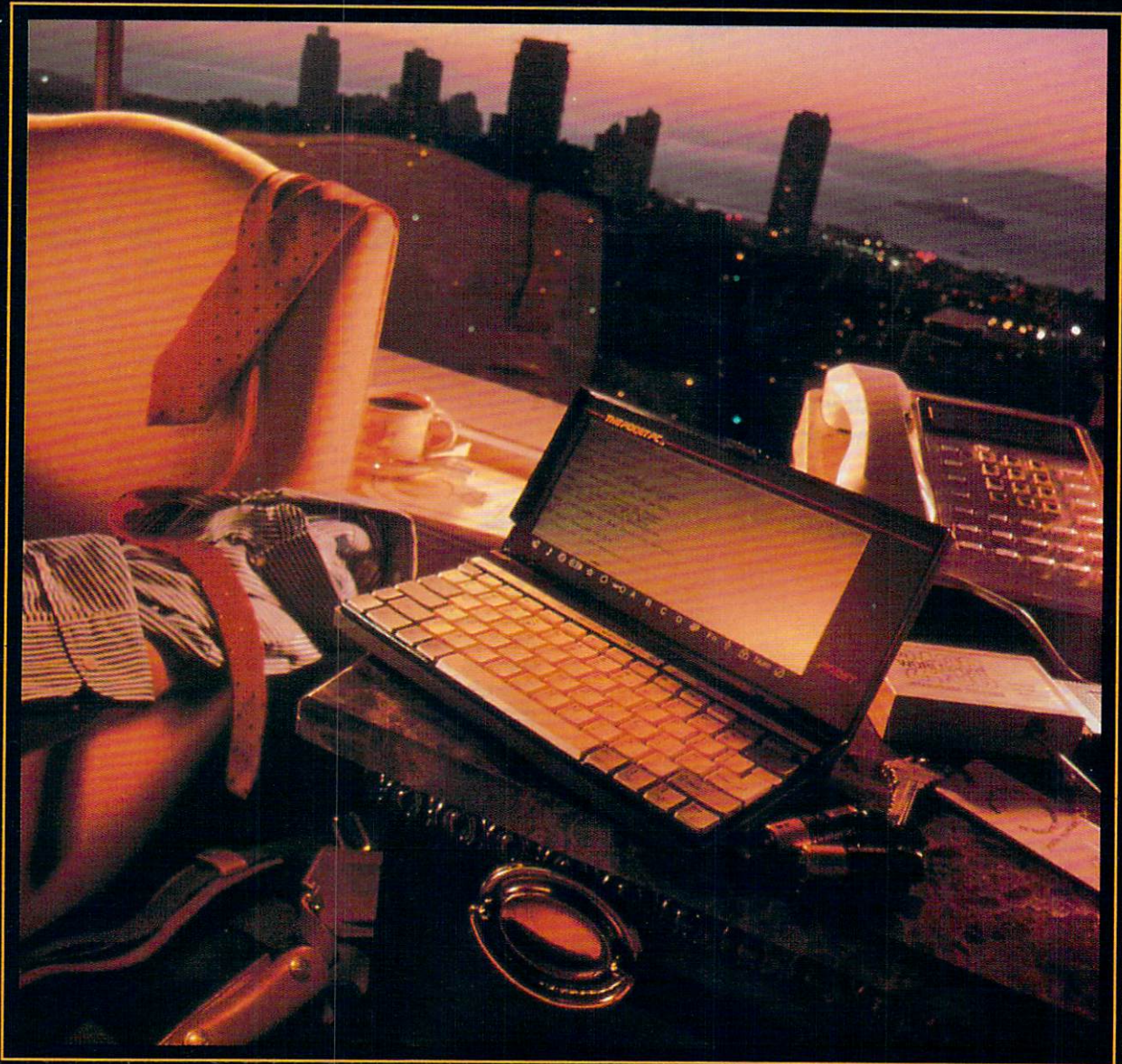
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POCKET COMPUTER CORP.

# POWER IN YOUR POCKET

By Scott Leibs

Laptop and notebook computers let you take your work where you've never taken it before, but when you're standing at an airport pay phone or making your way through the crowded aisles of a trade show, they simply aren't portable enough.

Fortunately, a recent explosion in hand-held electronic organizers now lets you reach into your pocket and pull out reams of data as well as a variety of powerful applications. Push a few keys, and you can call up phone numbers and appointments, keep track of expenses, and maybe even recommend the perfect bottle of wine at dinner.

In fact there are so many electronic organizers, if you decide you need one, you could get completely disorganized trying to sort through them all. And with new models being introduced frequently and competitors copying each other's best features, the field can seem to be one big moving target. Fortunately, all this competition also means prices are dropping fast.

The first thing to do is set your spending limit; then decide how much computing power you need to hold in your hand. If you

want to keep to a minimum the price of your initial foray into this new breeding ground of electronic brains, the DataStor 1000c from SelecTronics might be a good place to start.

This device retails for about \$40 and offers the most basic functions—calculator, electronic memo pad, phone directory, and appointment calendar. Just slightly larger than a credit card, it has a two-line screen, alarm, battery-backed memory, and other features. Despite the fact that its limited functionality keeps programming to a minimal level, programming it isn't entirely intuitive—don't throw away the directions. But if you want to keep phone numbers handy and you can keep your memos brief (the non-QWERTY keyboard will likely frustrate anyone accustomed to touch-typing), the DataStor 1000c has its uses. If nothing else, it allows you to invest very little money to find out if you've got what it takes to leave diary and pencil behind and trust your appointments to an electronic device.

Far more function-rich—and expensive—are the high-profile Sharp Wizard and the Casio B.O.S.S. In fact, these are entire fam-

ilies of products, with new models added seemingly every month. They're powerful tools with many built-in features and they're enjoying a boom in the variety of available software.

The Sharp Wizard, the pioneer product in the field, comes in several different models ranging in price from \$110 to \$360 and weighing from five to ten ounces. The low-cost ZQ series is designed primarily for people who don't have extensive software needs. It has a QWERTY keyboard and up to 64K of memory, and it offers the ability to transfer data among members of the Wizard family (and with some models, between Wizards and IBM-compatible and Apple PCs) by using special cables.

The ZQ series offers built-in functions such as a calendar, calculator, scheduler, phone book, memo feature that can accommodate up to eight pages of data, and, on some models, a built-in ledger that tracks expenses as well as a to-do list that can prioritize activities. Data is displayed either 12 characters by four lines or 16 characters by eight lines.

The more sophisticated OZ series can accept software on smart cards. These credit-card-size circuit

boards offer applications ranging from language translators to city guides to a new fax/modem card to—naturally—videogames.

The OZ series also features a much better display of 40 characters by eight lines, more memory, and an expanded array of built-in functions, including a very useful built-in help feature. More software is coming every day (see sidebar), and the devices are proving popular among both consumers and business people. Several corporations, including Pepsi-Cola and Prudential, have bought thousands of units to give to field salespeople and others who need easy access to a wide range of information. San Diego Padres general manager Joe McIlvaine uses a Sharp Wizard to track the performance of minor league players, and New York Mets marketing vice president Jim Ross uses one to store the team's complete schedule as well as a list of good restaurants in each city the Mets visit.

The Casio B.O.S.S. (Business Organizer Scheduling System) is similar to the Wizard in virtually every way. While some Wizard models are meant to be opened like a book, with keyboard on one side and

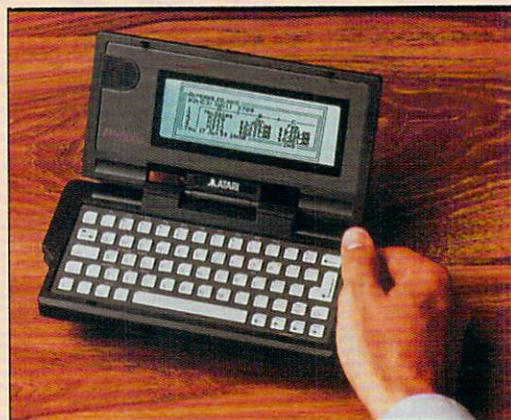
The kind of power  
you need  
to manage your  
time  
and resources  
may be  
sitting in the  
palm  
of your hand

## BIG THINGS IN SMALL PACKAGES



COURTESY OF CASIO

In addition to business-oriented smart cards, the Casio B.O.S.S. accepts a number of "diskware" applications downloaded from a PC.



COURTESY OF ATARI COMPUTER

Atari's Portfolio is DOS compatible and comes with five built-in applications, including a Lotus 1-2-3 file-compatible spreadsheet.



COURTESY OF SHARP ELECTRONICS

The Oz version of Sharp Electronics' Wizard pocket computer is one of the more sophisticated pocket PCs.



COURTESY OF HEWLETT-PACKARD

Hewlett-Packard's 95LX is the newest palmtop to hit the market. The 95LX can act as an additional drive to a desktop PC.

screen on the other, all the Casio models open like a carton of eggs, with the keyboard held in the palm. While recent entries in the B.O.S.S. family accept software and memory upgrades in the form of smart cards, users can also buy some applications on 3½- or 5¼-inch disks that must be downloaded to the B.O.S.S. from a PC. While that's time-consuming, the applications cost only \$22.95. As of this writing, such "diskware" includes guides to wine, foreign languages, travel sites, weight loss and nutrition, and horoscopes/lottery numbers. Smart cards from Casio are more business-oriented and include a spreadsheet, expense tracker, and various dictionaries.

Casio has also begun to build some electronic-organizer capabilities into its calculators, allowing users to

program in phone numbers and brief memos. And two models of its Digital Diary fall squarely between the B.O.S.S. and upgraded calculators, allowing users to enter not just phone numbers but longer memos and schedules while also providing a month-at-a-glance feature.

Scientists and engineers who'd like a pocket-size tool all their own should take a look at Hewlett-Packard's \$350 HP 48SX (for Scientific eXpandable) calculator. This device lets you enter equations as you would write them on paper and provides a new level of graphics and calculus functions. The 48SX also accepts memory and applications smart cards, but be warned: This device is for the mathematically sophisticated. I literally had to read the owner's manual to figure out how to add 2 + 2.

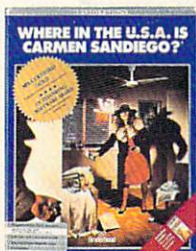
For those who simply can't have enough power in hand, the emerging field of palmtop computers may be the answer. Like personal information organizers, these devices are lightweight (about a pound), can be held in one hand and operated with the other, and accept smart cards.

The similarities end there. The Poqet PC, a pioneer in the field, is a full-blown DOS computer with all the power that implies. The Poqet PC has a 77-key QWERTY keyboard, a display of 80 characters by 25 lines, and four drives (two internal, two that accept smart cards via sliding doors). By cabling it to a desktop PC, you can download any DOS application as well as transfer data in both directions. The unit comes with a handful of built-in (ROM-executable) applications, including a word processor,



# Take your choice of these popular children's computer software programs worth up to \$59.95... FOR JUST \$9.95!

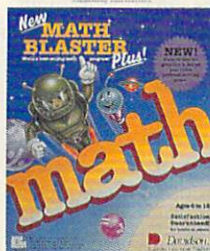
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World's best-selling math program has fun "Blasternaut" game.  
New Version Now Available for IBM, Apple II version's MBP, ITEM NUMBER 3



■ Super Solvers Outnumbered:  
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Best Home Learning Award!  
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Travel with a pioneer family across the 19th century wilderness, learning how to survive.  
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Regular Price: \$59.95  
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Printer required.  
Available for IBM and Apple II, ITEM NUMBER 7



■ Mixed-Up Mother Goose:  
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Help Mother Goose find the missing pieces to her rhymes.  
Available for IBM and Apple II, ITEM NUMBER 8



■ Stepping Stones I & II:  
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From early reading to addition, spelling and vocabulary.  
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## SOFTWARE SELECTION GUIDE

### Key to Colors:

- Ages 3-7
- Ages 7-10
- Ages 10-13+

## Watch your children laugh and learn...with software that's fun, fun, fun!

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The Learning Adventure Computer Club takes the work out of software selection for you. We review hundreds of computer programs for youngsters — invite children like yours to test them — then select only the ones that combine active fun with measurable learning in:

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To find out which programs are best for your child, check the colored square by each program: they're keyed in three age groups. Blue programs introduce your 3-7 year-olds to the computer with activities that arouse their curiosity...capture their imagination...and instill a lifelong love of learning. Red programs turn the Three R's into rip-roaring adventures for 7-10 year-olds with programs developed to supplement their education and turn their weaknesses into strengths. Green programs stretch the minds of 10-13+ year-olds with sophisticated software that make academic challenges fun and rewarding!

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**YES!** Please send me the program I have indicated below to preview for 15 days at no risk or obligation. I may return the program after 15 days and have no further obligation. If I am pleased with the program, I'll pay for it at the special new member price of only \$9.95 plus \$2.95 shipping and handling, and enroll as a new member under the terms outlined on this page. As a new member, I need to buy just 3 more selections at regular club prices in the next year and may cancel any time thereafter.

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
Telephone ( ) \_\_\_\_\_

1. Please send me item number \_\_\_\_\_ to preview. (Please fill in identification number of program shown above.)
2. AGE of child (check one):  
 3-7     7-10     10-13+
3. Computer you own and size of disk required (check one):  
 IBM/Tandy & Compatibles with 5 1/4" disk drive  
 IBM/Tandy & Compatibles with 3 1/2" disk drive  
 Apple II Family & Compatibles with 5 1/4" disk drive
4. Child's name \_\_\_\_\_  
 Child's birthdate: Month \_\_\_\_\_ Day \_\_\_\_\_ Year \_\_\_\_\_
5. Please check below if you have a:  
 Printer     Modem     Color Monitor
6. Parent's Signature \_\_\_\_\_

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calculator, scheduler, and phone directory. An optional modem, external 3½-inch disk drive, and the ability to expand RAM up to 2MB takes you well beyond the typical electronic organizer, as does the \$1,450 list price. In fact, if your eyes are good enough and your fingers small enough, the Poqet PC could satisfy all your portable computing needs. Many other PC makers, including several Japanese companies, are aggressively pursuing the palmtop market, so the options here could mushroom by late 1991.

meric keypad, and includes ROM-executable versions of DOS 3.22 and Lotus 1-2-3 release 2.2 built in. The 95LX includes an advanced financial calculator and several printer drivers. Along with graphics, database, and macros features, 1-2-3 accessories include a filer, phone book, appointment book, communications module, and memo writer. Suggested retail price for the 95LX is \$699.

The real power of the 95LX palmtop comes with an optional Connectivity Pack from Traveling Soft-

prescription will suddenly be obsolete.

The efforts going into improving laptop screens and finding ingenious ways to make keyboards both portable and full-functioning (and, with folding keyboards, even full-size) are certain to further boost the potential productivity of these hand-held devices. Add to that the deep price cuts that intense competition is already inspiring, and business people in all walks of life will soon be reaching for pint-size computers the way they reach for pens today. □

## Smart Card Software

Hand-held information devices rely on a variety of miniaturized components. One of the most important is the integrated circuit (IC) card, also called a smart card or a RAM card/ROM card. These hard plastic cards are about the size of a stack of three credit cards. They hold from one to as many as eight microchips, depending on whether they are used to hold a software application or to expand memory.

The cards slide into a hand-held device in much the same way that a floppy disk slides into a desktop PC. One drawback at this point is that many devices have proprietary IC interfaces, meaning that a smart card for one will not work with another. Manufacturers of the cards are hammering out standards, which will ensure interoperability when used in machines that use the same operating system, although electronic organizers that use proprietary systems will continue to require specialized IC cards. That's a major reason why you should as-

sess the availability of software for a given model before you buy such a device.

Currently, smart card applications are priced from about \$50 for games for the Wizard to \$495 for *XyWrite* for the Poqet PC. RAM cards follow a similar path, from about \$80 for 32K for the Wizard to \$700 for a 1MB card for the Poqet. As with the hardware, prices are expected to drop, although in the short term, the hassle of connecting to a desktop machine may be worth it. Many observers say that as computer makers try to cut the size and weight of laptop and notebook computers, floppy drives will be replaced by IC cards. If the U.S. embraces the cards for pay phones, pay TV, banking, and the many other things for which European consumers use them, you may need to be sure that every business suit you wear has two functional pockets: one for your hand-held computer and one for your smart cards.

—SCOTT LEIBS

Atari offers a sort of hybrid between the Poqet PC and the Wizard and B.O.S.S. Its Portfolio is a DOS-compatible \$300 device that has five built-in applications (*Lotus 1-2-3* file-compatible spreadsheet, text editor, calendar, address/phone directory, and calculator), a 40-character by eight-line display, and RAM expandable to 640K. As with the Poqet PC, one of the beauties of the Atari Portfolio is that it can run for weeks on three AA batteries (the Poqet uses two). A host of optional products, including a PC Card Drive, serial and parallel interfaces, file transfer cables, and 1200-baud modem let the user connect easily between the Portfolio and a desktop PC. While the base product doesn't pack the power of the Poqet PC, letting users buy peripherals as they are needed is a sound strategy.

Hewlett Packard's 95LX is the newest palmtop to hit the market. Weighing just 11 ounces with a 40-character by 16-line display, it's somewhat smaller than the Poqet and has 1MB of ROM and 512K of RAM. Designed primarily for spreadsheet users, it has a QWERTY keyboard with separate arrow keys and a separate nu-

ware that includes *DOS Connect*, a TSR program that allows the 95LX to act as an additional drive to your desktop PC so you can access files without having to transfer them. The Connectivity Pack contains *DOS Connect* software and PC versions of the filer, phone book, appointment book, memo writer, and calculator; merge and translate utilities; and a special serial cable to connect your PC to the 95LX. Although not cheap at \$99.95, you'll want the Connectivity Pack if you get the HP 95LX.

The power being packed into these hand-held devices is impressive, but they aren't panaceas. The QWERTY keyboards, for example, are a big improvement over the ABC type that many of the original pocket computer products offered, and the 95LX's separate keypad is certainly an advantage for spreadsheet users, but mainly they simplify the search for a given key; touch-typing is virtually impossible due to the small size of the keys and keyboards. And the displays are fine for reading a phone number or entering in a quick note to send so-and-so a business card, but draft a letter or two, and your eyeglass

## Product List

### B.O.S.S.

\$239.95-\$299.95

### Executive B.O.S.S.

\$319.95

Casio

570 Mt. Pleasant Ave.

Dover, NJ 07801

(201) 361-5400

### Connectivity Pack

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Traveling Software

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Bothell, WA 98011

(206) 483-8088

### DataStor 1000c

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SelecTronics

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Pittsford, NY 14534

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### Electronic Organizer

109.99-\$239.99

### Wizard

\$299.99-\$359.95

Sharp Electronics

Sharp Plaza

Mahwah, NJ 07430

(201) 529-8200

### HP 48SX

\$350.00

### HP 95LX

\$699.00

Hewlett-Packard

1000 NE Circle Blvd.

Corvallis, OR 97330

(503) 752-7736

### Poqet PC

\$1,450.00

Poqet Computer

5200 Patrick Henry Dr.

Santa Clara, CA 95054

(408) 982-9500

### Portfolio

\$299.95

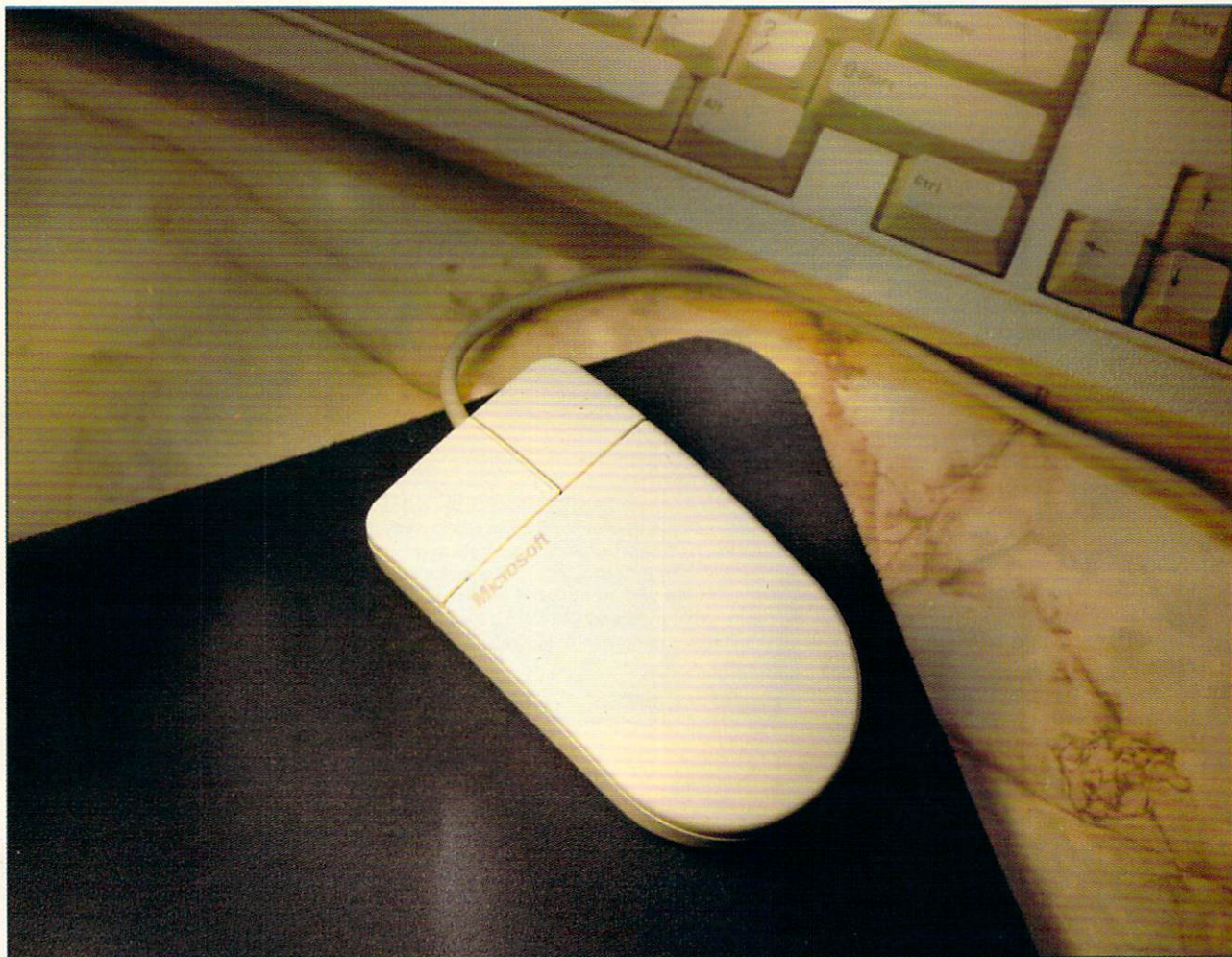
Atari Computer

1196 Borregas Ave.

Sunnyvale, CA 94086

(408) 745-2000

(408) 744-0880



MARK WAGONER © 1991

This month *COMPUTE*'s Test Lab focuses on mice, trackballs, and other pointing devices—14 in all. In combination with today's user-friendly software, especially today's popular graphical user interfaces, you can use these devices to traverse your screen and perform a variety of commands more easily. This month's lineup includes a variety of devices from mice to trackballs and special laptop peripherals such as the BallPoint, the MousePen Portable, and the ICONtroller. What's the best pointing device for your needs? Test Lab's expert reviews will help you decide. Our benchmark statistics offer you the specifics you'll need to choose the right device for your applications. And you'll find a variety of useful and interesting sidebars that explain the technology, provide background history, and show you how to maintain your mouse.

- Appoint MousePen Portable
- Kensington Expert Mouse
- Key Tronic Professional Series Mouse
- Kraft Mouse
- Kraft Trackball
- Logitech MouseMan
- Logitech MouseMan Cordless
- Microsoft BallPoint Mouse
- Microsoft Serial-PS/2 Mouse
- MicroSpeed PC-TRAC
- ProHance Mouse
- ProHance Trackball
- Suncom ICONtroller
- Z-NIX Cordless Super Mouse

## APPOINT MOUSEPEN PORTABLE

The MousePen Portable is a unique attempt at solving a recent problem: bringing mouse control to laptop and notebook computers. It incorporates an age-old design into a new-age machine—a pointing device that you use like a pen.

The MousePen Portable's shape is, paradoxically, its advantage and disadvantage. The slim design means you can stick it in your shirt pocket or find room for it in your laptop case. You can use the MousePen on any kind of surface, including your leg.

Holding the pen correctly takes a lot of practice. The pen's manufacturer, Appoint, claims its studies show that people who are not predisposed to mice—that is, people who don't use them on a regular basis—adapt to the pen quite readily. For others, picking it up and using it correctly require extensive retraining.

What works best is to grasp the pen near the base, with an index finger on the lower button, which is equivalent to the left button on a desktop mouse. From this position you can move the pen as you would a ball-point pen. The movement of the pen as it relates to the onscreen cursor registers "dynamic gain," which means that the faster you move the pen, the more screen area you'll cover. Use small, slow movements for drawing, and swifter movements for menu selection or for selecting text.

The MousePen has two buttons, arranged vertically on the stem. The lower button has a raised knob on it to signal its function as the left button on a conventional desktop mouse. Connections are made through a PS/2-compatible connector or with the 9-to-25 pin serial-port adapter. The driver is Microsoft compatible, and I experienced no problems using the pen in *GrandView*, *Works*, and several other software applications.

The MousePen package includes a mouse pad with a holder, which you can use if you decide to keep the

**APPOINT**  
1332 Vendels Cir.  
Paso Robles, CA 93446  
(805) 239-8976

**System Requirements:** 256K RAM, serial port or PS/2 mouse port

**Included Accessories:** five-foot cable and PS/2 connector, adapter for DB9 or DB25 serial ports, Microsoft-compatible mouse driver with installation program, *Menu Maker* for using the MousePen with nonmouse applications, *Telepaint*, 3½-inch and 5¼-inch disks, user manual, and a custom carrying case

**List Price:** \$109  
**Street Price:** \$96\*



MousePen closer to home. The package also includes a basic paint program called *Telepaint* and a menu program you can use to design menus for your DOS applications.

For dyed-in-the-wool mouse mavens, the MousePen Portable is somewhat disappointing because its radical design poses as many problems as it solves. But it does work, and if you're prepared to put up with a nonstandard solution to the portable mouse

problem, it's certainly worth a test drive. It can also be useful for computer artists who are looking for a more natural drawing tool. In the meantime, the rest of us will wait for touchscreens on our laptops. >

PETER SCISCO

\*Test Lab street prices are an average of prices advertised in computer magazines and national newspapers during May 1991.

# KENSINGTON EXPERT MOUSE

I've used the Macintosh version of this trackball for over a year now. Because it uses an optical sensor instead of mechanical moving parts, it's the only Mac trackball that comes close to the response of a mouse.

When I heard that Kensington had developed a trackball for the PC, I was eager to give it a try.

The Expert mouse offers you the same look and feel as the top-selling Macintosh version. The entire unit is large (4½ inches × 5¾ inches) and sturdy—but more importantly, the ball itself is large and easy to move (it's about the same size as a billiard ball). The two oversized buttons are on either side of the ball and easy to reach. You can configure the unit as a one-, two-, or three-button mouse and even swap the two buttons for left-handed use.

You can also set up the Expert mouse with a handy click-lock mode. It's possible to configure the device with this option so that pushing and releasing one button (you decide which one) simulates holding the other button down. This option can be useful in graphics programs for drawing lines or dragging objects across the screen.

Kensington supplies its own mouse driver which lets you set the degree of automatic acceleration (the faster you move the ball, the more the cursor accelerates). You can also write your own acceleration curve table to further fine-tune the response. Unless you're using a high-resolution monitor (1078 × 768, or higher), the combination of a 200-dpi trackball and software-based acceleration should be sufficient for just about any of your applications.

As well as they work, trackballs aren't for everyone, so try one before you buy. If you do find you prefer a trackball to a mouse (or don't have the room to use a mouse), the Expert mouse is an excellent choice. ▶

DAVID ENGLISH

**KENSINGTON MICROWARE**  
251 Park Ave. S  
New York, NY 10010-7399  
(800) 535-4242

**System Requirements:** up to 60K RAM, depending on how many of the drivers are selected for use

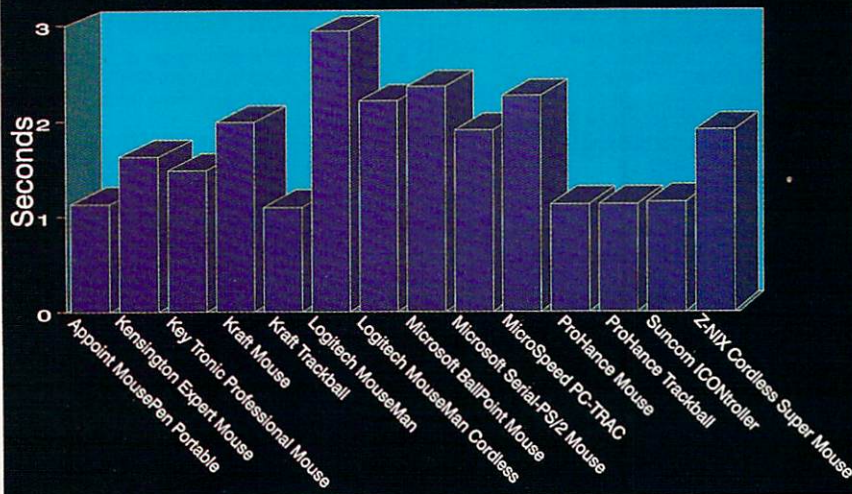
**Included Accessories:** manual, driver, menu software, and test software

**List Price:** \$149.95 for serial version (\$179.95 for bus version)

**Street Price:** \$100.50



## Time for 60,000 Mouse Driver Interrogations



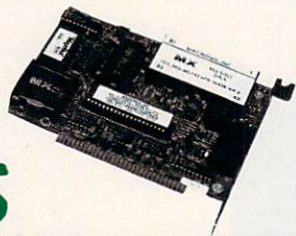
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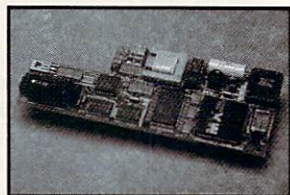


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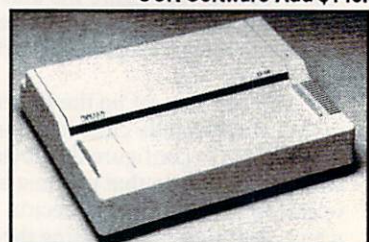


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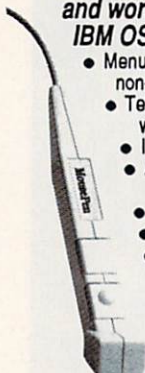


## The MousePen

Uses existing drivers in Windows® and works with Microsoft or IBM OS/2 drivers. Includes...

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- TelePAINT® color paint program with VGA support
- IBM PS/2 Mouseport Connector
- Adapter for DB9 and DB25 serial ports
- 5-1/4" & 3-1/2" diskettes
- User's Manual
- Custom Pen Holder

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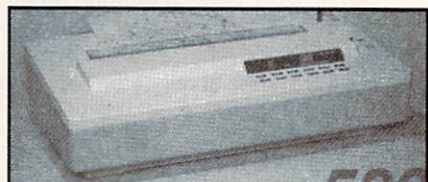
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6450372	2MB Memory Adapter 6450367	395.00
6450603	1MB SIMM PS/2 70-E61; 121	68.00
6450604	2MB SIMM PS/2 502-70	108.00
6450608	2MB SIMM PS/2 70 - A21	128.00
34F2933	4MB SIMM PS/2 55SX; 65SX	279.00
6450375	1MB Mem. BD PS/2 80-041	96.00
6450379	2MB Mem. BD PS/2 80 111-321	158.00

CAT. #	DESCRIPTION	NSI
6451060	4MB Mem. BD PS/2 80-A21-A31	298.00
6450605	2-8MB Xpand Mem. PS/2 70&80	348.00
	w/2MB	
34F3077	2-14MB Xpand BD. PS/2 70&80	388.00
	w/2MB	
6450609	2-14MB Xpand BD. PS/2 50-65SX	388.00
	w/2MB	

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256x9	17.00	19.00	21.00	24.00		
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1MBx9			53.50	54.95	65.00	68.00
4MBx8				259.00	279.00	309.00
4MBx9				279.00	269.00	299.00

**DRAM CHIPS**

	150	120	100	80	70	60
64x1	.90	1.20	1.50			
64x4	2.00	2.15	2.50			
256x1	1.25	1.40	1.60	1.85	2.10	
256x4	5.35	5.70	6.00	6.75	7.50	
1MBx1		5.45	5.65	6.50	7.50	

**COMPAQ MEMORY**

CAT. #	DESCRIPTION	NSI
107331-001	512KB Upgrade Portable III	38.00
107332-001	2MB Upgrade Portable III	118.00
107651-001	1MB Module Portable 386	218.00
107653-001	4MB Xpand Mem. Portable 386	630.00
107654-001	4MB Mem. Xension Portable 386	630.00
108069-001	1MB Xpand Memory DP386-16	285.00
108070-001	4MB Xpand Memory DP386-16	630.00
108071-001	1MB Memory Upgrade DP386-16	108.00
108072-001	4MB Memory Upgrade DP386-16	438.00
110235-001	1MB Memory BD SH 286	162.00
110237-001	4MB Memory BD SH 286	630.00
112534-001	4MB Module DP386S-16	298.00
113131-001	1MB Module DP386286E, 386 20-25E	96.00
113132-001	4MB Module DP286E, 386 20-25E	228.00
113633-001	1MB Xpand Mem. DP386S-16	148.00
113634-001	4MB Xpand Mem. DP386S-16	358.00

CAT. #	DESCRIPTION	NSI
113644-001	1MB Xpand Mem. DP386 20E, 25E	148.00
113645-001	4MB Xpand Mem. DP386 20E, 25E	358.00
113646-001	1MB Module DP386S-16	110.00
115144-001	1MB Module DP386-33, 486-25, Syspro	158.00
116558-001	8MB Module 486-25, Syspro	899.00
116559-001	32MB Module DP486-25, Syspro	4,990.00
117077-001	512KB Mem. BD Portable LTE	119.00
117081-001	1MB Mem. BD Portable LTE 286	99.00
117081-002	2MB Memory BD Portable LTE 286	158.00
118304-001	1MB Module for SLT/386	174.00
118304-001	2MB Module for SLT/386	270.00
118305-001	4MB Module for SLT/386	630.00
118688-001	1MB Module DP286N, 386N	90.00
118689-001	2MB Module DP386N, 386S-20	168.00
118690-001	4MB Module DP286N, 386N, 386S-20	396.00
118700-001	0-4MB Exp-BD DP286N, 386N	108.00

**LASER PRINTER MEMORY**

Cat. #	WORKS WITH	NSI
H33474B	1MB HPLaser Jet IIP, III, IIID	99.95
H33475B	2MB HPLaser Jet IIP, III, IIID	139.95
H33477B	4MB HPLaser Jet IIP, III, IIID	214.95
H33443B	1MB HPLaser Jet II & IID	99.95
H33444B	2MB HPLaser Jet II & IID	139.95
H33445B	4MB HPLaser Jet II & IID	214.95
EP1000	1MB Epson EPL-6000	129.00
EP2000	2MB Epson EPL-6000	169.00
EP4000	4MB Epson EPL-6000	249.00
T11000	1MB Texas Instrument MicroLaser PS	129.00
TB1000	1MB Toshiba Page Laser 6	118.00
TB2000	2MB Toshiba Page Laser 6	164.00
TB3000	3MB Toshiba Page Laser 6	208.00
TB4000	4MB Toshiba Page Laser 6	248.00

Cat. #	WORKS WITH	NSI
1039136	1MB IBM Laser 4019; 4019E	129.00
1039137	2MB IBM Laser 4019; 4019E	169.00
1038675	3.5MB IBM Laser 4019; 4019E	229.00
M6005	1MB Apple LaserWriter II/INTX	85.00
M6006	4MB Apple LaserWriter II/INTX	319.00
S63-1300	1MB Canon LBP-B11	119.00
S63-1880	2MB Canon LBP-B11	189.00
N/A	4MB Canon LBP-B11	269.00
PA1000	1MB Panasonic KXP4420; KXP4450	118.00
PA2000	2MB Panasonic KXP4420; KXP4450	164.00
PA3000	3MB Panasonic KXP4420; KXP4450	208.00
PA4000	4MB Panasonic KXP4420; KXP4450	248.00

**TOSHIBA MEMORY**

CAT. #	DESCRIPTION	NSI
PC6-PA7137U	3MB Mem Card Portable T3200	228.00
PC7-PA8301U	2MB Mem Card Portable T5100	168.00
PC8-PA8302U	2MB Mem Card Portable T1600	162.00
PC9-PA8340U	512K Mem Card Portable T3100E	120.00
PC9-PA8341U	2MB Mem Card Portable T3100E	168.00
PC10-PA8304U	2MB Mem Card Portable T5200 Toshiba Desktop T8500	168.00
PC12-PA8307U	2MB Mem Card Portable T3200SX	168.00

CAT. #	DESCRIPTION	NSI
PC12-PA8309U	4MB Mem. Card Portable T3200SX	389.00
PC14-PA8306U	2MB Mem Card Portable T1200XE	168.00
PC14-PA8311U	1MB Mem Card Portable T1000SE; T1000XE	218.00
PC14-PA8312U	2MB Mem Card Portable T1000SE; T1000XE	276.00
PC15-PA8308U	2MB Mem Card Portable T3100SX	162.00

**NEC MEMORY**

Cat. #	DESCRIPTION	NSI
APCH655X	2MB Mod Powermate 386/25	458.00
APCH656X	8MB Expansion Board Powermate 386/25	1,190.00
APCH657X	3MB Base Board Powermate 386/25	1,250.00
APCH850E	1MB Expansion Board Powermate SX Plus	240.00
APCH852E	4MB Expansion Board Powermate SX Plus	690.00

Cat. #	DESCRIPTION	NSI
PC21-21	1MB CD ProSpeed 286; 386SX	245.00
PC21-22	4MB CD ProSpeed 286; 386SX	569.00
PC21-26	2MB CD ProSpeed 286; 386SX	309.00
PC31-21	2MB CD ProSpeed 386	319.00
PC31-22	8MB CD ProSpeed 386	1,190.00
KTN2000	2MB Expansion Board /SX	440.00
KTN8000	8MB Expansion Board /SX	1,190.00

**AST MEMORY**

CAT. #	DESCRIPTION	NSI
500510-001	512K Upgrd Kit Prem 286 FASTRAM	39.00
500510-002	2MB Upgrd Kit Prem WS 386SX; WS 286; Bravo 286 & 386SX; Rampage Plus 286; Advntg Prem & 2; Ram Advntg; Advantage	118.00
500510-003	1MB Upgrd Kit Premium 386	96.00
500510-004	4MB Upgrd Kit Prem 386; Rampage Plus/MC; Advntg 286 & 386	310.00
500510-007	1MB Upgrd Kit Prem 386C; 386/16	65.00
500510-008	4MB upgrd Kit Prem 386C; 386/16	230.00
500510-010	Advanced FASTRAM; FASTboard 386	39.00
	512K Upgrd Kit Prem WS 386SX & WS 286; Bravo 286, Rampage + 286	

CAT. #	DESCRIPTION	NSI
500510-011	128K Upgrd Kit Bravo 286	40.00
500709-001	512K Upgrd Kit Advn 2; Rampage PC	40.00
500709-003	512K Upgrd Kit Rampage Plus/MC	40.00
500718-001	1MB Mod. Prem 386/25 & 386SX/16	65.00
500718-002	1MB Mod. Prem 386/33-25; SX/16; 486/33; 25T; 25T; 25; 25E; Adapter Board 500722-004	75.00
500718-004	2MB Upgrd Kit Prem 486 Series	166.00
500780-001	8MB Kit Prem 486 Series	870.00
500818-004	1-16MB Exp Bd Prem 386/25-33; Prem 486's	450.00
ASTSX20	1MB Mod Prem II 386SX/20	84.00

**HP MEMORY**

Cat. #	DESCRIPTION	NSI
D1354A	2MB Up-Kit Vectra QS/16S & ES12 PC	114.00
D1640A	1MB Up-Kit VECTRA QS/20PC; RS25PC & 20C	62.00
D1642A	1MB Up-Kit VECTRA QS/20PC; RS25PC & 20C	234.00

Cat. #	DESCRIPTION	NSI
D1540A	1MB Up-Kit VECTRA QS/16S	62.00
D1540A	1MB Up-Kit VECTRA QS/16S	62.00
D2150A	1MB Mod VECTRA 486 PC	78.00
D2151A	4MB Mod VECTRA 486 PC	282.00
D2152A	8MB Mod VECTRA 386/25; 486PC	300.00
D2381A	2MB Mod VECTRA 386/25 PC	144.00

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**BOCARAM/AT PLUS**—Provides up to 8MB of extended, expanded or backfill memory. Operates up to 33MHz and is set software. Uses 256K D-RAM—with OK ..... \$119.00  
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**BOCARAM 50/60**—Provides up to 4MB expanded, extended or backfill memory for PS/2 model 50, 60. Uses 1MB D-RAM—with OK ..... \$149.00  
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with 4MB ..... 349.00

**BOCARAM/AT-I/O PLUS**—Provides up to 4MB of Extended, Xpanded or backfill memory. For 16 bit bus. Operates up to 33 MHz and is set software, has serial and parallel port. Uses 1MB D-RAM—with OK ..... \$149.00  
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**BOCARAM 50Z**—Provides up to 2MB, 0 wait state, expanded or extended memory for IBM, PS/2 model 50, 50Z, 60. Uses 11MB D-RAM—with OK ..... \$129.00  
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## KEY TRONIC PROFESSIONAL SERIES MOUSE

**K**ey Tronic's Professional Series mouse is a two-button mouse, available in either a serial or a bus version. I reviewed the serial version.

