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November 1989

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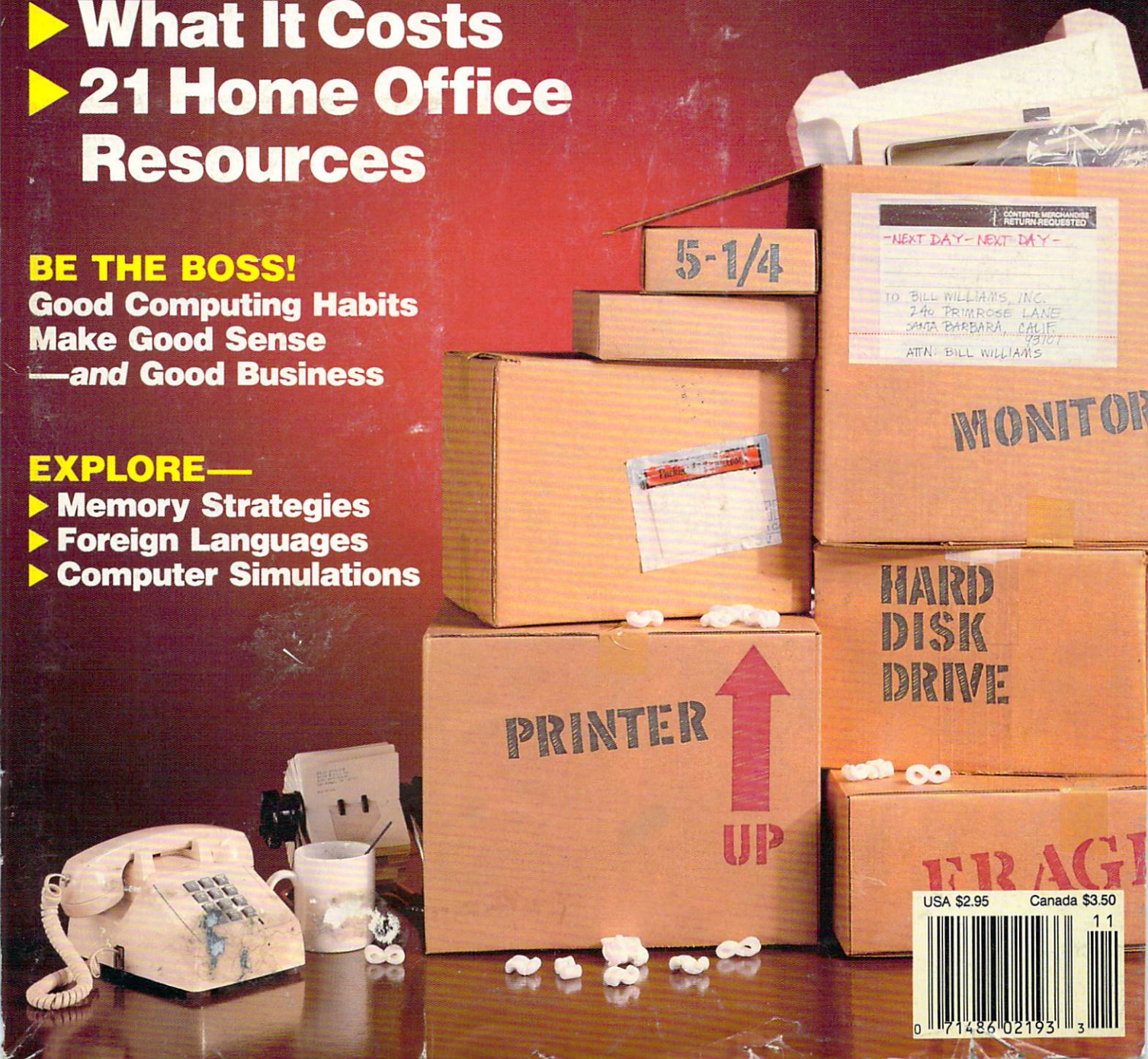

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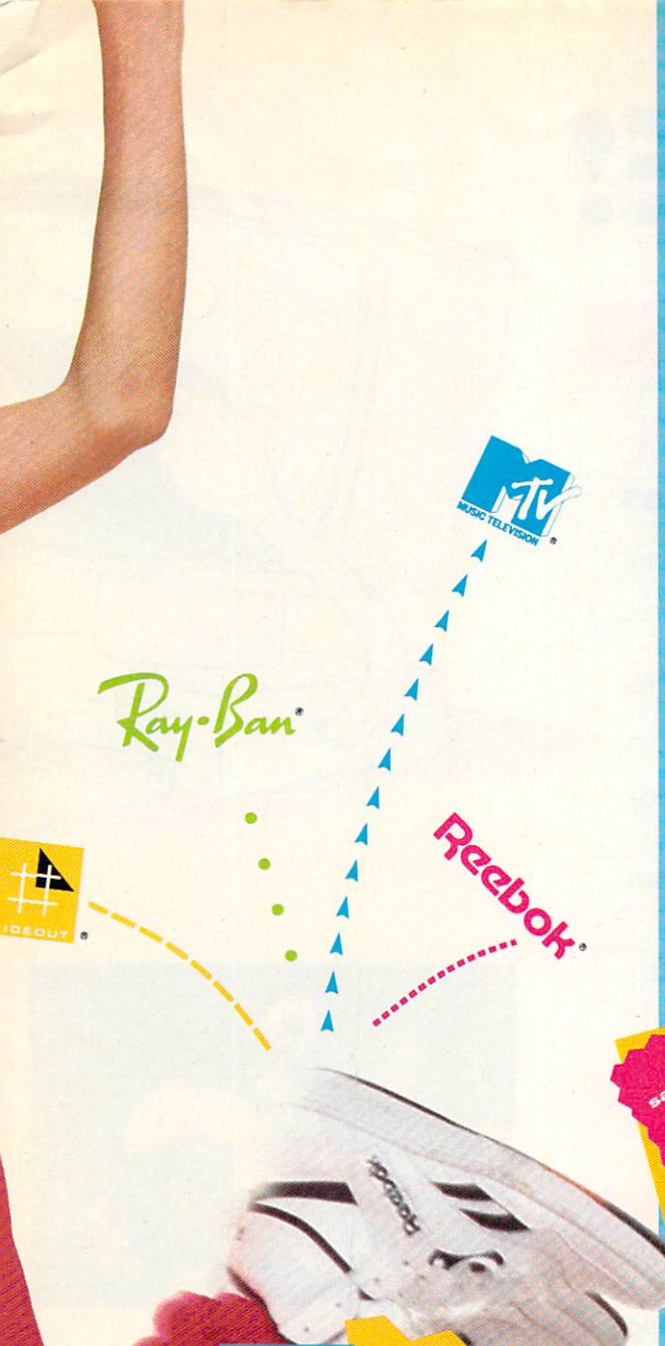

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4) _____

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2. Winners will be selected in a random drawing by the Independent Judging Organization, Inc., a subsidiary of Comart-KLP, and will be notified by mail. By entering the sweepstakes, entrants agree to these rules and the decisions of the judges. Odds of winning depend on the number of entries. Affidavits of eligibility and liability/publicity releases may be required for major prize winners (in case of a minor, their parent/guardian). Travel companion of Grand Prize winner must sign release. Void where prohibited or restricted by law.

3. One Grand Prize: A five-day trip for two to New York City consisting of round-trip airfare from the major airport nearest the winner's residence, four nights hotel accommodations, a visit to MTV studios and $1,000.00 spending money. Winners under 18 must be accompanied by parent/guardian. Dates to be determined by sponsor. (Approximate Retail Value $3,500.00.) 100 First Prizes: Reebok Hi-Tops. (ARV $65.00.) 250 Second Prizes: Sideout Sportswear "Rap Ensemble," including T-shirt and pants. (ARV $65.00.) 1,000 Third Prizes: Ray-Ban Drifter sunglasses. (ARV $60.00.) No prize transfers or substitutions except by sponsor due to availability at time of drawing. Such replacement will be of equal or greater value.

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COMPUTE!

THE CHOICE OF HOME PC ENTHUSIASTS SINCE 1979

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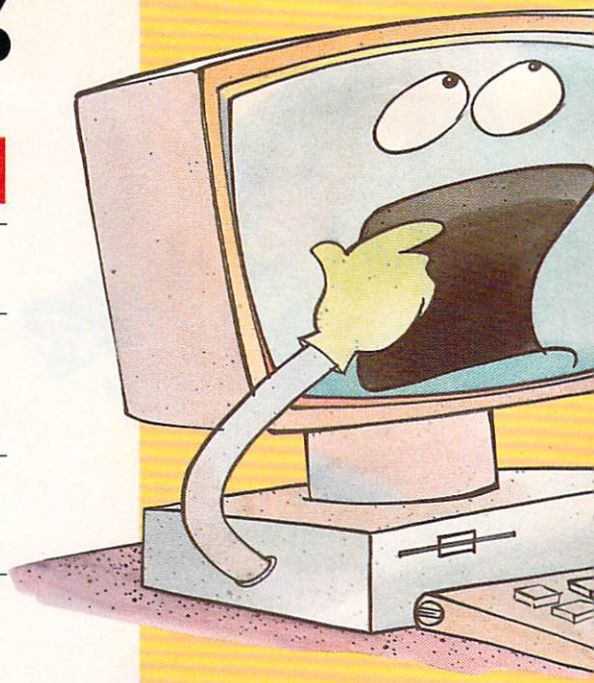

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MY VIEW /38/ PAUL AND SARAH EDWARDS

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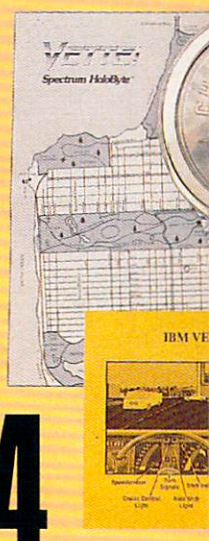

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COMPUTE! The Choice of Home PC Enthusiasts Since 1979 (USPS: 537250) is published monthly by COMPUTE! Publications, Inc., ABC Consumer Magazines, Inc., Chilton Company, one of the ABC Publishing Companies, a part of Capital Cities/ABC, Inc. Editorial Offices are located at 324 West Wendover Avenue, Greensboro, NC 27408. Domestic Subscriptions: 12 issues, $19.94. **POSTMASTER: Send Form 3579 to: COMPUTE!**, P.O. Box 3245, Harlan, IA 51537. Second-class postage paid at New York, NY and additional mailing offices.

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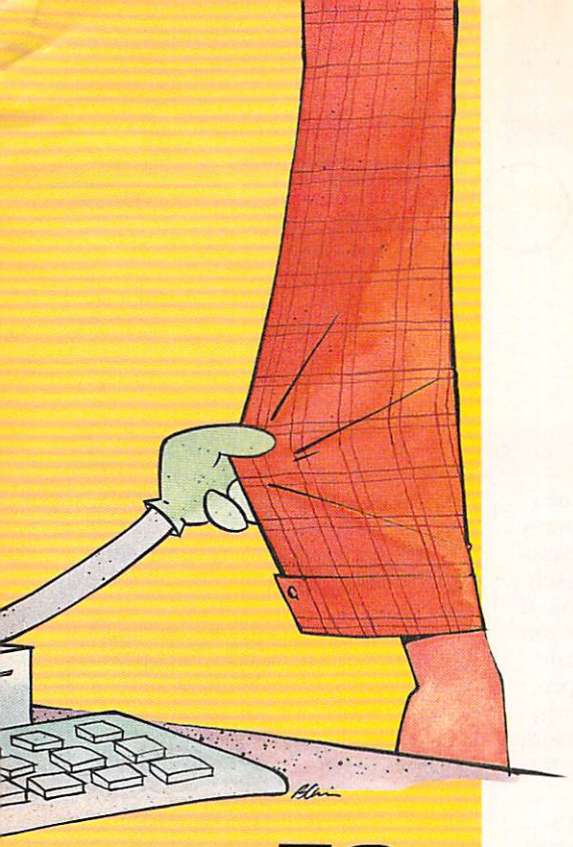
ISSN 0194-357X.



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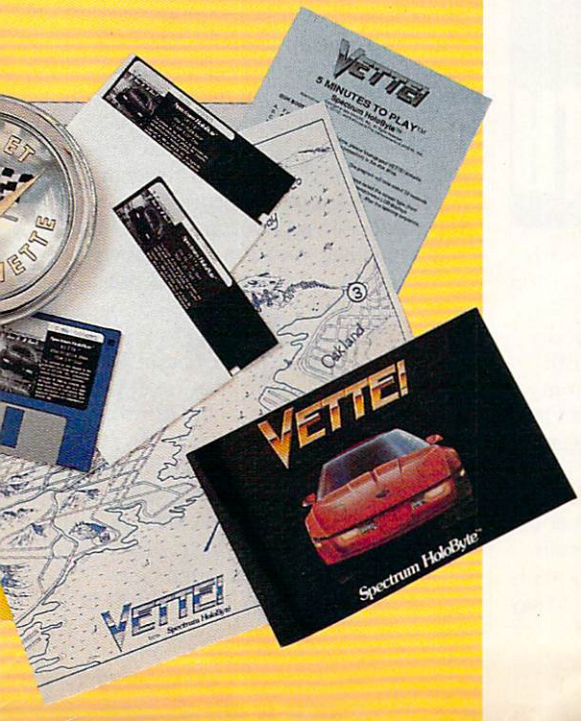

PRODUCTIVITY

COMPUTE! CHOICE /68/ DAVID STANTON
Use the VGA-TV board to convert VGA graphics to NTSC video signals for dynamic presentations.

PLEASE FEED THE PC/76/ DAN GOOKIN
Make memory chips part of a balanced PC diet.

PC PRIMER /82/ HINTS AND TIPS FROM OUR READERS
Give new power to the DIR command.

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COMPUTE! CHOICE /102/ JOEY LATIMER
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Personal computers are helping a lot of people learn foreign languages.

HOMEWORK /114/ HINTS AND TIPS FROM OUR READERS
Teach shapes and colors with your PC and a drawing program.

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COMPUTE! CHOICE /84/ PETER SCISCO
Drive into the world of 3-D graphics with *Vette*.

GET REAL /92/ HEIDI E. H. AYCOCK
Computer simulations are the next best thing to reality.

GAMESCOPE /100/ HINTS AND TIPS FROM OUR READERS
Golf lessons from our resident pro.

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A price tag is no measure of your home computer's worth.

IMPACT /72/ DAVID D. THORNBURG
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The best of the new games call for more than just reflexes.

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With its planned product line, Apple is really cooking.

NOVEMBER 1989 • VOLUME 11 • NO. 11 • ISSUE 114

EDITORIAL LICENSE

PETER SCISCO

Don't quote me on the figures, but I think it's fair to say that 90 percent of American households own a television, and a sizable percentage of those homes own two or three. Yet at the same time, only about 20 percent of American households (I'm being generous here) own personal computers.

The most persistent explanation for the relatively low penetration rate of personal computers is price: You can pick up a decent color TV for less than $300, a pretty good VCR for about $400. A decent home computer system—one that you can expand to take care of your computing needs for the next five years—will run you about $1,200. Computers cost too much, period.

The harder you look at that argument, however, the less convincing it becomes. Don't compare computers with televisions; compare them with goods of equal value and equal worth. Take camcorders, for example. One of those babies will set you back a cool grand, yet Americans can't buy them fast enough. Or consider a moderate-quality home stereo with a compact disc player, tape deck, graphic equalizer, speakers, tuner, and turntable: You're looking at about $1,200.

So it's not price, it's value. It's what you get out of your purchase compared with what you put into it. I'm talking perception here. Given a choice, more people would see greater value in a camcorder than in a comparatively priced computer. After all, they would use a camcorder a lot more than they would a computer, right? Think about it. How many everyday events are worth recording on video? The family's summer vacation. The baby's first steps. Your son's wedding. Your daughter's graduation. Not everyday occurrences. Most of the time, after the first few weeks of excitement, a camcorder will sit on a closet shelf and gather dust.

But your stereo is different, right? You play it all the time, you buy new recordings every week, you've always got the radio tuned to beautiful classical music—probably not. Most likely you turn it on every couple of days. If you turn it on more regularly, are you an active listener, or does the music drone in the background as you perform other tasks? I love music, even taught myself the guitar, but I seldom sit still and listen to records more than once or twice a week.

So price alone isn't the culprit. Value, which is a perception of worth, is the key to bringing computers home in greater numbers. And since most people don't fully appreciate the value of personal computers, they don't buy them or use them to their full potential. For example, a fellow recently wrote a letter to the editor of our local paper in which he berated the education establishment for abandoning what he called "the basics" in favor of teaching kids how to work with computers. Although I sympathized with his concerns, I found his lack of vision disconcerting.

I have no problem with schools teaching reading, writing, and arithmetic; in fact, I encourage it. But my encouragement is tempered by an appreciation of technology as an agent of change. The personal computer isn't simply a blackboard for the 1990s. It's a unique medium with inherent possibilities too undervalued by an establishment that equates test-taking skills with critical thinking. That isn't to say that you need a computer to teach your kids to think. (More books! Less TV!) But by incorporating computers into the learning process, we can see true value.

There's more to home computers than education, of course. They provide intriguing entertainment and make it possible for you to earn a living without the large support staff required of so many small businesses. In both cases, work and play, a certain amount of perspective is required to appreciate your computer's value. Flying a jet, reliving history in feudal Japan, building a city from the ground up, shooting 68 at the Kemper Open—these are but a few of the worlds awaiting any computer gamer. But, to really appreciate any of them, you need to play some summer softball, take a woodland hike, ride a carousel with a child. In short, you need to take part in the world around you to discover the worth of the world inside your computer.

The same goes for working. Your computer can be your best working partner or your worst office slouch. Don't get caught up in new technology just for its glitz and glitter (hard advice for an enthusiast). Corporate America and business computer magazines notwithstanding, the Intel 80286 has a lot of life to give. And don't forget the Amiga, the lower-priced Macintosh models, the Apple II line, even that old workhorse Commodore 64, all of which can perform more than adequately according to your needs. Most important, don't become a slave to your computer; develop the best tool for the job and use it wisely.

At the risk of preaching to the converted, I believe home computers have yet to fulfill their promise of revolutionizing the world as the printing press did 500 years ago. Too many people still see computers as difficult machines with no discernible value. As computer users, we have the opportunity to change that perception through our own habits. Appreciate your computer. For what it's worth. ⊡

NEW FOR IBM!

The Children's Writing & Publishing Center™

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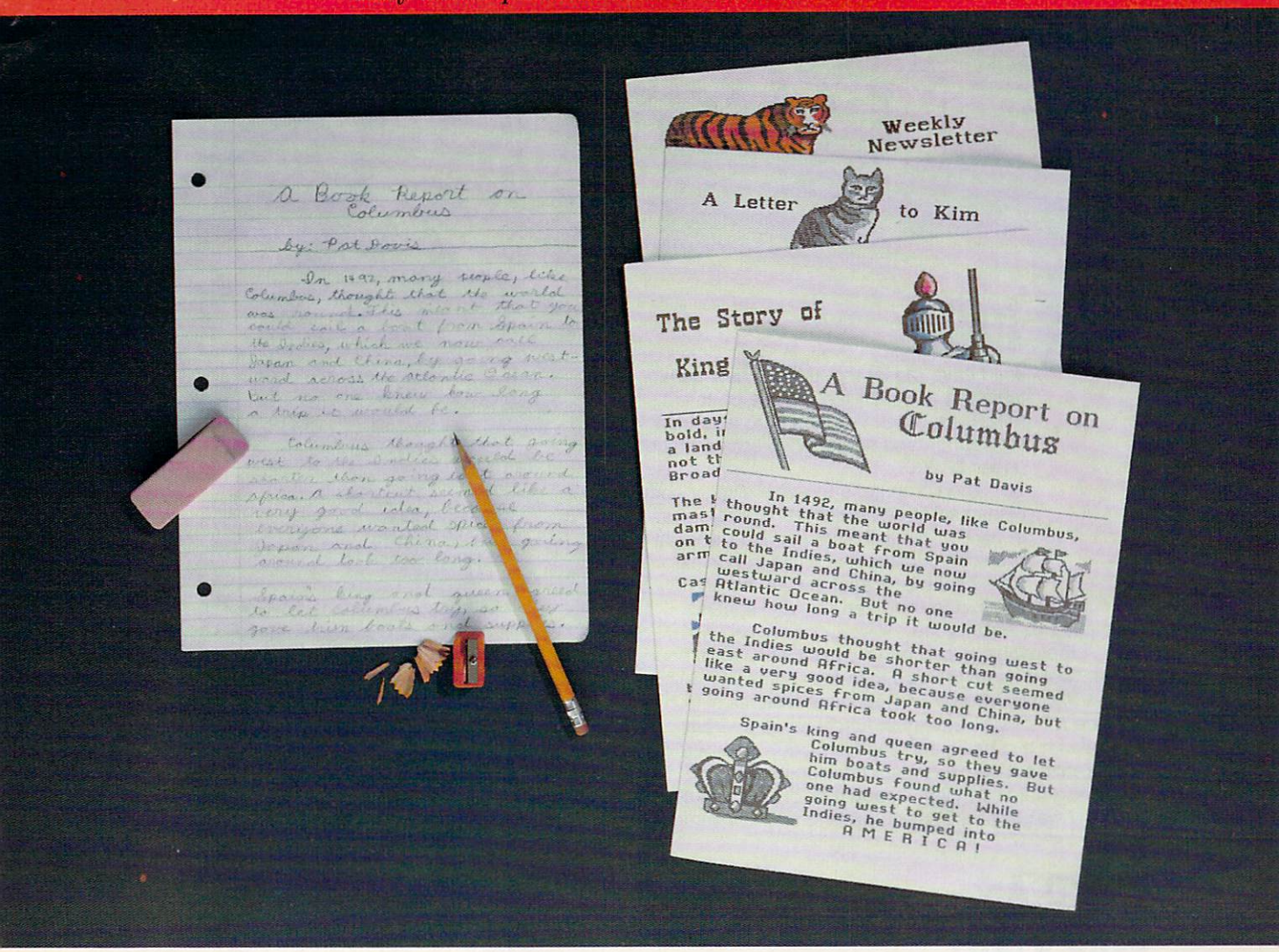

THIS IS CLEARLY WRITING.

THIS IS WRITING AND THINKING MORE CLEARLY.

Now there's a tool that encourages children to write down what they think: ***The Children's Writing & Publishing Center***. This new fun and easy-to-use software program picks up where pencil and paper leave off. ***The Children's Writing & Publishing Center*** stimulates the natural creativity of young people and makes the process of writing both fun and rewarding. It combines powerful features in word processing, picture selection, and page design to help children, families and schools produce first-class illustrated reports, letters, stories, newsletters, and more. Now children can write more freely and creatively. . .and explore more possibilities! ***The Children's Writing & Publishing Center***: an easy, powerful way to get it in writing.

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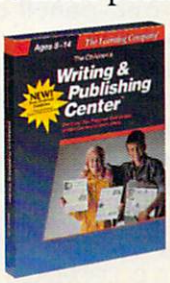


Suggested retail price: $69.95 (IBM/Tandy & compatibles), $59.95 (Apple II/IIGS)

The Learning Company®

NEWS & NOTES

LITTLE ZENITH

Zenith gave the laptop arena a new contender in July with the release of its MinisPort, which weighed in at less than six pounds and hit the price scales at just under $2,000.

The computer's 9½-inch display combines backlit and reflective technologies. In dark or dimly lit settings, the backlight provides illumination, while in normal light Zenith's "transflective" screen eliminates the need for backlighting and extends battery life.

A removable ni-cad battery pack lasts three hours under heavy use and more than four hours with MinisPort's Intelligent Power Management features, which include a "silicon" drive that functions as a virtual disk—with a capacity ranging from 360K to 1.36MB.

Zenith's most significant development is the MinisPort's 2-inch, 720K floppy disk drive. Less than half the weight of a 3½-inch drive, it also consumes

150 percent less power. Although the same relative size, Zenith's small disks aren't interchangeable with the 2-inch floppies used in video cameras.

The accessory list includes an internal modem, a carrying case, extra battery packs, a battery charger, and external drives. Suggested retail prices are $1,999 for the one-megabyte model and $2,799 for the two-megabyte model.

RICHARD C. LEINECKER

LIE TO A COMPUTER?

Georgia Tech researchers have found that job applicants answer questions more honestly when asked by a computer. The results don't apply uniformly to everyone, however. Management candidates often exhibit resentment, and computer phobia afflicts some job applicants.

Four different questioning techniques were compared: using a friendly interviewer, an impersonal interviewer, paper-and-pencil application forms, and a computer. Although there were more accurate answers when answering a computer's questions, Dr. Dennis Nagao of Georgia Tech points out, "People are an essential part of the system."

RICHARD C. LEINECKER

MAKE IT MOVE —MACINTOSH MULTIMEDIA

Media—multiple and optical—were the big stories at Macworld Expo, held in Boston this past August.

In his keynote speech, Apple president John Sculley envisioned the Mac as *the* information tool of the 1990s. More importantly, he said desktop multimedia and presentations would have the same growth potential in the 1990s as desktop publishing enjoyed during the 1980s.

Multimedia tools are expensive, though, aimed squarely at the Fortune 500 market. There was little at Macworld for the home consumer, although Electronic Arts made a strong showing with *Studio 1,* an animation program, and *MacRecorder,* a musician's program. On the entertainment front, Spectrum HoloByte drew large crowds with its line of Mac games.

But it was multimedia that stole the show. Dramatic displays included ABC News Interactive's videodisc portrait of Martin Luther King; *Newsweek's* interactive look at unrest in China; and disc-based programs from Harvard, WGBH ("NOVA"), Warner New Media, and McGraw-Hill.

Multimedia is even being used to help Mac users: Datapro's Macintosh Consultant is a CD-ROM consumer guide to Macintosh products and information.

KEITH FERRELL

Amiga Gets More Perfect

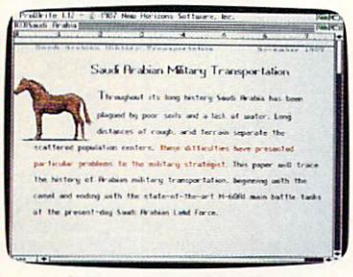
In the wake of rumors that WordPerfect would pull out of the Amiga market (*COMPUTE!*, August 1989), the company released an updated version of Amiga *WordPerfect* 4.1.

"The file requesters are Amiga-style now," explained Lynn LeBaron, WordPerfect's manager of Amiga Development. The new version also adds default directory paths for documents and macros, audible beeps and backup warnings, automatic hyphenation, resizable edit buffers, and "a *lot* of bug fixes." The program opens on its own custom screen and will support taller onscreen fonts.

LeBaron said work continues on an update that will incorporate many features found in IBM *WordPerfect* 5.0.

To upgrade, send $12.50 and a photocopy of your serial number to WordPerfect Amiga Update, 81 North State Street, Orem, Utah 84057.

New Horizons' Amiga word processor, *ProWrite,* is new and improved, too. Using version 2.5, you can mix graphics with your printer's standard near-letter- or draft-quality fonts. Other new features include adjustable page size, an



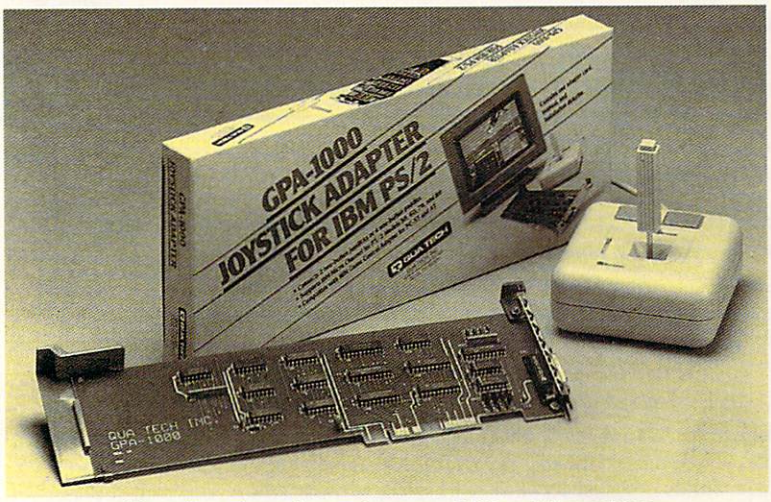
Mix graphics and fonts with the updated version of *ProWrite*.

interactive spelling checker, and a ruler that can be turned off. Typing and spell-checking speeds have been improved; it's almost impossible to out-type version 2.5.

The upgrade costs $20 for *ProWrite* 2.0 owners, and $30 for *ProWrite* 1.0 owners. Add $5 for shipping ($10 outside the United States). Send your original program disk with a check or money order to New Horizons Software, P.O. Box 43167, Austin, Texas 78745.

DENNY ATKIN

ANY GAME PORT IN A STORM



All work and no play makes your PS/2 a dull machine.

Your new Micro Channel Architecture PS/2 blows the socks off your old XT when it comes to number crunching, database sorting, and desktop publishing. Now, with Qua Tech's affordable new game-port board, it can also play a mean game of *Pac-Man.*

The GPA-1000 interface board supports two joysticks and can be used on the IBM PS/2 Models 50, 60, 70, and 80. The $79.95 board is compatible with the standard IBM Game Control Adapter, so it will work with most MS-DOS game software, such as Microsoft's *Flight Simulator* 3.0.

For more information, write Qua Tech, 478 East Exchange Street, Akron, Ohio 44304; or call (800) 553-1170.

DENNY ATKIN

Finding Missing Children

By "aging" photos of missing children, Lewis Sadler and Scott Barrows have helped police locate 21 missing children in the last four years. The process is slow and involved by hand, but, recently, the team has started using computers. Although the procedure is still new, it is much faster.

"Basically, we were working with mathematical algorithms anyway," said Sadler, head of the Department of Biomedical Visualization at the University of Illinois at Chicago. "It just was the wrong way to be doing it. Our software proves that."

To age the image of a child, Sadler and Barrows start with an old photograph. "Based on average growth indicators, we're able to move points on the face," said Sadler. "Then, the computer warps the face based on that information."

A grant from AT & T has helped the two professors carry on their work; Sadler and Barrows charge nothing for their help.

"We have always done this as a free service to law enforcement and parents, and, by hook or by crook, we'll keep it that way," said Sadler.

Sadler and Barrows provide the service on a national basis in cases where children have been missing for more than three years. Cases come to Sadler and Barrows through the National Center for Missing and Exploited Children in Washington. For more information, contact the center (800-THE-LOST).

HEIDI E. H. AYCOCK ⊡

Cure home finance headaches.

Keeping your personal finances in order can be a pain. And if you've tried the existing software, you probably have an even bigger headache.

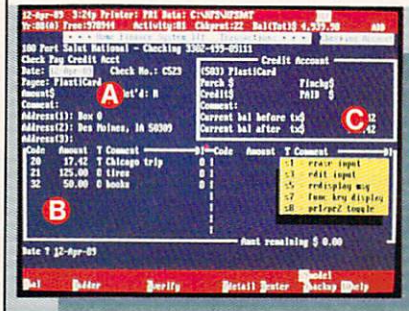
HFS-III is written by a non-accountant, for non-accountants. It works the way you do.

Home Finance System-III is set up very much like your checkbook and check register. You can start using it immediately to track payments, deposits, ATM transactions, and to balance your checkbook. It's so easy to use that people are calling it smart.

HFS-III is designed to meet your needs month after month, year after year.

Define up to 100 asset accounts including checking, savings, CDs, cash, mutual funds, you name it. Because HFS-III integrates all your accounts, you can transfer funds between accounts with a single transaction. And your reports can include summary information from all your accounts.

Models let you enter recurring transactions with just a keystroke.



Pay monthly bills. All the information you need is on one screen: balance before and after transaction and your checking account balance.

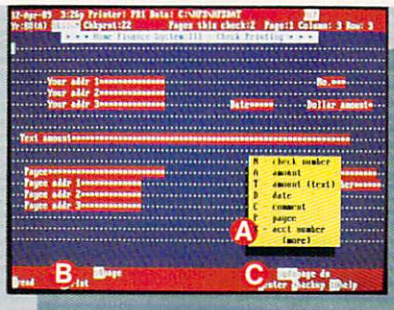
A. Just start typing the account name or number and a Smart Menu finds the closest match. Payee, address and date are filled in automatically.
B. Up to 14 expense codes per transaction, each with tax flag and space for a comment.
C. Remembers amount owed and expense codes.

You get full editing capabilities.

To start with, HFS-III helps you enter error-free data. But if you do make a mistake, you can correct your entries from previous months and years. There is no artificial "archiving" of data.

Printing checks. HFS handles two "hand-written" checkbooks plus a computer-printed checkbook for each account. Custom design the printout for ANY business-size check, with or without stubs, including checks for laser printers.

A. Automatically print payee's account number on checks.
B. Keep checks in one printer, report paper in another. Toggle with one keystroke.
C. Design and save 3 different formats.



Order HFS-III today. Kiss financial headaches good-bye.

ONLY $49.95

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ADVERTISING OFFICES

New York: ABC Consumer Magazines, Inc., 825 Seventh Ave., New York, NY 10019. Bernard J. Theobald, Jr., Associate Publisher/Advertising, (201) 989-7553. Susan Annexstein (212) 856-9897.

Greensboro: COMPUTE! Publications, 324 West Wendover Ave., Suite 200, Greensboro, NC 27408; (919) 275-9809. Kathleen Ingram, Marketing Manager.

New England & Mid-Atlantic: Bernard J. Theobald, Jr. (201) 989-7553. Susan Annexstein (212) 856-9897. Kathleen Ingram (919) 275-9809.

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Address all advertising materials to Tammie Taylor, COMPUTE! Publications, Inc., 324 West Wendover Ave., Suite 200, Greensboro, NC 27408

Editorial inquiries should be addressed to The Editor, COMPUTE!, Suite 200, 324 West Wendover Ave., Greensboro, NC 27408

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5 sure steps to a fast start as a high-paid computer service technician

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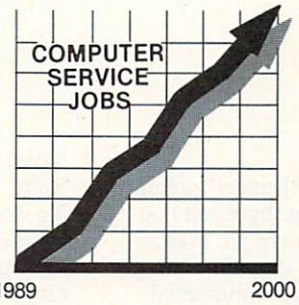

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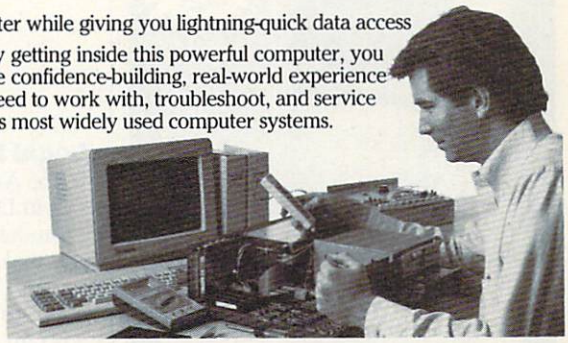

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LETTERS

Legal Impact

In the August 1989 "Impact" column, David D. Thornburg suggested that "Another avenue you might explore [for making money] is a will-writing service. You can use a commercial software program to help you create wills for clients, or you could create them yourself with a word processor."

There is a name for this business; the preparation of wills for others for a fee is called the practice of law. In most states the practice of law by a person who is not a licensed attorney is a crime. Although some might argue that such laws benefit attorneys rather than the public, they are on the books and are enforced.

CHARLES V. GERKIN, JR.
ATLANTA, GA

Many states do consider writing wills for hire to be practicing law. You should contact your local bar association to determine whether it's legal in your area.

Nolo Press, publisher of WillMaker, *told us that it doesn't license its software for commercial will writing. If you want to help people write their wills, Nolo suggests you buy each client a copy of* WillMaker *and walk each one through the program.*

Suspicions Confirmed

COMPUTE! does not consider the Commodore 64 to be a personal computer! A feature article in the July 1989 issue, "Nintendo: Just Kids' Play or Computer in Disguise?" states, "You can get started with a Nintendo base system for about $100—several hundred dollars less than even the least costly personal computer."

Eight pages further into this issue, an advertiser offers for sale the Commodore 64C with GEOS software for $119.95.

In my opinion, with both systems using a television as the display, the Commodore 64 only needs a $4.95 joystick and any one of the many cartridge games available to put Nintendo out to pasture.

COMPUTE! was the first of many computer magazines to which I have subscribed since the early 1980s. Sadly, I will not be renewing again. No wonder dedicated game machines are taking over videogaming, when this publication, which owes its beginnings to Commodore 8-bit computers, no longer considers the Commodore 64 to be a personal computer.

SAMUEL J. HAND
COLUMBIA, SC

Keith Ferrell replies: Not only do I consider the Commodore 64 a personal computer, I think it's an important one. But while you can buy the 64 CPU for about the same price as a Nintendo Entertainment System (NES), you still have to add a disk drive—roughly doubling the price. It's been some time since games for the 64 were available on cartridge. Price aside, the 64 is superior to the NES. It's a computer. The NES is a toy.

Which Computer?

Thanks for putting out a magazine which attempts to tackle the monstrous task of covering all types of personal computers under one cover.

However, this multicomputer coverage can sometimes cause a bit of confusion as it relates to computer screen shots, usually used in your reviews of recreational software. I would suggest that below each screen shot you print which computer and, if applicable, which video mode—that is, EGA, VGA, and so on—the screen shot represents. This would assist computer owners in knowing whether or not they can expect their systems to display the program similar to the screen shot used in the review.

DAVID G. BRITT
MADISON, MS

Whenever possible, we use the IBM-version screen shot to illustrate our reviews. We understand the confusion an Apple or Commodore screen shot might cause readers who think they're looking at an IBM screen. We're working on ways to make the identification of screen shots clearer. ⊡

MS-DOS

Power Up

Let's face it: If you don't have a hard drive, you *need* one; if you have one, you need a *bigger* one; and if you have a big one, you need *two.*

With scores of hard drives available, shopping for a new one can be confusing. But when it comes to value, the Seagate 251 (Seagate Technology, 920 Disc Drive, Scotts Valley, California 95066-4544; 408-438-6550) is hard to beat.

This 5¼-inch, half-height drive comes in two versions: the 251-0 has an access time of 40 ms and a street price of $350, and the 251-1 has an access time of 28 ms and a street price of about $400. Except for the access times, the two models are identical.

Since adding a hard drive to your system can present a few challenges, here's a rundown of what to expect when installing a Seagate 251 as a single or a second drive. But first, an anatomy lesson.

Your hard drive system consists of a controller card and the drives themselves. The controller is connected to the hard drives by two types of cables—the control cable, which is 34 pins wide and has connectors for two hard drives on it, and two data cables, which are each 20 pins wide.

The standard controller card supports two control cables: one for two daisychained hard drives and one for two daisychained floppy drives. On the daisychained cables, the connector at the end is for drive 1; the connector in the middle is for drive 2. On some systems, the control cable has a twist just before the end connector. This is important.

Seagate drives have a drive-select jumper that configures it as number 1 or 2, and each drive has something called a *terminating resistor,* which tells the hardware that this is physically the last drive in the daisychain.

If you're installing a 251 as a single drive in your system, things couldn't be easier. First, if your control cable is smooth, put the drive-select jumper on DS-1; if the cable has a twist in it, put the jumper on DS-2. Make sure the terminating resistor is in place, and connect the *end* of the control cable to the drive. Slide on the data cable, and you're ready to go.

Things are a little more involved if you're installing the 251 as a second hard drive. The first thing you need to do is tell your system which hard drive is 1 and which is 2. If your control cable is smooth, simply configure the two drives as numbers 1 and 2 by setting drive-select jumpers on DS-1 and DS-2. If your cable has a twist in it, you'll want to set both drives on DS-2.

Now connect drive 1 to the end of the cable and drive 2 to the middle. Remove the terminating resistor from the drive attached to the middle of the cable (drive 2), and make sure the drive at the end of the cable (drive 1) has its terminating resistor in place.

After you've tightened the screws, you're ready to take your new Seagate for a spin. To introduce the new drive to your system, run your computer's setup program (if you have an AT), partition the new drive, perform a low-level format, and last, perform a high-level format.

Please note that DOS 3.3 or lower normally requires that you partition large drives like the 251 into two logical drives (DOS versions through 3.3 can manage partitions of 32MB or *smaller;* DOS 4.0 and higher can handle much larger partitions).

To its credit, Seagate supplies a special device driver with the 251 that allows you to create partitions larger than 32MB, so you can allocate the 251's entire 40 megabytes to one large partition if you wish.

Installing a 251 should be easy, but if you encounter any problems, Seagate provides technical support by phone. You may have to wait on hold for quite a while before you get a representative, but I found Seagate's techs know their products inside out and are eager to help.

How does the Seagate 251 perform? Flawlessly. I've run my 251-0 nonstop, 24 hours a day for three solid months without a hint of trouble. It's fast and reliable, and I've found performance to be as good as or better than Seagate's specifications. The Seagate 251 is a byte-for-the-buck winner.

Big Deluxe

You've seen the ads: Throw away an entire shelf of software and replace it all with one package—*PC Tools Deluxe* (Central Point Software, 15220 NW Greenbrier Parkway, Suite 200, Beaverton, Oregon 97006; 503-690-5160; $129). I thought it was all hype.

It's not. With version 5.5, released this past June, Central Point's *PC Tools Deluxe* goes head to head with heavyweights Peter Norton Computing *(Norton Commander* and *Norton Utilities),* Borland *(SideKick Plus),* and Fifth Generation *(Fastback Plus)* for the title Number 1 Power Tool.

PC Tools Deluxe is really three programs all rolled into one: Desktop, a memory-resident organizer; PC-Shell, a DOS shell and menu program that acts as a front end for many of *PC Tools Deluxe*'s disk utilities; and PC Backup, which is an easy-to-use backup program. You can use just one of these programs or all three. They have a consistent interface (one of the program's nicest features), but they're independent.

Desktop is a revelation. You can run the program either as a stand-alone command or as a TSR. In memory-resident mode, Desktop uses just 40K, loading itself from disk when you press its hot key. The pen-

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alty for this lean memory usage is the time it takes to call *PC Tools Deluxe*—about five seconds on a 12-MHz AT compatible. If you have EMS or enough extended memory to install a 400K ramdisk, however, Desktop will use these and give you lightning-fast access.

Desktop's modules provide just about everything you could want in a memory-resident organizer: a notepad (with spelling checker), a *dBase*-compatible database, a scheduler (complete with repeating alarms), three calculators, telecommunications (including an optional background mode), an outliner, macros, a clipboard for cutting and pasting between applications, autodialing, and an ASCII chart. All modules include excellent mouse support, and you can have as many as 15 Desktop windows open at once.

While many programs (such as *Norton Commander*) provide a limited but well-rounded diet of functions, PC Shell is an extravagant smorgasbord of features. For example, *Norton Commander*'s bottom-line menu bar lists 10 selections; PC Shell has 22. *Commander*'s main menu has 9 selections; PC Shell has 17. You'll find this everywhere in the program. Novices may find the large number of possibilities in PC Shell a little daunting, but power users will enjoy the feast.

PC Backup is the least exciting component of *PC Tools Deluxe* (backup programs are never interesting until you get an unfriendly *General failure* error message), but the program is easy to use and reliable.

There's much more to *PC Tools Deluxe*—disk utilities, PC Secure, and Mirror—but the recommendation is clear: Even if you don't need everything this ensemble offers, there's almost certainly something you'll find indispensable, and you'll have a blast playing with the rest of the programs.

The Great Detective

Your chances of encountering a computer virus are slim, but their existence is a dark cloud hanging over many computer users. There are several antivirus programs around, but they tend to be difficult to learn and time-consuming to use.

Enter *Viruscan* (McAfee Associates, 4423 Cheeney Street, Santa Clara, California 95054; 408-988-3832; Shareware, $15 registration plus $4 postage and handling; also available on McAfee BBS, 408-988-4004), a fast, easy-to-use program that scans your disks for 29 known viruses and issues a report on its findings.

Checking your hard disk is as simple as entering the command SCAN C: at the DOS prompt. The program examines your entire hard disk in a matter of minutes. It checks the partition table and boot block, and it opens every COM and EXE file to search for 29 known viruses.

If you find a virus, you can call the company for assistance. If your infestation is deep-seated, McAfee sells disinfectors that range in price from $30 to $70.

McAfee is dedicated to updating *Viruscan*. You can always find the latest version of the program on McAfee's BBS.
Clifton Karnes

DOS PROMPT

If you've been working with PCs for any length of time, you know how overpopulated a hard disk can become. Files proliferate on one of these babies like mosquitoes on a farm pond. After a while, sifting through a 30-megabyte hard disk to find a single program or data file begins to resemble King Arthur's legendary quest for the Holy Grail. Fortunately help is on the way in the form of two programs, *Magellan* and *ViewLink*, each of which takes a different approach to solving the problem of hard disk clutter.

Like the Portuguese sailor after whom it is named, *Magellan* (Lotus Development, 55 Cambridge Parkway, Cambridge, Massachusetts 02142; 617-577-8500; $195) explores your hard disk, discovering hidden data and claiming files in the name of the application programs that originally created them. To accomplish this, *Magellan* takes a bottom-up approach—that is, it begins at the lowest level, with the actual data your files contain, and then works its magic from there.

Suppose, for example, that you need to review any information on your hard disk relating to the ABC Manufacturing Company. To accomplish this, you'd simply type *ABC Manufacturing* at the *Magellan* query screen and send that request sailing on its way. Within a few seconds, *Magellan* returns a listing of all files containing the specified phrase. Furthermore, in scanning the listing, a separate window displays the phrase in the context of the currently highlighted file. *Magellan* recognizes and can display data files created by a wide range of popular programs, including all Lotus products, *dBase*, and most major word processors. *Magellan* also includes a Launch option to automatically run whatever application program created a highlighted file and then load that file for further review or editing. You'll no longer have to navigate your way through twisting subdirectories.

ViewLink (Traveling Software, 18702 North Creek Parkway, Bothell, Washington 98011; 206-483-8088; $149.95) takes a more long-term approach to hard disk management. Rather than specializing in quick, one-time data searches, *ViewLink* lets you create and maintain collections of related files, called *views*, which then become the basic foundation of your operating environment. In essence, *ViewLink* superimposes a logical structure over your hard disk's directories and subdirectories.

Take the example of ABC Manufacturing again. You could create a view called *ABC* comprised of all your files containing information about that company. You could include files in that view regardless of where they are on your hard disk and no matter what application program you used to create them. Then, anytime you had to work on a project involving ABC Manufacturing, you could call up your ABC view. Like *Magellan*, *ViewLink* lets you scan the contents of a file in a display window and open an application by simply identifying the data file on which you want to work.

Both *Magellan* and *ViewLink* chart new territory. Each has its own advantages and disadvantages, and which one is the better program for you depends largely on how you use your PC. Information buffs who demand quick access to tons of data should sail with *Magellan*. Obsessive organizers might want *ViewLink*. Regardless of your choice, a little organization can provide a lot of relief for anyone needing to tame their wild hard disk.

The Rite Stuff

While we're on the subject, let me mention a package that's a must-have for anyone who owns a hard disk. *SpinRite* (Gibson Research, 22991 La Cadena, Laguna Hills, California 92653; 714-830-2200; $59) is a nifty little program that does one thing, does it well, and doesn't set you back on next month's mortgage payment in the process. *SpinRite*'s entire *raison d'être* is to test the performance of your hard disk and, if necessary, take the appropriate steps to improve it.

Perhaps the most impressive feature of *SpinRite* is its ability to perform a low-level format and reset the sector interleave on a hard disk without destroying the data on the disk. Some of you might recognize immediately what an amazing feat this is. For the uninitiated, let me offer a brief explanation.

Basically, the sector interleave represents how far apart successively numbered sectors are placed on your hard disk. For example, with the sector interleave set to 3—the standard setting for XT systems—each successively numbered sector will be spaced three sectors from the prior one.

The problem lies in the fact that this standard setting is pretty much an arbitrary value and might not represent the most efficient sector interleave for your hard disk. For instance, if your hard disk is capable of reading successive sectors placed only two sectors apart, then an interleave setting of 3 makes your disk travel farther than it needs to between each read operation. On the flip side, hard disk performance may also suffer if its current interleave value is lower than its optimal setting.

SpinRite includes a utility that automatically calculates the most efficient sector interleave for each hard disk installed in your system. It then gives you the option of changing any current values to their ideal setting.

Normally, the low-level format required to reset a sector interleave erases all data on the hard disk being recalibrated. *SpinRite*'s reformat doesn't. As a result, you can change the interleave on your hard disk to its ideal setting without first having to back up your hard disk, reformat it, and then restore your data to it (and pray that everything worked as expected). One friend of mine realized a 200-percent improvement in hard disk throughput with *SpinRite*. The program performs a number of other hard disk maintenance chores, but its interleave reset feature easily earns it my highest recommendation.
Jack Nimersheim ▷

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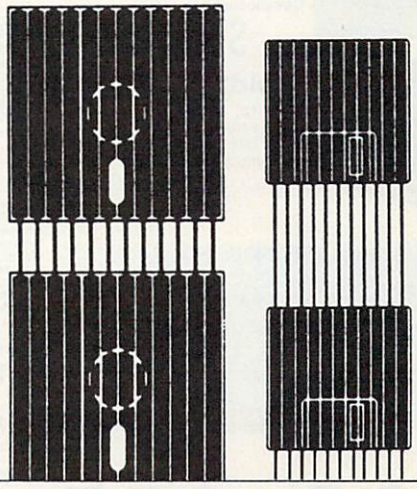

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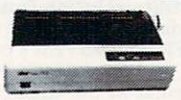

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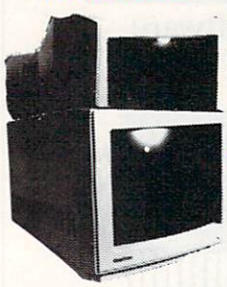

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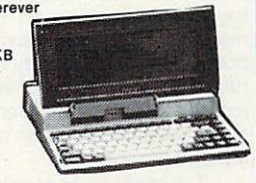

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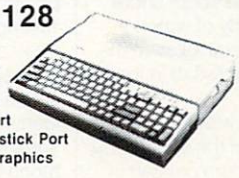

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64/128

First up this month is *Fire King,* a fantasy from Australia's Micro Forte. Micro Forte is the first affiliated label acquired by Strategic Studies Group (1747 Orleans Court, Walnut Creek, California 94598).

Fire King is a highly unusual game. The plot certainly isn't out of the ordinary (the Fire King has died and you are sent to destroy the offending monster in the catacombs), but the gameplay is.

You begin by choosing a character to represent you. My favorite is Hubert the Just, but with names such as Broderic Broadaxe and Sally the Slaughtermaid kicking around, any interest should be well served.

You control your character with a combination of joystick and keyboard, and you pick up or access items by walking over them. These items include keys, food, books, chests, armor, weapons, magical scrolls, boots, and rings. You may also run into bells, which can freeze monsters, confuse them, or cause them to rush you in a murderous rage.

The game takes a while to get used to. You should pay close attention to the program's manual if you want to succeed. It includes a lengthy walk-through of the first town, with some extremely useful advice. There's also a two-player mode, in which you and a friend work together to solve the *Fire King* quest. Games can be saved, and the disks aren't copy-protected.

Two Spotlight Games

Spotlight Software, an affiliated company of Cinemaware (4165 Thousand Oaks Boulevard, Westlake Village, California 91362) has released two interesting games, *Total Eclipse* and *Dark Side*. Both feature the Freescape system first seen in Epyx's *Space Station Oblivion,* which was designed by the same group. The strength of the Freescape system is the 3-D, first-person view it affords of the landscape.

In *Total Eclipse,* you find yourself inside a pyramid, fighting against an ancient Egyptian curse. The pyramid is large, and your task is to work your way through it to try to undo the curse before the upcoming eclipse of the sun. If you succeed, all is well; if not, the world ends. There are ankhs to collect, treasures to find, locked chambers to enter, and a whole host of mummies in various stages of decay.