Quick to install, the mouse came with complete and easy-to-follow documentation. You can connect the mouse to a 9-pin port or use the 9-to-25 pin adapter which comes with the mouse.

Key Tronic has contoured the mouse to fit your hand comfortably and has provided raised dots on the left button for quick orientation. Each of the buttons worked well; clicking and double-clicking achieved the desired results in the software I tried the mouse with. The mouse worked equally well on a pad or on a desktop.

Included on the disk is a nice extra: menuing software for *WordPerfect* 4.2 and 5.0, *Lotus 1-2-3* 1A and 2, and *dBASE III PLUS*. You also get a mouse test program.

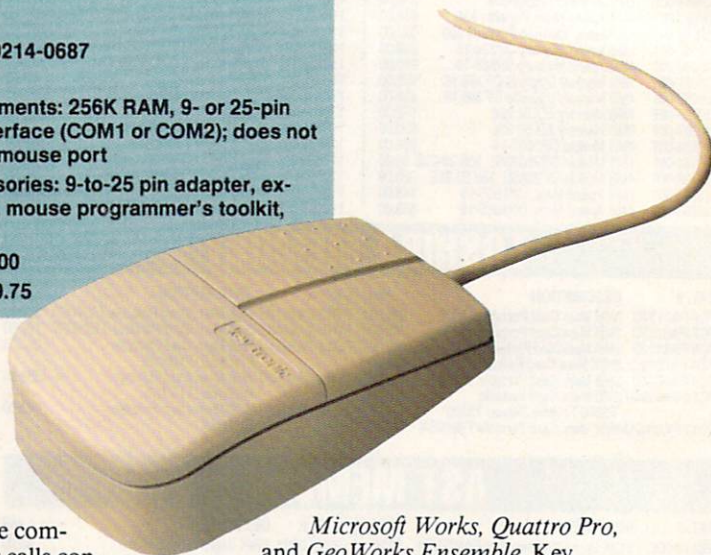
Another attractive feature is Key Tronic's toll-free support line, al-

**KEY TRONIC**  
P.O. Box 14687  
Spokane, WA 99214-0687  
(509) 928-8000

**System Requirements:** 256K RAM, 9- or 25-pin serial port interface (COM1 or COM2); does not support PS/2 mouse port

**Included Accessories:** 9-to-25 pin adapter, extension cable, mouse programmer's toolkit, mouse pad

**List Price:** \$109.00  
**Street Price:** \$59.75



though I expect the company gets very few calls concerning the installation or operation of this mouse.

This mouse worked well with all the software I tried it with, including

*Microsoft Works, Quattro Pro, and GeoWorks Ensemble.* Key Tronic claims it will work with hundreds of software programs, including all of the most popular applications. ▸

STEPHEN LEVY

### Mouse Driver Basics

My experience with mice has taught me one important lesson: Always use the latest Microsoft mouse driver.

Since almost every Microsoft product supports the mouse, most Microsoft software comes bundled with the latest driver. You may have ignored these drivers in the past, especially if you don't have a Microsoft mouse, but there are some good reasons to try them.

First, new applications often demand new drivers, and your current driver may not work with newer software.

In addition to compatibility, the latest driver is probably a better performer than previous ones, and it's usually more bugfree.

So, if you're offered a newer driver with a Microsoft product, try it. Since most mice are Microsoft compatible, the chances are good it will work with your mouse. The

problem you'll run into is that it probably won't work well. At least not without some adjustment.

With most non-Microsoft mice, the Microsoft driver will be sluggish. You can adjust the sensitivity of the driver and cure this problem, but unfortunately, the information you need to do this appears only in the mouse manual that comes with the Microsoft mouse. If you don't have a Microsoft mouse, you're left holding the short end of the mouse tail. Here are some guidelines to make your mouse work with a Microsoft mouse driver.

There are two ways to adjust the mouse's sensitivity. You can combine horizontal and vertical sensitivity into one number with

**DEVICE=MOUSE.SYS /Sn**

where *n* is sensitivity. Or specify horizontal and vertical sensitivity separately with

**DEVICE=MOUSE.SYS /Hn /Vn**

with the numbers after H and V indicating the horizontal and vertical sensitivities, respectively.

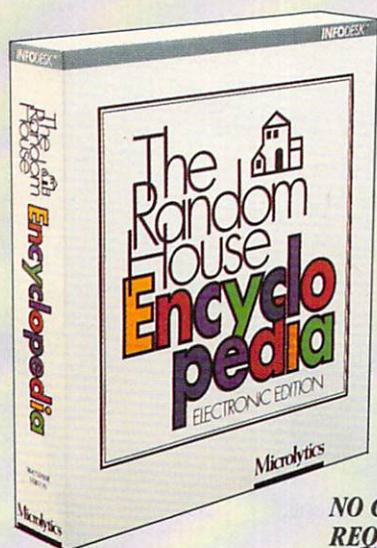
The value for *n* can range from 5-100. Higher numbers make for a faster mouse. The same syntax works for device drivers installed in CONFIG.SYS (MOUSE.SYS) or as a TSR (MOUSE.COM).

I've found that for non-Microsoft mice, sensitivities of 50 and higher work best. Start by finding the number that works well using the /S switch. Then fine-tune the mouse's movement by specifying separate numbers for horizontal and vertical sensitivities.

—CLIFTON KARNES



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## THE MOUSE BENCHMARK TESTS REVEALED

You can hold it, maneuver it, and price it, but how will you know whether a mouse or other pointing device has what it takes for your applications? Our benchmarks should help. Following are some explanations to assist you in sorting out the facts.

### Time for 60,000 Mouse Driver Interrogations

Mouse-driven software relies on the mouse driver to keep up with the status of the mouse, including the cursor position and state of each button. To get this information, applications need to make a call to the mouse driver that reads this information.

The faster the driver returns the information, the less time the application spends waiting for the update. That means that applications perform more efficiently and you spend less time waiting for the program to perform its housekeeping chores.

Our benchmark program timed 60,000 reads, and you can see the results in the chart labeled "Time for 60,000 Mouse Driver Interrogations." The lower bars indicate the better performances.

### Vertical Sensitivity Reported for Entire Screen

Your mouse reports even the smallest movement to the software driver. A mickey is a unit of distance which is approximately

1/200th of an inch. The mouse software keeps track of where the mouse is by counting the number of mickeys the mouse device moves horizontally and vertically. The greater the sensitivity setting of the software, the greater the movement on the screen for each device movement.

We performed our vertical sensitivity benchmark test three times and then calculated the average of the three. The tests report the actual number of mickeys that the mouse moved as the cursor traveled from the top of the screen to the bottom of the screen. The greater the number, the more mickeys the mouse traveled and the greater the mouse device movement required to move the mouse cursor on the screen.

How do you know what's best for you? That depends on how you like your mouse to respond. If you prefer more movement of the mouse cursor for less movement of the mouse device, then greater sensitivity will suit you. If you look at the graphs, you'll notice that the lower bars indicate less movement of the mouse device required to move the cursor down the screen. That means they're a bit more sensitive.

If you use a desktop publishing, CAD, or art program, you might want the driver set to a lesser sensitivity. That will give you greater accuracy as you use your mouse.

Most mouse software can be config-

ured to various settings when it is installed. We used the default settings and then doubled that sensitivity for the second test.

### Horizontal Sensitivity Reported for Entire Screen

Just as our vertical sensitivity benchmark test reports the number of mickeys that the mouse device traveled while the mouse cursor moved from the top of the screen to the bottom, the horizontal test reports the number of mickeys that the mouse device moved while the mouse cursor moved from the left side of the screen to the right.

The greater the number, the more mouse movement required to move the mouse cursor. So the higher bars indicate that the corresponding mice were set for less sensitivity.

### Sensitivity Reported for One Inch of Vertical Screen Movement

This test reports the number of mickeys that the mouse moved for a vertical screen cursor movement of one inch.

### Sensitivity Reported for One Inch of Horizontal Screen Movement

This test reports the number of mickeys that the mouse moved for a horizontal screen cursor movement of one inch.

—RICHARD C. LEINECKER

## KRAFT MOUSE

The Kraft mouse is a three-button mouse whose low-current design accommodates a wide range of computers, from laptops with 5-volt RS-232 ports to standard desktops with 12-volt ports. The mouse also comes with 9- and 25-pin connectors, making it easy to connect to any serial port.

Pressing the middle of the Kraft's three buttons is the same as pressing the left and right buttons simultaneously. The exact operation depends on the software you happen to be using.

The mouse driver can be installed manually or automatically on hard drives or floppy drives. Installation and operation are clearly explained in the two slim manuals that accompany the mouse. Advanced users can customize their installations.

The accompanying software offers users a resident utility for changing the resolution of the mouse from 10 to 1150 dots per inch (dpi). Most mice have a resolution of 200 to 340 dpi. You can make adjustments at any time while running most mouse-supported applications.

Additional features permit the Kraft mouse to be used with applications that normally do not support a mouse. Several menus are supplied for such programs as *Lotus* and *WordPerfect*. An accompanying script language permits you to create custom pop-up menus for almost any application that does not normally support a mouse.

The Kraft mouse appears to be well made, has a solid feel, and comes with a five-year warranty. The ability to fine-tune its cursor sensitivity is a particularly attractive feature. When used with a fast-moving arcade game, the ball occasionally seemed slow to engage the contacts. In testing with other games, applications, and CAD packages, however, the Kraft mouse performed extremely well. ▶

TOM NETSEL

**KRAFT SYSTEMS**  
450 W. California Ave.  
Vista, CA 92083  
(619) 724-7146

**System Requirements:** 128K RAM

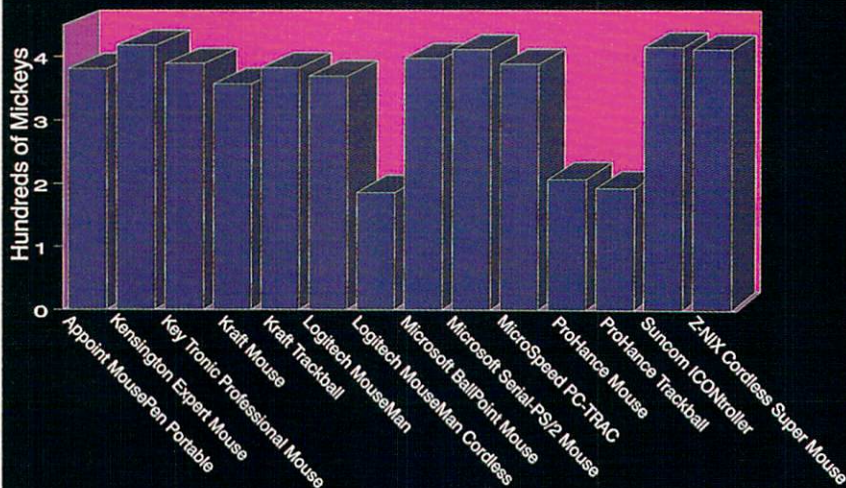
**Included Accessories:** two manuals, 3 1/2- or 5 1/4-inch disks with drivers, *MenuPops* software

**List Price:** \$79.95 (\$99.95 with *Telepoint* software)

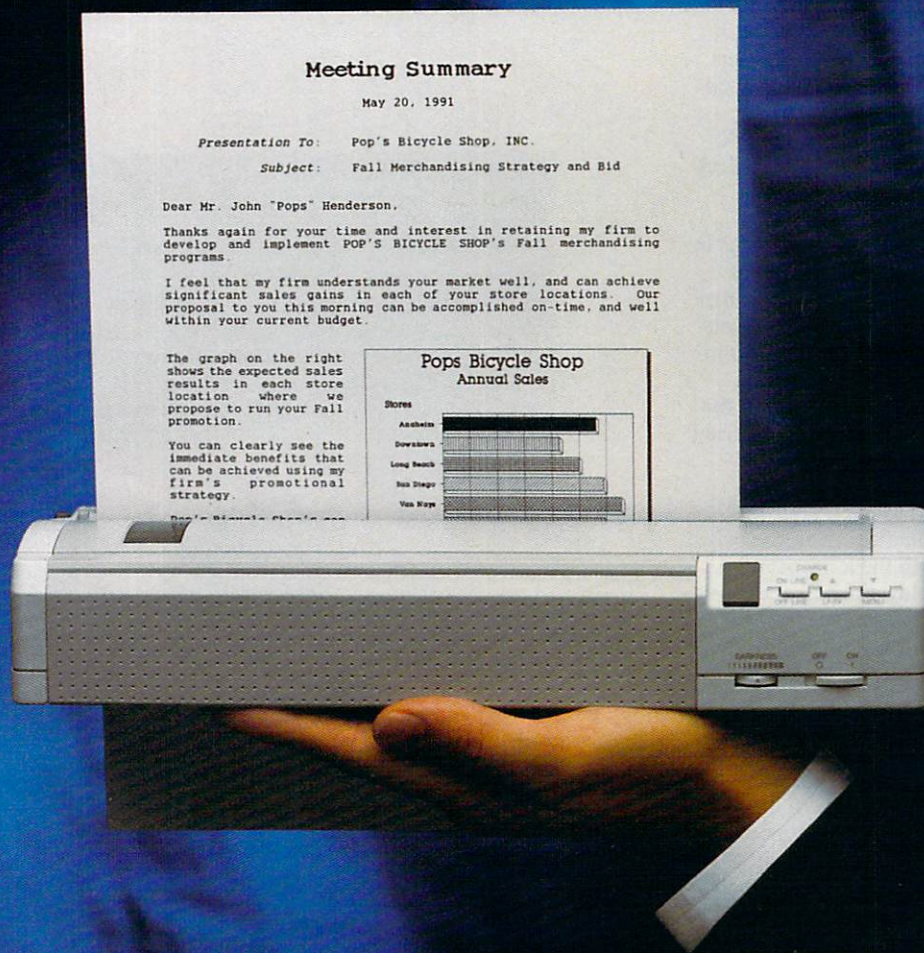
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## KRAFT TRACKBALL

**M**ost mice would feel right at home amid the clutter of my desk top—but not mechanical mice. That's why the prospect of using this Kraft trackball intrigued me. Finally I'd have room on my desk, not to mention the freedom to move unencumbered around the desk top on my screen.

Software installation was a snap—I just followed the directions in the documentation, which I rate as very good. Don't overlook the on-disk documentation, which provides plenty of valuable information about optimizing for your applications.

Switching from my mouse to the Kraft trackball took some getting used to—rather like learning a new gear-shift configuration. With practice, however, I began to appreciate it. I placed my middle fingers on the ball and my thumb on the leftmost of three buttons below the ball and was able to traverse the screen fairly easily. Using the right button or the middle button is less natural, more difficult, and, thankfully, seldom required. A few of the applications I use allow me to highlight text by clicking and dragging, and this would be unbearably awkward had Kraft not been thoughtful enough to include a fourth button above and to the left of the ball. It functions like the left button, but click it once, and it's locked—end of problem. Drag to your heart's content.

I have only two problems with the trackball. The buttons are harder to push than the mouse buttons on my Microsoft mouse, though not unreasonably so, and occasionally the ball skids while the pointer jogs in place. I remedied the latter problem with a quick back-and-forth movement.

Interestingly, the software that comes with the trackball lets you use it with mouse-driven applications and those that aren't mouse driven. You can customize the mouse driver several ways to set speed, port recognition,

and other elements. Kraft includes an adapter so that you can use your trackball with either a 9-pin connection or a 25-pin connection.

If your mouse is hampered by the clutter on your desk and you're ready to consider an alternative, take a look at the Kraft trackball, a capable and versatile pointing device. ▸

MIKE HUDNALL

**KRAFT SYSTEMS**  
450 W. California Ave.  
Vista, CA 92083  
(619) 724-7146

**System Requirements: 128K RAM**

**Included Accessories: 3½-inch and 5¼-inch disks with Microsoft-compatible drivers, 9-to-25 pin adapter, two manuals, dust cover**

**List Price: \$99.95 for the economy package (\$119.95 for package with foot pedal and Tele-paint software)**

**Street Price: \$69.00**



All Benchmark/Performance Testing is conducted by Computer Product Testing Services, Inc. (CPTS), an independent testing and evaluation laboratory based in Manasquan, New Jersey. Every effort has been made to ensure the accuracy and completeness of this data as of the date of testing. Performance may vary among samples.

# LOGITECH MOUSEMAN

If you think all mice are created equal, try Logitech's new MouseMan. It sports a radical new shape that fits your hand like a leather steering wheel in an expensive sports car. And because Logitech recognizes that everyone isn't right-handed, the company offers the ultimate in custom tailoring—right- and left-handed models.

For a long time I've been an avid fan of the Microsoft mouse. But after using the MouseMan, I must say that I prefer it considerably over the Microsoft mouse. First, it has a more natural feel because of the slight right-hand downward slope of the case. You'll find it much less fatiguing than the average mouse. Second, it has three buttons for complete flexibility in your applications.

The MouseMan comes packaged with Logitech's latest version of *MouseWare Utilities*. Most of the utilities are easy to use and quite helpful in configuring the mouse or for use with other applications. The drivers allow you to adjust cursor sensitivity for pinpoint precision or extra high speed. I found the 400-dpi resolution adequate for my desk top. A Control Panel TSR lets you make quick and easy adjustments at the touch of a button. You get a custom mouse driver for *Lotus 1-2-3* and one that provides three-button support in *Microsoft Windows*. In addition, you get *Go-Menu*, a program that lets you create mouse menus for applications that are keyboard based. Logitech's manual offers clear explanations of these utilities, as well as examples of how to implement them.

I found the Logitech MouseMan package very complete and easy to use. The MouseMan itself is very sturdy and feels better than any other mouse I've tried. If you're thinking about buying a new mouse, I strongly recommend the MouseMan. ▸

TROY TUCKER

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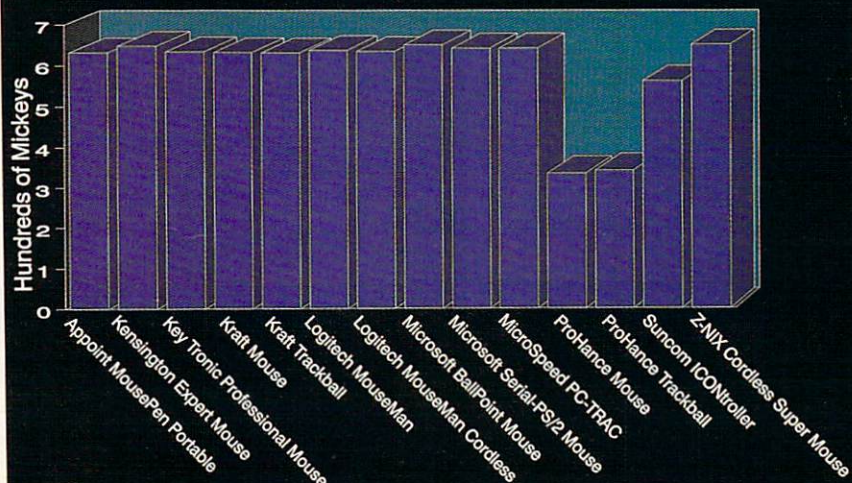
**System Requirements:** 384K RAM, dual floppy drives or one floppy drive and one hard drive, DOS 3.0 or higher (3.1 or higher for use with *Windows*), 9- or 25-pin serial port

**Included Accessories:** *MouseWare*, *Getting Started* manual, *Getting the Most from Your Mouse* manual, 3½- and 5¼-inch disks with drivers

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Street Price: \$72.50



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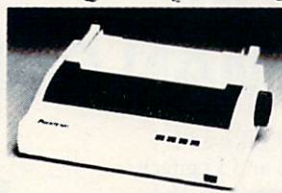
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# LOGITECH MOUSEMAN CORDLESS

The best-laid plans of mice and men, or rather mice and Logitech, have finally come together. The result is the MouseMan Cordless, a mouse that runs mazes around any trackball or short-tailed mouse that dares to come near it.

Movement of the MouseMan Cordless is practically unlimited without a cord to get in the way. The mouse itself is light and easy to move, and the buttons press easily. I found the tracking a bit too sensitive at the default setting, but that's easily fixed with the *CLICK* pop-up menu included in the software.

The MouseMan is programmed with an adjustable ballistic effect that causes the cursor to speed up and slow down with your movements. Low sensitivity in tandem with a high ballistic effect gave me the most control and the best feel.

Installation is a snap. A radio transmitter in the mouse unit controls the onscreen pointer. Its eight-channel receiver plugs into your computer's serial port or PS/2 dedicated port.

Software includes mouse drivers; *Mouse-2-3*, for use with *Lotus 1-2-3* versions 2.2 and lower; *LOGI-MENUS*, which contains other pre-programmed menus for popular nonmouse applications; and *GO-MENU*, which allows you to create or customize your own menus. Another nice feature is the ability to swap buttons for left-handed use, which, surprisingly, doesn't feel that awkward.

My only real criticism is that I found no advantage to having the unit shaped for my right hand. A smaller unit designed for either hand would have been a lot more comfortable.

Although Logitech's MouseMan Cordless isn't perfect, it could, with a little refinement, be the best thing that ever happened to computer mice. >

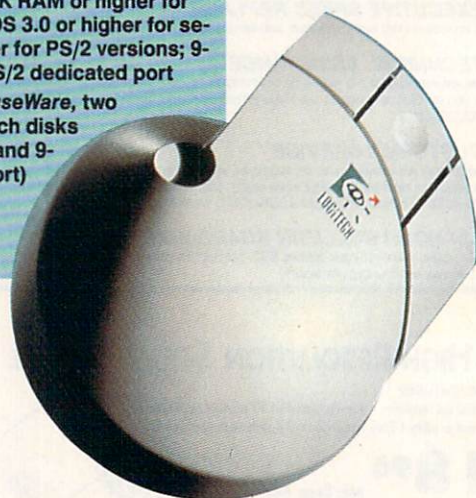
JILL CHAMPION

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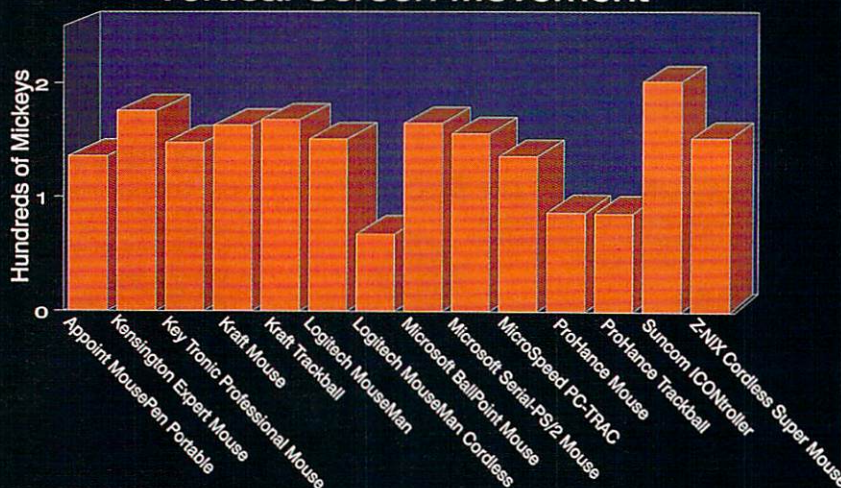
**System Requirements:** 256K RAM or higher for *MouseWare* software; DOS 3.0 or higher for serial versions, 3.3 or higher for PS/2 versions; 9- or 25-pin serial port or PS/2 dedicated port

**Included Accessories:** *MouseWare*, two manuals, 3½- and 5¼-inch disks with drivers, 9-to-25 pin and 9-to-6 pin (for PS/2 style port) adapters

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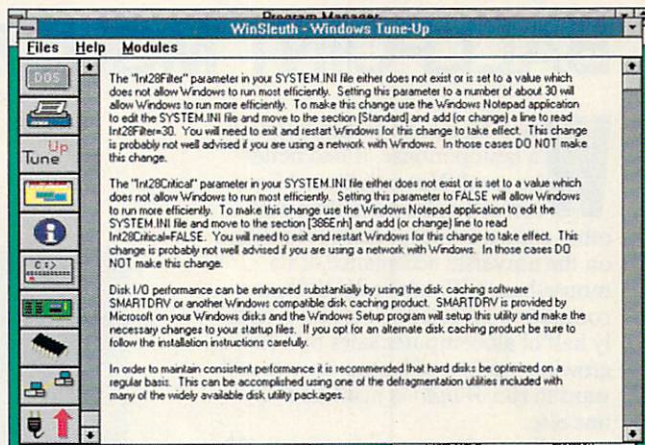
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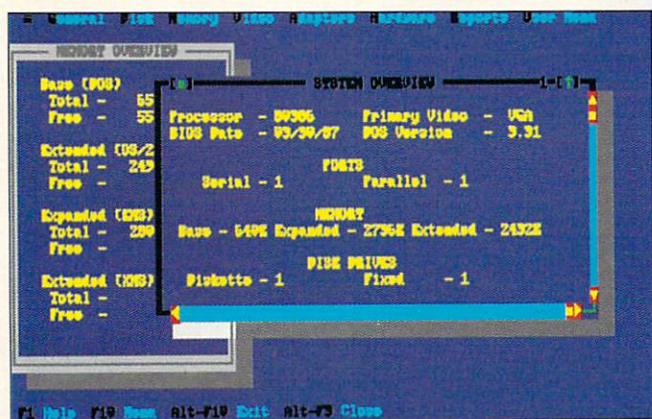
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# MICROSOFT BALLPOINT MOUSE

**W**hen Microsoft comes out with a laptop mouse, it had better be good. Not only does Microsoft sell more mice than any other company, but it has a lot riding on the universal acceptance of its mouse-based *Windows*. With laptop computers expected to comprise nearly half of all computer sales by 1994, a growing number of laptop owners will want to run *Windows* just like everyone else.

Microsoft's answer is a small 400-dpi trackball that clamps onto your laptop computer. Because laptops come in many shapes and sizes, the package includes several sizes of clamps that let you attach the BallPoint directly onto your laptop.

The BallPoint's mouse driver lets you choose any combination of its four buttons and set up its orientation. (Because you can position the BallPoint in a variety of angles, you need to tell the mouse driver which directions are up, down, left, and right.) The package also includes a new *Windows* Mouse Control Panel that lets you adjust the BallPoint's acceleration, double-click speed, and vertical and horizontal sensitivity.

At first, I didn't like the BallPoint—I couldn't attach it in a way that seemed comfortable for me. I also didn't like having to detach it every time I moved my laptop. (With most laptops, you can't close the case until you remove the BallPoint's clamps.) Later, when I discovered I could take off the clamp mechanism and set the BallPoint beside my laptop, I was won over.

Microsoft understands that BallPoint users may need a warming-up period—the company is offering an unusual 30-day money-back guarantee. The only way you'll know if it's right for you is to try it. ▸

DAVID ENGLISH

**MICROSOFT**  
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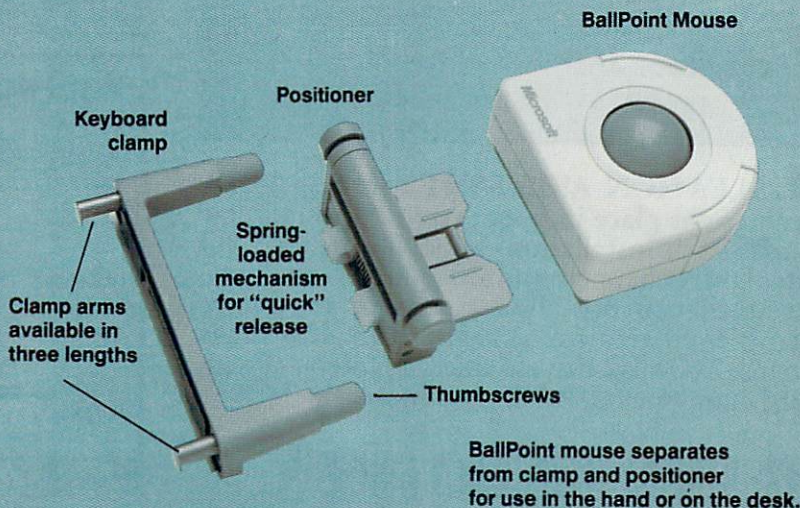
**System Requirements:** 20K RAM,  
9-pin serial port or PS/2 mouse  
port (optional 25-pin serial port  
adapter available)

**Included Accessories:** universal clamp,  
Microsoft mouse driver 8.0, carrying  
case, adapter for PS/2-style port

**List Price:** \$175  
**Street Price:** n/a



## BallPoint Installation



# MICROSOFT SERIAL-PS/2 MOUSE

**M**icrosoft revolutionized the mouse world when it introduced its third-generation Dove-bar mouse in 1987. In addition to a new streamlined shape and Ivory-soap color, the Microsoft mouse boasted two revolutionary firsts: Its two buttons were different sizes (the left button, which is the workhorse button, was larger than the right), and the ball, traditionally placed under the palm of the hand, was moved forward, nearer the buttons.

The Serial-PS/2 mouse reviewed here has everything that revolutionary mouse had plus two important extras: higher resolution and a ballistic driver.

While the original Dove-bar mouse had a resolution of 200 dpi, the newest Microsoft mouse boasts a resolution of 400 dpi. The higher resolution means that it takes less mouse movement to spirit the cursor across the screen. In short, the mouse is faster.

The ballistic driver makes mouse movement more efficient by trying to second-guess your intentions. It assumes that if you're moving the mouse quickly, you want to cover a lot of screen territory fast, and it thinks that if you're moving slowly, you must be doing careful positioning.

The driver works by detecting increases in mouse speed and moving the cursor faster than normal when a speed threshold is crossed. The Microsoft driver uses 16 thresholds, so it is constantly adjusting to the speed you move the mouse.

As an example, when you move the Serial-PS/2 mouse quickly, it crosses a normal 80-column text screen with less than 1 inch of mouse movement. If you move the mouse slowly, the same cross-screen journey takes more than 3½ inches. The high-

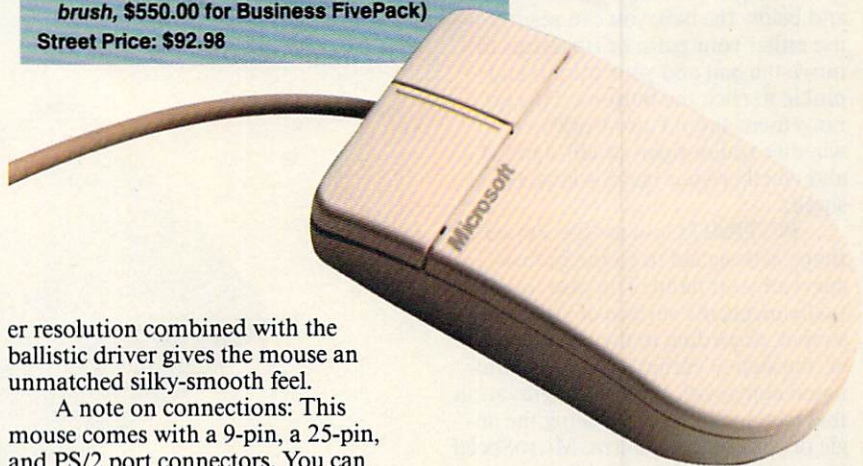
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**System Requirements:** 14K RAM, CGA, EGA, or VGA graphics card

**Included Accessories:** driver software

**List Price:** \$125.00 (\$225.00 for package with Windows 3.0, \$150.00 for package with Paintbrush, \$550.00 for Business FivePack)

**Street Price:** \$92.98



er resolution combined with the ballistic driver gives the mouse an unmatched silky-smooth feel.

A note on connections: This mouse comes with a 9-pin, a 25-pin, and PS/2 port connectors. You can plug it into almost anything but a wall socket.

For me, the Microsoft mouse is close to perfection. Its shape and balance are ideal, its high resolution easi-

ly laps the competition, and its ballistic drivers are the fastest and most surefooted in the industry. ▸

CLIFTON KARNES

## How an Optomechanical Mouse Works

Mice of this genre combine the best of both worlds—mechanical and optical—in that they use a moving ball to turn sensing rollers mechanically as well as an LED and photosensors to read and interpret the movement data. Instead of the rollers turning electrical resistors as in the mechanical mouse, the rollers in an optomechanical mouse rotate wheels with slots or holes in them through which the LED beams are aimed. The interruptions caused by the solid portions of the wheels "breaking" the beam

received by the photosensors are counted and translated into data which, in turn, controls the cursor movement onscreen. Since optomechanical mice also utilize roller balls and other mechanical components, their heft and feel make them quite similar to their purely mechanical counterparts. Optomechanical mice are very popular, second to mechanical mice, and are available from several manufacturers.

—TOM BENFORD, PRESIDENT  
COMPUTER PRODUCT TESTING SERVICES

## MICROSPEED PC-TRAC

The PC-TRAC from MicroSpeed is the perfect solution if your computer desk top is crowded or cluttered. The unit's innovative two- or three-button configurability and ergonomic design make the PC-TRAC a standout in the crowded pointing-device market.

PC-TRAC's cueball-sized ball is bordered by wraparound buttons on each side and a third, smaller button at the top. This arrangement is the best I've seen on a trackball; since the left and right buttons extend above and below the ball, you can readily use either your palm or fingertips to move the ball and your thumb and pinkie to click the buttons. This arrangement should also work well whether you're right- or left-handed and whether your hand is large or small.

PC-TRAC's low-profile sloped shape is designed to fit the natural curve of your hand. The case front actually meets the surface of your desk, so that, according to the manufacturer, the step of earlier designs is eliminated along with the wrist aggravation that came with it. In reducing the angle of your wrist and arm, MicroSpeed has minimized fatigue while at the same time allowing you to maintain precision and control.

The smaller third button can optionally emulate a middle mouse button, or, more usefully, act as a drag lock. One major problem when using trackballs with GUIs such as *Windows* and *GeoWorks Ensemble* is that it's very hard to move the pointer while holding down a selection button. With the drag lock feature enabled, you can click the middle button after you've positioned your pointer, move the pointer, and click the middle button again to release. As far as the computer knows, you were holding down the button the whole time. PC-TRAC also has a chord mode, which allows you to simulate holding down both buttons while moving the

mouse. Generally I've found trackballs awkward to use with GUIs, but drag lock eliminates this awkwardness. PC-TRAC was much easier to use than a mouse for games such as flight simulators.

MicroSpeed selected the 2.25-inch ball because its research showed a significant increase in pointing control with larger-diameter balls. Research revealed as well that higher mass also contributed to user control, and the 2.25-inch ball offers 30 percent more mass than a 2-inch ball and 70 percent more than a 1.5-inch ball.

For its suspension design, MicroSpeed uses bearings made of Delrin plastic. In addition to being self-lubri-

cating, they are more resistant than metal bearings to pitting, dirt, and damage due to mechanical shocks (such as being dropped).

Software support is excellent. The trackball is fully compatible with the Microsoft mouse driver. The included PrecisionPointer drivers for DOS and Windows offer a number of trackball-specific enhancements, such as ballistic gain (the distance the pointer moves depends on how fast you spin the ball). Also included is KeyMAP, a driver for text-based applications, as well as a *Tetris* driver and a special trackball-compatible version of the ever-popular *Welltris*. ▸

DENNY ATKIN

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System Requirements: available bus slot (for bus version) or serial port  
Included Accessories: PrecisionPointer device driver with AutoAdjust resolution, AutoCad ADI digitizer driver, KeyMAP keyboard emulator with templates, Welltris, 9-to-25 pin adapter  
List Price: \$119.00 (\$139.00 for bus version)  
Street Price: \$52.50



# PROHANCE MOUSE

**F**ew accessories prove as useful as the ubiquitous mouse, and almost no mouse user would want to surrender such a timesaving tool. Mouse quality does vary, however, and for discriminating shoppers, the ProHance mouse is a contender for best buy.

The ProHance mouse driver supports resolutions of 50–800 dots per inch (dpi), allowing for extremes of precision or speed, whatever your needs may be. For intricate pixel-by-pixel drawing, the ProHance mouse provides more than enough steady control, and for moving place to place in a hurry, 800 dpi is plenty. Some DOS-based applications don't ordinarily offer mouse support (*Lotus 1-2-3* and *WordPerfect* prior to version 5.1 are good examples), so ProHance includes a set of pop-up menu templates that transparently provide abbreviated keystrokes and rapid cursor movement—a welcome boost to your productivity.

If your favorite software isn't already supported, a separate utility allows for custom menu creation. Used with software that features mouse adjustment as part of its architecture—the *Windows* control panel, for instance—the ProHance driver complies with such adjustments without grumbling, allowing for trouble-free transitions from DOS to multitasking environments.

Designed to be used as either a PC or Microsoft mouse, the ProHance mouse comes with the three requisite buttons for PC mode. Because I prefer a firmer button press, the ProHance mouse's plastic *click* left me feeling ambivalent toward the mouse design.

ProHance Technologies gives you an antistatic mouse pad for superior tracking, though control suffers little on other surfaces, such as a desk top. A mouse pocket, complete with adhesive backing, may be affixed to your monitor, your computer, or another convenient spot, and provides

## PROHANCE TECHNOLOGIES

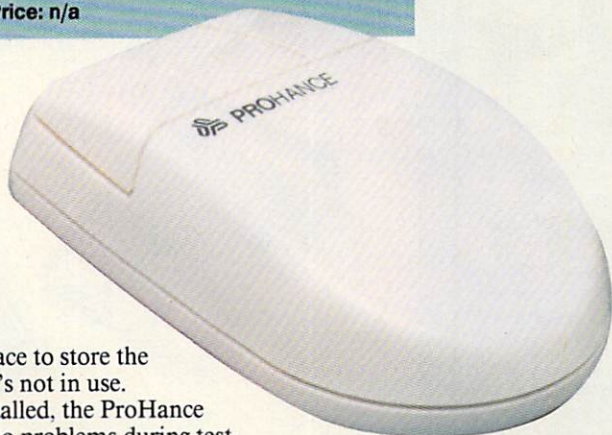
1307 S. Mary Ave., #104  
Sunnyvale, CA 94087  
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**System Requirements:** 10K RAM, serial port or PS/2-style mouse port

**Included Accessories:** driver, 9-to-25 pin adapter, mouse pad and pocket

**List Price:** \$69.95 (\$74.95 for bus mouse, \$104.95 for bus mouse package with mouse pocket and pad and professional paint program)

**Street Price:** n/a



an excellent place to store the mouse when it's not in use.

Easily installed, the ProHance mouse posed no problems during testing and worked well in both games and productivity software. As either a replacement or first-time mouse purchase, this mouse delivers both stand-

ard versatility and a few extras—a solid value at its price. ▶

DAVID SEARS

## How a Mechanical Mouse Works

As you might guess from its name, the mechanical mouse uses mechanical means to generate signals governing cursor movement. A heavy ball (either solid hard rubber or steel covered in rubber) moves against sensing rollers inside the mouse body. The rollers have contact brushes which stroke a sensing conductor with multiple segments. Electrical impulses are generated as the rollers rotate along the segments of the sensor and are counted by the electronic circuits within the mouse body.

Forward movements of the mouse

generate positive impulses, while rearward movements produce negative impulses; in a like manner, left and right movements produce either positive or negative impulses from the lateral (side) rollers. Angular movements causing both the vertical and lateral rollers to rotate simultaneously produce dual readings for oblique directions. The counting circuitry calculates the x and y screen coordinates from the rotational data produced by these rollers and conveys the signal to the cursor of the host PC.

—TOM BENFORD, PRESIDENT  
COMPUTER PRODUCT TESTING SERVICES

## THE TALE OF THE MOUSE

*Where did mice come from? They have become so popular so quickly that it might seem they came out of the woodwork. But it was a bit more complicated than that . . .*

The mouse actually evolved from a philosophy that computing should be interactive—a revolutionary notion, in fact.

It might seem incredible to think so now, but there was a time when even an intense computer user would have only a passing familiarity with the hardware. In 1978, for example, my wife was attempting to run a criminology study using the campus mainframe at Central Michigan University. She had to submit programs to the system operator in batch format on printed cards, wait overnight, and then retrieve a print-out (usually full of mysterious error messages) the next day. It took her all semester to get it to run properly, and even at that, she was the first person in the class to succeed.

Being able to *interact* with a computer in realtime, through the use of a terminal or by actually having a microcomputer on the desk in front of you, is really nothing short of revolutionary, when you consider how awkward it once was to "run" a computer.

But once it was possible to interact directly, the keyboard instantly seemed inadequate. After all, the computer could easily cope with our input even if we could type thousands of words a minute. Your computer spends most of its time patiently waiting for you to press another key when you're word processing or programming or giving your computer commands on the command line.

At the same time that computers were becoming more democratic and interactive, new ways of looking at files were emerging. Files began to be thought of not

as interminable strips of code on tapes or disks but as objects that could be manipulated. You could pick up a file here and place it there, copy it in a moment, and start up the application that created it by performing a command on the file itself. Shortly thereafter, these objects began to be thought of as objects, and soon as visual objects—actual rectangles on the screen. They cried out for some easy way to manipulate them, to move them around. This was the impetus behind the creation of a mouselike input device. It was

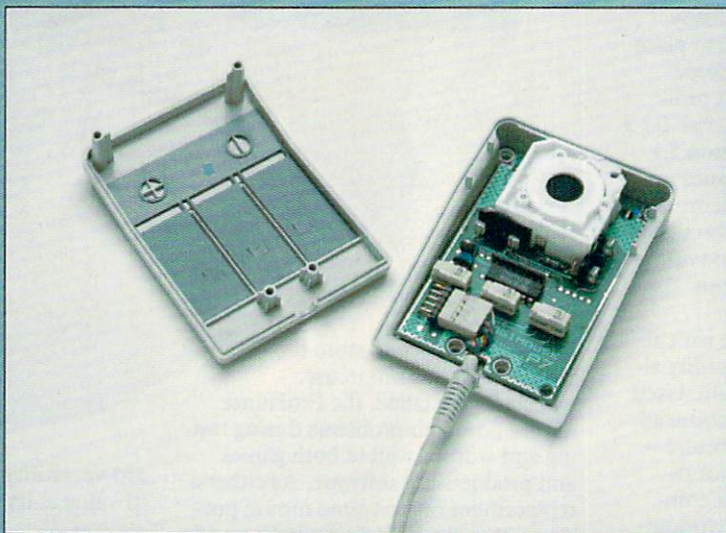
and the close-knit microcommunity members (many of whom had met as minicomputer hackers, homebrew computerists, and phone phreaks) were proud to show off their latest developments to friends and competitors alike. One fellow who took the cook's tour of Xerox PARC was Steve Jobs, then the head chutzpa at Apple Computer. He liked what he saw, as was evident in the Lisa computer, which took many of the ideas Xerox had introduced on its own failed computer, the Star. Lisa also managed to fail, probably because she was extremely overpriced (at \$10,000) and moderately underpowered. One thing everyone could agree on, though, was that the operating system and the innovation of the mouse (provided with each Lisa) made file management a breeze.

Little wonder that when Jobs came out with the Macintosh, a computer that was only moderately overpriced (but made up for it by being extremely underpowered), he continued to provide the mouse. Yuppies bought Macintoshes by the bushel, and the rest is history.

Microsoft created *Windows* to provide a mouse-driven, graphical interface for the PC. Thereafter, no computer could be taken seriously unless it had a

mouse. Even the waning 8-bit computers were dutifully outfitted with mice. Within a period of about three years, mice had completely saturated the market, changing the way people interact with and think about computers forever. Mice have led the graphical revolution, in essence allowing the user not only to interact directly with the computer but to reach inside the computer and manipulate files. What's the difference between entering `ERASE filename.ext` on the command line and sliding a file icon in the trash can? Simply, a mouse and a mouse-based operating system.

—ROBERT BIXBY



Today's mouse makes computing easier and more interactive than ever.

equipped with a roller underneath, two switches, and a long cord that carried its impulses to the computer. Because of its size and shape, with switches a little like ears and a cord a lot like a tail, the device was dubbed *the mouse*.

But so far, the mouse was a meek and little-noticed creature. It scurried around desk tops at a research facility operated by Xerox: the Palo Alto Research Center, known familiarly as PARC.

Those were exciting, freewheeling times. Microcomputers were just appearing on the market. The concept of trade secrets was still largely a thing of the future,

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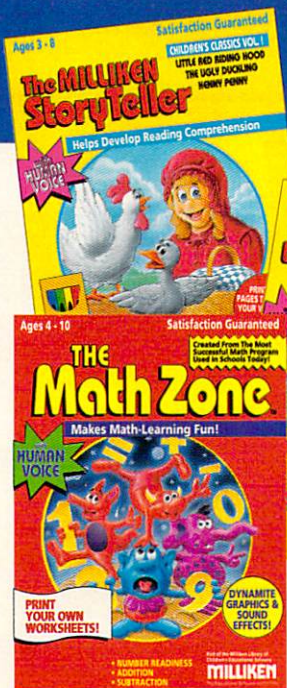
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## MOUSE RESOLUTION

Your computer's screen is composed of thousands of points called *pixels*. The number of pixels horizontally and vertically is often referred to as the *screen resolution*.

Mouse manufacturers typically list the resolution that their products are capable of in dots per inch (dpi). They might specify a capability of up to 1150 dpi or a capability of 10-1150 dpi. These numbers translate to the number of dots that the mouse cursor moves for every inch that you move the mouse. If you move the mouse one inch in a resolution of 300 dpi, the mouse cursor will move 300 dots.

How do dots relate to pixels? That depends on your monitor. To start with, check your monitor manual for its dot pitch specification. A typical dot pitch might be .29 points per pixel. That means there are about three dots for every screen pixel. If your mouse is set to 300 dpi, then moving the mouse one inch on your desk would move the mouse 100 screen pixels.

Your monitor's dot pitch isn't all you need to know; some video modes have pixels that are larger than others. In text mode, for instance, each text cell is really com-

posed of eight pixels horizontally and vertically. That means that each time the mouse cursor moves in any direction, the mouse driver has registered the equivalent dot movement for eight pixels. Low-resolution CGA, EGA, and MCGA also have screen pixels that are larger. For these modes the mouse driver registers more dot movement for each pixel movement of the mouse cursor than for each pixel movement in higher-resolution modes.

Why buy a mouse with high-resolution capabilities? Some kinds of applications, such as computer-aided design (CAD) packages, require a very high degree of detail and input control. Using a mouse at lower resolutions would be like drawing with a crayon; the lines you draw wouldn't be any wider, but the lower resolutions would not afford the degree of control you'd need for sophisticated drawing applications. On the other hand, using a mouse at high resolutions would be like drawing with a precision writing instrument. The greater the resolution, the better your control as you move around the screen. ▸

—RICHARD C. LEINECKER

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## ProHance Trackball

The best thing about using the ProHance trackball is that you don't have to worry about room to maneuver your arm. On the other hand, my thumb got a real workout, and my wrist didn't suffer any less.

If you're right-handed, you'll find the ProHance effortless to move with the flick of a thumb, and the buttons simple to press. Hand position was comfortable overall, but constantly moving the ball with my thumb was somewhat tiresome.

If you're accustomed to using a mouse left-handed, be prepared for some problems. My little finger wasn't nearly as flexible as my thumb when it came to rolling the trackball left-handed.

Difficulty of control is probably the biggest drawback—you have to watch the screen closely, and it's hard to get a real feel for moving the pointer around. You're allowed to set resolution anywhere between 50 and 800 dots per inch (dpi), although changing it from the default (200–400 dpi) didn't give me a better feel.

The ProHance is available in serial and PS/2 versions. The serial version is compatible with a two-button Microsoft mouse or a three-button PC mouse.

A disk included with the package contains, along with the mouse driver, pop-up menus for 14 nonmouse programs, including *WordPerfect*, *WordStar*, DOS, and EDLIN.

Also, for those who can't live without a mouse or trackball device for *everything*, you can use the menu builder to create your own pop-up menus for nonmouse programs. MENU.DOC contains the instructions, along with a tutorial to help simplify the process for nonprogrammers.

The ProHance trackball is a nice piece of equipment if space is short and you really don't like dealing with mice—and if you're right-handed. ▸

JILL CHAMPION

### PROHANCE TECHNOLOGIES

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Sunnyvale, CA 94087  
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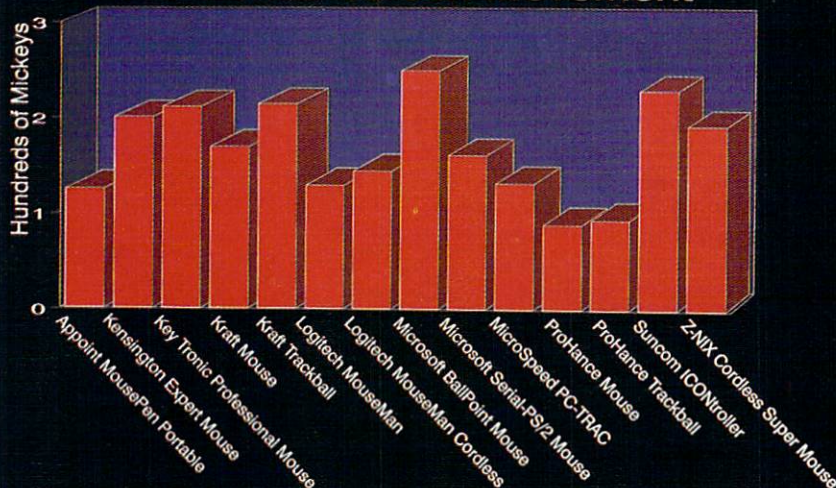
**System Requirements:** 10K RAM, serial port  
**Included Accessories:** driver, pop-up menus for nonmouse programs, menu-builder program, 9-to-25 pin adapter

**List Price:** \$99.95 (\$109.95 for PS/2 version)

**Street Price:** n/a



Sensitivity Reported for One Inch of Horizontal Screen Movement





# SUNCOM ICONROLLER

**T**his tiny, wedge-shaped joystick works as an alternative mouse and is primarily intended for laptops.

The ICONtroller is more than a joystick, though, despite appearances. It plugs into the serial port and mimics mouse movement. But it's more than a mouse, too. It's festooned with buttons that make adjustments, such as the speed of cursor movement and the kind of mouse emulation. The ICONtroller provides pixel-by-pixel movement when the joystick is deflected less than 20 degrees.

Suncom has located the mouse buttons about where you would expect to find the fire buttons on a normal joystick. There's even a "thumb button" at the top of the joystick. Holding the joystick between my thumb and second finger, I operated this button with my index finger as if it were my left mouse button. It was an intuitive positioning that I adjusted to instantly.

Although you can attach this unit to the side of your keyboard with Velcro patches, I found it more natural to operate it two-handed, with the base in my left hand and the joystick in my right. I came to appreciate the advantages of joysticks: no more desk space sacrificed to the mouse pad and no more fights with desktop clutter for control of the mouse cord, to name but two.

Don't try to draw with the ICONtroller. Technically, it's completely proportional, but my experience was that the cursor wanted to move in one of eight directions (N, NE, E, SE, S, SW, W, or NW). Therefore, it's better used as a general pointing device than as a complete mouse substitute, and in this role it was a success.

The ICONtroller was the simplest to install of all nonmouse mice I've tried and the friendliest to *Windows* and *GeoWorks Ensemble*. ▸

ROBERT BIXBY

## SUNCOM TECHNOLOGIES

6400 W. Gross Point Rd.  
Niles, IL 60648  
(708) 647-4040

**System Requirements:** serial port

**Included Accessories:** driver on installation disk  
(3½- and 5¼-inch)

**List Price:** \$99.95

**Street Price:** n/a



## How an Optical Mouse Works

Unlike the mechanical mouse, the optical mouse has *no* moving parts within its body. Instead of relying on the rotation of a ball against rollers to generate a signal for processing corresponding cursor movements, the optical mouse uses light beams produced by an LED (Light-Emitting Diode) and reflected from a special mouse pad to establish vertical and lateral positioning. The mouse pad used by an optical mouse has a special reflectorized surface with grid lines embedded in it at precise intervals. An LED in the mouse body shines its beam on this pad, and a photoreceptor within the mouse

body reads the reflected light. The grid lines interrupt the reflectivity of the beam when it passes over them. These interruptions are counted by the internal sensing circuits, and the data is passed along to the computer to control the cursor. Optical mice are very lightweight and glide effortlessly over their special reflectorized mouse pads. Though they don't have any moving parts to wear out as mechanical mice do, optical mice still do not seem to be as popular as mechanical mice.

—TOM BENFORD, PRESIDENT  
COMPUTER PRODUCT TESTING SERVICES

# Z-NIX CORDLESS SUPER MOUSE

**T**he words *sleek*, *sporty*, and *unencumbered* best describe the Z-NIX Cordless Super Mouse.

Instead of moving the mouse, untangling the cord, and then watching the cursor move, you move the mouse, and the cursor moves. It's what mice should have been from the beginning.

This mouse fits perfectly in the palm of my hand, moves across my mouse pad with little resistance, and has perfectly placed buttons. I've never had to divert my train of thought from my work to the task of making the mouse behave properly. It's the easiest and most comfortable way I've found to improve productivity with mouse-based software.

Its battery recharges every time you set it in its cradle. The cradle gets its power from the computer, so you won't have to worry about another plug. You will, however, have to remember to park it in the cradle anytime you're not using it. That way the batteries stay fully charged. It's not a design flaw; it's a matter of retraining yourself to use the mouse a new way. But the small effort to develop this habit is well worth the effort.

I didn't find any software that presented incompatibility problems. As a matter of fact, I used it to run some of the most demanding software there is, such as Microsoft's *Codeview*. If a mouse and its driver perform under these circumstances, they'll usually do well just about anywhere else. But I made sure; I put it through its paces. *Windows*, *DeluxePaint*, *Applause II*, and many more large applications didn't turn up any problems.

After publicly stating that I'd never trade my Microsoft mouse for another, I'm eating my words. This mouse will make a convert of just about anyone who uses it. □

RICHARD C. LEINECKER

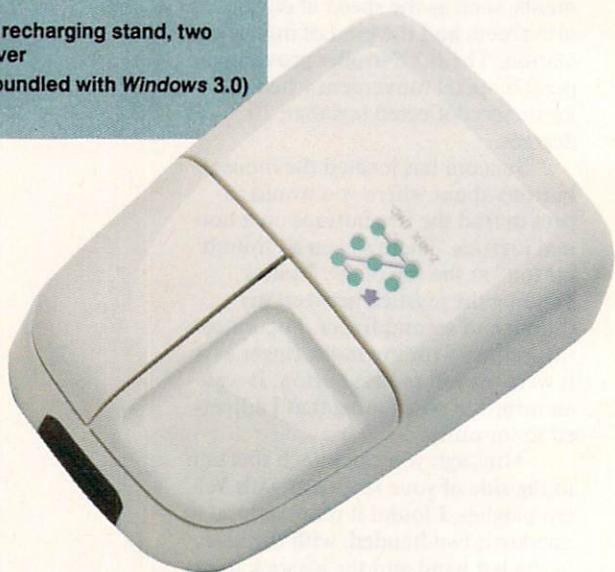
**Z-NIX**  
211 Erie St.  
Pomona, CA 91768  
(714) 629-8050

**System Requirements:** 16K RAM, serial port, one floppy drive

**Included Accessories:** recharging stand, two batteries, mouse driver

**List Price:** \$164 (\$282 bundled with *Windows 3.0*)

**Street Price:** n/a



## Important Dates in Mouse History

**1963.** Douglas Engelbart invents the first computer mouse—a simple analog device with an exterior of wood and one button.

**1970.** Xerox's Palo Alto Research Center commissions Jack S. Hawley to build the first digital mouse. The mouse becomes an integral part of the Alto computer system, which later grows into the Star, which in turn inspires both the Macintosh and *Windows* interfaces.

**1983.** Microsoft introduces its first bus mouse for the IBM PC. The mouse uses two small buttons and is mechanical.

**1984.** Apple releases the Macintosh, the first personal computer to come with a mouse as standard equipment.

**1984.** Microsoft releases a serial version of its mouse that attaches directly to an RS-232 serial port.

**1985.** Logitech introduces its famous wedge-shaped three-button mouse, the C7.

**1987.** Microsoft introduces its Dove-bar mouse. The ball is moved to the front of the mouse, and the two buttons are larger and nonsymmetrical (the left button is larger than the right).

**1989.** Microsoft introduces the 400 Series mouse, which provides 400 dpi, double the resolution of the 1987 mouse. The new mouse driver is ballistic, which means that the faster you move the mouse, the farther the cursor moves on the screen.

—CLIFTON KARNES

## GOOD MOUSEKEEPING

The best thing that you can do for your mouse is to give it a sterile environment—squeaky clean, including the mouse pad and the hands that use it—and retire it to its dust jacket at the end of the day.

How can you tell when your mouse or trackball is ready for the cleaners? The most obvious sign is reduced performance—the pointer skips on the screen, or traction feels too light or even nonexistent. In most cases, the culprit is dirt and grime on the ball and rollers. Dust and dirt on the electronic parts become electrically charged, attracting more dust and even moisture. The longer your mouse goes without a good cleaning, the faster it accumulates dirt.

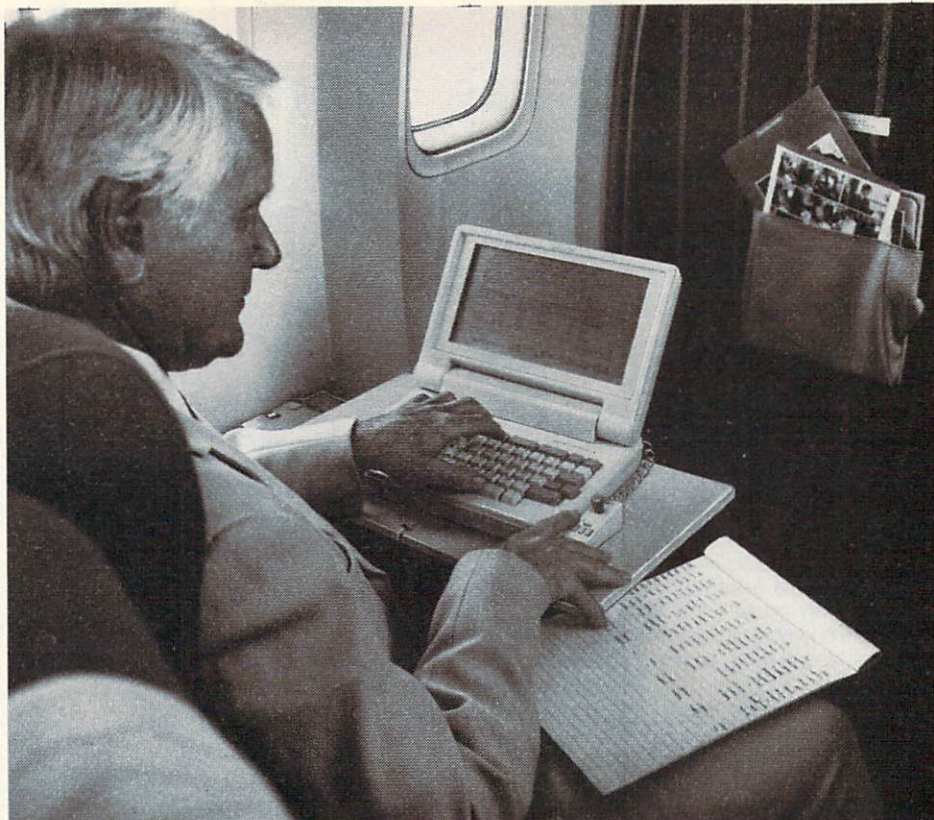
Most mice have a removable tracking ball, which makes it easier for you to get inside and clean the rollers. If you don't have a removable tracking ball, your best defense is to maintain a very clean work area to prevent dirt from entering the mouse to start with. Save the snacks and sodas for the kitchen, and make sure that your hands are clean before you handle your mechanical rodent.

Also, you should keep your mouse dry. Excessive moisture, spilled drinks, and open windows on a rainy day all add up to a drowned rat.

Some manufacturers recommend cleaning the ball, after you've removed it, with a mild detergent or noncorrosive substance like hydrogen peroxide. Others suggest wiping it with a dry, lint-free cloth. Also, the rollers must be cleaned very carefully. Use a toothpick or Q-Tip, and handle the entire unit very gently—as if it were actually *alive*. How often you use your mouse will help determine the frequency, but as a rule, the more you use it, the more often you should clean it. In fact, you probably can't clean a mouse too often. Be sure to consult your documentation for the best cleaning procedures. If you're not exactly sure how to maintain your mouse, call the manufacturer's technical support line.

If you use a mouse pad, make sure that it's lint-free and not the hairy variety—those can be hazardous to your mouse's health, quickly causing it to clog up and operate poorly. If you prefer the tabletop to a mouse pad, be sure that the surface is clean and dry and that it's dusted on a regular basis.

—JILL CHAMPION



# It's like a mouse for your laptop.

## Only without the runaround.

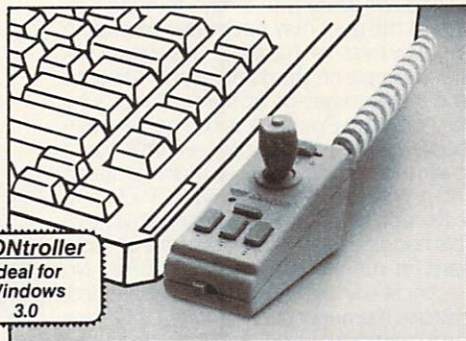
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Try ICONtroller from Suncom. It's the mouse solution for your laptop that'll stand still when you're on the move.



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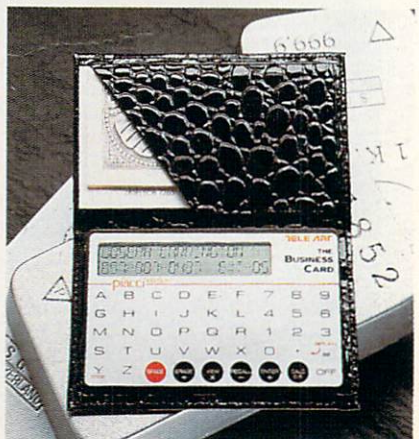
Are you one of the millions of Americans who loves to barbecue — but not only in summer? Then the Contempra Indoor Electric Char-B-Que is for you. Constructed of beautiful stoneware and measuring 15"x11¼"x4¼", this barbecue provides a 150 square inch cooking area, large enough for the entire family or for company. This energy efficient indoor electric grill has a unique reflector system that directs heat at the food,



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Even if it weren't so specially low-priced, this food dehydrator would be immensely economical. Using almost none of your valuable time, it makes nutritious, preservative-free, refined-sugar-free, *healthful* dried fruits and snacks, plus yogurt — at a tiny fraction of their price in stores. Simply slice fruit into lemon juice, spread on the perforated plastic stacking trays and forget it for 12 to 24 hours. With electrical coil at bottom, the unit is engineered for convection heating; no fan needed, so it's energy-efficient and noiseless. A 28-page instruction book provides guides for adjustable vents and timing plus enticing recipes. Treat kids to crispy banana chips, make dried apples, apricots, raisins...even beef jerkey and vegetables for soups and camping trips... try zucchini slices with sesame seeds — a dieter's dream substitute for hi-cal chips. 12" dia., UL Listed. 5-tray Dehydrator (shown) **\$51.98** (\$6.25) #A1887X. 3-tray Dehydrator **\$41.98** (\$5.25) #A1886X.

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more 3-way bulbs to buy and you pay for only as much light as you need. UL listed; one-year factory warranty. **\$15.98** (\$4.00) #A1700. 2 for **\$27.98** (\$6.00) #A17002.



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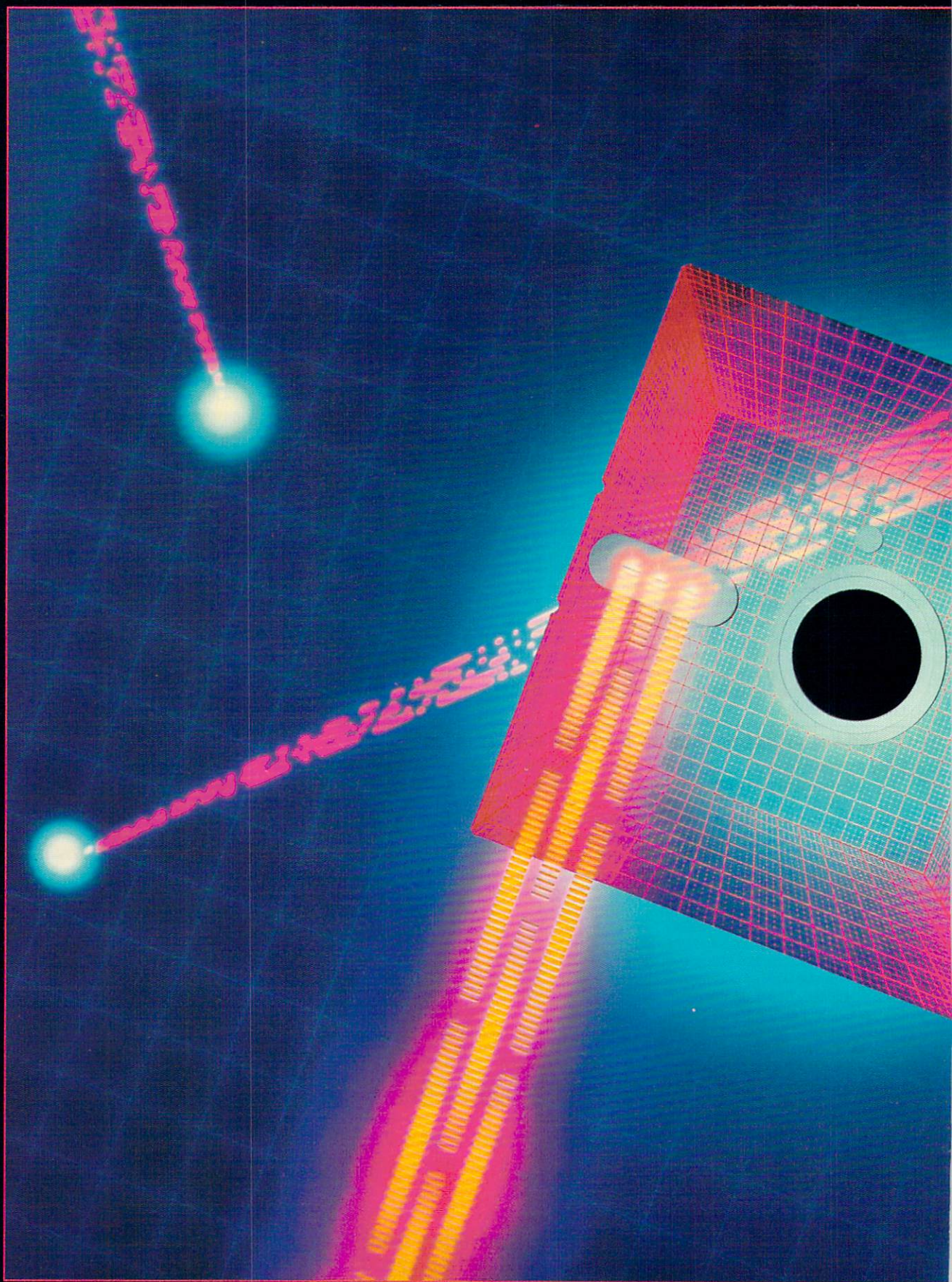
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# BEAUTIFUL BATCH FILES

DAZZLING BATCH FILES  
ARE JUST AROUND THE CORNER

**S**ince *Windows 3.0* hit the streets, it's almost embarrassing to be caught operating your PC from the old DOS prompt.

Let's face it, though. There are millions of PCs out there for which *Windows 3.0* is not a practical option. They'd need more memory, more speed, and more hard disk space than the budget will allow for anytime in this century.

But don't despair. With a little work, a little creativity, and a handful of utilities from this issue's *COMPUTE's PC Disk*, you can put some snap in your DOS interface and make your PC system easier for you and your whole family to use.

This article shows you how to create a batch file system that you can use to

- Run programs from menus rather than from the DOS prompt.
- Instruct your system to behave differently depending on who's running it.
- Create and display attractive menus and help screens.
- Include musical signals to let you know when an operation is completed.

One of the problems with DOS's batch language is that it's missing a few important features that would make it practical for a powerful menuing system.

## Problem Number 1

The main deficiency with DOS's batch language is its inability to accept and act upon user input. Solving this problem is relatively easy using a stand-alone program that accepts user input and passes an exit code back to your batch file. In fact, such a program is the centerpiece of any enhanced batch file programming and is demonstrated in the program *MENUDEMO.BAT* that accompanies this article.

Several versions of this type of utility are available under names like *GETKEY.COM*, *ASK.COM*, or *CHOOSE.COM*. *COMPUTE's* version of *GETKEY*, which is included on this issue's *PC Disk*, reports back to the batch file the ASCII code of a key pressed by the user. The *MENU* program, also on the disk, provides another method of accepting user input.

If you don't have *COMPUTE's* version of either *GETKEY* or *MENU* but do have a similar program

BY TONY ROBERTS

that accepts user input for use in batch files, you should be able to adapt it to MENUDEMO.BAT with little difficulty.

Once your program is able to accept commands from the user, you can use the other programs on the disk to make your batch programs sparkle with everything from colorful text and boxes to music.

### Variable Blues

Another problem batch programmers face is that there's no straightforward provision for using variables. This difficulty can be circumvented, though, by using environment variables to keep track of changing information. MENUDEMO.BAT shows how to capture user input, act on it, and store and retrieve environment variables. This program, although large by most batch file standards, doesn't do very much itself. It's simply a shell you can use to build your own program based on the characteristics of your system.

You'll notice that this batch program uses labels and GOTO statements liberally and keeps the entire program in one file. This keeps things simple. It saves you the trouble of remembering dozens of batch file names, and it can save quite a bit of disk space.

On a typical hard disk, where each file uses a minimum of 2,048 bytes of disk space, ten 100-byte batch files would consume 20,480 bytes while one 1,000-byte batch file would use only the minimum 2,048 bytes.

### Faster Floppies

If you run batch files from a floppy disk, however, it might be wise to break your menu system into several small files to improve execution time. If you have DOS 3.3 or above, you can use the CALL command to execute one batch file from inside another.

Why is this faster? When batch files are run, the disk is read as each program line is executed. A large batch file, run on a floppy disk, will be very slow because DOS will slog through the file line by line looking for the appropriate section.

Note also that the batch file extensions demonstrated in the program have some overhead themselves. When you execute a PUTTEXT command, for example, the PUTTEXT program runs, delivers your message to the screen, and then returns control to the batch file.

All of this activity takes time. If you want really fancy programs and plan to use several BOX and PUTTEXT statements, you'll be better off building your screens and saving them with SAVESCRN. Then your batch

## MENUDEMO.BAT

```
@ECHO OFF
REM MENUDEMO.BAT
REM A demonstration of how batch programming extensions, such as
REM BOX, PUTTEXT, NOTES, MENU, and TIMEDATE might be used in setting up
REM a master menu for your system.
IF (%user%) = ( ) GOTO logon
:mainmenu
CLS
BOX 2 5 15 3 116 2
PUTTEXT 3 7 116 Hello %user%
BOX 2 25 40 3 116 2
PUTTEXT 3 31 116 Our Family's Computer System
BOX 8 20 40 12 113 1
PUTTEXT 18 22 113 Please make a selection.
IF %user% == BILL GOTO bill
IF %user% == MARY GOTO mary
IF %user% == TOMMY GOTO notyet
IF %user% == SUZIE GOTO notyet
ECHO Valid User Not Found
PAUSE
PAUSE
GOTO end
:bill
PUTTEXT 10 22 113 A. Run CHKDSK
PUTTEXT 11 22 113 B. Set the Time
PUTTEXT 12 22 113 C. Log In New User
PUTTEXT 14 22 113 X. Exit to DOS
GETKEY
IF ERRORLEVEL 65 IF NOT ERRORLEVEL 66 GOTO chkdisk
IF ERRORLEVEL 97 IF NOT ERRORLEVEL 98 GOTO chkdisk
IF ERRORLEVEL 66 IF NOT ERRORLEVEL 67 GOTO setclock
IF ERRORLEVEL 98 IF NOT ERRORLEVEL 99 GOTO setclock
IF ERRORLEVEL 67 IF NOT ERRORLEVEL 68 GOTO logon
IF ERRORLEVEL 99 IF NOT ERRORLEVEL 100 GOTO logon
IF ERRORLEVEL 88 IF NOT ERRORLEVEL 89 GOTO end
IF ERRORLEVEL 120 IF NOT ERRORLEVEL 121 GOTO end
GOTO bill
:chkdisk
CLS
CHKDSK
NOTES 523 36 494 9 440 18
PAUSE
GOTO mainmenu
:setclock
TIME
GOTO mainmenu
GOTO end
:mary
PUTTEXT 10 22 113 A. Checkbook
PUTTEXT 11 22 113 B. Calendar
PUTTEXT 12 22 113 C. Log In New User
PUTTEXT 14 22 113 X. Exit to DOS
GETKEY
IF ERRORLEVEL 65 IF NOT ERRORLEVEL 66 GOTO cbook
IF ERRORLEVEL 97 IF NOT ERRORLEVEL 98 GOTO cbook
IF ERRORLEVEL 66 IF NOT ERRORLEVEL 67 GOTO calendar
IF ERRORLEVEL 98 IF NOT ERRORLEVEL 99 GOTO calendar
IF ERRORLEVEL 67 IF NOT ERRORLEVEL 68 GOTO logon
IF ERRORLEVEL 99 IF NOT ERRORLEVEL 100 GOTO logon
IF ERRORLEVEL 88 IF NOT ERRORLEVEL 89 GOTO end
IF ERRORLEVEL 120 IF NOT ERRORLEVEL 121 GOTO end
GOTO mary
:cbook
CLS
PUTTEXT 5 5 31 Enter commands for CHECKBOOK program in this section.
PAUSE
```



## MENUEMO.BAT cont.

```
GOTO mainmenu
:calendar
CLS
PUTTEXT 5 5 31 Enter commands for CALENDAR program in this section.
PAUSE
GOTO mainmenu
:logon
CLS
TIMEDATE
SET user=
MENU t=System Log On,m=[B]ill,m=[M]ary,m=[T]ommy,m=[S]uzie
IF ERRORLEVEL 255 GOTO NOPICK
IF ERRORLEVEL 3 IF NOT ERRORLEVEL 4 SET USER=SUZIE
IF ERRORLEVEL 2 IF NOT ERRORLEVEL 3 SET USER=TOMMY
IF ERRORLEVEL 1 IF NOT ERRORLEVEL 2 SET USER=MARY
IF ERRORLEVEL 0 IF NOT ERRORLEVEL 1 SET USER=BILL
GOTO mainmenu
:nopick
ECHO No logon selected.
SET user=
NOTES 330 9 330 9 330 9 262 18
GOTO end
:notyet
CLS
PUTTEXT 5 5 7 When setting up programs of this type, it's wise to include
PUTTEXT 6 5 7 a section that can stand in for parts of the program that
PUTTEXT 7 5 7 have not been written yet.
PUTTEXT 9 5 7 In this case, I haven't written the menus for Tommy and Suzie,
PUTTEXT 10 5 7 so the program comes here, tells you there's still work
PUTTEXT 11 5 7 to be done, and lets you proceed without error.
NOTES 1046 9 1568 9 1046 9
PAUSE
GOTO logon
:end
CLS
```

files can use LOADSCRN to load in the screen files faster than redrawing them.

Finally, if you don't have a hard disk, you can get the best performance out of this type of system by installing a RAM disk, copying the batch files and the batch file extension programs to the RAM disk, and running everything from the RAM disk.

### How MENUEMO Works

By way of a quick walk-through of MENUEMO.BAT, the program is an assembly of several sections, each of which is labeled. Each section ends with a GOTO command to transfer control to another section. The program keeps returning to the main menu section until the user chooses to exit to DOS.

MENUEMO first checks to see if an environment variable called *user* exists. If not, the log-on section is executed, a menu of valid users is displayed, and the *user* variable is established.

Next, the main menu is displayed, and choices pertinent to the current user are presented. From there, the program acts on any selec-

tions made by the user and returns to the main menu when finished.

Note that one of the options in every user's menu is Log In New User. This makes it easy to switch from user to user without having to reboot or rerun the program.

Once you get going with this system, carry it as far as you like: Design separate menus for each member of the family rather than filling in one generic template as this program does. Introduce a games submenu that's accessible from every user's main menu. If you telecommunicate, create a submenu that runs scripts to log you on to all your favorite services with the touch of a key.

If you've stayed with me this far, you probably enjoy tinkering with your computer as much as you enjoy running software. The other members of your family, however, probably want results, not challenges.

They'll appreciate being able to turn on the computer and run their programs without having to call on you to find the correct subdirectory, look up the proper parameters, reset the printer, load the printer driver, and on and on and on.

## Turbocharge Your Batch Files

In the predecessors of today's PCs, batch processing was a method of instructing the computer to carry out tasks without operator intervention. Long printing tasks and other time-consuming business was scheduled to run unattended late at night when drowsy humans were sleeping and wakeful computers were looking for some action.

As DOS developed, the batch programming language it incorporated was designed to accomplish the same goals—getting work done without operator intervention.

PC users, however, did not behave like mainframe programmers. Rather than using batch programs to handle work while the operator is away, most PC users employ batch files to carry out repetitive tasks while they're sitting right in front of the screen.

Whereas no one cared what the display on the mainframe console looked like, PC users want boxes, colors, noises, and otherwise interesting and informative screens.

To make the batch language conform better to our needs, COMPUTE has developed a handful of small programs to provide the visual excitement and interactivity that normal batch programs lack.

These programs, BOX, GET-KEY, LOADSCRN/SAVESCRN, MENU, NOTES, PUTTEXT, and TIMEDATE, are all available on this issue's *PC Disk*. (These programs and more can also be found on *COMPUTE's PC Productivity Manager*

### Batch File Tips

- Don't assume anything. Before executing the command to run a program, use the CD command to change to the proper directory. If there's any chance you'll be logged on to the wrong drive, log on to the proper drive first.
- Include a command to return to the root directory at the end of your batch files.
- If a batch file requires parameters to run properly, test to make sure the parameters were provided. If no parameters were supplied, print a message telling the user what is expected.
- Include remarks in the batch file so two years from now you'll remember why you wrote it.
- If batch programs create temporary files, make sure they clean up after themselves and delete those files before returning control to DOS.
- If you have DOS 3.3 or above, you can place the commercial at sign (@) in front of any command to prevent that command from being displayed when the batch file is executed.

## Musical Notes and Frequencies

Note	Frequency				
A	55	110	220	440	880
A#	58	117	233	466	932
B	62	123	247	494	988
C	65	131	262	523	1046
C#	69	139	277	554	1109
D	74	149	294	587	1175
E	82	165	330	659	1319
F	87	175	349	698	1397
F#	93	185	370	740	1480
G	98	196	392	784	1568
G#	104	208	415	831	1661

By using NOTES, you can program your PC's speaker to play something more lively than the usual beep. This chart provides frequencies for five octaves of musical notes. For reference, the frequency of middle C is 262.

disk, a collection of 38 batch file extensions and power utilities.)

Here's a rundown of how to use these batch file extensions.

**BOX**—Draw boxes anywhere on your screen using this utility. You control the size, shape, border type, and color. To use the program execute the command

**BOX row column width height color border**

Valid values for *row* are 0–24, and this indicates the row number for the top of the box. *Column*, which can be from 0–79, indicates the column number for the left side of the box. *Width* and *height* define the size of the box in columns and rows, respectively. To determine a color value, multiply the background color by 16 and add the foreground color. (The accompanying Color Selection Table will make this task a little more convenient.)

To select a border, enter 0 for no border, 1 for a single-line border, and 2 for a double-line border. If you enter any other character, that character will be displayed as the border.

**GETKEY**—This program is important for setting up interactive batch files. First display a menu of choices; then enter the command GETKEY. The batch program pauses until a key is pressed.

GETKEY returns an exit code that can be tested with the IF-ERRORLEVEL command to determine which key was pressed.

The exit code returned is the ASCII value of the character pressed. (See "Understanding ERRORLEVEL" for more details.)

**LOADSCRN/SAVESCRN**—This pair of programs makes it possible to build screens ahead of time and display them in a flash. This is especially helpful if you're running your batch files from a floppy disk. Batch files are slow-running programs because the system keeps going back to the disk to read and execute each line.

Creating elaborate screens full of boxes and text requires several lines of programming and takes several seconds to display.

To use these utilities, write a batch file that creates your screen and

then, as the last line in the batch file, issue the command `SAVESCRN filename`. The screen display will be recorded as a file on your disk using the filename you provide.

Later, when you want to display that screen as part of a batch file, issue the command `LOADSCRN filename`, and all the boxes and text will be loaded quickly with a single command.

**MENU**—This utility makes it easy to create, display, and use menus. You can make menu selections with the keyboard or the mouse. To set up a

## Understanding ERRORLEVEL

The IF-ERRORLEVEL construction in the DOS batch programming language provides a lot of programming punch, but it's a pain to deal with.

Fortunately, though, once the programming is done, you can forget about ERRORLEVEL while the program does its work. The value of ERRORLEVEL's service clearly compensates for the difficulties of setting it up.

ERRORLEVEL's original purpose was to provide a way to monitor the exit codes generated by the BACKUP and RESTORE commands of DOS 2.0. Assuming that users would want to use batch files to handle hard disk backups, the designers provided the ERRORLEVEL codes as a crude method of passing along information about the success of the backup operation.