Dark Side is a direct descendant of *Space Station Oblivion*. That game was set on Mitral, the moon of Evath, and your mission was to release the pressure caused by the Ketars when they engaged in decades of irresponsible drilling. This time, the Ketars have decided to wipe out your beloved Evath by covering the second moon, Tricuspid, with an artificial surface and drawing energy from Evath's sun into a huge weapon. You have been sent to Tricuspid to destroy all the energy-collection devices.

AD & D Again

Finally, we have *Curse of the Azure Bonds,* the newest release in the Advanced Dungeons and Dragons line from Strategic Simulations (675 Almanor Avenue, Sunnyvale, California 94086-2901). This one takes place in the Tilverton region, part of the Dalelands area of the Forgotten Realms campaign. *Pool of Radiance,* the first installment, was set in Phlan, on the north shore of Moonsea; *Hillsfar,* the less ambitious second part, took place in Hillsfar, on the south shore of the same body of water. Now we're several miles to the southwest, smack-dab in the mountains.

In keeping with the continuing nature of the series, you can use characters created in either *Pool of Radiance* or *Hillsfar*. Alternatively, you can create characters from scratch, and these begin the adventure at level 5. Rangers and Paladins have been added to the character classes, welcome additions to *Pool of Radiance*'s limited number of classes.

Other changes from *Pool* include an improved means of moving the party overland, a number of new monster types, and a couple-dozen new spells. All of these changes are as welcome as the new character classes, because with each addition the system comes closer to approximating AD & D itself. The bad news, for users of the 64/128, is more disk access and longer playing times.

As with *Pool of Radiance, Curse of the Azure Bonds* is combat-intensive. Become embroiled in a large combat, and much of your evening disappears.

Neil Randall

APPLE II

Optimum Resource has made the name *Stickybear* synonymous with entertaining educational programs. Stickybear is a familiar face to thousands of preschoolers and school-age kids who use Apple II's. For those lucky enough to sit in front of an Apple IIgs, though, Stickybear had been available in only one IIgs flavor—Alphabet. Now that package is joined by two new IIgs-specific releases: *The New Talking Stickybear Shapes* and *The New Talking Stickybear Opposites*.

Both packages use the IIgs's speech, sound, and graphics muscle to enhance a proven program. *The New Talking Stickybear Shapes* has three activities that teach children elementary shape identification. Kids learn how to identify circles, triangles, squares, rectangles, and diamonds; match those shapes with their names; and spot shapes hidden in clever pictures.

The New Talking Stickybear Opposites puts control in the child's hands by letting him or her switch screens and sounds from, say, happy to sad or backward to forward. It's a fun discovery process for kids, and it's even enjoyable for Mom and Dad as they watch and listen.

Both new Talking Stickybear programs require a 512K-equipped Apple IIgs with a 3½-inch disk drive. Each retails for $49.95 (lab packs for the classroom are available for $85.00). For more information, contact Optimum Resource, 10 Station Place, Norfolk, Connecticut 06058; (203) 542-5553.

Super Stuff

Another educational software publisher that's still going strong in the Apple II market is Scholastic, which is keeping that history alive with recent updates to two of its most popular products.

SuperPrint II is a new version of the feature-laden *SuperPrint* package. It includes new paint and draw tools, new clip art, improved text capabilities, and additional functions such as graphics-image inversion. The program has a suggested retail price of $87.45 but costs only $69.95 for educators under Scholastic's discount plan. You can upgrade from *SuperPrint* to *SuperPrint II* for $34.95.

Story Tree has also been enhanced and updated with new advanced drawing tools, clip art, type styles, sound effects, music, special visual effects, and three branching options for plot twists. By saving your stories to self-booting disks, you can show them to people who don't have the program. *Super Story Tree* retails for $79.95.

Both *SuperPrint II* and *Super Story Tree* require a 128K-equipped Apple IIe, IIc, IIc Plus, or IIgs. For more details, contact Scholastic at 2931 East McCarty Street, P.O. Box 7502, Jefferson City, Missouri 65102; (800) 541-5513.

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- 2 **Lotus Learning System** (810, 811)—Master Lotus 1-2-3! (2 disks)

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- 3 **PC-Write 3.02** (851–853)—The BEST word processor for under $200! Has spell checking and hundreds of other features (3 disks) 512K.
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- ☐ **PC-Outline** (860)—An excellent idea organizer and free form database.
- 2 **WP 5.0 Learning Sys.** (863,864)—Helps you learn and master Word Perfect 5.0. (If you have WP 4.2, select disks #861 & #862.) (2 disks)
- 2 **WP 5.0 Macros** (857)—Several macros for Word Perfect 5.0. (If you have WP 4.2, select disk #856.)
- 3 **PC-Type+** (870–872)—Complete word processor with 100,000 word dictionary and mail merge. (3 disks)

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Gregg Keizer

AMIGA

One of the neat things about software is that, like fine wine, it often improves with age. One program that has gotten a lot better is NewTek's *DigiPaint 3.* This upgraded HAM paint program is a complete rewrite of the original, adding tons of new effects, drawing modes, and painting tools.

DigiPaint 3 includes most of the standard drawing tools you've come to expect in a paint program. Texture mapping tops the list of significant new features. You can wrap brushes onto any shape imaginable, creating spectacular 3-D effects. Take a map and wrap it on a globe, for instance. Adding visual effects to your paintings is a snap with adjustable dithering, smoothing, transparency, and lighting placement.

Unlike the original *DigiPaint,* which had no font support, *DigiPaint 3* lets you use any Amiga font in your artwork. Instead of typing your text directly onscreen, you select a font and type your text into a requester box. It's then converted into a brush that can be stamped anywhere onscreen. This lets you use any of the special brush effects to create warped, texture-mapped, antialiased, or even transparent fonts. On the downside, *DigiPaint 3* doesn't support the Amiga ColorFonts standard.

DigiPaint 3 features a new user interface designed by well-known Amiga artist Jim Sachs. It's not completely intuitive—you *will* need to read the manual—but once you're familiar with the program, formerly complex operations become easy. Would-be Ted Turners will find colorizing black-and-white pictures much easier with the updated version than with the original program.

While *DigiPaint 3* doesn't have every feature you'd ever want in a paint program—no flood fills, for example—it's a fast and powerful painting tool. If you want to add a HAM paint program to your digital palette, check this one out.

DigiPaint 3 retails for $99.95 from NewTek, 115 West Crane Street, Topeka, Kansas 66603. *DigiPaint* owners can upgrade by sending NewTek page 56 of their manual and $29.95 plus $6.00 for shipping. Owners of *DeluxePaint I* and *II, Deluxe PhotoLab, Express Paint,* or *Photon Paint* can send $49.95 plus $6.00 shipping and page 6 of their manual to receive *DigiPaint 3.*

Falcon Soars

Falcon is one of the most realistic flight simulators available for the Amiga. But its first incarnation seemed harder to fly than the real plane.

Spectrum HoloByte has released an upgraded version that is much easier to control using the joystick or keyboard (I still found mouse control imprecise). It's also much more forgiving on landing—you can now touch down off the center of the runway without crashing. Best of all, enemy MiGs no longer try to shoot you down as you're landing. The upgraded *Falcon* can be installed on a hard drive, and it now works on Amigas with 68010, 68020, and 68030 microprocessors.

A mission disk, *Operation: CounterStrike,* is now available along with the upgrade. This is a definite must-have; it adds 12 new air-to-air and air-to-ground missions, all of which are tied into one nonstop scenario. For example, you have to destroy the Soviet T-80 tanks in the first mission quickly, or else you'll find the landing craft from the second mission are already beaching next to your airfield.

The *Falcon* upgrade costs $7.50, or you can order the *Operation: CounterStrike* mission disk for $24.95 and receive the upgrade as a free bonus. Send a check or VISA/MasterCard information to Falcon Amiga Upgrade, Spectrum HoloByte, 2061 Challenger Drive, Alameda, California 94501, or call (415) 522-3584 for more information.
Denny Atkin

MAC

Apple has lowered the prices on all 68000-based SEs by $300. They'll retail for $2,869.

"It's just a matter of providing more value to the customer and making the technology available to a broader range of people," said an Apple spokesperson.

Besides chopping prices, Apple has also including the FDHD SuperDrive in all Mac SE models. This is the high-density drive (1.4 megabytes of storage) that reads and writes to MS-DOS–, OS/2-, and Apple II–formatted disks.

In Your Palm

In the search for a portable Macintosh, you could try a palmtop instead of a laptop. Microlytics (One Tobey Village Office Park, Pittsford, New York 14534; 716-248-9150) has started marketing The DataStor 8000.

The DataStor 8000 is an electronic personal information package that includes a pocket-size computer, a data-exchange program, a database manager, and cables. You can use the package to transfer information between your Mac and your pocket. The system works with most Macintosh models, including the 512KE, the Plus, the SE, and the II.

The unit stores as many as 395 entries, the equivalent of 7951 characters, and retails for $149.95.

This isn't the only handheld personal information manager that links up with the Macintosh. Traveling Software (18702 North Creek Parkway, Bothell, Washington 98011; 206-483-8088) has built a bridge between Sharp's Wizard and the little gray Apple.

Plain Words

To fill the no-frills word processor gap, New Horizons has released *WordMaker.* It's reminiscent of early *Microsoft Word*—full-featured, yet manageable and unburdened by rarely used features.

You still get a spelling checker (something you didn't find in early Macintosh word processors). You get nice details like curly quotation marks and text-wrapping. To track how much you write, summon the word-count feature. *WordMaker* is economical, not primitive.

For information, contact New Horizons at P.O. Box 43167, Austin, Texas 78745; (512) 328-6650.

Another Publisher

If you're ready to turn your word processing business into a desktop publishing service, look beyond the obvious programs, like *PageMaker* and *Ready-Set-Go.* Timeworks has just released *Publish It!* for the Macintosh.

Priced competitively at $395 (retail), it offers many features that you'd find in the old standbys, including a spelling checker and a thesaurus for word processing. Use *Publish It!*'s rotation tool to turn text by one-degree increments. And, now that you've learned how to wrap text around an object, use this package to wrap text inside an object. You can also edit graphics imported from other packages.

To find out more about *Publish It!,* contact Timeworks at 444 Lake Cook Road, Deerfield, Illinois 60015; (312) 948-9200.

Short Takes

To get that extra mileage from your Mac, look for *Math Magic* educational software from MindPlay, 3130 North Dodge Boulevard, Tucson, Arizona 85716 (800-221-7911); a file and disk security program called *DiskLock* from Fifth Generation Systems, 11200 Industriplex Boulevard, Baton Rouge, Louisiana 70809 (800-873-4384); *Desktop Help for Excel,* an online manual for *Excel* 2.2 users, from Help Software, 10659-A Maplewood Road, Cupertino, California 95014 (408-257-3815); and *Power of Wingz* (Scott Foresman and Company, 1900 East Lake Avenue, Glenview, Illinois 60025; 800-782-2665), Dr. Neil J. Salkind's book about the new Informix's recently released spreadsheet package.
Heidi E. H. Aycock ⊡

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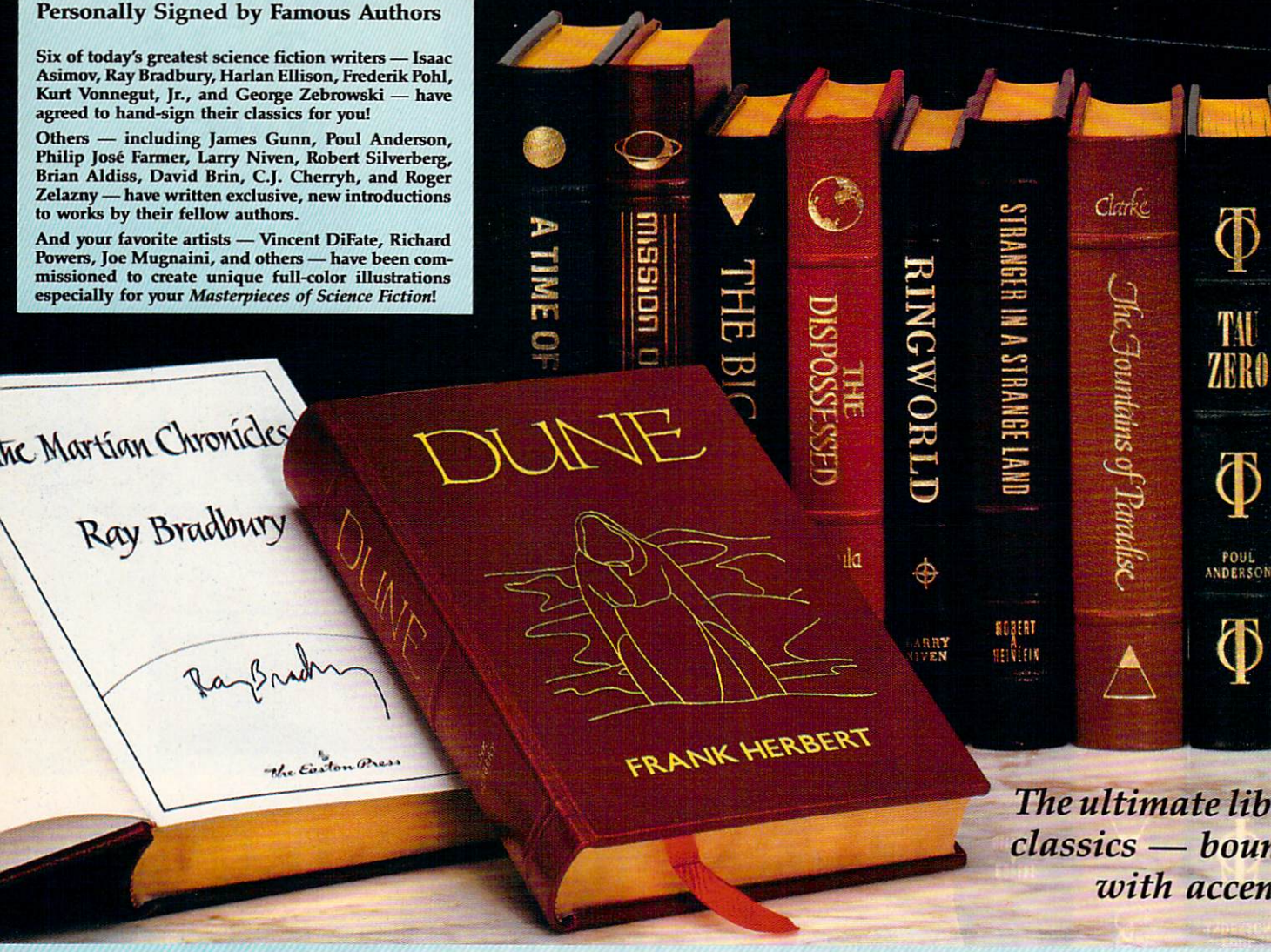

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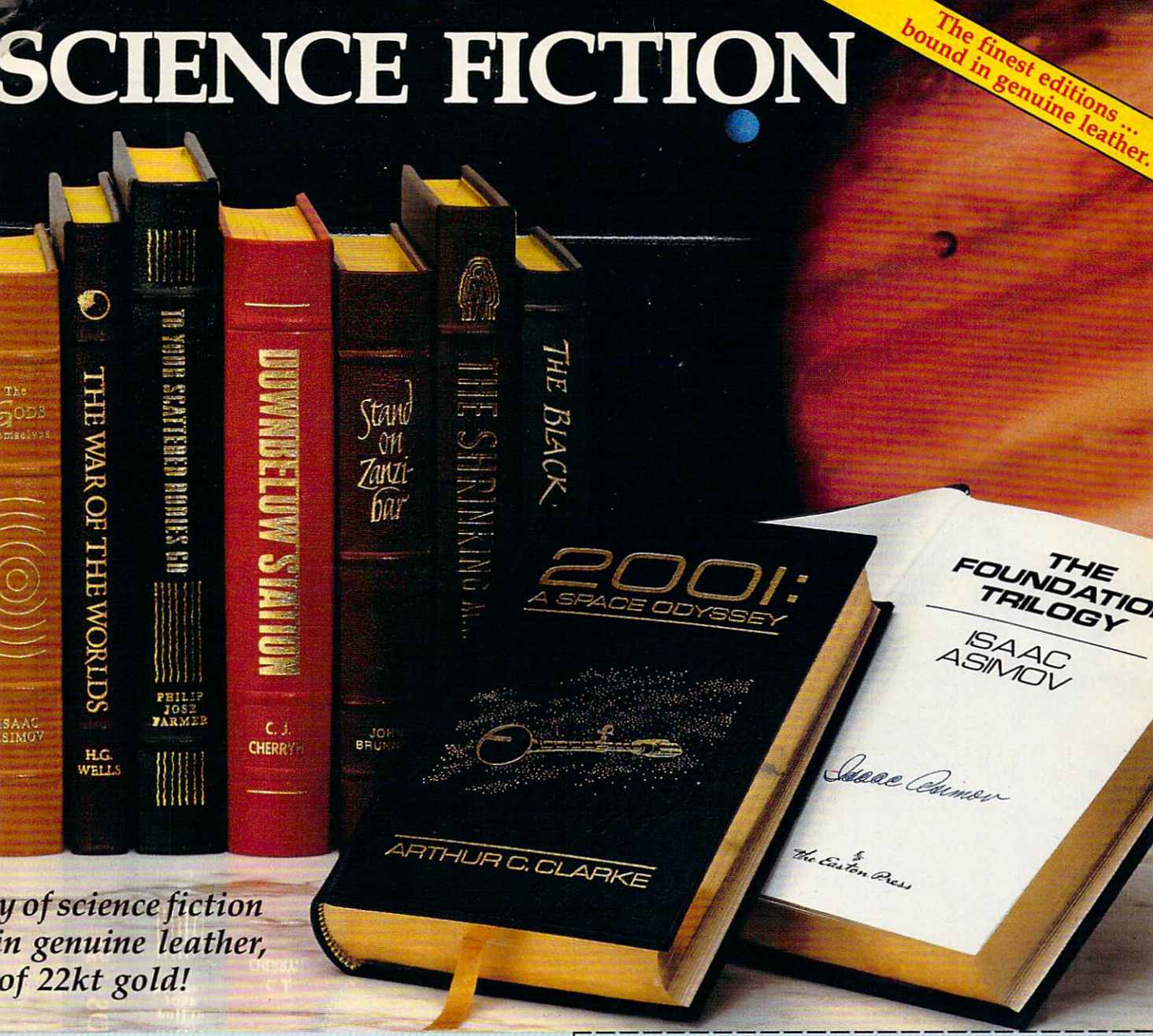

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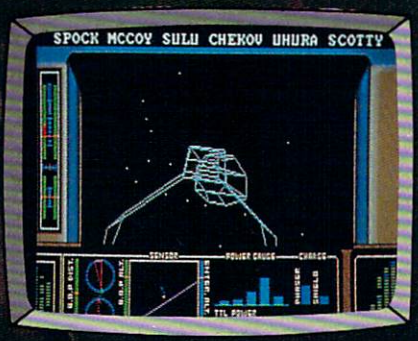

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YOUR HOME OFFICE

Your Home Office

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NEIL RANDALL

Millions of people have discovered the advantages of working at home. The guest bedroom, the recreation room, the basement, the garage—all can be corporate headquarters for your home business. Start with some basic office furniture, a telephone, and an answering machine. Add to that an XT-class computer with two floppy disk drives, 256K of RAM, a decent word processor, and a 9-pin dot-matrix printer.

The first step to equipping your office is learning what you need. Spend nothing without your business plan clenched firmly in hand, and use this article to examine purchase possibilities in three price ranges for three categories of home businesses.

Babysitters and building contractors certainly qualify as freelancers, but we've concentrated on freelance writers/illustrators in our first group because they can do so much of their work with a computer. Our second group, consultants and researchers, present themselves as experts in a specific field and use the home office as a research-and-presentation station. Our last group, service providers, can include everything from real estate agents to training services. We've concentrated on just two areas—catering and desktop publishing—to illustrate the makings of a service-oriented home office. ▷

Matching your

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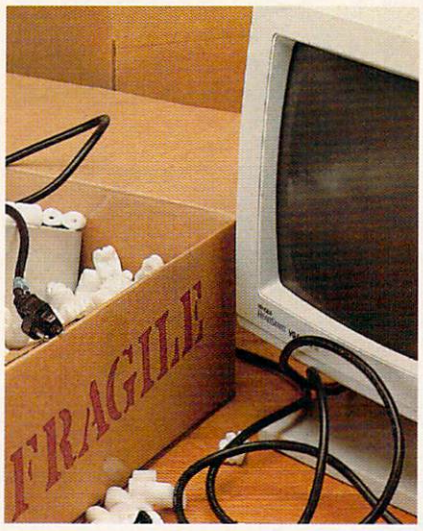
wallet to your home-business needs.



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Writer/Illustrator

Increasingly, freelance writers are sending their copy to publishers via modem. Most publishers work on computers themselves, and it's much more cost efficient for them to feed text directly into their systems than for them to rekey printed submissions. Even disk-based submissions aren't always good enough, because file transfers aren't always perfect.

For freelance illustrators, a modem serves two functions. First, it provides a means of keeping in touch, via electronic mail, with clients. Second, modems are critical to designers whose illustrations are meant for desktop publishing or for online graphics.

Supra Modem 2400	$149
Corel Draw	285
Microsoft Works	110
Panasonic 1124 printer	319
40-megabyte hard disk	399
SideKick Plus	128
Total:	$1,390

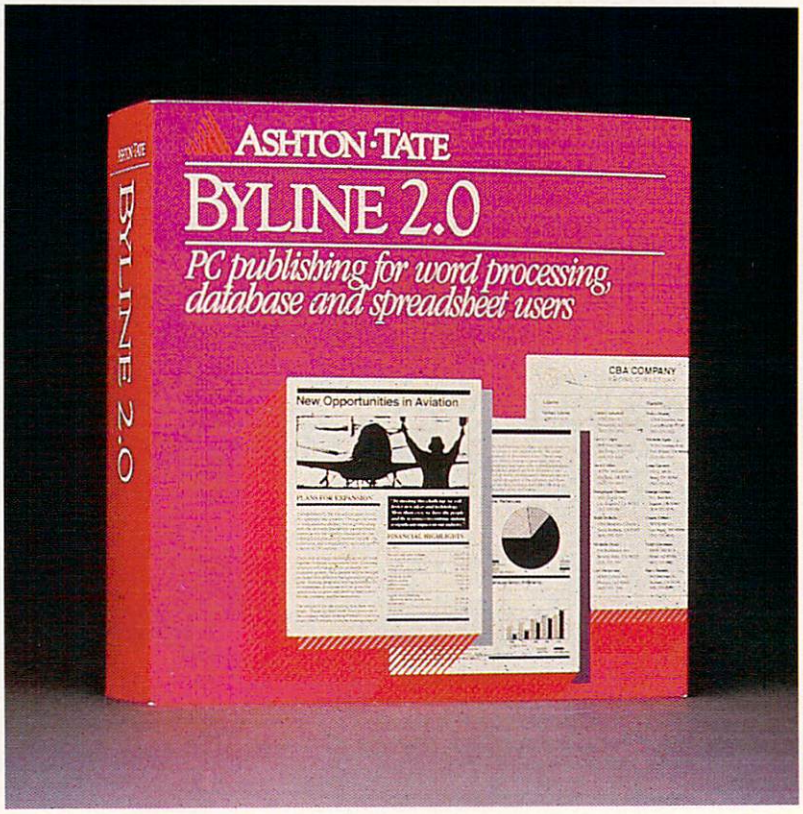
Modems are also useful in developing contacts. Telecommunications services such as CompuServe and GEnie offer public forums from which you can uncover freelance possibilities. A 2400-baud modem (about $150), makes access to these services more efficient.

But no matter how useful your new modem is, you may sometimes be required to submit article and book proposals (and in some cases the articles and books themselves) and thumbnail graphic designs to publishers on paper. Unfortunately, 9-pin printers, even those with NLQ and graphics modes, aren't good enough to satisfy submission standards.

Fifteen hundred bucks won't get you a laser printer (unless you forego the rest of your equipment purchases). But you can pick up a high-quality 24-pin dot-matrix printer for between $400 and $600. Another choice might be an ink-jet printer ($900), but that will pretty well clean you out. If the quality of your printed output is vital to your business, don't scrimp.

Printing is the tail end of the writing/illustrating process. To get there, you'll need to invest $200–$450 for a top-quality word processor or $300–$550 for a top-quality illustration package.

If you're a writer, you may not need all the features packed into the latest versions of *WordPerfect* or *Word,* for example. But you do need a word processor you can trust, and one with advanced goodies such as a thesaurus and an excellent spelling checker. If the program boasts an outliner, so much the better. For that inevitable run-in with a publisher who demands submissions in, say, *WordPerfect* files, look for a program that emulates the file structures of the big guys—or buy the real thing. For illustrators, your software choice must reflect the degree to which you expect to use it. If you don't use your computer as a drawing tool, then you don't need a drawing program. If you use the computer only as a way of conceptualizing an illustration, then a less-expensive drawing package will do. Keep in mind your clients' future plans. If they're considering computerized illustration, now is a good time for you to learn what it's all about. ▷



Ashton-Tate's *Byline* 2.0 is a low-priced alternative to the more expensive desktop publishing programs on the market.

THE BATTLE OF BRITAIN. UP CLOSE AND PERSONAL.

One pilot described a World War II dogfight "like being on the inside of a beehive." And that's just what it feels like to play *Their Finest Hour: The Battle of Britain.*™ The new air combat simulator from Lucasfilm Games that's keeping simulation buffs and action gamers alike on the edge of their seats.

Their Finest Hour includes all the acclaimed features of our *Battlehawks, 1942.* Plus a few new twists.

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Want to show your friends how you erased that *Flying Pencil* with fancy deflection shooting? *Their Finest Hour* lets you save your proudest combat performances to disk. And relive them in real time, fast forward, or frame by frame.

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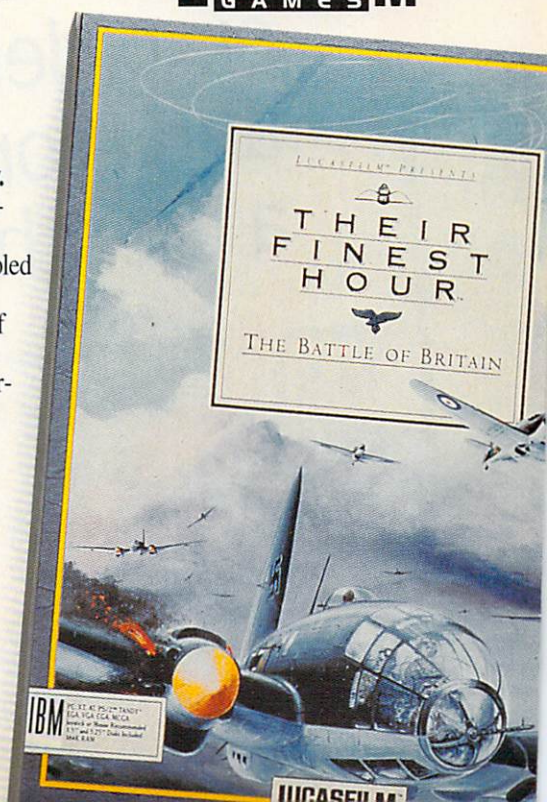
LUCASFILM™ GAMES



IBM screens shown. Available for IBM (includes AdLib™ sound card support), Amiga, and Atari ST.

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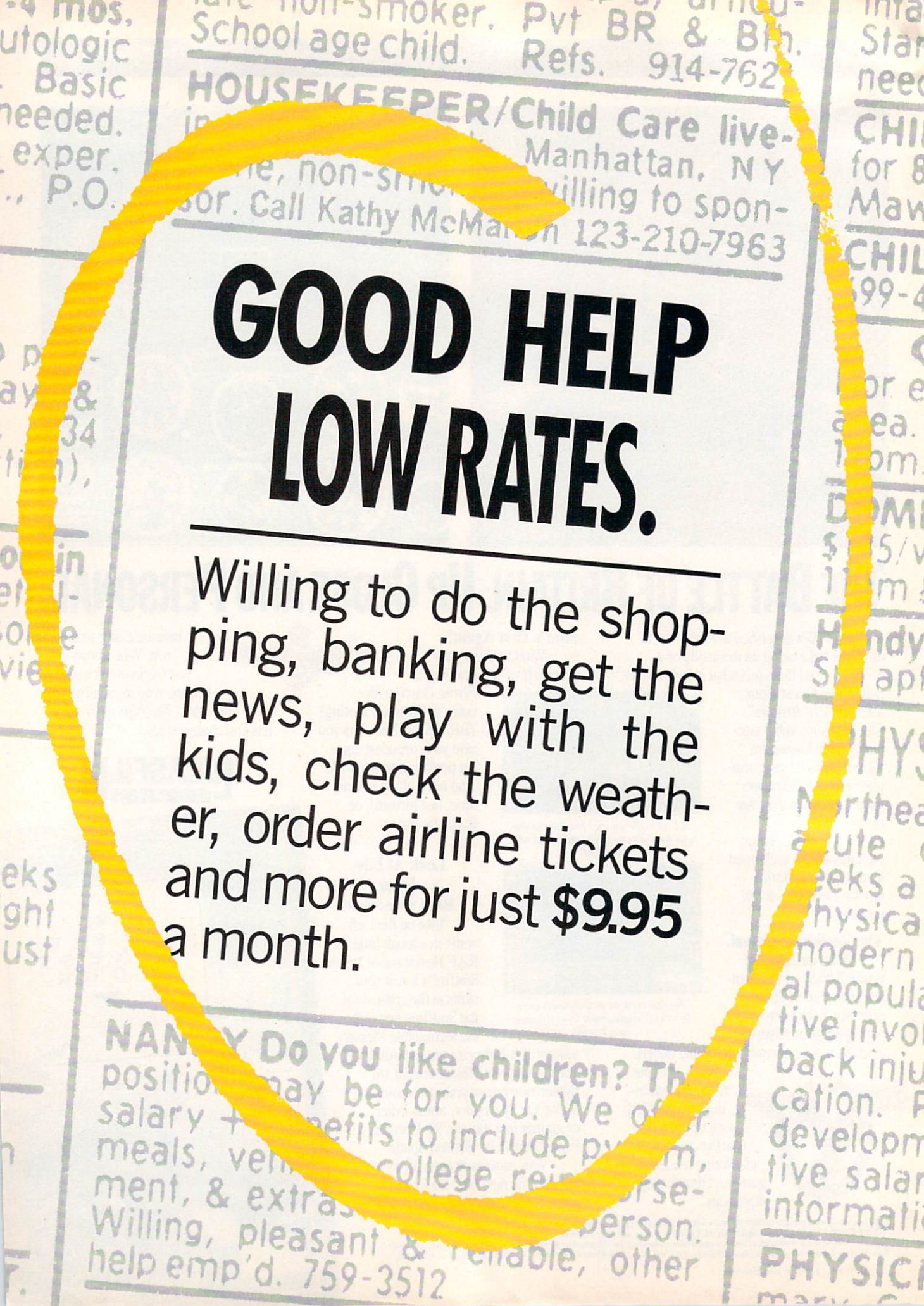
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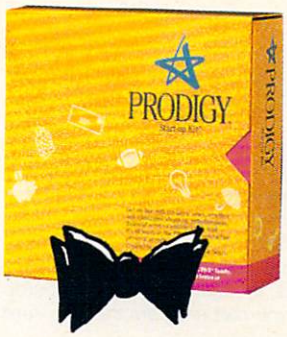

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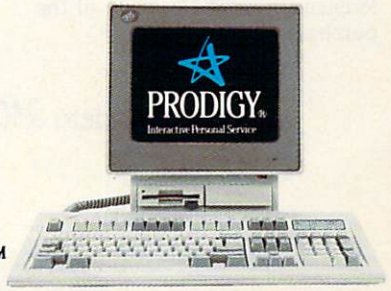
To find out where to get your Start-up Kit, just call 1-800-822-6922, ext. 591. Once you're on-line, you'll find that good help is not only easy to find, it's affordable.



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Circle Reader Service Number 109

Just the Fax

In the home office, money is always an object. A stand-alone fax machine can eat up roughly $1,500—a real bite out of your business. But a fax board for your PC may be just what you need. The cost ($300–$1,100) is lower than that of a stand-alone, and the benefits are nearly identical.

Fax boards and fax machines have one big difference: Fax boards can't fax hardcopy. With a fax machine, you feed in a piece of paper, and it takes care of the rest. With fax boards, you must work with digital (computer-generated) material. You might, for instance, create a page using *WordPerfect* or a spreadsheet using *Lotus 1-2-3*, print it to disk, and then send the file over the fax board.

To work with hardcopy, you'll have to buy a scanner for your PC, and that will raise your cost. The combination is still worth thinking about, though, because fax boards let you send output to several destinations at once, and you can program them to send during the night when phone costs are lower.

There are problems. Installation is tricky, and some of the software is still buggy. Also, you'll need at least a 40-megabyte hard drive to use a fax board.

Once you have landed a few clients and are balancing several projects, you may want to trade up to a hard disk. Hard drives not only keep floppy disks from overwhelming your desk, they also force you to organize (if you don't, you won't be able to find anything on the drive). They also increase your productivity because you can get information faster from a hard disk than you can from a floppy disk. Illustrators especially will find hard disks almost essential.

Organization is key to managing a hard disk, and desk accessory software can make organizing easier. For about $150, you can probably find one package that will handle your phone and address lists, calendar, and appointment diary. If you want to keep your software purchases to a minimum, an integrated package ($100–$300) might work just as well. Such programs typically include a word processor, a spreadsheet, a database, and telecommunications software. Some include desk accessories as well.

Consultant/Researcher

For the consultant/researcher group, some of the purchases in this price range are the same as those in the writer/illustrator group. The differences lie in the priority of the purchase.

If you work with computers a great deal, for example, or with graphics software designed to produce top-notch presentations, you'll never regret upgrading to a hard disk drive.

An integrated software program will take care of the two or three specific areas for which you don't need top-quality packages. Financial consultants, for example, will need something far beyond the spreadsheet capabilities of an integrated package, opting instead for *Lotus 1-2-3, Excel,* or another highly regarded package. Similarly, researchers needing large-database capabilities may go for *dBase IV* above the more limited features offered on integrated packages.

Two other purchases also serve this group well: information-management software and a 2400-baud modem. Consultants and researchers juggle a lot of projects, and both frequently need access to other computers. An information manager like *Agenda* or *IZE* makes tracking multiple projects, clients, and deadlines much easier. For consultants, the modem provides a means of receiving information, feedback, and orders from clients; researchers will use a modem to connect their computers to the networks used by universities and large industries and to mainframe computers at research institutions.

SupraModem 2400	$149
dBase IV	473
Grandview	185
Microsoft Works	110
40-megabyte hard disk	399
Total:	$1,316

Service Provider

Again, our shopping list overlaps somewhat with the other two categories. A catering service, for instance, can generate attractive invoices, advertisements, and price lists with a 24-pin dot-matrix printer—especially when combined with a sturdy, if not flashy, word processor or a low-end desktop publishing package.

For caterers or desktop publishers, an integrated package provides a platform for designing brochures and price lists, for keeping customer lists, and for budgeting and accounting. A good desktop accessories program is another, cheaper way of keeping customer lists, and you can use it for scheduling as well.

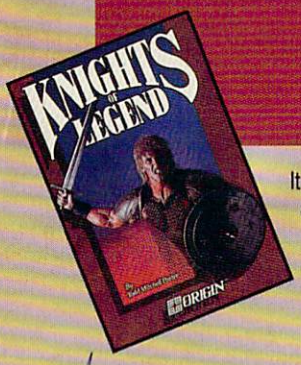
BPI General Accounting 2.1	$245
GrandView	185
Microsoft Works	110
Panasonic 1124 printer	319
40-megabyte hard disk	399
SideKick Plus	128
Byline	189
Total:	$1,575

An information-management package will help a desktop publishing service track its clients' projects from beginning to end. You'll need the help if you're handling several projects at one time, all at various stages of completion.

Accountants cost money, so buying accounting software makes a lot of sense. Combined with a good printer, an accounting package can provide an attractive printed invoice for your customers. The package will also track your cash flow and your payables, and will even print out your checks. Sooner or later, however, you'll need to hire an accountant to handle your books.

The central element in a desktop publishing service, of course, is the desktop publishing software. The rule here is to get the best you can afford. *PageMaker* and *Ventura Publisher* are the standards, but other available programs might suit your needs at a lower cost. Because of the space these applications require, desktop publishers need at least a 40-megabyte hard drive. ▷

KNIGHTS OF LEGEND™



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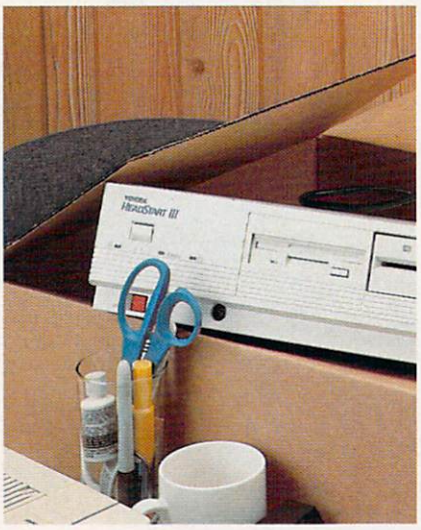
IBM/COMPATIBLE VERSION

APPLE VERSION

Available for: IBM/Tandy/compatibles, C-64/128, Apple II series; *coming soon for*: Amiga. Actual screens may vary.

Can't find KNIGHTS OF LEGEND at your local retailer? **Call 1-800-999-4939 (8am to 5pm EST) for Visa/MC orders; or mail check or money order (U.S.$) to ORIGIN. All versions $49.95; shipping is FREE via UPS. Allow 1-2 weeks for delivery. ORIGIN, P.O. Box 161750, Austin, Texas 78716.**



$2500

Writer/Illustrator

Twenty-five hundred dollars isn't enough for you to chuck everything and buy a laser printer, but your other choices are getting much more interesting.

CompuAdd VGA Combo	$615
HP ScanJet Plus	1,395
FAX-MAIL 96	499
Total:	$2,509

For example, you may want to pick up a fax board for your computer. A fax machine may offer more features (like a second telephone), but your only real alternative in this price range is the board. To make a fax board completely effective, you'll also need a scanner. If you have no need for printed copy, you can do without the scanner, but for the freelance illustrator, I highly recommend one. It gives you the ability to instantly add artwork to your designs.

A writer/illustrator, especially one who works at the computer a lot, looks into the screen for hours on end. That makes an investment in a VGA card and monitor worth considering. A VGA-specific monitor is a good choice, but if you can afford it, you should pick up a multisync monitor that's also compatible with Super VGA—just in case you upgrade.

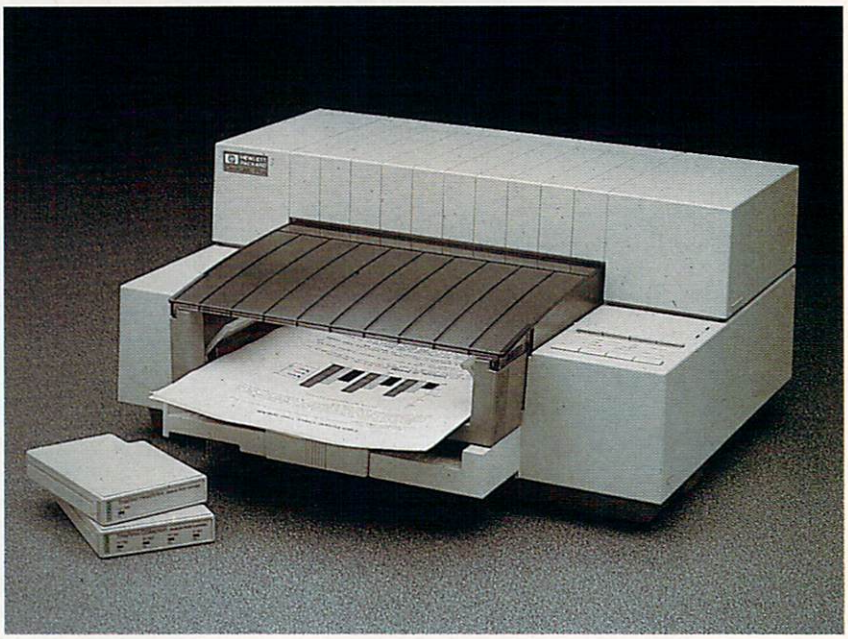
Consultant/Researcher

Consultants need a way of transmitting proposals, reports, and data to clients as quickly and easily as possible. They also need a way to accept counterproposals, letters, and needs-assessment research. These factors make a fax board essential.

A researcher in the sciences or social sciences should consider purchasing statistical-analysis software. Many university researchers have comprehensive statistics packages available from their university mainframes, but for consultants who perform research and for private researchers, a statistics package is practically mandatory.

A VGA graphics board and accompanying monitor also make sense for this group.

Complete Statistical System	$495
NEC MultiSync 3D monitor	679
Panasonic FX-89 fax board	669
VEGA VGA board	275
Total:	$2,118



New desktop publishing businesses should investigate ink-jet printers, like the HP DeskJet, before leaping into laser printing.

Service Provider

From this price range on, I'll concentrate only on the desktop publishing service. A catering business that wants to use an attractive monthly customer mailing as a marketing ploy may want to enlist the help of a desktop publishing service.

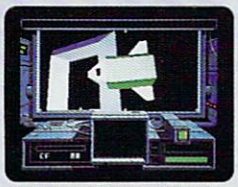
That said, the first business need a desktop publishing service must satisfy is its need for a high-quality printer. At this price range, your best bet might be an ink-jet printer. You can upgrade to a laser in the future. If you need color in newsletters and brochures, a color ink-jet is a very economical choice. Eventually, you'll want to go to four-color separation and use a professional typesetting service.

A scanner lets you incorporate graphics into documents and is much less expensive than hiring professional computer artists. A fax board makes a great companion to the scanner and lets your clients see what you've produced as soon as possible. ▷

HP DeskJet Plus	$ 685
HP ScanJet Plus	1,395
FAX-Mail 96	499
Total:	$2,579

SPACE ROGUE™

Rocket into the striking realism and spectacular visuals of **SPACE ROGUE**, the phenomenal 3D space flight simulation. You'll discover authentic flight dynamics, precision navigational aids and sophisticated weapons technology as you maneuver through turbulent ion storms and confront alien foes. You'll visit space stations and mining outposts — swapping tales with pirates, drinks with friends and goods with merchants. It's the seamless integration of space flight and role playing that makes **SPACE ROGUE** the first ORIGIN Cinematic Experience™.



IBM/COMPATIBLE VERSION

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Circle Reader Service Number 138

$5000

Writer/Illustrator

With another $2,500, several options become available. Laser printers enter the picture, as do full-page monitors, video cameras, and even a second (or upgraded) computer. At this level of spending, you should consider carefully how much benefit your business will derive from each piece of equipment or how the equipment might define your business.

A respected tax package will help you keep your money anxieties under control. (You can hire an expert at tax time.) Alternatively, you could simply opt for a good spreadsheet to perform budgeting and other financial functions.

Amiga 2000 and monitor	$1,800
BPI General Accounting 2.1	245
NEC LC890 Laser Printer	3,197
Total:	$5,242

If you need high-quality output, you'll definitely want a laser printer. The operative word here is *need.* Don't spend your hard-earned money unless you have to, because there are plenty of print shops and laser services around, in your city and via modem. The cost of a laser printer isn't just the cash up front. You need good quality paper, and toner must be replaced at roughly $20 a pop. Eventually, you'll also have to replace the drum, and this will set you back over $100. If you buy a laser printer, put it to work immediately. If you don't, you'll have an extremely cost-ineffective machine sitting in the corner, and that's not good for any business. ▷

The Vital Computer?

In Barbara Andrew's business, computers occupy center stage. Her firm, Ponsonby Communications, operates in both the desktop publishing and desktop video fields, producing newsletters, magazines, brochures, and multimedia presentations for medium to large businesses.

Like most businesses of this kind, Andrew has found it necessary to maintain an MS-DOS platform. Her clients often send in disks containing IBM ASCII files. But the heart of Ponsonby are two Amigas: an Amiga 1000 and an A2000 equipped with a PC-compatible Bridgeboard.

Michael Hale conducts his graphic design business out of his home in the country near Elora, Ontario, about an hour's drive from Toronto. He designs books, corporation brochures, recruitment brochures, annual reports, business cards, letterhead, and newspaper ads.

Hale describes his home office as a desk in a corner of the living room. "My files are up in my studio on the second floor," he says. "My bank accounts are stuck in a cubbyhole cupboard beside the kitchen table." When you add in the darkroom, it's plain that Hale has spread his office around.

But while Andrew sees her computers as an integral part of her business, Hale regards his as secondary. "A number of people I know use their computers for graphic design, but I don't," Hale says. "I won't rule out the possibility, but I just haven't had the need yet." He uses an Apple II Plus with 48K of memory and two drives, plus a dot-matrix printer. "It does the job," he says.

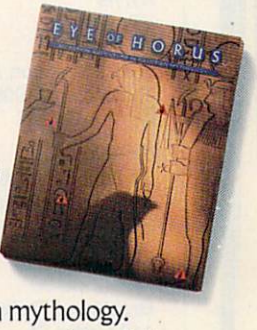
Andrew is just the opposite. She feels her equipment brings in new business and keeps her steady clients happy. "We have a 2400-baud modem, which is a real necessity," she says. "Clients often send us text by modem, and we take it and massage it from there." Aiding the final massage are a QMS PS-800 Plus laser printer and a low-end Sharp fax machine. "The fax machine is indispensable," she explains. "Many of our clients are 60–100 miles away, and it's much more efficient to fax them copies of the output than it is to send it by courier."

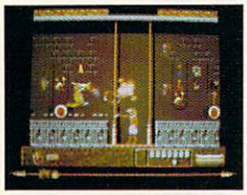
Hale doesn't feel his work suffers from the system he has chosen. "When you find that the tool limits what you can do, then you look around for something else. But I still haven't used all that *AppleWriter* [his word processing software] has to offer, so why should I change?"

The common ground that Hale and Andrew share is the studied perspective of the role computers play in their businesses. "It's a tool, but like any good tool it becomes an extension of your brain," says Hale. "The Apple broke down last week, and I feel as if a part of me has been cut off."

A second computer, such as the Amiga 2000, opens up new business prospects for graphics and publishing services.

His mummy don't dance and his daddy don't rock and roll.





Horus isn't a happy guy. You see, his father, Osiris, was murdered. His mother, Isis, just lays around the pyramid, grieving. And evil Uncle Set — who's caused all the problems — has challenged him to a fight to the death. It's the original family feud — Egyptian style. And it's all in The Eye of Horus™. A brand new game from Fanfare™ — based on Gods and legends as described in ancient Egyptian mythology. Set has ripped Osiris's corpse into seven pieces and hid them in a dark forbidden tomb deep below the scorching Sahara sands. Your task is to help Horus find the remains, and avenge his father's death. But first Horus must search the dark catacombs for weapons and sacred amulets to aid him in battle. And he'll need all the help he can get. Because in the final confrontation, Set will turn into a dragon to destroy him. Self mapping arcade adventure. State-of-the-art animation. High resolution graphics. The Eye of Horus. An exciting new game for the MS-DOS, Amiga, and Atari ST systems. Look for it at your local software store. Or, call us at 800/572-2272 (in CA: 415/546-1866). LOGOTRON RECREATION

It's no cruise down the Nile. In fact, it's downright ungodly.

Circle Reader Service Number 112

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Depending on your need, you may find a photocopying machine a good investment. But it will eat up the bulk of your additional $2,500. Buy only if you find yourself spending, say, $80–$100 per month on photocopying costs. A word of advice: Try before you buy. A photocopier of only moderate quality is of no use.

Although it may sound strange, you might want to buy a second computer. A spare computer can serve as a backup to your main machine in case of breakdown. Or, if you put it in another room, it can provide a break from working in your office. It can also keep the kids occupied. (They might even start a business of their own!) If you buy a different system from your mainstay machine, a second computer can open up business possibilities. For example, illustrators who use an MS-DOS machine might consider enhancing their client potential by picking up a Macintosh or an Amiga.

Consultant/Researcher

With an extra $2,500, the consultant/researcher might think about buying an 80386-based computer system. If you're a researcher performing numerous mathematical calculations, a financial consultant working with large spreadsheets, or anyone working with huge databases or elaborate presentation software, a 386 computer can be a boon to your business. Alternatively, you can upgrade a 286 system by adding a math coprocessor. But if you buy a new machine and you can afford it, keep your old machine and use it as a backup or for dedicated tasks like terminal emulation or word processing.

CompuAdd 386/20	$3,225
HP LaserJet Series II	1,749
Total:	$4,974

A laser printer might also be in order if there's strong economic justification. Other possibilities include such specialized items as software and hardware for video production. Though video-production equipment is expensive (there goes your five thousand bucks), consultants engaged in training or presentations might find it the most important equipment they've ever bought.

Service Provider

For the desktop publishing service operating at this price range, a laser printer becomes mandatory. You need the best output possible, even for your drafts. It might be necessary to go outside your business for the final product (to a professional typesetter), but you simply must invest in a good laser printer.

Because desktop publishing packages work by having you design pages (not just screens), a full-page monitor makes a lot of sense as well. You'll reduce aggravation and increase productivity when you can see the full page on the screen. The result is a superior product. Some advice: Make sure that the software supports your monitor.

NEC LC890 Laser Printer	$3,197
Multiview Monitor and GrafixPro adapter	1,050
117-megabyte hard disk	869
Total:	$ 5,116

Upgrading to a large (120-megabyte) hard drive would also be wise. At this level, a desktop publishing service needs lots of hard disk storage. Page layouts hog enormous amounts of disk space, and you'll want to call up graphics files and style sheets quickly and effortlessly. Be sure to back up your hard disk: Lose that much work and you may lose your business. ⊡

Shopping Spree

Byline
dBase IV
Ashton-Tate
20101 Hamilton Ave.
Torrance, CA 90502
(213) 329-9989

SideKick Plus
Borland International
4585 Scotts Valley Dr.
Scotts Valley, CA 95066
(408) 438-5300

FAX-MAIL 96
Brooktrout Technology
110 Cedar St.
Wellesley Hills, MA 02181
(617) 235-3026

Amiga 2000
Amiga 1084SD Monitor
Commodore Business Machines
1200 Wilson Dr.
West Chester, PA 19380
(215) 431-9100

CompuAdd 386/20, VGA Combo board and monitor
CompuAdd
12303 Technology Blvd.
Austin, TX 78727
(800) 627-1967

BPI General Accounting 2.1
Computer Associates
1240 McKay Dr.
San Jose, CA 95131
(800) 531-5236

Corel Draw
Corel Systems
1600 Carling Ave.
Ottawa, Ont.
Canada K1Z 8R7
(613) 728-8200

VEGA VGA
Headland Technology
46335 Landing Pkwy.
Fremont, CA 94538
(415) 656-7800

DeskJet Plus
LaserJet Series II
ScanJet Plus
Hewlett-Packard
19310 Pruneridge Ave.
Cupertino, CA 95014
(800) 752-0900

Microsoft Works
Microsoft
16011 NE 36th Way
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Circle Reader Service Number 10

MY VIEW

PAUL AND SARAH EDWARDS

OPEN THOSE COLLARS

YOU'RE WORKING AT HOME

Sarah and I have been described as pioneers because we began working from home in the 1970s. Working at home was unusual for white-collar workers. In fact, at least one neighbor believed I was unemployed.

But, as much as we'd like to accept the title of pioneers, we discovered while writing *Working from Home* that many homeworkers had preceded us. In fact, the original home offices belonged to the ancient Romans.

But they didn't have the personal computer.