ERRORLEVEL is used with the batch programming's IF command to execute commands conditionally based on the exit code provided by the most recently run DOS program. Exit codes can be in the range of 0–255. The syntax is

**IF [NOT] ERRORLEVEL *n* COMMAND**

In this syntax, replace *n* with the ERRORLEVEL exit code number being tested and *COMMAND* with the action to take if the conditions of the statement are met. The NOT is optional and is used to determine whether an exit code fails the test.

An ERRORLEVEL condition is true if the exit code is equal to or greater than the number in the condition. In other words, if a program returns an exit code of 4, the statement `IF ERRORLEVEL 2 ECHO Two` would pass the condition.

Dealing with this idiosyncrasy requires that conditions be tested in a descending order. Here's an example:

```
IF ERRORLEVEL 5 GOTO OPTION5
IF ERRORLEVEL 4 GOTO OPTION4
IF ERRORLEVEL 3 GOTO OPTION3
IF ERRORLEVEL 2 GOTO OPTION2
IF ERRORLEVEL 1 GOTO OPTION1
IF ERRORLEVEL 0 GOTO END
```

This method is adequate if your program produces a limited number of predictable exit codes, but if there are many more possibilities (as is the case with GETKEY, the program on this issue's PC Disk), an-

other solution is required. GETKEY returns an exit code equal to the ASCII code for a key pressed on the keyboard.

Testing all 255 possible ASCII codes would take all afternoon.

The solution is to combine two IF conditions in one statement, using one normally and one with the NOT option. For example, to test whether the A key, ASCII 65, had been pressed, the following line would work:

```
IF ERRORLEVEL 65 IF NOT ERRORLEVEL
66 ECHO UPPERCASE 'A' WAS
PRESSED.
```

Translated into English, the first condition, IF ERRORLEVEL 65, is true for any character with an ASCII value of 65 or greater. The letter A qualifies, as do all the letters in both the upper- and lowercase alphabets. The second condition, IF NOT ERRORLEVEL 66, is true for any character with an ASCII value below 66.

Combining the two conditions, the letter has to have an ASCII code of at least 65 and less than 66. An uppercase A, ASCII 65, is the only character that meets both conditions and will allow the ECHO statement to be processed.

If your program allows either upper- or lowercase input, be sure to test for both versions of each possible letter.

```
IF ERRORLEVEL 65 IF NOT ERRORLEVEL
66 GOTO OPTION_A
IF ERRORLEVEL 97 IF NOT ERRORLEVEL
98 GOTO OPTION_A
```

The presence of both of these statements would make sure the program branched to the OPTION\_A subsection no matter whether A was pressed in a shifted or unshifted state.

Do keep in mind, however, that each IF-ERRORLEVEL test takes time, especially if the program is being run from a floppy disk. It pays to structure your program so you test for the more likely option first and the less likely option last.

In the examples above, testing for the letter A makes sense as written if the user is likely to have CapsLock engaged. If the user usually enters commands in lowercase, it would be more prudent to reverse the statements and test for the lowercase letter first.

### Color Selection Table

	Black (0)	Blue (1)	Green (2)	Cyan (3)	Red (4)	Magenta (5)	Brown (6)	White (7)
Black (0)	0	16	32	48	64	80	96	112
Blue (1)	1	17	33	49	65	81	97	113
Green (2)	2	18	34	50	66	82	98	114
Cyan (3)	3	19	35	51	67	83	99	115
Red (4)	4	20	36	52	68	84	100	116
Magenta (5)	5	21	37	53	69	85	101	117
Brown (6)	6	22	38	54	70	86	102	118
White (7)	7	23	39	55	71	87	103	119
Gray (8)	8	24	40	56	72	88	104	120
Light Blue (9)	9	25	41	57	73	89	105	121
Light Green (10)	10	26	42	58	74	90	106	122
Light Cyan (11)	11	27	43	59	75	91	107	123
Light Red (12)	12	28	44	60	76	92	108	124
Light Magenta (13)	13	29	45	61	77	93	109	125
Yellow (14)	14	30	46	62	78	94	110	126
Bright White (15)	15	31	47	63	79	95	111	127

The BOX and PUTTEXT programs require a color parameter. To determine the correct number to use, choose a background color, multiply it by 16, then add the foreground color. The chart above simplifies the process. Choose a background color from those listed at the top, select a foreground color from those along the side, and use the number that falls at the intersection of the two rows.

menu, enter the command:

**MENU T=***title*, **M=[M]enu Item 1**, **M=[M]enu Item 2**, and so on.

You can enter several menu items, placing the hot key for each item in the square brackets. For example:

**Menu T=SYSTEM OPTIONS**  
**M=[C]HKDSK**, **M=[F]ormat Drive A**, **M=[W]ord Processing**

When a menu selection is made, an exit code is returned that can be tested with IF-ERRORLEVEL, and the program can branch to the appropriate section. If the first menu selection is picked, an exit code of 0 is returned; if the second menu selection is chosen, an exit code of 1 is returned; and so on. If Cancel is chosen, either by clicking on the cancel box or by pressing Esc, an exit code of 255 is returned.

**NOTES**—This program elicits something a little more interesting from your computer's speaker than the usual flat beep. To use NOTES, enter

**NOTES** *frequency delay [frequency] [delay]* and so on.

For reference, the frequency of middle C is 262. See the accompanying chart for other values.

*Delay*, which specifies how long the note should be played, is measured in intervals of 1/18 of a second. Specify a delay of 18 to play a note for 1 second, 9 to play a note for 1/2 second, and so on.

A crude rendition of "Mary Had a Little Lamb" looks like this:

**NOTES 330 3 294 3 262 3 294 3 330 3 330 3 330 6**

**PUTTEXT**—Here's a big improvement over the ECHO command. With PUTTEXT, you tell DOS where you want your message to appear and in what color. The syntax is **PUTTEXT** *row column color text*. The color parameter is calculated by multiplying the background color by 16 and adding the foreground color.

**TIMEDATE**—Here's an easy way to add the date and time to your menus.

Just issue the TIMEDATE command by itself to get both the time and date or specify TIMEDATE T for time only or TIMEDATE D for date only.

If you use TIMEDATE with a B parameter, the display will be boxed and centered on your screen. □





# POINT & CLICK

C L I F T O N K A R N E S

**M**ost people think the *Windows* startup screen is as inevitable as death, taxes, and Unrecoverable Application Errors. Surprisingly, it isn't. Not only can you tell *Windows* to skip the screen altogether, but with a little effort, you can have anything you would like displayed on startup.

First off, if all you want to do is bypass the startup screen, there's a simple way to do that. Just type *WIN :* to run *Windows*. Be sure to put a space before the colon. This doesn't make *Windows* load any faster, but you'll get to look at a calming black void instead of Microsoft's blue logo.

Changing your startup to some other graphic is easier than you might think, but it does involve several steps. First, a little background.

When you run *Windows*, you execute *WIN.COM*, found in your *WINDOWS* subdirectory. If you look at *WIN.COM*, you'll notice it's fairly small, and you might reason that this one file is not all of *Windows*. You're right. *WIN.COM* really does just three things: It checks your system configuration, displays the startup screen, and loads the rest of *Windows*.

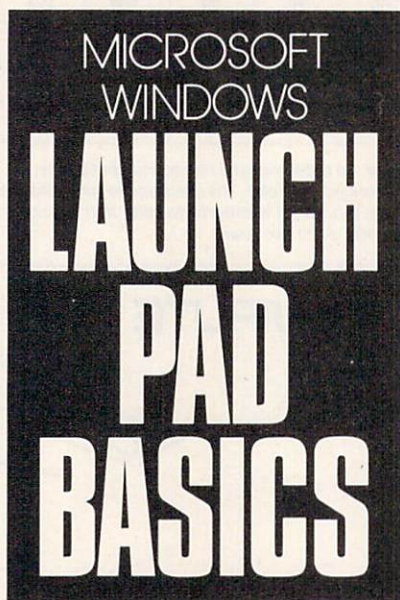
The interesting thing about *WIN.COM* is that it's the concatenation—the combination—of three other files, all found in your *SYSTEM* subdirectory: *WIN.CNF*, *VGALOGO.LGO*, and *VGALOGO.RLE*. The configuration portion of *Windows* is *WIN.CNF*, *VGALOGO.LGO* is the loader for the startup screen, and *VGALOGO.RLE* is actually the startup screen itself.

To get your feet wet and prove that all this is really so, let's combine these three files into an alternate *Windows* startup called *WIN2.COM* (we want to be sure not to overwrite our original *WIN.COM*). To make our new *Windows* *COM* file, we'll use the *DOS COPY* command with the binary switch, since these files contain binary, as opposed to text, information. Change to your *SYSTEM* subdirectory, and enter the following command: *COPY/B WIN.CNF+*

*VGALOGO.LGO+VGALOGO.RLE WIN2.COM*.

In this command string, */B* is the binary switch, the plus sign is the concatenation operator, and the last filename is the destination file.

Now, move *WIN2.COM* to your



*WINDOWS* subdirectory, and check out the *WIN.COM* and *WIN2.COM* file sizes. They should be identical. Run *WIN2.COM* (exit *Windows* first). It's the same as your old *WIN.COM*. OK, so now you know where *WIN.COM* comes from. How do you change it?

That's easy. All you have to do is substitute your own graphic screen for *VGALOGO.RLE*. To do this, you need either a prepared *RLE* screen (*RLE*, by the way, stands for *Run Length Encoded* and is a method for compressing information) or *WinGIF* (SuperSet Software, P.O. Box 1036, Orem, Utah 84059; \$15), an excellent shareware graphics file viewer and converter. You can find *WinGIF* and lots of *RLE* screens on CompuServe, GENie, and most other BBSs.

The only restrictions are that your graphic must be 640 × 480 with 16 colors and that the total size of

your *WIN.COM* file must be less than 64K, which means your *RLE* graphic must be fairly small.

Many people will want to create their own startup screens, so let's go through that procedure. Fire up *Windows Paintbrush*, and create a bitmap. For your first experiment, try something simple like your initials.

When you've finished, you'll need to get your *Paintbrush* file into *WinGIF*. You can save the *Paintbrush* image as a *BMP* or *PCX* file and load that into *WinGIF*, or you can use the *Clipboard* and express-mail the image to *WinGIF*. Since the latter process is faster and easier, let's do that.

Run *WinGIF*, return to *Paintbrush*, and select your picture (or a part of it) with the rectangular cutout tool found in the upper right corner of the toolbox. Press *Ctrl-Ins* to transfer your selection to the *Clipboard*. Next, make *WinGIF* active and press *Shift-Ins* to paste the image from the *Clipboard*.

Now that you have your image in *WinGIF*, you need to save it as an *RLE* file. Select *File Save* and choose a name for your logo. Next press the *Format* button. Click on *4bpp* and *RLE 4*. Now press *Save* to save your *RLE* file.

You already know the next step. Let's say your *RLE* file is named *MYLOGO.RLE* and you want to call your new *Windows* command file *MYWIN.COM*. You'd enter *COPY/B WIN.CNF+VGALOGO.LGO+MYLOGO.RLE MYWIN.COM*.

Again, make sure you and your *RLE* logo are in the *SYSTEM* subdirectory before entering the command. Now move *MYWIN.COM* to your *WINDOWS* subdirectory, and you're all set.

If the file is too large, *Windows* simply won't load. Since you didn't overwrite *WIN.COM*, you can type *WIN* to get back into *Windows* and tweak your graphic.

To downsize a too-large *RLE*, return to *Paintbrush* and select a smaller part of the image with the cutout tool, and repeat the process. □



# PROGRAMMING POWER

T O M C A M P B E L L

For a long time, I've used a utility by J.P. Garbers called LF that lists the files in a directory alphabetically by extension and then alphabetically for each extension. Reimplementing LF in *PowerBASIC* for this month's column was illustrative, because it highlighted in an interesting way the tradeoffs between high-level and low-level languages.

This month's program is DE.EXE, for Directory by Extension. You'll need *PowerBASIC* to type it in and compile it. The command line syntax is simple:

## DE d:path

Without the optional drive and path, DE lists the files in the current directory. Otherwise, it uses the specified location. The output looks like this:

```
. files:      FOO
.BAK files:  COL0691  COL0791
.BAS files:  DE        FT
.EXE files:  DE        FT
.TXT files:  COL0691  COL0791
```

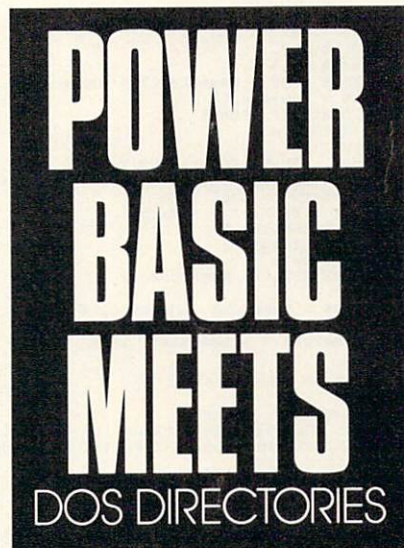
You can pause the output by pressing Space or quit by pressing Esc. This lets you bail out if you typed the program name by accident or if you only need to see the first part of the listing.

Writing DE took a couple of hours. Thanks entirely to *PowerBASIC* features, it runs very fast. It lists a 236-file directory in one second on my 386 versus two seconds for LF. Its output, however, can't be redirected, as LF's can. On the other hand, LF doesn't let you cancel by pressing Esc or pause by pressing Space (although you can pause the output using DOS's built-in Ctrl-S feature).

DE requires almost 30K when compiled versus 478 bytes for LF. Had I chosen to write DE in assembly language, it would have taken me several days, and while I doubt I'd get it as tiny as 478 bytes, it certainly wouldn't have reached the 1K mark. Conclusion? I'll take *PowerBASIC* any day of the week for a job like this.

A decade ago, every byte of disk space counted, and BASIC wasn't available as a compiler on the PC. Today, my time is too valuable to spend writing a simple utility like DE in assembly if I can help it.

This month's column explains how to get a list of the filenames in a directory. You'll need this skill to write utilities like DE or pick list boxes for loading files. It also showcases some of *PowerBASIC*'s special features: very fast printing to the screen, array sorting (*PowerBASIC* pays for itself with this feature alone), and the versatile DIR\$ function.



## Power Directory

Surprisingly, getting the names of files in a directory isn't easy to do in most versions of BASIC for the PC. *Turbo Pascal* handles it the best of any language I know of, and *QuickBASIC* requires you to employ an assembly language interface to DOS, but *PowerBASIC* has a handy function called DIR\$ to help out. It's a highly unusual function in that its syntax is different on the first invocation than it is on subsequent invocations. The first time, it's passed the file specification as the first parameter (for example \*.\* , \*.txt, win\*.\* , or foo.bar) and the attri-

bute of additional files as the second parameter. The most common attribute is 0, for normal files. You can add files to the search by adding the following values: 2 for hidden files, 4 for system files, 8 for the volume label, and 16 for subdirectories.

DIR\$ then returns as a string the name of the first file in the directory matching the file specification and attribute mask. After the first invocation, use DIR\$ by itself, without the parameters, to return the rest of the matching files. Here's a simple program that lists all the files in the directory:

```
' First file.
NextName$ = DIR$(*.* , 0)
' Get rest.
WHILE NextName$ <> ""
  PRINT NextName$
  ' No params.
  NextName$ = DIR$
WEND
```

Because DIR\$ employs DOS functions 4Eh and 4Fh, it inherits a ridiculous limitation of these functions. There's no way to select *only* subdirectories, *only* the volume label, and so on. Any invocation will return all normal files matching the file specification in addition to those requested by the mask (the second, numeric parameter). I would much rather *PowerBASIC* return only files matching the attribute and file specification. *Turbo Pascal*'s implementation suffers the same deficiency, but since the return value from its FindFirst routine (a superset of *PowerBASIC*'s DIR\$) is a compound data structure including file size, attributes, and other information in addition to the name, your program can weed out the undesirables more efficiently. As we'll see in a moment, handling subdirectories in the file specification posed a problem.

## Doing What's Expected

Easily the most challenging aspect of writing DE was its handling of the optional drive and path specifications. Nothing came easy here; DE follows



# PROGRAMMING POWER

the syntax of DOS commands such as DIR. For example, where you have a subdirectory on the drive D called \UTILS, the command line

**DE D: \UTILS**

really means

**DE D: \UTILS \ \*.\***

The DOS Find First and Find Next functions don't make this substitution for you, and with good reason. What if there's a file using the name D: \UTILS? COMMAND.COM and most external DOS utilities resolve this ambiguity by assuming you want to look for a subdirectory, but, of course, it means that you *can't* search for a file that has the same name as a subdirectory.

Since Find First doesn't make this choice for you, you must first check the file specification to see if it's a subdirectory. The routine IsDir% does this for you. It's a nice little black box to have around. Just call it, passing it the name of the prospective subdirectory, and IsDir% returns a nonzero value if the name is a subdirectory and 0 if not. The brute-force method it uses is to see if anything (file or subdirectory) matches the specification.

If there's no match, IsDir% immediately exits, returning 0. If there is a match, we still don't know if it's a file or a subdirectory, thanks to the less-than-helpful Find First. (Note here that IsDir% is one of the rare times you'll see DIR\$ used only once.) We then try opening a file by that name. If that can be done, IsDir% again returns false. Otherwise, we've narrowed it down—the input does indeed represent a subdirectory.

In any case, the command line is parsed, and DIR\$ is used to get the list of filenames. A single, incredibly powerful command called ARRAY SORT does what it would take me a couple of days to write—a machine-coded QuickSort on the array of filenames. The filenames are upended with the extension first so that the sort will proceed properly, in one fell swoop sorting by extension and then alphabetically within. Files are displayed with no extension at all, since each group's listing is preceded with the note <ext> files.

```
' Compiled using PowerBASIC 2.10a
FileList$ = COMMAND$ ' Get the command line.
IF FileList$ = "" THEN FileList$ = "**.*" ' List all files if no command line.
LastChar$ = RIGHT$(FileList$, 1) ' Get last char in filespec.
IF IsDir$(FileList$) THEN
  IF INSTR(FileList$, "**") = 0 THEN ' Don't append if there already.
    IF Right$(FileList$, 1) <> "\" AND Right$(FileList$, 1) <> ":" THEN FileList$ =
FileList$ + "\".*" ELSE FileList$ = FileList$ + "**.*"
  END IF
END IF
Count% = 0 ' Total files in this directory.
NextName$ = DIR$(FileList$, 0) ' Get first file matching spec.
WHILE NextName$ <> "" ' Get the rest of the files
  Count% = Count% + 1 ' that match and keep count.
  NextName$ = DIR$ ' After 1st call, use no params.
WEND

IF Count% = 0 THEN ' Quit if no files at all
  PRINT "No files in " + FileList$ ' match the filespec.
  SYSTEM
  END IF

DIM Directory$(Count%) ' Allocate memory for the array.

Directory$(1) = DIR$(FileList$, 0) ' Copy in the first filename.
NextName$ = DIR$ ' After 1st call, use no params.
FOR Total% = 2 TO Count% ' Copy the rest of the files into
  NextName$ = DIR$ ' the array. First, move the
  NameLen% = LEN(NextName$) ' extension to the front of the
  ExtPos% = INSTR(NextName$, ".") ' filename.
  IF ExtPos% <> 0 THEN ' But only if there is one.
    NextName$ = MID$(NextName$, ExtPos%+1) + ". " + MID$(NextName$, 1, ExtPos%-1)
  ELSE ' Fake a null extension if none.
    NextName$ = ". " + NextName$
  END IF
  Directory$(Total%) = NextName$ ' Add tweaked name to the array.
NEXT Total%

ARRAY SORT Directory$() ' Sort the array--fast!

PrevExt$ = CHR$(0) ' Set sentinel value.
Total% = 1 ' Tracks our position in WHILE loop.
NameWidth% = 9 ' Width given each name.
NameStart% = 15 ' Starting column.
ScreenMax% = 80 - NameStart% + NameWidth% ' Farthest right a name can start.
NamePos% = NameStart% ' Position of leftmost name.
WHILE Total% <= Count% ' Loop through whole array.
  CALL GetPause ' Let user interrupt.
  NewExt% = 0 ' Assume extension isn't new.
  ExtPos% = INSTR(Directory$(Total%), ".") ' Find its position.
  Ext$ = Left$(Directory$(Total%), ExtPos%-1) ' Parse it out of the filename.
  IF PrevExt$ <> Ext$ THEN ' A new extension has been found.
    PRINT : PRINT ". " + Ext$; ' Print a blank line & the extension.
    LOCATE CSRLIN, 5 ' Move to the right.
    PRINT " files:"; ' Note which files are being listed.
    NewExt% = 1 ' Flag that a new extension's hit.
    LOCATE CSRLIN, NameStart% ' Go where the filename belongs.
  END IF
  NamePos% = NamePos% + NameWidth% ' Position for the next filename.
  IF (NewExt%) THEN NamePos% = NameStart% ' Wrap to beginning if necessary.
  IF (NamePos% > ScreenMax%) THEN ' And go back to the first
    PRINT ' column of names.
    NamePos% = NameStart%
  END IF
  LOCATE CSRLIN, NamePos% ' Move to the next column.
  ' Print the filename without its extension.
  PRINT RIGHT$(Directory$(Total%), LEN(Directory$(Total%)) - ExtPos%);
  PrevExt$ = Ext$ ' Note the extension.
  Total% = Total% + 1 ' Track position in loop.
WEND

' Returns nonzero if InputDirName$ is a directory or 0 if not.
FUNCTION IsDir$(InputDirName$)
  LOCAL ThisDir$
  DirName$ = DIR$(InputDirName$, 16) ' String is visible only in FUNCTION.
  IsDir% = 0 ' See if it's a regular file or
  IF DirName$ <> "" THEN ' a subdirectory. Stop if not.
    ON ERROR GOTO ErrorTrap ' Disable error checking because
    OPEN DirName$ FOR INPUT AS #1 ' the program will halt if it
    GOTO EndFunc ' can't be opened if not a file.
    ErrorTrap: ' If a runtime error occurred,
    IsDir% = 1 ' InputDirName$ is NOT a file--so
    Resume EndFunc ' we know it's a subdirectory.
  END IF
  EndFunc:
  CLOSE #1 ' In any case, close the file.
END FUNCTION

' Quit if Esc is pressed, or just pause if Space is pressed.
SUB GetPause
  LOCAL NextKey$
  IF NOT INSTAT THEN EXIT SUB ' Used only in this SUB.
  SELECT CASE INKEY$ ' Return if no key was pressed.
    CASE CHR$(27) ' Quit if the Esc key was pressed.
      PRINT : PRINT "Interrupted before all ' Print a message first.
      SYSTEM ' files were listed."
      CASE " " ' Return to DOS.
        WHILE NOT INSTAT : WEND ' If the Space key was pressed,
        NextKey$ = INKEY$ ' wait 'til another key is
      END SELECT ' pressed. Remove from keyboard
  END SUB ' buffer.
```



# TIPS & TOOLS

## H I N T S   A N D   T I P S   F R O M   O U R   R E A D E R S

### Floppy Copycat

If you have a fairly common system setup with three drives (drive A, 5¼-inch 1.2MB; drive B, 3½-inch 1.44MB; and drive C, hard drive), you're up a creek when it comes to copying files from one disk to another disk of the same type (5¼-inch to 5¼-inch, for example). You have to copy from drive A to C and then back to A and so on. An easy way to remedy this is to add the following lines to your CONFIG.SYS file.

```
DEVICE=DRIVER.SYS /D:0 /F:1
DEVICE=DRIVER.SYS /D:1 /F:7
```

These two lines allow the use of drive A as either A or D and drive B as either B or E. To copy the files from A to A, enter `COPY filename D:`, where *filename* is the one you want to copy. You can use wildcards to copy more than one file at a time.

*Jim Reece  
Tuscon, AZ*

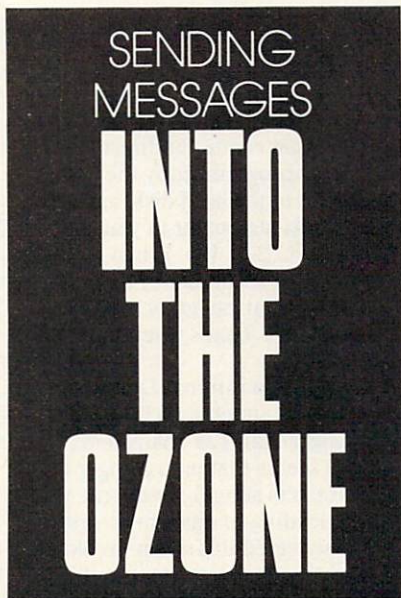
### Shutting Off Error Messages

You probably know that you can redirect the output of most DOS utilities to NUL as a way to switch off their output. For example, you might have a batch file that does this:

```
COPY *.* A: > NUL
```

This runs the COPY command, but instead of displaying its message on the standard output device, the screen, it redirects the output to the NUL device, which is a sort of special file that doesn't do anything (nor does it take up disk space). But some commands or error messages those commands issue refuse to cooperate with redirection to NUL. That's because they send their output to the standard *error* device, not the standard *output* device. For example, if you already have a directory called TMP and you enter the command MKDIR TMP on the command line, you will see the error message *Unable to create directory*. This harmless but ominous-looking error message can make naive

users uncomfortable. The answer is to use CTTY but to use it within batch files only. CTTY causes all further output (even the standard error device) and keyboard input to be delivered through the device named on the command line. If you make that device NUL, output will be halted altogether—but so will input. That's why



you must use the CTTY NUL command in a batch file; by setting it to NUL, you nullify the possibility of keyboard input. To demonstrate, run this batch file:

```
MD TMP
CTTY NUL
MD TMP
CTTY CON
```

The first line creates the directory TMP. If it already exists, you will see the message *Unable to create directory*. If it doesn't, nothing appears at all. The second time an MD occurs, the error message is issued. But since CTTY has been set to NUL, the message is sent into that great bit bucket in the sky, and you don't see it. CTTY CON sets input and output back to

their default state. If you neglect the CTTY CON in your program or try CTTY NUL interactively by entering it at the command line, your machine will lock up (remember that it's not accepting keyboard input), and you'll need to reboot.

*Tom Campbell  
Irvine, CA*

### Getting Keyboard Input

One of the lesser-known tricks of the trade allows you to enter a string from the keyboard that a batch file can use. There are a couple of caveats, however. The user must finish typing with the F6 key and then Enter. Also, the string is copied into the environment, where there's often a severe shortage of space. First, create a file called SETIT.TXT as follows (no deviations, and don't use your text editor—use COPY CON):

```
COPY CON SETIT.TXT
SET TMP=~Z
```

This will form the basis of a batch file called SETIT.BAT that'll be generated on the fly. Second, type in this batch file:

```
ECHO off
ECHO Please enter your name and
press F6 and then Enter when you're
finished.
REM Get the user's name from the
keyboard.
COPY CON SETIT.TMP
REM COPY SETIT.TMP onto the end
of SETIT.TXT to create
SETIT.BAT.
REM Neither SETIT.TMP nor
SETIT.TXT is disturbed. The +
is a
REM little-used feature of the COPY
command called concatenation.
COPY SETIT.TXT + SETIT.TMP
SETIT.BAT
DEL SETIT.TMP
REM Replace CALL with
COMMAND/C if your DOS
version is < 3.3.
CALL SETIT
ECHO Hi, %tmp%
```



# TIPS & TOOLS

```
IF %tmp% == Tom ECHO Your
user level is #1.
IF %tmp% == Bubba ECHO Your
user level is #2, Bubba!
IF %tmp% == Clif ECHO You
shouldn't even be on this system!
```

Run this file (as TEST.BAT or whatever) and enter the names *Tom* and *Clif* as input on separate runs, being careful to end the name with F6 and then Enter. This program is case sensitive. If you run out of environment space, use SHELL= in your CONFIG.SYS. A line like

```
shell=command.com /P /E:1024
```

gives you an environment of 1024 bytes rather than the default of 160. The /P option runs AUTOEXEC.BAT. If you're using versions of DOS before 3.3, divide the E figure by 16.

*Tom Campbell  
Irvine, CA*

## Backing Up Is Hard to Do

Put this batch file, NDBACKUP.BAT, in a directory specified in your PATH statement. It displays the files located in the current subdirectory that aren't backed up.

```
@ECHO OFF
ATTRIB *.* %1|FIND "A"|MORE
```

It lists the names of the files and their attributes. The ATTRIB command reports on files that are not backed up by putting an *A* (Archive) next to their filenames. It also reports files that are read-only by putting an *R* next to their names. The ATTRIB command looks at the file attributes, and the FIND filter shows only those files with the *A* attribute. I added the MORE pipe so the filenames wouldn't scroll off the screen. To run the batch file, enter NDBACKUP /S at the DOS prompt. Make sure that FIND.COM and MORE.COM are available to the system when you run the batch file. (They should be in a subdirectory listed in the PATH.)

The /S switch reports on not only the current subdirectory but any subdirectories below the current subdirectory. Invoke this batch file from the root, and it will report on every file on the drive that hasn't been backed up.

*Mark Minasi  
Arlington, VA*

## The Long Unwinding PATH

The proliferation of larger hard disks has brought out an insidious DOS bug: the long path bug.

As you use larger disks, you end up with more places to store things on the disks. More places to store things means more items on your path, and that means that your path gets longer. The path has a maximum length of 128 characters.

You can't enter a path longer than 128 characters on the command line. If you type in *any* DOS line longer than 128 characters, DOS will beep at you. So you're protected from trying to create a long path with the keyboard.

But most of us create our paths from batch files—AUTOEXEC.BAT in particular. More and more new programs come with automatic install programs that create subdirectories for the new program, copy the program's files to the hard disk, and modify the PATH statement in your AUTOEXEC.BAT file. When you have installed a number of them, the PATH statement can grow beyond 128 characters. That's when the problem occurs.

There is no internal DOS check against PATH statements that set paths longer than 128 characters. Worse, it seems that paths longer than 128 characters actually overwrite part of DOS, leading to random errors!

I discovered this when invoking the batch file that gets me into the *Microsoft BASIC Professional Development System*. My batch file added a few items to the path and activated the *Microsoft BASIC Professional Development System*. The only problem was that it never got to BASIC. Instead, an endless series of printscreens were sent to my printer. (This gets your attention when you've got a laser printer; believe me!) I ran around in circles trying to figure out the problem for a few days until I realized that the batch file was extending the path length. When I ran the part of the batch file that extended the path, bingo—endless printscreens. Once I removed the part of the batch file that extended the path, the batch file worked fine. I have discovered other machines with the same problem, so it may be becoming more common.

*Mark Minasi  
Arlington, VA*

## Filing Floppies

If floppy disks multiply faster than jack rabbits in your computer room, try this filing system. Pick up some index card file boxes at an office supply store. The boxes I use look like shoe boxes—5 × 6 × 12 inches.

Use one for original program disks, one for backup copies, and another for working disks and data disks. Since each box holds well over 100 floppies, it only takes a few boxes to clean up most disk dumping grounds. These boxes stack neatly on shelves, hold more disks, and are easier to use than most of the files sold specifically for disks.

*Tony Roberts  
Greensboro, NC*

## Bad Batch Memory?

Do you write batch files and then find yourself weeks, months, or years later wondering what they do or how to use them? The solution is to make each batch file self-documenting.

If the batch file uses a replaceable parameter, have the first line of your program test to see if the parameter has been supplied. If not, have the program go to an ECHO statement that explains how to run the program.

```
IF (%1) == ( ) GOTO HELP
PROGRAM LINE 1
PROGRAM LINE 2
```

```
...
PROGRAM LINE X
GOTO END
```

```
:HELP
ECHO Put instructions for using
program here. Use as many lines
as you need.
:END
```

When you forget how to use a program, just run it without specifying the parameters, and you'll get the help you need.

*Tony Roberts  
Greensboro, NC*

*If you have an interesting tip that you think would help other PC users, send it along with your name, address, and Social Security number to COMPUTE's Tips & Tools, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408. For each tip we publish, we'll pay you \$25-\$50 and send you a COMPUTE's PC clock radio while supplies last.* □



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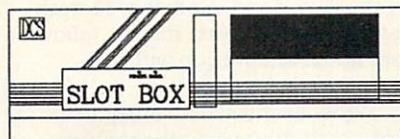
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# INTRODOS

T O N Y R O B E R T S

**P**eople often ask how they can make their computers easier to use. Much as I'd like to provide a simple answer, nothing cut-and-dried comes to mind. I do have some suggestions, though, that if implemented over time, will help anyone to be a more confident and productive computer user.

- Use your computer. It may be complex, but it's not too difficult to handle. Remember getting your learner's permit and sliding behind the wheel of an automobile for the first time? Driving a car is a complicated process, but by doing it every day and using all the options, you quickly mastered it.

Computers are no different. You can learn complicated processes by using them repeatedly and regularly.

- Protect yourself from disaster. Mistakes occur; programs crash; disks go bad. Make copies of your work often enough so you can recover important information quickly if problems occur.

Keep in mind that computers and software are just tools, and like other tools, they go out of balance and break down.

Don't ruin your day by getting angry when a mishap occurs. Simply do what's necessary to correct the problem and take what steps you can to minimize the chance of the problem recurring.

- Don't learn on deadline. Nothing tightens the nerves more than covering new ground in a crisis.

Imagine this scene: The boss pops in one sunny morning and says, "Your word processor does mail merge, right? Great. Let's send this letter to the 500 names on this list. I'd like to get it out this afternoon."

If you're now turning to the mail-merge chapter of your manual for the first time, it's going to be a long day.

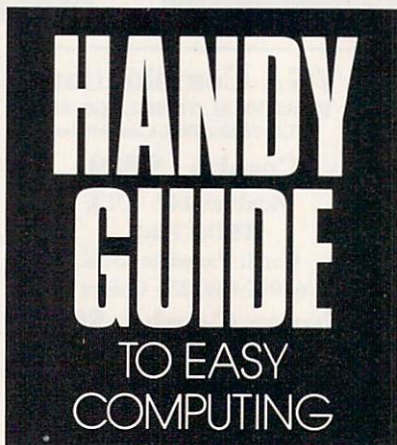
To avoid this kind of crunch, test all the features of your software under nonthreatening circumstances.

You could learn to use mail merge by preparing invitations to your child's birthday party. By com-

pleting a small project, you go through all the necessary steps of using the software—without the fear that your job is on the line if you make a mistake.

An understanding boss may even allow you to use company time and equipment to conduct such personal business, as long as you make it clear that you're doing so to improve your ability to handle future assignments.

- Know the manual. I know it's possible to muddle through many pro-



grams without reading the book, and I know manuals are deadly dull, but they sure can make life easier. Remember, however, that the process for reading a manual isn't the same as for reading a spy novel.

To get the most out of a manual, read as much of the introductory material as seems appropriate to get the program up and running; then page through the rest of the book, looking at what's there but not trying to read it.

Look at the headlines, the illustrations, and any tips or warnings that are highlighted in bold type or with boxes.

The goal is to learn what's in the manual and where to find it when you need it. Later, as you explore the software, be willing to pick up the manual and read fully the sections

that pertain to the commands or functions you're using.

Finally, take a few minutes from time to time to page through the entire manual again. This time, stop and read items that catch your eye. As your familiarity with the software grows, instructions and explanations that once seemed cryptic will begin to make perfect sense.

- Keep a notebook. It's difficult to learn some procedures because they're not performed often enough for you to remember them well. For example, if you have trouble remembering how to set up a monthly report, jot the steps down while they're fresh in your memory. Next month, follow your notes, and the job will be a breeze.

Whenever you ask someone for help, try to summarize the problem and the process to solve it in your notebook. Your local computer whiz will always be willing to assist you as long as you don't ask him to solve the same problem month after month.

- Learn to take shortcuts. When you give someone directions to your house, you have them travel the most well-known streets even if that path is longer and more time-consuming. You, on the other hand, use side streets, back alleys, and other lesser-known thoroughfares to get home as quickly as you can.

When you learn software, you usually learn the long way. Don't let yourself stop there; once you become comfortable with the program, check out the shortcuts.

- Finally, remember that computers are wonderful at performing repetitive tasks. Recognize actions that are taken repeatedly and learn to automate these tasks. Use batch files to set up printers, make network connections, and launch programs.

Use the macro capabilities of your software to help with editing and reformatting data. It might take you ten minutes to program a macro today, but whenever you use that macro in the future, you'll be getting a big payback in time saved. □



# ON DISK

T O N Y R O B E R T S

This issue's MS-DOS disk is a grab bag of utilities that will help you with batch file programming, documentation printing, and disk maintenance.

Take a look at this lineup.

## MicroMacroBat

The old saying that good things come in small packages is appropriate when applied to *MicroMacroBat*, a batch program extender that brings color, animation, and excitement to batch files like never before.

Programmer Bill Fitzpatrick created the program as an exercise to test a new compiler that was advertised to create compact code. It apparently worked because this program, which allows for box drawing, scrolling, printing, coloring, and a plethora of other functions, is bundled into a 17K file.

You have to see the demo to believe everything *MicroMacroBat* can do. The demo, which fully exercises most *MicroMacroBat* functions, runs a little slowly from a floppy disk, but it really sails when placed on a hard disk.

*MicroMacroBat* is shareware with a \$35 registration fee. The registered version includes a typeset manual and breaks the program into three separate modules so loading time is reduced and performance is enhanced.

## Productivity Manager

The editors and programmers at *COMPUTE* put together a disk called *Productivity Manager* which contains 38 DOS utilities and enhancements. We took a handful of utilities from the disk—those that make batch files more powerful—and used them to illustrate the article on batch file programming in this issue.

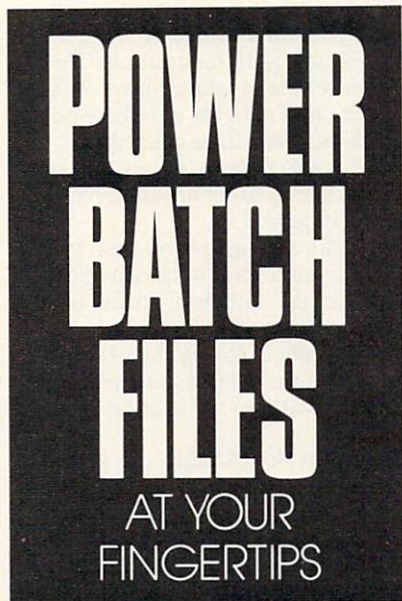
These batch program enhancements—BOX, MENU, GETKEY, PUTTEXT, NOTES, SAVESCRN, and LOADSCRN—are included on this issue's disk and carry no registration fee.

By calling these programs from your batch programs, you can create

menus and batch files that respond to users' keystrokes and mouse clicks.

## DOC2COM

Here's a nifty program that turns regular text files into executable COM files. This is the perfect way to deliver messages, instructions, or documentation on disk; those who have to read the files will thank you for your thoughtfulness in giving them an easy, convenient way to read your wisdom.



*DOC2COM* presents information a screenful at a time and allows full forward and backward scrolling. It's impossible to get lost when using files prepared with *DOC2COM* because the program provides a helpful prompt if the user tries to use keys that are not valid.

De Pyper, who is currently working on an enhancement to the program, doesn't require registration or payment for *DOC2COM*, but in the spirit of shareware, he says he will accept \$5-\$10 donations.

## MicroText

This program is a shareware lover's dream. *MicroText*, written by the for-

mer author of this column, George Campbell, can print up to four pages of information on one sheet of paper.

This paper-saving feat is accomplished by having the printer use a tiny font and by reformatting the text file to eliminate wasted space. This is a great way to store hardcopy of material you refer to only occasionally.

*MicroText* features a clean, simple-to-use interface with drop-down menus. The program can also be run directly from the command line. The program works with most dot-matrix and PCL, but not PostScript, printers.

*MicroText* is shareware. The registration fee is \$10.

Also included on this disk is *Print 4 in PostScript*. Similar to *MicroText*, *Print 4 in PostScript (P4PS for short)* performs its magic on PostScript and PostScript-compatible printers.

## AltPage

*AltPage* is another paper-saving printer utility, but this one uses normalized text and allows printing both sides of the page.

*AltPage* breaks text files into two separate files—ODD.TXT and EVEN.TXT. Once the breakup is complete, print ODD.TXT first, and then turn the paper over and print EVEN.TXT on the back side.

Because the program only works with straight ASCII files, a second program, *Strip*, is provided to help convert files that originate in word processors that use a character's high bit for certain control functions.

*AltPage* is shareware, and its \$20 registration fee entitles the user to a disk containing the program plus several other utilities by the same author, Jack A. Orman.

## CPU Usage Meter

Here's something that will intrigue users of *Windows 3.0*. *CPU Usage Meter* monitors the CPU activity and lets you know how busy your processor is.

With this program you can see which applications are the real resource hogs and which ones wait

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are called into action.

The program creates an icon that indicates the percentage of available CPU time that's being used. The icon is refreshed every three seconds, giving you a good idea how much strain various operations put on your processor.

Jim Seidman says he created the program just to see what was going on in his own machine. It's available as freeware. There is no registration fee.