I do. I sold my Hasselblad camera and bought an Osborne I. Our work lives have never been the same. For millions of people, home and office have become one. City governments that are, on one hand, enforcing zoning ordinances restricting home businesses are, on the other hand, installing or urging telecommuting programs to ease traffic congestion and air pollution problems.

This has created a new category: open-collar workers. They do their jobs and run their businesses from home, and their ranks number in the millions. The 1989 National Work-at-Home Survey by Link Resources found more than 26 million homeworkers. Between 1988 and 1989, over 4 million people began working at home for the first time—almost double the number of new homeworkers the previous year and nearly four times the number from two years ago. Link Resources' Tom Miller projects that by the time we elect our next president, 31 million people will be working at home.

What are people doing at home? Everything from alarm operation and aerobics instruction to zipper repair. We've developed a list of approximately 400 types of home-based businesses, and well over 100 of these are based on the personal computer.

Personal computers have made traditional home-based business more productive. Plumbers, electricians, contractors, writers, and craftspeople have worked at home longer than microcomputers have, but now these people can perform many office tasks more effectively and efficiently than in the past. They can write letters, send invoices, track projects, and produce marketing materials. People who ran their businesses from their back pockets benefited from the low overhead of a computerized home office.

Before personal computers, no one made a living at desktop publishing, no one used computer brokering, no one converted data or formatted disks. These are but a few ways people are carving out livelihoods using PCs.

Some major companies, such as American Express, Best Western, and J.C. Penney allow their employees to work at home by telecommuting. Actually, telecommuting, according to consultant Gil Gordon, simply means being linked by telephone with your office, but, for most of us, it means using a computer and a modem.

Your best opportunities for a job at home are with a smaller company. According to Link Resources, nearly two out of three homeworkers are employed by firms with fewer than 100 employees. One further tip: Your most likely source of home-based work is your current employer. Companies rarely hire people they don't know for work away from the office.

Instead of staying late at the office or coming back to work on weekends, a rapidly growing number of people are taking their work home on floppy disks. These are the after-hours workers. Approximately 14 million of the 26 million homeworkers fall into this category. That's about one out of every eight people in the work force.

There's a good chance you may be an after-hours worker. If so, you could use your computer to start a part- or full-time business. Surveys show that more than half of all Americans want their own business. Some want to earn extra income. Others seek independence. Those who succeed will be in good company. Major companies, including Apple Computer, Domino's Pizza, and Walt Disney, have started in spare bedrooms, garages, and basements.

Many of these well-known companies, of course, predate computers. Today personal computers make starting and operating a business easier and more certain. In fact, statistics from the Small Business Administration tell us that the survival rate has doubled and 40 percent of these businesses are still around after five years.

So if you're thinking about starting your own business or talking your management into letting you bring your job home, now is a good time. After all, someone's going to do it; it might as well be you.

Paul and Sarah Edwards write extensively about home offices. They co-host "The Home Office Show" on the Business Radio Network. ⊡

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& Hundreds of Other Prizes

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ABC's Monday Night Football from Data East MVP Sports. Experience it! Up close and personal. More action, more color and more fun. The sights and sounds of ABC's Monday Night Football.

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How to enter: Simply take the prize symbol "game piece" in this ad to your participating retailer. Exactly match the prize symbol on your game piece with one of the prize symbols found on specially marked packages of Data East MVP Sports' ABC's Monday Night Football games and you win the prize indicated. You may also obtain a match and win prize symbol game piece (while supplies last) and a copy of the winning prize symbols by sending a stamped, self-addressed envelope by December 31, 1989 to Data East MVP Sports Sweepstakes Requests, P.O. Box 8455, Beaverton, OR 97076. WA and VT residents need not affix postage to return envelope. If you are a prize winner, claim your prize by sending your winning prize symbol game piece with your signature and your name, complete address and phone number in the spaces provided via certified or registered mail to Data East MVP Sports Sweepstakes Winner, P.O. Box 8456, Beaverton, OR 97076. All winning claims must be received by January 10, 1990. Any official game piece or package symbol which is forged, tampered with, mutilated, contains printing errors or is obtained through other than approved distribution, is void. Decision of judges is final on all matters. All unclaimed prizes will be awarded in a Second Chance random drawing. If you are not an instant winner, print your name, complete address and phone number in the spaces provided on your prize symbol game piece and mail to Data East MVP Sports Second Chance Sweepstakes, P.O. Box 8458, Beaverton, OR 97076. Second Chance Sweepstakes entries must be mailed separately and received by January 10, 1990. If there are any unclaimed prizes, Second Chance winners will be randomly drawn on January 15, 1990, by ACS Marketing Services, Inc., an independent judging organization whose decisions are final. Odds of winning Second Chance Drawing depend on the number of unclaimed prizes and valid entries received. Not responsible for lost, late, misdirected, incomplete or illegible entries. Winners will be notified by mail. One Grand Prize winner will receive a trip for four to Super Bowl XXIV in New Orleans. Trip includes round trip coach airfare (or reasonable ground transportation if applicable), three nights lodging, tickets for four to the Super Bowl XXIV game, transfers to and from the game, pre-game brunch and $500 cash for expenses, approximate retail value (based on furthest point of departure) $8,500. One First Prize winner will receive $5,000 in cash. Two Second Prize winners will each receive a Sony Entertainment Center, approximate retail value $3,500 each. Three Third Prize winners will receive a Data East ABC's Monday Night Football Pinball game, approximate retail value $3,000 each. 1,000 Fourth Prize winners will each receive an ABC Sports Monday Night Football 20th Anniversary Commemorative video, approximate retail value $20 each. Total approximate retail value of all prizes $49,500. Odds of winning instantly are: Grand Prize—1:2,000,000, First Prize—1:2,000,000, Second Prize—1:1,000,000, Third Prize—1:666,667, Fourth Prize—1:2,000. Sweepstakes open to residents of the U.S. except employees and families of Data East USA, Inc., its affiliates, subsidiaries, advertising and promotion agencies and printers. All prizes will be awarded. Limit one prize per family/household. No substitutions or cash equivalents. Taxes are responsibility of winners. Sweepstakes void where prohibited, taxed or restricted. Winners may be required to sign affidavit of eligibility and publicity and travel releases. To obtain an official winners list, send a stamped, self-adressed envelope by March 1, 1990 to Data East MVP Sports Sweepstakes Winners List, P.O. Box 8460, Beaverton, OR 97076.

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If you are a prize winner, claim your prize by filling in the information below and sending via certified or registered mail by January 10, 1990, to Data East MVP Sports Sweepstakes Winner, P.O. Box 8456, Beaverton, OR 97076.

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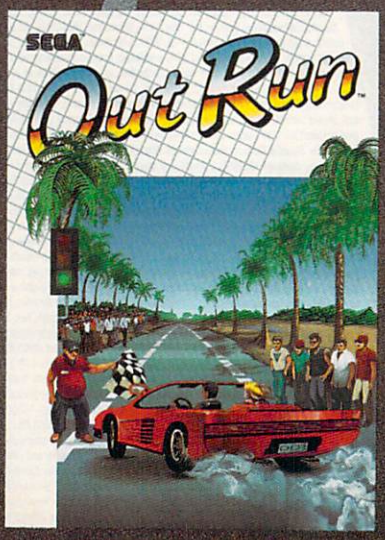

Hot car. Hot music. Hot scenery—beaches, cities, snowy mountains, deserts and the blonde next to you will tempt you to take your eyes off the road. At close to 300 KPH, our advice to you is a 4-letter word. DON'T.

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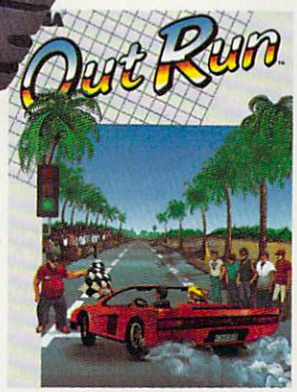

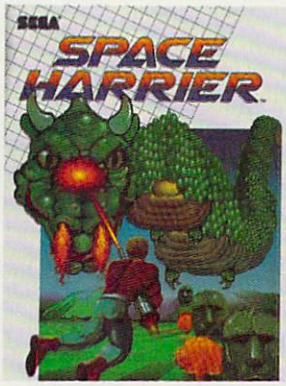

Out Run. One of the biggest arcade hits ever, and the ultimate motor-sports simulation. Now you can bring the action home! With 4.4 liters under the hood, you're driving a beast of a machine only top drivers attempt to drive. Can you handle it? Maybe. Maybe not.

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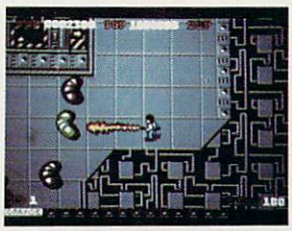

Alien Syndrome. Genetic lab overrun by hideous organic mutations! Scientists captured! Activate the lab's self-destruct mechanism! Break in and blast away the slimy hordes and the biggest, most grotesque mutants guarding the doors. Can you do it before the bomb explodes?

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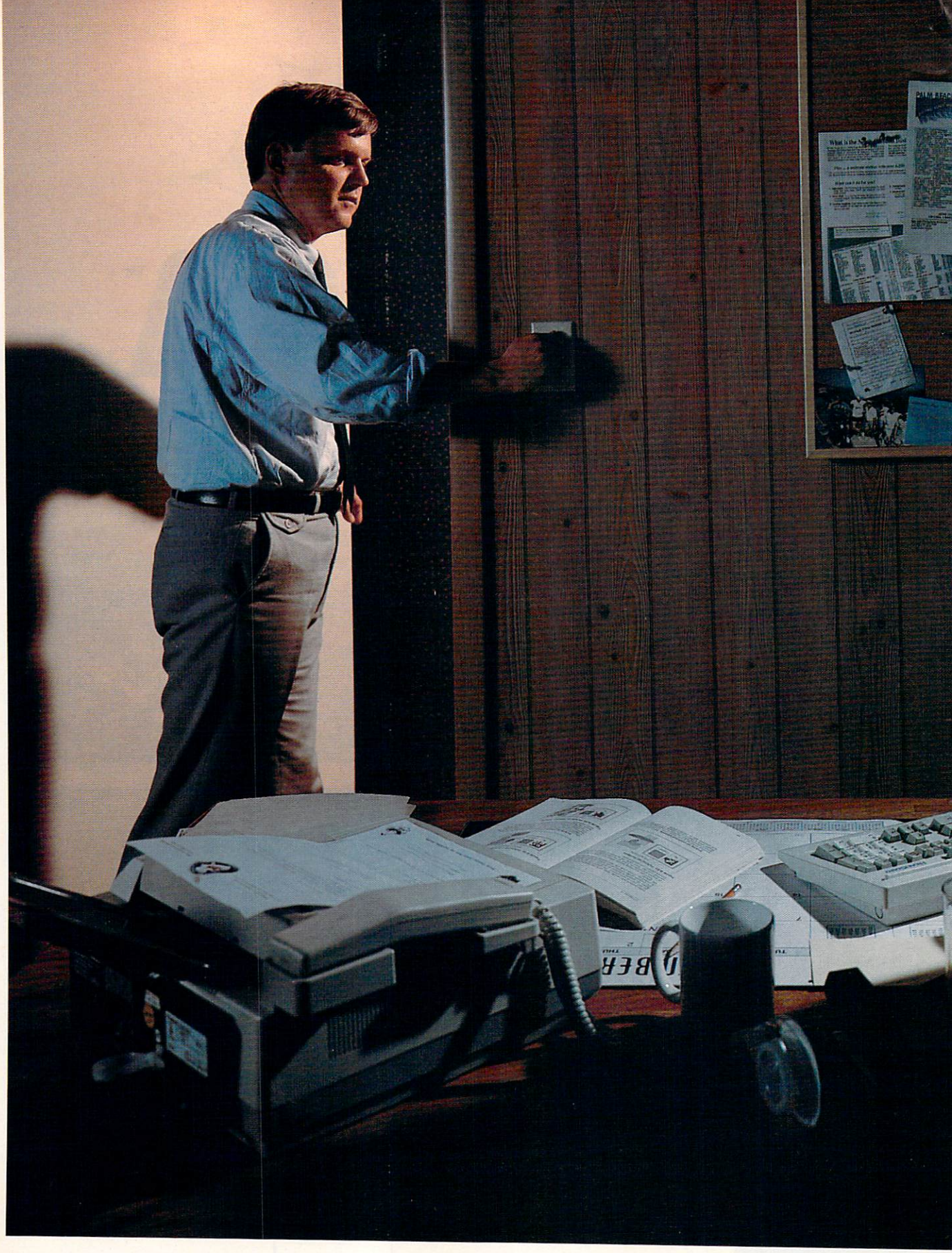


Turn off your computer and

Photo © 1989 Mark Wagoner

Take Five

KEITH FERRELL

The most important trend in computers and computer-related work is the home office, right?

Wrong.

Home office, if you examine it, turns out to be one of those high-concept marketing terms. Everyone targets that home office: It's the place you put the office equipment and supplies you buy.

Your home office is where you work.

But your home *business* is what you work on.

Think of it that way, and the place and the importance of the computer may change a bit. Your home office, for example, may well revolve around your computer. Your home business, except in a few special cases, probably shouldn't. Rather, your home business, like any business, should be focused upon your products, services, and customers. The computer must serve these needs first.

This philosophy applies almost equally to self-contained home businesses or to employees who carry materials from the outside office to the home office. Too often, though, home workers serve their computers, spending as much if not more time managing hardware and software than attending to business.

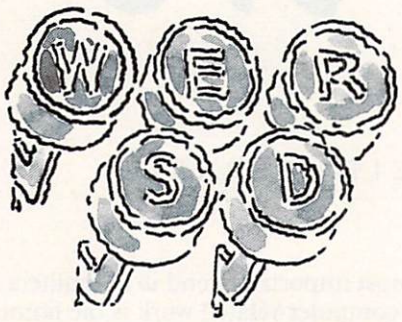
This isn't the way the computer revolution, much less the home-office counterrevolution, was supposed to work. ▷

take a walk

Take Five

Adventures in Home Business

I ran a successful home business full-time for six years, and it has continued to thrive part-time over the two years I've been at COMPUTE!. My business was writing. My products included books (*not* computer books), magazine and newspaper articles, as well as business and corporate communications ranging from newsletters to annual reports to industrial training films.



For the first three years of its operation, I ran that business on a typewriter. Admittedly, it was a very good typewriter—a Facit—but it was, nonetheless, a typewriter. Old-wave technology.

When I made the leap to computing—an XT, 640K RAM, 20-megabyte hard disk, *yeah*—I assumed that every aspect of my work and work habits would be changed as if by magic.

We all know what happens when we *assume*.

Every bit of it happened to me.

First there was the Learning Curve, on whose steepest early slopes I could be found gazing at my typewriter with unalloyed nostalgia.

Then came the Land of Lost Data, in whose marshes I cursed myself for ever *thinking* that computers could be valuable tools. My stay there wasn't lengthy and was followed eventually by the Province of Power Use, where terminate-and-stay-resident programs, WYSIWYG word processing, ramdisks, and so forth occupied an inordinate amount of my time and interest.

Finally, there was the Environment of Endless Editing. It's so *easy* to change things on a computer. Rewriting and retooling paragraphs was so simple, in fact, that it was easier to spend a morning on stuff already written than it was to get on with new work. Less copy was flowing from the computer out of my house than had flowed from my typewriter.

At some point, though, I experienced a breakthrough that changed the way I thought about computers, got my production back to normal levels, and provided me with a perspective that I think is valuable to anyone who works at home.

I turned the machines off.

Turn It OFF!

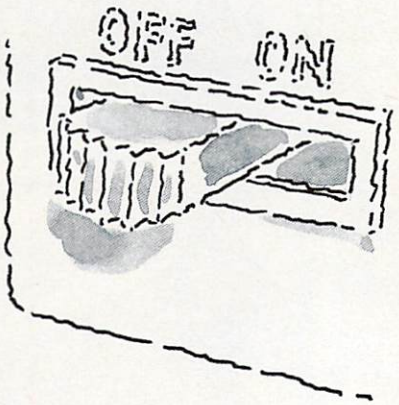
Sometimes the most important business aspect of your computer is the power switch. Sometimes the most important thing you can do for your business is to get up from your desk, leave your office, and take a walk—especially if you're one of those home office workers who becomes more enamored of the computer and its software than the work you're supposed be doing with them.

More and more often I meet people who operate businesses out of their homes. Less and less do I look forward to talking to them. Not because they're dull—give most people a chance to discuss their profession and, chances are, you'll learn something interesting.

But most of the home businesspeople I've met lately don't want to talk about their professions. They want to talk about their possessions. Specifically, they want to talk about office electronics.

Which is fine. I do it myself. I *love* computers and their peripherals and consider them to be the most important office tools ever developed. Obviously, I owe a large part of my income to computers.

But the focus of home office workers is too often placed upon the *tools* rather than the work. The best shovel in the world isn't going to make you a better ditch digger, and the most elaborate office electronics setup in the world isn't going to make your business successful. *You* can make your business succeed. If you use computers to do it, so much the better. But the burden is on your flesh-and-blood shoulders, not on the machines' silicon and circuitry.



The idea that tools make the business is just as fallacious (and dangerous) as the old chestnut that clothes make the person.

Who's in Charge Here?

I know, for example, people who run million-dollar businesses with Commodore 64s, and people who have run businesses into the ground with 386 machines. I've read good novels written on Apple IIs and seen collections of rejection slips gathered by writers using loaded Macintoshes.

It's not a question of degree. It's a question of common sense.

Putting the machines first puts you and your business in a dangerous position. You may find yourself making computer excuses. We've all heard them. *My computer can't do that.* And *I'd love to do business with you, but my computer isn't set up for it.*

In some cases, those answers are appropriate. Too often, though, a business problem is blamed on the computer. The computer, in other words, dictates what the business can and can't do. That's a lot more freight than your computer should have to carry. It violates common sense and good business sense. Computer excuses

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can become a rut that's easy to get into and hard to get out of—until your business fails.

Common sense should also remind you not to get more electronics than your business can afford. It's easy to spend a lot of money on computers, peripherals, and software. Few home businesses, especially those just getting started, have a lot of money. Shop carefully. Think through your purchases before you make them.

You may find, for example, that a high-quality keyboard can do more for your productivity than a hundred extra megabytes on your hard disk. For small businesses, a good integrated software package may be more useful—not to mention more affordable—than a trio of the industry's top sellers.

Talk to other home businesspeople, preferably those who've overinvested in equipment. Listen to their stories.

If your neighborhood is like mine, you'll find at least a couple of prime examples of computer excuse-makers, of technology-addicts who've traded business goals for computer buzzwords. The outgrowth of this is that computers dictate how their businesses operate.

It shows. Believe me, it shows.

Gray-Flannel Output

Where it shows first is, of course, in printed materials.

I see a lot of material produced on computers. And a lot of it could use a lot of work. In the course of a week at COMPUTE!, my desk might be blessed with half a dozen clearly written and sensibly designed query letters and proposals.

During that same week I may see three times as many submissions that are a jumble of typefaces and badly positioned graphics. Just as annoying are the packages that eschew fancy fonts and graphics but present their plain-vanilla text in nowhere-near-letter-quality print, usually produced on a ribbon whose best days passed years ago.

Let's get the common-sense point out of the way first. Not everyone needs or can afford a laser printer. But no one doing business can afford to use worn-out ribbons. Whatever your printer, replace its ribbon regularly. The impression even your occasional correspondence makes is worth far more than the number of extra impressions you get from your ribbon. Don't overspend on the big items, but don't cheap out on the small ones.

For correspondence, the best rule is to remember to keep it *simple!* Letterhead is necessary; font changes within the body of the letter are not only unnecessary, they distract from the business at hand. Correspondence puts *your* business in *their* hands—make sure you give them something they'll hold onto.

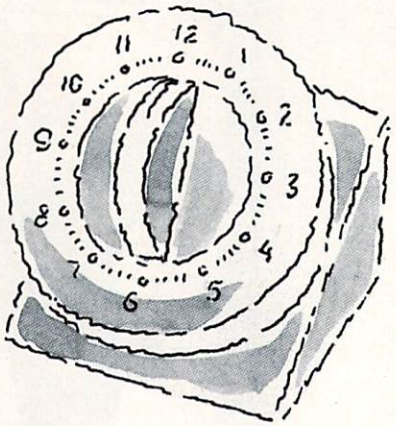
Graphics and fonts are more complex, but common sense again has a lot to offer. The best-looking desktop publishing materials in the world aren't going to help a proposal that has nothing to offer. Nor will a conservative and careful presentation harm a dynamite idea. In business—even in American business today—content counts more than appearance. Keep your content foremost in your mind.

More elaborate presentations will naturally call for more elaborate treatment. Just bear in mind that desktop design and desktop publishing are tools, not ends in themselves. Otherwise you might find yourself in the position of the chef who places all of his emphasis on the sauce, neglecting the entree it's intended to enhance.

Matters of Time

Not as immediately evident as flawed printed materials, but ultimately more devastating for your business, is the amount of time your computer requires—or, to be more accurate, the amount of time you spend at your computer.

For devices intended to make us all more efficient and productive, computers can be among the biggest time-consumers in your business. This is, in part, a result of the malleability of the materials you're working with.



The ease with which you can change things on a computer makes it easier to become dissatisfied with what you've produced. Writing is rewriting, as they say, but the computer can transform rewriting from a craft into a career. The same is true for numbers: Is your third hour of adjusting figures on that spreadsheet *really* more valuable than the first?

Go into each project with an idea of where the appropriate stopping places should be found. Then start looking for them. Don't be afraid to turn the machines off and take that walk. You'll come back refreshed and better able to see how much you've accomplished, not how much you think needs to be changed.

Another good tip is to turn, from time to time, to old-wave technology—specifically, to pencil and paper. When you finish a first draft of a business proposal, print it. Go over it with pencil in hand, making corrections and notations on paper.

Witness A Perfect Game

Fifty years from now, we'll be sitting on porches with our grandchildren, recounting the wondrous story. . .

"Yep. I saw it. I was there to play HardBall II."

Like Don Larson's perfect game, new *HardBall II*™ will be remembered as a milestone. A great accomplishment in baseball history.

The original *HardBall!* stands as the best-selling computer baseball game of all-time. And true to its heritage, new *HardBall II* captures the essence of the national pastime. You can almost smell the fresh cut grass and oiled leather as the computerized boys of summer sprint across the diamond.

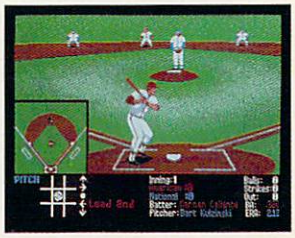
But *HardBall II* goes beyond the effortless gameplay and realism that made its namesake famous. *HardBall II* offers more. Much more.

More frames of animation. So each diving catch and double play looks major league smooth.

More features. Like real baseball stats that are updated and stored from at-bat to at-bat and game-to-game. TV-like instant replays to help relive your greatest moments. League play,

where every win brings you closer to the pennant.

More options. Should you steal with two out? Attempt to pick the runner off at second? Get caught in a rundown? Shift the defense for a dead pull hitter? Real managers have options. So do you.



And more choices. Step on the turf of seven familiar big league ballparks. Gaze out onto the field from five network TV field perspectives. Create your very own dynasty with the team editor.

HardBall II is in a league by itself. And fortunately for our grandchildren, we get to play it in its prime.

How to order: Visit your favorite retailer or call 800-245-7744.

ACCOLADE™

The best in entertainment software.™

Actual game screens from IBM PC EGA version of the game. Other versions may vary.

Circle Reader Service Number 178

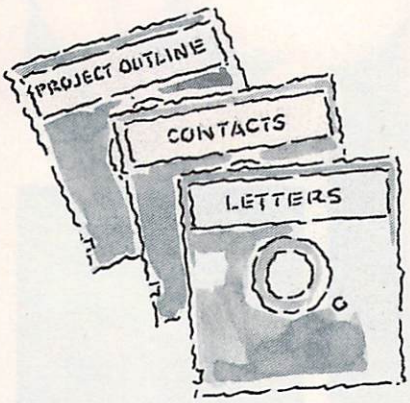
Take Five

If you bill your clients and customers by the hour or receive overtime for work brought home, you're already tracking the time you spend at your keyboard. If not, give it a try. Take a hard, honest look at how much time you spend at the keyboard, breaking the hours down into creative, productive, and nonproductive time. The results of the experiment may guide you to change your computer habits.

Set Yourself Free!

If the computer can breed bad business habits, it can also help you break them.

Having said so many conservative, if not negative, things about computers, I feel obliged to point out that the computer is without question the most valuable tool a business can have.



Even better, it's the most flexible of tools. Word processing is by far the most popular computer application. Spreadsheets and databases each make their own valuable contributions to the operation of a well-ordered business.

But the most sophisticated word processors and the most feature-laden databases and spreadsheets still deal with the more prosaic side of business—words, names, numbers. Your business—any business—rises and falls on the creative energy you bring to it. Too often overlooked in our rush to think of the home office as a place of tools, is the computer's ability to serve your creativity and, in turn, your business.

Brainstorming is a good example.

The late John D. MacDonald, among the best suspense novelists of his generation, once offered a hint for plotting a novel. Take a scratch pad and write one idea per sheet of paper. Didn't matter if the notation was a character's name, or a setting for a scene, or a plot twist. By the time you're through with the scratch pad, you should have a good sense of where your story is going and what its main elements will be.

The same free-association strategy can be just what the doctor ordered for a stubborn business problem, for laying a strategic groundwork, or for gaining control of seemingly unrelated material. And the computer makes a perfect scratch pad for cycling through mounds of ideas.

I find outliners to be the most useful tool for this type of session, although your word processor or a free-form database can serve the purpose just as well. The more fluid and flexible the software, the better. Set up a few categories—existing clients, for example, hot prospects, new services or products—and take a deep breath.

Then, for an hour or so, free-associate, typing in every relevant or even irrelevant idea that passes through your head. Scramble the categories, shuffle the notes in different directions. You'll be surprised how quickly you begin to generate new insights and how easily those insights spark others.

You can take the same approach with existing databases. Cycle through your records from different perspectives, attempting to discover what your clients have in common.

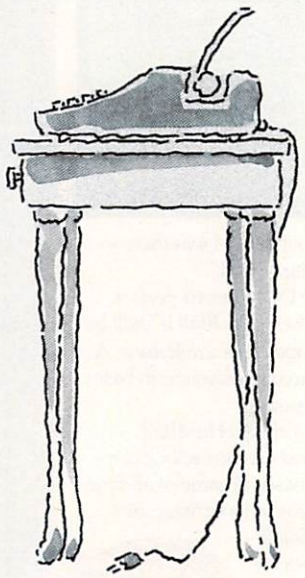
(And when you've finished your brainstorming session, save your materials, turn off the computer, and go for a walk. Your juices will still be flowing, and, freed from the keyboard, you may find even larger insights than you produced at your desk.)

In short, don't be afraid to use the computer creatively. It's capable of more than just routine work, and so are you.

In Place

My home office is perhaps my favorite place on earth. There are plenty of electronic devices that I *want*—386, fax, laser printer—but at the moment I have everything I *need*.

One thing I need, and that helps me maintain what I think is a healthy perspective, is that typewriter. I turn to it at least once a day, to type an envelope or fill in a form. It's appropriate technology, and it has its place in my office. So do pencils and paper.



So does the computer. If the computer's place is more prominent (it's on my main desk; the typewriter, on another, smaller desk off to the side), that's because the computer is now my primary business tool.

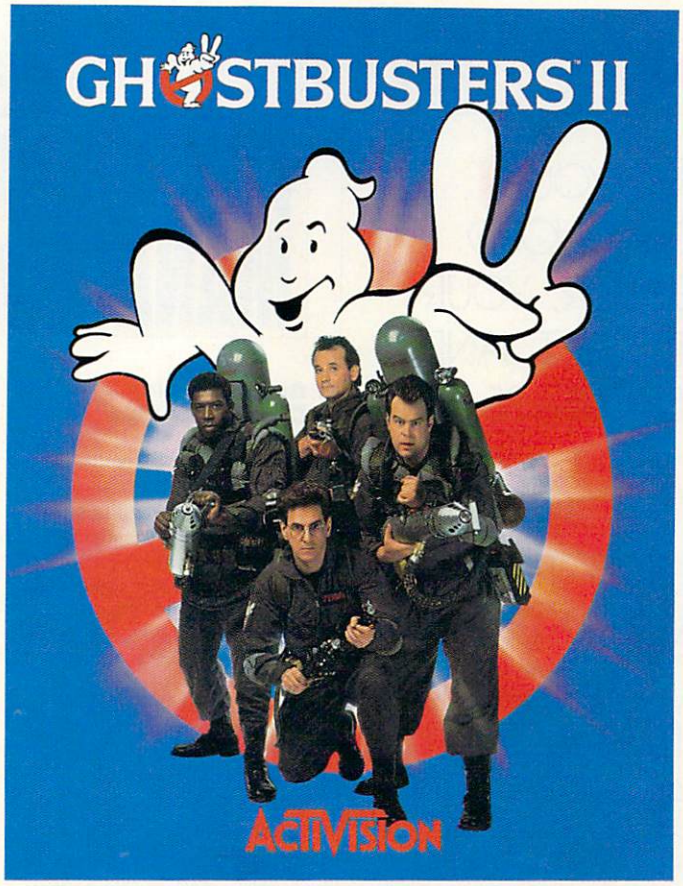
But it is a tool, a means by which I accomplish my goals. That perspective has made me a more productive computer user, I think, and has made my use of the computer more enjoyable, not to mention profitable.

More important, it has helped my business succeed and grow.

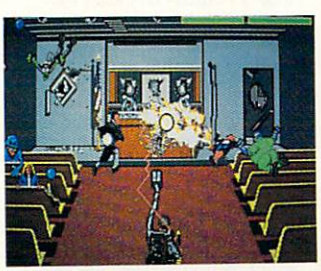
Your home office is a special place—but the success of your home business is the goal toward which that office, and all of its equipment, should be dedicated. ⊡

Keith Ferrell is features editor of COMPUTE!. His home office is his castle, but he does go fishing in the moat occasionally.

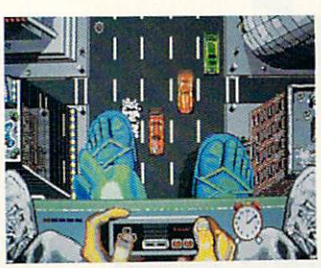
Bustin' Makes You Feel Good!



Who ya gonna call? The Ghostbusters—again.
Clear the courtroom of ghouls and get back in business. Bust your pals out of the insane asylum. Trap ghosts around New York City, then turn the slime to your side and march the Statue of Liberty across town to the Museum. If you've got the slimeblower, wasting the evil Vigo should be easy.



Get Ready to Believe Them.



Launch Miss Liberty on a rescue mission.

ACTIVISION

See your local retailer, or call 1-800-227-6900 to order.

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Circle Reader Service Number 118

BUYER'S GUIDE

CAROLINE D. HANLON AND JEFF SLOAN

YOU HAVE YOUR PC, YOUR WORD PROCESSOR, YOUR SPREADSHEET, AND YOUR DATABASE. BUT YOU NEED MORE. YOU NEED THAT PERFECT PROGRAM FOR THOSE LITTLE DETAILS AND THOSE BIG PLANS. UNLOCK YOUR ENTREPRENEURIAL SPIRIT AND GET A JUMP ON THE COMPETITION WITH THIS

HOME OFFICE SOFTWARE SAMPLER

FINANCIAL MANAGEMENT

Andrew Tobias Checkwrite Plus

MECA
IBM PC and compatibles
$49.95

For homes and small businesses, *Checkwrite Plus* handles budgets and checking accounts. An aid to home financial management, the program lets you set up budgets, reconcile bank accounts, manage credit cards, analyze loans, forecast expenditures, plan taxes, and print loan amortization schedules. For business use, you can customize checks, prepare budgets, calculate profits and losses, track accounts, analyze loans, check business reports, and create graphs. You can export data to *Managing Your Money* and spreadsheet programs, including *Lotus 1-2-3*. The program is available on 3½- and 5¼-inch disks.

CheckFree

CheckFree Technologies
IBM PC and compatibles
Requires Hayes-compatible modem and two floppy disk drives or one hard drive
$29.95

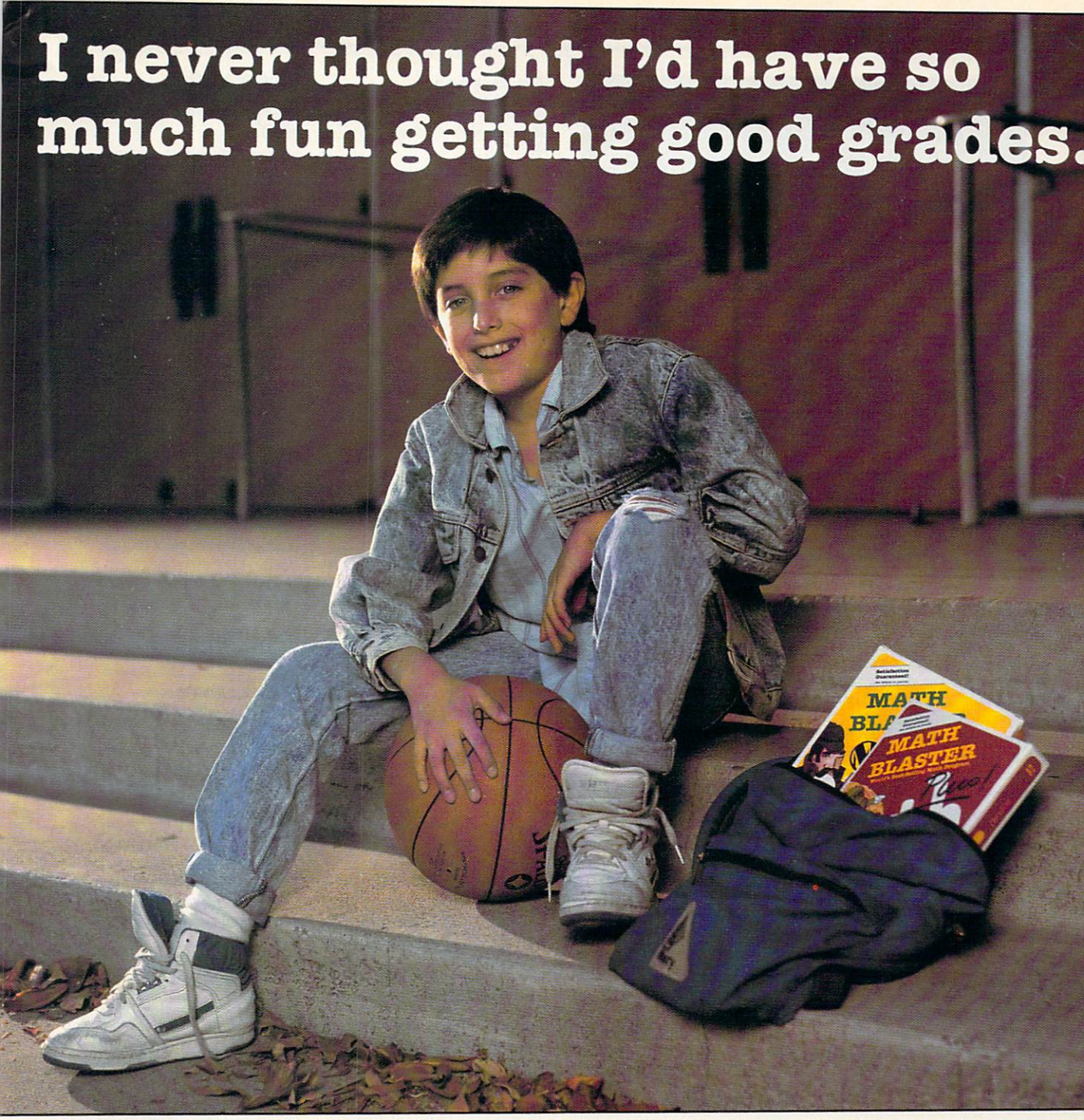
Using *CheckFree* and a Hayes-compatible modem, you can perform your checking transactions electronically. You complete onscreen check forms and transfer them, by modem, to the CheckFree processing center. Automatically, the payee's account is credited while your checking account is debited. The review/balance register tracks payments and deposits and maintains your balance. The budget and reports menu helps you keep track of your income and expenses, and publishes an annual report with a month-by-month listing of payments.

Clan Practical Accountant

Sir-Tech
IBM PC and compatibles
$79.95

Using *Clan*, people with little or no accounting experience can see a complete picture of their financial status. The program develops a financial statement for each month and traces tax deductions and income. Those who decide not to use any of the nine included charts of accounts can customize their own. The program handles up to 128 accounts with more than 4000 transactions, and all account balances are carried forward to the next year. You can format reports for your individual needs and display them on 40- or 80-column screens or print them out. You can store as many as 20 liquid-asset records on one data disk. A password option is provided. Four included guidebooks and an available hot line offer product support. The program is available on 3½- and 5¼-inch disks.

I never thought I'd have so much fun getting good grades.

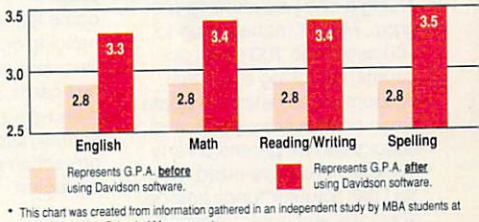


Davidson Software Age Level Guide

PROGRAM	AGE LEVEL 3	4	5	6	7	8	9	10	11	12	13	14	15	Adult
Math Blaster Plus!														
Math Blaster Mystery (NEW!)														
Algebra-Blaster Plus! (NEW!)														
Word Attack Plus!														
Word Attack Plus Spanish														
Word Attack Plus French														
Math and Me														
Reading and Me														
Grammar Gremlins														
Spell It Plus! (NEW!)														
Speed Reader														
Read 'N Roll														
Homeworker														

Additional data disks extend the level of the program.

UCLA Study* Verifies Davidson Software Improves Grades



* This chart was created from information gathered in an independent study by MBA students at UCLA's Graduate School of Management.

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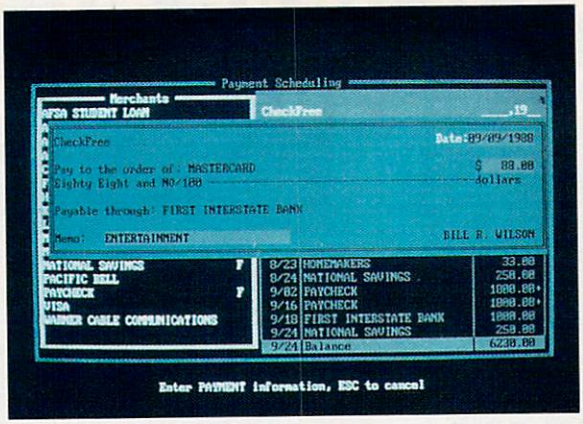
Davidson.



Pay your bills electronically with *CheckFree*.

Dollars and Sense

Monogram
IBM PC and compatibles
Requires 80-column display
$179.95

Using *Dollars and Sense*, you can create budgets, print checks, pay bills, perform automatic transactions, and view your overall financial condition. Five what-if scenarios let you experiment with different liability options, and the outcome is displayed (on a color graph if the monitor allows). A portfolio manager keeps track of stocks, and, using Monogram's *Moneylink/Moneyline* software, you can access online services. With Forecast, you can estimate federal income taxes and plan strategies up to five years ahead. The program contains two sets of predefined starting accounts and has unlimited account capability. Double-entry accounting functions are computed automatically. Reports can be displayed on the screen or be printed. Data can be exported to *Lotus 1-2-3* and other spreadsheet programs. Onscreen help is provided.

HFS-III

Jay Gold
IBM PC and compatibles
$49.95

A single-entry accounting program, *HFS-III* manages up to 100 asset and 100 credit accounts. Checking and credit accounts automatically update when checks are written, and checks can be printed on any standard business-sized form. You can transfer funds among accounts and enter frequently used records through model transactions. Single CD or IRA account changes send automatic adjustments to the parent IRA account balance. You can print reports (including account activity), financial summaries, and tax-deductible expense lists. The program also features help windows, macro keys, and pop-up menus. This package is not copy-protected, and it contains three disks and a manual.

MoneyCounts 6.0

Parsons Technology
IBM PC and compatibles
Requires 384K and two floppy disk drives or one hard disk
$35.00

This money-management package handles as many as 999 accounts and 100,000 transactions per year. Besides printing checks on pin-feed forms, it monitors cash, credit cards, and checking and savings accounts. The financial calculator determines interest rates, loan payments, and amortization schedules, while the pop-up calculator can be used for onscreen computations. You can generate and print four financial statements, three inquiry reports, and an amortization schedule. The data displays and prints in three-dimensional graph form. The program also estimates income taxes and analyzes financing options, manages mail lists, and prints labels and index cards. *MoneyCounts* 6.0 is menu-driven and provides onscreen help. It offers password protection and is not copy-protected.

On Balance

Brøderbund
Apple II
IBM PC and compatibles
$59.95

On Balance tracks your financial transactions, accounts, net income, and net worth. You can view text or bar-chart displays of transactions and accounts and specify the criteria for searches. All transactions are entered through a screen that looks like a checkbook register.

Personal Portfolio Manager

Abacus
IBM PC and compatibles
Requires 384K and two disk drives; modem recommended
$150.00

Personal Portfolio Manager is a securities and portfolio manager for home and business use. Portfolios can be updated manually by entering stock quotations or automatically while connected with Dow Jones News/Retrieval or Warner. Separate portfolios can be set up for each broker to include cash exchanges, T-bills, mutual funds, options, securities, and other transactions. Predesigned reports can be printed, or you can create custom reports for almost any need. The program automatically performs most calculations, and there is a four-function pop-up calculator. Onscreen help is available at all times. Personal Portfolio Manager includes a manual and is available on both 5¼- and 3½-inch disks.

Quick Check

Intracorp
IBM PC and compatibles
$14.95

Quick Check is a basic check-writing program for tracking up to five bank accounts and an unlimited number of expense accounts. You can print on form-feed checks without exiting other programs. The program works in the resident background memory and generates files for *Lotus 1-2-3* and *dBase III*.

Quicken 2.0

Intuit
IBM PCs and compatibles
$49.95

Version 2.0 of this program contains the same check-writing and financial-management features as the original version plus some new capabilities. A bill-minder feature reminds you when it's time to pay a bill, and the program can automatically write recurring checks. Financial records are updated whenever a transaction occurs. Reports such as income and payroll tax records, budgets, and income and expense can be generated and printed out. Version 2.0 also allows an unlimited number of bank accounts and transactions. The package includes a quick-start-and-tips card, a manual, sample checks and envelopes, and a check and envelope order form. Disks are available in 3½- and 5¼-inch formats. Free telephone support is provided.

Small Business Accounting—General Ledger

Publishing International
IBM PC and compatibles
Requires 512K
$27.95

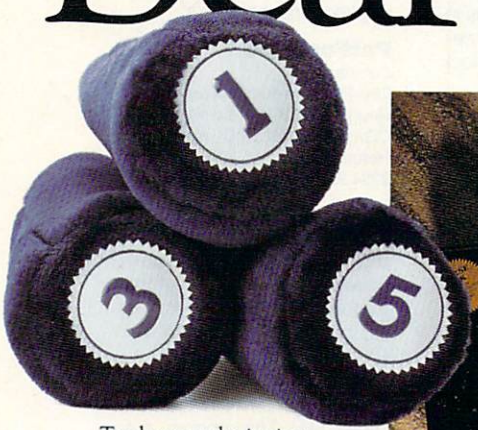
This basic accounting program tracks your income and expenditures without the expertise of an accountant. *General Ledger* has a double-journal entry system so accounts and records may be easily viewed or edited. Balance sheets and income statements are prepared automatically.

Smart Money

Sierra
IBM PCs and compatibles
$79.95

Smart Money controls day-to-day expenditures and plans for the financial future. The program sets up a budget, tracks bills, reminds you of payment dates, and reconciles credit-card and checking-account statements. Transactions are automatically updated to the proper accounts. This program also shows you how to save for major purchases, decide when to borrow money, and plan investments in stocks and IRAs. Reports such as profit-and-loss and investment analyses can be printed.

The Bear Essentials.



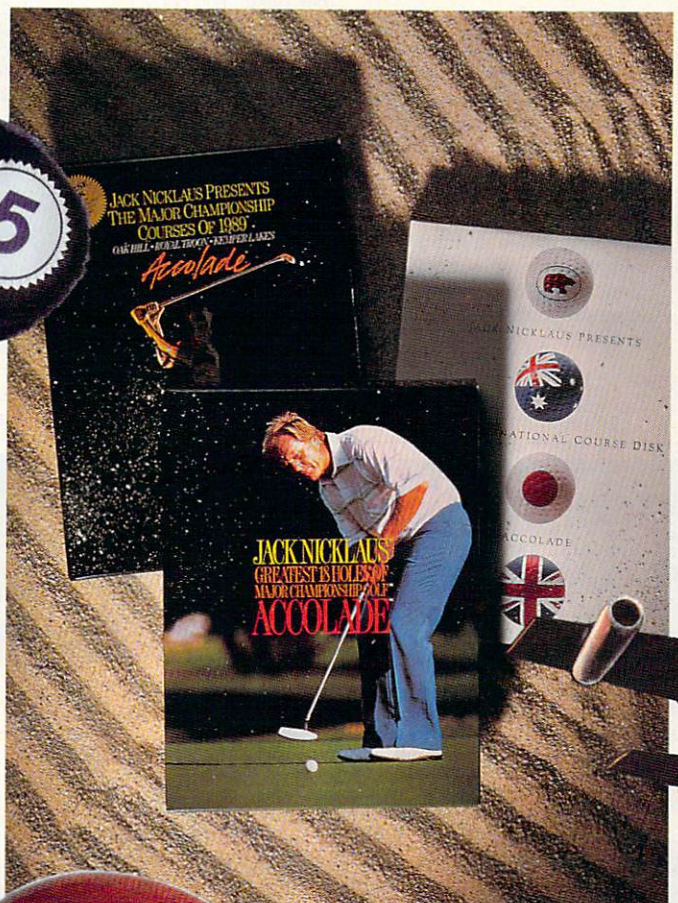
To play award-winning computer golf, you need a great set of clubs.

Country clubs.

Jack Nicklaus' Greatest 18 Holes Of Major Championship Golf™ and its add-on course disks offer you a lifetime membership to nine of the world's most exclusive country clubs. Courses selected by the "Golden Bear" himself as the ultimate tests of golf.

The main course? Unlimited use of the most challenging 18 holes in the majors, each hand-picked by the master himself. Then avoid greens fees on two more Nicklaus designed courses: Castle Pines, Colorado and Desert Mountain, Arizona.

And that's just the Bear minimum.



Boot-up *Jack Nicklaus Presents The Major Championship Courses Of 1989*™ and take on the toughest tournaments of the year. Hit it big at Oak Hill Country Club, New York. Take

on hills, heather and gorse at Royal Troon Golf Club, Scotland. Bring your water wings and sand pail to Kemper Lakes Golf Club, Illinois.

Then it's time to pack your putter.

The add-on *International Course Disk*™ jets you off to three world-class layouts designed by Jack. Battle par on such faraway fairways as the Australian Golf Club, Japan's St. Creek Golf Club and Saint Mellion Golf & Country Club in England.

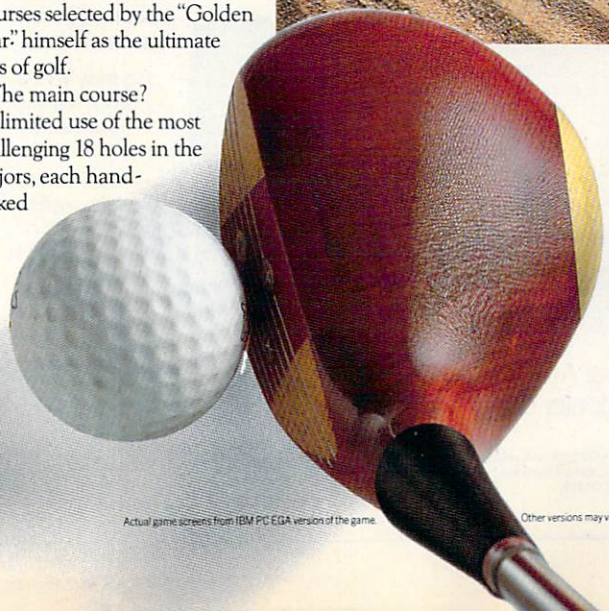
All told, you get nine exceptional bastions of golf—without the outlandish membership dues and outrageous blazers.

Now…isn't it time for a new set of clubs?

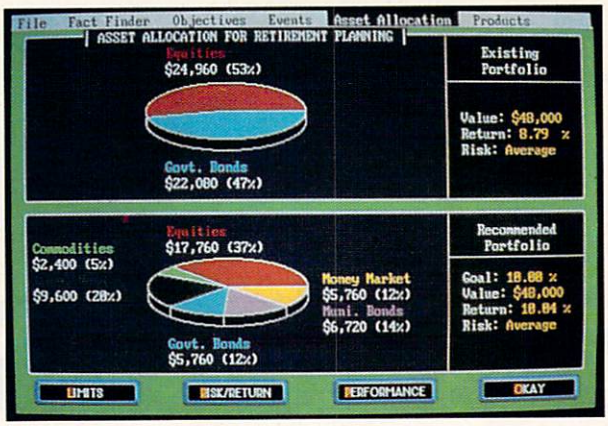
How to order: Visit your favorite retailer or call 800-245-7744.

ACCOLADE™

The best in entertainment software.™



Actual game screens from IBM PC EGA version of the game. Other versions may vary. Jack Nicklaus' Greatest 18 Holes Of Major Championship Golf is a trademark of Golden Bear International, Inc.



Plan your financial strategies and goals with *WealthBuilder*.

WealthBuilder
Reality Technologies
IBM PC and compatibles
$249.95

This money manager is built around three modules. First, you test yourself with the Money Quiz. Second, you study the money tutorial to learn the techniques of productive money investment. Third, *WealthBuilder by Money Magazine* determines your best strategies. After establishing your monetary goals, the program decides where to deposit your money and the best way to make investments in such things as mutual funds, stocks, gold, and limited partnerships. *WealthBuilder* uses profile sheets to track statistics and keep your budget and finances in order.

FORM MAKERS

EZ-Forms Lite
EZX
IBM PC and compatibles
Requires 320K
$49.00

EZ-Forms Lite lets you create, fill in, print, and revise business forms. Available graphics include borders, lines, shades, and combs. Other features include autotime, autodate, sequence numbering, and block cut, paste, and copy.

FormSet
SoftView
Apple IIgs
IBM PC and compatibles
Macintosh
Requires 768K and two drives (Apple); 640K, hard disk, and graphics adapter compatible with Microsoft Windows (IBM)
$95.00

FormSet's stock of 65 predesigned business forms allow you to automatically insert information in individual or linked forms. The forms are divided among five menus: general, accounting, payables, personnel, and sales. Individual forms cover everything from inventory summary to payroll records. The program also creates company letterheads and accepts logos transferred from any standard paint program. The mouse- or keyboard-driven program accommodates most printers.

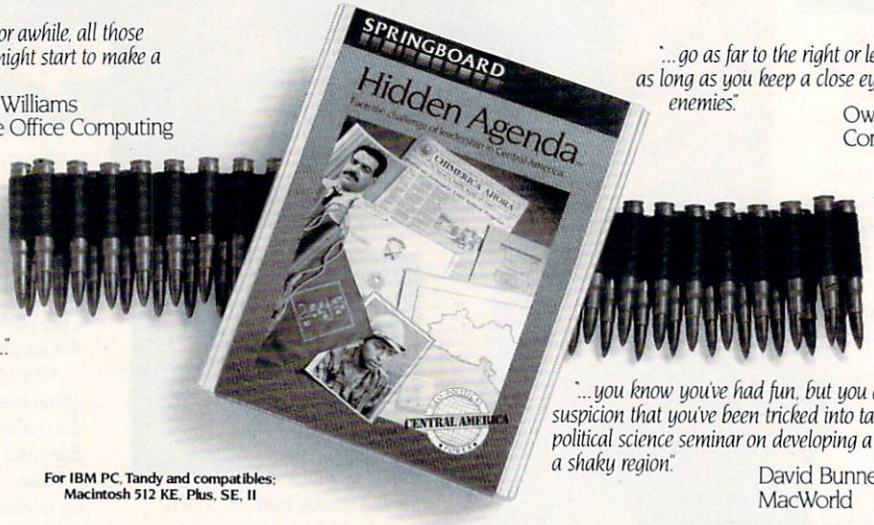
PerForm 2.0
Delrina
IBM PCs and compatibles
Requires 640K, hard disk, and CGA, EGA, VGA, MCGA, or Hercules
$294.95

PerForm 2.0's WYSIWYG interface lets you create, edit, and print forms—from questionnaires to flowcharts. Customize them with boxes, lines, varying fonts, and scaled graphics. Fill in your form using the WYSIWYG text-based format or import data from ASCII or *dBase* files. The program automatically fills in dates and times, serial numbers, page numbers, and checkmarked boxes.

You can play Hidden Agenda™ for fun.
But Ortega and Noriega are playing it for keeps.

"...after you play for awhile, all those headlines you read might start to make a little more sense."
Steve Williams
Home Office Computing

"...go as far to the right or left as you want—as long as you keep a close eye on your allies and enemies."
Owen Linderholm
Computer Currents



"It's for the little world leader in all of us."
Andrew Tobias
Author, Managing Your Money

"It's a superb game..."
John Dvorak
San Francisco Examiner*

"...you know you've had fun, but you also get the sneaking suspicion that you've been tricked into taking a college-level political science seminar on developing a stable government in a shaky region."
David Bunnell
MacWorld

For IBM PC, Tandy and compatibles; Macintosh 512 KE, Plus, SE, II

Can you survive the challenge of leadership in Central America? Get Hidden Agenda at your Springboard Software dealer or call **1-800-445-4780, Ext. 8106.**

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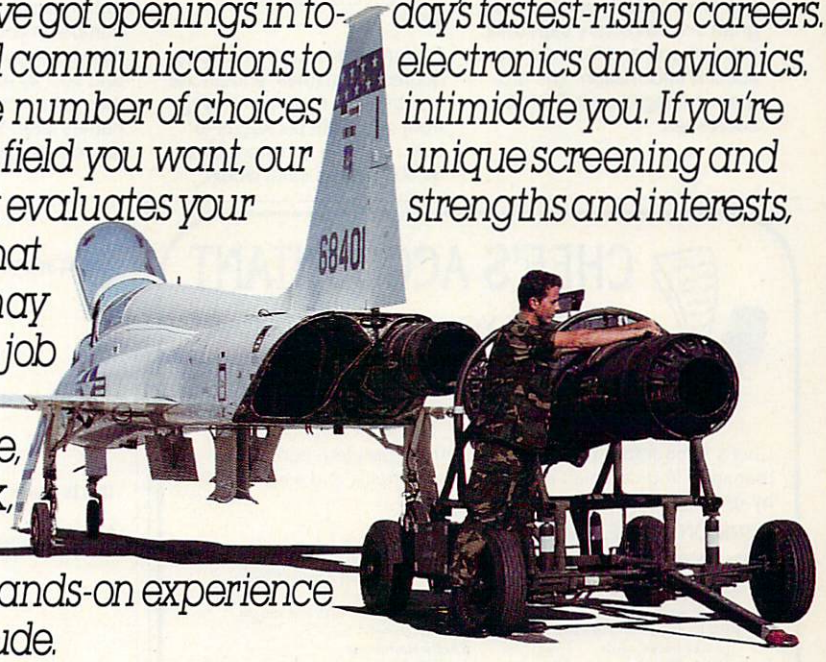
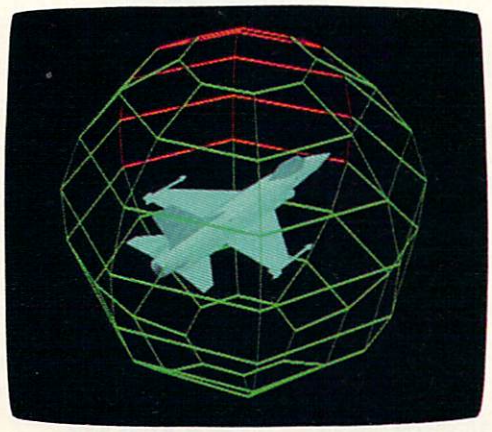
SPRINGBOARD
7808 Creekridge Circle, Minneapolis, MN 55435

Circle Reader Service Number 123

PERHAPS YOUR FUTURE'S UP IN THE AIR. AND YOU JUST DON'T KNOW IT.

If you're undecided but looking for a future that's exciting, rewarding and full of possibilities, allow us to point you in the right direction: Up. In the Air Force. We've got openings in today's fastest-rising careers. From computers and communications to electronics and avionics. Over 200 in all. But don't let the number of choices intimidate you. If you're not already sure about which field you want, our unique screening and orientation process can help. It evaluates your strengths and interests, and helps you find a career that makes the most of them. You may discover talents (and valuable job opportunities) you never knew you had. Of course, no matter what career you pick, you'll get top-quality training and guaranteed hands-on experience in your area of choice or aptitude.





Plus the chance to continue your education as you build a career. You can pick up college credits or even a degree in the fully-accredited Community College of the Air Force.

So whatever your dreams are, if you want to get them off the ground, call 1-800-423-USAF.

It could be one of the more uplifting things you ever do.

AIM HIGH.

AIR FORCE

Circle Reader Service Number 126

ADDRESS BOOKS

Address Book Plus
Power Up
IBM PC and compatibles
$49.95

Address Book Plus can handle most small-business mail needs ranging from bulk mail to personal greetings. You store names, addresses, phone numbers, birthdays, and other information. The program lets you browse, edit, delete, print, and import or export records with a few keystrokes. The program will search and sort your addresses by character combination, name, company, zip code, profession, date, and more. You can print your list on a variety of paper sizes for address books, rotary files and index cards, mailing labels, and envelopes. Using the program's subdirectory capability, you can sort and list even more specific information. The program manages up to 75,000 addresses.

Addresselope
Barry A. Watzman
IBM PC and compatibles
$46.95

You can use *Addresselope* to print addresses on as many as four different envelope sizes using eight type fonts. You can capture addresses from within documents, print from a choice of predefined return addresses, and print advertising or promotional messages on the envelope. *Addresselope* can store up to 16 addresses before printing. The program isn't copy-protected, and it supports any printer which can feed and print envelopes.

Fastpak Mail
BLOCPublishing
IBM PC and compatibles
$79.95

Fastpak Mail tracks and sorts addresses, names, and phone numbers for mailings ranging from overnight packages to bulk mail. You can store up to 64,000 names, print labels, merge mail, and sort ZIP codes according to bulk-mail regulations. You can print return-address labels, envelopes, rotary index cards, file-folder labels, invoices, checks, newsletters, and subscriber lists. *Fastpak* lets you merge names and addresses into the body of a letter or convert lists from other programs. Additional features include an automatic proper-name capitalizer, network support, overnight-mail addressing, and compatibility with most word processors. The program comes on 3½- and 5¼-inch disks.

Influence
Varteck
IBM PC and compatibles
Requires 385K and a hard disk
$98.00

Influence can store more than 10,000 names, addresses, phone numbers, and descriptions. You can access the information by category, keyword, or name. The program will also automatically dial any phone number in your file. Using keywords, you can categorize and specify each entry and then sort or search those names later. You may also search your list using personal information notes or dates. *Influence* lets you store up to four phone numbers per person and make notes at each entry pertaining to your most recent conversation.

Mailing and Phone List
Publishing International
IBM PCs and compatibles
$24.95

Mailing and Phone List is a standard mailing program that lists addresses and phone numbers, dials automatically, and prints envelopes and labels. You can print, search, and sort alphabetically by name, category, ZIP code, or text string. The program is mouse-compatible.

MyBASE
Useful Software
IBM PC and compatibles
Requires 384K
$89.95

MyBASE can store and print names and addresses, catalog and search data, access various utilities, and generate quick-reference material. You can print the addresses and names in many formats, including Rolodex cards and Day-Timer pages.

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STRETCH YOUR FOOD DOLLAR$ WITH
The most powerful home food management software available!

Chef's Accountant turns your PC into a complete home food manager. You can plan more nutritious meals and save money by gaining control of your food dollars.

VERSION 1.3 FEATURES:

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- Use our recipes or add your own.
- Locate recipes by name, ingredient, even nutritional content.
- Print recipes on standard sheets or 4x7 index cards.
- Import/Export recipes. (Converts recipes from other formats)
- Resize recipes.

Grocery Manager
- Maintain complete grocery inventory.
- Monitor shopping history and costs.
- Organize your discount coupons.
- Print inventory and shopping lists.
- Historical cost reporting.

Communications
- Send/Receive recipes over telephone.
- Automatic dial and log-on features.

Chef's Handbook
- Helpful tips on cooking, nutrition, exercise, and meal planning.
- Personal Text Editor.

Additional Features
- Full-Color Menu's with Light Bar Selection
- Online Context Sensitive help.
- Pop-Up Calculator
- Full Featured Text Editor
- DOS Window
- User Definable Drive/Directory Setup.

SYSTEM REQUIREMENTS: IBM PS/2, PC, XT, AT, or 100% compatible. 512K RAM 2-Floppy Drive or Hard Drive and 1 Floppy Drive, MS-DOS 2.0 or higher

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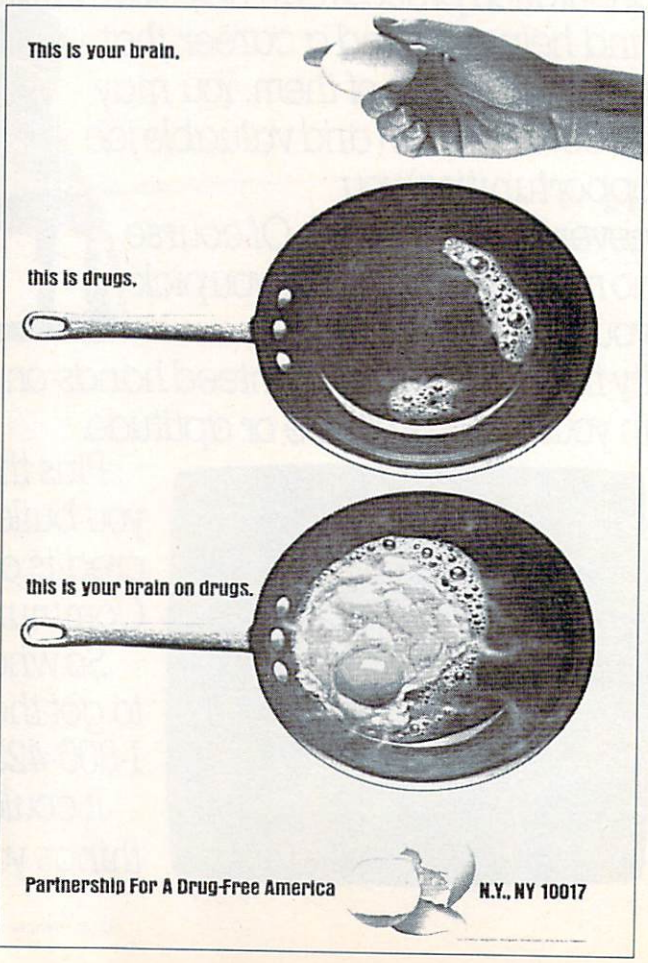
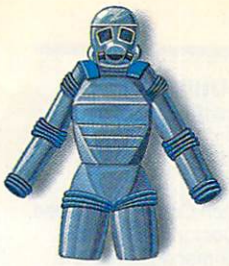
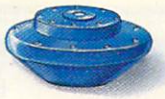




BOMB BLAST SUIT
Shields you from explosions.

FLASHLIGHT
Illuminates underground passages.



MINES
Set them in key locations. Up to three per screen.

INGRAM MAC-II
Semi-automatic submachine gun. Silencer optional.

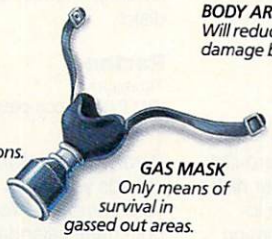
GEAR UP.

BERETTA M92F
Single action hand gun. Silencer optional.

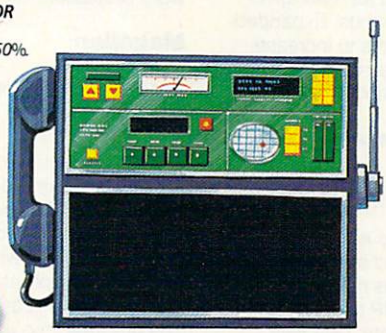
BODY ARMOR
Will reduce damage by 50%.

ROCKET LAUNCHER
Destroy enemy equipment from a safe distance.

ANTIDOTE
Neutralizes poisons.



GAS MASK
Only means of survival in gassed out areas.



TRANSCEIVER
This is your most valuable piece of equipment. With it, you'll receive vital information from headquarters telling you where to find essential weapons and supplies.

REMOTE CONTROL MISSILE
Guide it with your control pad.

ANTENNA
Allows you to use transceiver despite enemy jamming devices.

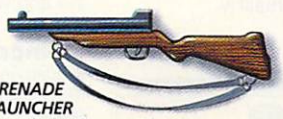
COMPASS
Helps you navigate through uncharted deserts.

OXYGEN TANK
Keeps you breathing underwater.

INFRARED GOGGLES
Used to detect infrared alarm sensors.

PLASTIC EXPLOSIVES
For perfectly timed explosions.

BINOCULARS
Allow you to see one screen ahead without risking your life.



GRENADE LAUNCHER
Launch deadly grenades into strategic locations.

MINE DETECTOR
Discovers location of enemy mines.

IRON GLOVE
Allows you to locate hidden doors with a single punch.

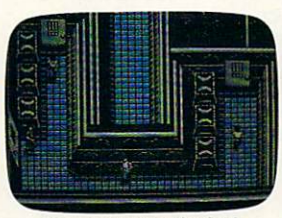
METAL GEAR™

In this intense maze game, your mission is to destroy the ultimate weapon: METAL GEAR. You'll accomplish it by winding your way through five enemy strongholds, seeking vital information from hostages and searching for essential weapons and equipmen while occasionally tripping hidden alarms.

If you hope to survive, rely heavily on your transceiver, your map and your wits. And a word to the wise: don't believe everything you hear.

ULTRA® GAMES

Screen shown: IBM®



Screen shown: Amiga®

Screen shown: Commodore®

Screen shown: IBM

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LABELS

LabelPro
Avery
IBM PC and compatibles
Requires 512K and CGA, EGA, VGA, MCGA, or Hercules card
$99.95

LabelPro lets you preview and print almost any label with a choice of fonts ranging from 6 to 96 points. The program also lets you add clip art and import company logos and other images. *LabelPro* can produce transparencies and generic labels such as *Please Rush* and *Parcel Post*.

Labels!
POP Computer Products
IBM PC and compatibles
$29.95

Labels! can store up to 4000 names and addresses in as many as ten formats to let you create and print the labels you want. The program's Lookup Engine searches for partial character combinations if you can remember only part of a listing. The grabber feature lets you enter an address once and save the data to later print on an envelope. The program imports and exports ASCII text files.

Labelworks
Zephyr Services
Apple II
IBM PC and compatibles
$29.95

Labelworks provides several formats for producing labels ranging from name tags to labels for boxes and containers. You use the fill-in forms on the screen to generate standard-size labels one, two, three, or four columns across. Lists can be organized for mailings or general reference. Expanded-size characters to increase readability can be printed on a dot-matrix printer.

PC Names and Labels
Data Easy
IBM PC and compatibles
$100.00

Using *Names and Labels,* you can enter and search data in fields such as name, address, city, state, ZIP code, phone, purchase, date, selected codes, and more. You can pick any combination of attributes to list and print on labels. For a little more money, other versions of *Names and Labels* give you more data fields and increased versatility.

LABOR SAVERS

Backup Pro
Software Toolworks
IBM PC and compatibles
$99.95

Backup Pro offers security for unexpected hard drive crashes and burns. Using a mouse, *Lotus*-style keystrokes, or DOS commands, *Backup Pro* can back up ten megabytes of information in four minutes. The full-directory display lets you point and shoot your back-up selections either individually or as a group.

Business Card Maker
Intracorp
Amiga—$59.95
Apple II—$14.95
Atari ST—$59.95
Commodore 64—$14.95
IBM PC and compatibles—$14.95
Macintosh—$59.95

Business Card Maker offers a WYSIWYG interface, graphics and text editing, 12 typefaces, and three type sizes to help you create the business card of your choice. You can create a logo of your own or use one of the prestored logos. You can choose from hundreds of card designs and print in color with a color printer.

Data Manager
Timeworks
IBM PC and compatibles
$39.95

Data Manager acts as the background support for your business computing by filing, storing, sorting, retrieving, evaluating, and updating information. You can use the program as a stand-alone, or you can interface it with other compatible programs to produce reports, documents, and form letters. Other features include a numerical calculator, built-in graphics, database capability, and a name-and-address file. The program uses pull-down menus and password protection.

Magellen
Lotus
IBM PC and compatibles
Requires 512K
$195.00

This search-and-sort hard disk utility can streamline your disk management. *Magellen* locates any stored information on your hard disk with specified concepts, phrases, or words and then lets you edit. The program also gathers portions of files from different applications into a single file. *Magellen* reads ASCII files stored on a hard disk as well as most of the major software applications including *Lotus 1-2-3* and *WordPerfect*.

MemoryMate
Brøderbund
IBM PC and compatibles
$69.95

MemoryMate neatly files away everything for you. Whether it's a phone number, name, idea, strategy, or reminder, this program will hold it for you until you want it again. To call up the desired information, you enter a word or string. *MemoryMate* then lists any files with text that matches your entry. The Reminder option can schedule any file to appear on a specified date. *MemoryMate* runs as a stand-alone program or can be interfaced with DeskMate.

Norton Utilities Advanced Edition
Peter Norton Computing
IBM PC and compatibles
$150.00

Peter Norton Computing added the Disk Doctor to its *Norton Utilities* for management and organization of disk files. The Disk Doctor can help you diagnose and correct a variety of floppy and hard drive ailments, even if you have no technical expertise. The package also includes a directory sorter and the Norton Control Center to change the parameters of your computer. Other features let you format disks, create interactive batch files, simplify utility loading, and test and protect disks.

Partner
Timeworks
IBM PC and compatibles
$39.95

Partner takes all the clutter that crowds your desk and puts it in your computer. You get an appointment calendar and scheduler, memo pad, phone book, autodialer, address book, alarm clock, financial calculator, typewriter, and SwiftDOS. You can operate *Partner* simultaneously from other programs without switching windows or files. The memo pad acts as a small word processor and can be used to write letters or create documents. The financial calculator can calculate interest, annuities, loan amortizations, standard deviation, and correlation. With SwiftDOS, you can access DOS commands while still in another program.

PC Logbook
Kerner Software
IBM PC and compatibles
$69.95

You can track the time you spend on projects, support billing claims, and document your home office computer work for tax deductions with *PC Logbook*. This time-management program tracks the time spent on phone calls and other business tasks and runs while you work. The program begins when you assign a project name to a task. Free technical support is available with the program.

ALERT! EMBASSY OFFICIALS HELD HOSTAGE

- Command a six person strike force
- Run, rappel from the roof, search…destroy
- Find the hostages; get them out safely

This rescue must be executed with surgical precision. It requires nerves of steel, strategy, deadly aim.

Three difficulty levels—each with five mission time limits—add excitement and playability. TV quality graphics insure ultra realism.

Ripped straight from today's headlines— it's the world's deadliest game!

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Small Business Inventory

Publishing International
IBM PC and compatibles
$24.95

You can keep track of your furniture, equipment, supplies, and merchandise with the *Small Business Inventory*. The program records serial numbers, equipment value, warranty information, and more. You can search and sort the records through a variety of fields and print single or multiple records. Records may also be written to disk as a file and added to letters or reports. The program is mouse-compatible.

Twist and Shout

Software Toolworks
IBM PC and compatibles
Lotus and *Quattro* add-in versions—$59.95
Add-in version for *VP Planner Plus, Framework, Symphony, Lotus,* and *Quattro*—$79.95

This program combines three computing utilities into one. Twist prints spreadsheets or text files horizontally across your computer paper. It provides type variables such as bold, underline, italics, and color. Shout uses a set of 52 graphics and varying typefaces to print oversized alphanumeric characters and graphics for banners. Disk Spooler II lets you send a file to a printer or to disk while you work on your computer. You can set margins, paper size, character and line spacing, and whether you want bidirectional printing. Other commands let you suspend, restart, and clear the print spool file on Disk Spool II.

ViewLink

Traveling Software
IBM PC and compatibles
Requires 384K; hard disk recommended
$149.95

This file organizer and program management system helps you organize your hard disk system. Once *ViewLink* is installed, it creates a series of views—a collection of related items. You can build views based on filenames, applications, dates, or file types; or you can combine your criteria for even more detailed views. Views can also be built manually by linking or unlinking any number of items with any individual view or set of views. ⊡

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FREE*

COMPUTE!'s SHAREPAK
for IBM PC and Compatibles

Compiled by Don Watkins

Each month, *COMPUTE!* brings you top-quality shareware, hand-picked for your home-computing needs. All required documentation is on the disk. You pay just one low price for the complete package—and this month, to celebrate *COMPUTE!*'s ten-year anniversary, it's **FREE!***

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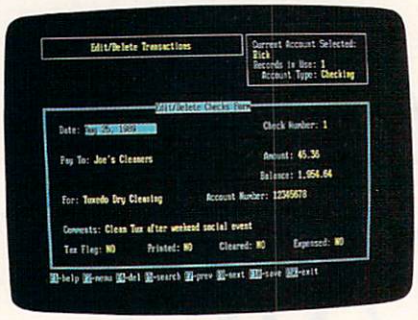
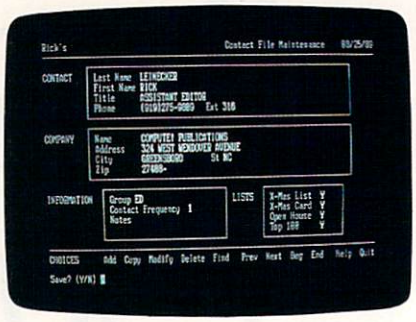


CheckMate Version 1.70

Need help managing your cash flow or balancing the company checkbook? *CheckMate* can do this and more. Maintain multiple checking and savings accounts for your small business or personal finances. Reconcile your bank statements quickly and easily. Compile and print transaction registers and account reports, or print your own checks without computer-form checks. Pull-down menus, pop-up windows, and context-sensitive help screens guide you each step of the way. Supports mouse control and all video adapters. Requires 256K and DOS 2.0 or higher.



Contact Manager

Keep track of all your contacts in four easy lists. Enter data on each client, add your own codes for tracking and follow-up, and note each time a contact is made. Jot down comments in the free-form note field attached to each entry. You can store a client record in one list or all four, if you like. Search and print by data field, or use *Contact Manager* to print mailing labels. Supports all graphics displays. Requires 256K and DOS 2.0 or higher.

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COMPUTE!'s SHAREPAK is a collection of shareware and public domain programs. Public domain programs are free; you can use them and pass them around as much as you like. On the other hand, shareware isn't free; you pay the shareware author if you decide to use the program. Here's how shareware works.

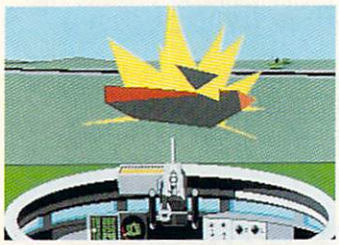
If you like a program on the disk, you should register yourself directly with the shareware publisher (not with COMPUTE!). Each program includes a license agreement that explains who to contact and how much the program costs. Shareware prices are very low compared with similar commercial programs.

Registering means you pay the software author for a program he or she developed, plus it entitles you to technical support and information about upgrades. You'll find shareware publishers are easy to work with and eager to help.

Don Watkins is the sysop of CompuServe's IBM NET. He can be reached at CompuServe 76703,750 or P.O. Box 919, Forestville, California 95436.

M1 Tank Platoon.

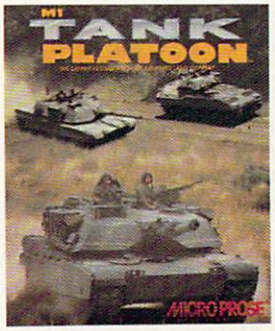
Armored warfare the way it really happens.



You've never known tank combat like this before.

Because no other game captures the thrills and strategy of real armored warfare like M1 TANK PLATOON. Only M1 TANK PLATOON lets you control a full platoon of four tanks, not just one. And only M1 TANK PLATOON lets you conceal your tanks behind hills, like a real commander would, using authentic rolling terrain!

Feel the excitement and the pressure as you lead 16 men into battle with the Warsaw Pact. Jump into any tank and take over any position! Master detailed instrumentation and high-tech weapons. Zoom in on the 16,000 acre battle map, and call for air and artillery support. All with the spectacular Super 3-D Graphics that made us famous.



MicroProse is the first, last and best name in combat simulations. We've advanced our reputation once again with M1 TANK PLATOON.

After you've jumped into real tank combat with M1 TANK PLATOON, anything else will seem like child's play.

Features:

Control four awesome M1 tanks!

Command 16 men! Jump into any tank and take over as commander, gunner or driver

Authentic rolling terrain for real-life maneuvers!

Call for infantry, air or artiller support.

See everything on battle map with 5 levels of zoom!

Spectacular Super 3-D Graphics!

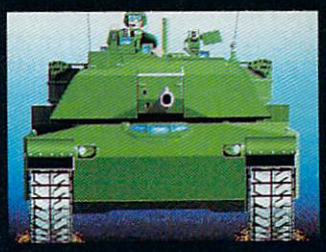
High-tech weapons!

Authentic instrumentation!

Unlimited variety of terrain, weather, battle situations.

Constant stream of landmarks and targets for real life battle action!

You choose when to promote and decorate your men!



Watch for "The Major's Mission" Contest coming to your favorite retailer November 1!

Can't find M1 TANK PLATOON? Call (301) 771-1151 x208, weekdays 8:30 am to 5:30 pm Eastern Time and order by MC/Visa/AmEx; or mail check/money order for $69.95 (specify disk size). U.S. funds only. MD residents add 5% sales tax. MicroProse Software, Inc.; 180 Lakefront Drive; Hunt Valley, MD 21030. *For IBM-PC/XT/AT/PS2/Tandy/Compatibles. Requires 384k RAM. Supports MCGA/VGA, EGA, CGA and Hercules graphics.*

MICROPROSE
Just For Fun.

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If you have a modem, you can find valuable information through many telecommunications services and bulletin board systems. Start with these companies.

Try logging on to Prodigy's Money Talk bulletin board and find the Your Own Business section. People share all kinds of tips and advice, as well as services and support. For information, contact Prodigy Services at (800) 822-6922, extension 205.

The business section of Delphi (3 Blackstone Street, Cambridge, Massachusetts 02139) is well rounded. Commodity quotes, Donoghue Money Fund reports, and Security Objective Services (Stock Advisory) are only a small portion of what is offered. Call (800) 544-4005.

The Working from Home Forum on CompuServe is a place for small-business people to gather electronically. Contact CompuServe at P.O. Box 20212, Columbus, Ohio 43220; (800) 848-8199, or (614) 457-0802 in Ohio.

For a comprehensive news service, try NEWSNET (945 Haverford Road, Bryn Mawr, Pennsylvania 19010). AP DataStream Business News Wire, American Banker, and Bechtel SEC Filings Index are just a few of the specialized categories. Call (800) 345-1301.

Orbit Search Service (8000 Westpark Drive, McLean, Virginia 22102) offers access to large databases. Of particular interest to the homeworker are the U.S. Patent, U.S. Trademark, and accounting sections. Call (800) 456-7248.

PUBLICATIONS

Good reference books are priceless. You can find many useful selections in catalogs and bookstores. Several suggestions are listed below.

Business Applications with Microcomputers, by Jeanne M. Follman; Prentice Hall Computer Books, Simon & Schuster, One Gulf + Western Plaza, New York, NY 10023; (212) 373-8140

MacOffice, edited by Gregg Keizer; COMPUTE! Books, Chilton Book Company, Chilton Way, Radnor, PA 19089; (800) 345-1214

InfoWorld Consumer Product Guide, edited by Jeff Angus; Brady Books, distributed by Prentice Hall Trade, Simon & Schuster, One Gulf + Western Plaza, New York, NY 10023; (212) 373-8140

Working from Home, by Paul and Sarah Edwards; Jeremy P. Tarcher, distributed by St. Martin's Press, 175 Fifth Ave., New York, NY 10010; (800) 221-7945

The Start-up Entrepreneur, by James R. Cook; Harper and Row, Perennial Library, 10 E. 53rd St., New York, NY 10022; (800) 242-7737

How to Run a Business out of Your Home, by Steve Kahn; Longmeadow Press, 201 High Ridge Rd., Stamford, CT 06904; (203) 352-2110

The Self-Employment Test, by Steve Kahn; Longmeadow Press, 201 High Ridge Rd., Stamford, CT 06904; (203) 352-2110

How to Write a Winning Business Plan, by Joseph Mancuso; Prentice Hall Press, Simon & Schuster, 15 Columbus Cir., New York, NY 10023; (212) 373-8140

Fortune Magazine; The Time Inc. Magazine Company, Time & Life building, Rockefeller Center, New York, NY 10020-1393; (800) 541-1000

Entrepreneur Magazine; 2392 Morse Ave., Irvine, CA 92714; (714) 261-2325

Equipment

If you're looking for mail-order equipment, get a copy of The Computer Shopper (Coastal Associates Publishing, 5211 South Washington Avenue, P.O. Box, Titusville, Florida 32781). Most newsstands and bookstores sell it. You will find a comprehensive list of equipment sources and services. For information, call (407) 269-3211. Check classified ads in your favorite computer magazine, too.

Several companies specially design computer furniture with your comfort and productivity in mind. Try O'Sullivan Industries at 100 Gulf Street, Lamar, Missouri 64759; (417) 682-3322. For Macintosh entrepreneurs, ScanCo (P.O. Box 3217, Redmond, Washington 98073-3217; 800-722-6263) offers desks that suit the special size of the Mac and its peripherals.

Organizations

Networking can be your most valuable asset—not local area networking, but people networking. Consider these and other small business groups for support and camaraderie:

American Home Business Association, 397 Post Road, Darien, Connecticut 06820; (800) 433-6361

National Association for the Cottage Industry, P.O. Box 14850, Chicago, Illinois 60614; (312) 472-8116

Check with the chamber of commerce or small business administration in your community for other helpful groups. ⊡

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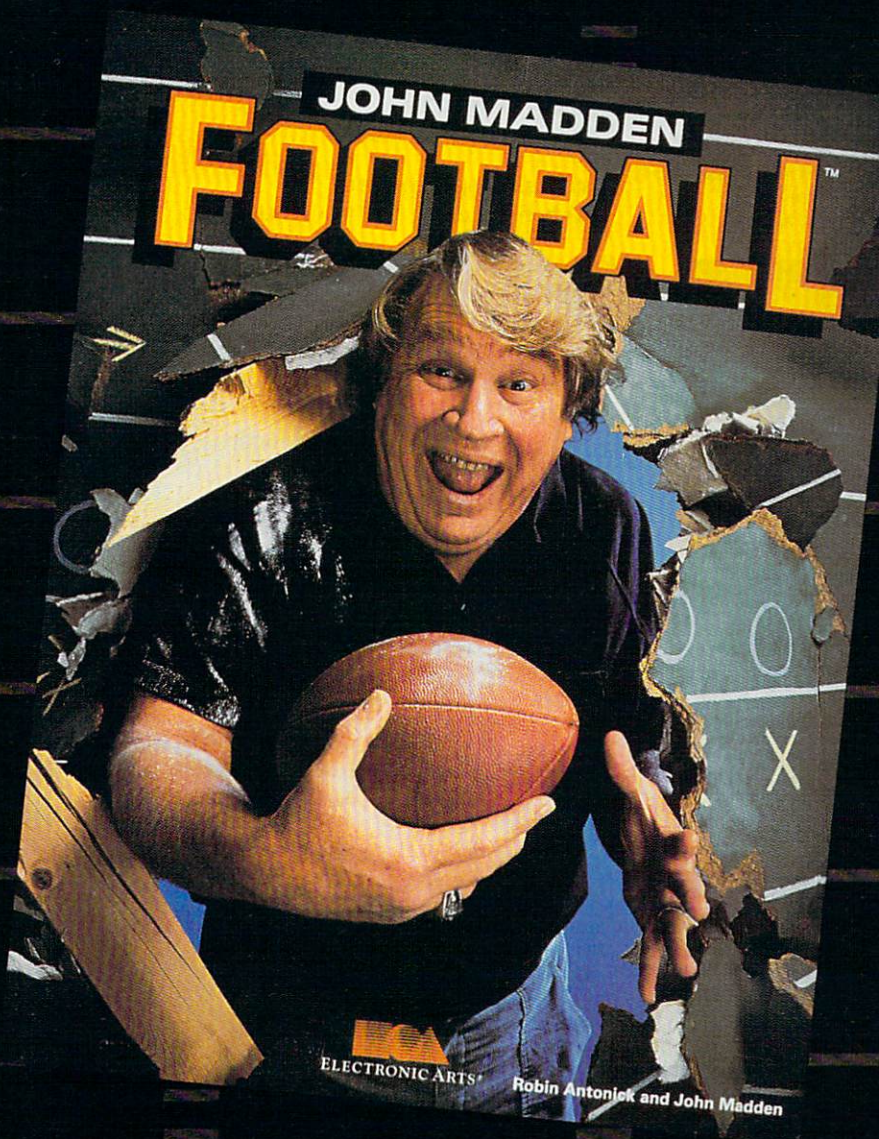

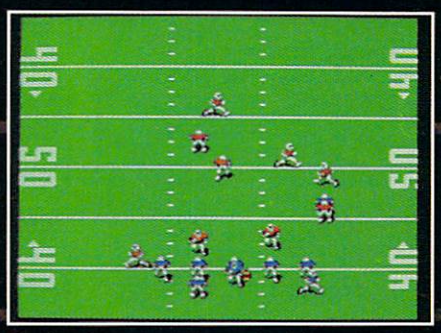

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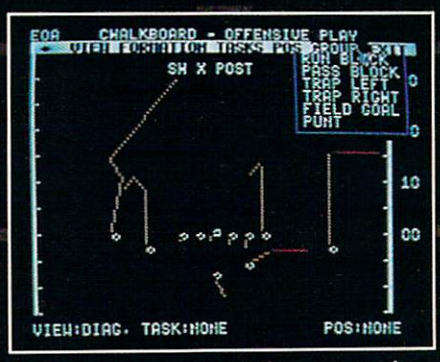

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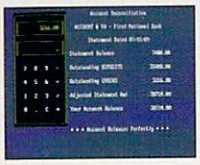

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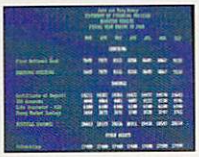

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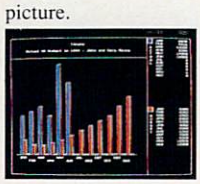

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Account Balancer	YES	YES	YES	YES
Automatic Error Finder	YES	NO	NO	NO
Accounts Can Be Added When Entering Transactions (Data)	YES	YES	YES	NO
Financial Reports				
Actual Financial Results	YES	YES	YES	YES
Month and Year to Date	YES	YES	YES	YES
All Months On One Report	YES	YES	YES	YES
Budgeted Financial Results	YES	YES	YES	YES
Actual Compared to Budget	YES	YES	YES	YES
Actual Compared to Prior Month	YES	NO	NO	NO
General Ledger Report	YES	YES	NO	NO
Accountant's Trial Balance	YES	NO	NO	NO
Net Worth Computation	YES	YES	YES	YES
Inquiry Reports				
Check and/or Deposit Register	YES	YES	YES	YES
Account Analysis	YES	YES	YES	YES
All Transactions with Party	YES	YES	YES	YES
Cash Requirements Forecast	YES	YES	YES	YES
Aged Invoices Payable	YES	NO	YES	YES
Reports Export to Lotus or Quattro	YES	YES	YES	YES
Graphics	YES	NO	YES	YES
Bar Charts	YES	NO	YES	YES
Pie Charts	YES	NO	YES	NO
Optional Password Protection	YES	YES	NO	YES
Financial Calculator	YES	NO	YES	YES
Prints Amortization Schedules	YES	NO	YES	YES
Prints Accumulation Schedules	YES	NO	YES	YES
Mail List Manager	YES	NO	YES	YES
Prints Address Labels and Index Cards	YES	NO	YES	YES
Prints Telephone Directory	YES	NO	YES	NO
Mail Merge with Word Processor	YES	NO	YES	YES
Check Writer	YES	YES	YES	YES
Prints Laser Checks	YES	YES	YES	NO
Prints Any Pin-Feed Check	YES	NO	YES	YES
Personal Income Tax Estimator	YES	NO	YES	YES
Pop-up Note Pad	YES	NO	YES	YES
Pop-up Math Calculator	YES	YES	YES	YES
Optional Canadian Features				
International Dating	YES	YES	NO	NO
International Terminology	YES	NO	NO	NO
Capacity				
Total Number of Accounts Per File	999	255	**	120
Total Number of Open Transactions	100,000	65,535	**	4,000

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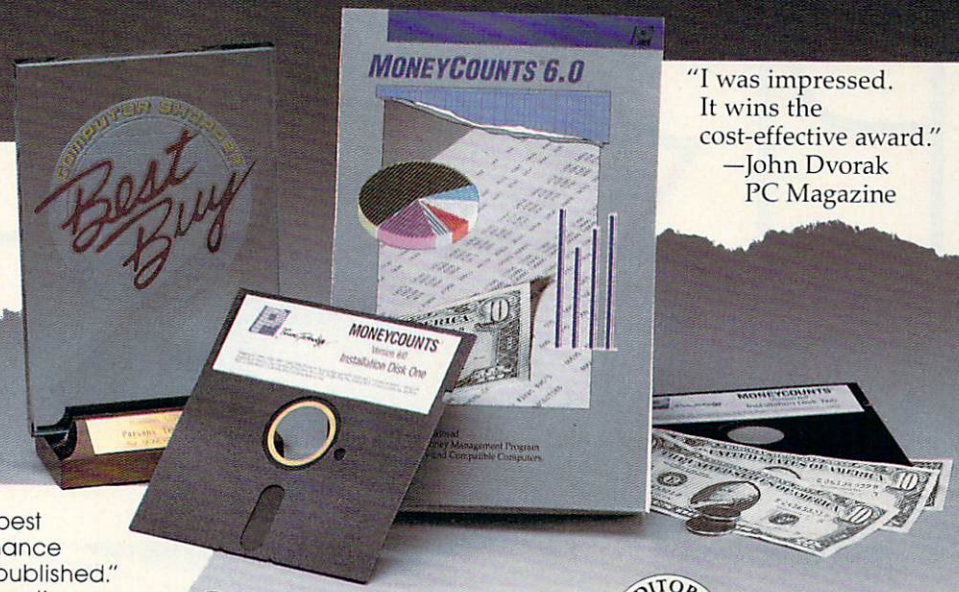

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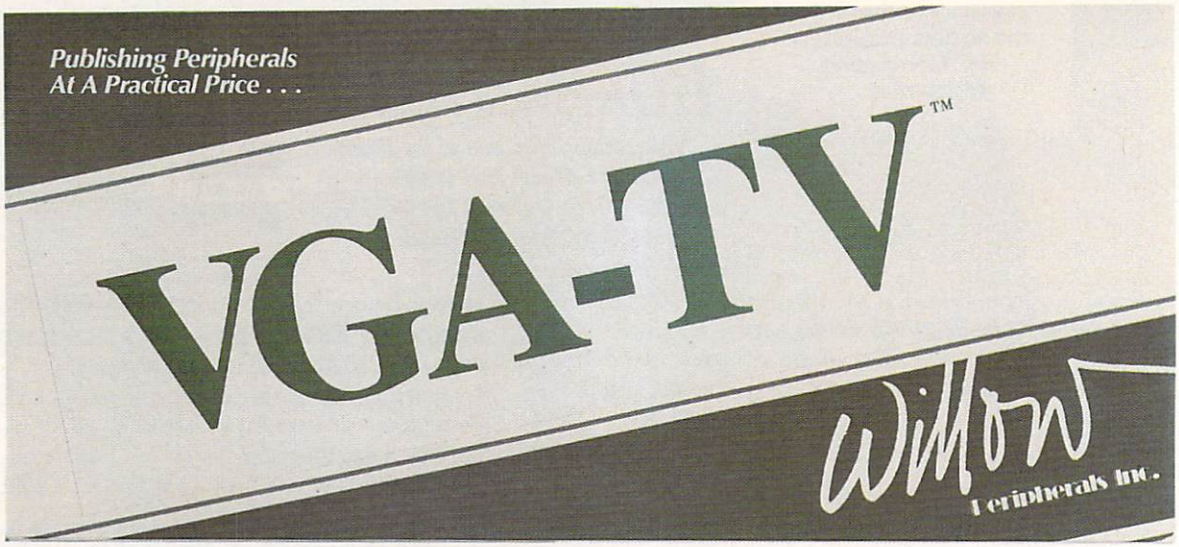


CONVERT VGA GRAPHICS TO TELEVISION SIGNALS AND ENTER THE DESKTOP VIDEO WORLD

COMPUTE! CHOICE

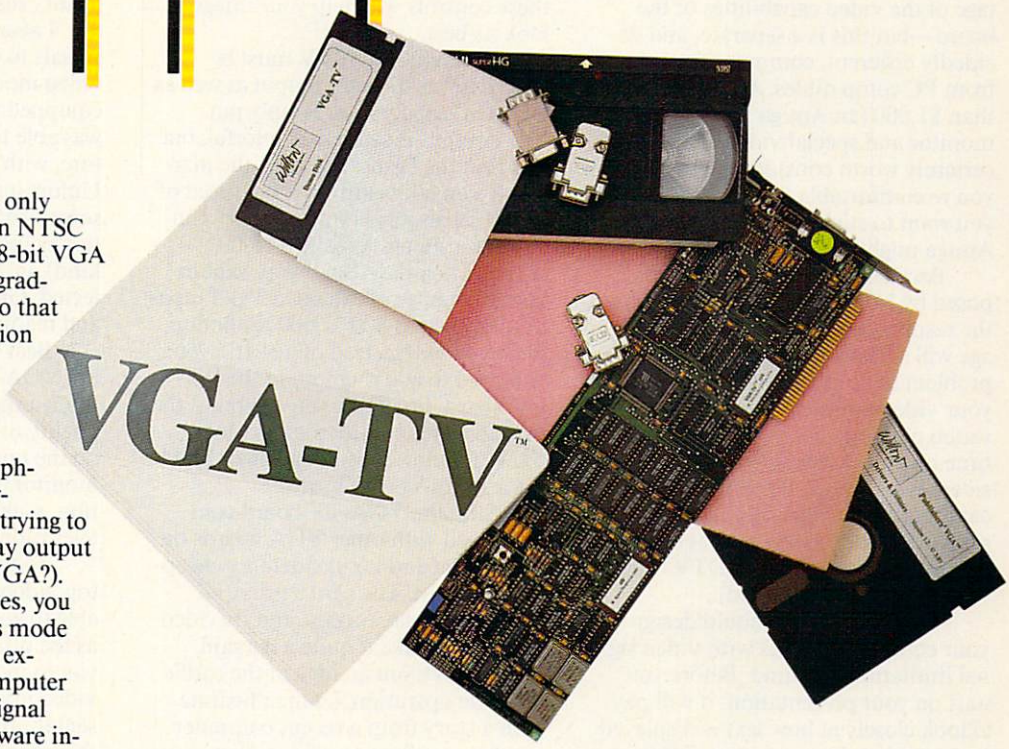
DAVID STANTON

Customers in a New York sports bar cheer enthusiastically while a patron tries to land his F-14 jet on the rolling deck of an aircraft carrier. He's playing a computer game, one that he's played on his home computer many times. Tonight his mistakes cause the jet to roll over the edge of the carrier and crash into the sea. The tavern crowd groans as the animated computer graphics of his plane crash are displayed on the bar's giant-screen TV—the same screen they'll watch later to see a televised sporting event.

A manager for a growing company is teaching two new employees to use the firm's computer accounting program—while she meets some friends for dinner. She can be in two places at once because she previously videotaped an entire accounting session as run by an experienced employee. As she dines tonight, her new employees will view this custom-made training tape on their own home videotape players.

Both of these situations were accomplished using Willow Peripherals' VGA-TV, a full-length, 8-bit VGA board that comes with 256K onboard memory. The name stands for *VGA To Video*; by using a simple software switch, you can change your computer's signal from VGA to NTSC (National Television Standards Committee—the North American video standard). The board is easy to install, requires but one slot, and comes with plenty of software, including a dazzling demo disk. The VGA-TV board's $699 price tag, while not cheap, makes it possible for home users and small businesses to enter the potentially lucrative world of desktop video without decimating their operating capital.

TIVITY



The VGA-TV board not only converts the VGA signal to an NTSC signal, it's also a full-fledged 8-bit VGA card. If you're thinking of upgrading to VGA, this board will do that and also will give you the option to convert to a video signal.

Willow's card installs in a full-length slot. To ensure proper operation, you'll have to remove any other graphics cards from your PC (otherwise, your CPU will go crazy trying to determine what kind of display output you're shooting for—EGA? VGA?). Using the board's DIP switches, you can select the default graphics mode that best suits your needs; for example, you could set your computer to boot to an NTSC display signal rather than to VGA. The software included with the board also lets you toggle back and forth between NTSC and VGA modes from the DOS prompt, a nice touch.

The VGA-TV board sports an RCA plug that allows connection to most VCRs, to some recently produced televisions (older sets may require an RF converter that connects to the TV's antenna terminals), and to those few VGA monitors set up to accept composite video signals. The card's analog jack serves as a connection to most VGA computer monitors.

With the ability to change your computer's output to NTSC, you have the option of feeding a video camera, recorder, or television monitor straight out of your microprocessor. Put your computer presentations on videotape, and even people who don't own computers can see them. Send your computer's output directly to a projection TV and deliver dynamic presentations to your sales force—without asking everybody to crowd around the computer screen.

With so many possibilities, you may wonder why more computer owners haven't yet taken advantage of the computer/video marriage. For PC users, the reason is that, until recently, there were few ways to accomplish this conversion that weren't expensive, complicated, or both.

VGA and NTSC color displays require five separate signals: red, green, and blue color signals and horizontal and vertical timing pulses. The NTSC signal combines all these signals into one for ease of broadcast and is therefore called a *composite* signal; it requires the receiving unit to break the signal back down to separate, manageable signals. To be compatible, VGA's separate signals must be combined into a composite signal that video technology can use.

It's important to note that the VGA-TV board doesn't allow you to superimpose computer images directly onto video images (for use on a videotape demonstration, for example) because it lacks genlock capability. To understand what genlock does, you have to know a little about how the playback of video signals works: Videotape is played back at the proper speed by making use of sync pulses—sync pulses that are not part of the standard VGA signal. In order to superimpose a signal onto a sync-pulsed signal, like NTSC, you must lock into the sync pulses. This is genlock. You could superimpose signals using the VGA-TV board by first translating the VGA signal into NTSC and then doing the superimposition with video equipment—but it's expensive.

Overcoming all the difficulties of VGA-to-video conversion may make the folks at Willow Peripherals seem more like alchemists than computer-enhancement designers, but people have been converting computer signals to NTSC for some time now. In most cases it's expensive, and in some it's complicated, but there are ways to put computer signals on videotape.

For around $15,000 you can purchase a Yamashita Scan Converter to turn your VGA signal into NTSC. The results from the Yamashita are arguably some of the best available, but with its correspondingly high price, it's way out of reach for the home computer user.

Targa add-in boards from Truevision in Indianapolis have recently become popular; they come in 8-, 16-, 24-, and 32-bit versions. Targa boards accomplish the NTSC-to-VGA signal conversion and offer a genlock capability as well. But at $1,595 (for

the 8-bit version), they're at least twice as expensive as the VGA-TV board. Besides, because the Targa board is a dedicated signal converter, you must already have a VGA board in your computer for it to work.

Amiga owners have had the ability to go to video since that computer was introduced in 1985. An external genlock device is available, and there's a lot of software to take advantage of the video capabilities of the board—but this is a separate, and decidedly different, computer system from PC compatibles. At a cost of less than $1,000 (an Amiga 500 with a monitor and special video cable), it's certainly worth considering, but if you're comfortable with your PC and you want to stick with that format, the Amiga might not be your best choice.

Because of the limitations imposed by NTSC (as opposed to VGA), the resolution of your final video image will suffer a bit. But that's not a problem to keep you from exploring your video options. After all, you watch pleasing video images all the time on your home television. Besides, even though the NTSC signal can't match the high-end computer-graphics displays now available, it's the only game in town (HDTV is still 7–10 years down the road).

This means you should design your computer images with video signal limitations in mind. Before you start on your presentation, it will pay to look closely at how text is displayed on television. In most cases, TV productions use highlighting and drop shadows to improve the readability of text characters.

If text is on a colored background, more pleasing, easier-to-read characters can be obtained by making the text bigger than you might normally use (about 40 characters per line works well). Likewise, if you know your final product is to be video, with its inherent color limitations, you may want to opt for a simpler color scheme in your computer designs.

If you rent videos to watch on your VCR, you may have had to adjust the television's image controls to get an acceptable image. Different inputs may require adjustments to the monitor's hue, intensity, brightness, contrast, and tint controls. When using the VGA-TV card to send signals into a video monitor for presentations, a few minutes spent tweaking these controls will help your image look its best.

Naturally, VGA-TV must be judged for its monitor output as well as its NTSC capabilities. Simply put, VGA output is sharp and colorful, but this isn't the fastest board on the market. It's an 8-bit card, so if the speed of the VGA display is your primary concern, you should look into 16-bit graphics boards. Also, if you want to take advantage of extended VGA capabilities, such as 800 × 600 resolution in 256 colors (instead of just 16), you will need to add memory to the Willow board. For $100, you can boost the card to its maximum memory load, 512K. (Willow is thinking about building a 16-bit VGA-TV card.)

Still, the VGA-TV board compares well with other VGA boards on the market and is considerably cheaper than most. The card's price, its range of display modes, and its video capability make it quite a bargain.

To give you an idea of the card's versatile operation, let me illustrate with a story from a recent computer graphics conference held in New York. A friend attending the show brought some computer graphics on disk (fractal images) to my house, and I invited several people over to have a look. My PC was in its customary setup—short CGA card and mono monitor—and for a moment it looked as though the show was off.

Then I remembered I had the VGA-TV card. I installed it without any trouble, only to realize I lacked the proper cable for my larger TV. Not to be outdone, I ran the signal from the computer through my VCR and from there to the television. That did it. We gathered around and enjoyed the show: outstanding computer graphics displayed clearly on a color television for a room full of people.

I tested the card in a variety of configurations. Recording the computer signal on VHS-format videotape was easy enough and delivered images of pleasantly high quality. I also recorded computer graphics on a Beta-format VCR, as well as on an 8 mm camcorder; both tests gave very satisfactory results.