### Sweep

This handy utility searches all corners of a hard disk looking for specified files that can be deleted. *Sweep* is a quick way to get rid of the BAK or TMP files that seem to accumulate with some programs.

You create a configuration file specifying what should be swept out: \*.BAK or \*.TMP for example. Then, whenever the program runs, files that match those patterns anywhere on the specified disk will be deleted.

It's also possible to limit the program's action to certain subdirectories, if desired.

Before using any program such as this, you'll want to have a good commercial "undelete" utility on hand in case you have second thoughts about losing any of the files *Sweep* lists as deleted. *Sweep* is freeware with no registration fee.

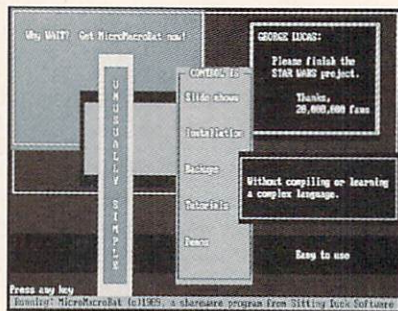
### Print 4 in PostScript

*Print 4 in PostScript* (*P4PS* for short) is similar to *MicroText*, but it performs its magic on PostScript printers.

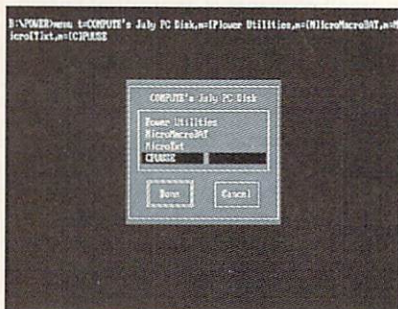
*P4PS* runs from the command line and is very fast and easy to use. Beneath its straightforward face, however, are myriad options that you can select if you're interested.

Here's what *P4PS* does: prints four pages of text on a single sheet, handles 80-column or 132-column text, prints to any DOS device or file, prints multiple copies, provides macros to control page header information, allows printing of an entire document or a range of pages, and offers double-sided printing.

*P4PS* is a shareware program, so if you use it, you should register it with the author. The \$29.95 registration fee entitles you to a copy of the registered version of *P4PS* and a printed manual. □



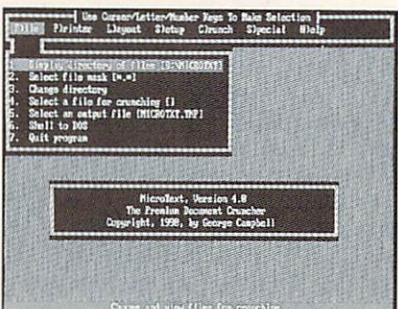
**MicroMacroBat**



**Productivity Manager**



**DOC2COM**



**MicroText**



# HARDWARE CLINIC

M A R K M I N A S I

I'm buying a new motherboard because I'm tired of waiting for my 10-MHz 286 clone to do *Windows* redraws. I'm lucky because (years ago) I bought a clone in a regular generic AT-type case.

That means that the motherboard is standard size, so I can make the whole system a 386 screamer just by replacing the motherboard. Come on along and see how you can jazz up your system, too.

Oops—I forgot to tell you just what a motherboard is. If you take the cover off your PC, you'll see, off to the left, a bunch of upright circuit boards. Now take a look at what they're standing on—another circuit board, a big one lying flat on the bottom of your PC's case. The board lying down is the motherboard.

The motherboard is the Big Cheese in your PC. It's the board that most likely contains your main CPU, your math coprocessor, some memory, your BIOS, and other items.

Because it's so important, changing the motherboard changes your PC's entire personality, as well as its speed and, in some ways, its flexibility. Motherboard surgery isn't for everyone.

If you've got a strange-shaped case, like one of those "slimline" or "small footprint" PCs, your manufacturer achieved that small footprint by using a nonstandard-size motherboard, which pretty much lets you out of this discussion. (Stick around anyway; you'll get some tips on buying your next computer.)

I want a lot of features in a motherboard—some necessary, some merely nice. My necessary list includes room for at least 16MB of RAM on the motherboard; the ability to disable shadow RAM; a BIOS with user-defined hard drive type; BIOS contained in two ROM chips, not one; BIOS from AMI, Award, or Phoenix; eight expansion slots; and a 16-MHz 386SX or 20-MHz 386DX processor.

The unnecessary-but-highly-desirable list includes adjustable bus speeds,

a faster CPU with cache, and a motherboard that's XT size, not AT size.

## Thanks for the Memories

I dream of a day when I won't want more memory.

Sounds crazy when I say to you, "You must buy motherboards that accommodate at least 16MB of RAM," but it's true. Blame it on *Windows* 3.0. Blame it on *386Max* and *QEMM*. The fact is that four megabytes is a bare minimum required to get anything done with *Windows*. Eight megs is much comfier. And more software's coming down the pike that will give you even more reasons to want more RAM.

## UPGRADING THE MOTHER OF ALL BOARDS

So I figure that in a year or two, everyone will have eight megs and will want more. At about \$45 per megabyte for RAM chips and SIMMs, it's not unreasonable.

But, of course, there are a few catches. In the XT and AT days, you just expanded memory by buying a memory expansion card, putting memory chips on it, and putting the card into one of the PC's expansion slots. But you can't do that with faster PCs. No matter how fast your PC is—20, 25, 33 MHz—the expansion slots

still only run at 8 MHz.

Why do the slots run so slowly? Because most expansion boards can't operate above 8 or 10 MHz. So whenever the system is accessing an expansion board, it slows down to 8 MHz. That sounds pretty awful, but it's not that bad. Most boards in expansion slots communicate with things that are fairly slow anyway, like floppy drives, printer ports, modems, and the like.

What really hurts is having to put a memory card in an expansion slot. Memory runs best when it runs at the full speed of the CPU, so it's a crime to make a 25- or 33-MHz machine slow down to 8 MHz when accessing memory.

By the way, a few motherboards give you the option to experiment with a faster bus. For example, I've got a 20-MHz 386 system that lets me set my bus speed to 6, 8, or 10 MHz.

If all of your expansion boards are a bit faster than average, you can get away with running the bus at the practically illegal rate of 10 MHz, and speed up video and disk access in the process. More on this in a future column, but having the speed adjustment is a nice motherboard option.

Manufacturers have found two ways to avoid this problem. First, some manufacturers design a special high-speed slot for the motherboard that will only accommodate a particular card—a memory board.

If you buy a motherboard of this type, make sure you get the memory board at the same time you buy the motherboard, or you won't be able to put any memory on the system.

Other manufacturers put sockets for memory right on the motherboard, eliminating the need to deal with the expansion slots. If you buy one of these motherboards, ensure that there's enough room for at least 16MB.

Be warned, however, that most of the boards on the market only have room for 8MB, so pick carefully. Some motherboards, by the way, combine both methods—they have



# HARDWARE CLINIC

room for about 8MB on the motherboard itself and also have a high-speed memory slot for a board that will hold another 8MB.

You don't need the memory board until you're ready to exceed 8MB of total system memory, but buy the board immediately anyway. Why? Because the board may not be available when you need it in a year or two. These boards generally run \$100-\$200.

## Me and My Shadow

Many 386 systems have a feature called *shadow RAM*. It's supposed to speed up system response. Actually, shadow RAM has little real-world value and can cause trouble when running *Windows 3.0* and other programs. I don't mind having the feature with the system, but I sure want to disable it. Make sure your system gives the option to disable shadow RAM.

You see—shadow RAM speeds up any attempt to read the BIOS, a basic, low-level piece of software that controls your keyboard, disk, screen, and printer.

The argument goes that any input/output operation will be sped up by shadow RAM. This argument is specious because it overlooks an important fact: Most software bypasses the BIOS and controls the PC hardware directly in order to achieve maximum speed.

If software used the BIOS, shadow RAM wouldn't be a bad idea—but most software doesn't. It looks good on benchmarks (which politely access the hardware via the BIOS), but *Windows, 1-2-3*, and *WordPerfect* (to name a few) will be unaffected by shadow RAM, so don't feel bad about disabling it.

## Buying the Best BIOS

I just mentioned the BIOS and that it's a piece of software. It's an unusual piece of software, however, in that it's encased in hardware. Where most software is loaded from a floppy or hard disk into the computer, the BIOS comes in a chip called a *ROM (Read Only Memory)*.

When shopping for ROMs, it turns out you've got to be concerned both with the software in the chip and with the way the chip is packaged.

First, ask who's writing the soft-

ware. The BIOS software must be very, very compatible with an IBM BIOS, or your system won't be 100-percent PC compatible. Developing compatibility takes lots of practice, so buy a BIOS from a vendor with some experience.

I'd recommend AMI (American Megatrends, Incorporated), Award Software, or Phoenix Software brands. That doesn't mean the other guys are trash, understand—they just need some more time. Stay with AMI, Phoenix, and Award, and you'll be OK.

And there's no reason why you can't get a BIOS from the vendor of your choice—all three make BIOSs for just about every 386 system under the sun.

The BIOS's original job was the low-level hardware functions I described earlier, but nowadays there's more to look for. First and probably most important is a user-defined drive type. Since the advent of the IBM AT in 1984, 286/386/486 BIOSs have contained a table of hard disk drive types—descriptions of common hard disks.

As ROM space is limited, most ROMs only contain 47 drive descriptions, which, of course, aren't enough—there are new drives appearing every day.

If the drive you're trying to install doesn't match anything on the table, either you won't be able to install the drive or you'll have to settle for a description of a smaller drive, leading the PC to waste some space.

In 1989, AMI and Award introduced a useful new feature, the user-defined drive type. It allows you to describe a drive directly, rather than trying to match your drive to the closest prestored type. Since then, most BIOS vendors have included user-defined drive types, so make sure your BIOS includes this feature.

Other desirable BIOS features are a built-in system setup (which eliminates the need to hunt around for the *SETUP* disk every time you make a change to the system), the ability to set memory wait states, the ability to enable and disable blocks of memory in the BIOS (rather than having to physically remove memory in order to isolate and test it), and the ability to set keyboard speeds via the BIOS (freeing you from having to use third-

party utilities to make your keyboard more responsive).

The last BIOS feature has to do with its packaging. Most BIOSs are shipped as a pair of chips called the *even ROM* and the *odd ROM*. More recently, however, I've seen motherboards that use a BIOS packaged as a single ROM.

I would counsel you against these motherboards simply because it will be more difficult to find ROM upgrades in the future. There are several ROM vendors in the U.S., and none that I've talked to were prepared to offer a single ROM BIOS—they all use the more normal dual-chip BIOS.

So for the sake of easy upgrades later, stick to motherboards that use a pair of ROMs to house the BIOS. (Why would you want to upgrade your BIOS? To solve new compatibility problems or to support new hardware, such as the upcoming 2.88MB floppy drives.)

## Odds and Ends

Most 386 motherboards used to be large, about the same size as an old AT motherboard. More advanced chip design has reduced the number of chips on the motherboard, reducing power consumption and leading to smaller, XT-size motherboards. I'd recommend the smaller XT motherboards because you can fit them into smaller cases, which take up less space on your desk.

But don't buy a motherboard that achieves smaller size by reducing the number of expansion slots—you want an eight-slot motherboard. The more slots, the more long-term expandability you'll have.

I know you're waiting for me to make a recommendation about a brand. I don't have space to discuss all the motherboards I like, so I'll just say that there are actually lots of terrific no-name motherboards. New vendors appear and disappear almost weekly. Check out your local *clonemeister's* offerings: A decent 33-MHz motherboard with cache will set you back about \$900.

No matter which 386 motherboard you buy to replace your current 286 PC's motherboard, you'll be quite pleased by the results. But as you can see, attention to a few extra details will make using your newly improved system even more satisfying. □



# ONLINE

D E N N Y A T K I N

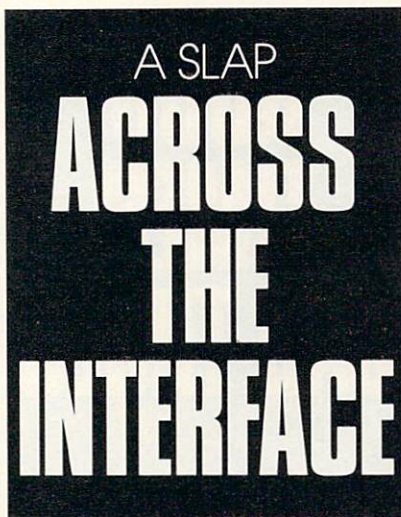
**Y**ou hand the usher your E Ticket and sit down as a deep, monotonous voice fills the room. "Welcome to ModemWorld, the land of the user-hostile. We'd appreciate it if you'd check your mouse and GUI at the door. No, madam, you can't enter that way. We deal in doors here, not *Windows*. Now, if everyone will please fasten the safety straps, we'll begin our journey back into that archaic world where ASCII characters are king, icons are forbidden, and you'd better know your stop bits from your parity bits if you hope to survive." An evil laugh fills the room, and you lurch forward as your car plunges down into the bitstream.

Riding through the vast network of online services and BBSs is like taking a trip back through time to the days when IBM PCs shipped with text-only display cards, UNIX was considered to be a relatively user-friendly operating system, and graphics were something only game players cared about. While you may have a nice GUI-based terminal program, those menus are only good for controlling what's happening on your computer, not communicating with the remote service.

Once you're logged on, the only interaction you'll have with the service is through the keyboard. That in itself is not horrible; many of us use older MS-DOS programs all the time with clunky, text-based interfaces. However, not only do most BBSs and online services have interfaces that date back to the 1970s, but they also all have different interfaces! A user might type *G* (Good-bye) to log off one system, *O* (Off) to log off another, and *BYE* to exit yet another. No wonder getting online for the first time can be overwhelming.

Some services have begun the move to graphical user interfaces, but as yet they're still awkward and clunky, and will bring back memories of using *Windows 1.0* or a 128K Mac—they have potential, but their limitations overshadow their ease of use. Generally, you're faced with a

service like Prodigy, which is very easy to use but just as easy to outgrow, or America Online, which addresses many of Prodigy's limitations but is still so young that you won't find the variety of offerings available on more mature networks. And I've still never encountered a full GUI on a BBS, although the Amiga's SkyPix protocol comes close.



You could avoid BBSs and just use front-end programs like *Aladdin*, *GEE!*, *Whap!*, or *TapCIS*. But local bulletin boards are too much fun to miss out on. And while front-ends are very handy for quickly gathering messages and files from online areas you've visited before, they're useless for exploring the systems—you have to already know what you want to read. Plus, if you encounter problems online that confuse the front-end program, you've got to know the basics of navigating that service to get the program unstuck.

Don't let the variety of intimidating interfaces keep you from going online, though. While the learning curve can be steep, the eventual results are worth the effort. The best thing you can do, for your wallet as well as your sanity, is to pick up a good book with instructions, tips, and tricks for your

favorite terminal program or online service.

The best all-around book I've seen so far for both the beginning and experienced telecommunicator is McGraw-Hill's *Dvorak's Guide to Desktop Telecommunications*, ostensibly written by John Dvorak and Nick Anis. (Many chapters of this formidable 776-page tome were actually written by experts in the fields covered by those sections; for instance, noted Amiga sysop Harv Laser penned most of the text in the chapter "Communicating by Amiga.")

To risk a cliché, if you only buy one book on telecommunications, get this one. It starts with a general description and history of telecommunications, then moves on to tips on selecting and installing telecommunications hardware and software.

The book covers not only most of the major (and minor) online services but also many commonly used BBS systems. It explains concepts like BBS doors (programs that can be run from within BBS software) and file transfer protocols in easy-to-understand terms. Techies will appreciate the chapters on how a modem works and on new communications technologies such as ISDN. There's even a four-page listing of emoticons. The book doesn't take the narrow view that all telecommunicators use MS-DOS computers. There are chapters with online tips for Amiga, Macintosh, OS/2, and UNIX users as well.

If you're a heavy user of GENIE or CompuServe, you might want to check out McGraw-Hill's other offerings. *Glossbrenner's Master Guide to GENIE*, by Alfred Glossbrenner, covers every service GENIE offers. The author's friendly writing style makes this thorough and informative guide a pleasure to read, even for the experienced GENIE user. CompuServe users will find similarly helpful information in *The Complete Guide to CompuServe*, by Brad and Deborah Schepp.

Send comments and suggestions to DENNYA on BIX and GENIE, DENNY on Plink, or 75500,3602 on CIS. □



# ARTS & LETTERS

R O B E R T B I X B Y

If you want to make me happy, send me a board to install in my computer or a pile of spaghetti wire to plug into its various ports. I've had much enjoyment recently trying out tools and boards.

First, ComputerEyes (Digital Vision, 270 Bridge Street, Dedham, Massachusetts 02026), one of the oldest names in video digitizing, is bigger and better than ever, providing the desktop publisher on a budget a tool that captures video signals in a trice and converts them to useful, editable graphics. It can cope with a range of screen resolutions and input devices as various as TVs, VCRs, computers with composite output, and still and motion video cameras.

It provides an interactive preview that shows a fast-capture input screen so you can set the focus and aperture of your camera. Then you can elect to capture a screen at various speeds (from 1.6 to 24 seconds), with the resolution related to the speed (it supports screen formats through Super VGA—640 × 480 with 256 colors).

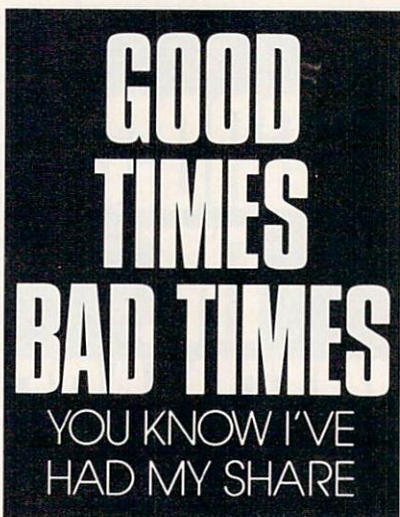
ComputerEyes can work with 24-bit color (16.7 million colors) or 8-bit gray scales (256 gray levels). When the image is captured, you can use its editing tools to adjust the image or save it out to one of several formats (including TIFF, PCX, *DeluxePaint* LBM, MSP, IMG, Targa, and *Splash*) for editing in your favorite paint program. ComputerEyes lets you generate real-world art for your desktop publishing projects.

I was less taken with FTG Data Systems' light pen (10801 Dale Street, Suite J-2, P.O. Box 615, Stanton, California 90680). I don't like the mouse as an input device—particularly for drawing—and I'm always looking for useful alternatives. As soon as I read about the FTG light pen, I wanted to look at it. But after about a week of trying to make it work with *Windows* and my ATI graphics board (and extended phone calls with the helpful folks at FTG), I gave up utterly.

*Windows* slows to a crawl whenever the pen is pointed at the screen. I

accumulated a list of anomalies no one could explain (the cursor followed the pen everywhere on the screen except the menu bar, to name one frustrating example). Upgrades may improve its performance, but currently this tool isn't viable for *Windows*.

A year ago I had an opportunity to review a new input device called the Wiz (CalComp, 2411 West La Pal-



ma Avenue, P.O. Box 3250, Anaheim, California 92801). For various reasons, I wasn't impressed by its performance, but I liked the idea. The Wiz combines a digitizing tablet with a mouse (or a pen) to provide extremely tight cursor control. CalComp has a new driver for DOS and *Windows* 3.0 that works beautifully. It also offers a template system that allows you to enter *Windows* or DOS commands (or specialized commands for many popular programs) by clicking on various positions on the touch tablet. Although it works, I have never liked this part of the system.

CalComp provides a pen that can be substituted for the mouse. It allows you to draw in a very natural way, holding the electronic pen as you would an ink pen and drawing on the digitizing tablet as you would on a paper tablet.

The only problems I had were in double-clicking and accessing the right mouse button. When you bear down on the pen, its point clicks, simulating a left mouse button click. Unfortunately, it's very difficult to double-click the point without moving the point on the digitizer surface, which prevents the double-click from registering. Also, the pen's second button isn't designated to function as the right mouse button. You can make it act as the right mouse button, or you can make the point act as the right button and the pen's side button act as the left mouse button, but that's not much help. Clicking on the side of a pen without moving the point is also next to impossible.

The Wiz is compatible with the Microsoft mouse (if you have the new 1.1D Wiz driver), but you still may have to go through some setup gymnastics to get it to work. *GeoWorks Ensemble* required that I install *GEOS* so that its own mouse driver was ignored. *Presentation Team* from Digital Research required that I install the program as if I were using a bus mouse. The control was remarkably tight when the mouse was in use, and the pen worked well, except for the clicking problems I mentioned. You have to get used to the fact that the mouse must be aligned with the pad for the movement of mouse and cursor to be analogous.

If you know of a good light pen (or other interesting input device), send me the name and address of the manufacturer, and I'll try to review it in these pages.

Although it isn't a tool or board, not to mention *CorelDRAW!* would be a sin after the hours of enjoyment it's given me. Corel Systems isn't the type of company to add a few bells and whistles to something and call it a product upgrade. The next "Arts & Letters" column will be a close-up of *CorelDRAW!* 2.0. It has all the features you've heard so much about for the last couple of years, plus a generous measure of tools you'll wonder how you got along without. □



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# FAST FORWARD

D A V I D E N G L I S H

If your graphics card and monitor are your computer's video system, why can't you just hook up your television to your computer? Or why can't you run a cable to your VCR, pop in a videocassette, and paste Aunt Ethel into your paint program? Better yet, why can't you use your paint program to create a colorful title (something like *Our Summer in the Rockies*) and zap it down your monitor's cable directly into your family's vacation tape?

After all, it isn't so hard to bring text—or even sound—into and out of your PC. So what's so special about video? And how much money do you have to spend before you can send Aunt Ethel dancing across your computer screen?

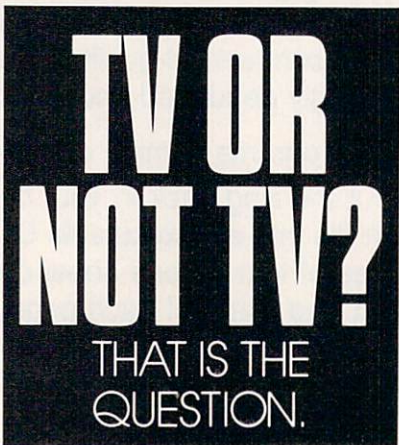
More than anything else, it's a question of standards. All television equipment in the U.S. must conform to the NTSC (National Television Standards Committee) specifications.

Because your TV, VCR, video camera, and laser disc player speak the same video language, you can hook them together without giving it a second thought. Each of these video devices displays the same number of horizontal scan lines, uses a particular kind of interlaced blanking, and alters the phase of the chroma signal to create a specific range of colors.

Even though any NTSC device can accept the video signal from any other NTSC device, you run into trouble if you try to mix two or more signals together. Video devices have to be synchronized with each other, as well as with the NTSC standard. Because videotape can stretch, you'll also need a time-base corrector (TBC) to compensate for timing deviations from the NTSC standard.

That's just on the video side. When you try to bring NTSC video to your computer, you'll have to deal with overscanning, different horizontal and vertical sync rates, and different aspect ratios. It's no small feat to design a card that can send a video image to your computer screen and have it look at all like its earlier form.

Fortunately, the situation is improving. Faster processors and higher-resolution monitors are driving a whole new generation of affordable NTSC video cards. While we're a long way from plug-and-play video, with a bit of patience and a lot of perseverance, you can begin to bridge the gap between TV and CPU. NewTek, for instance, has a Video Toaster/Amiga product that interfaces with the PC.



If all you want to do is watch TV on your computer, check out DESKTOPTV (AVVIEW Technology, 2401 North Forest Road, Buffalo, New York 14226; 800-866-7288; \$395). It's a full-size card that lets you display live video on your computer screen. The card includes a built-in 119-channel television tuner, which you can control from either of two DESKTOPTV programs—a TSR or a *Windows* application.

Before you get too excited about the possibilities of watching "I Love Lucy" reruns in the corner of your *Excel* spreadsheet, let me bring you back down to earth. Only the high-end (and very expensive) video cards let you see computer and full-motion video images simultaneously. With DESKTOPTV, you can view one or the other—but not both at the same time. You can listen to the sound all the time, so if you hear something interesting, you can quickly pop over and

see what's going on. But with this system, it's an either/or situation—your screen is either a computer monitor or a television set.

If you want to bring a video image into one of your programs, take a look at ComputerEyes/Pro (Digital Vision, 270 Bridge Street, Dedham, Massachusetts 02026; 617-329-5400; \$399.95) and VideoLinX: FrameBuffer (VideoLinX, 20111 Stevens Creek Boulevard, Suite 100, Cupertino, California 95014; 800-222-0042; \$695.00). Both let you grab a single video image and convert it to a standard PC graphics file. ComputerEyes/Pro can accept composite video or the higher quality S-video (used by SuperVHS and Hi 8 video recorders). It can convert to PCX, TIFF, Targa, ColoRIX, and other formats.

VideoLinX: FrameBuffer includes video out as well as video in. The video in works much like the ComputerEyes card by converting individual composite-video images to PCX, Targa, TIFF, and other formats. The video out operates in the other direction, converting graphics files into video pictures that you can display on a television set or record on a VCR. Keep in mind that these are individual pictures, not moving images. To create animation with the FrameBuffer, you would need to purchase a special \$2,000 VCR with single-frame capability.

Both cards support (but can't display) 24-bit color for 16.7 million colors. (Most programs that handle 24-bit color files will display them in 16 or 256 colors with VGA or Super VGA cards.) FrameBuffer lets you view 24-bit color files on your TV—a real plus if you work with 24-bit color but don't have a 24-bit color graphics card.

So how much money does it take to have Aunt Ethel dance across your computer screen? At this point, live full-motion video is still just around the corner. But with lower hardware prices and *Multimedia Windows*, Auntie may be ready to do her thing sometime in late 1991. □

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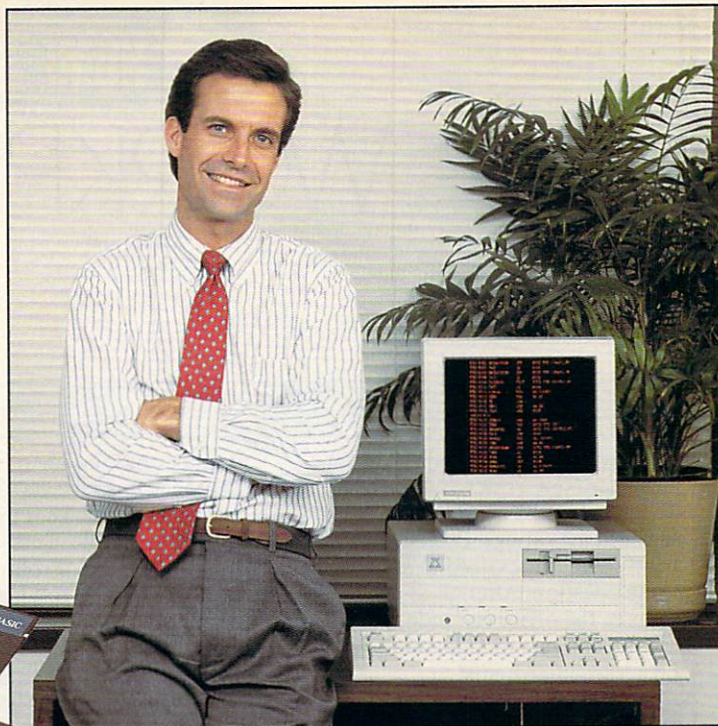
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# WORKPLACE

D A N I E L J A N A L

**H**ow'm I doin'? That's what former New York City mayor Ed Koch liked to ask people to find out his ratings. People who work from their homes need to ask the same question. After all, our counterparts in the office can judge their accomplishments by title, salary, and office accouterments.

How can we judge ourselves? All the home officers I know are presidents, make as much money as they want, take their vacations without prior approval from supervisors, and usually have their offices furnished with stereos, couches, and microwaves. They have their own private executive parking spots, too. So how can we tell if we're really making it?

When I first started out, the "burn ratio" was useful to determine how long you could afford to stay in business. It went something like this: You have fixed expenses of \$1,500 a month and \$6,000 in the bank. Divide the money by the expenses, and you come up with 4. That equals four months of living expenses. If no money comes in during four months, you've burned your capital.

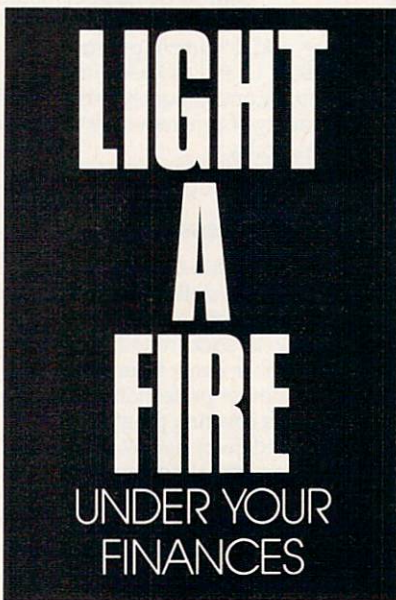
You can do that kind of math in your head. But when you become successful and start spending money on discretionary items like travel, entertainment, and 20 other categories, and you earn your income from several different clients, you need a computer to do it for you.

I began using a spreadsheet program called *Quattro* from Borland to do my math quickly and accurately. I created a table with all my expenses listed in the left-hand column of the screen, and month and totals listed horizontally across the top. Every month, I faithfully retrieved my expense receipts and entered the figures into the computer, where *Quattro* instantly added them up.

I turned into a spreadsheet junkie. I soon added an extra column that figured out what percentage each expense accounted for. Devising the mathematical formula that calculated that figure and displayed it as a whole

number ranks as one of my greatest lifetime achievements.

*Quattro* also kept track of my accounts receivable. This table had five columns: Clients, Professional Fees, Client Expenses, Total, and Date Payment Received. I faithfully typed in the information as I sent out each bill and logged in my income within seconds of ripping open the envelope. Totals at the bottom of each column told how much money was earned, how much was outstanding, and how much tax was due.



If you put your receipts in a shoebox and dump them on your accountant's desk on April 14, not only should you be ashamed of your sloth, but you're also denying yourself one of life's great pleasures—seeing your money add up every month. Talk about instant gratification and positive reinforcement! Get a spreadsheet.

Nearly all the calculations can be done with simple formulas that add the contents of the cells. You don't have to be a rocket scientist or buy *Bozo's Big Book of Macros* to figure it out. Most people can use spreadsheets effectively with just a few commands.

I used this system for four years, and it worked well enough for me to know my burn rate instantly. The spreadsheet system also helped me wrap up income taxes in one painless visit to the accountant. But then everyone began talking about *Quicken*, a check-writing program. I soon discovered this was more than an electronic replacement for my mother who wrote checks for me once a month.

*Quicken* is a combination spreadsheet and database that creates every report you need to figure out how well you're doing. It can create net worth statements, cash flow analyses, year-by-year budgets, and reports of investments and income by client.

You can get all these reports simply by telling the computer three pieces of information when you write a check or make a deposit: the name of the payee or client, the category, and the amount. After selecting a report format, which *Quicken* lets you adjust by date, amount, payee, or just about any other variable, you press the Display key to see your results either onscreen or on paper. The process is so fast that you can check your financial progress every day in just seconds! Now that's *really* instant gratification.

My favorite feature is the budget analysis, which lets me compare this year's budget to last year's to see how things are going. *Quicken* also saves me a lot of time by finding "missing" checks. Because the program tracks payments by payee, you can quickly print a list of all checks paid to the phone company, for example. So if someone claims I haven't paid my July invoice, *Quicken* quickly finds the entry for the disputed check.

*Quicken* makes it so easy to keep finances on track that you'll probably toss away your shoebox. While I could still use my spreadsheet to tabulate the information, *Quicken* does it faster, and it already includes report templates—something spreadsheet programs usually don't have.

So how'm I doin'? Just fine, thanks. □

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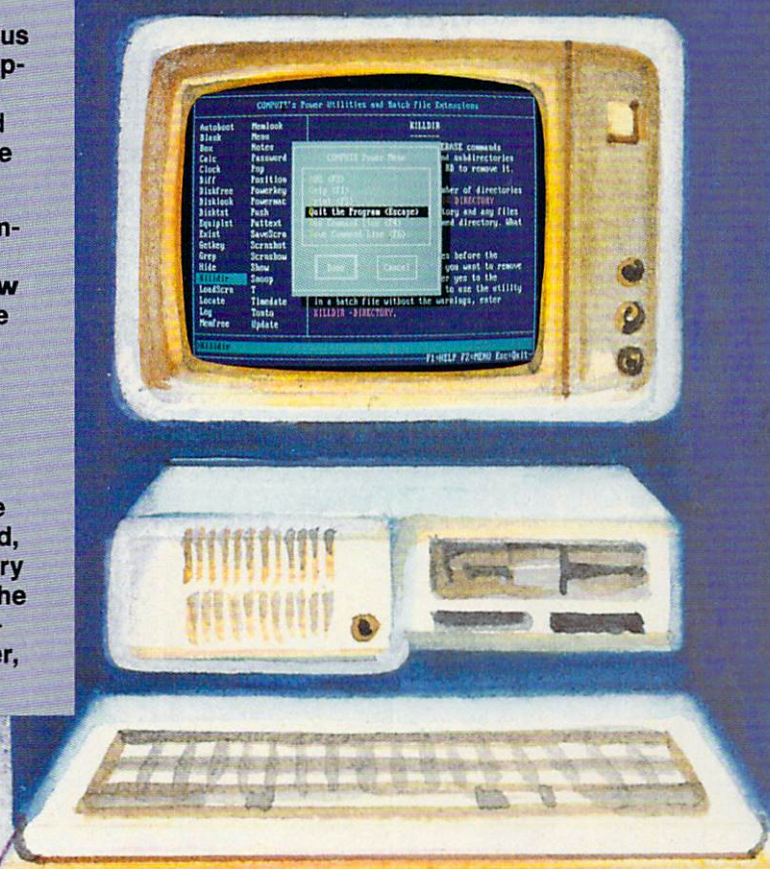
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# PLAN TO SUCCEED

BY TOM CAMPBELL

**Y**ou have a great idea for a business. You've finally decided to make the leap. Your carefully chosen network of potential clients, employees, and future contacts is strong enough to support a new company. You're willing to give up vacations and weekends. You're ready to face a career where the 40-hour week is a misty daydream and a 60-hour week means you're slacking off. But there's a hitch; you need money. A lot of it. ▸

## Other People's Money

It's a nasty contradiction, but sometimes starting your own business—your dream of independence embodied—means depending on other people for money. If you need more money than you have to get started—or need to borrow a substantial amount of money after startup—you'll need a business plan.

In short, the purpose of a business plan is to convince people that they can make money by lending it to you or by purchasing part of your company. I found creating and presenting my business plan an eerie recap of the same things that sent me screaming from a traditional job: surrendering control, dealing with people I didn't always want to deal with, asking for more money, writing résumés, and depending on other people for my livelihood. But the excitement of running my own business made it all worthwhile.

You need to look at your business plan as others will. Step into the shoes of the people you need to convince and see whether your plan makes the right sort of impression.

Who will see your business plan? Bankers, venture capitalists, or small investors willing to risk a few thousand dollars. In general, bankers loan amounts up to the hundreds of thousands. Venture capitalists start at about \$100,000 (though many won't touch anything under a million). Who are the small investors? Generally people you know, people with a couple of thousand lying around collecting dust and insufficient interest in a savings account or CD. When it comes to handing out your business plan, don't forget Mom and Dad. Even if they don't require one, you should write one—the process of writing it will often cause you to make major changes in your game plan. Reading this article and writing a business plan will also help you avoid some common pitfalls, such as mistaking marketing for sales and learning the importance of a good presentation after the marketing plan has been written.

## A Word Is Worth \$1,000

In high school, your English teacher probably tried to explain the importance of being able to write a coherent essay, and a business plan is structured like a good essay. You tell 'em what you're going to say, say it, and tell 'em what you said. It worked in high school, and it works in business plans, too. Depending on how busy your potential investor is, the table of contents and introduction may be all that ever get read. If you're a bad writer, you should get a professional writ-

er to do it for you. A typical business plan has the following elements:

- Cover
- Table of contents
- Introduction
- Description of your product or idea
- Description of what the investor gets in exchange for the investment
- Market research and sales projections
- Marketing plan
- Sales plan
- Distribution plan
- Plans for future enhancements, product lines
- Profit and loss projections
- Job history and experience for you and any other people involved

The description of your product or idea and market research are very important. The product description may only take up a page or two, but it had better excite the person reading it.

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## Ironically, your dream of independence requires that you depend on other people for money.

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Market research is problematic, but you'll find even the least sophisticated potential investors will ask for market research.

I managed to sell my idea with none, arguing that market research would be expensive and, more to the point, would tip off other software companies to the idea. Still, if I had to do it over again, I would have done the market research, even though more than 75 percent of the people to whom my partner and I gave our presentation bought stock.

I've since realized that any but the simplest of ideas is probably safe, just because the kind of people who tend to steal ideas don't tend to be very good in their execution. So take the time to find out about your customers. Your market research should contain as many hard numbers as possible, presented with charts and graphs, and it should emphasize the unique aspects of your venture.

When you write your description of the product or idea, bear in mind that the reader may know nothing about the industry you work in. Make no assumptions about his or her level of knowledge. Read the description over and over, pestering family, friends, and passersby at the bus stop until you've distilled it into a highly focused miniessay. Like a newspaper article, it should go from broad to narrow, doing everything it can to catch the reader's attention without larding the information with puffery and hype. You're forgiven the urge to wax eloquent in the sales projections, but make the description totally straightforward. People who are about to sink their hard-earned cash into a speculative venture don't want to be entertained at this point in the plan.

Market research shows who will buy your product or service. A marketing plan maps the strategy you'll use to get it to them. For example, my product was a utility program for power users, MIS directors, and consultants. This determined my market. My marketing plan was to focus on getting free press by sending out creative press kits to narrowly focused computer magazines, appearing at user groups, and getting the product reviewed in major magazines. As the product made money, we would take out display ads in the appropriate publications; the marketing plan described what publications would be good to advertise in.

Since I had done similar work for other companies before, I was able to include samples of previous work as a demonstration of my value—not only could I program, the theory went, but I could write press releases, too. As it turned out, my partner did most of the marketing, but my ability to wear several hats impressed potential investors.

The sales plan details how the marketing will be executed. *Marketing* means determining who buys the product or service; *sales* means getting it to those people. For example, if your marketing plan details the kind of ads you'll run and their placement, the sales plan details how much the ads will cost to run, how you'll get the phone orders when they start rolling in, and so on. As you'll find out when you read the sidebar, "Selling It," you'd better be a good salesperson when you present your own plan. I found that my enthusiasm carried me where intimate knowledge of sales didn't.

The distribution plan shows the logistics of getting your product to dealers and keeping it there (if you're selling a service, this section probably won't apply). It tells how you'll create



a dealer network, how you'll maintain it by offering them special discounts at certain quantities, how you'll train the dealers, what sort of special promotional materials you'll create for your dealers, and how you'll prune out the deadwood dealers. Many small companies, including software companies, can function well as their own distribution networks, although I dislike this end of the business. I'd rather have Egghead move 1000 copies of my product a month than sell those copies to individuals, even though the individuals buy at list price and Egghead gets a sharp discount. Economies of scale are just as important for a small business as a big one.

Your plan for future products and enhancements shows potential investors that you have a good grasp on the market. No one told me this before I wrote my business plan, but it turned out that this was one of the strongest

points of my plan. In fact, I scaled this part down because I thought it would make me look less pragmatic than I am, too much like a dreamer. Instead, many people were impressed with the clarity of vision—and at the thought of being able to make money on my product years after its introduction.

Your profit-and-loss projections (P & Ls) will be important to any investor with a sophisticated knowledge of money, even though planning it a year ahead of time is pure voodoo. I skirted the issue by creating three versions, from pessimistic to reasonably optimistic. This turned out to be a standard practice, even though I secretly thought it a copout. P & Ls shouldn't be too detailed. Look in a book or a big company's annual report for examples.

Finally, your job history and experience must be included. A one-page summary is fine; you need in-

clude only what's relevant. Your job working at Wendy's in 1974 isn't relevant unless you're opening up a fast food joint. On the other hand, if you're opening a computer store, your experience working as a support tech at the city college ought to be included. Under no circumstances should you lie or waste the reader's time.

### General Tips

Here are some things to bear in mind before and during your creation of the business plan:

**Write well.** While most books on writing a business plan tell you to find writers in the local directory or writer's organizations, I suggest that you go to the source. Contact a writer you've seen in the local paper's business section, someone whose writing you like. If your kid brought home a term paper with snappy, cogent notes from the teacher, consider hiring the

## POLISHING PRESENTATIONS WITH PCs

Your PC can help every aspect of your business presentation, from words to numbers to pictures. Here's how.

**Words.** Your business plan should be either typed on a typewriter or printed on a laser printer. Use someone else's laser printer if you must, but avoid dot-matrix at any cost. I prefer to use soft fonts and a Hewlett-Packard LaserJet II or III; I feel that these bitmap fonts look even better than PostScript fonts in small sizes. Speaking of size, use 10- or 12-point type for the body text; never go smaller. A 12-point face is good because many people have trouble reading small text and appreciate being able to read your document without glasses.