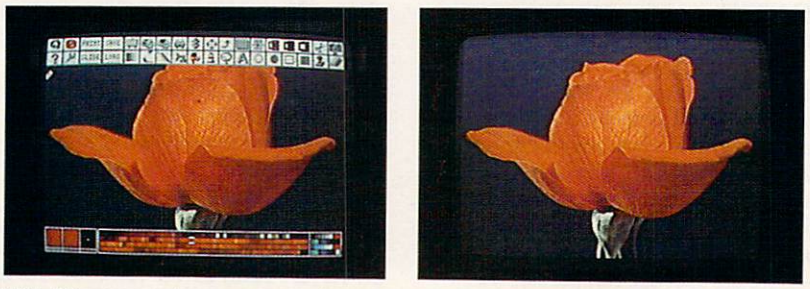
I also used the board to deliver signals to different televisions and video monitors. On a Sharp color TV equipped with a video/TV switch, I was able to produce an acceptable picture, with crisp graphics and colors. Unfortunately, text definition suffered somewhat. When I used my regulation color set (the "under-$250" kind), image quality was severely affected. Graphic details were blurred, and reading text caused eyestrain.

Bear this in mind if you plan to use VGA-TV for presentations. Although the board functions well, the quality of its NTSC output depends on the quality of your television or monitor. If it's an important presentation, make sure you have a very good television.

To fully enter the world of desktop video, of course, you'll need to be able to go from VGA to NTSC as well as the other way around. This allows you to incorporate camera-captured video images into your computer presentations. Although VGA-TV lacks this capability, Willow's first product, Publisher's VGA, allows just such transfers. A board that combined both conversion capabilities would be welcome.

As desktop video gains prominence, signal conversion will become an everyday process. Delivering computer-generated images and information to videotape users—even those that don't own computers—will soon be commonplace.

NTSC is the American standard, but PAL and SEACAM signals dominate in Europe and the rest of the world. Willow is already working on versions of VGA-TV that will generate these signals—and you may need these capabilities sooner than you think. After all, as the powerful video presentations and sales tapes you create with VGA-TV extend your profit margins upward, you may want to take your business worldwide.



VGA-TV converts images created on your computer in VGA *(left)* into NTSC signals *(right)* for display on television screens.

VGA-TV

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IMPACT

DAVID D. THORNBURG

A torrential downpour splatters the windshield, all but blocking the view of the runway below. Except for the altimeter and fuel gauge, all of the plane's instruments have shorted out. The plane is close to stalling, and runway lights are looming closer as the plane drops down for a landing. A last-minute gust of wind tilts the plane to the right as the landing gear bounces on the runway. The pilot, jarred and sweaty, brings the plane to a stop and eases herself out of the cockpit of the flight simulator—a small box in which she has just spent an hour of sheer terror.

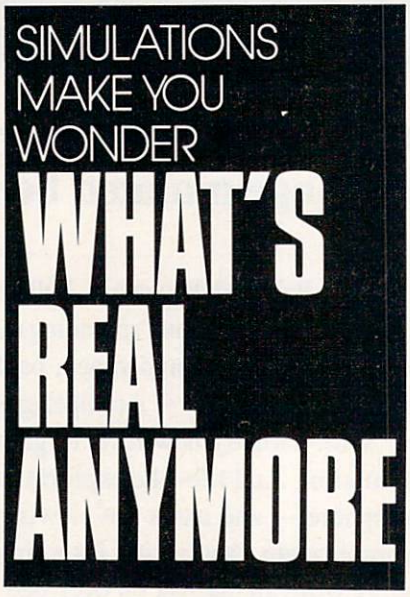
Computer-based simulations have long been used to train pilots of planes and ships, operators of power plants, and other people who work in potentially dangerous environments. Of all the areas where computers have made their mark in the past 30 years, simulations rank among the most exciting. With the simple change of a disk, we have piloted jets, headed up major corporations, and traveled in space.

The computer's task in most simulations can be broken into two parts. First, the program needs to present an interface to the simulated world that is real enough to allow the player to experience the emotional as well as the intellectual aspects of the simulation. For instance, a flight simulator usually has a realistic set of instruments and out-of-cockpit view.

The second major part of a simulation program is the underlying model or set of rules that describes how the simulation responds to the choices made by the player. In some simulations these choices are completely determined by the player's actions (turning a steering wheel turns the car, for example), while in other cases, the player's actions only form part of the computer's response. Other conditions (such as weather) are adjusted by the computer to provide an element of chance and challenge to the player.

Simulations can teach different aspects of the situation they are recreating. The player can gain practice in a complex task when the simulation accurately models the real world. By changing variables in the program, the player can examine the consequences of outside influences and random occurrences on the overall performance of a task.

Consider the most popular simulation program of all: the spreadsheet. Computer-based spreadsheet programs are used to model all kinds of business activities. Most businesses wouldn't dream of starting a new project without creating a computer model of the financial factors involved. By changing assumptions regarding sales, product-development costs, or delivery times, a company can get an idea of a product's potential for success before investing in its development.



Of course, the result is only as good as the underlying assumptions used to create the model. Bad assumptions may result in a glowing prediction that is never realized in the real world.

When viewed in this light, the only difference between programs like *Flight Simulator* and spreadsheets is subject area and the ability of the user to change the game's rules.

While few would argue with the power of simulations in the recreational, educational, and business domains, there is another field into which simulated reality is growing by leaps and bounds: music.

Until a few years ago, music synthesizers were sophisticated waveform generators that created musical sounds through the use of oscillators, filters, phase shifters, and other circuit elements that could be adjusted to create a wide variety of timbres. The creation of a sound consisted of selecting a basic waveform and then specifying the attack, decay, sustain, and release parameters for the sound. By blending several such patterns together, one could create rich sounds that, in some cases, resembled the sounds of traditional instruments.

While there will always be a place for music synthesizers of this type, many of the newer synthesizers use sampled sounds. A sampling synthesizer is provided with a sound from a traditional source, such as water dropping onto a sheet of metal. This sound is converted into a set of numbers which, when processed through a digital-to-analog converter, will reconstruct the original sound. If the sampler digitizes the sound in sufficiently high resolution, the result sounds amazingly like the original.

Once a sound is sampled, it can be played back at different rates to produce different pitches. It can be played backward, looped onto itself, or even cut into slices that can be combined with other sounds. Once the sound is digitized, there is virtually no limit to what you can do with it.

Many recordings and live performances take advantage of the high-quality samplers to provide complete string sections, percussion, or other effects. I was amazed to find that one of my favorite recordings of the *1812 Overture* used sampled church bells during the finale. The next time you listen to your favorite music, ask yourself: Is it real or is it a simulation? ⊡

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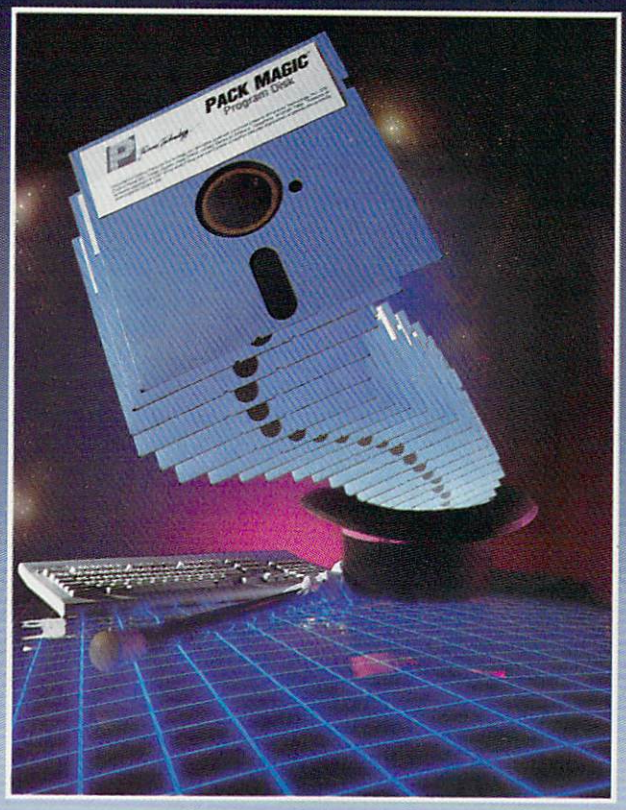

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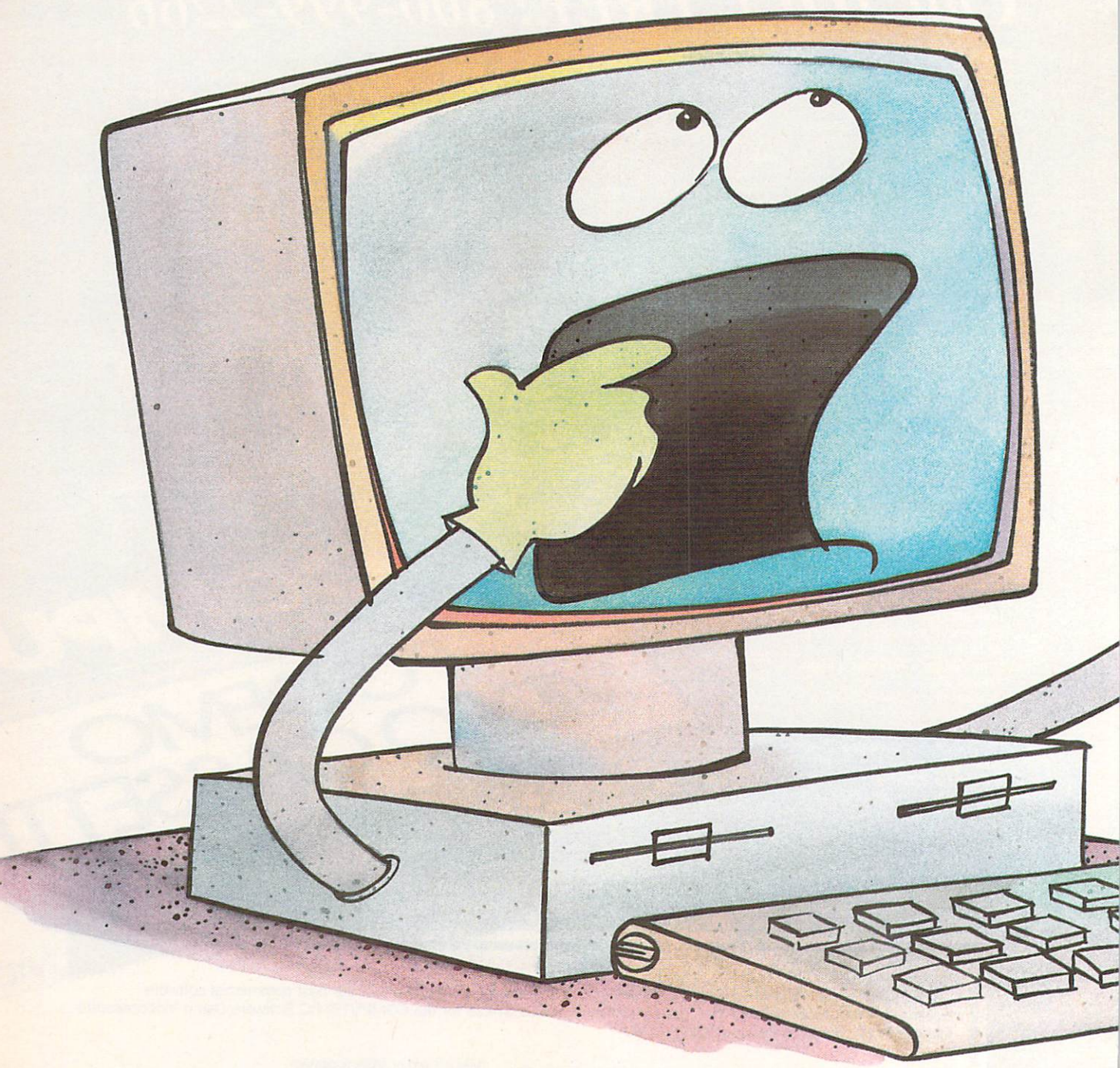
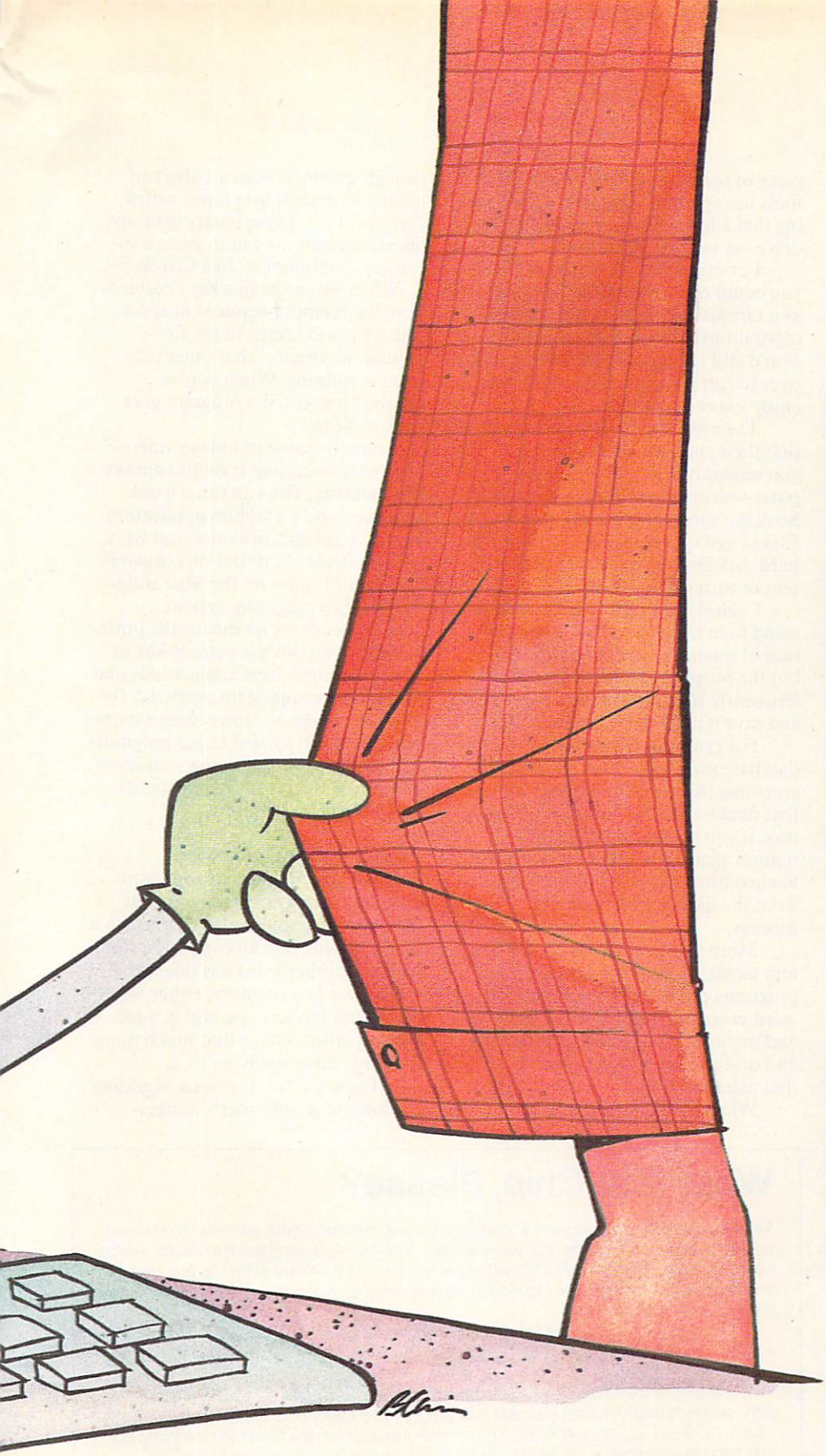


WHEN YOUR PC'S STOMACH GROWLS, FEED IT



SOME MEMORY CHIPS

PLEASE FEED THE PC

DAN GOOKIN

Beep. Out of memory. That new word processor you bought is hungry. And RAM is what it needs. It doesn't want more disk space; it doesn't want more ROM. Disks are for long-term storage—great for hibernating data, but not so great for a red-hot software application. And ROM (Read Only Memory) remains unchanged at the heart of your computer: Your software can't get a bite out of it. It's RAM (Random Access Memory) or nothing. If you want to put some more RAM on your computer's menu, this article can give you the right recipe.

Computer Nutrition

In microcomputers, RAM is temporary storage, organized into locations and accessed by addresses. These locations hold values representing program code, data, or other interesting information. The more memory you have, the more locations are available for storing information and the more

things your computer can do.

Today's personal computer systems can have and use about one megabyte (1MB, or 1024K) of RAM, with a potential to go up to 4, 8, or 16 megabytes. The way that memory is organized and how your computer uses it depends on two factors: the computer's CPU, also called a microprocessor, and its BIOS, which is a collection of ROM routines.

The microprocessor sets up limitations on how memory is used in your computer. Eight-bit microprocessors usually handle up to 64K of memory, while 32-bit microprocessors can handle up to four gigabytes of memory.

A computer's BIOS, which really makes up the personality of the computer, is stored in ROM. The BIOS also plays a part in how your computer's memory is organized, by "reserving" certain locations in RAM for itself and device drivers. Sometimes those reserved BIOS locations complicate future memory expansion.

For example, the 8088 processor on the IBM PC limits RAM to one megabyte (about 1 million memory locations). The system uses the upper 384K of that for the BIOS, video memory, and expansion cards. That leaves 640K for running programs, storing data, and other tasks. Because of this, MS-DOS was originally written to address only 640K of memory. Even though the 80286 and 80386 chips allow the system to use much more than one megabyte of memory, MS-DOS is still limited to 640K. Other operating systems, such as OS/2 and UNIX, can use the larger amounts of RAM with no problem, but DOS must juggle the higher memory addresses into a window of RAM in the 256K–1MB area.

Exercising Your Healthy Computer

Why does your computer cry out for more memory? So that it can do more. Most computers come with just enough memory. You can always use more because programs just keep getting bigger and bigger.

Not every program uses all the memory in your system, though. Put that excess memory to good, practical use and it won't be excess anymore.

Aside from running programs and managing normal system operations, your computer can use excess memory for a number of things.

The oldest and most traditional way to use extra memory is to create a ramdisk. Basically, you run a special piece of software (called a *driver*) that fools the operating system into believing that a hunk of memory is a disk drive—a very fast disk drive.

For example, on a PC with 640K, you could use 360K of that memory as a ramdisk, giving you the storage capabilities of another floppy drive. You'd still have plenty of memory left over to run programs, but you'd also enjoy a speedy ramdisk.

The only drawback to ramdisks is that their contents disappear when you reboot or turn off your computer—as do all the contents of RAM. So make sure you copy any important files stored on a ramdisk to a floppy or hard disk before you reboot the system or turn off the power.

Caches are a bit harder to understand than ramdisks. They use a portion of memory, just like a ramdisk, but the purpose of a cache is to store frequently read information from disk and save it in memory for quick access.

For example, if you're running a database program that is continually accessing the same data from disk, that data is saved in the cache. That way, if you need to read the information again, it would be quickly fetched from the cache rather than from the disk, speeding up the process.

More memory also lets your system tackle some of those really huge programs out there. Big spreadsheets, word processors that incorporate text and pictures, color graphics programs, and drafting applications just love that extra memory.

When you have more than enough memory, you can also run memory-resident programs, called *TSRs* on PCs. These handy little applications wait for you to press a special key combination, like Ctrl-Shift-A. When you press this key combination, the memory-resident program wakes up and jumps to the foreground, no matter what other program is running. When you've finished using it, the program goes back to sleep.

Finally, some of today's microcomputer operating systems support multitasking. You can run a word processor and a graphics application at the same time, provided you have enough RAM. You find this capability in MultiFinder on the Mac and in the Amiga's operating system.

These are by no means the limits to which you can use extra RAM in your computer. New applications and utilities are popping up every day to take advantage of your system's memory. The trend toward larger programs will not stop, so upgrading your memory now will have definite benefits and payoffs in the future.

Feeding Your Computer

You can add memory to your computer in two ways: directly to your computer's motherboard or through a card you plug into an expansion slot (if your motherboard has one). The memory is just memory, either way. So, no matter how you add it, your system will still have that much more memory, up to 640K on PCs.

There are two methods of adding memory to a computer's mother-

What Size Chip, Please?

Memory chips come in sizes of 256 kilobits or one megabit. There are other sizes available, but these are the most common. Individual chips are assembled into banks, which make up either 256K or 1MB (1024K) of memory. Since there are eight bits in a byte, you need eight 256-kilobit or eight one-megabit chips to make either a 256K or a 1MB bank of RAM, respectively.

The exception is the IBM PC and compatibles. These machines need nine chips in a bank. The extra chip is used for a *parity* bit. The parity bit verifies that the PC's memory is working properly.

Aside from their sizes, chips also have speeds. The speed of a chip is measured in nanoseconds (ns). A nanosecond is one billionth of a second. Common speeds are 150 ns, 120 ns, 100 ns, and 80 ns. The smaller the number, the faster the memory. For fast microprocessors, such as 20MHz 80386s and fast 68030s, you need a minimum speed of 100 ns, but ideally you'd use chips running at 80 ns or faster.

Slower chips are still usable, but they cause *wait states*. The microprocessor is continually reading data from and writing data to the computer's memory. If a microprocessor is faster than the memory, it has to wait for the memory to catch up with it. This wasted time is known as a wait state. For the run-of-the-mill XT, 150-ns memory is fast enough to avoid wait states. On a faster AT, 120-ns chips will do fine.

Put this information to work when you buy memory for your computer. You should specify the size of the chips (256K or 1MB), the number (eight or nine), and the speed (in nanoseconds). If you're unsure, consult your dealer or your system's technical reference manual.

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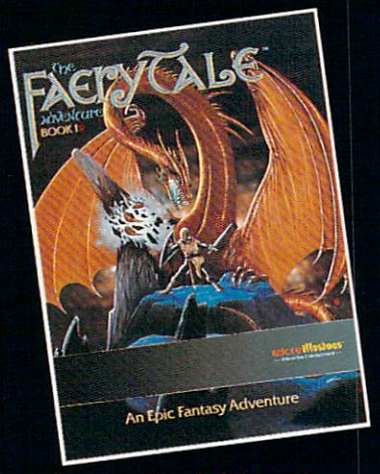

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board: You can plug the memory chips directly into socketed holes on the motherboard, or you can plug in a tiny card of chips called a *SIMM*. SIMM is an acronym for Single In-line Memory Module. SIMMs can be more convenient and easier to install than individual chips.

Upgrading memory on an expansion board is sometimes your only choice; for example, you may have exhausted all the open chip or SIMM sockets on your system's motherboard. Check for an open slot. If all of your slots are full, consider removing one card and getting a combined memory/something-else board. For example, you could use a memory board that also contains a serial and a parallel port.

Once you locate an open slot, you can choose from a variety of memory boards on the market. (Check the "Buyer's Guide" in the September issue for detailed information.) In general, you should beware of AT-only or PC-only memory-upgrade boards.

Nearly every memory board will come with some memory chips on it. Usually 256K or 512K—just something to get you going. If you want more memory, you'll have to buy it and plug in the chips yourself or ask your dealer to do it for you.

As with the motherboard, you plug the added memory into rows of chip sockets or SIMM slots on the memory board. Some boards allow you to upgrade one bank at a time—for example, one row of 256-kilobit or one-megabit chips—where other boards insist on an upgrade of a multiple of either 512K or 1MB. Check the board's technical manual. Nothing is more distressing than buying one bank of chips only to come home and find that you're one or three banks short.

On some systems, especially IBM compatibles, any time you add memory you'll need to change some DIP switches to let the computer know about the new memory. For the ATs and 386s, there's a setup program in the system's ROM that informs it of how much memory is installed.

Second Helpings

Your word processor is satisfied, for a while at least. You can run your favorite TSRs—an address book, a calendar, and the memory-resident version of *Tetris*—and all your applications run faster.

Don't get the idea that your computer won't beep at you again, though. The hunger for RAM is endless. Programs keep growing, the need for speed beckons seductively, and multitasking waits patiently for you to summon it. So start cooking up some nutritional RAM treats now to keep your computer happy later. ⊡

Dan Gookin is, as far as he can remember, a programmer and writer in San Diego. He writes "Off Line," *COMPUTE!*'s monthly humor column.

Extended or Expanded?

There will always be confusion in the IBM world about extended and expanded memory. Let's clear that muddy puddle once and for all.

- Both types, extended and expanded, are memory above and beyond the 640K brick wall in DOS computers.
- Extended memory is only available on AT or 386 computers. (Remember—XT computers cannot use eXTended memory.)
- All PC compatibles can use expanded memory, provided they have the right EMS, or Expanded Memory Specification, software.

Extended memory (remember, only on ATs or 386s) is used mainly by operating-system applications to run programs in the protected mode. For example, OS/2 uses extended memory (it needs 1.5 megs of it) to run. Other advanced operating systems use that memory as well, yet it's not as popular or as well received as expanded memory.

Everyone can use expanded memory. Although you can't use it directly for programs, you can use it as speedy memory storage for some applications, as well as for disk caches and ramdisks.

Many applications use expanded memory for fast memory storage. For example, the Windows operating environment uses expanded memory. If you use *SideKick Plus*, having oodles of expanded memory really speeds up your work. *Lotus 1-2-3* users can manipulate larger spreadsheets more effectively, and Ashton-Tate's *Framework* makes excellent use of expanded memory. Not all programs use expanded memory, so check the software package.

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HINTS AND TIPS FROM OUR READERS

HANDY DOS COMMANDS GIVE DIRECTORY ASSISTANCE

The DIR command, which shows a disk directory, is probably the most used DOS command of all, yet it holds much untapped potential.

If you have a lot of files on your disk when you execute a DIR command, the listing scrolls faster than you can read it. Luckily, the DIR command comes with a pause switch. DIR /P displays the directory listing one screenful at a time. If you want nothing more than filenames, use the Wide Display switch. DIR /W displays filenames five-across on the screen.

Say you're looking for a letter you wrote recently and you can't recall the filename, but you do know that it has an LTR extension. The command DIR *.LTR shows you all your letter files.

Perhaps you're missing another file. You can't remember the name, but you know it started with the letter *F*. Use the command DIR F*.* and you'll see the possibilities.

Building a directory of a disk in another drive is nearly as easy. DIR B: shows you what's on the B: drive. DIR B:*.TXT shows you all your text files on drive B:.

If your system has a hard disk, it's likely to be full of both files and subdirectory names. Use the command DIR *. if you want to exclude your files from the listing and see only subdirectories.

You can use DOS to sort a directory listing. First, put the DOS SORT program in the current drive or directory. Then enter the following command at the DOS prompt:

DIR | SORT

If you want a printed listing of the sorted directory, enter

DIR | SORT > LPT1:

If you want a disk file which contains the sorted listing, enter

DIR | SORT > *filename.ext*

where *filename.ext* is the name of the file in which you want to store the sorted listing.

Unlike utility programs which sort the directory on the disk, DOS doesn't actually make any changes to the disk—it merely sorts the directory *listing*.

Using some special DOS symbols, the filter symbol (|) and the redirection symbol (>), you can expand your sorting abilities. These symbols allow you to control the way output is routed through your system. Rerouting information that flows from one device to another is called *piping*.

In the last two examples, the output of the DIR command is filtered through the SORT command and then is piped to the printer or a disk file.

The root directory is the main directory of a disk. Every disk, when freshly formatted, has only the root directory. To make additional directories, you use the DOS command MKDIR or MD. For example:

MD LETTERS

This creates a new directory named LETTERS. Directories created in this fashion are called *subdirectories*. A subdirectory may contain files, just as a root directory can, and is sort of like a disk within a disk.

Use the DIR command to display a list of files in any other directory, including a subdirectory. To log on to a subdirectory, use the DOS command CHDIR or CD. For example:

CD LETTERS

Now when you type DIR, the directory that appears is for the subdirectory LETTERS. When you want to know which directory you're logged on to, enter

CD

by itself at the DOS prompt. DOS responds with the current drive letter and the name of any subdirectory you're logged on to. If you're in the root directory, it responds with the drive letter and a backslash.

If you're logged on to a subdirectory and want to move back to the root directory, enter the CD command with a backslash:

**CD **

It's easy to change the DOS prompt to keep yourself informed about which directory you're logged on to. At the DOS prompt, enter

PROMPT PG

and DOS always displays the current drive and directory as part of the prompt. The $P in the command above instructs DOS to print the current drive and directory, and $G instructs it to display the familiar greater-than sign (>).

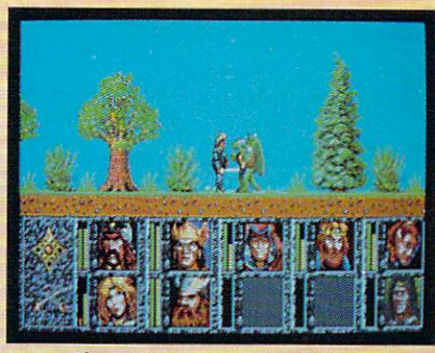
Tony Roberts

Do you have advice that makes a PC more productive? If so, we'd like to hear from you. Send your tip, no matter how brief, to COMPUTE! Feedback, P.O. Box 5406, Greensboro, North Carolina 27403. If we publish your suggestion, we'll send you a gift. ⊡

DRAGONS OF FLAME

Advanced Dungeons & Dragons®
COMPUTER PRODUCT

Tanis confronts a troll before the throne in the Hall of Ancients.



Traveling through the wilderness, Sturm encounters a Draconian.

Set in the legendary DRAGONLANCE® game world, DRAGONS OF FLAME explodes with red-hot action. You control up to ten Companions, one at a time. Your quest: rescue slaves held by the ravaging Dragonarmies in the foul fortress of Pax Tharkas.

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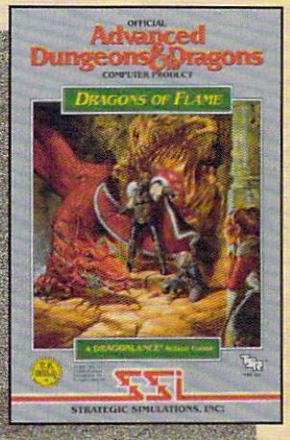
All the terrors of the journey, however, pale in comparison to the horror of your destination. The fortress of Pax Tharkas looms before you, crackling with vile energy.

Can you stand the heat?

CAN YOU STAND THE HEAT?



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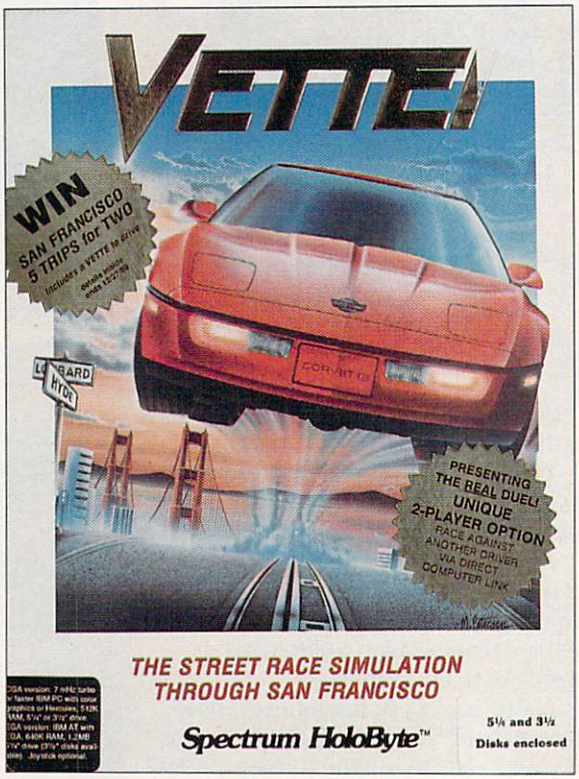


PETER SCISCO

COMPUTE! CHOICE

VETTE! SURPASSES OTHER DRIVING SIMULATIONS IN SCOPE AND REALISM

Cruising San Francisco's Lombard Street at 146 miles per hour, I crest a hill and find myself careening through a pedestrian mall and then flying headfirst into a concrete abutment. If it hadn't been a simulation, I'd be in a heap of trouble.

Powerful cars are the heart of driving simulations, but they aren't the only ingredient of a successful package. Beyond the cars lies the world conceived by the design team. Imagine *Falcon AT* on the ground and you'll have a pretty good picture of Spectrum HoloByte's newest road warrior.

Vette! puts you behind the wheel of America's premier street racer, the Chevrolet Corvette. The Corvette is practically unmatched in its mystique, performance, and sex appeal. On the showroom floor, it's a 3300-pound fiberglass fireball that pushes 245 horsepower to more than 150 miles per hour.

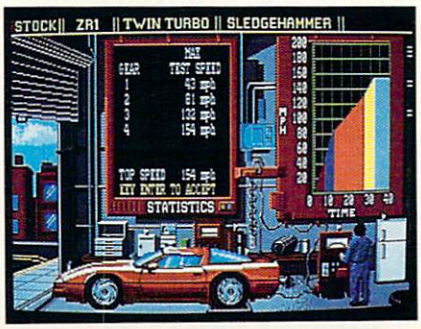
This game packs the entire city of San Francisco into your computer. You're in the driver's seat as you take your little red Corvette over the Golden Gate Bridge, past the yellow rails of expressway on-ramps, through the rolling green of Golden Gate Park, and up and down the hills that define San Francisco.

But while you can tool around town however you like, this isn't your normal Sunday excursion to Fisherman's Wharf. The name of this game is racing. Like Steve McQueen in a high-octane road riot, you're teasing

INMENT

the redline, winding out fourth gear, pushing to make the Bay Bridge in under three minutes.

All the detail that went into developing this game could very well have overwhelmed the sheer excitement of steering your Corvette through the city. But the crew at Spectrum HoloByte succeeds in outstanding fashion. Buildings line the streets, pedestrians pace the sidewalks, traffic moves through intersections; you're free to turn down cross streets, make U-turns, and map out your own route to the finish line.



Choose from four Corvettes and examine their attributes before you hit the streets.

This level of realism is possible because of 3-D solid-modeling graphics. Although some players might object to these stylized representations, in *Vette!* they add a degree of playability that far offsets such complaints. Anyone familiar with the latest generation of flight simulators will immediately feel at home with the boxes that represent trucks, cars, buses, trolleys, and people. And even if the vehicles don't look exactly like their real-life counterparts, you'll recognize them easily. More importantly, the illusion of driving depends on quick graphics processing. Without 3-D modeling, your Corvette would run like a Model T.

There's a price for this sophistication, and Spectrum wants your hardware to foot the bill. You can't really enjoy the IBM version of *Vette!* on anything less than an 8-MHz machine with 512K of RAM. The package ships with one 3½-inch 720K disk, one 5¼-inch 360K disk, and one 5¼-inch high-density (1.2-megabyte) disk. The high-density disk holds an EGA version, and the other two disks each hold a CGA version. For EGA systems without 5¼-inch high-density drives, Spectrum will exchange disks for $3. The game doesn't support Tandy 16-color graphics.

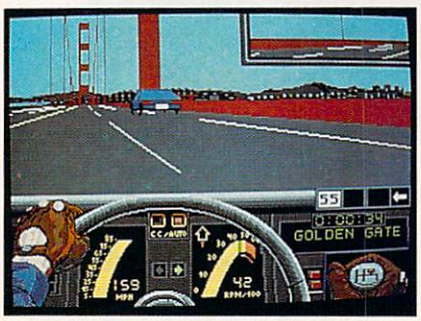
The CGA version of the game works, but isn't as enjoyable as the

EGA version (that's no surprise). In CGA it's difficult to see oncoming traffic and to distinguish vehicles from buildings, buildings from roads, or even roads from other cars. In a nice touch, however, you can reverse the CGA colors, so you can play the game on some laptops.

The game opens in the garage, where four 1989-model Corvettes idle, waiting to hit the streets. Your choices are a stock Corvette, the ZR1 (a six-speed flash that tops out at 180 mph), and two custom Vettes built by Reeves Callaway. One of Callaway's cars is the Twin Turbo (six speeds and a motor that runs the quarter mile in under 13 seconds), and the other is the Sledgehammer (0 to 60 in 4.2 seconds). This last number is the devil's car for sure: It has nearly 900 horses under the hood and runs like a scalded dog.

Although you can drive with a joystick, the game doesn't support one during the introductory screens. Keyboard commands are available throughout the game, as is mouse support. Select your car and test it on the dynamometer, which displays the car's attributes.

Any of these cars will get you where you're going fast, but the real fun in *Vette!* is picking your route. Unlike other driving simulations, you're not limited to a racetrack oval or a cross-country ribbon of road. In this game, the city is your track. The manual describes the four races, but you have to pick the route that will make you a winner. This is no RAC



Chase your rival across the Golden Gate Bridge and into the city.

rally: Traffic laws are for the meek, and in this case the meek inherit the wind—sucking the exhaust of the front runner.

Use the game's three skill levels to gain proficency with your car and to learn your way around town. On the Trainee level, it's nearly impossible to damage your car severely enough to summon the tow truck. The Rookie level offers more challenges, and the Pro level is for experienced drivers only—nothing peels a Corvette's fiberglass faster than sideswiping a city bus at 100 mph.

Out on the road is where *Vette!* really shines. Your car's cockpit display (it doesn't seem right to call it a dashboard) tells you everything you need to know about your vehicle and your surroundings. Besides the usual speedometer and tachometer (both digital), you have indicator lights for cruise control, automatic transmission, even turn signals that blink when you change lanes or take a side street.

Beyond these instruments, Spectrum has enhanced your Corvette with a lap-time clock, a display panel that names the street you're driving on and the upcoming cross street, and a four-panel display screen that shows the posted speed limit, traffic signals, and road signs for upcoming streets and intersections.

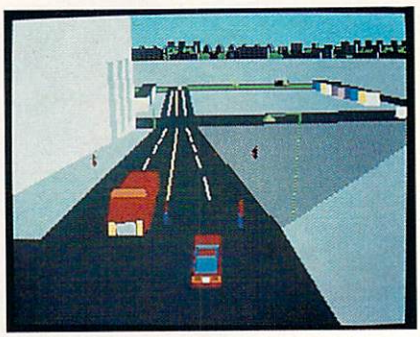
Keep an eagle eye on all your instruments if you want to make it to the finish line in one piece. If you get confused, you can pause the game and consult the street map. Or, if you like, you can press the H key to display an on-board map that pinpoints the location of your car. (That little extra is ahead of its time—the major car makers are working on such on-board maps for passenger cars but have yet to solve the problem of storing the vast amounts of data needed to keep the map up to date.)

Other nice touches include documentation designed to look like a Corvette owner's manual, a topographical map (with hidden messages), a card diagram of the keyboard commands, and a quick-start card.

You may choose your computer opponent from four barely street-legal roadsters: a Porsche 928, a Lamborghini Countach, and two Ferraris—the Testarossa and the F40. Also, like a few other games that have come out recently, *Vette!* takes group entertainment seriously by allowing you to play against a human opponent by modem or through a null-modem cable.

You'll have some obstacles to contend with, including traffic, jaywalkers, and the ever-vigilant police. I enjoyed the light touch Spectrum used with the police car: If an officer pulls you over for a violation, the game offers you several excuses so you can try to talk your way out of trouble. Some work, some don't. I'm just glad the cop in this game isn't Harry Callahan—he'd empty his Magnum into me for some of the stunts I've pulled in this game.

Spectrum's attention to detail pays off handsomely. If you want to change your perspective on the game, the F4 key whisks you to a helicopter view high above the action. This is a great position if you're bent on making the best time, but it replaces the game's realism with a simple arcade scroll. If you want to add more realism, you can toggle off the front dash display so that all you see is the road ahead and the world growing smaller in your rearview mirror. This is the closest thing to looking out an actual windshield that I've ever seen in a driving simulation.



A helicopter view gives driving a new perspective.

As with any simulation, *Vette!* has its quirks. Things get especially weird at high speeds; for instance, once, I drove right through the side of a bus without a scratch. I know I was speeding—but a complete mass-to-energy conversion? I witnessed a few airborne vehicles and watched one tanker truck drive across the surface of the bay. These little bits of strangeness didn't harm the overall game experience; in fact, I found them amusing.

I was disappointed in the game's sound. I wish Spectrum had elected to support a couple of the sound cards that are gaining popularity. I also wish that one of the Corvettes of choice had been a vintage Stingray from the sixties complete with analog speedometer and tachometer.

Still, even with these limitations, *Vette!* surpasses other driving simulations in its scope and realism. Although other games have made strides in depicting the driving experience as shifting scenes, instead of routine scrolls, none of them match the wide-open feeling that *Vette!* so successfully emulates.

Vette!

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GAMEPLAY

ORSON SCOTT CARD

Several years ago, when *COMPUTE!* and I were young, I wrote an article in which I called for constructive computer games—games that would let players build something and then would bring it to life. My example was a program to create a network of railroads. You lay down the track, and then the computer makes the trains go. Simple enough—but no one ever did it.

Instead, it seemed as though all the new computer games were dedicated to putting the player under the control of the computer instead of the other way around. The arcades are full of them now: games that train you to respond reflexively, allowing you no choices, giving you no chance to create.

The drought is over. Indeed, with two remarkable new games, *SimCity* and *Populous,* it feels as if we're in a deluge of brilliant world-creation games. In our house right now, the chief complaint is that we have only the Amiga versions of both games, so we can only have one of them running at a time!

SimCity does all that I had ever hoped for—and more. Starting with an interesting landscape (forests, rivers, open country) you begin to build up your city from nothing. You build a power plant and then add zones for industry, commerce, and housing.

The traffic moves on the roads. The stadium you build fills up with crowds from time to time. Trains, ships, and airplanes all move through your landscape. And, if you're careful, the citizens will even *like* you; every year you get the results of an opinion poll letting you know just what they think of you.

As a simulation of reality, *SimCity* is superb; even if you know nothing about city planning, you will by the time you're through. (You may even have a bit more sympathy for the folks down at City Hall—or, perhaps, a bit more anger at some of the obvious mistakes they make!)

As a game, *SimCity* is very good, too. Not everything goes smoothly for you: There are shipwrecks and plane crashes, power brownouts, earthquakes, tornados, and even an occasional 90-foot monster that stomps through your town.

My 11-year-old loves the game of disasters. He's the one who enjoys playing out scenarios based on real cities—Tokyo, San Francisco, Rio de Janeiro—as bad things happen to crowded towns. But he also loves the process of building. Just like playing with blocks as a little kid. You build it up, and then you knock it down, as spectacularly as possible.

My gripes are few. The instructions promised that a town can achieve "megalopolis" status, but even when I brought my population above 300,000, it didn't happen. More frustrating was the fact that, unlike real sites, the city maps have edges—but that's a limitation of computer memory.

I'm looking forward to Maxis's proposed *SimCity* sequel—*SimCounty*. I hope eventually they can find a way to combine the games, so that we can keep several cities going at once, interacting with each other.

DELUGED BY
BRILLIANT WORLD-CREATION
GAMES

Populous is another build-up/break-down game, only instead of dealing with a city, you have a considerably larger landscape. To put it bluntly, in this European import (distributed in the U.S. by Electronic Arts), you are a god. You have a group of people who are loyal to you—and therefore good—and a group of hostile people who are trying to destroy you.

As a semi-omnipotent being, wherever you have worshippers, you have certain powers. You can raise and lower land to create level areas where your people can farm. As they get more arable land, they prosper—huts turn to houses, houses to mansions, mansions to castles.

Eventually, though, you have to interfere with the enemy to keep them from overpowering you. Sometimes you'll simply use a moat to keep them away from your people; other times, though, you'll create swamps, volcanos, earthquakes, and floods.

Make no mistake: *Populous* is a game of all-out war. But it is enacted through strategy, not violence, and it's usually won by the player who is least aggressive and most nurturing.

SimCity's controls are all obvious and intuitive. *Populous,* on the other hand, has a confusing array of possible controls, and it takes some learning—and frustration—before you remember what all the strange words and icons mean. Don't let it throw you. After a short time, you'll be playing a god as if you had majored in that subject in college.

Both of these games are visual delights. *SimCity* makes the most of its flat overhead map—it never *feels* two-dimensional. And *Populous* is very clever in the way it simulates a three-dimensional world, and the various landscapes, ranging from desert to glacier, are astonishingly beautiful.

Best of all, you create your own worlds—and determine how hard or easy, how aggressive or peaceful a game you want to play. In short, you control the world of the game, instead of the other way around. ⊡

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(These comments are from the correspondence from real SimCity users. ***Honest!***)

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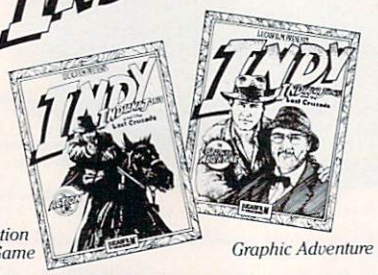

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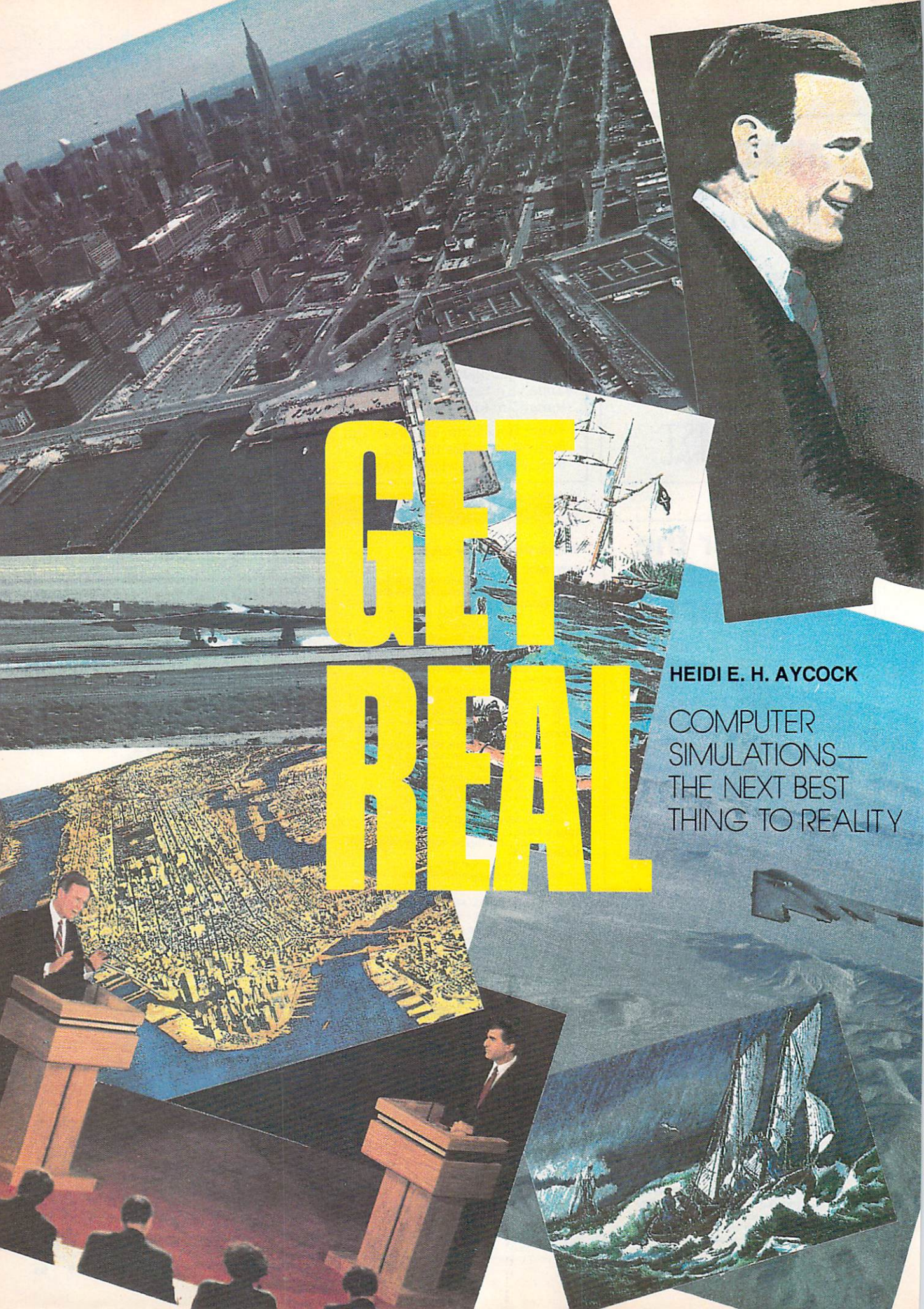

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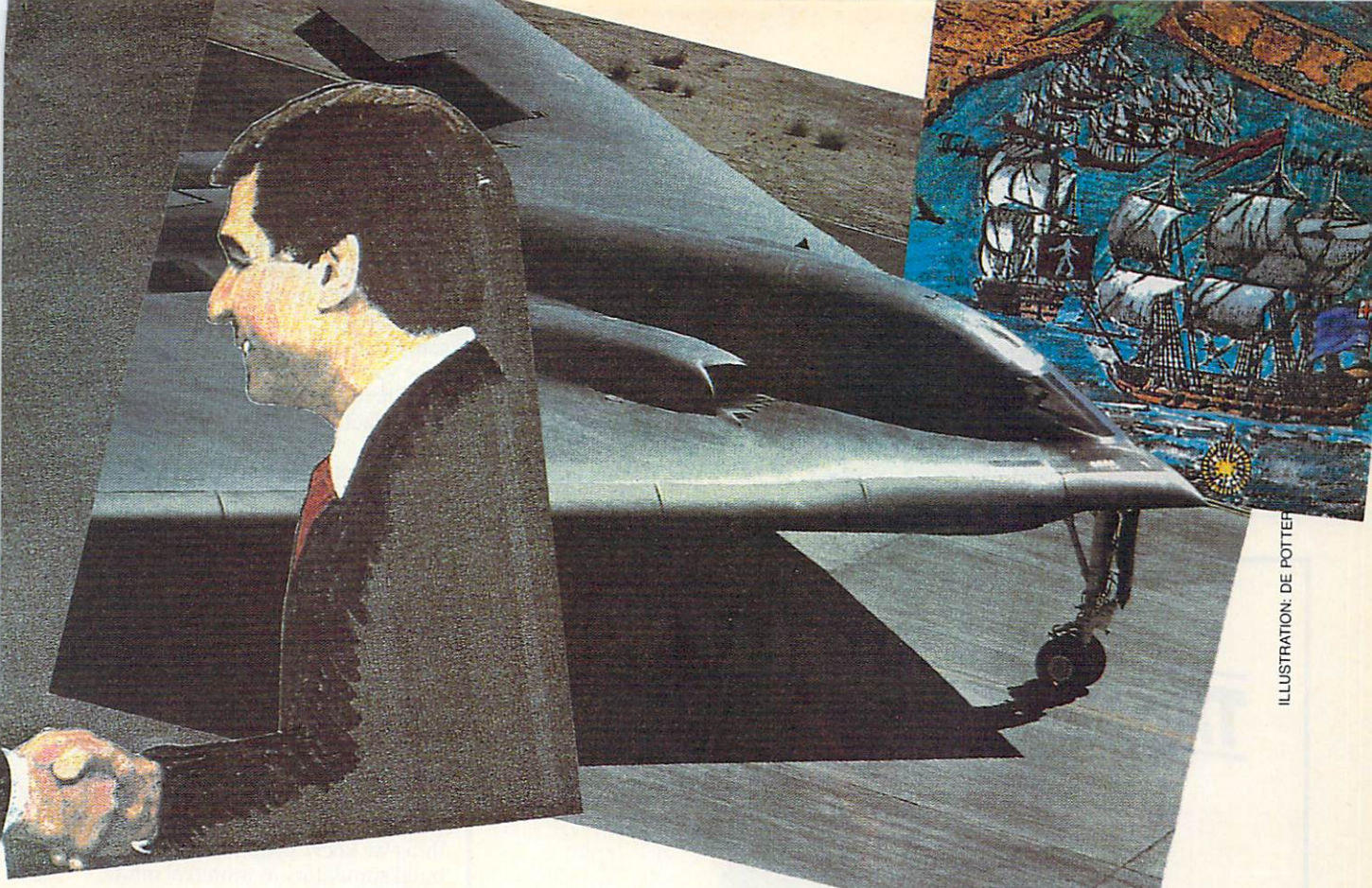
COMPUTER SIMULATIONS— THE NEXT BEST THING TO REALITY



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July 1988: George Bush is 14 points down in the polls. Nelson Hernandez cranks up *President Elect,* his political simulation, and proclaims Bush as the November victor. He predicts the distribution of electoral college votes within 1 percent and the popular vote within 0.13 of 1 percent.