Avoid garishness. If you aren't a graphic designer, stick with Times Roman or some other conservative serif font for the body and Times Roman or Helvetica for the headlines.

If you aren't positive about your layout, copy someone else's. You don't want to end up looking like an amateur when you hand a copy of your report to someone with \$100,000 to invest. Simple never hurts, but tacky does.

If you're good at teaching people, you may have a hidden talent that will please any investors who know PCs. Demonstrating that you not only know how to use software for more efficient business practices but can train new employees on software will elevate investors' estimation of your skills. Thanks in part to Apple Computer's advertising, Wall Street knows that PCs are severely underused in the workplace. If you have a knack for getting employees to work better with existing tools, you can demonstrate that your PC knowledge has a concrete value to the business. If you show another bar chart to a venture capitalist, it'll be just one of doz-

ens; but show that same person your nifty envelope printing trick in *WordPerfect*, and you'll be one of the standout presentations of the week!

**Numbers.** While most of your presentation should be understandable to computer neophytes, you are given free reign when it comes to presenting numbers. Spreadsheet printouts and graphs are not only acceptable but desirable. Remember that the person investing in your business

investors aren't afraid of numbers, they become very impatient with numbers you can't explain or numbers that appear simply to help you fill up a page. If you can't explain exactly why the row marked *Misc.* accounts for 25 percent of projected expenses, you haven't done your job. And Murphy dictates that you will be found out at the worst possible moment.

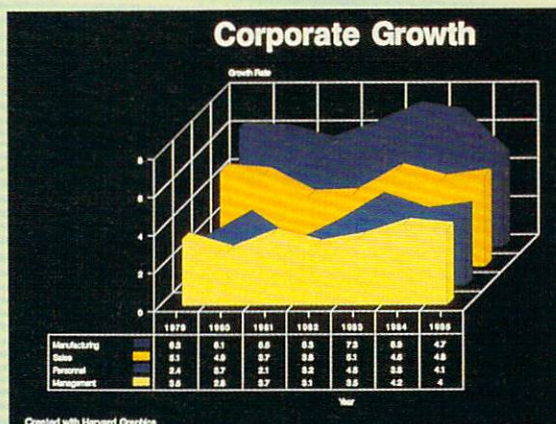
**Pictures.** Your PC is a remarkable source of dramatic imagery, and good

pictures can turn a good presentation into a great one. This is a double-edged sword, however—good pictures with a bad presentation can easily wreck your pitch. Investors are usually highly pragmatic and very busy. They don't want to be snowed any more than your high school English teacher did.

If pictures are a part of your business, cut loose and show investors everything you can. If you're pitching a real estate database that employs digitized pictures of the houses for sale, create a mock-up with half a dozen records. If you want to start a slide bureau, do some work for free and include those slides in your presentation. If you're selling a software product that requires VGA, show what it would look like in

CGA mode to explain why you're foregoing 30 percent of the market.

Using your EGA- or VGA-equipped PC for a lowball multimedia show isn't a bad idea, either. You may already have the tools to do it. *Windows* comes with a fine paint program that uses PCX files, and there's a wealth of PCX screen show or capture programs and clip art available as inexpensive shareware. The advantage in a pricier approach, such as Zenographics *Pixie* or Microsoft *PowerPoint*, is that these programs come with templates you can use if you're not an artist yourself.



Harvard Graphics will help you create graphs for a professional quality presentation.

is probably already a spreadsheet user and no doubt shuffles numbers with a facility approaching that of instinct. I was fascinated at how quickly even the least computer literate of my prospects could scan a spreadsheet printout; they cruised through them as easily as a soap opera buff reads the tabloids. Knowing how to speed-read spreadsheet data is how they make a living, and they will rely on these numbers for as long as they hold stock in your company. Your cost and profit projections will serve as a reference point for years to come, and the corollary to this principle is that while in-

teacher. Or scan author blurbs in magazine articles you like for a writer living near you.

**Leave a trail of evidence.** Anytime you can illustrate a point in your business plan, do it. If you plan to distribute fliers, staple one to the back and refer to it in the marketing plan. If you wrote—or were written about—in any industry trade magazine, by all means include copies of those articles. Seeing your name in print gives the investors a feeling that they are dealing with a known quantity.

**Throw away your computer.** Take a moment to imagine your presentation without all the bells and whistles. Imagine what your presentation would be like if you didn't have a computer: a typed business plan, no graphics, and no animated slide shows on your Super VGA monitor. If the presentation stands on its own, you've done a good job, and your other presentation tools will make it a slam dunk. If it doesn't stand on its own, pretend that you've had to throw away your computer. Start from scratch. Your potential investors almost invariably have a lot of common sense. They'll see through a hollow presentation as if it were printed on gauze.

**Borrow a computer.** Now that you have a good presentation, you'll want to make it better. A PC can be a powerful ally in giving a business presentation (see "Polishing Presentations with PCs"). If your PC isn't up to the task or if you need expensive hardware such as a laser printer, there are several ways to get access to high-end computers and peripherals. In my area there are at least three junior colleges with excellent Macintosh and PC facilities. I was able to get access to them by purchasing a membership in the school library (enrolling in a course is another good way to do it). Several local print shops also have Mac networks, where the machines can be rented for \$10 or so an hour. If you want to present a multimedia show to a group of investors and don't think huddling them around your PC in the master bedroom is a good idea, consider renting a training center on an off night. Radio Shacks in my area make their training facilities available when they aren't in use.

**Watch yourself.** Having been on the ground floor with both successful and unsuccessful companies, I've concluded that a few simple, fundamental, and somewhat out-of-fashion truths endure. Above all, never lie to yourself or your investors. It's often more difficult to tell the truth in the short run, but it's almost always easier in the long run. For example, if a potential investor asks you about your

marketing skills and you say they're great when they're not, you'll face some hard questions when sales don't meet projections. And you might find out too late that that same investor knew a really good, but hungry, startup agency that would've created some great ads on the cheap. If you don't know exactly why shipping costs much more than you think it should, ask around. Maybe one of your stockholders knows how to work a deal with the shipping company. If you find yourself answering questions with more authority than you have just because you're the boss, apologize immediately and learn to say "I don't know."

**Avoid cram.** Avoid cramming more than three or four phrases worth of text on word charts, avoid using clip art that doesn't help the presentation directly, and be very conservative in your use of color. Above all, never use pictures when they're not needed. It might lead an investor to think you have nothing to say.

## The Royal Road

Writing your business plan can lead you to unexpected revelations. You might discover that you don't want to run a business after all. Or that if you do, you might want to choose a slower growth plan and use the business to finance itself.

You might even discover that you need a partner, rather than stockholders, because writing the plan has helped you identify some important gaps in your own abilities. Or you might discover the opposite: I realized while writing my business plan that my seemingly checkered past in the job market resulted in a wide array of skills—I was competent in enough areas that we were able to cut the personnel requirements substantially.

Writing a business plan isn't just a way to raise money. It's a way to sharpen your powers of observation and a way to learn about yourself. It can even be the touchstone of a whole new way of thinking about your business—and about life. □

## SELLING IT

Writing a business plan is only half of the story. The other half is finding qualified investors and presenting the plan to them efficiently and effectively.

### Finding Qualified Investors

Selling the idea of your business is like selling anything else, and part of your job is to find the right people to sell to. My approach was a little unusual but highly effective; I went to my tax advisor and asked him how to raise money for a software company. He inquired in detail about my idea, sat back, and said, "Let me think about this for a few days. I'll get back to you." The next day he called back with a proposal. For a cool 25 percent of the company, he'd take responsibility for raising the necessary money and managing the books. Over the next year and a half he raised about \$200,000 from his tax clients directly, and referrals from those clients brought in another \$100,000. During this time he sold his practice, eventually becoming president of my company.

A more traditional method is to use the resources of your bank. As you might imagine, your history with the bank counts for a lot. Equity in a home or ownership in some other large, salable item counts for even more. I had no such equity, so approaching a bank was out of the question. I thought that my idea counted as a sort of "brain equity" and would be enough, but a bank, naturally, thinks only in terms of failure: How can it get the money back if your idea doesn't pan out?

Finally, you can always check with Mom and Dad, or Uncle Vinny. Chances are they won't require a business plan. But there's nothing like a large quantity of money exchanging hands to bring out the traits of a family. If you have a solid relationship,

losing Uncle Vinny's money will strain your conscience, but it might even bring you closer. On the other hand, if you and Vinny have any old resentments lingering between you, they'll be brought into vivid focus if something goes seriously wrong with the investment.

### Pitching the Plan

Presenting your business plan is as much an art as writing it, and it deserves no less attention. The first lesson: *The business plan will not sell itself.* You may think that your idea stands on its own merits, but it doesn't. It is imperative that you talk about your product with genuine enthusiasm and conviction. If you find that no one is interested and you've already reevaluated the business plan itself and found it flawless, take a Dale Carnegie course or some other sales course for tuning up your ability to project confidence. This is especially helpful if you find yourself betraying the tiniest bit of uncertainty or fear in your presentation. Many people are unable to let their natural enthusiasm show around people they've just met, but you *must*. If you don't, potential investors may be afraid you don't believe in your own idea, even if you do.

Finally, don't make too many assumptions about your prospects. We found, for example, that successful entrepreneurs with large amounts of money to invest were much easier to sell than individuals with modest sums. Large investors identified with us, whereas small investors tended to be much more cautious. On the other hand, venture capitalists in our neck of the woods (southern California) want total control, a much slicker business plan, and businesses virtually guaranteed to gross a lot of money over the short term.

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## PATHWAYS

S T E V E N A N Z O V I N

I'm probably not the only adult who remembers with less than affection the sights and sounds of high school chemistry class: the sour smell of hydrochloric acid, the rattle of boiling water in beakers perched over Bunsen burners, the endless hours of reading about moles, covalent bonds, and benzene rings.

One day my chem teacher gave us a break and showed us how to mix up a mild explosive—good for making rude bangs when painted on the soles of the class clown's shoes—but it didn't help us understand chemistry's relevance to us and why we should bother studying it.

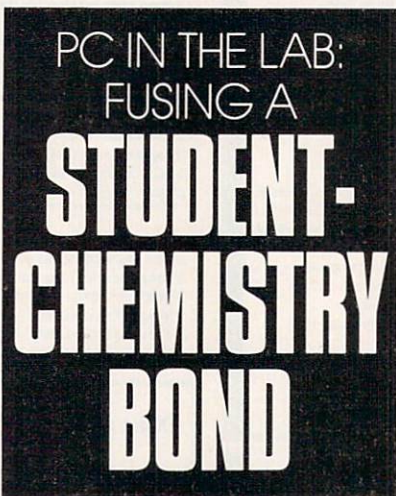
I flunked chemistry, and so did about 20 percent of the class. That was considered the normal attrition rate; nobody thought there might be something wrong with the way we were taught.

Science teacher Vinnie Cusimano has a different idea of what high school science education should be, and PCs are a big part of it. Cusimano is a 25-year veteran of the New York City public school system. Five years ago, when the NYC Board of Education was seeking a way to reach students turned off by traditional methods of teaching science, Cusimano came up with a proposal to integrate computers with lab technology. (You might think this is an obvious idea, but as late as 1988, some 85 percent of eleventh graders had never used a computer in a science class—and neither had their teachers.) The goal was to stimulate students to do real problem solving rather than just memorize facts to pass a test.

Called Partnership in Technology for the Physical Sciences (offices are at Susan E. Wagner High, 1200 Manor Road, Room 456, Staten Island, New York 10314; 718-698-4200), the program won a National Science Foundation grant and receives assistance from IBM. Currently, it's being tested in five high schools throughout New York City, ranging from middle-class Susan E. Wagner High on Staten Is-

land to Thomas Jefferson High in a high-minority, low-income neighborhood of Brooklyn. The students are mostly ninth graders, many of them below-average achievers.

One physical science classroom at Wagner is fully wired for science and computing. Along with the expected black-top lab tables are standard IBM compatibles and PS/2s networked to instructor Walter Styczynski's computer. Sensing probes are linked to the network so experimental data can be displayed right on-screen. The PCs run off-the-shelf software—a spreadsheet template, a



graphing program, a word processor, and a database—and are involved in every aspect of the class.

Kids investigating the nature of heat energy, for example, can do an experiment, collect temperature data with the sensors, and then pump those numbers directly into a graphing program or spreadsheet. At that point they can ask what-if questions and perhaps go back to the experiment. Reports are typed with a word processor, and data is stored in a database for later use. This system works for classroom demonstrations as well. The teacher can perform an experiment at the front of the room with the networked science probes, locking the

students' screens so everyone can see the experimental data as it feeds into a graph. Then the screens are released so students can manipulate the information themselves.

At first the program met some resistance from teachers inexperienced with computers and wary of the complex curriculum (the documentation, written mainly by the teachers themselves, runs to 800 pages). But after a few months of the program, says Cusimano, teachers were hooked, deluging him with new ways of using the technology.

The effect on the kids, though, is what counts, and that is profound. "People think that if you put computers in the room, kids are motivated, but it's not true," says Cusimano. New students realize right away that they can't hide in the back of the class—there's no place to be but in the group and learning.

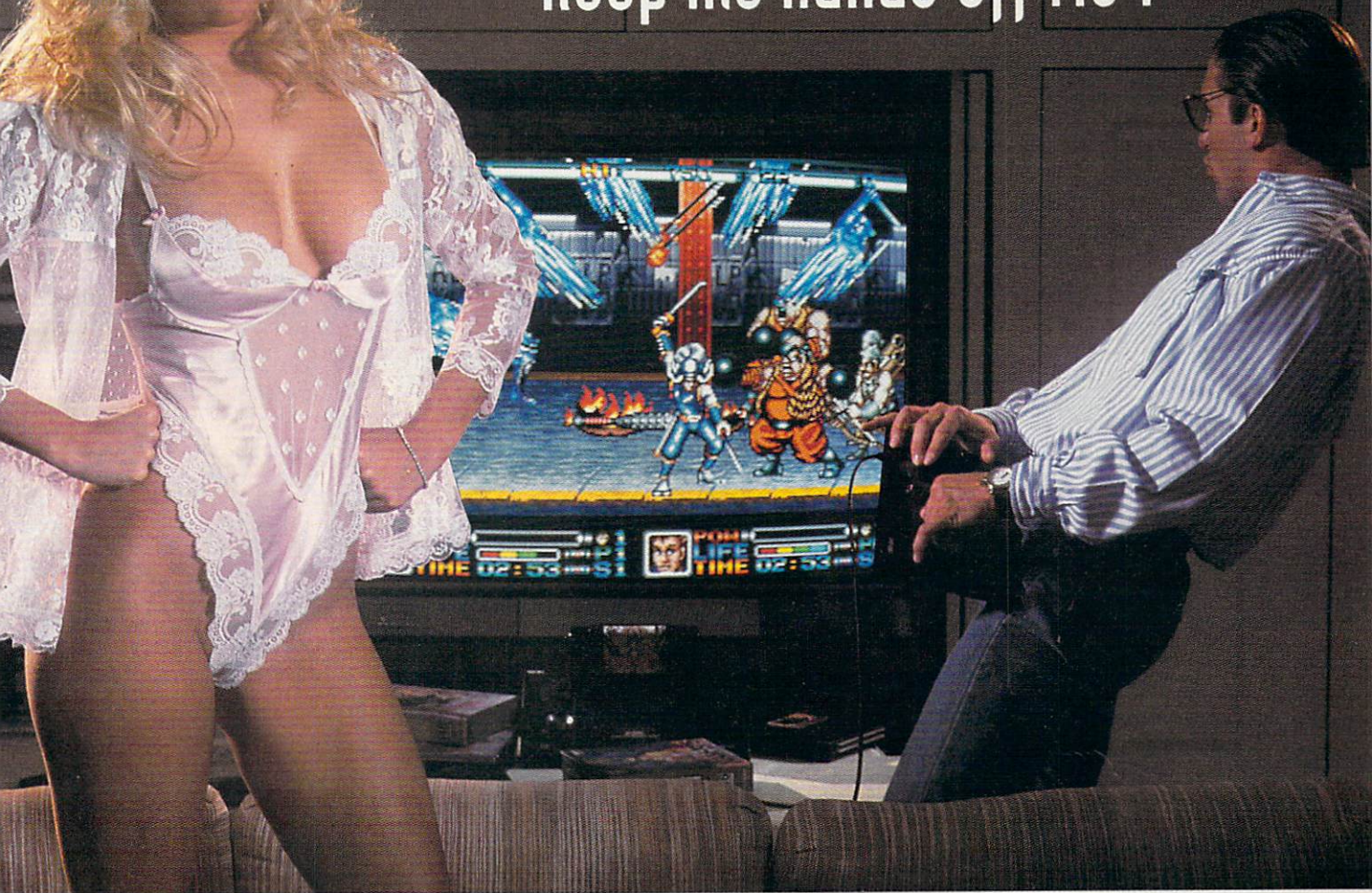
Soon, however, students begin to pool data and methods on their own and to cooperate in small groups without prompting from the teacher. Within six months, even low achievers are proud to show their work.

Styczynski is amazed at how comfortable the students have become with computers and sees them bringing away an understanding of science that they often couldn't have before.

David Podell and Sally Kaminsky of the Research Foundation of City University, who are evaluating the program for the Board of Education, note that students who have participated are more likely to take higher-level science courses, score better on the state's Regents' Competency Test in Science, and even have better attendance. It's the independence computers provide that seems to make all the difference.

Students themselves give the best evaluation of the project, says Cusimano. "If you go in a class, you can feel the kids' enthusiasm. They say, 'Come here; look at this.' If any science teacher can get a kid to say that, he is successful." □

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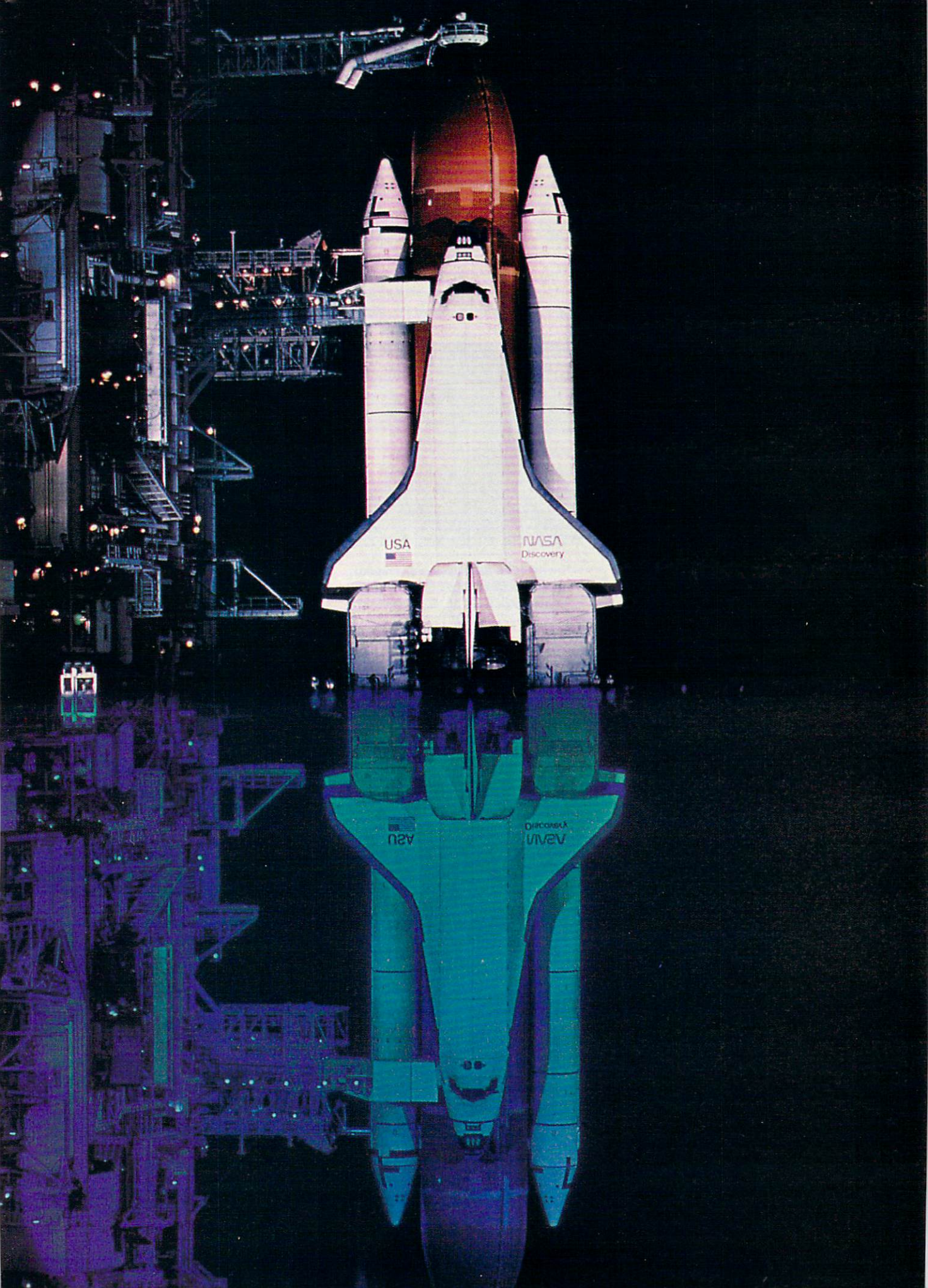
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**S**pace shuttle computer system. The words probably bring visions of a high-tech, state-of-the-art computer command system to mind. Or perhaps you think of the most advanced flight simulators designed for aerospace use.

Surprisingly, each of the shuttle's five on-board computers has the equivalent of only 400K—less than most micros!

When the space shuttle's General Purpose Computer (GPC) was originally designed in January 1972, NASA chose state-of-the-art flight computers, similar to those proposed for the F-16 fighter. Unfortunately, state of the art for the 1970s *wasn't* state of the art for the 1980s when the shuttle was first launched.

In earlier spacecraft, astronauts could take manual control if their computers failed. Neil Armstrong and Buzz Aldrin overrode their Lunar Module computer when it almost landed them in a crater. However, the shuttle is a much more sophisticated vessel, combining the capabilities of a spacecraft, a truck, and a glider, and it's much more computer dependent.

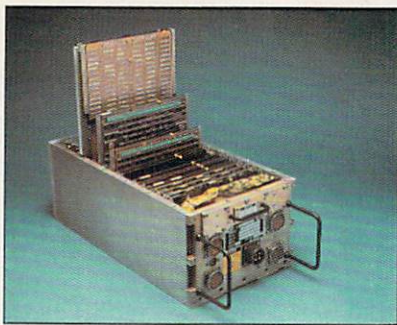
### The GPC in Its Infancy

The earliest General Purpose Computer, the AP-101B, has 104,000 32-bit words of iron-core memory (small iron rings threaded on a loom and magnetized to determine ones and zeros). It uses 650 watts of power, weighs 51.8 kilograms (114 pounds), performs 400,000 benchmark tests per second, and has an MTBF (Mean Time Between Failures) of 5200 hours.

Each shuttle has more than 300 electronic "black boxes" with over 300 miles of wiring and 120,400 wire segments with 6,491 connectors. The total weight of the black boxes, wiring, and connectors is 7,780 kilograms (17,116 pounds)—heavier than a fully loaded Apollo Command Module spacecraft.

Since the computers are essential, NASA decided to use five identical computers in operation for critical periods like launch and landing. Four of the units operate together, and if one has a different result, it's presumed wrong and is "outvoted." The fifth computer is programmed separately from the other four and acts as a backup to prevent possible generic software errors from causing problems. In addition, an offline spare—a sixth GPC—is carried, which can be swapped with a malfunctioning GPC in orbit if necessary.

The OPS 101 program controls the shuttle from T-20 minutes in the countdown-through-orbit insertion sequence. All five computers must be in



**The new AP-101S General Purpose Computer. Five identical units will operate in tandem aboard the shuttle.**



**The AP-101S (left) uses only one box, operates three times faster, and is twice as reliable as its 18-year-old cousin, the AP-101 (right).**



**Left to right: AP-101S General Purpose Computer (GPC), Mass Memory Unit (MMU), Keyboard, Display Unit (DU), and Display Electronics Unit (DEU).**

sync and working properly; otherwise, the launch is scrubbed (see the sidebar, "Fewer GPC Failures for the Future?").

When the shuttle arrives in space, the crew reconfigures the computers for orbital operations. Two GPCs run the on-orbit program, and one GPC is dedicated to payload operations. One GPC is powered down but has the landing program loaded in case an emergency requires the crew to return in a hurry. The final GPC is powered down until needed.

If one GPC fails in orbit (or even two), the mission won't necessarily be aborted if the problem isn't expected

to affect the other GPCs. In theory, any of the five computers has the capability to land the shuttle safely. During reentry and landing, all five GPCs operate together again. Sophisticated control loops command the shuttle's aerodynamic surfaces and respond to the pilot's inputs.

While the original GPCs have worked well, their age is showing, and their limited capabilities now put a strain on the shuttles' operations.

### A New GPC Is Launched

For the past six years, NASA has been designing, building, and testing upgraded AP-101S computers. One of the most important requirements in the new computers' design is that they're functionally compatible—in both physical connections and software.

Functional Test and Instruction Set Test Programs have verified that the hardware and CPU will produce the same results. Astronaut Kenneth Reightler explained that one of the key factors in implementing the new computers was to make the change completely transparent to the astronauts, although software differences would be necessary at the programmers' level.

The new GPCs were tested for functionality in the avionics laboratories with the actual flight software, and hardware validation tests were performed before they were installed in the shuttle simulator. In all, the AP-101S computers were tested for three years.

*Atlantis* was the first orbiter to launch with the new GPCs. STS-37 (Space Transportation System is NASA's designation for the shuttle program) was launched on April 5, 1991, just a week shy of the tenth anniversary of the first shuttle's launch. Launch director Bob Sieck said, "We couldn't tell any difference during the countdown. We didn't have to alter our procedures or software, so [the change] was essentially transparent after we installed the [new GPCs]."

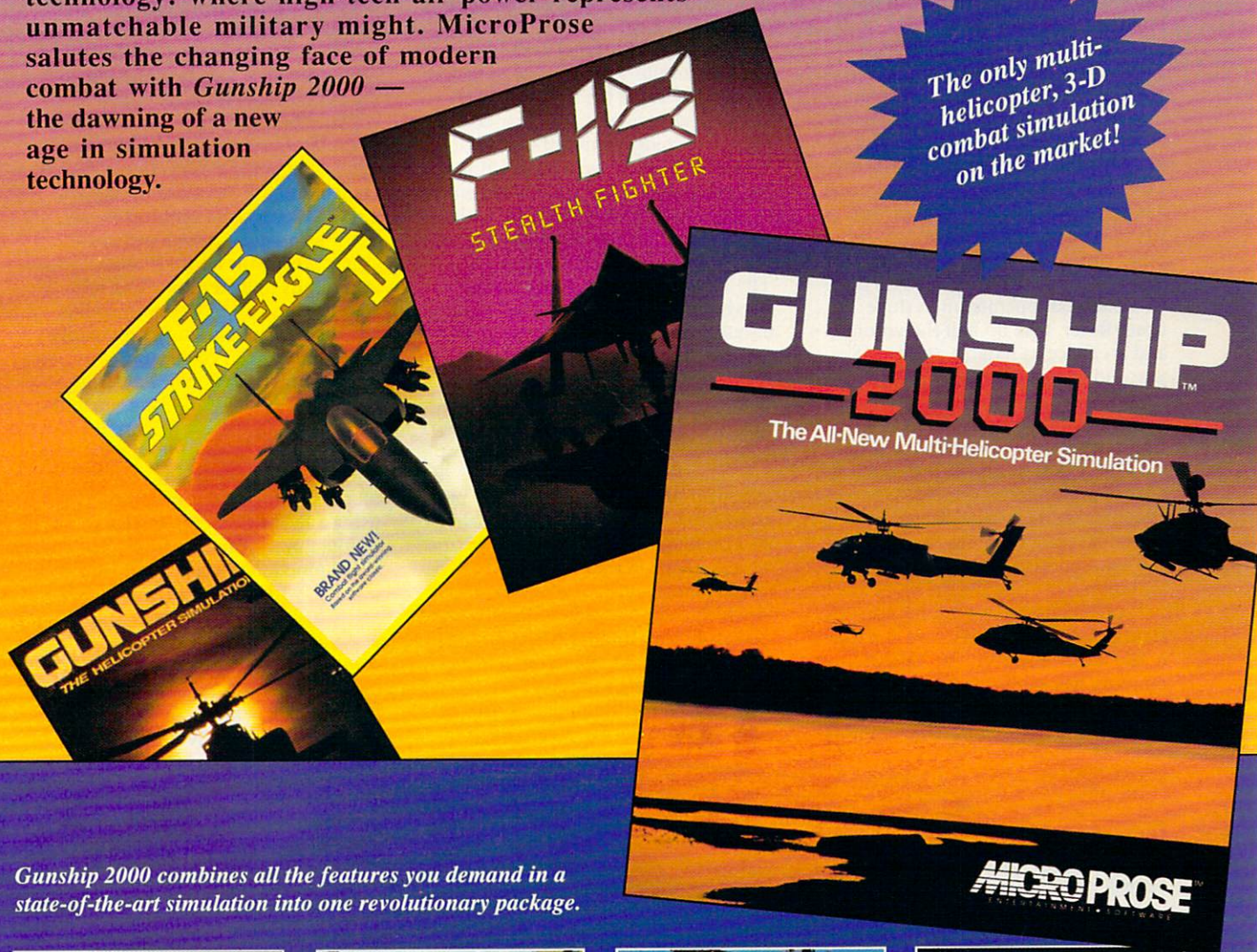
*Discovery* also carried the new GPCs, and *Endeavour* and *Columbia* will have them installed for their next flights, which are scheduled for mid 1992. The last flight of the original GPCs was the STS-40, *Columbia's* Spacelab Life Sciences (SLS) mission which was scheduled to launch in May, but eventually went up in June after several delays. One of the old GPCs failed early in the countdown and had to be replaced. While *Columbia* was controlled by five of the old AP-101SL computers, it also carried modified versions of the AP-101S, which were used to control its Spacelab cargo.



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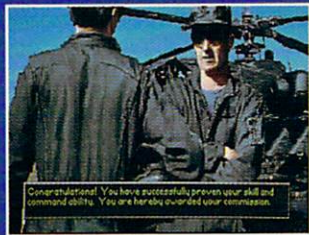
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On the previous Spacelab mission, both 1970s-era French-built DDS (Data Display System) computers failed halfway into the mission, forcing the controllers and flight crews to control the telescopes manually. Spacelab managers were glad to replace the DDS computers with the brand-new AP-101SL models.

The AP-101S GPC has 256,000 32-bit words (roughly equivalent to 1MB of RAM) of CMOS (Complementary Metal Oxide Semiconductor) memory. It uses 550 watts, weighs 29 kilograms (64 pounds), and performs 1.2 million benchmarks per second. It has an MTBF of 10,000 hours, and fits into one box instead of two. In other words, the new GPCs have 2½ times as much memory, use less power, weigh less, operate up to three times faster, take up half the volume, and are twice as reliable as their 18-year-old cousins, the AP-101B.

### More Memory, Less Risk

Iron-core memory, used in the original GPCs, is slow and bulky and uses a lot of power, but it does have two advantages over silicon memory. It doesn't require power to retain its contents, and it isn't sensitive to radiation.

CMOS memory requires constant power, and cosmic rays can easily flip a bit. However, the AP-101S memory has a fail-safe battery backup and an automatic error-correction circuit that constantly scans the memory

for upsets and corrects errors.

The programmers were ecstatic to double their memory. (Remember when you doubled *your* computer's memory?) The additional memory will be used for routines that couldn't fit within the earlier limitations, and now multiple programs can be combined, unlike before.

Will the additional capabilities really be useful? The STS-26 launch in September 1988, the first since the *Challenger* accident, was delayed due to unexpectedly calm upper-level winds. The GPCs were programmed for higher winds, but there was neither enough memory to permit more than one wind profile nor enough time to load another profile into the GPCs. The launch was delayed for almost two hours until the winds picked up enough for a positive safety margin.

While delays due to memory limitations can be annoying, a lack of memory can also cause life-threatening problems during an emergency abort.

The original GPCs have just enough memory for the OPS 101 program from T-20 minutes through launch, potential launch aborts on the launch pad, and the dangerous RTLS (Return To Launch Site) abort mode in which a shuttle would literally make a U-turn and land back at the Kennedy Space Center if something were to go wrong early in flight.

All of these functions have to be squeezed into RAM, which doesn't

leave enough additional memory for the TransAtlantic Landing (TAL), another abort mode. In a TAL abort, the shuttle would continue to fly across the Atlantic Ocean, but the main engines would shut down early, and the shuttle would land in either Africa or Europe, depending on the flight path and fuel reserves.

While neither abort mode has been needed, a TAL is preferable to the RTLS abort since it's much less stressful on the orbiter's structure and doesn't require a U-turn. Unfortunately, the original GPC doesn't have enough memory to store the launch and TAL programs simultaneously.

Astronauts must change programs *during* the abort. It takes 15 to 20 seconds to load in the TAL software—time during which the pilots have to control the shuttle manually and anything can go wrong.

The next version of the flight software, which will use the capabilities of the AP-101S, will store the TAL program in an unused portion of memory and move it into active memory if it's required—similar to using a RAM disk on a micro. In addition, dozens of other improvements are planned that wouldn't have been possible with the earlier GPCs.

The additional speed, reliability, and memory all make the AP-101S computers much more useful. But one of the best features is that at \$1 million for each flight unit, they're half the price of the original GPCs. □

## Fewer GPC Failures for the Future?

What does an MTBF of 5200 hours mean in real life? The shuttle's flight computers have thousands of power-on hours for each mission, including check-out time while the orbiter is being prepared for flight, tests and rehearsals on the launch pad, and the actual mission. The five GPCs must all be working in tandem before NASA will approve a shuttle launch.

During three countdowns, GPCs were replaced with spares when they failed while the shuttle was being prepared for flight. Also, there have been a couple of GPC failures in flight where the backups had to take over.

The most exciting GPC failure was during the countdown for the very first shuttle mission. On April 10, 1981, the long-awaited, heavily delayed first shuttle launch was finally ready to go. Astronauts John Young and Bob Crippen were in the cockpit, and the countdown clock was running as thousands of spectators watched. But at T-20 minutes, the back-

up computer wouldn't sync with the four primary computers, and the launch was scrubbed for two days.

What is astonishing is that a software bug that caused the sync problem was a 1-in-400 coincidence. Most of the time, the primary and backup GPCs will start together, but 1 out of 400 times they'll be off by one cycle. The GPCs were tested countless times before with thousands of simulated countdowns in test stands and aboard the orbiter and in several simulated countdowns and engine tests. Naturally, the GPCs had to wait until the most critical launch day to mis-sync!

As Kennedy Space Center software engineer Mike Peacock explained, a simple solution would have been to reset the countdown and restart the computers, but since this was the first shuttle launch, the launch team wanted to be safe, wisely choosing to examine the problem and make sure it couldn't happen again. Two days later, with a quick patch to the flight

software, *Columbia* was launched.

There have been two in-flight failures of GPCs. During the ninth shuttle mission in November 1983, two GPCs failed when they were started up to prepare for landing. Mission controllers kept the orbiter up another 90 minutes while they examined the problem and determined the shuttle could be landed safely using the three functioning GPCs. Post-landing analysis determined that microscopic aluminum particles had entered the GPCs and shorted them out.

To date, the only in-flight changeout of a GPC was during the STS-30 mission where the astronauts swapped out GPC4 on their reentry day when it didn't start up properly. The reentry burn was delayed one orbit to give the astronauts time to disconnect the malfunctioning computer and hook up the spare.

With the new GPCs twice as reliable as the earlier ones, flights should be delayed less often, with fewer mission problems due to computer failure.

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# GAMEPLAY

O R S O N S C O T T C A R D

Last month I wrote about playing around online, and I recommended Prodigy as a family online service. However, if you're hoping to find some neat shareware games by using your neat new modem, Prodigy will be no help at all—it doesn't allow uploading or downloading of software.

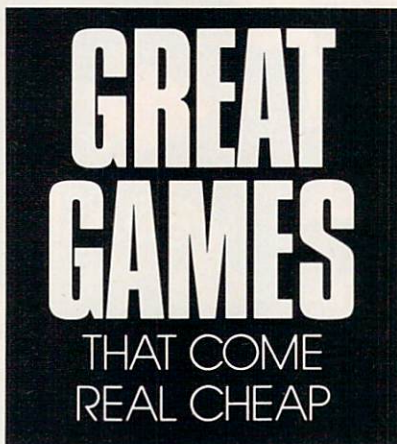
There *is* software to be found on the full-service networks like Delphi, GENie, and—above all—CompuServe. Some of it is *freeware*—stuff you can download and use without paying for anything more than the connect time that it takes to download it. But most of it is *shareware*—software that you can try out for free but which you must (or at least *ought to*) pay for if you're going to use it over the long haul.

For instance, the game that Kristine and I are totally addicted to right now is a nifty little *Windows*-based backgammon game from Graphics Software Labs (7906 Moonmist Circle, Huntington Beach, California 92648). Like most shareware products, the free tryout version has some built-in annoyances designed to goad you into paying the registration fee (in this case a mere \$15) to get the latest version. But it's fully playable as is. You'll find your computer a worthy, challenging opponent.

Still, the game isn't always a genius about using doubling, so you *can* get the upper hand. I'm ahead right now, by more than 150 games. Why? Because I'm dang good, that's why. And because I must have played 500 games since I downloaded it to my computer last week!

Some of the shareware that you find online isn't really up to professional grade. For instance, I downloaded *Blackout* (Zarkware, 2243 East Thompson Street, Springfield, Missouri 65804) from CompuServe. The game's author made no bones about the fact that it was a pretty simple little game. I found it dumb, but fun enough to play a few dozen times, so I registered it for a mere \$12—the author did *not* have an inflated idea of its value!

Another game has become something of a cult hit on CompuServe. While there are several shareware mah-jongg games available online, Nels Anderson's version has a huge following. Why? Because along with his game he includes a great little tile editor that allows you to design your own set of playing pieces. Designing your own tile sets is one of the most popular options in the game. A lot of enterprising tile makers have uploaded their tile sets (uploading is free on CompuServe) so others can enjoy the fruits of their labors. That makes Anderson's *Mah Jongg* into a kind of



communal experience. I'm tempted to make a tile set of my own to upload.

I had never played mah-jongg in my life, by the way, until buying Microsoft's *Windows Entertainment Pack*, which includes a version of mah-jongg that I'm sad to say is a bit more smooth-playing than Anderson's game. But Anderson's game doesn't require *Windows*. And the *WEP* version doesn't let you design your own tile sets.

Speaking of *WEP*, it also includes, besides a ho-hum *Tetris*, the most diabolically addictive game I've seen lately: *Minesweeper*. If you've got *Windows* and you have enough cast-iron self-control to get your real work done before you play, then this game is worth the entire price of *WEP*

(\$39.95). But be sure to read the instructions—the game is almost unplayable unless you learn some tricks, and you can't save games in progress.

Sometimes the best prizes you find online aren't, strictly speaking, games at all. I'm not talking about the serious shareware programs, either, though I've picked up a free DOS text editor and a first-rate (but *not* free) *Windows* program editor online. What I'm talking about is a strange little program called *Babble* (Korenthal Associates; 76004,2605 on CompuServe; 212-242-1790).

Written by Jim Korenthal, *Babble* is more of a DOS toy than a game. Feed it any ASCII text file, and it analyzes it and plays it back to you in a strange babbled form.

At first glance there's nothing remotely useful about this program—but you can't stop reading the babble, if only for the sheer weirdness of it.

The program comes with a fistful of prebabbled files that you can combine for even stranger results. Text from Shakespeare, "Leave It to Beaver," and *TV Guide*, combined with a few choice insults, results in stuff like: "What light from grade-B Wally, you blithering soft upon her cheek." Pure poetry. You can soup it up even more with special effects and ethnic accents ranging from Elmer Fudd's voice to a Texas drawl.

It's most fun, though, when you analyze your own files. It's almost restful, after you finish a term paper or a report or a memo or (in my case) a story, to save it also as an ASCII file and then load it into *Babble* for analysis. What comes back at you is your own language, in your own style, but now insane. And yet, sometimes out of the madness come wonderful combinations that have given me insights that change the shape of the story.

Imagine this scenario, if you would: When your boss sends you a particularly obnoxious memo, you can babble it and pass the nonsense version around to your coworkers. As long as you don't lose your job, it makes *Babble* well worth the price! □

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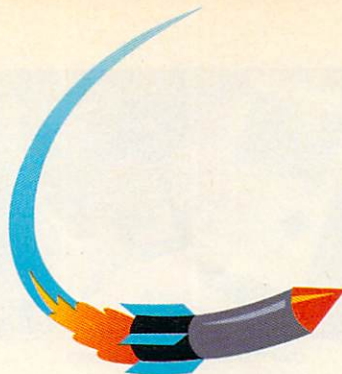


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# THE FINGERTIP ARCADE

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



# TIMEQUEST™

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A high speed chase through time, TIMEQUEST is a classic adventure game that features pageantry, danger, and puzzle-oriented adventure. The game is epic in scope, spanning four continents and three thousand years — from Stonehenge to Hitler.

Criss-crossing time and space, you will travel to England, Rome, Peking, Cairo, Babylon/Baghdad, and Mexico from 1361 BC to 1940 AD, meeting Caesar, Hitler, Napoleon, Genghis Khan, Attila the Hun, Cleopatra, Michaelangelo, and many others.

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:

- high resolution EGA graphics
- superb musical score featuring RealSound as well as Roland and AdLib support
- unique Legend screen design with pushbutton options
- menu driven parser

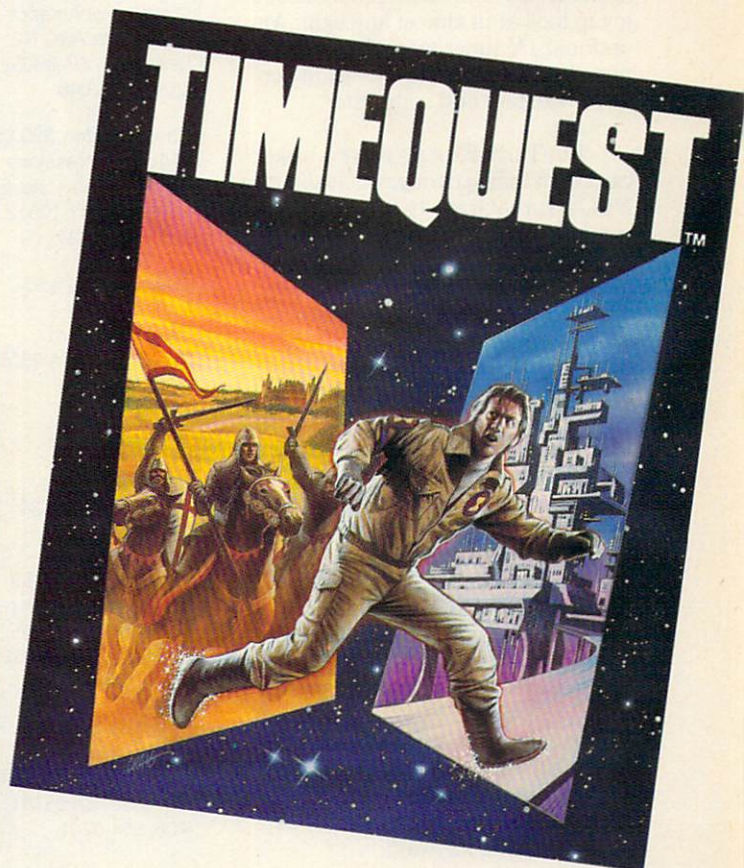
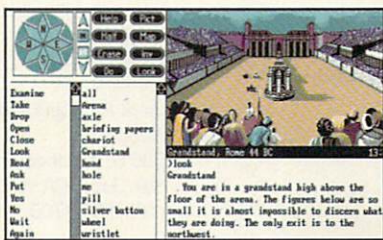
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COURTESY OF NEC TECHNOLOGIES

**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

Capcom USA  
3303 Scott Blvd.  
Santa Clara, CA 95054  
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**Ishido** \$29.95

Nexoft  
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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  
(800) 366-0136  
(708) 860-9500

**Jack Nicklaus Turbo Golf** \$54.95

Accolade

550 S. Winchester Blvd., Ste. 200  
San Jose, CA 95128  
(408) 985-1700



# 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.

## 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.

## From the Grapevine

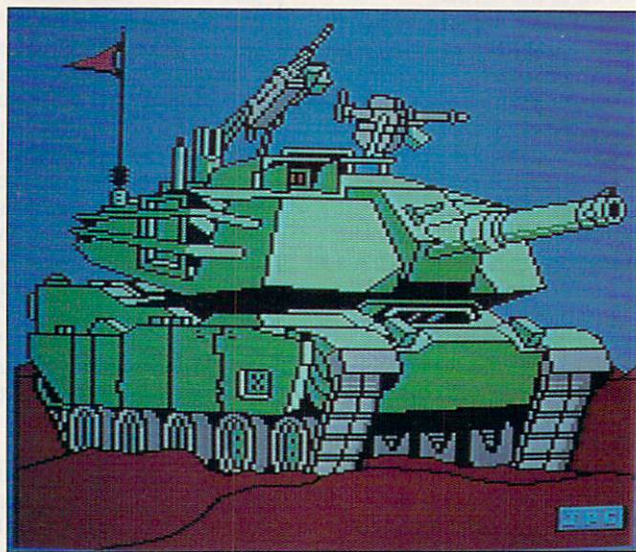
Need a new SID chip, upgraded ROM for your 1571, or Z80A CPU for your 128? If you're looking for spare parts, integrated circuits, chips, cables, or other items for your Commodore products—including your Amiga—look for them in the new free catalog from the Grapevine Group (3 Chestnut Street, Suffern,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



## 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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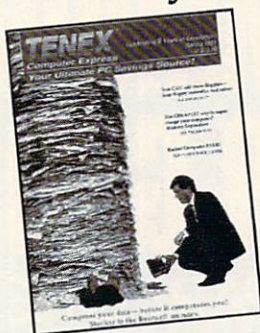
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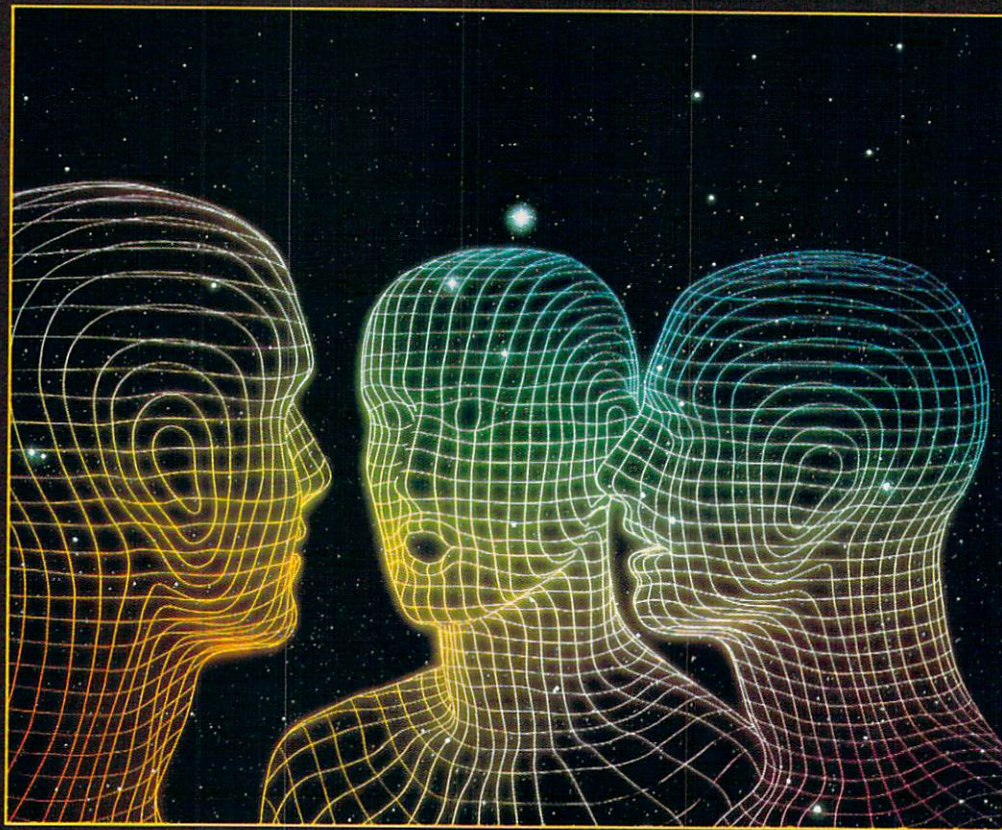
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A GUIDE TO  
**COMMODORE  
USER GROUPS**  
PART ONE

EDITED BY KANDI SYKES

UNIPHOTO/PICTOR



**T**his 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.**  
Box 6502, Eureka, CA 95502  
**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

## COLORADO

**Colorado Commodore Computer Club,**  
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(BBS# 303-469-3265)  
**Front Range Commodore Club, P.O. Box**  
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**Western Slope Commodore Users Group,**  
3125-B Lakeside Dr., Grand Junction,  
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## CONNECTICUT

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**Capital Region Commodore Computer**  
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er's Group (NLCCUG), P.O. Box 697,  
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1750)

## DELAWARE

**First State Commodore Club, P.O. Box**  
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**Lower Delaware Computer Club**  
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DE 19969 (Voice# 302-945-7224)

## FLORIDA

**Welaka Commodore Users Group, P.O.**  
Box 1104, Welaka, FL 32193-1104  
**Commodore User Group of Pensacola,**  
P.O. Box 36367, Pensacola, FL 32516  
(BBS# 904-484-9952)  
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mock Rd., Milton, FL 32583  
**Gainesville Commodore User Group, P.O.**  
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4716  
**Titusville Commodore Club,** 890 Alford  
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269-2169)  
**Central Florida Commodore Users' Club,**  
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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  
34264-0698 (BBS# 813-748-7513)  
**Dinosaur 64, c/o Robbin Tate, P.O. Box**  
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**Clearwater Commodore Club, P.O. Box**  
11211, Clearwater, FL 34616  
**Gulfcoast 64's Commodore Users Group,**  
P.O. Box 11180, Clearwater, FL 34616  
(BBS# 813-584-6040)  
**Suncoast Commodore Club, P.O. Box**  
6628, Ozona, FL 34660-6628

**Suncoast Bytes Commodore Computer**  
Club, P.O. Box 721, Elfers, FL 34680  
**Starcom User's Group of Martin County,**  
P.O. Box 1446, Port Salerno, FL  
34992

## GEORGIA

**Metro Atlanta Commodore Klub (MACK),**  
P.O. Box 813481, Smyrna, GA 30081  
(BBS# 404-439-7350)  
**Commodore User Group of Atlanta, P.O.**  
Box 2031, Tucker, GA 30085-2031  
**Stone Mountain Users Group (SMUG**  
64/128), P.O. Box 1762, Lilburn, GA  
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

## HAWAII

**Commodore Hawaii Users Group**  
(CHUG), P.O. Box 23260, Honolulu,  
HI 96823-3260 (BBS# 808-672-6483)

## IDAHO

**Pocatello Commodore Users Group**  
(PCUG), Rte. 2, Box 48E, Pocatello,  
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

## ILLINOIS

**Diskoveries PD Library Club, P.O. Box**  
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**Knox Commodore Club, P.O. Box 494,**  
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344-5042)  
**Survivors of the Sixty-Four Users Group**  
(SOSUG), P.O. Box 6108, Macomb,  
IL 61455  
**Canton Area Commodore Users Group,**  
P.O. Box 61, Canton, IL 61520  
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dore Enthusiasts (C.I.F. A.C.E.) #19,  
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(BBS# 309-745-9273)  
**Champaign-Urbana Commodore User**  
Group (CUCUG), P.O. Box 716,  
Champaign, IL 61824-0716 (BBS#  
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6644)

## INDIANA

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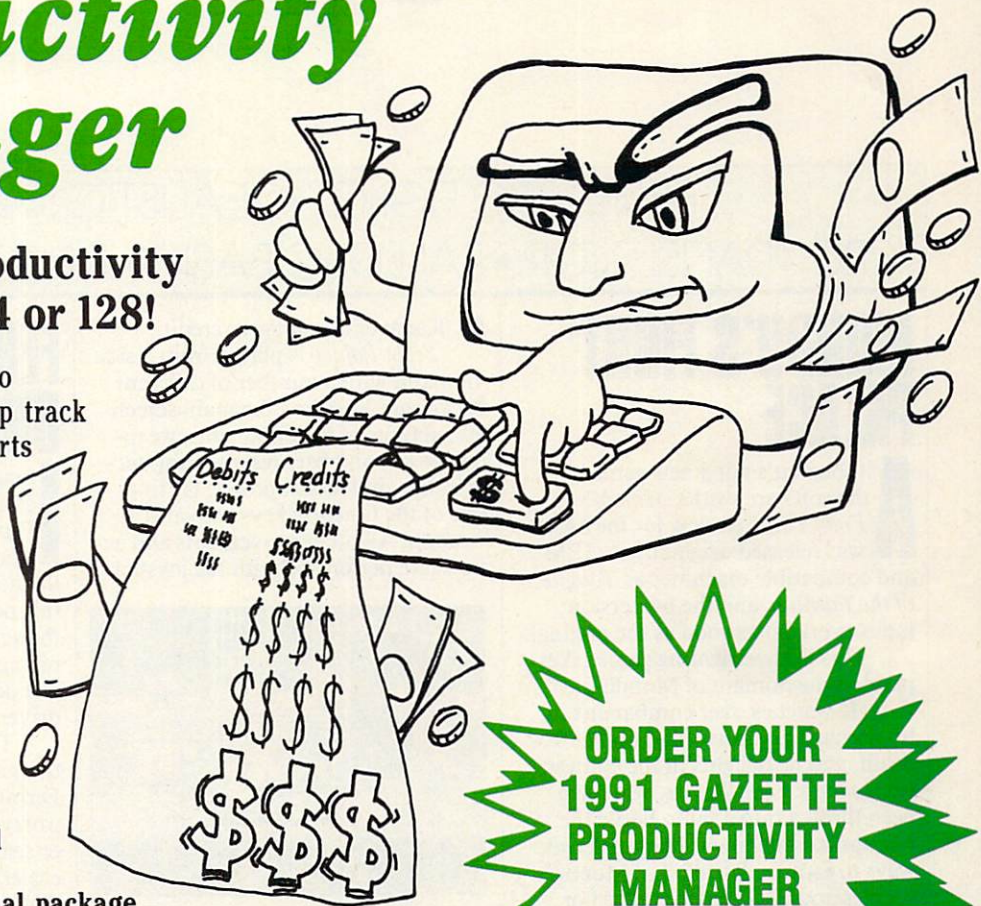
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# REVIEWS

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## MONDU'S FIGHT PALACE

**A**lthough 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.

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## FERRARI FORMULA ONE

**I**magine 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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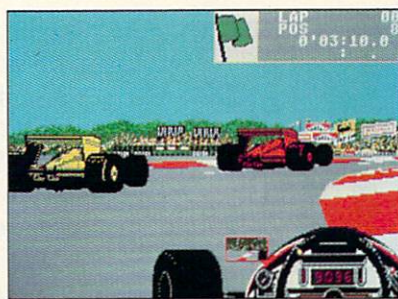
## REVIEWS

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

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

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  
Commodore 64, 1571 or 1581 disk drive—\$29.95

SOGWAP SOFTWARE  
115 Belmont Rd.  
Decatur, IN 46733  
(219) 724-3900  
Circle Reader Service Number 312

## 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  
12137-96 St.  
Edmonton, AL  
Canada T5G 1V9

Circle Reader Service Number 313

## WAR OF THE LANCE

**S**SI'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 #90
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 #90
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 point 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

**C**ommodore 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*.

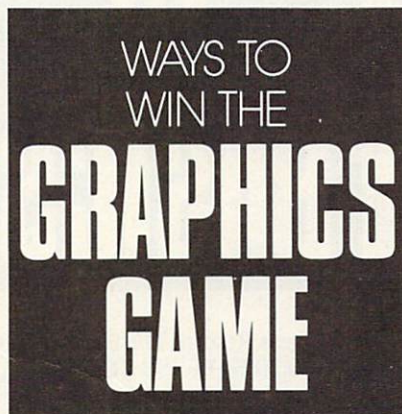
Even with the page-wide screen of *geoPaint 128*, this process will quickly run out the clock, and you'll still be left with the task of fitting the scraps back together. Sometimes it's easier just to patch an offending graphic with opaque, borderless white boxes and hope no one will notice.

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 overflow 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

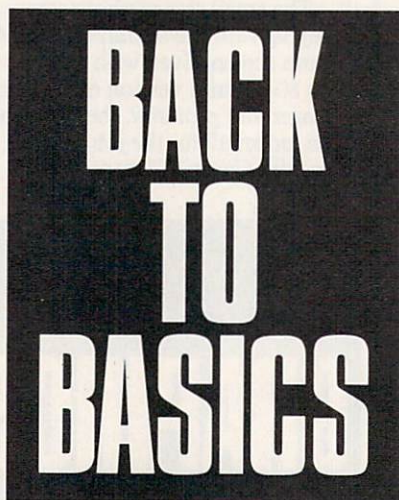
If I have a group of users interested in machine language, I sometimes publicly write a simple program. Beginners might not follow all the details of coding, but they will be presented with a few simple ideas: writing in machine language is a logical process no different from writing in another language, 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

**W**e'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.

```

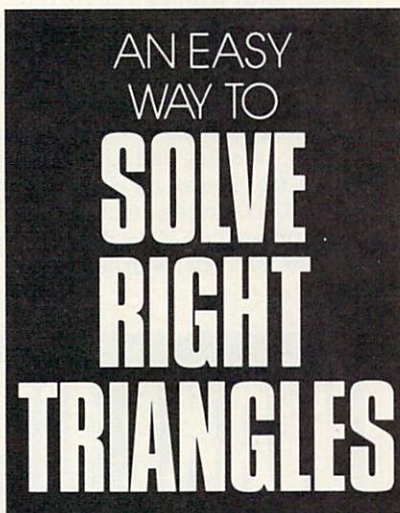
AM 10 PRINTCHR$(147)
HS 20 POKE53280,12:POKE53281,1
      5:POKE646,1
DJ 30 PRINTTAB(28)"{2 DOWN}
      {GRN}RIGHT
HC 40 PRINTTAB(28)"TRIANGLE
KE 50 PRINTTAB(28)"SOLVER
JR 60 PRINTTAB(28)"-----
      {6 UP}{WHT}
DE 70 FORT=1TO14:PRINTTAB(11)C
      HR$(170):NEXT
HP 80 PRINT"{HOME}"
CQ 90 FORT=12TO25:PRINTTAB(T)C
      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 IFBTHENIFCCTHENAA=SQR(
      CC^2-BB^2):GOTO360
KX 330 IFAATHENCC=AA/SIN(A*^/1
      80):BB=SQR(CC^2-AA^2):G
      OTO370

```



```

XX 340 IFBTHENCC=BB/COS(A*^/1
      80):AA=SQR(CC^2-BB^2):G
      OTO370
CQ 350 IFCCTHENAA=CC*SIN(A*^/1
      80):BB=SQR(CC^2-AA^2):G
      OTO370
MF 360 A=ATN(AA/BB)*180/^: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

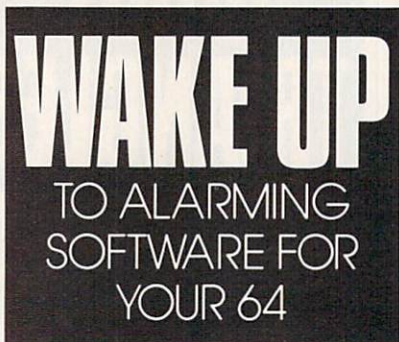
**T**he 64 has not one, not two, not three, but six different hardware timers. And thanks to these timers, graciously provided by the computer's two Complex Interface Adapter (CIA) chips, the 64 is guaranteed punctual operation.

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 TIM
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 TI
ME (HHMMSS) ":GOSUB 180
XA 150 POKE 56333,4:REM TURN A
LARM ON
FB 160 SYS SA:PRINT "{CLR}ALAR
M 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$)>129999 OR VA
L(MID$(T$,3,2))>59 OR V
AL(RIGHT$(T$,2))>59 THE
N 190
PE 210 FOR I=1 TO 6:T(I)=VAL(M
ID$(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 LANGU
AGE 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 S
TATEMENTS":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 DA
TA
DS 340 DATA 120,169,060,141,02
0,003,169,003,141,021,0
03,088,096
CM 350 DATA 173,013,220,041,00
4,240,039,141,013,220,1
73,032,208,072,238,032,
208
AD 360 DATA 032,159,255,165,19
7,201,057,208,244,104,1
41,032,208,169,000,133,
198
BF 370 DATA 120,169,049,141,02
0,003,169,234,141,021,0
03,088,076,049,234
```

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# D'IVERSIONS

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

**W**e 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—"Rosalanne," "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 ovens. 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.

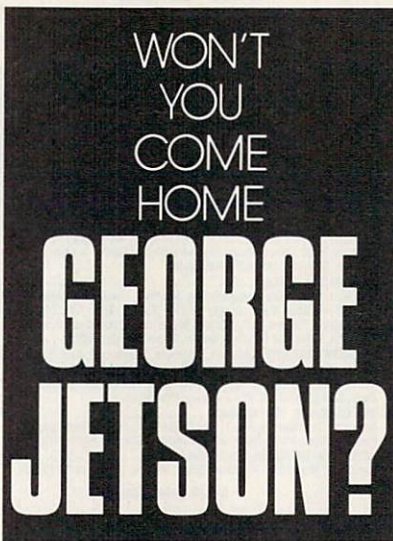
In the 1950s we looked forward to a future in which machines did most of the work. We were told to expect more leisure time, shorter work weeks, and a carefree existence. The George Jetson easy street was just around the corner. Technology would save us so much work that we'd have time on our hands.