"Dukakis tried to make inroads with the solid South by selecting Bentsen as his running mate," Hernandez says. "I could have told him that wasn't going to work. I consider myself the best predictor of presidential elections in the country."

Maybe he is. Maybe he isn't. But one thing's for sure, simulations are more than just games. City planners can experiment with Maxis Software's *SimCity.* Concerned citizens can learn about Stealth-fighter technology from MicroProse's *F-19 Stealth Fighter.* And eager students can develop a better understanding of our Latin American neighbors by leading Chimerica in Springboard's *Hidden Agenda.*

The Real Feel

Think of a simulation as a possibility engine. It sets up a situation, then lets you change parts of that situation. Finally, it shows you the result of your changes. Simple as that.

"I think *simulation* is a very broad category, and sometimes things are called simulation for lack of a better or more specific term," says Jim Gasperini, senior designer at TRANS Fiction Systems, which produced *Hidden Agenda.*

"Simulation is like a species of theater," he says. "It puts you in a role. You're the protagonist, and the other characters are supporting roles. Then it's like an actor's improvisation workshop."

In a flight simulator, the simulation sets the scene in an airplane, creating your tools (your flight instruments and controls) and creating the factors that affect the plane. Those factors are all the outside influences—from the physical nature of air to the capricious whims of weather—that add to the scene. The simulation designer quantifies the factors by writing an equation to describe how much effect they have on the situation.

In a political simulator, setting a scene is more difficult because the external factors are often human influences. It's much easier to quantify how gale-force winds affect a plane than it is to quantify how general discontent affects a presidential campaign.

Using this process of collecting variables and creating equations, simulation designers develop models of the situations they're trying to set up.

"A model is a way of representing aspects of the real world inside the computer," says Sid Meier, vice president of MicroProse Software and designer of *Pirates!* and *F-19.*

"The model is a key part of computer games, and it's one that has the potential to grow in sophistication in the coming years," Meier says. "That's part of the neatness of the future of computer games. It's the potential we have for making more and more sophisticated and realistic models of the world."

As computers get more powerful and memory becomes more plentiful, simulations grow more complex. And the more complex a simulation can be, the more like real life it can feel.

Adventures in Reality

Some simulations may sound more like adventure games than models of reality.

MicroProse's *Pirates!,* for example, drops you into the middle of the buccaneer age. You captain a sailing ship, collecting treasure and fighting other pirates. The game has many elements of adventure games, but it's still a model of reality. Fencing and sailing are based on the way a real fencing match is organized and the way a real ship responds to winds and storms.

"Even in products that are simulation-oriented, we've added some role-playing to let you start inhabiting the computer," says Meier.

"With people like Sid out there, we're beginning to consider that we can do more with simulation than just simulating a vehicle," says Gilman

Louie, CEO of Spectrum HoloByte. "The reason why *Pirates!* is such a good game is because it does more than simulate the vehicle. There are personalities and people involved."

Ezra Sidran, president of Intergalactic Development of Davenport, Iowa (maker of *Universal Military Simulator*), explains how simulations are different from other games. "Arcade games are more ballistics than anything else. Text games and adventure games are involved with something hard—text parsers, language processing, and riddles. Simulations are very, very heavily grounded in logic. There's just no way around it. If a wizard shows up out of nowhere, then it's not a simulation."

Seize the Possibilities

With a possibility engine, you can predict the future, explore new worlds, try new vehicles, and lead the masses. But the accuracy of the simulation is only as good as its model.

So Spectrum HoloByte's *Falcon* can be a good runway for prospective flyers, but it's certainly no substitute for real flight. You can't hop from computer cockpit to Navy fighter once you've mastered a flight simulator. There's simply no way to model all the factors involved in flying—not yet.

"There are some skills you just can't train for in simulators," says Louie, who designed and programmed Spectrum HoloByte's *Falcon*. His simulators train people in the generics of flying, making real-world training more efficient. He explains that a flight simulator can be a practical lesson as well as a fun adventure. "*Falcon* started off as a computer game," he says. "It's what I wanted to see on my Macintosh. When the product came out, the Air Force saw it and gave us a call. The Navy called us. The Pentagon called us. The next thing we knew, people wanted us to build simulators to train real pilots."

Meier also discourages people from trying to fly a plane with only simulator experience under their belts. "We try to keep our products interesting, but our primary purpose is to create for the player the interesting parts, not exactly what the real world is," he says.

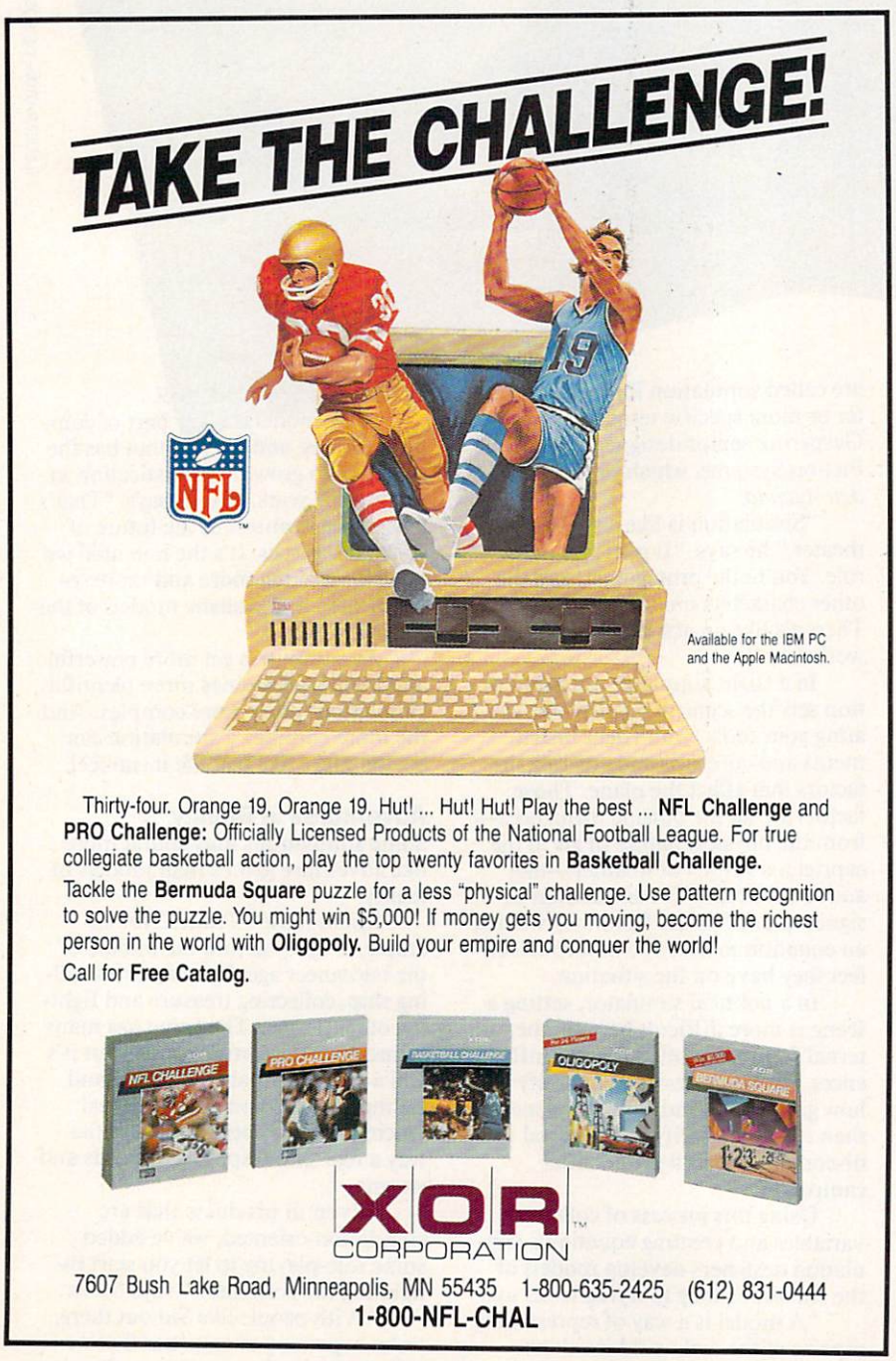
"It's kind of a two-edged sword because there's got to be some realism," Meier says. "The simulation can't be too contrived, but it's not realistic to the extent that you could hop into the Stealth fighter. I don't think you can have both. The real world runs at a little less exciting pace than a game."

Other kinds of simulations, such as *President Elect* and *Hidden Agenda,* don't actually train you in a skill. They teach you about human nature.

"A lot of lessons are implicit," says Hernandez. Heed his teachings and you'll understand how a political campaign works. You'll also learn what factors make or break a candidate.

"I looked at the things that win an election," Hernandez says. "First of all, it's the people involved. What are their personal attributes? These are subjective things, but you recognize that these are subjective and you try to quantify them."

In *Hidden Agenda,* you learn about Latin American politics from the point of view of the people involved. "One of the wonderful things a simulation can do is put you in the shoes of somebody else," says Gasper-



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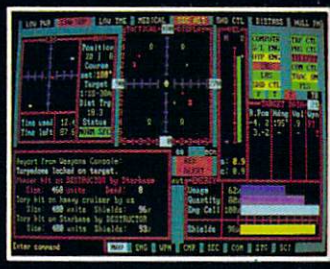

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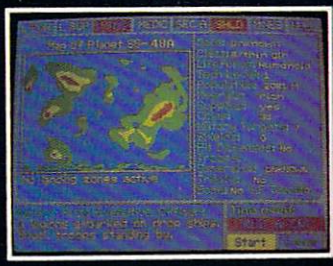

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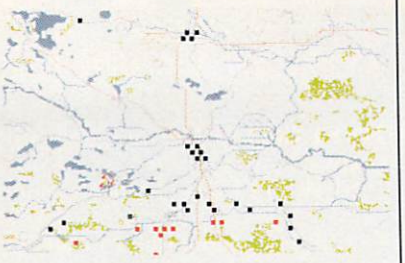

Historical map drawn from 1:100,000 scale maps captured from the Red Army by the Wehrmacht and captured from the Wehrmacht by the Allies.

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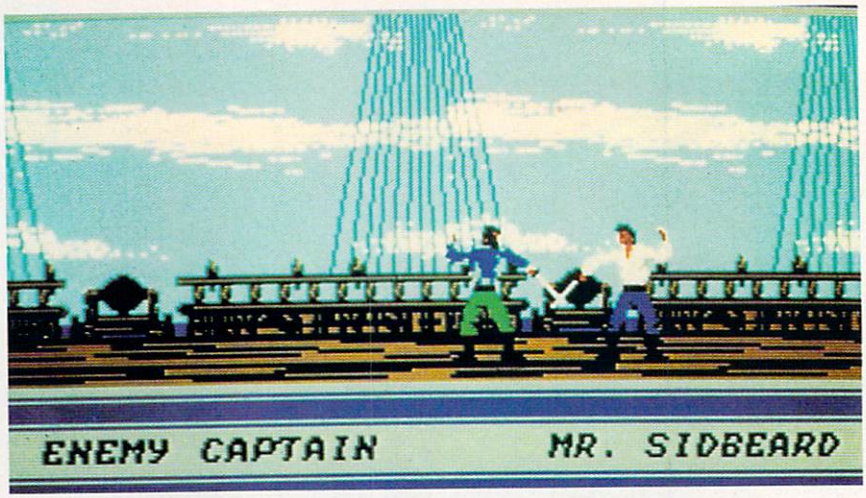
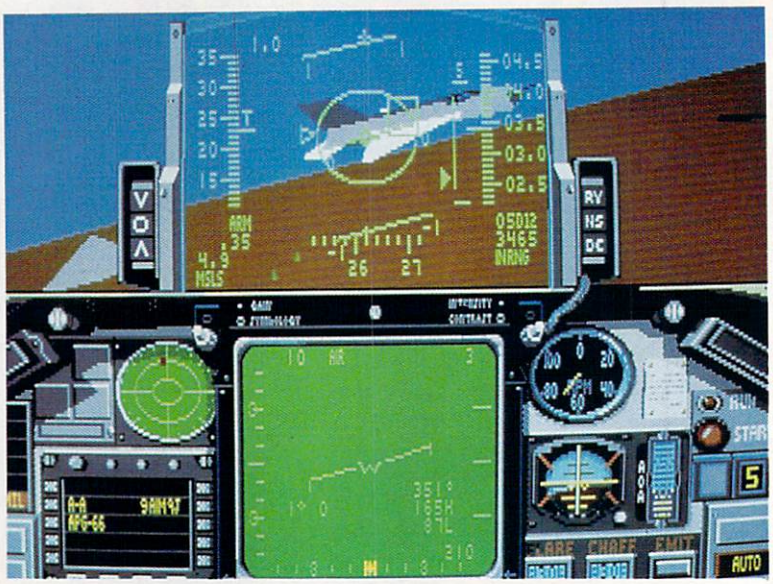


Role-playing features make the *Pirates!* simulation more engaging.



After seeing *Falcon*, the Pentagon asked for training copies.

ini. "It's perspective shifting. Our goal was to put you in the role of a Latin American leader. The more you play *Hidden Agenda,* the more you are encouraged to look at the world as a Latin American would."

You don't learn concrete facts from Gasperini's simulation. You learn about the Latin American experience. "*Hidden Agenda* teaches patterns of conflict, and it teaches what the issues are that are important in Latin America," he says. "Then people can turn around and look at the actual history and current events and be sensitized to the underlying issues that cause these events."

His simulation has attracted the attention of the Foreign Service Institute, an arm of the State Department. That agency uses *Hidden Agenda* in its training classes. Diplomats, drug enforcement officers, and CIA agents alike delve into the world of Chimerica in an effort to look at Latin America in a new way.

For the lessons learned in war rooms, *Universal Military Simulator* is a good choice and a good teacher. The game teaches you general battle strategy. "As far as *UMS* goes, you definitely learn lessons," says Sidran, who designed the game. "You can learn the lessons that Lee learned at Gettysburg, for example. That is, you cannot charge thousands of men across an open field against masses of artillery."

Underneath all the obvious lessons is a lesson about the logical and illogical ways that the world works. Simulations are based on a lot of rules and a few random numbers. But the games are still unpredictable. ▷

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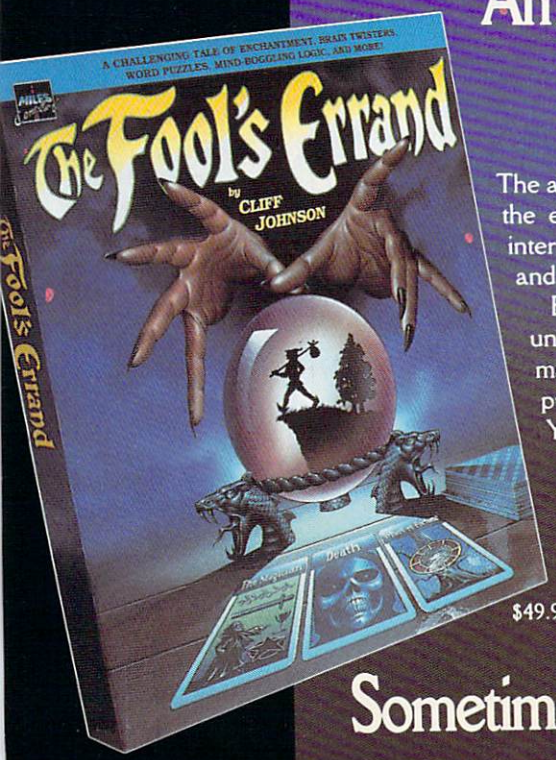

The award-winning *Fool's Errand* is a game like no other. It tells the enchanting story of the fool in his search for wisdom, intertwined with over 80 original puzzles: graphic, word, logic, and more.

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Messin' with the Real Thing

No matter how much you learn about a particular simulation, and no matter how well you understand the underlying model, you can't win with counterintuitive tactics. You can't survive your tenure as Chimerica's leader, for example, by killing everyone you encounter. You can't use your understanding of the model underlying Maxis Software's *SimCity* to build a city that loves pollution. While simulations are based on a quantitative model, the challenge comes from their unpredictability.

"The trick is, if the person who wrote the program loses once in a while then you know that you have a pretty good model that makes the game unpredictable," says HoloByte's Louie.

Many designers agreed that they can't cheat at their own simulations.

"If you understand the simulation, it helps you win, but what messes people up is the unpredictability," agrees Will Wright, *SimCity*'s designer and part owner of Maxis. "Also, you can always run a simulation forward, but you can't run it backward. And, theoretically, you can't compute the final result without going through the game."

Random numbers help account for chance in a simulation and keep the game from becoming too familiar. But there's another element that keeps games from going stale: emergent behavior.

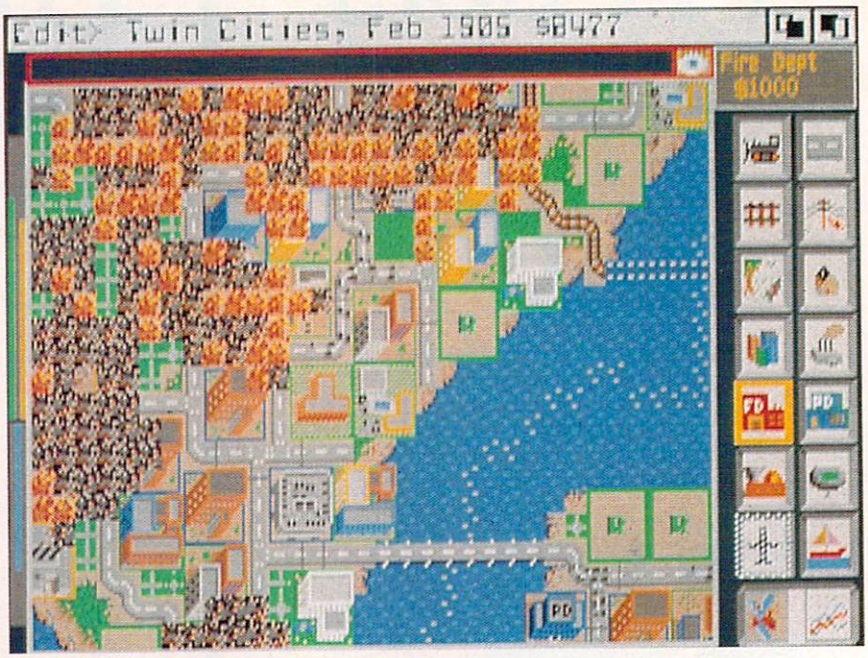
"If you set up properly, you can have a lot of things happen that the designer didn't even plan," Wright says. "It's called *emergent behavior*. It emerges as a result of the rules. It wasn't coded into the program. I think emergent behavior is something we should be striving for."

Emergent behavior and chance combine with recognizable patterns and just enough predictability to give the best simulations a rich sense of realism.

Your World or Mine?

For a taste of other worlds, other jobs, other experiences, you can't beat a simulation. Some simulations provide escape hatches to new worlds. Others act as crystal balls, revealing tomorrow's events.

Simulations have their own tomorrow. Look for more mixing of role-playing adventures and simulations. Look for games that bring futuristic cars and flying machines to your desktop. Experience nonlinear narratives and interactive theater.



Each town is a new city-planning experiment in *SimCity*.

By the way, Hernandez says to look for Charles Robb, a Virginia Democrat, to make a strong run for the 1992 presidency. But if the economy stays healthy, he says, the incumbent Bush can't be beat. Whichever scenario proves correct, simulations will remain home computer winners. ⊡

Heidi E. H. Aycock is an assistant editor for *COMPUTE!*, and the popular mayor of Heidi Hill, her *SimCity* creation.

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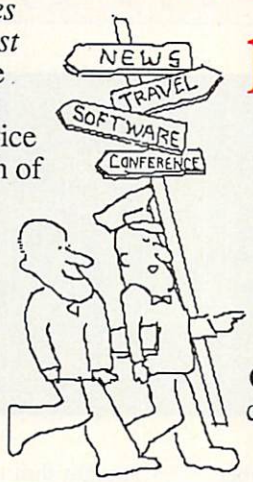

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HINTS AND TIPS FROM OUR READERS

Greens are good for you. Well, at least the ones found on golf courses. Crowds of golfers head out to local courses every weekend to seek sport and relaxation. But what to do on the rainy Saturdays? Silicon golf courses are open 365 days a year, and you never have to pay a green fee or wait to tee off.

You overhear the ABC sportscaster as you line up your shot: "He's 36 yards from the green and should make par. There's the backswing, the connect—*was that a driver?* Yes, he used a wood and the ball went into orbit!" To save yourself from embarrassment and wasted strokes, make sure you select the club that's appropriate for your current shot. A couple of pointers: Unless you're bogged down in a sand trap, woods generally send your ball farther than irons. Also, consult the chart of club ranges that accompanies your golf program—it's like having a personal caddy.

For some shots, you may decide to choose a club with more distance potential than necessary and hit the ball with less than full power. The most obvious case is when you're chipping the ball onto the green. The target distance will almost always be less than the range of your pitching wedge. In any other circumstances, especially around water, you'll find that less-than-full swings will produce less-than-desirable results.

You'll have to make some rough choices when your ball lands outside the fairway and off the green. Shots from sand traps and the rough require extra power. Add 25 percent to the power you would select under fairway conditions.

Regardless of your ball's proximity to the green, an obstacle might determine the club you choose. If you hit a tree from close range, your ball may ricochet and you'll find yourself in a bad spot. If you're pretty far from the hole, you may want to use a two or three iron; but, a lower-number club won't lift the ball above tall obstacles. A five or six iron may not get you to the green but might get you over a tree and back onto the fairway with a clear shot at the hole.

Although straight shooting is normally the best path to a lower score, sometimes using a hook or a slice is a better bet. These two shot deviations have opposite effects. Slicing sends your ball to the right, while hooking veers it to the left. The harder you hit the ball, the more pronounced the effect will be. These shots come in handy on doglegs, holes that bend sharply to the right or left.

Wind adds an element of realism to golf simulations. The higher you hit your ball, the greater the wind's effect on your shot, so you'll need to compensate more when swinging a seven iron, for example, than when swinging a two iron. You can either aim partially into the wind or use a hook or slice to overcome the breeze's force.

Just like in the real game, putting will affect your score more than any other aspect of the game. Two major factors to consider when attempting to successfully sink the ball are distance and slope (or *break*, in some games). On a straight and level surface, you'll find that hitting the ball with enough force for an extra four feet will give you more consistent shots. Remember to adjust the power of your stroke if you're shooting up or down a slope. Grades that cause a straight shot to roll away from the hole are most troublesome. The only solution is to aim toward the high ground. Greater distances need even larger compensatory angles.

Weary of the sublime and a ten-plus handicap? Miniature golf satisfies the need for relief, mostly comic. Here's some advice: Don't go alone, even if you're the only one at the computer. Using multiple players will increase your odds of scoring well and offer you a better chance to master the hole. You're also more likely to get through to the next hole in games that allot a certain number of total strokes for each hole.

If you don't know your own strength, and you're not sure how hard to hit the ball, take it easy. In almost every case, less force is better.

On some around-the-corner shots, you may have to bank it. Consider your shot carefully, play all the angles, and remember some geometry: The ball will come away from the wall at the same angle at which it struck. Good luck with your game, and go easy on the 19th hole!

Richard C. Leinecker

If you've got game tips and shortcuts of your own, we'd like to hear from you. Send your tip, no matter how brief, to COMPUTE! Feedback, P.O Box 5406, Greensboro, North Carolina 27403. If we publish your suggestion, we'll send you a gift. ⊡

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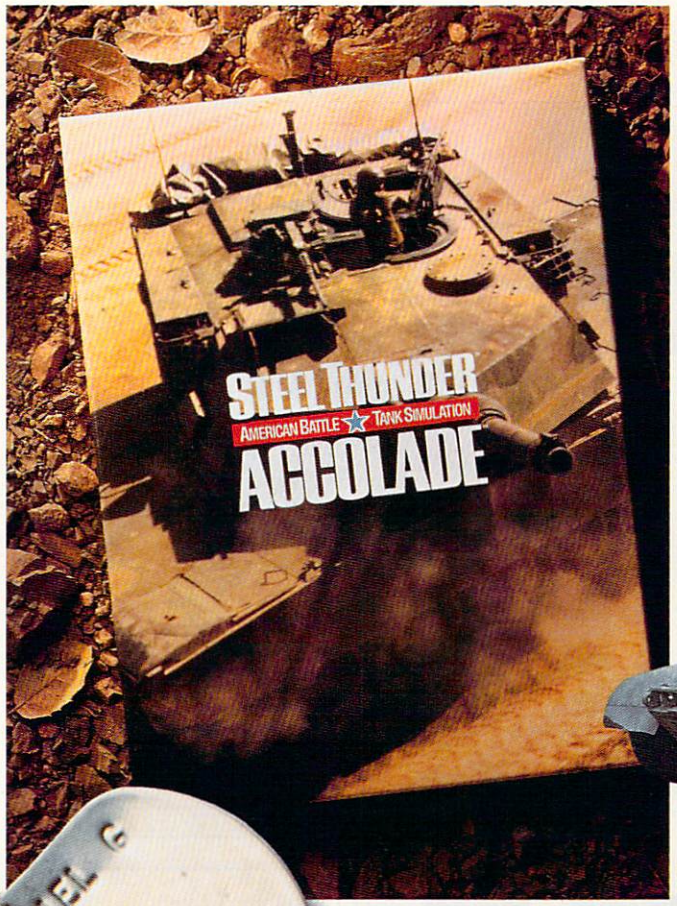

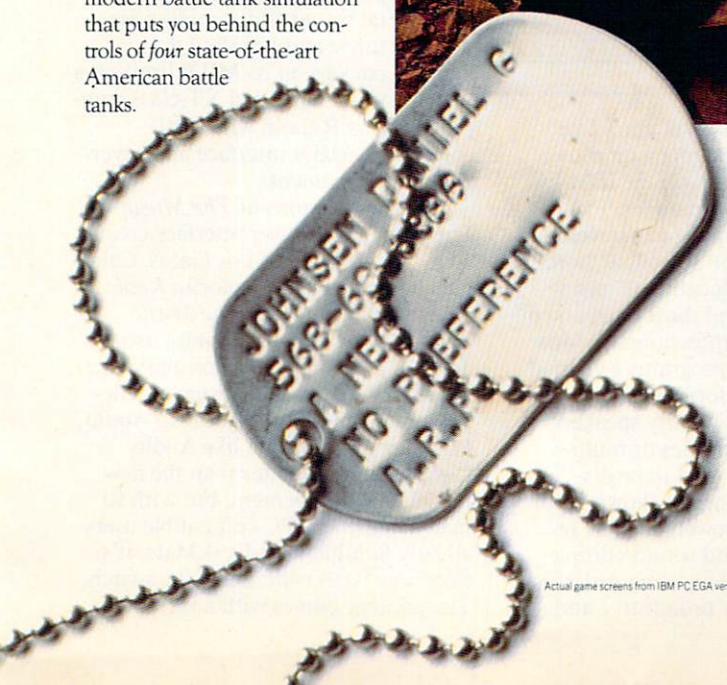

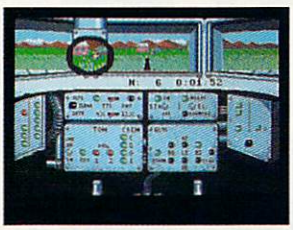

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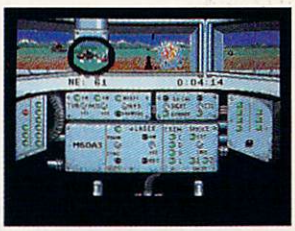

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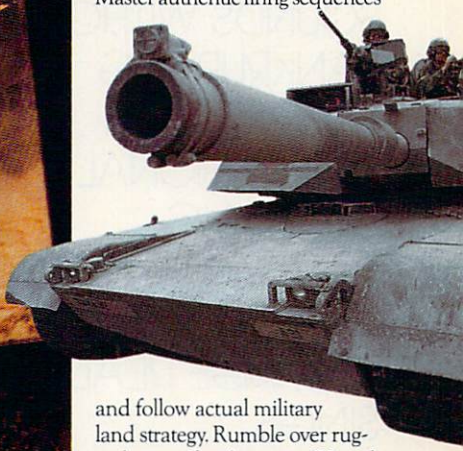

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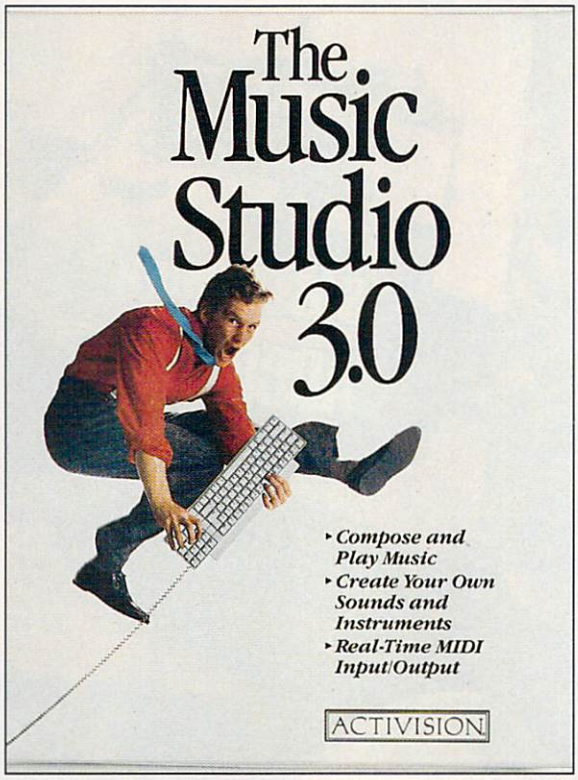


COMPUTE! CHOICE

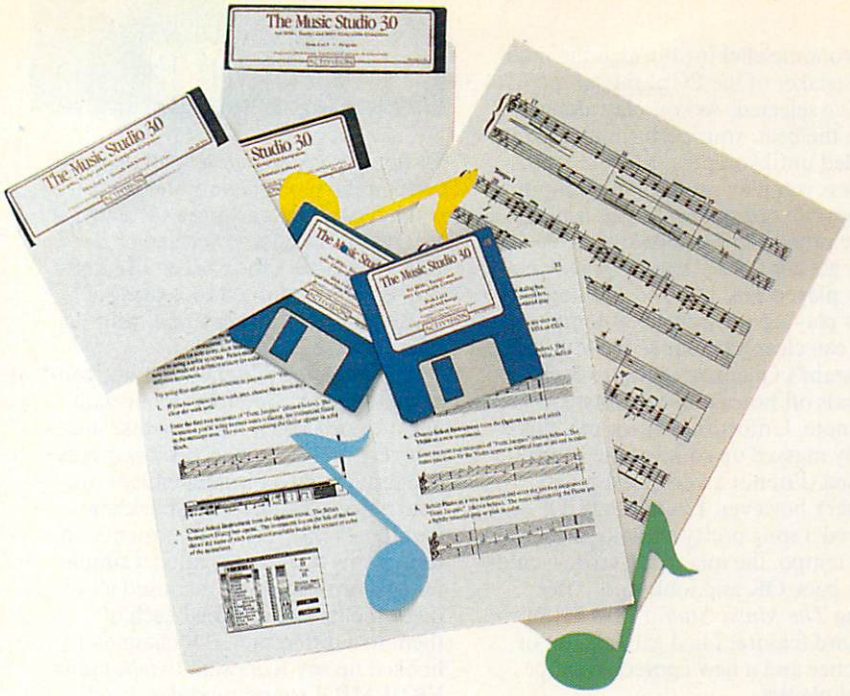
JOEY LATIMER

During the six years I've been playing with music programs on the IBM PC and compatibles, I've seen a large gap develop between so-called "home and educational" products and those earmarked for "professionals." Most of the programs I've tried in the former category use only the PC's poor-quality speaker, don't support harmonies or multivoiced sound, and tend to be discounted in price—and it shows. And while many high-powered MIDI recording, scoring, and sound-editing software packages have emerged, the prices are generally prohibitive and the features are best understood only by experienced arrangers.

The Music Studio 3.0 falls right in the middle. It's reasonably priced at under $100, is easy to use, and can charm a pro musician's ears by playing 15-voice arrangements through MIDI instruments. Best of all, it has a lot to teach about making music with computers.

The program's versatility required that I experiment with three separate system configurations to cover all the possibilities: I tested it on a stock PC-monochrome system to simulate the use of only the tiny built-in speaker for one-voice music; I tried the program with a Tandy 1000SL with its 16-color graphics and three-voice digital sound and sampling features; and I pushed the package to its MIDI limit on a CGA-equipped XT-class computer with a Roland MPU-401–compatible MIDI interface and several MIDI instruments.

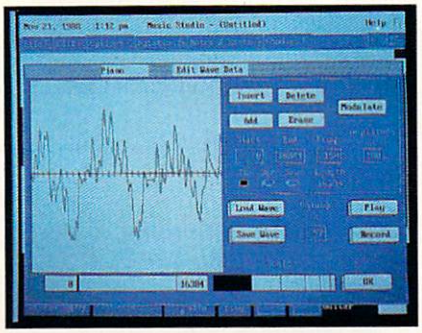
Earlier versions of *The Music Studio* featured a user interface created by Audio Light of Los Gatos, California (makers of the colorful *Koala Painter* program). But *The Music Studio* 3.0 for PC compatibles uses Tandy's DeskMate as its primary user interface, with overall design and development credits still going to Audio Light. In some ways, I like Audio Light's interface better than the new DeskMate arrangement, but with so many Tandy and PC-compatible users already familiar with DeskMate, it's clear why Activision made the switch. The package comes with a runtime



version of DeskMate for users who don't own a copy; also, instructions are provided for loading and running *The Music Studio* on your current system, if you're a DeskMate user.

The first thing to strike me about *The Music Studio* 3.0 was how user-friendly it is. When the program starts, you're brought face-to-face with a musical staff, a pointer that you can control with a mouse or joystick, and a screen made up of pull-down menus and icons that you use for selecting various options. Moving the pointer up and down the staff produces tones corresponding to the notes indicated on the staff. For music students, this creates an immediate relationship between musical notation and the sound a note makes. Of course, if you want to put notes on the staff without hearing them, you can turn off that feature.

The title of the current song is displayed across the top of the screen with the date and time. Just below, the DeskMate-style menu bar offers pull-down menus labeled File, Edit, Options, Notations, Notes & Rests, and Goodies. The work area takes up the middle of the screen and consists of a musical staff for entering standard musical notation and vertical and horizontal scroll bars for scrolling through the current musical composition. At the bottom of the screen, a series of icons represent controls for song playback, including volume, tempo, time signature, key signature, note value, song number, pitch name, instrument name, and the play button. You can access each of *The Music Studio*'s features represented on the main screen with your mouse or joystick button, adding to the program's intuitive feel; just point at what you want and click.



Editing sampled sounds introduces you to a new world of unique sound effects.

The Music Studio 3.0 gives you a choice of two methods of composing: You can place notes directly on a staff (grand, treble, bass, alto, or tenor) using the point-and-click method; or, if you've connected a MIDI instrument to your system, you can record a musical performance that the program will automatically convert into notes on the staff. Also, the instrument sound you select when entering notes is the one that plays back. But although other *Music Studio* versions let you paint music on the screen using a stylus, that feature isn't included in this PC incarnation. (*The Music Studio* 2.0, designed for the Apple IIGS, does have this capability.)

If you use a 16-color Tandy or EGA monitor, the program assigns a color to the instrument you select. For example, violin notes might be green, flute notes might be light blue, and piano parts might be pink. This color scheme eases the editing process for music students because they can tell exactly which instruments they're affecting when they change the arrangement. In the case of CGA and monochrome systems, the notes for each instrument are the same color, but each note has a different graphics pattern. It's more difficult, but not impossible, to identify different musical parts using this approach. If you're serious about learning music composition on the PC and you go with this package, I recommend an EGA-equipped (or a Tandy 16-color) computer.

For ultimate control over the composing process, place your notes directly on the staff. The pull-down menus make it easy to select the exact musical notation required to produce the sound you want to hear. Using the Notation menu, you can add notations such as crescendos, diminuendos, repeats, measure bars, beams, ties, and slurs to a song. The Notes & Rests menu lets you change the type of notes and rests you add to a song by adding dots, accents, staccato marks, accidentals, triplet markings, and rests. *The Music Studio* 3.0 gave me an enjoyable, educational experience as I entered, bar by bar, pieces by my favorite classical composer, J. S. Bach. After I had entered each bar of *Bourrée,* I played what I had and listened for mistakes. Being the klutz that I am, I made some bad ones. In the course of straightening out the problems, however, I learned a lot about musical notation that I never learned during guitar lessons.

Using a MIDI instrument to enter notes is fun but difficult unless you're a good player. I used a Kurzweil 1000 synthesizer with a velocity-sensitive keyboard to test the MIDI Record feature. After you select MIDI Record from the Options menu, you're offered the option of a metronome (highly recommended) to keep time while you play and record. Pressing the Start Record button starts the

metronome clicking through the internal speaker of the PC at the tempo you've selected. As you play along with the beat, your performance is recorded until you press a key to stop. Unless you play precisely on tempo, however, your musical score is likely to be pretty jumbled-looking. You may get a lot of 1/16 notes when you only played 1/8, 1/4, and 1/2 notes. If your playing was a little off-tempo, you can clean up your score with the program's Quantize option, which rounds off notes to the nearest 1/64 to 1/2 note. Unfortunately for me, this really messed up some of the songs I played (I'm not a very good piano player); however, I found that if I played a song pretty close to the correct tempo, the quantized score would play back OK and look fine. After using *The Music Studio* 3.0's MIDI Record feature, I had gained a lot of practice and a new appreciation for good players.

Entering notes is but one step in the composing process. The program's powerful editing tools are there to take you to the next level, where you modify your score to your liking. The program's editing arsenal allows cutting, copying, merging, pasting, transposing, or filtering blocks within a song. (A *block* is a section of music that you define by highlighting. By defining and altering a whole block at once, for example, you can avoid having to transpose an entire song note by note—and that saves work and time.)

No piece of music can be complete until it's heard, and *The Music Studio* 3.0 includes plenty of options for this experience as well, all dependent on the type of computer setup you have. If you're using a PC without MIDI instruments connected or if your PC isn't a Tandy SL or TL model, then you're limited to hearing a single note at a time emitted from the PC's tiny speaker.

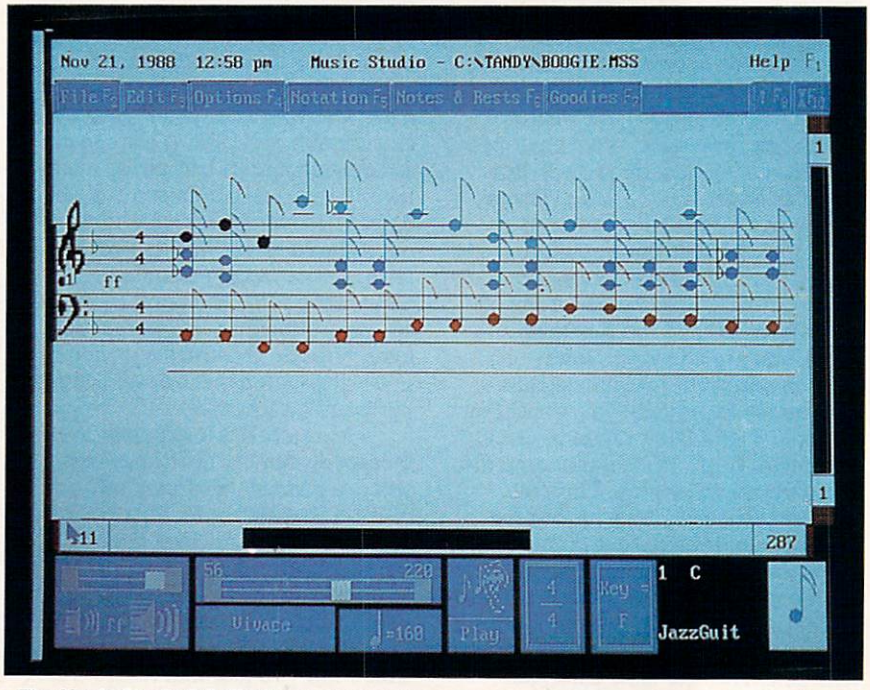
If you have a MIDI interface connected to your computer, along with one or more MIDI instruments, you can play more complex arrangements containing up to 15 independent musical parts. Of course, playback may require several MIDI instruments. In testing this feature, I created a simple four-bar arrangement that used all 15 instruments and assigned each of them to a different MIDI channel. I hooked up my Kurzweil, two Yamaha FB-01 MIDI sound modules, two Casio CZ-101 synthesizers, and a drum machine. I was then able to isolate and test all of *The Music Studio* 3.0's 15 instruments. Even though my arrangement sounded horrendous when all the instruments played together, I'm living proof that you can play all 15 at once.

Tandy SL or TL computer owners get a real treat out of this program, not the least of which is the chance to play back songs with up to three voices of digital-instrument sound samples. In addition, you can use *The Music Studio*'s Design Sound feature to create, edit, and store your own instruments using a sampling rate of 11,000 samples per second. You edit on a high-resolution graphics display using editing functions I've previously seen only in expensive professional sound-editing programs. With a mouse, you can modify waveforms and play the current sound you're editing so that you can continuously hear what you're doing. You'd be hard-pressed to find a better way to gain hands-on experience designing instrument sounds without spending big bucks for professional sampling hardware and software (we're talking $1,000 and up, easy).

Printer support on *The Music Studio* 3.0 enables you to print your music to a Tandy DMP 105, 200, 420, or 430 printer; an IBM-compatible graphics printer; or a Hewlett-Packard LaserJet or LaserJet-compatible printer. On my IBM-compatible graphics printer, I found the results to be good enough to read but not anything fancy. A previous version of *The Music Studio* designed for the Apple IIGS produced far more impressive results on an ImageWriter II. Also missing from the PC version is the ability to integrate and print lyrics along with a musical score. This feature made it fairly simple to create an accurate melody/lyric lead sheet for archiving songs, and I wish it were offered in version 3.0.

A 92-page user manual documents all of *The Music Studio* 3.0's functions in a clear, easy-to-follow manner. Especially helpful are the many screen shots throughout and the 10 pages dedicated to hardware/software requirements and installation. I was able to get the program up and running quickly, without a hitch, on each of the systems I used.

For experimenting and learning about music, it's hard to beat *The Music Studio* 3.0. Create simple or elaborate musical scores and get instant results. Try new musical ideas without worrying where you'll find the soloists, trios, and orchestras to play them. The program is simple enough for a child to operate yet powerful enough for incorporating classical works and faithfully reproducing them through modern MIDI instruments. Whether you're new to *The Music Studio* line or an old hand at computer-generated music, this is one package that's really in tune.



***The Music Studio* 3.0 displays notes on the screen as you compose your masterpiece.**

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How to tell if an integrated software package is right for you.

Look How Things Have Changed.

When integrated software first appeared, it had limited functionality, was difficult to learn, cumbersome to use, and cost between $300 and $500. Today most integrated products have a more complete set of features, are easier to learn, and are priced between $149 and $259.

Amazingly, critics say Eight-in-One™, a product costing only $60, is the easiest to learn, easiest to use, yet has the highest performance. Who needs an integrated package the most? And what can you do with them?

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Working in a home office or small business usually means that you do a little bit of everything - write reports, do financial analysis, schedule appointments, track customer information, and anything else it takes to run a business without lots of people. If you have all of the tools you need in one integrated software package you get several immediate advantages.

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With integrated packages you can save a lot of time. Since you probably teach yourself how to use software (unlike working in a large corporation where you'd get training and support from the department down the hall) you'll appreciate how much more quickly you'd become productive using one integrated package rather than many separate programs. Because when you learn one tool, you've learned them all.

And you can save a lot of money too- over $1000. Because you won't have to buy many separate packages like a word processor, spreadsheet, database, graphics, and communications program, just to get all of the tools you could find in one complete, affordably priced, integrated package.

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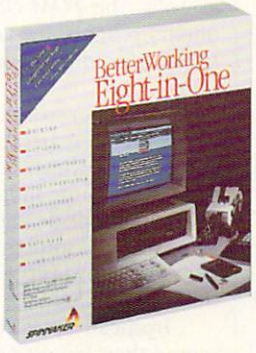
The best integrated packages put a complete solution at your fingertips. They provide you with all of the useful tools that you need to do your job- a word processor, spreadsheet, database, outliner, desktop organizer, communications module, graphics program and powerful spell checker and thesaurus.

Well designed integrated packages are obvious-to-use. All of the options are right there on the screen. And each tool should work in the same way, so that after spending a few minutes working with one of the applications, you've virtually mastered the entire program.



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What's more, the best integrated packages are lightening fast. Doing things like recalculating a large spreadsheet or spell checking a letter should never slow you down. So with a high quality integrated package you take full advantage of the power of your computer. Many users say they get their work done in half the time.

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LEARNING

DISCOVERIES

DAVID STANTON

Poking fun at educators, R. J. Heathorn's satirical essay "Learn with BOOK" first appeared in 1962. In it the English writer took aim at educators and others he felt had succumbed to the lure of expensive and unproven gadgetry and forgotten the time-tested power of books as teaching and learning tools.

He compared books with electronics, and, on every point, books came out on top. Books are small and require no electricity, so they can be transported and used anywhere. Books cover every subject and are available for everyone from beginning readers to college professors. Books are inexpensive. They require no batteries and have no confusing buttons, switches, or knobs—just easy, orderly learning from page to page.

Of course, Heathorn couldn't have had modern-day microcomputers in mind. The first of those didn't even appear until the mid-1970s. Nevertheless, his point is well taken. Expensive doesn't necessarily imply effective. Newer doesn't always mean better.

But if he were writing that essay today, he might take a different view. Experienced craftsmen usually select the best tool for the job without regard to matters of history or hype, and writers are no different. In recent years, computers have proven themselves far superior to traditional print media in a number of situations.

For beach reading, magazines and paperbacks remain supreme. Sand and sun won't harm them. Shakespeare, Hawthorne, Michener, and Frost still read better from cover to cover than from screen to screen. At 7:00 a.m. on a leisurely weekend morning, nothing can replace freshly brewed coffee and the local newspaper. But anyone who's still doing research the old-fashioned way has a lot to learn about technology.

Remember the *Reader's Guide to Periodical Literature,* those green indexes we spent hours poring over in high school and college? The *New York Times Index* wasn't perfect either, but it kept our thumbs relatively free of black printer's ink. Even with those venerable research tools and a myriad of specialized indexes, a diligent few spent more than one evening leafing through stacks of magazines and papers. Computers and compact discs have changed all that!

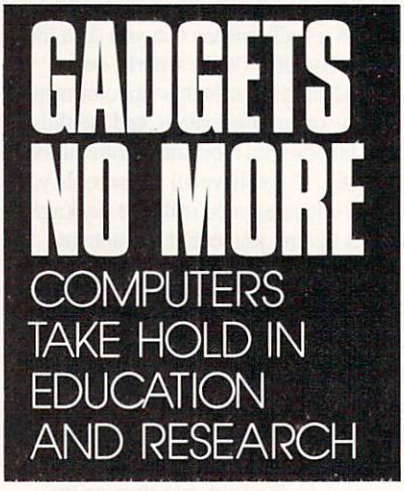
Consider InfoTrac's *Magazine Index Plus.* This CD-ROM database from Information Access Company covers over 400 popular magazines and recent issues of the *New York Times.* Monthly updates assure currency, and listings going back four years (two months for the *Times*) guarantee sufficient depth for many purposes. For those who need more, InfoTrac provides a four-year backdate of its *Magazine Index Plus* and several additional CD-ROM indices as well—the *TOM Database* for secondary schools, the *General Periodicals Index,* the *Academic Index,* and others.

Users can search by subject or author, and a research task that took hours in Heathorn's day requires less than one minute today. Next time your college pride and joy brings tears to your eyes complaining about his or her dated word processing software, think about that.

Ironically, electronics have scored their largest victories over print media in libraries. H. W. Wilson Company, one of the oldest and most respected publishers of reference materials, now produces CD-ROM versions of many titles, including the previously mentioned *Reader's Guide.* Grolier's *Academic American Encyclopedia* is available on compact disc, as are Bowker's *Books in Print,* the *Merriam Webster Ninth New Collegiate Dictionary,* and hundreds of other library favorites. Not only does researching CD-ROM databases take less time, but students with a computer and a modem don't even need to leave home. They can do much of their work via national online services. Three computer terminals have taken over all card-catalog duties at my alma mater.

But you don't need to go to a library to see computers improving upon print. A home computer can do many things with text that books could never do.

Imagine pages that talk and stories that respond to reader input. *Tran* (shareware for IBMs and compatibles) and *CNSay* (Macintosh freeware; requires Macintalk—also free) add speech-synthesis capabilities to their host computers without requiring any additional hardware. Just load a text file into them, and they'll read it aloud. By now everyone knows about



interactive adventures that mix text with graphics and sound. Both commercial products and public domain/shareware plots abound. With Scholastic's *Super Story Tree* and similar software, users can create their own interactive adventures. And don't forget hypertext applications. What book could provide instant definitions and other clarifying material at the click of a mouse?

Bibliophiles don't need to worry; no one is predicting the complete elimination of print media. Nor should we judge Heathorn too harshly. After all, who could have predicted in 1962 what we take for granted today? ⊡

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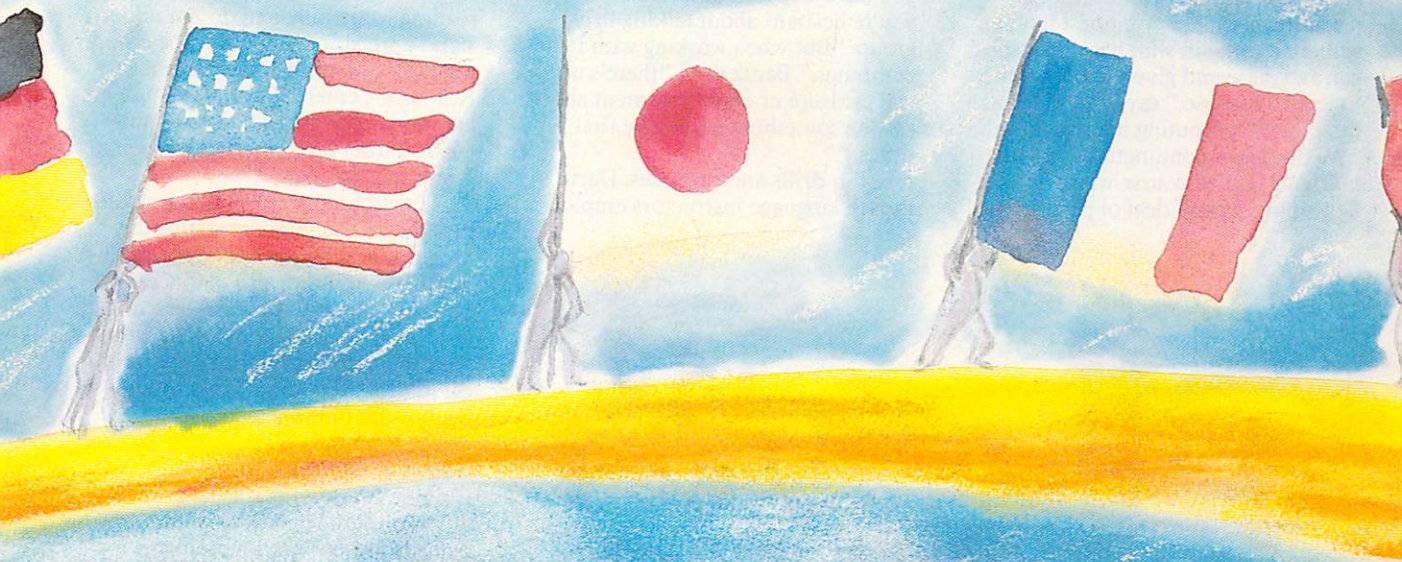
NEW PROGRAMS

TEACH NEW LANGUAGES



SPEAKING IN TONGUES

TOM NETSEL

The best way to learn a foreign language is to visit a foreign country. The second-best way is in a classroom with a teacher. The third-best way is to learn a language by yourself. No matter which route you choose, take along a computer; it can help. Computers offer foreign language students a wide range of learning possibilities, says Dr. Frank Dominguez, associate professor of Romance languages at the University of North Carolina at Chapel Hill.