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
    - ALL RIGHTS RESERVED
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 POKEL98,0:PRINT:PRINT:P
    RINT" CHAR,RESTART,QUIT
    (C/R/Q)";:INPUT S$:RET
    URN
AA 280 POKEL98,0:PRINT:PRINT"
    {SPACE}ARE YOU SURE (Y/
    N)";:INPUT S$
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
```



# PROGRAMS

G A Z E T T E COMMODORE 64/128

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	C0	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	0E	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	E0	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	2D	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	07	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	3F	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	F9	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	5A	A9	67	85	8A	C6D8:8D	0C	D0	A9	E8	8D	06	D0	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	A0	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	5A	A9	67	85	8E	8E	C6F0:D0	60	AD	12	D0	C9	26	D0	A0
C228:6E	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	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	E8	23	D0	20	F1	92
C240:CE	08	D0	CE	0A	D0	CE	0C	73	C4A8:FB	C9	A2	00	A0	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	ED	01	A6	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	ED	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	8C	E0	34	C538:C9	C9	BD	90	B9	A9	C0	8D	5F	C7A0:02								

# PROGRAMS

C810:CA 85 D5 AD 03 CA 85 D6 23	CA78:E0 04 D0 E3 60 A9 60 A2 E4	S=0:X=X-64
C818:AD FE C9 20 CA F1 68 AA 15	CAB0:00 9D F8 43 9D F8 47 9D CD	PH 200 IFX<63488THEN150
C820:CA D0 CE AD 04 CA 85 D1 28	CAB8:F8 4B 9D F8 4F 9D F8 53 E6	PH 210 FORT=60160TO61439:POKET
C828:AD 05 CA 85 D2 AD 06 CA A7	CA90:9D F8 57 9D F8 5B 9D F8 61	.,:NEXT
C830:85 D3 AD 07 CA 85 D5 AD 65	CA98:5F E8 E0 04 D0 E3 60 A2 ED	HX 220 FORT=57344TO58623:POKET
C838:08 CA 85 D6 68 A8 68 AA FF	CAA0:A0 A0 C0 20 67 C3 60 A9 7D	.,:NEXT
C840:A9 00 28 4C CA F1 A9 40 22	CAAB:00 8D 20 D0 8D 21 D0 20 65	FD 230 FORT=201*64+3TO201*64+3
C848:8D 0A CA A9 43 8D 09 CA 44	CAB0:F2 C6 A9 1C 8D 5C C8 A9 81	+60STEP6:POKET,,:POKET+
C850:A2 43 A9 00 85 FD AD 0A C2	CAB8:60 8D 96 C8 20 46 C8 A9 96	1,,:POKET+2,,:NEXT
C858:CA 85 FE A9 20 A0 00 91 40	CAC0:20 8D 5C C8 A9 A9 8D 96 87	MM 240 SS=1:CC=0:X=47104+64
C860:FD E6 FD D0 02 E6 FE A4 C5	CAC8:C8 A9 FE 8D E0 78 A9 FD 20	CM 250 S=201*64:E=201*64+63:N=
C868:FE CC 09 CA D0 EF A4 FD 08	CAD0:8D E1 78 A9 FB 8D E2 78 A3	X:GOSUB720
C870:C0 E8 D0 E9 EE 0A CA EE 79	CAD8:A9 F7 8D E3 78 A9 EF 8D 09	PG 260 X=X+128:CC=CC+1
C878:0A CA EE 0A CA EE 0A CA 31	CAE0:FE 78 A9 DF 8D E5 78 A9 D8	RK 270 IFCC=2ANDSS=0THENCC=0:S
C880:E8 E8 E8 E8 09 CA E0 7B	CAE8:BF 8D E6 78 A9 7F 8D E7 74	S=1:X=X+64
C888:63 D0 C7 A2 1A B5 D8 09 85	CAF0:78 A9 00 85 FD A9 D8 85 53	CR 280 IFCC=2ANDSS=1THENCC=0:S
C890:80 95 D8 CA D0 F7 A9 93 DC	CAF8:FE A0 00 A9 00 91 FD E6 F9	S=0:X=X-64
C898:20 CA F1 4C 3C C8 48 A5 2B	CB00:FD D0 02 E6 FE A6 FE E0 EA	XF 290 IFX<49152THEN250
C8A0:CB C9 3F D0 05 A9 04 8D E3	CB08:DB D0 F2 A6 FD E0 E8 D0 A0	CG 300 FORT=5TO1STEP-1:PRINTTA
C8A8:88 02 68 4C 47 FE A9 9E F8	CB10:EC 20 F2 C6 A9 0B 20 5C 07	B(10)MID\$(C\$,T,1)M\$"
C8B0:8D 18 03 A9 C8 8D 19 03 BB	CB18:CB A9 0C 20 5C CB A9 0F F7	{UP}":FORDL=1TO20:NEXT:
C8B8:EA 4C 83 A4 20 F1 B7 E0 A6	CB20:20 5C CB A9 01 20 5C CB FF	NEXT
C8C0:00 D0 0A 20 E1 C8 A9 60 AF	CB28:A9 03 20 5C CB A9 0E 20 60	DS 310 REM SLATE/TEXT DEMO
C8C8:85 FE 4C 2C C9 20 E1 C8 84	CB30:5C CB A9 06 20 5C CB 60 E8	AH 320 SYS51071,12,11,15
C8D0:A9 68 85 FE 20 2C C9 20 57	CB38:A9 0E 20 5C CB A9 03 20 1D	PE 330 SYS50930:PRINT"{CLR}
C8D8:E1 C8 A9 70 85 FE 4C 2C B6	CB40:5C CB A9 01 20 5C CB A9 F1	{BLU}{6 DOWN}{11 RIGHT}
C8E0:C9 A9 00 85 9B 20 F1 B7 13	CB48:0F 20 5C CB A9 0C 20 5C D1	S I M U L V I D E O"
C8E8:E0 00 D0 05 A9 A0 85 9C CC	CB50:CB A9 0B 20 5C CB A9 00 01	KC 340 PRINT"{HOME}{14 DOWN}
C8F0:60 E0 01 D0 05 A9 A8 85 BD	CB58:20 5C CB 60 AE 12 D0 E0 D6	{13 RIGHT}COPYRIGHT 199
C8F8:9C 60 E0 02 D0 05 A9 B0 CB	CB60:FF D0 F9 8D 21 D0 A0 4B 1D	1"
C900:85 9C 60 E0 03 D0 05 A9 A6	CB68:A2 32 CA D0 FD 88 D0 F8 F0	DF 350 PRINT"{HOME}{16 DOWN}
C908:B8 85 9C 60 E0 04 D0 05 B0	CB70:60 AD 12 D0 C9 3C D0 F9 CD	{6 RIGHT}COMPUTE PUBLIC
C910:A9 E0 85 9C 60 E0 05 D0 8C	CB78:60 00 00 00 00 00 00 40	ATIONS INTL LTD"
C918:05 A9 E8 85 9C 60 E0 06 3C		HQ 360 PRINT"{HOME}{18 DOWN}
C920:D0 05 A9 F0 85 9C 60 A9 AA		{11 RIGHT}ALL RIGHTS RE
C928:F8 85 9C 60 A9 00 8D 1A B5		SERVED"
C930:D0 A9 35 85 01 A9 00 85 C9		AP 370 SYS50930
C938:FD 8D 0B CA A6 9C E8 E8 9E		PB 380 SYS51388,0,6:SYS50740,1
C940:E8 E8 E8 E8 E8 E8 E8 C2		:SYS50752,2,1
C948:CA A0 00 B1 9B 91 FD E6 8A		FJ 390 SYS51388,0,6:SYS50740,0
C950:9B E6 FD D0 04 E6 9C E6 14		:FORDL=1TO100:NEXT
C958:FE A5 9B CD 0B CA D0 EB 36		SG 400 SYS50746,0:SYS51388,1,6
C960:A5 9C CD 0C CA D0 E4 A9 75		,6:SYS51569:SYS51579
C968:37 85 01 A9 01 8D 1A D0 F6		DX 410 SYS51388,0,6:SYS51725,0
C970:60 A2 A0 A0 C0 20 67 C3 14		:SYS51750,1:SYS51725,1:
C978:4C 75 C0 A2 A0 A0 C0 20 FA		SYS50746,0
C980:67 C3 4C 3F C1 20 FD AE 6F		RA 420 REM SLATE/BACKDROP DEMO
C988:20 9E AD 20 82 B7 A6 22 ED		MP 430 SYS50916:SYS50740,1:PRI
C990:A4 23 20 BD FF A9 01 A2 6A		NT"{CLR}";:SYS50746,1
C998:08 A0 00 20 BA FF 20 F1 62		GQ 440 FORDL=1TO100:NEXT:SYS51
C9A0:B7 8A A8 A2 00 8A C0 00 9D		879:SYS51388,0,6:SYS507
C9A8:D0 05 A0 A0 4C D5 FF C0 7E		46,0:SYS50740,0:SYS5074
C9B0:01 D0 05 A0 A8 4C D5 FF C5		6,0
C9B8:C0 02 D0 05 A0 B0 4C D5 CD		HM 450 FORT=1TO2:SYS51725,0:FO
C9C0:FF C0 03 D0 05 A0 B8 4C 5A		RDL=1TO100:NEXT:SYS5175
C9C8:D5 FF C0 04 D0 05 A0 E0 5C		0,0:FORDL=1TO100:NEXT:N
C9D0:4C D5 FF C0 05 D0 05 A0 22		EXT
C9D8:E8 4C D5 FF C0 06 D0 05 73		CD 460 SYS51388,0,6:SYS50740,0
C9E0:A0 F0 4C D5 FF A0 F8 4C A8		:SYS50752,0,1
C9E8:D5 FF 00 0E 03 03 09 03 81		JS 470 SYS50740,0:SYS50752,1,1
C9F0:03 09 03 0E 1E 2E 3E 4E FD		QM 480 SYS50740,0:SYS50752,3,1
C9F8:5E 6E 7E E4 DF 00 D0 D0 5F		JK 490 SYS50740,0:SYS50752,2,1
CA00:5E 1E 27 12 F8 42 00 27 4A		KF 500 SYS51388,0,3:SYS50740,0
CA08:13 63 60 00 F8 20 3F CA 9D		:SYS50746,0
CA10:E0 00 D0 09 20 5B CA 20 E4		AM 510 SYS51388,1,5,4:SYS51569
CA18:75 C0 4C 9F CA 20 7D CA B8		:FORDL=1TO200:NEXT:SYS5
CA20:20 75 C0 4C 9F CA 20 3F A7		1579
CA28:CA E0 00 D0 09 20 7D CA F6		QQ 520 SYS51388,1,4,5:SYS51569
CA30:20 3F C1 4C 9F CA 20 5B 66		:FORDL=1TO200:NEXT:SYS5
CA38:CA 20 3F C1 4C 9F CA 20 58		1579:SYS52024
CA40:40 A9 00 9D FF 57 CA D0 FD		JE 530 REM OVERLAY MODE DEMO
CA48:FA A9 60 8D 9B C4 20 66 41		EA 540 SYS50946,2,14,1:SYS5093
CA50:C4 A9 20 8D 9B C4 20 F1 B1		0:PRINT"{CLR}";
CA58:B7 60 60 A9 60 A2 00 9D B3		EH 550 FORT=1TO3:PRINT"
CA60:FC 43 9D FC 47 9D FC 4B BE		{17 RIGHT}
CA68:9D FC 4F 9D FC 53 9D FC 3D		
CA70:57 9D FC 5B 9D FC 5F E8 F6		
	<b>SIMULVIDEO.DEMO</b>	
	GD 10 REM COPYRIGHT 1991 - COM	
	PUTE PUBLICATIONS INTL L	
	TD - ALL RIGHTS RESERVED	
	QM 20 POKE53280,0:POKE53265,11	
	:PRINT"{CLR}{9 DOWN}":PO	
	KE53281,0:FORDL=1TO200:N	
	EXT	
	FP 30 POKE53265,27:MS="ONE MOM	
	ENT PLEASE. . ."	
	EK 40 CS="{BLK}{4}{5}{8}{WHT}"	
	:FORT=1TO5:PRINTTAB(10)M	
	ID\$(C\$,T,1)M\$"{UP}":FORD	
	L=1TO20:NEXT:NEXT	
	EC 50 POKE147,0:SYS57812"SIMUL	
	VIDEO.OBJ",8,1:SYS62631	
	CA 60 FORT=200*64TO201*64+63:R	
	EADX:POKET,X:NEXT	
	BH 70 SS=0:CC=0:X=61440	
	QR 80 S=200*64:E=200*64+63:N=X	
	:GOSUB720	
	PE 90 N=X-2048:GOSUB720:N=X-40	
	96:GOSUB720:N=X-14336:GO	
	SUB720	
	BP 100 X=X+128:CC=CC+1	
	DC 110 IFCC=2ANDSS=0THENCC=0:S	
	S=1:X=X+64	
	GG 120 IFCC=2ANDSS=1THENCC=0:S	
	S=0:X=X-64	
	PJ 130 IFX<63488THEN80	
	DC 140 SS=1:CC=0:X=61440+64	
	GE 150 S=201*64:E=201*64+63:N=	
	X:GOSUB720	
	EH 160 N=X-2048:GOSUB720:N=X-4	
	096:GOSUB720:N=X-14336:	
	GOSUB720	
	RQ 170 X=X+128:CC=CC+1	
	HH 180 IFCC=2ANDSS=0THENCC=0:S	
	S=1:X=X+64	
	PJ 190 IFCC=2ANDSS=1THENCC=0:S	



# PROGRAMS

GAZETTE COMMODORE 64/128

<pre> {9 SHIFT-SPACE}{RVS} {SHIFT-SPACE}{3 SPACES} {SHIFT-SPACE}{OFF} {9 SHIFT-SPACE}";:NEXT QG 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}@@@{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><b>IMPORT</b></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"F ILENAME";M\$:M\$=M\$+"",P,R" SR 30 PRINT"{DOWN}ENTER FILENA ME TO SAVE SIMULVIDEO":I NPUT"GRAPHICS UNDER";C\$ 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&gt;2THENZ=0 AQ 90 NEXT:FORY=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 .

**T**eachers, 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

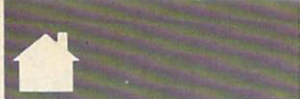
this section. When you have finished typing, be sure that you save a copy of the program before you exit the *Automatic Proofreader*.

**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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GAZETTE COMMODORE 64/128

AQ 300 IF P\$="<" THEN 160	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	GF 910 T=T-1:IFT<=0THENT=CN:PR INT#1:PRINT#1:N5=N5+2:G OSUB2130
JG 310 IF I\$="" THEN 270	PC 620 IF P\$="<" THEN I=I-1:IF I>0 THEN GOTO570	GS 920 NEXTI:PRINT#1
ER 320 LR = LEN(RA\$)	BH 630 IF I<=0 THEN I=N:GOTO400	QE 930 FORI=1TON
DC 330 GOSUB1560:PRINTLR;" DIS TRACTORS":PRINT	QQ 640 IF D\$(I)=""THEN570	JC 940 J=INT(1+N* <u>RND</u> (1)):IFC(J )=1THEN940
HK 340 IF N<>0 THEN PRINT"CURR ENT{SHIFT-SPACE}NUMBER {SHIFT-SPACE}OF {SHIFT-SPACE}PROBLEMS": PRINT"RVS}"N"{"OFF}":PR INT	XJ 650 FORJ=1TON:A=VAL(AS(J)): IFD\$(I)=AS(J) THEN670	CP 950 C(J)=1:O(I)=J:NEXTI:FOR I=1TON:C(I)=0:NEXTI
QB 350 PRINT"ENTER {SHIFT-SPACE}NUMBER {SHIFT-SPACE}OF {SHIFT-SPACE}PROBLEMS " :GOSUB1650	BE 660 NEXTJ:GOTO680	RC 960 X=0:FORI=1TON:IFX<LEN(A \$(I))THENX=LEN(AS(I))
XF 360 IF IP\$<>"ANDP\$<>"<"THE NN=VAL(IP\$)	CM 670 PRINT"DUPLICATES AN {SHIFT-SPACE}ANSWER":PR INT:GOTO590	JD 970 NEXTI
EH 370 IF P\$="<"THEN 270	ER 680 I=I+1:IFI<=LEN(RA\$) THE N 570	SC 980 ND=LEN(RA\$):FORI=1TOND
MR 380 IF N = 0 THEN 330	HX 690 GOTO30	KH 990 FORI=1TOND:IFX<LEN(D\$(I ) THENX=LEN(D\$(I))
AD 390 I=1	CS 700 GOSUB1580:INPUT"HIT {SHIFT-SPACE}RETURN {SHIFT-SPACE}WHEN {SHIFT-SPACE}PRINTER {SHIFT-SPACE}IS {SHIFT-SPACE}READY";ZR\$	SK 1000 :NEXTI:IT=X+6:CN=INT(8 0/IT):FORI=1TOND
DH 400 GOSUB1560:PRINTN;" QUES TIONS":PRINT	CK 705 IFZRS="<"ORRA\$=""THEN30	PQ 1010 J=INT(1+ND* <u>RND</u> (1)):IFC (J)=1THEN1010
FQ 410 IF Q\$(I)<>" THENPRINT"C URRENT{SHIFT-SPACE}QUES TION":I:PRINT"RVS}"Q\$(I ){"OFF}":PRINT	PE 710 GOSUB 1580	QB 1020 DS(I)=J:C(J)=1:NEXTI:F ORI=1TOND:C(I)=0:NEXTI
AX 420 PRINT"ENTER {SHIFT-SPACE}QUESTION " ;I:GOSUB1650	JE 720 INPUT"NUMBER {SHIFT-SPACE}OF {SHIFT-SPACE}COPIES";N\$ :NC=VAL(N\$):IFN\$="" OR {SPACE}N\$="<" THEN 30	GG 1030 FORI=1TOLEN(RA\$):IFX<L EN(D\$(I))THENX=LEN(D\$( I)):NEXTI
RP 430 IFIP\$<>"ANDP\$<>"<"THEN Q\$(I)=IP\$	RB 730 OPEN1,4,7:FORPG=1TONC	CJ 1040 IFPA\$="A"THENPRINT#1:P RINT#1,RA\$:PRINT#1:I=1 :J=1:T=CN
PC 440 IF LEN(Q\$(I))>70 THENPR INT"NO{SHIFT-SPACE}MORE {SHIFT-SPACE}THAN 70 {SHIFT-SPACE}CHARACTERS "	PQ 740 FORRS=139TO143:POKERS,A S(C(RA\$)):NEXTRS:GOSUB139 0	RJ 1050 IFPA\$<>"A"THENPRINT#1: PRINT#1:PRINT#1:I=1:J= 1:T=CN
CQ 450 IF LEN(Q\$(I))>70 THENPR INT:GOTO420	EP 750 X=0:FORI=1TON:IFX<LEN(Q \$(I))THENX=LEN(Q\$(I))	PK 1060 FQ=LEN(RA\$)/(N+LEN(RA\$ )
CH 460 IF P\$="<"THEN IF I=1 TH EN 330	RG 760 NEXTI	HM 1070 K=RND(1)
XG 470 IF P\$="<"THEN IF I>1 TH EN I=I-1:GOTO400	RC 770 IT=X+9:CN=INT(80/IT):QC =CN	BC 1080 IFK>FQ THENM=INT(1+26* RND(1))
DE 480 IF AS(I)<>" THENPRINT"C URRENT{SHIFT-SPACE}RIGH T{SHIFT-SPACE}ANSWER":P RINT"RVS}"AS(I)"{"OFF}": PRINT:PRINT"ENTER {SHIFT-SPACE}RIGHT {SHIFT-SPACE}ANSWER":GO SUB1650	KJ 780 LQ=0:ZS=1:ZE=76:LL=LEN( RQ\$):IFZE>=LLTHENZE=LL: GOTO820	KS 1090 LO=LEN(STR\$(O(I)))-3:R O=LO+2:Z=O(I):Z\$=RIGHT \$(STR\$(Z),RO)
JS 490 PRINT:PRINT"ENTER {SHIFT-SPACE}RIGHT {SHIFT-SPACE}ANSWER":GO SUB1650	XK 790 IFMID\$(RQ\$,ZE,1)<>" "AN DZE<>1THENZE=ZE-1:GOTO7 90	HR 1095 IFPA\$<>"A"THEN1130
SC 500 IFIP\$<>"ANDP\$<>"<"THEN AS(I)=IP\$	PX 800 PRINT#1,MID\$(RQ\$,ZS,ZE- ZS+1):ZS=ZE+1:ZE=ZE+76: LQ=LQ+1	CQ 1100 IFK>FQ ANDI<=N AND PA\$ ="A" THENPRINT#1,Z\$;CH R\$(64+M);"=";AS(Z);
DM 510 IF P\$="<" THEN 400	DJ 805 IFZE>=LLTHENZE=LL:GOTO {SPACE}820	SE 1110 IFK>FQ ANDI<=N THENPRI NT#1,SPC(IT-(LEN(CHR\$( 64+M))+3+LEN(AS(O(I)))) )-LO);
SF 520 IF AS(I)=""THEN480	FM 810 GOTO790	KH 1120 IFK>FQ ANDI<=N AND PA\$ ="A" THEN GOTO 1150
PG 530 IF LEN(AS(I))>70 THEN P RINT:PRINT"NO {SHIFT-SPACE}MORE {SHIFT-SPACE}THAN 70 CH ARACTERS"	GR 820 N5=12+LQ+LI	BS 1130 IFK>FQ ANDI<=N THENPRI NT#1,CHR\$(64+M);"="; AS(O(I));
FJ 540 IF LEN(AS(I))>70 THEN P RINT:GOTO420	SD 830 PRINT#1,RIGHT\$(RQ\$,LL-Z S+1):PRINT#1:LQ=LQ+1	JR 1140 IFK>FQ ANDI<=N THENPRI NT#1,SPC(IT-(LEN(CHR\$( 64+M))+3+LEN(AS(O(I)))) ));
GG 550 I=I+1:IF I<=N THEN 400	KC 840 ZS=1:ZE=76:LI=0:LL=LEN( I\$):IFZE>=LLTHENZE=11:G OTO880	QH 1150 IFK>FQ ANDI<=N THENI=I +1:T=T-1
MR 560 I=1	EX 850 IFMID\$(I\$,ZE,1)<>" "AND ZE<>1THENZE=ZE-1:GOTO85 0	QA 1160 IFT<=0THENT=CN:PRINT#1 :PRINT#1:N5=N5+2:GOSUB 2130
RB 570 GOSUB1560:PRINTLEN(RA\$) ;" DISTRACTORS":PRINT	MJ 860 PRINT#1,MID\$(I\$,ZS,ZE-Z S+1):ZS=ZE+1:ZE=ZE+76	EJ 1170 IF K>FQ THEN1220
EM 580 IFD\$(I)<>" THENPRINT"CU RRENT{SHIFT-SPACE}DISTR ACTOR";I:PRINT"RVS}"D\$( I)"{"OFF}":PRINT	DH 865 IFZE>=LLTHENZE=LL:LI=LI +1:GOTO880	KF 1180 IFJ<=LEN(RA\$)THENPRINT #1,MID\$(RA\$,J,1);"="; D\$(DS(J));
EA 590 PRINT"ENTER DISTRACTOR" ;I:GOSUB1650	BX 870 GOTO850	PG 1190 IFJ<=LEN(RA\$)THENPRINT #1,SPC(IT-4-LEN(D\$(DS( J)))));
HS 600 IFIP\$<>"ANDP\$<>"<"THEN D\$(I)=IP\$	AR 880 PRINT#1,RIGHT\$(I\$,LL-ZS +1):LI=LI+1	JM 1200 C=0
	CF 890 T=CN:PRINT#1:PRINT#1:FO RI=1TON	EJ 1210 IFJ>LEN(RA\$)THEN1220
	PB 900 PRINT#1,STR\$(I);". ";Q\$( I);SPC(IT-LEN(Q\$(I)))-L EN(STR\$(I))-2);	CJ 1215 J=J+1:T=T-1:IFT<=0 THE NT=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}FR 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}FR 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	ZZ\$=""
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	QD 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				



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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.

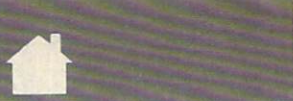
### Mouse Mechanics

*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
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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,"U 2 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,"U 2 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,"U 2 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

**T**his 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$:GRAPHI
    C5
GJ 20 PRINT"{CLR}{3 DOWN}
    {5 RIGHT}SETTING UP T/E
    {SPACE}80 . . ."
JB 30 FAST:COLOR6,1:DCLOSE:GOS
    UB2720
DS 40 PRINT"{CLR}{BLU}"SPC(27)
    "{A}CCCCCCCCCCCCCCCCCCC
    CCCCC{S}"
SC 50 PRINTSPC(27)"B{A}CCCCCC
    CCCCCCCCCCCCCCCC{S}B"
PD 60 PRINTSPC(27)"BB
    {9 SPACES}{6}T/E 80
    {9 SPACES}{BLU}BB"
XJ 70 PRINTSPC(27)"BB {22 U} B
    B"
KJ 80 PRINTSPC(27)"BB
    {7 SPACES}{6}MAIN
    {2 SPACES}MENU{7 SPACES}
    {BLU}BB"
MP 90 PRINTSPC(27)"B{Z}CCCCCC
    CCCCCCCCCCCCCCCC{X}B"
HC 100 PRINTSPC(21)"{A}CCCC
    {E}CCCCCCC{10 SPACES}C
    CCCCC{E}CCCC{S}"
CJ 110 PRINTSPC(21)"B{A}CCCC
    CCCCCCCCCCCCCCCC{S}B"
KF 120 FORN=1TO7:PRINTSPC(21)"
    BB"SPC(36)"BB":NEXT
KG 130 PRINTSPC(21)"B{Z}CCCC
    CCCCCCCCCCCCCCCC{S}B"
GA 140 PRINTSPC(21)"{Z}CCCC
    CCCCCCCCCCCCCCCC{S}B"
DX 150 PRINTGB$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 GOTOL50
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}":GETKEYAS:I	
	CCCCCCCC{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\$:GETKEYAS: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}CCCCCCCC{R}CCCC	XK 640	IFAS="--"THENS=S-1:GOTO3	4\$CM\$G3\$MT\$	
	CCCC{R}CCCCCCCCCCCC		70	XJ 1030	PRINTG5\$"{6 SPACES}"T"
	CC{R}CCCCCCCC{R}CCCC	RM 650	IFAS="+ "THENS=S+1:GOTO3	{12 SPACES}"S:GOSUB266	
	CCCC{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=	EEL(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}CCCCCCCC{E}CCCC	HS 700	IFK=16THENK=20	"{WHT}"T	
	CCCC{E}CCCCCCCCCCCC	HB 710	GOTO800	ED 1080	SYS49176,0,22,27:PRINT
	CC{E}CCCCCCCC{E}CCCC	GA 720	I=I+64:K=K+1	S	
	CCCC{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:GETKEYAS: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	DA 930	IF(PEEK(M+I))+128>255TH	ENS=16:RETURN	
FG 450	PRINTGB\$SET\$G2\$G3\$G3\$G		ENSYS49176,0,K,J:SYS491	XB 1270	RETURN
	4\$G4\$G5\$G5\$G6\$G6\$G7\$G7	KA 940	55,(PEEK(M+I))-128,143:	HB 1280	:
	\$:IFPTHENP=0:GOTO470		GOTO950	SM 1290	REM TRACER
AP 460	I=0:K=17:J=9:M=6144			FH 1300	PRINTG4\$TL\$GB\$SET\$G2\$CM
AJ 470	SYS49176,0,0,0:GOSUB930	HP 950	SYS49176,0,22,57:PRINT"	\$G4\$CM\$G6\$CM\$G3\$F\$F\$	
XX 480	GETKEYAS		{WHT}"I:SYS49176,0,22,6	PM 1310	WINDOW35,12,54,12,1:IN
XP 490	IFAS="C"THEN840		8:PRINT"{4 SPACES}	PUTF\$S:IF\$=""THENWINDO	
HF 500	IFAS="T"THEN880		{4 LEFT}"PEEK(M+I)	W0,0,79,24:GOTO40	
XD 510	SYS49176,0,K,J:SYS49155	SD 960	RETURN	QF 1320	DOUNTILLEN(FS)=16:F\$=F
	,PEEK(M+I),143	CE 970	PRINTGB\$"{RED}ZEROING-	\$+CHR\$(160):LOOP:WINDO	
EQ 520	IFAS="{UP}"THEN690		{6}":FORN=6144TO6399:PO	W0,0,79,24	
MM 530	IFAS="{DOWN}"THEN720		KEN,0:NEXT	JF 1330	PRINTGB\$CS\$G3\$CM\$G5\$CM
KG 540	IFAS="{LEFT}"THEN750			\$G4\$00\$:GETKEYAS:IFAS<	
PM 550	IFAS="{RIGHT}"THEN780			>CHR\$(13)THEN1330	
PC 560	IFAS="Z"THEN970			XA 1340	PRINTG4\$TJS



# PROGRAMS

G A Z E T T E C O M M O D O R E 6 4 / 1 2 8

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=	"e":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}CCCCCCCCCCCCCCCCCCC	=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 PRINTGASTS\$G4\$CM\$G3\$TF
RA 1600	PRINTAT\$"Q}CCCCCCCCC	CJ 1800 SYS49176,0,K,C:PRINTLS	\$
	CCCCCCCCCCC+CCCCCCCCC	(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}CCCCCCCCC	HJ 1830 :GETKEYA\$:IFAS<>CHR\$(1	\$:GETKEYA\$:IFAS<>CHR\$(
	CCCCCCCCCCC{W}	3)THEN1830	13)THEN2160
	{3 SPACES}{6}HEX -	KP 1840 :SYS49176,0,24,15:PRIN	FP 2170 PRINTG4\$CM\$:G\$=F\$:M=67
	{9 SPACES}{BLU}B"	TSPC(59)	67:X=0:FORN=1TOLEN(G\$)
KX 1630	PRINTAT\$"B{6}DIRECTORY	EH 1850 BEND	:POKEM+X,ASC(LEFT\$(G\$,
	):{5 SPACES}{GRN}18	SS 1860 NEXTN:GOTO1910	1))
	{5 SPACES}{BLU}B	CP 1870 SYS49176,0,24,25:PRINT	G\$=RIGHT\$(G\$,LEN(G\$)-1
	{3 SPACES}{6}DEC -	"MORE - PRESS RETURN T	):X=X+1:NEXTN:PRINT"
	{9 SPACES}{BLU}B"	O CONTINUE":GETKEYA\$	{CLR}{DOWN}"SPC(40-LEN
RJ 1640	PRINTAT\$"Z}CCCCCCCCC	DB 1880 SYS49176,0,24,25:PRINT	(F\$)/2)"{RVS}{GRN}"F\$"
	CCCCCCCCCCC{E}CCCCCCC	CHR\$(27)"Q":IFAS<>CHR\$(	{OFF}"
	CCCCCCCC{X}"	(13)THEN1870	CH 2190 PRINT"{HOME}{RVS}{RED}
XH 1650	PRINTAT\$"A}CCCC{R}CCC	DX 1890 WINDOW21,10,24,22,1:WI	'NO SCROLL' TO PAUSE L
	CCCC{S}{A}CCCC{R}CCCC	NDOW26,10,32,22,1:WIND	ISTING{OFF}{CYN}"CHR\$(
	CC{S}{A}CCCC{R}CCCC	OW35,10,38,22,1:WINDOW	14)
	CC{S}"	40,10,46,22,1:WINDOW49	AE 2200 WINDOW0,3,79,24:SYS678
KJ 1660	PRINTAT\$"B{6}BLK:{BLU}	,10,52,22,1:WINDOW54,1	3,LEN(F\$)









# 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  
2050 Duane Ave.  
Santa Clara, CA 95054  
(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



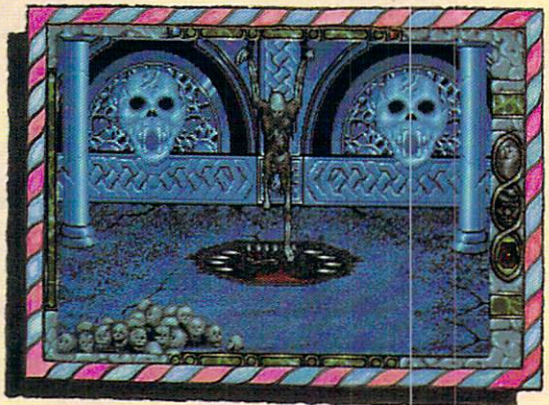
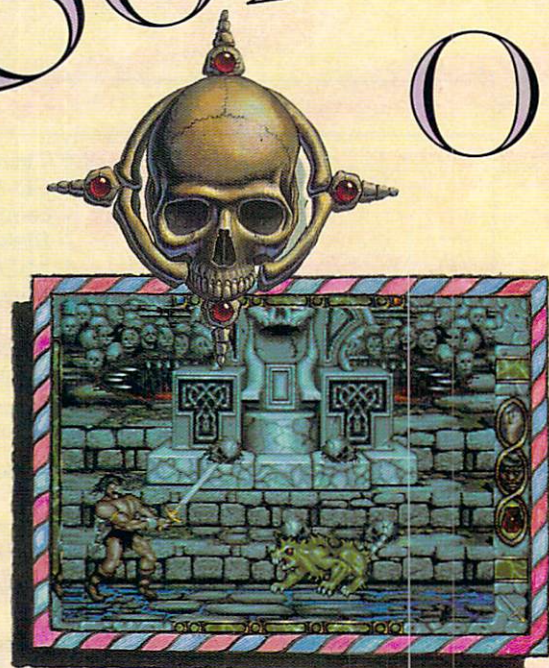
ou have heard the tales of Conan's adventures. Only now will you have the opportunity to live the life of this fierce barbarian from the land of Hyborea.

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.

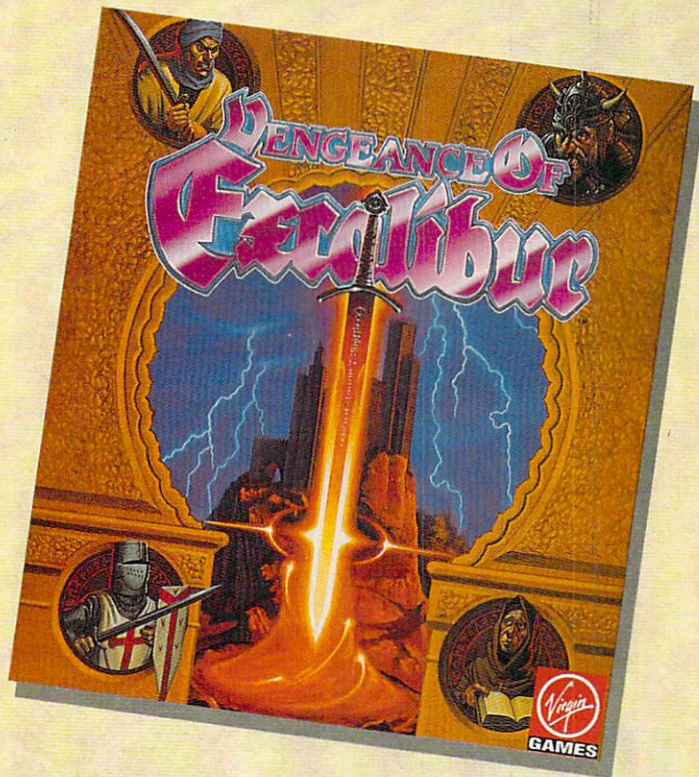
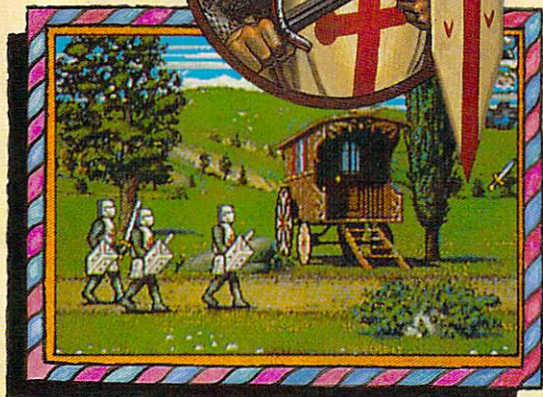
# SOME OF



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SUGGESTED RETAIL - \$49.99

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Virgin Games, Inc. 18061 Fitch Ave., Irvine, California 92714

# THING LD



**I**n 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!

Command knights and whatever followers they are able to recruit to track the Shadowmaster through hazardous, beautiful and mysterious medieval Spain. Explore the hundreds of villages and cities, fortresses and castles, dungeons and palaces and all the secret places where the Shadowmaster may dwell.

Seek what aid you can as you acquire and learn the use of the sorceries of Moorish Spain, for only with the aid of enchantments and the loyalty of strong allies will you stand a chance of ridding the world of the demonic Shadowmaster once and for all.

AVAILABLE FOR THE IBM, AMIGA, ATARI ST AND MAC THIS SUMMER.  
SUGGESTED RETAIL - \$49.99.

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# SOME NE

ALSO TAKING OVER A  
SEGA  
GENESIS  
NEAR YOU  
THIS FALL

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

Talk about your work-related stress! As a ZODIAC special agent, your job is to crack the complex security systems of the Universal Cybernetics Corporation and track down the mutant robot they have designed as the ultimate killing machine.

You'll arm yourself with a whole arsenal of weapons - everything from hologram projectors to special vision enhancement visors to thermal infra-red image intensifiers. If all else fails - you'll have to rely on your own psychic powers!

**FEATURES INCLUDE:**

- 16-level 3-dimensional environment complete with fast, smooth scrolling
- Realistic action control of six characters: 2 male, 2 female and 2 droid
- 360 degree vision
- Environmental sound effects

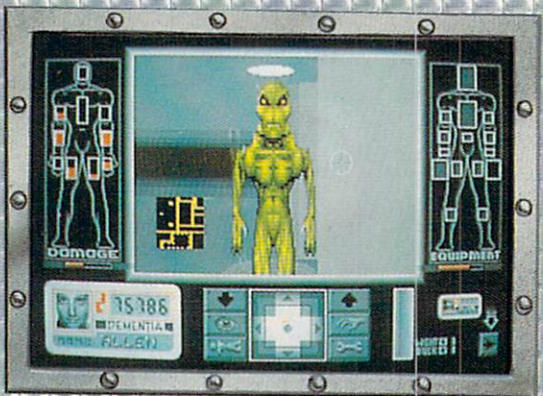
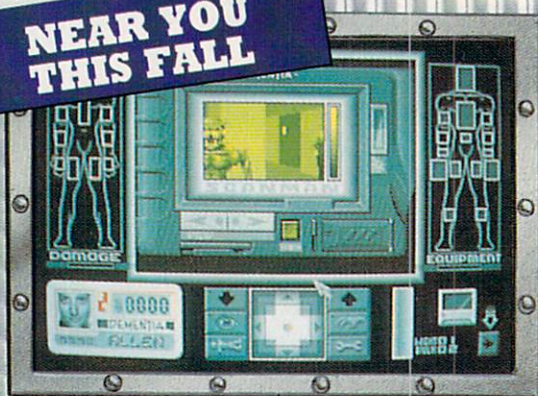
"Tension and unease, with danger lurking around every corner.... This Number One European Hit will keep you on your toes and coming back for more."



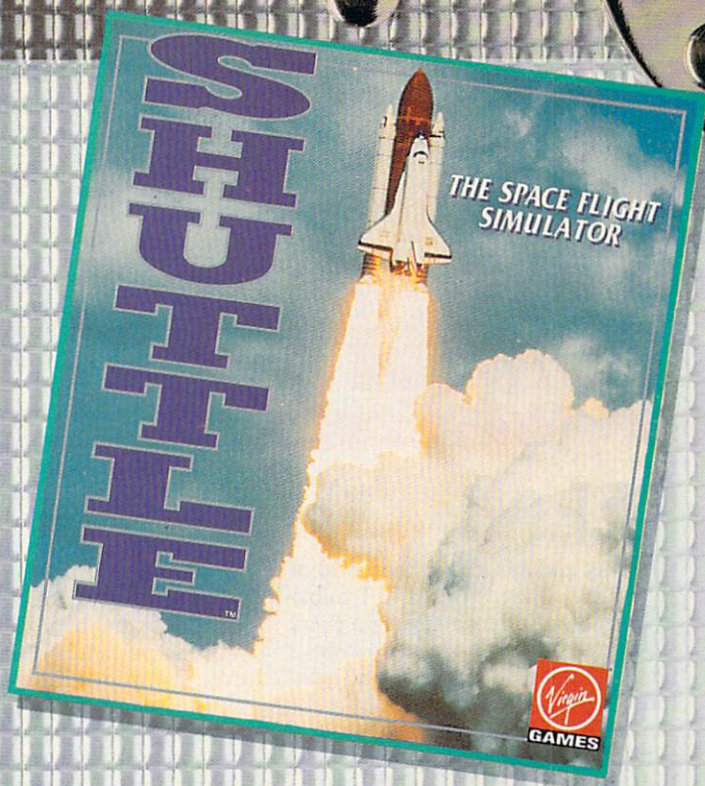
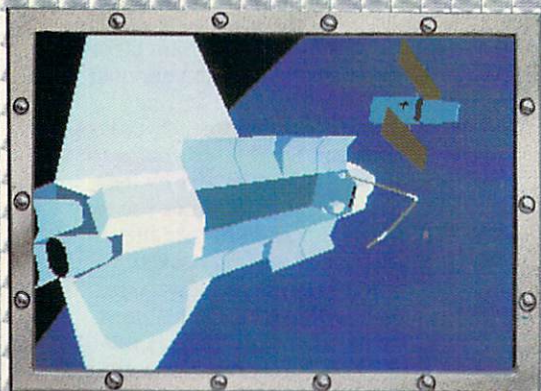
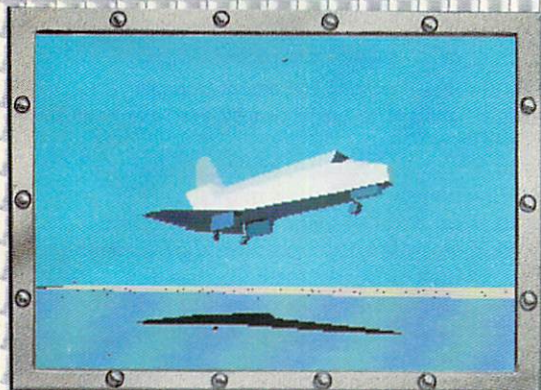
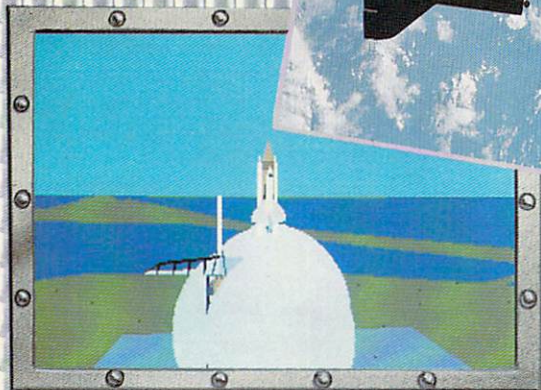
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# THING W



**T**he 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.

With the aid of Mission Control, you will master such challenges as deploying and repairing satellites, launching spy satellites, maneuvering your craft in zero gravity, attaining the correct re-entry trajectory, and pulling off complicated landings.

Advanced polygon and elliptical graphics, along with actual land and star maps were used to create the breathtaking 3D panoramas of the Orbiter and its environment, which can be viewed from any angle at any time.

Other features include:

- Authentic control panel display
- Detailed comprehensive training and reference manual
- Numerous training, scientific and "Star Wars" (SDI) Missions
- Multiple help levels from "novice" to "veteran"
- Various launch and landing sites
- Orchestral quality music
- Fold-out Shuttle flight deck poster

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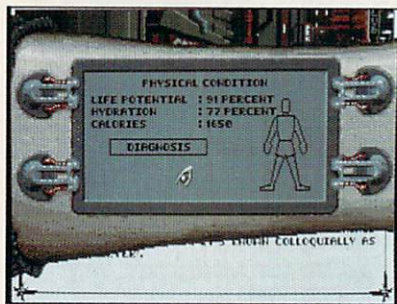


## GAMES

C H O I C E

### B.A.T.

**G**ritty 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 Bidirectional 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  
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## 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 *Sim-City* 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.



# REVIEWS

## 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

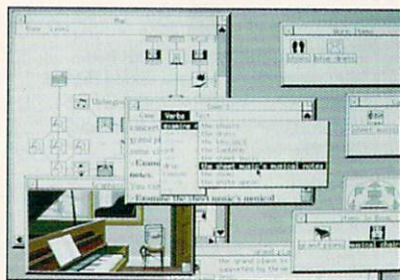
VIRGIN MASTERTRONIC  
18001 Cowan St., Ste. A  
Irvine, CA 92714  
(714) 833-8710

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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18001 Cowan St., Ste. A  
Irvine, CA 92714  
(714) 833-8710

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  
1820 Gateway Dr.  
San Mateo, CA 94404  
(415) 571-7171

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

STRATEGIC SIMULATIONS  
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Circle Reader Service Number 306

## PRODUCTIVITY

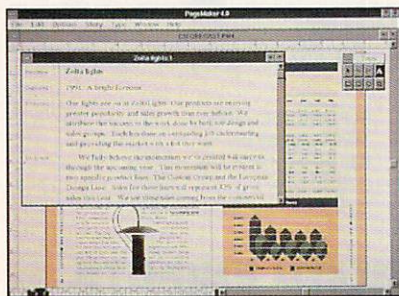
### C H O I C E

## 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.

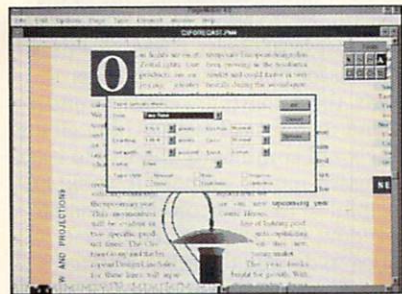
Imported graphics handling has been updated as well, with *PageMaker* keeping track of the links with external files. Through its new Link command, *PageMaker* can alert you if an external graphic has been modified since it was placed in the publication. If you desire, *PageMaker* automatically updates 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.

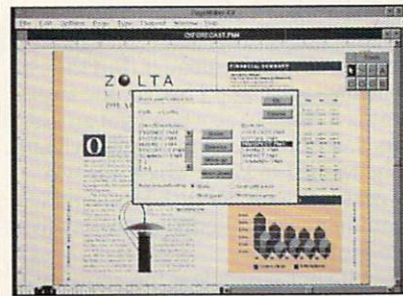
With *Table Editor*, a separate program provided with *PageMaker* to simplify the creation of tables and charts, you can easily create rows and columns of information perfectly lined up and properly formatted. *Table Editor* even imports information from spreadsheets and databases.

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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Seattle, WA 98104-2871  
(206) 622-5500

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

**T**he 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 setup 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  
(312) 329-0700

Circle Reader Service Number 316

## MYINVOICES/ MYCHECKBOOK/ MYBACKUP/ MYPHONEBOOK

**M**ySoftware'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-



## PRODUCTIVITY

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

**Y**ou'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



# REVIEWS

## PRODUCTIVITY

*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 jockey 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

MULTISOFT  
15100 SW Koll Pkwy., Ste. L  
Beaverton, OR 97006  
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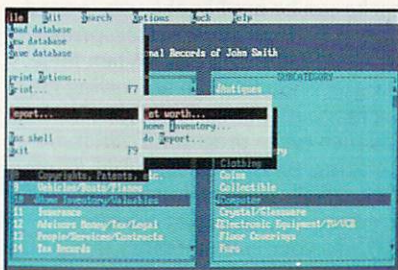
## FOR THE RECORD

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  
(708) 916-1600

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## 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.

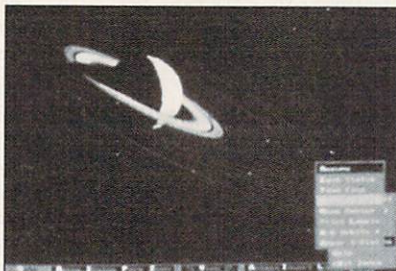
And no other PC program gives you a better sense of the utterly graceful chaos of our solar system than *Dance of the Planets*. Where other stargazing software puts static pinpoints of light on the screen to represent galaxies and worlds, *Dance of the Planets* puts realistic, spinning spheres shepherded by covays 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 coprocessor 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

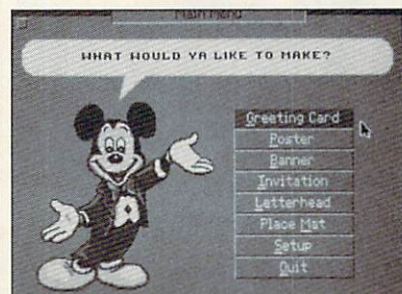
IBM PC and compatibles, 512K RAM, graphics adapter; sound card support includes Tandy TL/SL or 2500, Sound Blaster, Echo, IBM Speech Card, Covox Speech Thing, and Hearsay; mouse optional—\$44.95

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3135 Kashiwa St.  
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## 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

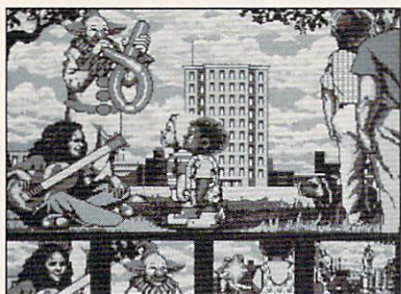
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500 S. Buena Vista St.  
Burbank, CA 91521  
(818) 841-3326

Circle Reader Service Number 330

## LEARNING

### MCGEE AT THE FUN FAIR

**W**hen 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

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### MY PAINT

**C**hildren 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

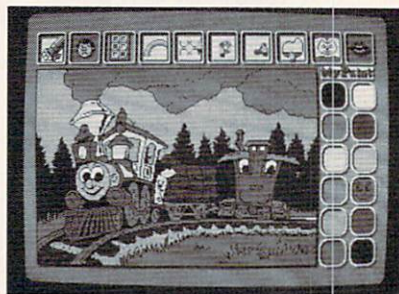
your child's own imagination. As testament, my child, who won't color with crayons, will spend hours drawing and coloring with *My Paint*.

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

## 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

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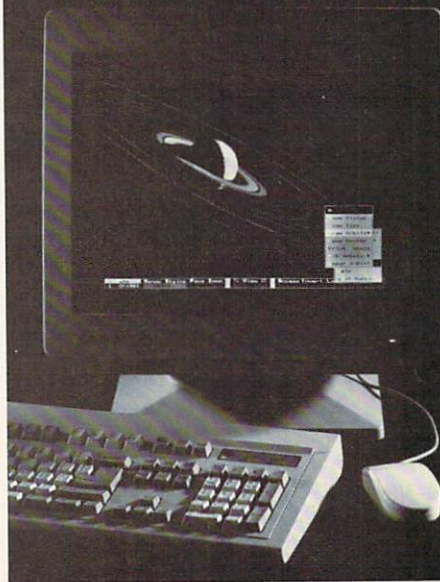
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James Bond and Sherlock Holmes, make room—only computerdom's top sleuth (that's you) can thwart the evil schemer Carmen Sandiego. As you travel around the world (not in 80 days, but in 6), you decipher clues that lead you to one of Carmen Sandiego's 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

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Phil Morrison Scientific American

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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

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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

IBM PC and compatibles with an 80386 or 80486 CPU, 4MB of RAM, and a hard disk; *Windows 3.0* optional—\$595

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## BOOKS

MICROLEAGUE  
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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  
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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

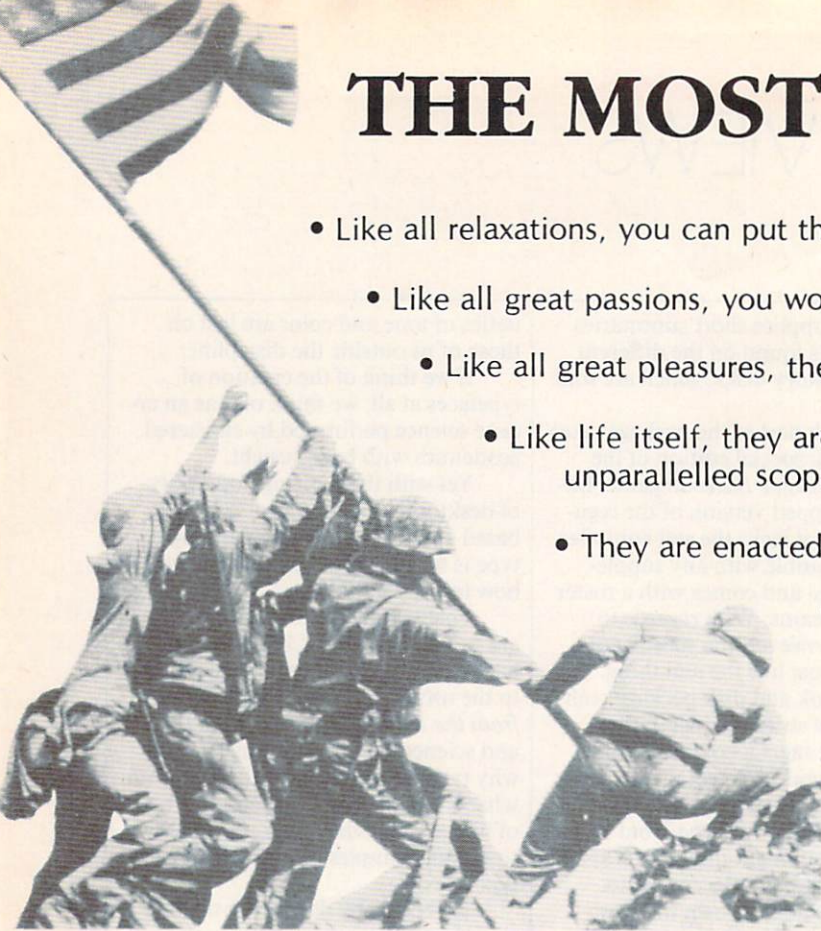
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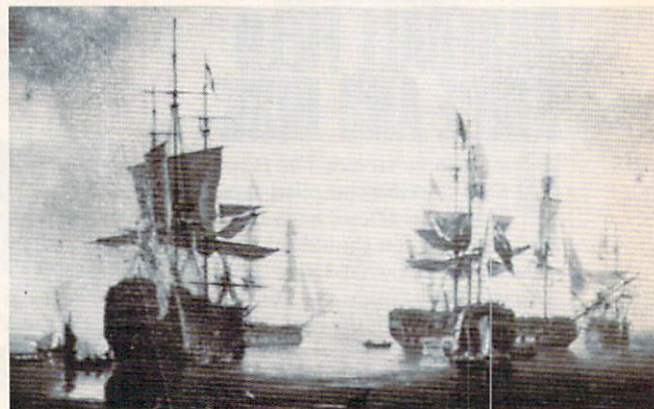


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The tapestry of these struggles was dark to its creators, its final outcome obscure and inevitably the result of a panoply of individual efforts. For example, the French were undone in Spain by *Napoleon's* inability to personally supervise the campaign.

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- Prussian .....

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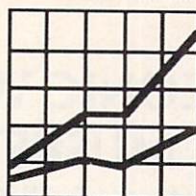
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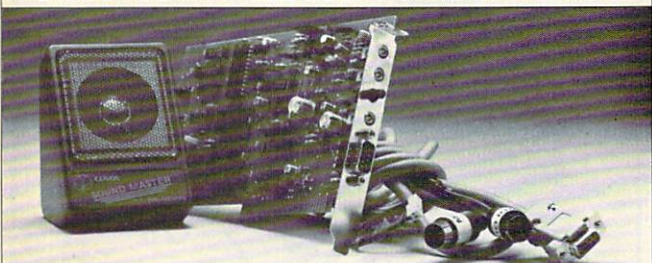
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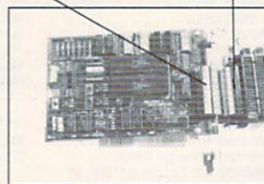
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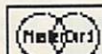
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# FAST FACTS

## 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?	Broderbund
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?	Broderbund
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?	Broderbund
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:

### Software Publisher of the Year

Psygnosis

### Computer Game of the Year

Lemmings

### Best Graphics

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

Atari Lynx

### Best Art Package

Deluxe Paint III

### Best Music Package

Bars & Pipes

### Best Home Education Package

Fun School 3

### Best Home Productivity Package

Microsoft Works

### Most Innovative Peripheral

Video Toaster

### Multimedia Package of the Year

AmigaVision

### Home Computer of the Year

Amiga 500

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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  GEInet  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  
 37  38  39  40
- J. How many times per year do you purchase by mail order?  3-5  6-10  >10  
 41  42  43
- K. What is your age? \_\_\_\_\_ years

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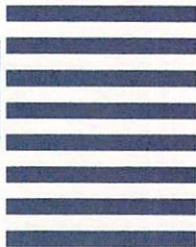
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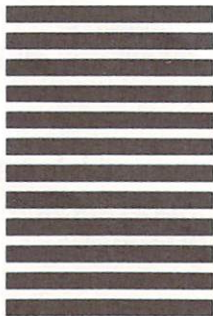
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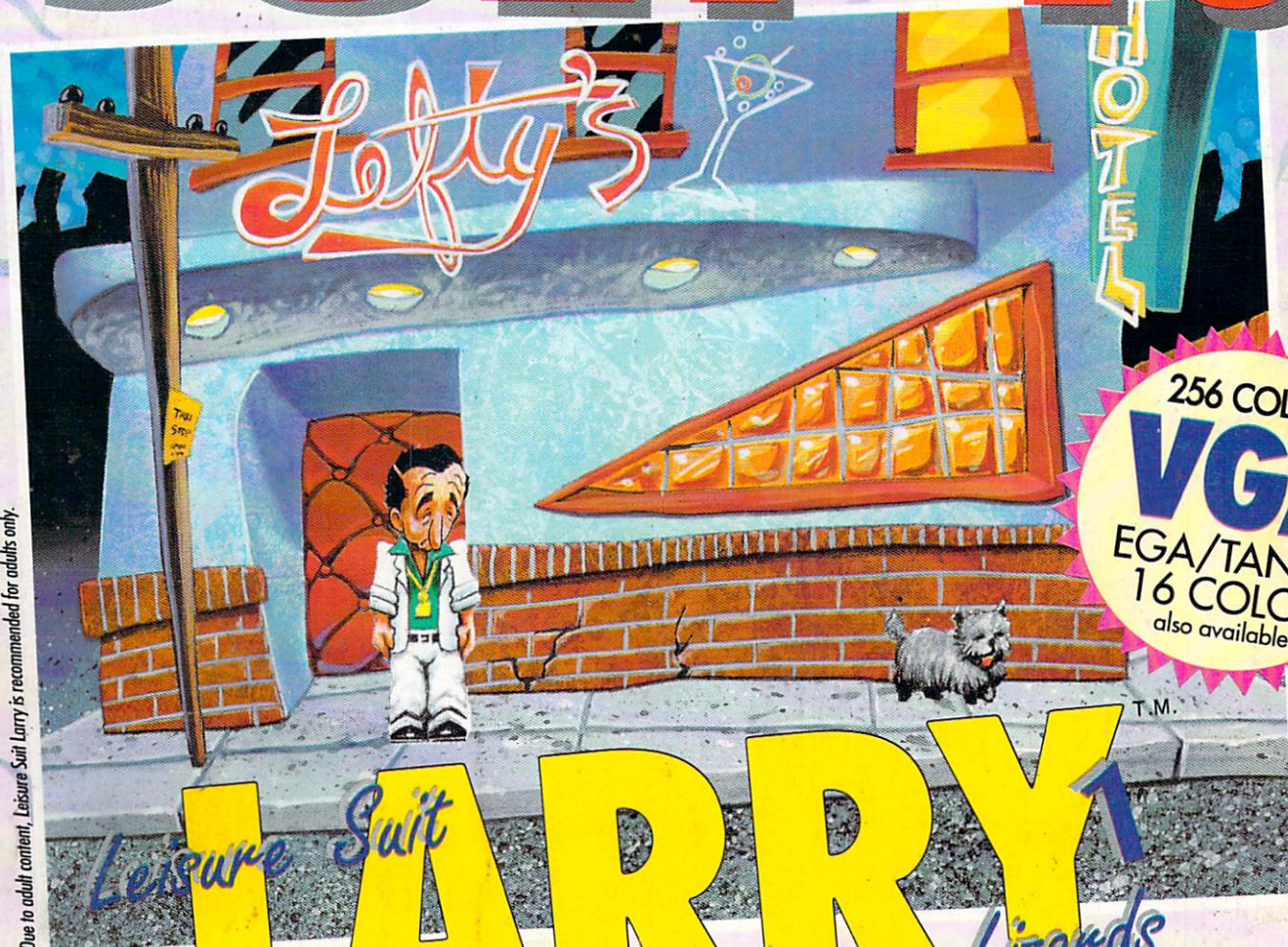
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