Coupled with sophisticated software and hardware, computers bring not only text but also audio and video into the learning experience.

"When there's more money available—and that's usually in an institutional setting—then the student has access to digitized speech, videotapes, and videodiscs," Dominguez says. "This equipment is not yet in the mass market, but I can see it coming with the new CD-ROM drives."

Take a look at what higher education is doing with foreign language software today.

French and Spanish Tortoises

In *En Route* and *Caminando*, you crawl into a tortoise shell and find your way around a French- or Spanish-speaking village. You show your progress by giving accurate directions, identifying local landmarks, and following traffic signs. Before finishing the game, you must answer questions in the target language and visit a school, a home, a restaurant, and a train station.

En Route and *Caminando*, from Gessler Educational Software (55 West 13th Street, Suite 34, New York, New York 10011; 212-627-0099), teach you about four main topics: family life, meals, education, and travel. You test your knowledge of the country's culture in addition to its language. For classwork, teachers can modify the program to create new questions and data.

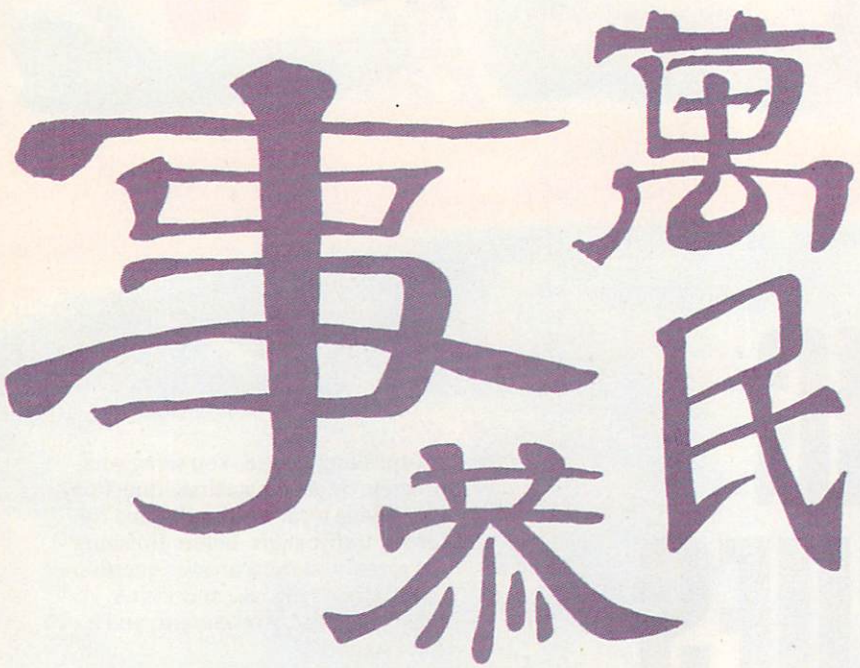
These two programs were designed for beginners, but they provide a vocabulary review for intermediate students. "*En Route* and *Caminando* are well balanced programs. They help students develop vocabulary and general knowledge of the culture. But more importantly, they help students to retain what they have learned," says Katrine Watkins, co-principal of the French-American School of New York, where the programs were field-tested.

Computers as Adjuncts

In some foreign language classrooms, computers are almost as familiar as

SPEAKING IN TONGUES

textbooks and chalk. At Dartmouth College in Hanover, New Hampshire, computers in foreign language classes are used as adjuncts to traditional teaching methods. "We don't have someone come in who has never spoken Japanese and give them software to learn Japanese," says David Bantz, director of computing in humanities. "We do this in conjunction with a regularly scheduled course where the students have a great deal of personal interaction, repeating the language, and doing written assignments."



At Dartmouth, instructors focus computer activities on areas not easily duplicated in the classroom. For example, the computer gives students a sense of control that they don't have in group lessons. "In a classroom, an instructor may spend considerable time covering material you already understand without getting to the areas where you need additional help," Bantz says. "With a computer, you work at your own pace and repeat a section as often as you like. A computer gives you the individualized control you need."

A computer is ideal for drills because it provides instant feedback and doesn't embarrass you if you get something wrong. There's no clock ticking and there's no score. Working with a computer is designed to be low-key, low stress, Bantz says. This contrasts with the pace set in Dartmouth's foreign language classes, where instructors call on every student at least once per minute. In such an intense environment, you may find the experience stressful, especially if you have a speech problem or if you're hesitant about talking in a group. "But when working with the computer," Bantz says, "there's no social pressure or embarrassment about getting something wrong the first 11 times."

For drills and exercises, Dartmouth language instructors employ some commercial software designed for universities—Yale's *Private Tutor* and Harvard's *MacLang,* for example. But computer and language experts on the New Hampshire campus are working on advanced language-skill programs, making computers perform new and extraordinary tricks.

Advanced Learning Techniques

Bantz says Dartmouth is experimenting with interactive online foreign language texts and dictionaries. The program is called *TextWindow.* "Instead of reading through a simplified reader, second-semester German students may be presented with an actual short story by Günter Grass. When stumped by a word or phrase, instead of flipping through a dictionary and deciding which meaning is appropriate, students simply click on the puzzling item for an instant translation."

TextWindow is an ideal application because computers quickly sort through information such as words in a dictionary or thesaurus. It's easier to translate when you can simply click on a word for an instant glossary. "I find it most boring to always have to leaf through a dictionary when I am reading something and do not understand a word," says Otmar Foelsche, manager of Dartmouth's Language Resource Center. "I also find students are more likely to ask things—and tackle harder texts—if they know it's easy to get an answer."

Foelsche and computer programmer Kevin Calhoun are testing the program with beginning German students. Versions are also planned for Spanish students. Text can be scanned in or typed in manually. Along with the definition, cultural and grammatical information appear in a window at the bottom of the screen.

Say It in Chinese

Chinese is receiving special attention at Dartmouth. This language and its dialects present special problems for Western students. Chinese is a tonal language. In most Western languages, people raise or drop the tone of a word for emphasis. In Chinese, however, changing a word's tone often changes its meaning. A word can have two totally different meanings, depending on whether its tone increases or decreases.

Adding digitized speech to a pronunciation program helps students understand this concept. With Dartmouth's *Hanzi* program, you can hear each of 2500 Chinese characters spoken in a digitized voice so you catch the proper pronunciation and its all-important intonation.

Writing Chinese characters is also tricky. It takes several strokes of a pen or brush to create most characters. "As you quickly write a word," Bantz says, "you want the way you naturally distort the character to be the same as everyone else for it to remain legible. You have to learn to write Chinese in the proper stroke order."

Dartmouth's *Hanzi* project has a "card" for each of the 2500 different characters. Each card presents a digitized image of the character written in the traditional Chinese brush strokes and the same character written in ballpoint pen or pencil. The latter version is animated so you can see exactly how the character is formed.

"This is a fun way to help students learn and review characters," says Susan Blader, who teaches Chinese at Dartmouth and aided in the program's development. Blader emphasizes that the program is a high-tech study tool and not a replacement

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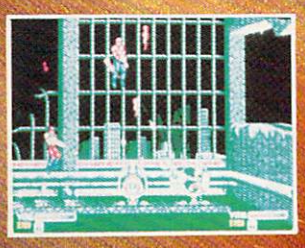
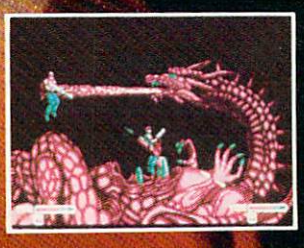


There's havoc in the factory as you blast away the invaders.



The Bronze Dragon is a formidable foe. You never know when it will strike!

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SPEAKING IN TONGUES

for conventional teaching. "The only real way to learn Chinese characters is to do them by hand."

Another prototype program challenges you to match what you hear with one of six Chinese characters presented on the screen.

Dartmouth's *Hanzi* program runs on a Macintosh computer and it's based on a similar program developed for IBM computers at Mount Holyoke College in South Hadley, Massachusetts.

Multidimensional Programs

With the considerable amount of software available, teachers and consumers often have difficulty deciding which programs to buy. Dartmouth's Otmar Foelsche offers software buyers some suggestions.

A lot of good software deals with some specific aspect of a language. "If it means Spanish verb conjugation, fine; we have programs for that and they work well," Foelsche says. "In language instruction in general, you're looking for something that is not so flat, which means single-dimensional—typing in, evaluating, and sending a message back to the student. What you're looking for is something multidimensional, using animation, sound, video, and input."

Multidimensional software may be the ideal, but gaps still exist between what's possible with certain hardware, what's available for that machine, and what's affordable on the consumer level. Digitized speech and images may be desirable but what about more traditional programs? "If you can't go back and forth within what's offered, discard it," Foelsche says. "Users should be able to control the material and select their own paths through it. You don't want to be led through it, forced to finish one task before going on to the next. We want users to do any task and possibly even encounter disaster. That makes them realize they should start at the beginning. But nothing should be blocked."

A Learning Environment

As technology makes further inroads into education, Foelsche sees language instruction branching out of the classroom and into what he terms *learning environments*. Springing up to aid travelers and language students, these learning environments could spring up in travel agencies, airports, ticket counters, supermarkets, or even restaurants.

These environments would include a dictionary and a small encyclopedia in a computerized workstation. They would take advantage of the multidimensional concept. A short video sequence with sound could allow students to replay phrases they had heard, with or without accompanying animation. They could hear the words, see them in print, and input material by using the keyboard or by clicking on multiple-choice selections with a mouse. "Students could go there knowing they could read, do reference work, see video sequences, and write in the language of their choice," Foelsche says. ⊡

Tom Netsel is assistant features editor with COMPUTE! Publications. A former Navy man, he has traveled all over the world.

Sprechen Sie Deutsch?

A Computer Tour of Germany

German students at Dartmouth can tour the city of Mainz on Macintosh computers. The program provides digitized pictures of different buildings and scenes in the ancient city and quizzes students about them, according to college spokeswoman Catherine W. Wolff. A complete video tour of Mainz has been recorded and is being incorporated into the program. Students can look forward to a speaking German dictionary, drills, and other activities that are also being developed.

Similar interactive programs are offered at MIT, Cornell, and Brigham Young University. Armed service personnel studying German at the Defense Language Institute at the Presidio of Monterey, California, can also tour Germany before they leave the United States.

"The idea is to take the student to a country, in this case Germany," says Earl Schleske, director of the Educational Technology Division of the institute's Foreign Language Center, which teaches 34 different languages. "*German Gateway* is a program designed originally as a language survival course for officers assigned to Germany."

Activities presented on this interactive video include scenes of a person renting an apartment, seeking car repairs, and asking for directions. The information is recorded on a videodisc which is played back through the army's Electronic Information Delivery System (EIDS). This interactive videodisc system is basically an IBM AT compatible with a 3½-inch floppy drive and a built-in videodisc player. The audio and video quality are as good as the equipment used to make the videodisc.

EIDS overlays the computer video signal with the picture coming from the disc player. The computer controls the disc player so students can choose the audio and video information and mix it with computer signals. "Students can select the computer information, any frame or any sequence from the video player, or mix both signals and have them appear on the monitor," Schleske says.

Various levels of help are available. Students can repeat a whole sequence or break one down sentence by sentence, Schleske says. One level of help explains what's happening in very simple German terms for students with little knowledge of the language.

Schleske feels the interactive nature and flexibility of this type of program is beneficial to language students.

SANTA CLAUS IS COMING TO TOWN

Better watch out!

After a test ride on Pocket Rockets, the high-speed motorcycle simulation game, Santa picked up a new sleigh that will make this year's rounds faster than ever. And whether you've been naughty or nice, you could win this Suzuki 600 Katana during "Santa's Sleigh Giveaway" in January.

Meanwhile, experience all the thrills and spills of high-speed racing with machines that take you from zero to 60 in under four seconds. Already gaining critical acclaim, Pocket Rockets lets you choose from four of the quickest, most exotic bikes on the planet. The action's as real as the adrenaline you'll feel.

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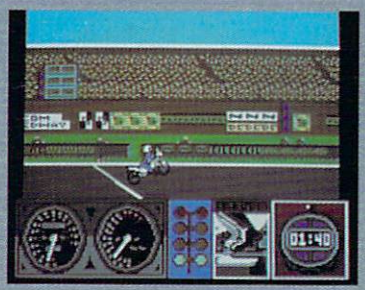
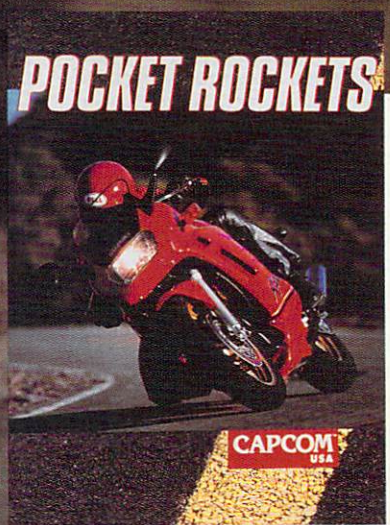


LEFT: Try your skill against the clock with a couple of laps around the test track. RIGHT: Drag racing demands a quick wrist and fast shifting. Just don't blow the engine!



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HOMEWORK

HINTS AND TIPS FROM OUR READERS

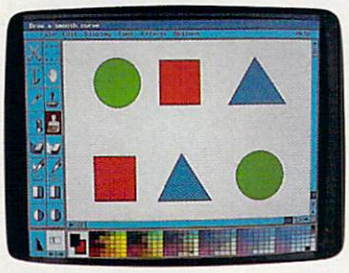
Sometimes, a great teaching tool is born of ingenuity and an ordinary graphics package. To teach your child about shapes and colors, you could buy one of the excellent educational packages on the market. Or you could put together your own tutorial using a paint program and these instructions.

Start by teaching your children about shapes. (You could teach them about colors instead, but choose one item at a time; don't jump into teaching colors and shapes together.) Draw two shapes on the screen—a square and a circle, for example. Identify them for your child: Say "This is a square," and point to the square with the mouse or your finger. Identify the circle in the same way. After a little drill, you can ask your kids, "What's this?" while pointing to the circle or square. When they've got it down cold, ask them to point to the circle or the square (physical activity helps kids remember). Next, replace one of the shapes with a new one, and after that add more shapes.

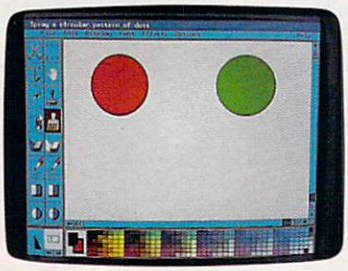
You can do the same with color. Draw two circles and fill one with red and one with green. Now point to the red one and say, "This is a red circle." Tell your kids what the color is and then make your kids tell you what the color is. At the beginning you'll want to use the same shapes with different colors so your children won't have to wrestle with two concepts at the same time. (This exercise works best if your computer has at least 16-color graphics. If you only have CGA graphics, you may want to stick with shapes.)

After you've drilled shapes and colors, you can try some matching games. These require your kids to combine reasoning with the rote learning they've already practiced.

Draw several shapes at the top of your screen and one shape—a square, for example—at the bottom of your screen. Pick up the square and let your child use the mouse to move the selected square under the other square on the screen. You can also draw a group of shapes at the top of the screen and a group of the same shapes in a different order at the bottom; then ask your children to put the two rows in the same order.



Matching games teach children to recognize shapes and colors.



Tell your children what color the circles are; then get them to tell you.

Translate this exercise to color by drawing one shape—a circle, for example—several times and filling each with different colors. Stick with one shape at first so that your children can focus on color. Then draw a circle at the bottom, fill it with a color, and pick it up. Ask your children to move the selected circle under the circle filled with same color. You can also try the other matching exercises using color instead of shape.

Finally, work on shapes and colors together. Draw a red square, a yellow square, and a red circle. Then ask your kids to pick the red square. Each of the exercises described above will also work here.

Draw a set of shapes in different colors and sizes. Using the cut and paste functions, construct composite pictures with these shapes and have your kids identify the pictures and pick out the various components. Help your children make their own pictures with the shapes.

Further exercises can reinforce size discrimination and sequencing. You can draw a big circle and a small circle. Talk about which one is big, which one is small. Talk about how they are the same shape even though they are different sizes. Then draw a circle in three or four different sizes and ask your child to put them in order from smallest to biggest or biggest to smallest.

These exercises will also work with letters and numbers. Use a large font to type several letters on the screen. Tell your kids the name of each letter and then ask them to repeat the names. You can even ask them to repeat the sound each letter makes if they're ready to learn phonics.

With numbers, you could draw groups of shapes and count them with your kids. Then draw several groups, perhaps organizing them as dots on the side of a die. Type a numeral at the bottom of the screen and ask your child to match the numeral with the group of the same value.

Infinite possibilities present themselves: That's the beauty of using a graphics package instead of a specially designed educational package. A paint program is flexible; you can use it to teach many different concepts. The exercises grow as your kids grow.

The most important ingredient, however, is *you*. Your interest and reinforcement can't be duplicated by a computer program.

Heidi E. H. Aycock

Do you have advice that makes a better teacher out of your PC? If so, we'd like to hear from you. Send your tip, no matter how brief, to COMPUTE! Feedback, P.O. Box 5406, Greensboro, North Carolina 27403. If we publish your suggestion, we'll send you a gift. ⊡

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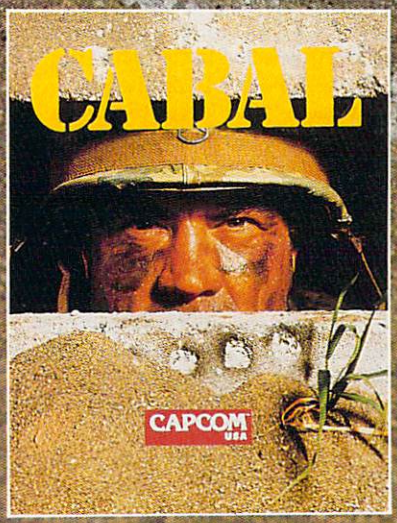

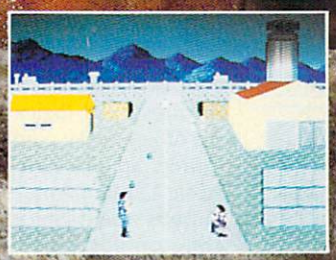

Cabal Screen Shots.

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BATTLE DOOM, PAINT PC PICTURES, PLANT STORIES, BLAST BADDIES, BUILD WEALTH, SEARCH SPACE, ELIMINATE EVIL, CLEAR VISION, INSPIRE KIDS, AND LEARN LAW.

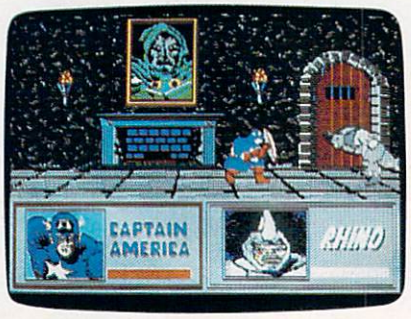
DR. DOOM'S REVENGE!

Comic books cry out for software adaptation; their material combines strong narrative with lurid characters—perfect for the computer screen. And the very best—Marvel's and D.C.'s top heroes and villains—seem made for interactive interpretation. Yet most computer adaptations have failed. It's a shame.

But Paragon's first adaptation of Marvel Comics characters captures much of the feel of a certain type of Marvel comic. Holding down the hero side of the game are two of Marvel's stalwarts: Captain America and the incomparable Spider-Man. Their challenge is to penetrate a heavily guarded castle, battle their way past an army of powerful but lesser villains, and confront the greatest Marvel villain of all, Dr. Doom.

The setup is a classic Marvel scenario: Dr. Doom has stolen a Thermo C4 VG missile, appropriately enough, a doomsday weapon. The missile is hidden at Doom's Latverian castle and guarded by the Doom Brigade. In alternating sequences, Spidey and Cap battle their way through the bad guys in hopes of stopping Doom's planned destruction of New York. It's up to webhead to stop the missile, while winghead captures Dr. Doom. This is harder than it sounds, and it doesn't sound easy.

Dr. Doom's Revenge! is a simple game to learn and a handsome one to watch. The framing sequences are set up like comic book frames, with a cursor that moves from one frame to the next. At appropriate points, the frames come alive, placing you and your character in the line of fire of one of the Doom Brigade. A health bar at the bottom of the screen lets you know how you're doing.



Captain America takes on an ornery Rhino in *Dr. Doom's Revenge.*

Action sequences are well animated, with characters that respond nicely to either joystick or keyboard control. Keyboard commands are, for the most part, logical, with only a couple of keystroke combinations required. Spider-Man can shoot web, while Captain America can throw his famous shield. Spidey likewise can cling to walls, but I would've loved to see him swing on a long strand of web. The game offers three levels of difficulty, each sufficiently advanced over the previous to ensure many hours of play before mastery is achieved.

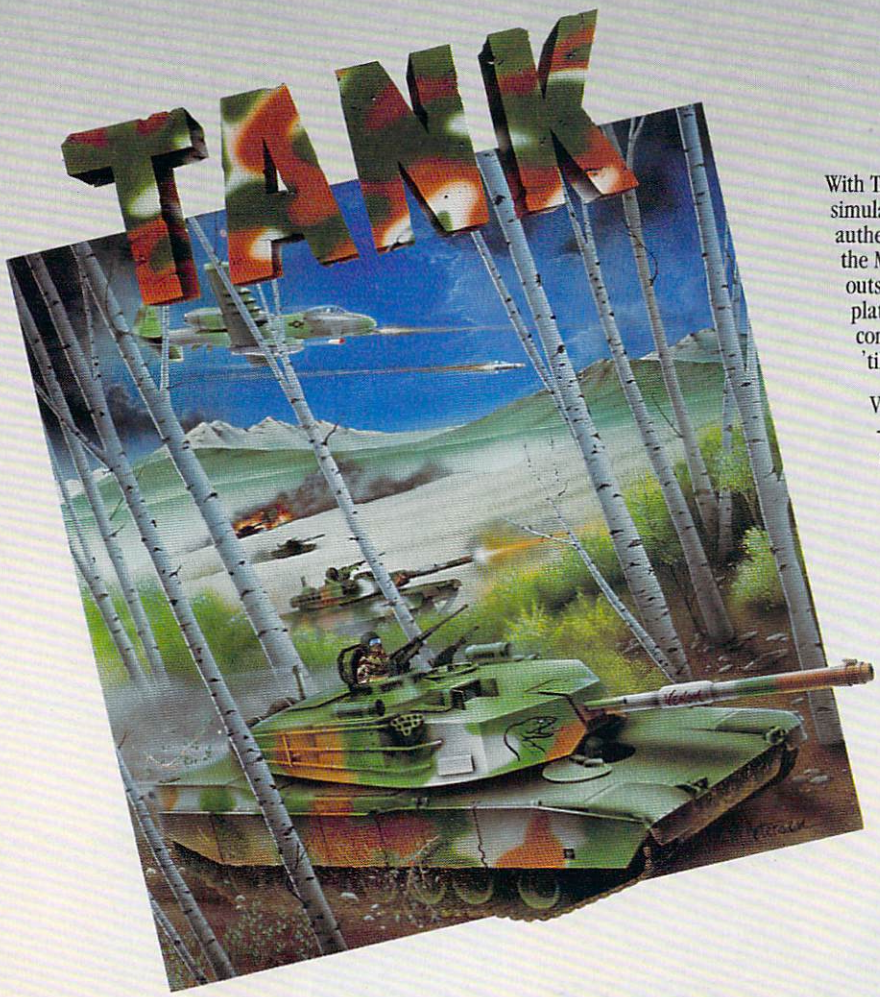
Dr. Doom's Revenge! is a handsome package. The soundtrack supports both the Ad Lib and Hearsay sound boards. An original 16-page comic is included; its story sets the stage for the game. The game demands little in the way of instruction; actual instruction takes up only 6 of the manual's 24 pages. The rest of the space is filled with thoughtful extras, ranging from an introduction by the ever-ebullient Stan Lee to biographies of the game's heroes and villains to a capsule history of Marvel Comics and the Marvel universe.

That history prompts my only reservation about the game. As the documentation points out, Marvel has produced some of the most sophisticated and intelligent comic books the genre has seen. It was Marvel that introduced a sense of the cosmic, not to mention the psychological and pseudophilosophical, to comics. Unfortunately, those aspects are missing here.

To be fair, I don't think Paragon set out to include them. This is an action game, and an admirable one. Its simplicity makes it perfect for arcade fans, especially younger ones. It has its moments for comic-book addicts as well, although serious members of the Mighty Marvel Marching Society might wish for a little more depth. There is, after all, more to most Marvel comics than just action. There was a framework, a context, a sense of mystery, of both infinite and personal complexity. I'd like to see some of that complexity included in the software.

With Marvel's material and its own arsenal of approaches to a story, Paragon has the opportunity to produce a new amalgam, a true interactive, intelligent comic book. The company's next stop is with those moody mutant adolescents, the X-Men, an ideal crew for such a project. Beyond that, we might hope for the Fantastic Four, the soulful Silver Surfer (and Galactus!), the mystical magic of Doctor Strange. (Personally, I'd give anything for a software version of *Nick Fury, Agent of S.H.I.E.L.D.*, done in the style of comic innovator Jim Steranko.) Handled properly, Marvel's universe should yield soft-

PATTON WOULD BE JEALOUS.



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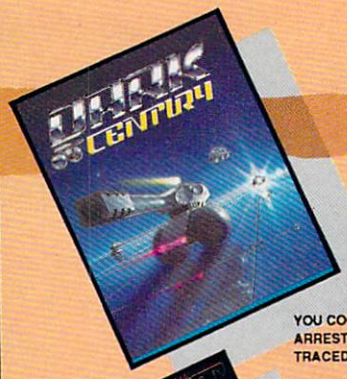

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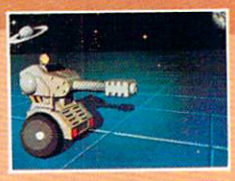

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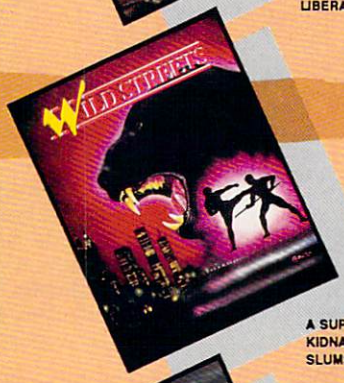

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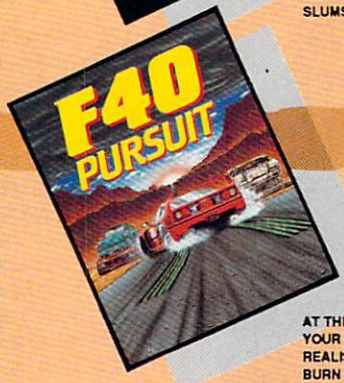

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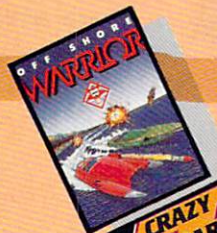

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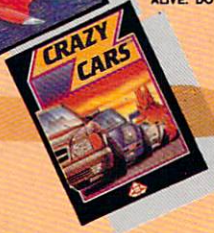
YOU ARE AN OFF SHORE WARRIOR AND YOUR FIRST ARENA, FULL OF FANS, IS WAITING FOR YOU. STRUGGLE AGAINST ROCKS, WAVES AND OPPONENTS IN A DEADLY GAME. ONLY FEW CAN LEAVE ALIVE. DO IT OR DIE!!!



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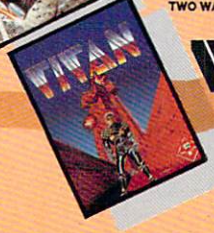

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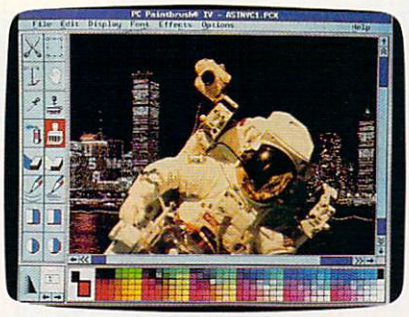
PC PAINTBRUSH IV

Paint programs were considered to be more electronic doodle pads than productivity tools when ZSoft's *PC Paintbrush* was released in 1985. Since then, over one million copies of the program have been sold, and the latest version, *PC Paintbrush IV,* will be snapped up not only by casual doodlers and computer artists, but by businesses and home-office users, too.

ZSoft has added many features to *PC Paintbrush IV,* including new tools for enhancing digitized pictures, VGA support, and the ability to load and save TIFF-format images.



Retouch scanned images using tools from *PC Paintbrush IV.*

Configuring *PC Paintbrush IV* for your system is easy thanks to a complete, menu-driven install program. Just tell the program what type of printer, mouse, and graphics adapter you're using, and PBsetup will install the program on your hard drive or create a work disk for floppy-based systems.

PC Paintbrush IV adds support for painting in the 256-color, 320 × 200 VGA and MCGA graphics modes. It also allows you to paint in CGA, EGA, or Hercules modes. Unfortunately, if you own a high-resolution graphics card and want to create a graphic in a lower resolution, you must load PBsetup and install a new graphics adapter driver from the Drivers floppy. It would be much more convenient if the program had a menu selection that would let you switch from 256-color VGA mode to 16-color EGA, for example, on systems supporting multiple resolutions.

The program's work screen will look familiar if you've used earlier versions of *PC Paintbrush* or programs like *MacPaint* or *DeluxePaint II.* A row of icons lines the left side, with the color palette running along the bottom of the screen. Functions and tools not represented by icons are selected using the keyboard or from pull-down menus.

Because the icon and palette tools take up so much screen space, the actual painting window is rather small when you are using the 320 × 200 graphics mode. The Show Screen selection lets you switch off the menus and tool bars to display the entire picture, but you can't paint in this mode.

PC Paintbrush IV includes all the standard painting tools: line, ellipse, and regular and rounded box tools; scissors; a spray can; two erasers; and

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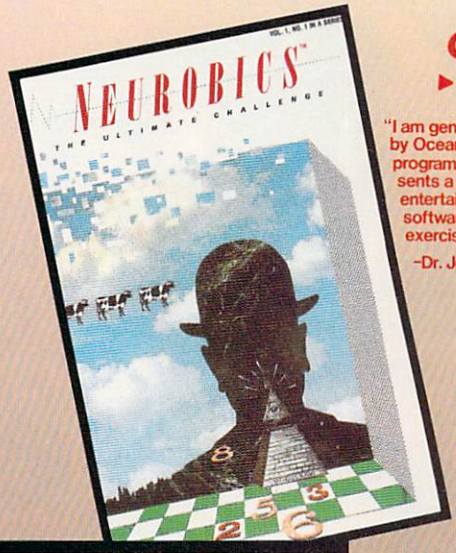

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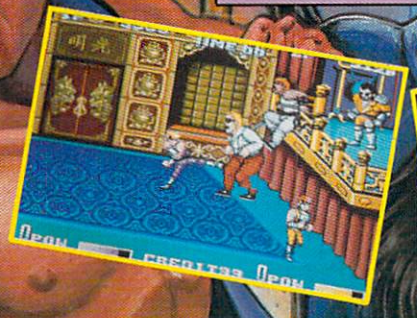

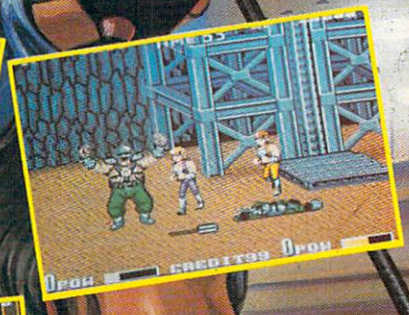

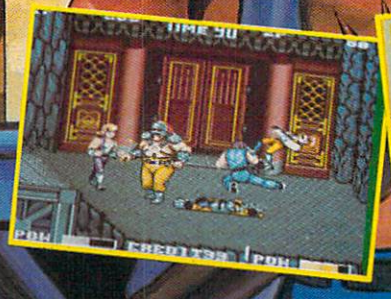

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a paint-roller fill tool. Variable Zoom magnification allows you to work on magnified details or display a reduced view of the entire page.

A surprising addition is a Bezier curve tool. Usually found only in high-end drawing and CAD programs, this tool lets you easily draw precise, smooth curves with a few mouse clicks.

The new Eyedropper tool is especially helpful in the 256-color mode, where you may have many shades of one color. Just click the eyedropper on the picture to pick up the color you want to paint with.

If your graphics adapter doesn't support 256 colors, *PC Paintbrush IV* will substitute dithered patterns for the extra colors. That way you can load and display pictures created in EGA or VGA modes even if you only have a CGA system. You can also edit gray-scale images for output on non-color printers.

The Effects menu has many features you'll appreciate if you ever need to modify or enhance digitized color images. The Brightness selection makes creating shadows easy. Using Contrast, you can make parts of the image seem blurry, as if they were being seen through foggy glasses. Blend will average the colors in an area, letting you smooth areas of sharply contrasting colors. Gradient will create shapes filled with a color that is graduated from light to dark, creating a 3-D effect.

The text tool has a number of new options, including support for both bitmap and outline fonts. Outline fonts are more suitable for titles and printing on high-resolution printers, since they don't appear blocky when blown up to large sizes. To make your titles really stick out on the screen, use the new Shadow and Gradient Shading commands to give text a 3-D look.

PC Paintbrush IV's Undo feature doesn't work as you'd expect it to. Instead of taking back your last brush stroke, Undo cancels all changes since the last time you selected a tool from the toolbox. If you make a mistake while drawing a series of boxes, Undo will remove all of the boxes, rather than just the most recently drawn box. The only way to work around this feature is to select the tool box *every* time you draw a new object, even if you aren't changing tools.

When you finish your video masterpiece, you can save it in either PCX or TIFF format. The PCX format is the de facto standard for PC graphics files—almost any MS-DOS program that uses graphics files will import PCX pictures. The addition of the TIFF format lets you use *PC Paintbrush IV* to edit images from scanners or to send pictures you've drawn through fax boards.

PC Paintbrush IV follows Microsoft's Common User Access interface standard, so the program will be easy to learn for anyone who has ever used a Windows-based program. A complete online context-sensitive help feature can be switched off once you've learned the program.

ZSoft has done an excellent job of updating *PC Paintbrush* so that it meets the demands of a more sophisticated market. While there are more sophisticated paint programs on the market, *PC Paintbrush IV* is relatively inexpensive. And it's hard to go wrong with a program that's considered to be a standard. ▷

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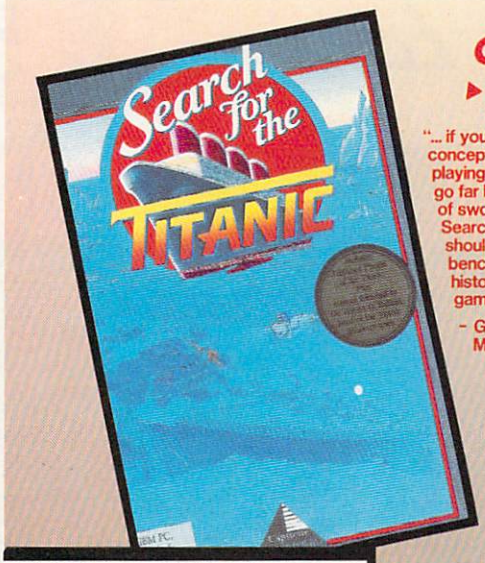

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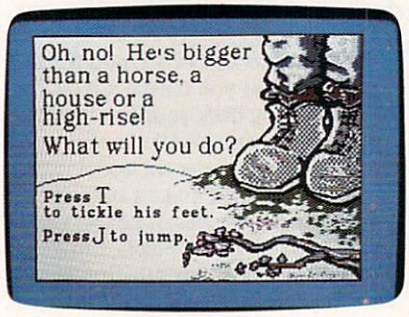
SUPER STORY TREE

Sit down under the *Super Story Tree* and listen to a tale of two—or more—endings. With Scholastic's *Super Story Tree,* kids can create interactive electronic storybooks with text, graphics, music, speech, and several possible resolutions. The finished stories run as stand-alone applications, so they can be shared with friends who don't own *Super Story Tree.*

The program is so flexible that children can create a wide variety of illustrated narratives, such as family histories, fairy tales, mysteries, adventures, or science-fiction sagas.

Youngsters develop an interactive story by designing individual pages that they link together into a book. A page holds straight text or a mixture of text and graphics. As readers flip through these electronic pages, they come upon branches in the main plot where they can choose a character's next step. Each decision leads the plot toward one of several possible endings.

To begin, children should work through Story Tree Help and through the program's online tutorial. The tutorial takes kids through all the steps to creating a branching story. They'll read a sample document, learn about its design elements, and get tips on writing their own interactive tales. For further information, they can refer to the detailed reference guide in the program manual.



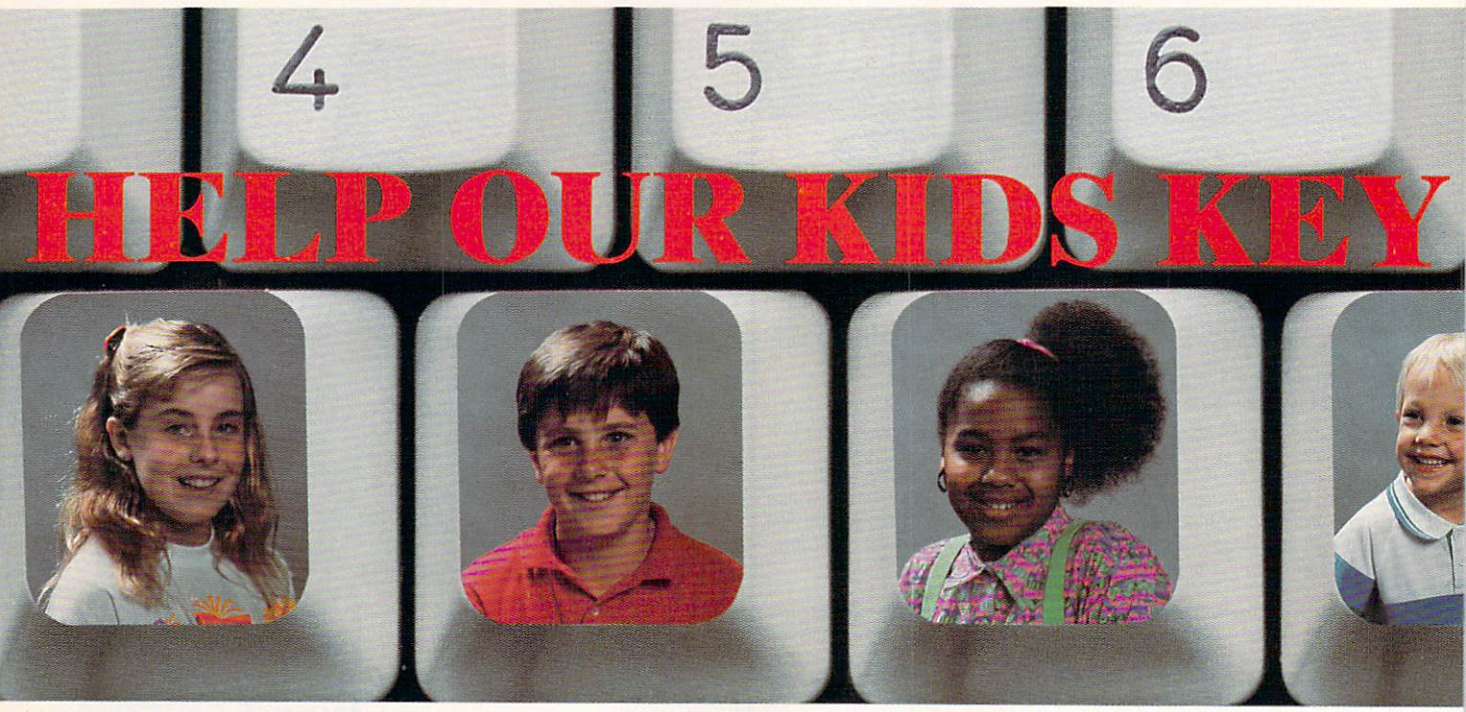
With *Super Story Tree,* kids create a story with several possible endings.

After the tutorial, it's time to start a project. Kids can jazz up text pages with sound effects and musical accompaniment, even though they can use only one font and one color. Graphics pages, on the other hand, display multiple fonts, shapes, borders, clip art, freehand drawings, and multiple colors. Kids can add sound and music to these pages, too. Although graphics pages are visually interesting, they take up more disk space.

Several tools help with page design. Young artists can select from 32 brush shapes, 80 colors, and five line widths. Drawing tools include filled and hollow rectangles, circles, and ovals. You can fill areas, copy and paste items from one page to another, and select from nine different fonts. While the drawing tools are not as powerful as those in dedicated paint programs, they are sufficient to create a wide variety of original art screens.

The clips in the sound-effects library include thumps, a siren, drums, a dragon's breath, and laser guns. There are also ten speech clips in the Sound Library, but the voice quality is poor. You're better off choosing one of the many musical scores. If these aren't enough, Scholastic sells additional theme packs containing graphics backgrounds, clip art, and sounds.

Kids can add even more pizazz to their stories with one of ten wipes—visual effects that are activated when



Kids are key to America's future. And so are computers. By the year 2010, virtually every job in our nation will require some computing skills. That means preparing all of our youth today to take on technology tomorrow.

Our students' math and science scores are far below those in other countries. To excel in our high tech times, our kids need to catch on to computers. They're tools that can inspire them to think more independently. More creatively.

The Computer Learning Foundation is a non-profit organization that's taking the lead in computer literacy efforts nationwide. We're bringing together companies, state departments of education, national non-profits and local groups.

Our Computer Learning Month in October is a focus for thousands of community and classroom programs. We've involved millions in discovering the benefits of computing.

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a page is turned. For example, a page can fade to black, turn like a Venetian blind, or dissolve. Once the text is finished, the graphics are done, and the special effects are added, kids must choose how the page will link with others in the story. The Continue link automatically moves the reader to the next page, while Choice offers the reader as many as eight pages to move to. The Chance link randomly moves the reader to one of two different pages.

Stories are created using a Macintosh-like user interface featuring scroll bars, dialog boxes, pull-down menus, and other options. The program accepts input from a mouse, joystick, graphics tablet, or keyboard; however, the mouse was easiest to use. Unfortunately, *Super Story Tree* doesn't use enough command-key equivalents. Enhanced keyboard control would make *Super Story Tree* more flexible. The user interface is almost identical to the one in Scholastic's *Slide Shop*. In fact, you can share clip art, screen backgrounds, sound effects, and music clips between the programs.

Super Story Tree comes on 3½- or 5¼-inch disks. The 5¼-inch version includes two double-sided floppies. While the program functions adequately with a single disk drive, a second drive reduces disk swapping. The 3½-inch version contains the startup program, tutorial, graphics backgrounds, clip art, fonts, borders, and sounds on a single 800K floppy. This minimizes, but doesn't eliminate, disk swapping.

Super Story Tree's strength lies in its open-ended approach. It builds language arts skills because children will want to write stories they can present to their classmates. The Teacher's Guide provides several ideas for integrating the program into other curriculum areas, such as science, social studies, and health. *Super Story Tree* is a program that clearly demonstrates the usefulness of the computer as an instructional aide in the classroom.

In the home, too, *Super Story Tree* encourages creativity. So sit down with your children and spin a yarn with an ending or two.

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Remember: In space, no one can hear you scream. But that doesn't mean it isn't noisy out there. The updated version of *Echelon* proves that. *Echelon* is an ideal platform for premiering Access's new RealSound, which lets standard MS-DOS machines produce realistic sound effects, voices, and music using the computer's built-in speaker—no add-on boards required.

With the steady hum of fusion engines and the voice of the ship's computer verifying your input, it's easy to feel as if you're really in the cockpit of a space fighter, much easier than with the "beep, click, buzz" of the old version.

With three different play modes, you can play *Echelon* to match your mood. Wiped out after a long day on the job? Select Flight Simulation and take a relaxing flight around the patrol area without fear of bad guys ruining

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your day. Your boss yell at you today? No problem; choose Arcade Action and blast away relentlessly at enemy ships, imagining your supervisor in the cockpit of each one. Snowed out of work with time on your hands? Select Exploration mode and start gathering some of the 240-plus artifacts that will help you locate the pirate base. But watch out: The pirates won't be happy with your amateur archeology.

Echelon already has outstanding graphics and play action, especially on faster machines with EGA or Tandy graphics. With the beeps and buzzes eliminated and RealSound added, *Echelon* becomes one of the most realistic simulations available for the PC.

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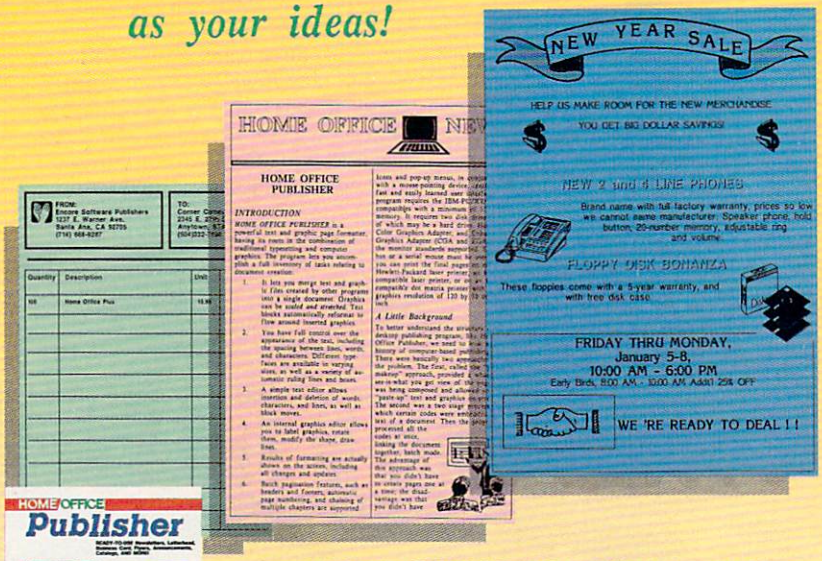

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WEALTHBUILDER BY MONEY MAGAZINE

Cash doesn't grow on trees, but you can cultivate it on the branches of stocks, bonds, precious metals, and other exotic plants. Designed for greenhorns and green thumbs alike, *WealthBuilder by Money Magazine* teaches you to budget and invest your money wisely. It also helps you plan for future crops.

WealthBuilder, from Reality Technologies, features three modules. First, take the Money Quiz to evaluate your mental soil. Second, study the tutorial to learn the techniques of a productive money-grower. And third, watch your seeds grow.

The Money Quiz takes about ten minutes. Some questions are trivial, but others are very helpful. Whether useful or useless, all the answers are in the program's tutorial. Coming back to the quiz after using *WealthBuilder,* you may be surprised at the financial savvy you've gained.

Unless you score very high on the quiz or you already know all about investments, learning is your next chore on the money farm. In the tutorial, you'll learn how to manage your funds through budgeting, saving, debt reduction, and investment. As a supplement to the tutorial, Reality Technologies has included *Money Magazine's Making Your Money Count* video.

Even if you don't have a large supply of money seeds, *WealthBuilder*'s tutorial can help you make the most of your funds. Perhaps you're fighting the credit-card weevils but also looking at investments. Then you win $1,000 in a contest. According to the program, paying off your credit card is your best pesticide, because paying off your balance by $1,000 can save around 18 percent before taxes. That's almost double what you'd earn if you put the $1,000 in a money-market fund.

The tutorial's Money Tips and Money Facts give you good advice on how to use your new knowledge. In the section on health insurance, one of the Money Tips explains that rising health costs have financially stressed some HMOs (Health Maintenance Organizations). The tip suggests that you investigate the condition of an

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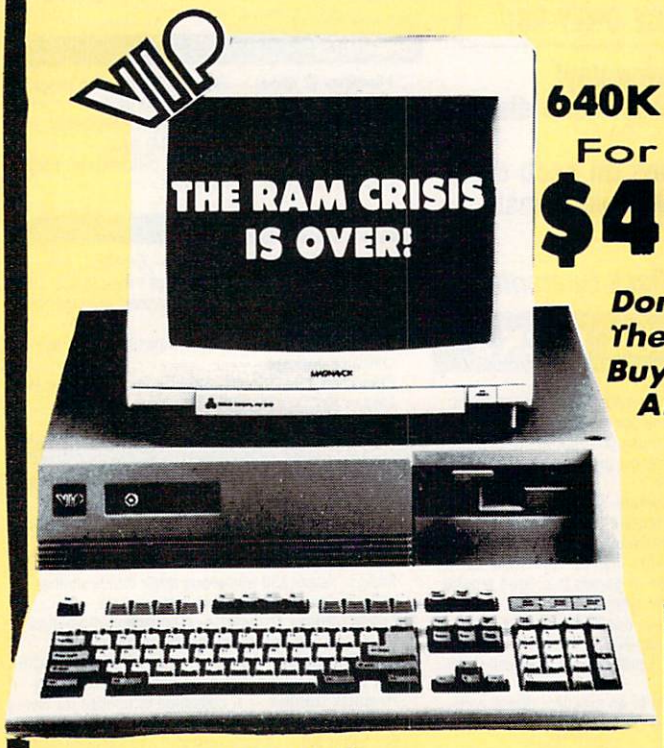

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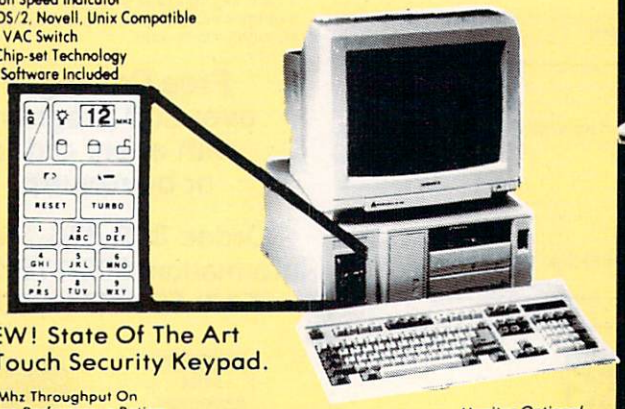

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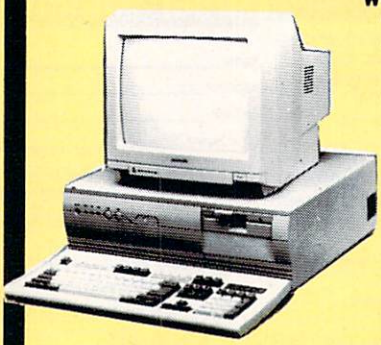

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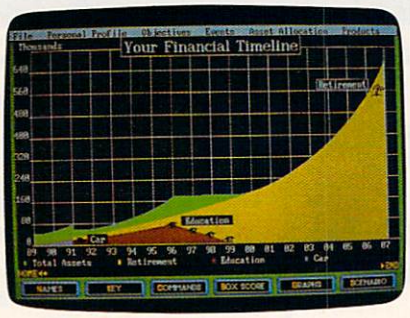
There are 18 sections in the tutorial which teach you how to plan for your family's future. A section on investment products unearths the secrets of such financial fertilizers as mutual funds, stocks, gold, and limited partnerships.



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One of *WealthBuilder*'s strengths is the way these different screens help you figure out your financial status. Unless you're very conscientious and organized, you probably can't make an accurate estimate of your monthly household expenses. It's easy to leave out small details. But call up the detail sheet on household expenses and you've got an instant itemized list.

Once you've completed the sheets, *WealthBuilder*'s other strength blossoms. Using all the data you've entered, the program tells you how much you need to save to reach your goals. *WealthBuilder* goes on to suggest how to invest your money—what portions of your savings you should put in equities, bonds, and precious metals. Armed with this Asset Allocation pie chart, you can use the program's database of investment products to identify the specific organizations with which you'll do business.

WealthBuilder's database sorts the investment products by risk, yield, and so on. If you see a government bond that interests you, you'll find a phone number for the organization that sells that bond. You'll also find the minimum investment, the bond's performance during bull and bear markets, and the cumulative returns during different times.

Moving from tutorial to information sheets to database is easy and fast. Although the program is mouse-driven, it actually works more smoothly from the keyboard. You get to main screens through menus, and you get to subsequent screens through context-sensitive key combinations.

WealthBuilder is for devoted cash farmers—beginners or old hands—who can invest time as well as money. But all the work is worthwhile. This program gives you the information you need to plant your money in fertile soil.

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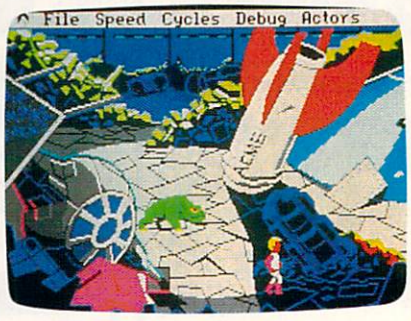
SPACE QUEST III: THE PIRATES OF PESTULON

Sierra's *Space Quest III* is a 3-D animated adventure that puts you in the role of Roger Wilco, an intergalactic sanitation engineer who was last seen (in *Space Quest II*) drifting through space in an escape pod. At the opening of *Space Quest III*, the pod drifts beneath a robot-controlled garbage ship, is mistaken for a piece of scrap, and is beamed aboard. Once aboard the garbage ship, your first objective is to discover a way to escape. Then you can go about your real mission, which is to search the cosmos for Two Guys from Andromeda.

It seems these Two Guys (*Space Quest* designers Mark Crowe and Scott Murphy) have been kidnapped by software pirates working for a disreputable software publisher called Scumsoft. Unless you save them, they will be forced to turn out dull, buckazoid-operated arcade games like Astro Chicken. Unfortunately, the location of Scumsoft Software Empire is a closely guarded secret.

You can use a mouse, a joystick, the cursor keys, or the numeric keypad to make Roger Wilco walk around the screen. Sierra's animated adventures have a 3-D feel because, along with horizontal movement across the screen, characters like Roger can also be moved up the screen into the background and down into the foreground. Roger can walk completely around many objects, disappearing as he passes behind large objects and reappearing again when he comes around to the front. This effect is enhanced not only by the shadow Roger casts when he's in the light, but also by the way his character darkens when he's moved into the shadows.



Only you, Roger Wilco, can defeat the bad guys from Scumsoft Software in *Space Quest III*.

Of course, just moving around won't help Roger get off of the garbage ship or find the Two Guys. You also have to explore your surroundings, take items that will help you achieve your goals, and interact with the people (and aliens) you meet on your travels. You do this by typing simple commands such as *Look at Computer, Take the Wire,* or *Examine Postcards.* At times, you're forced to quickly think of an appropriate command and enter it before Roger suffers some unspeakable horror. For instance, early in the game you must come up with the correct combination of commands that will save Roger as he heads down a conveyor belt toward a shredding machine.

As you make your escape on the spaceship Aluminum Mallard, the ship's computer display replaces your own display, and the onscreen function keys must be used to access the ship's weapons and navigation systems. Your options are limited, and your operation of the Mallard can't exactly be called flight simulation. But having even a small degree of control during a sequence that many game designers would have simply automated helps to maintain the illusion that you are part of the story, that you're not simply watching it unfold.

The animation looks good in all graphics modes. *Space Quest III* is the

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best-looking game in the series. There are several cinematic touches, such as dramatic close-ups of the Terminator as he stalks Roger Wilco on Phleebut, and a rat's-eye view from the rafters of the garbage ship as Roger searches for the reactor below. The garbage ship's interior and the exterior shots of the Aluminum Mallard are particularly stunning when the game is running in VGA or EGA mode. The game also sounds as good as it looks, thanks to a 30-minute musical score that can be heard through the Ad Lib and Roland MT-32 sound boards.

As with all Sierra adventures, *Space Quest III*'s gameplay is enhanced by several options available through pull-down menus and keyboard shortcuts. You can adjust Roger Wilco's movement speed, repeat the last text command, toggle sound on or off, or check Roger's inventory with a single keypress. You can also pause the game so that you can answer the doorbell or so you can take your time planning your next move without something dreadful happening to Roger. Be forewarned, however, that when you pause, the Two Guys will appear onscreen complaining, "Fine. Pause. Just don't be taking too long, OK? We don't want any babies playing this game!"

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There's nothing like a session of slaying evil creatures and avoiding deadly traps to keep the day interesting. Melbourne House's *Barbarian* lets you do it the hard way: learn by dying. You, Hegor the Barbarian, must descend into the bowels of the underworld to find your father's killer and avenge his death. Naturally, along the way you encounter every evil creature imaginable, from overzealous bulldogs and axe-wielding soldiers to an ornery, fire-breathing dragon.

Barbarian's two icon-based control panels make negotiating ladders and stairs easy. You're given a sword at the start of your quest. Along the way you can pick up a bow and other weapons to add to your arsenal.

If you're not in a fighting mood, you can bypass some of the bad guys by jumping, defending, or fleeing.

Your three lives give you a little breathing room as you encounter deadly trap doors, collapsing bridges, and falling ceilings. Memorizing the pitfalls and learning by death will lead you farther into the caverns each time.

Barbarian offers only one path to the game's end. But the challenge of mastering all the traps along the way makes it an enticing path to take.

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ULTRAVISION

Staying state of the art in the MS-DOS world isn't easy. Not long ago, you were showing off your incredible EGA graphics card to your jealous CGA-using friends. Now they have VGA systems, and it's your turn to cry. You'd like to upgrade to the more advanced VGA standard, but you don't have the $1,000–$1,500 to do it.

Luckily, there's another option. UltraVision, from Personics, tweaks your EGA system into an almost-VGA-quality display. Even more amazing, UltraVision performs its video magic for a mere $120, making it a very attractive alternative to a VGA upgrade.

The UltraVision package includes the Personics Booster Card, which attaches to your current EGA board, and software to access the card's advanced video features. To set up UltraVision, you plug the card into an unused feature connector included on most EGA cards. On some graphics cards, you must flip a few dip switches or reset some jumper pins on the EGA adapter itself. The UltraVision hardware guide has instructions and illustrations outlining the correct procedure for attaching the Booster Card to most EGA boards. It took about ten minutes to install it on my old ATI EGA Wonder board. Once the hardware upgrade has been completed, run a program to install the UltraVision software and you're ready to go.

How well UltraVision enhances your display depends on the type of monitor you use. On a standard EGA monitor, UltraVision adds a number of new display modes in addition to the default 80 column × 24 row display. You can expand your display vertically to 43 rows or stretch it horizontally to either 120 or 132 columns, ideal for working with large spreadsheets.

Installing UltraVision on an EGA system with a multisync monitor produces even more impressive results. With this configuration you can run *Windows* on a 640 × 480 pixel screen, using Microsoft's standard VGA driver. Other graphics-based programs show similar improvement in display resolution on multisyncs. Ultravision includes 17 custom screen fonts designed for better readability in high-resolution screen modes. Some of these custom fonts seem to be provided more for fun than for functionality; you probably won't use Old English, Script or Broadway fonts for your day-to-day PC operations. But you should be able to create a legible screen display using one of the remaining 14 typefaces.

See all 64 EGA colors at once using the UltraVision disk/card combo.

UltraVision also enhances the color capabilities of your EGA display. You can replace the default 16 EGA colors used by your applications with any of the 64 colors in the EGA palette using a simple menu-driven program. You can create and save up to six custom color sets, which can be loaded along with your application programs. Using some of the brighter colors supported by UltraVision will help reduce the eyestrain associated with working in a room illuminated by fluorescent lighting.

The most impressive feature of UltraVision is that it accomplishes all its tricks using only 7–17K of RAM, depending on your hardware configuration. Not only is UltraVision frugal,

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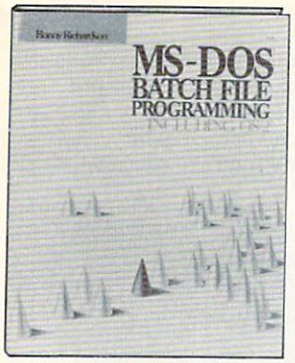

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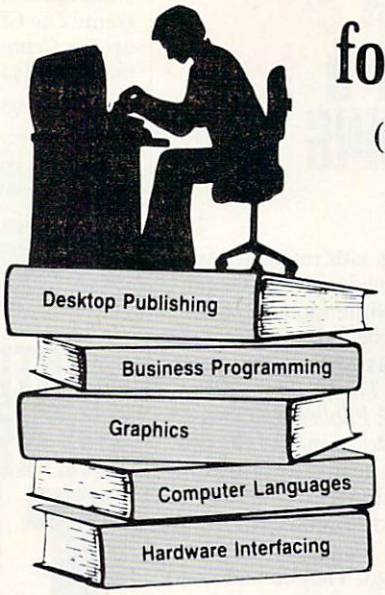

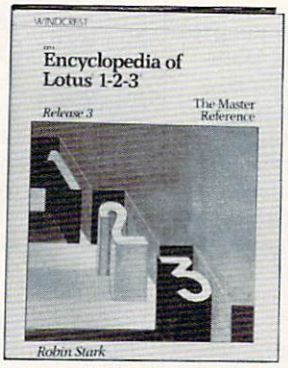

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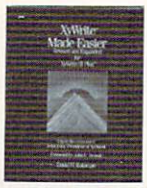

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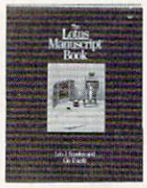

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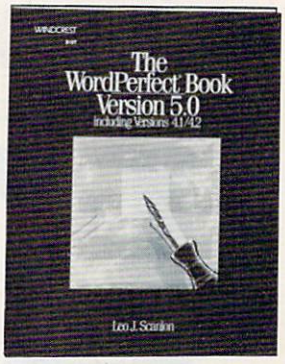

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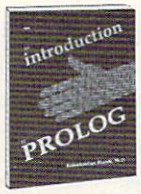

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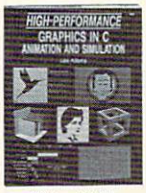

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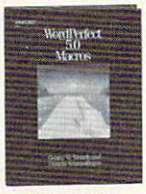

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it's also well behaved. I tested UltraVision with several programs, including graphics heavyweights like *Ventura Publisher* and Windows, and I had no problems with any of them. If you encounter a problem, you can disable UltraVision from the DOS prompt and return to standard EGA mode.

Even if you plan on upgrading to VGA sometime in the future, UltraVision is a good investment for now. For $120, it greatly enhances your current EGA system. UltraVision allows you to upgrade in logical increments as your budget permits. For instance, you could purchase a multisync monitor, giving you access to the advanced features of UltraVision, and that monitor could later be used with a VGA card.

Adding UltraVision results in a big improvement in your EGA display quality. My old EGA monitor will never look the same again.

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BOARD GAMES #2 (231) Checkers, Chess, Dominoes, Backgammon. Needs CGA.
ADVENTURE GAMES #2 (246) Empire & McMurphy's Mansion.
STRATEGIC WAR GAMES (226) War on the Sea, Tank & African Desert Campaign.
KINGDOM OF KROZ (244) Unique arcade-adventure game. National prize winner.
ARCADE SPORTS GAMES (223) PC-Pool, PC-Bowl & Archery. CGA or EGA.
ARCADE GAMES #1 (216) Spiders, Tank Wars & Disk Crash. Requires CGA.
PINBALL GAMES (225) 10 pinball games for 1-4 players. Requires CGA or EGA.
EGA FOOTBALL (257) New! You control all the great action. Plays like a real football game. Needs EGA.

UTILITIES

POINT-SHOOT BACKUP/RESTORE (401) Superior hard disk backup. CGA or EGA.
QUICKCACHE (443, 444) (2 disks) Disk caching speeds up your PC. Best we've seen!
BAKER'S DOZEN (406) Powerful package of 14 utilities from Jim Button. Top rated.
FLU-SHOT+ (411) New! Effective protection against virus programs.
CGA SIMULATOR (433) Run most CGA programs on Hercules compatible monochrome cards.
HARD DISK UTILITIES (437) Very useful set of hard disk utilities.
EGA FONTS (441) More than 50 fonts to make your EGA shine.
CATDISK (452) Easy, menu-driven disk cataloging system.
SPACE MAKER (467) Data compression package to save disk space.
BEST BATCH UTILITIES (473) 25 programs put power in your batch files.

MENUS and DESKTOP

POWER MENU (702) Excellent, easy menuing program. Needs hard disk.
HOMEBASE (601-602) (2 disks) Desktop organizer puts Sidekick to shame.
TREEVIEW (706) New! Our favorite DOS command shell with pull down menus.

WORD PROCESSING

WORDPERFECT 5.0 TOOLS (841) ASCII to WP5 format converter plus other super utilities to improve performance.
PC-WRITE 3.02 (809-811) (3 disks) New! Top rated w/spell checker.
WORDPERFECT CLIPART (843, 844) (2 disks) Over 180 great graphics.
PRO-SCRIBE (822) New! Really improves impact and clarity of your writing.
WORDPERFECT MACROS (831) for 5.0, **(837)** for 4.2. Over 70 great macros & templates.

GRAPHICS

GRASP (1605) Create and run fabulous graphic demos. Any graphics card.
PC-KEY DRAW (1607-1609) (3 disks) Powerful drawing/CAD program with clip art. CGA, EGA, or HERC w/CGA emulation.
OPTIKS (1619) Edit, merge, convert files from over 24 different graphic formats.
FINGER PAINT (1620) Like PC-Paint brush. Requires graphics card.
VGA PAINT (1622) New! Graphics/drawing in 248 colors. Requires VGA, 450K.
PRINTMASTER GRAPHICS (1602, 1603) (2 disks) New! Over 1,000 great Printmaster graphics. Requires Printmaster.
PRINT SHOP GRAPHICS (1663, 1664) (2 disks) New! 1,080 graphics for Print Shop.

DATABASE

dLITE (1031) Amazing dBASE multi-utility incl. cut & paste, and much more.
FILE EXPRESS 4.xx (1002-1003) (2 disks) Easy, powerful database. PC-Magazine said it "performs like a thoroughbred."
dPROG (1022) Fantastic dBASE III auto-programmer writes all codes for you.
WAMPUM (1006, 1007) (2 disks) Superb, full-featured dBASE III clone. Requires 512K, hard disk.
dFLIPPER (1025) New! Directly edit dBASE & compatible files from DOS.
PC-FILE+ 2.0 (1009-1011) (3 disks) New version. Jim Button's relational database masterpiece.

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CREATIVITY PACKAGE (3000-3002) (3 disks) Unique, 3-phase pkg. Computer brainstorming unleashes your creativity.
IDEA TREE (3003) Unique thinking tool & info manager. Gain control of thoughts with graphic display of ideas. Top honors.

PROGRAMMING

A86 and D86 (1403-1404) (2 disks) Finest macro assembler & debugger. Lightening fast. Rave reviews.
EBL & OPAL (1407) Two fantastic batch language processors. Super-charge your batch files.
SCREEN DESIGNER (1431) New! Exciting feature-packed screen designer for batch files & most programming languages. Needs 384K.

SPREADSHEET

AS EASY AS (902) Great Lotus 123 clone. Latest with 256x1024 grid. Does almost every Lotus function.
QUBECALC (903) Unique, powerful 3-D spreadsheet. View data as never before.
LOTUS TEMPLATES (907) Ready to run. Requires Lotus 123.
LOTUS MACROS (908) Saves loads of time. Requires Lotus 123.
123 POWER WORKSHEETS (911-912) (2 disks) 13 great worksheets for Lotus

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COMPUTER CHEF (1817-1818) (2 disks) Complete cooking program. Loaded with recipes.

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PROCOMM (1700, 1701) (2 disks) Newest. All features, menu-driven. Top rated.
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TUTOR (302) Complete interactive DOS and computer tutorial.
EASY DOS (305) Two great programs make using DOS very easy.
PC-FASTYPE (311) The very best interactive typing instructor. Needs CGA or EGA.
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SPANISH TUTOR (351) 3 powerful programs to help you learn Spanish.

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*TICKLEX	BU 143	A powerful tickler/calendar/scheduler for home/office and hard disk
*UPS MASTER	BU 144	If you ship by UPS then you need this complete shipping program - indispensable
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*FONE	BU 146	A new program to time your 'phone calls while you're on the line and save you money
*SMARTCALC 2.0	BU 147	We put this in the business section because it's really a completely computerized desk-top calculator, similar to those seen in most offices - complete with paper tape output. With this, you can throw out the calculator and free up more desk space!
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*BILLER 1.3	BU 151	Another good billing program; direct amounts or hourly rates, blank paper or forms, 1000 clients per file, HD or floppy, export data for mailmerge
*DENTAL OFFICE MANAGER	BU 152	Software for dentists and busy practices!
*PC-TICKLE	BU 153	More really useful Buttonware!
*EXPRESS CHECK 3.07	BU 154	Excellent checkbook management software from Expressware
*OWL PORTFOLIO MANAGER 2.0	BU 155	Investment analyzer and manager - maintains important personal financial records for taxes, loan applications etc.
*PAYROLL USA 2.11	BU 156	(2 disks) Another great payroll program from Anthistle Systems - recommended

EDUCATIONAL
History, Geography, Languages...

AMY'S FIRST PRIMER	ED 101	Latest version 1.7! A collection of routines for pre-schoolers with alphabet, counting, shapes and color
PC-TOUCH	ED 107	Super typing tutor with on-screen performance data as you progress towards that 150 wpm goal! Most of us need this one!
FLAGS	ED 110	115 in all, displayed on screen for recognition and learning
PHYSICS	ED 111	High school level - excellent
SPANISH	ED 112	(2 disks) Quality language tutor, beginner to advanced
ALGEBRA	ED 113	Both integer and real computations - 1st class!
TEEN ED 1	ED 124	Higher Math, Trigonometry, Geometry, Biology, Circuitry, Pi, Morse Code
HIGH SCHOOL VOCABULARY	ED 126	Multiple-choice quizzes with re-testing and clear definitions - recommended!
WISDOM OF THE AGES	ED 128	(4 disks) A major work! Worldwide classical data - quotes, thoughts, proverbs, epigrams
*VIDEO CHEMISTRY	ED 138	By very popular demand we present a perfect program for assisting in chemistry - valency and molecular combinations
*PC FASTYPE 3.01	ED 139	Another excellent menu-driven typing tutor
*FACTS	ED 140	A kid's tutor for capitals, states and presidents
*COMPUTER TUTOR	ED 141	If you're new to computers, then this is a must for you. It'll teach you the basic necessities in a fun environment
*THE PRESIDENTS	ED 142	(2 disks) Biographical and quiz system on all the US Presidents - recommended
*MICRO WORLD DATA BANK	ED 143	(5 disks) Very highly detailed world mapping database produced by the CIA
*LIFE 2.1	ED 144	An important educational tool, LIFE is a simulation game created by mathematician John Conway in the '60s. It is a type of cellular automaton game often used to illustrate certain math functions. Well documented
*NIMONIK 1.1	ED 145	A smart, menu-driven program that helps you memorize many different subjects/languages
*EDICOM-12	ED 146	A DOS assistance program which works as a tutor for new PC users
*ET	ED 147	A stimulating artificial intelligence neural network demo for EGA and mouse
*WORDSTALK	ED 148	(2 disks) A really entertaining word game for all ages, with ability to solve crosswords and cryptograms etc. Essential for those with an interest in words and word puzzles

MUSIC
Compose, Save, Play...

PIANOMAN 3.2	MU 101	Turn your computer keyboard into a piano keyboard - lots of fun!
PC-MUSICIAN	MU 102	Compose, save and play your own music - inspirational and educational
*MUSIC LIBRARY SYSTEM	MU 105	Here's a really nifty music database for cataloging all your CDs, tapes and records

*New This Month

SPREADSHEET & UTILITIES
Templates, Macros, Utilities...

PC-CALC+	SP 101	(3 disks) Superb 123 clone - interacts with PC-FILE+. Fantastic value & quality!
EZ-SPREADSHEET V.S21	SP 102	Simple to use but powerful system - ideal for beginners - one of the best we carry
AS EASY AS...	SP 103	Now V3.01 of this superb Trius spreadsheet loaded with features, and compatible with 1-2-3 files - highly recommended
LOTUS MACROS	SP 104	Save tedious work with these short-cuts for use with 1-2-3. A must!
LOTUS TEMPLATES	SP 106	If you use Lotus, you'll love these ready-made applications!
INSTACALC	SP 107	This one's special - a fully-powered spreadsheet MEMORY RESIDENT (TSR)!
PIVOT!	SP 108	Sideways print routine for SP 103
*QUBECALC	SP 109	This powerful 3-dimensional spreadsheet lets you view data in a new light. Ideal for consolidating from several sheets into one!
*123 POWER WORKSHEETS	SP 110	(2 disks) More powerful worksheets - these 2 disks are worth having if you use Lotus!
*MIPSCALC PLUS	SP 111	(3 disks) A wonderful spreadsheet running under the GEM environment - reads, writes Lotus files - needs GEM - recommended!
*WHITLING WORKSHEETS	SP 112	(2 disks) Excellent budgeting tools for Lotus 123 comprising CHEKCHEK and BIGPCXX - routines that budget and plan your finances
*LOTUS GOLF LEAGUE SCORING	SP 113	Worksheet for Lotus for golfers
*EXPRESSCALC 4.07	SP 114	Superb spreadsheet from Expressware - interacts with their ExpressGraph and File Express programs - recommended

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WORD PROCESSING
Style, Speller, Macros, Thesaurus...

PC-WRITE	WO 101	(3 disks) Latest version 3.02 of this powerful package w/mail-merge and spell checking!
GALAXY 2.43	WO 106	Easy to use WP with menus and quick keyboard commands. Fully featured and now latest version!
BRADFORD 2.04	WO 107	Letter quality output from dot-matrix in over 35 fonts - recommended
WORDPERFECT MACROS	WO 108	Over 80 macros for WordPerfect v 5.0
MINDREADER	WO 109	Uses artificial intelligence to complete words and phrases, learns your own style
EZX-WRITE 2.3	WO 110	Recommended VALUEWARE tm - these people are VERY professional and this package is ideal for a first, highly functional word processor. Includes pull-down menus
THESAUR V3.5	WO 111	Shareware's 1st thesaurus? - very useful for a variety of applications
ENVELOPE MAKER 2.3	WO 112	A useful envelope printing utility for Epson MX, FX, LQ or compatibles - excellent!
MAXI_MAX	WO 113	A set of useful macros for WordPerfect 4.2 - 6 dozen macros and templates - get it!
*WORDPERFECT 5.0 TOOLKIT	WO 114	ASCII to WP5 format converter plus lots of other useful utilities
*PRO-SCRIBE	WO 115	Improve the impact and clarity of your writing with this new program
*WRITER'S HEAVEN 4.0	WO 116	New in a line of accessories for PC-Write versions 2.6 and up. Adds a complete new set of ingenious command keys, and comes with a cursor speed-up program
*PC-WRITE MACROS 1.2	WO 117	A set of 100 macros for this popular word processor - automates tasks with a single keypress including video reversal, envelope addressing and overlapping instead of scrolling screens for document review. Requires PC-Write 3.0 or later (see WO 101)
*WORDPERFECT 5.0 POPUP	WO 118	Forget your plastic templates showing keypresses; this handy little tool pops all the information up on the screen as soon as you touch the ALT, SHIFT or CTRL keys!
*SPLIT/APPEND 1.0	WO 119	This excellent utility will split any file into multiple files, and will append any file to any other file - really useful
*WORDPERFECT MENUS	WO 120	Pull-down menus for both 4.2 and 5.0
*PHOENIX WP 1.0	WO 121	Good, robust and simple word processor with power as required - works in EGA mode also - recommended

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DATABASE MANAGEMENT
dBase, Files, Routines...

PC-FILE+	DA 101	(3 disks) The dBase killer! Full-featured and state-of-the-art DBMS! Highly recommended
dBASE III ROUTINES	DA 103	Over 60 helpful routines for the dBase III user. A must!
NEWBASE II 4A	DA 104	New version! Excellent user-supported DBMS with full menu package. Try for power and simplicity
WAMPUM 3.3S	DA 105	Latest version of this legendary dBase III/IV compatible clone. Powerful but ludicrously inexpensive!
FILE EXPRESS 4.3	DA 106	(2 disks) Another powerful package from Expressware - interacts with their ExpressCalc and ExpressGraph - recommended
dLITE 1.0	DA 107	Ward Mundy's (Wampum fame) new pop-up dBase marvel - background access to 10 dBase compatible applications!
*dPROG	DA 108	This super dBASE III programmer does all the code writing for you!
*EZ-dBASE TRAINER	DA 109	A really nice tutorial for dBASE
*WYNDFIELDS 1.0	DA 110	Here's a REALLY nice database that's 3 disks squeezed onto one - mouse supported and easy window menus - MOST HIGHLY RECOMMENDED
*JAGER MANAGER 1.4A	DA 111	A convenient information manager with database, dialling and calendar
*dBASE AUTO PROGRAMMER	DA 112	This dBase III utility writes the code for you!

GAMES
Chess, Planes, Adventures...

JET FLIGHT SIMULATOR	GA 101	Stimulating and fast-paced fun!
3-D CHESS	GA 103	Fantastic 2D and 3D play with many levels
ARCADE QUALITY	GA 112	Classic Kong, 3D Pacman, Pango & Bricks
GAMBLER'S DISK	GA 121	All the casino thrills - blackjack, slots, baccarat, solitaire
FLIGHTMARE	GA 124	Be a fighter pilot from the future!
MONOPOLY WITH GRAPHICS	GA 127	An old favorite cleverly programmed for absorbing fun!
ADVENTURE TOOLKIT	GA 138	(2 disks) Create and play your own text adventure games
PC-PRO GOLF	GA 139	(2 disks) A must for the golfing fraternity - good graphics
EGA TREK	GA 140	Superb Star Trek game for EGA - fight Klingons and Romulans - great grafix
MAZE	GA 142	Wolfgang Stiller's mind boggler - get this one for a LENGTHY mental challenge!
SOLITAIRE	GA 147	A collection of absorbing card games for one player - nice CGA/EGA graphics
EGA SORRY!	GA 150	Immensely popular version 2.0 of this classic game, for EGA card only
GAMESCAPE	GA 152	The incredible adventure game designing system that lets you write and distribute your own games!
PINBALL ART GAMES	GA 156	Good pinball action - circus, money maze, par 3 golf, spooky and runway
LOVE FIRE	GA 157	You fashion the structure of this love adventure as you go! Includes Red Planet & Castle Droganya
*CAPTAIN COMIC	GA 158	The best we've seen. Requires EGA, and programmed in stunning color. A Nintendo 'Mario Bros' style game with multi-levels of play, scrolling screens, bbeautiful sound effects. Sure to please the most discerning of game players - an essential to your collection
*BARD'S TALE CHAR-ED	GA 159	Allows modification of characters from Bard's Tale I and II
*ED'S CHESS	GA 160	A truly fine chess game with the power to beat Chessmaster 2000!
*CYRUS EGA CHESS	GA 161	Here's another challenging opponent for chess if you have an EGA card to show the fine detail - a program of pure breathtaking quality
*ARMCHAIR QUARTERBACK	GA 162	Set the scene and call plays in this football strategy game
*Q-BERT	GA 163	An all-time classic favorite arcade game
*MASTER THE MARKET	GA 164	Realistic and challenging stock market simulation - better than the famous "Millionaire" game in our opinion
*FORD SIMULATOR	GA 165	A new exciting driving simulator from Ford
*DRACULA IN LONDON	GA 166	A really good graphics and adventure game
*EGA GOLF	GA 167	Play 18 holes with scenery in finer detail on your EGA!
*PC-RAILROAD	GA 168	Control your trains on supplied routes or design your own
*NINJA	GA 169	A commercial quality arcade game with karate tactics!
*CRIME LAB	GA 170	A super, graphic, murder mystery game for all the family
*PCBINGO	GA 171	Play bingo at home with all the family with this realistic simulation of the commercial game - even prints out the cards for you!
*MORAFF'S EGA/VGA PINBALL	GA 172	Here's a high class pinball for high resolution!

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Astronomy, Finance, Travel...

MAIL MASTER	GE 101	Good and dedicated mailing list manager for form letters and labels
CITY DESK	GE 103	Desktop publishing - simple but effective for smaller applications
GENEALOGY ON DISPLAY	GE 105	(2 disks) A complete package, ideal for beginners
HOME INVENTORY	GE 106	Keep track of what you own - ideal for insurance records etc.
PERSONAL FINANCE MANAGER	GE 107	Household budgeting, savings, investments, checking etc.
MOVIE DATABASE	GE 118	Store and retrieve info about your favorites - comes with existing collection
MEMOIRS	GE 119	A private diary to keep your special thoughts hidden from others - fun!
STRESS & SHRINK	GE 122	Stress test and personality analysis
HOME BARTENDER GUIDE	GE 128	(2 disks) If you like a drink, you'll love these computer recipes!
LITTLE BLACK BOOK	GE 134	Creates pocket-sized address book; prints mini-alphabetized pages
TIMESTAR 2.08	GE 143	Time management system and desktop for Windows 2.0 or greater. Must have MS Windows to run!
PC-LOTTO 2.41	GE 152	Latest version of this popular and all-embracing package for use with worldwide lotto games
*NEW AGE NOTES 1.1	GE 153	Over 200 metaphysical compositions for the Open Minded Individual. Discusses Mankind's Endeavours on this Earth Plane and explains the Purpose of Human Existence. A beautiful collection of Modern Philosophical Thought, Astounding and mind-boggling in its implications
*GOLF MANAGEMENT	GE 154	Golf handicapping and league secretary programs for golf clubs and golfing fanatics, from Sports League Management Association
*XACT SERIES CALCULATORS	GE 155	Every now and then you come across a really neat and clever package, with an appeal of presentation and inspiration that matches its usefulness. Here's 3 Hewlett Packard calculators - faithful simulations of the HP-11C Scientific, the HP-12C Financial, and the awesome HP-16C Programmers' model.
*CREATIVITY PACKAGE	GE 156	(3 disks) Unleash the power of your brain with this creative thinking tool - a complete and unique three-phase package
*IDEA TREE	GE 157	Organize your thoughts with a graphic display of ideas
*LOTTO-CAL 1.01	GE 158	(2 disks) A powerful and scientifically oriented lotto predictor; should improve your chances in the face of the inevitable odds against you!
*PROTAB 1.1	GE 159	A statistical calculator for fast quantitive analysis of small data sets
*AMORT 1.07	GE 160	Paul Tucker's excellent loan amortization program - easy to use and has powerful features
*FAMILY TREE 6.0	GE 161	Latest version of succesful genealogical package, comes with full documentation and good presentation. Family history and family fun
*LOTTO 3.0A	GE 162	Simply one of the best lotto programs we've ever seen - with every conceivable lotto feature - excellent material from Miller-Ware!
*THE CODE MACHINE	GE 163	A program designed to key Ham Radio transmitters and provide Morse Code practice sessions
*COMIC BOOK COLLECTOR 1.4	GE 164	A dedicated database for comic book fanatics!
*BASEBALL CARD COLLECTOR 1.4	GE 165	A dedicated database for baseball card collectors!
*COUCH COACH	GE 166	Fantasy football drafter from Potato League Sports
*PRO FOOTBALL LINEMAKER	GE 167	Calculates and projects the point spread and expected statistics of any professional football game

UTILITIES
Disk & Program Management...

LINCOMATIC BANNER	UT 105	Design and print large banners - hundreds of uses at home and work!
LASER UTILITIES	UT 106	An assortment of utilities and fonts for lucky laser owners - great value
DOS TUTORIAL	UT 107	Master DOS with this able mentor
BATCH FILE TUTORIAL	UT 109	Learn and utilize batch (.bat) file processing. Time saving, very useful
DOS TIPS	UT 110	(2 disks) Advanced DOS tutorial
ON-SIDE 1.02	UT 111	Sideways printing software from Expressware
EZ-COPY-LITE	UT 120	GREAT floppy duplicator - SUPERB for mass copying - reads disk to memory
MAX-MENU	UT 121	Flexible menu system for both beginner and advanced - used by Fortune-100 company - extensive options inc. LAN
DESKUTIL	UT 122	A good desktop with all the useful features, won't clog up memory with things you don't use!
KARC/PKXARC 3.6	UT 126	Latest version of a great file compression/extraction tool. A must for hard disk users
*DBS-KAT	UT 131	A well-documented utility for hard disk owners, provides a feature-rich database system for making a complete diskette library catalogue without typing data, with lots of additional utilities
*METZ DESKTOP MANAGER	UT 132	Desktop manager for Microsoft Windows 2.0 or greater, provides menuing, file and windows management. Also includes screen blanker, windows arrangement functions, directory tree display, file finder, point and shoot file management and an automatic menu generator
*BEST UTILITIES	UT 133	Some of the greatest general utilities including a RAM disk and print spooler to free your computer while the printer's working
*SCREEN SAVERS/BLANKERS	UT 134	Prevent monitor burn-in! This disk provides many screen savers for mono, CGA, and EGASAVE and EGABLANK
*LAPTOP GASGUAGE	UT 135	Monitors laptop battery and lets you know when to recharge
*POINT & SHOOT	UT 136	A far better hard disk backup/restore utility than DOS provides!
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*HD UTILITIES	UT 139	A useful set of hard disk utilities
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*New This Month

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PRINTMASTER GRAPHICS	GR 109	3 additional libraries for PrintMaster
PRINTSHOP GRAPHICS II	GR 111	Another 500+ images for the PrintShop program
PRINTMASTER GRAPHICS II	GR 112	(2 disks) Another 500+ images for PrintMaster
VENTURA CLIP ART	GR 113	(5 disks) Office/business subjects for Ventura Publisher
MEGADRAW 1.3 EGA	GR 117	Create icons and animation sequences for CGA/EGA, with QBasic source generated!
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*EGA FONTS	GR 123	Here are more than 50 fonts to liven up your EGA display
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☐ **HELP DOS** On line DOS help with menus. Includes DOS dictionary of terms and a hints menu.

☑ **MORE DOS TIPS** (2 disks) More about DOS.

☐ **STILL RIVER SHELL** Run DOS commands from a menu. Makes DOS easy.

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☐ **BEGINNING SPANISH** Tutorial.

☐ **FACTS 50** Geography lessons for U.S. Nice graphics.

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☐ **PC-TOUCH** Learn typing.

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☑ **SIMCGA/HGCIBM** (2 Disks) Use with Hercules graphics card/compatibles to run programs requiring CGA on your monochrome PC.

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☐ **PC-MUSICIAN** Compose, save, and play music.

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tion, logic, and common-sense abilities under severe time constraints. Luckily Mindscape's *Mastering the LSAT* is there to help you make it through.

This program teaches you strategies for mastering the four broad question categories included on the LSAT. When you feel comfortable with the questions, you can take two full-length practice tests. The package includes a workbook containing rules, diagrams, and exam questions, plus printed versions of some introductory lessons, reading materials, practice questions, and on-disk examinations.

The reading comprehension section measures logical thinking skills. You are shown how to classify questions according to type and are given tips on answering each type successfully. Practice questions illustrate various question types. The feedback you receive will strengthen your problem-solving skills.

In the section on Conceptual Structures and Relationships, you encounter questions similar to brain teasers. These become easier to answer if you design logic diagrams to show relations of fact. You'll practice drawing several different diagrams in order to feel more comfortable with various question categories.

The Relevance and Logic section measures your ability to evaluate a question's relevance in relation to facts, a dispute, or rules. *Mastering the LSAT* teaches you how to interpret questions and choose the right answer.

Argument Analysis tests your ability to evaluate the structure of arguments. For some questions, you must read a passage to determine its flaws or basic assumptions. For others, you must select a statement that would weaken or strengthen the argument, identify a statement whose truth is implied by the argument, or recognize a proposition that resembles the argument. *Mastering the LSAT* reviews each question type, offering techniques that help determine an argument's assumptions.

The Practice Examination Submenu presents several options. You can choose to take the test, see answers and explanations for each section on the exam, check scores, or return to the Main Menu.

The program will keep progress records for up to three people. There is a password option to prevent unauthorized people from viewing personal performance files or using the program.

Surprisingly, Mindscape doesn't offer a 3½-inch disk version of the package. However, the program isn't copy-protected, so you can install it on a hard disk or copy it over to the smaller-size disk.

Mastering the LSAT isn't a substitute for rigorous courses offered by LSAT preparation centers. These facilities provide multifaceted training that hone the skills required for high test scores.

Mastering the LSAT provides you with the strategies and techniques needed to answer questions correctly at a fraction of the cost charged by professional training centers. The program teaches you how to manage limited exam time efficiently and how to answer questions with greater confidence. To improve test-taking skills and maximize LSAT scores, you should register for a course at a local test-preparation center *and* practice with *Mastering the LSAT*.

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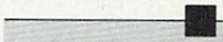

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Are You Ready for Calculus? (3534)—This is an excellent pre-calc tutor which reviews algebra and trigonometry.

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Lotus Learning System (3556, 3557)—A very complete package that makes Lotus 1-2-3 easier to use. (2 disks)

Computer Tutor (3562)—If you are a new user or computer novice, THIS IS WHAT YOU NEED! Learn in a fun, pressure-free environment. Highly recommended.

UTILITIES

Masterkeys (3300)—Like the popular Norton disk utilities, only better!

SimCGA (3305)—Utilities which allow you to run many programs that require a CGA card on your monochrome system.

Vaccines (3307)—Ten virus checker, eliminator, and protection utilities.

PC-DeskTeam (3375)—Large collection of Sidekick-Like desktop accessories (clock, calendar, phone book, etc.).

HDMenu (3379)—Puts all the programs on your hard disk onto an auto-booting, selection menu. (Easy to Install.)

On-Side (3387)—Prints your spreadsheets (or anything) sideways!

Q-Modem SST (3715–3717)—A professional modem telecommunications package which is powerful and versatile. (3 disks)

RELIGION/BIBLE

BIBLE-Q (3552)—Test your Biblical IQ.

BIBLE Men (3565)—Choose Old or New Testament and prepare to be quizzed on the people mentioned in the BIBLE.

Church dBASE (3812)—Automates membership record keeping for church congregations and other organizations.

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MISC. APPLICATIONS

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Fast Food (3802)—Know the nutritional values of most national chains' fast food items that your family eats.

ELISA (3805)—Let the famous computer psychiatrist analyze you. It's fun!

Lotto! (3823)—Complete system for most states' lotteries. (Requires printer)

The Diet Disk (3827)—Provides you with many tools for successful weight loss.

Astrology (3831)—Let the computer tell you what lies ahead in your stars!

Insta-Calendar (3835)—This calendar design tool and printer is easy to use.

Family History System (3852, 3853)—Helps you track your family roots and prints genealogical reports. (2 disks)

Piano Man (3902)—Record, edit, and then play back your favorite tunes. Also lets you turn your computer's keyboard into a musical instrument!

EDraw (3954)—Helps in the design of schematics and printed circuits.

GAMES

Striker (3400)—Arcade helicopter attack game. Bomb and shoot enemy targets. (CGA—Will not work with EGA)

Q-Bert (3403)—Play the famous arcade hit on your computer. (CGA)

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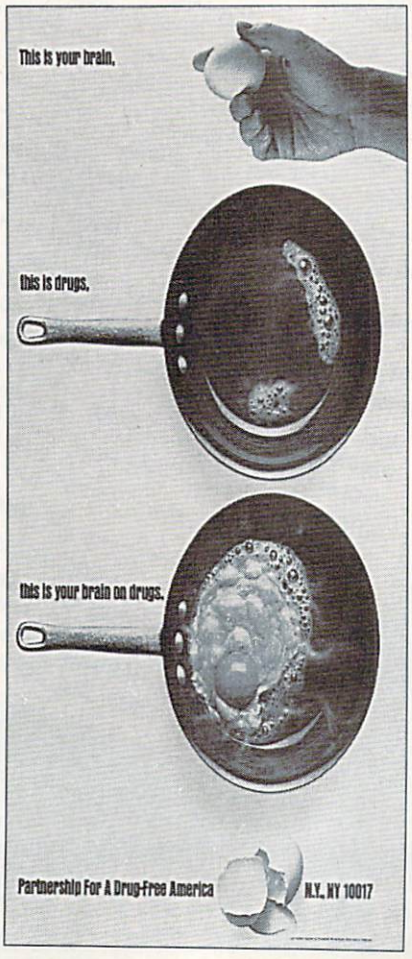

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SLEUTH (117) Who done it?
DND (119) Like Dungeons and Dragons.
ROUND 42 (120) Better than Space Invaders. 42 levels.
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SPACE WAR (158) Dogfight in outer space, using phasers, photon torpedoes, etc.
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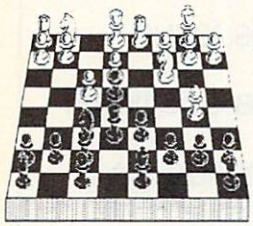

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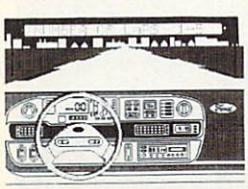

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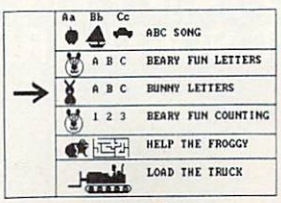

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After years of hesitation, Apple Computer has finally announced that it's going into the small kitchen-appliance business. Big Red plans to bring high tech to the home with its AppleKitchen product line, based on the company's Macintosh technology. Apple has coined the slogan *Cooking for the rest of us* to launch its new venture.

Planned for the AppleKitchen product line are the AstuteCoffeeMaker, the CleverMicrowaveOven, the CannyCanOpener, the IngeniousCheeseGrater, and the ShrewdGarbageDisposer. Consumers can hook all the devices together using standard KitchenTalk connectors to make their own SmartKitchen. In addition, the entire setup can run off of a Mac II, which can also be programmed to monitor the family VCR and, using the MacSifter peripheral, clean the cat's litter box.

The only part of AppleKitchen currently available is the IntelligenToaster, which Apple is billing as the basic unit in the SmartKitchen environment. "Without it, you might as well use a club to make bread," goes Apple's advertising.

The IntelligenToaster is truly a work of art. It looks similar to a modern toaster—except for the nine-inch monitor. In fact, if the slots on top weren't so wide, you might think it a Macintosh with top-mounted disk drives. It has a keyboard (the keypad is extra), mouse, connectors on the back (one for the KitchenTalk network, one for a universal power supply), a BreadScanner port, and a modem connector so you can phone in toast while you're away from home or dial up large bakeries.

According to an article in *KitchenWorld,* a new PCW Communications magazine catering to AppleKitchen users, the original design of the IntelligenToaster incorporated only one large orifice for inserting an entire loaf of bread. As originally designed, the machine would then slice and toast the entire loaf—it could even sense if the loaf was already sliced (apparently an early version mangled presliced loaves).

But soon, according to the *KitchenWorld* editors, a creeping sophistication oozed its way through the design team. The single knob on the toaster was replaced with a push-button keypad, which then evolved into a full-size keyboard. The fun-to-watch digital display blossomed into a hi-res monochrome screen. Apple claimed the improvements would make the IntelligenToaster easier to use and more versatile.

I secured an early evaluation unit for inspection and can offer my own insight into this mechanized marvel. Setup is simple, with just three options for system startup: Press the On button, give it a Start command via the KitchenTalk network, or clap your hands and say "Toast!"

After a few minutes for a RAM check, the screen comes to life and presents a smiling toast icon. The digitized "Good Morning," "Good Afternoon," or "Good Evening" greeting is governed by the time of day as sensed by the internal clock. (I love these smart appliances.) The system then asks you if you want to make toast. Just move the mouse, which is shaped like a stick of butter, to the Yes! icon on the screen and click.

Next, the IntelligenToaster asks how many slices of toast you'll be making. An image of a slice of bread appears, and you can press buttons 1 through 9, move the mouse, or whistle at varying pitches to determine how dark or light you want your toast to be. The toast graphic darkens or lightens with your selection.

If you've selected to toast special bread, such as raisin bread or special fiber bread made from wood chips, then you can make additional selections, using the mouse to shade those parts of the bread you want toasted. The optional BreadScanner, in conjunction with the ToastScript bread-description language, lets you get very specific with your toasting.

Finally, click on the big Toast! icon, place your bread into the slots, then click the down-arrow button. The bread lowers into the machine, then minutes later pops up, toasted to your specifications. If you want to toast the other side of the bread, simply flip it and repeat the process. (Apple says a later version of the IntelligenToaster will toast on both sides of the bread at once.)

I was positively delighted with the results of this handy little appliance. It takes longer than traditional toasting equipment, but the results are delicious. I liked the fact that I could preset and program in specific times and darknesses for my toast. And, with the planned KitchenTalk network, I'll be able to have toast, coffee, and microzapped sausage links ready when I wake up.

The base price of the IntelligenToaster is $2,495. The two-sided IntelligenToaster E with mixing bowl option will be available next quarter for $2,995. Apple upgrades for traditional toasters are $1,095 each. Start planning your SmartKitchen today! ⊡

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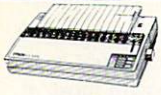

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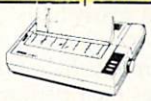

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Printer Has Up-Front Intelligence

With 75 functions controlled by Command-Vue and its liquid-crystal display, Citizen's GSX-140 eliminates the need for DIP switches. The 24-pin dot-matrix printer outputs 192 characters per second (cps) in high-speed draft mode and 64 cps in letter-quality mode. The Command-Vue control panel manages all print features, including font, pitch, layout, color, and emulations.

Control 75 functions from the GSX-140 panel.

In addition, the printer features continuous paper tear-off, a top-of-form feature, paper parking and a paper guide for single-sheet printing, and storage for up to 25 print settings. The GSX-140, which comes with an accessory utility disk, retails for $499 and carries a two-year parts-and-labor warranty.

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

Circle Reader Service Number 200.

Cave Games on PCs

Travel back to the age before fire and Olympic flames. Electronic Arts announced the release of an IBM PC and compatibles version of *Caveman Ugh-Lympics.* Choose from six prehistoric competitors, each with their own unique abilities, and battle it out in six somewhat athletic and humorous Olympic-style events.

Master the overhead smash and the knee swing in the Clubbing event. While Dino-Vaulting, an unsuccessful attempt turns your competitor into tyrannosaurus lunch. Unsportsmanlike conduct abounds in the Sabertooth Tiger Race, and in the Mate Toss, you heave your own partner. Rub your sticks the fastest to win in Firemaking, but beware of your opponent's club. The competition all climaxes with the challenging Dinosaur Race.

The suggested retail price for the IBM PC and compatible version of *Caveman Ugh-Lympics* is $29.95. The original Commodore 64/128 version also sells for $29.95.

Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404

Circle Reader Service Number 201.

Samurai Warrior

Experience the atmosphere, intrigue, and danger of feudal Japan in *Sword of the Samurai,* a fantasy role-playing game from MicroProse.

You attempt to guide an ambitious young samurai up the military and social ladder in pursuit of the all-powerful shogun title. The climb to power isn't an easy one. You must combine political savvy and battle strategy to defend your life and honor—especially important in 16th-century Japan—against like-minded ambitious rivals.

A far cry from John Belushi's samurai antics on "Saturday Night Live," *Sword of the Samurai* is accented with authentic Japanese graphics, music, and art. A combination of text windows and battle screens reveals the action, which features three types of combat: classic army land battles, melee screens where the player takes on opponents, and one-on-one samurai sword fights.

The game requires 384K of RAM and supports CGA, EGA, Tandy 16-color, and Hercules monochrome graphics, as well as the Ad Lib and Innovation sound boards. The program can be installed on a hard disk and uses a key-disk copy-protection routine. A joystick is optional.

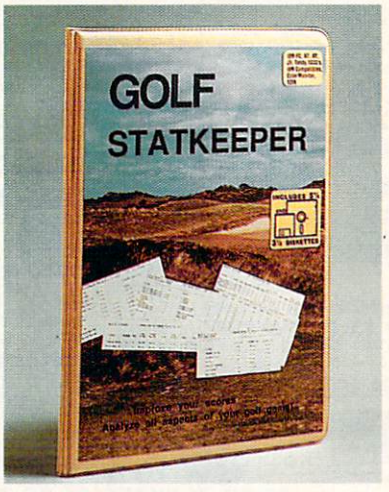
Sword of the Samurai has a suggested retail price of $54.95.

MicroProse, 180 Lakefront Dr., Hunt Valley, MD 21030

Circle Reader Service Number 202.

Birdies, Bogies, and Pars

For aspiring Arnold Palmers or the average weekend duffers who want to improve their game, 1 Step Software has announced the introduction of *Golf Statkeeper* for IBM PCs and compatibles and the Macintosh. The program tracks performance in areas such as driving accuracy, greens in regulation, putting, chip- and trap-save percentages, and birdie conversions.



Track your game with *Golf Statkeeper.*

It stores statistics for as many as eight golfers on 24 courses. You can review your game by performance on each hole, for each course played, or on a yearly basis.

Golf Statkeeper calculates golfers' current U.S.G.A. handicaps and compares their performance with those of other golfers recorded in the program. It also records information about the course and weather conditions and tabulates overall wins and losses by opponents. The program retails for $49.95.

1 Step Software, 510 Griffith Rd., Charlotte, NC 28217

Circle Reader Service Number 203. ▷

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Graphic Wars

Brøderbund has announced that *The Ancient Art of War* and *The Ancient Art of War at Sea* now support Tandy-16 color, EGA, and VGA graphics.

To upgrade your old version, send your name, address, and upgrade type to Brøderbund. Free upgrades are available to owners who order an upgrade within 90 days of purchasing the games. Eligible owners must send a copy of their dated sales receipt.

All other owners may obtain upgrades by sending a sales receipt, the proof-of-purchase tab from the manual's warranty page, or the program disk, and a check or money order for $7.50.

Brøderbund Software—Direct, P.O. Box 12947, San Rafael, CA 94913-2947

Circle Reader Service Number 204.

Advantage Accolade

Accolade has announced the addition of three new games to its budget-priced Advantage line. All three are available on IBM PC and Commodore 64/128 flippy disks.

The new lineup includes *Mental Blocks,* a strategic beat-the-clock collection of brain teasers; *Harrier 7,* an action-arcade air-combat game that features missions in a Harrier fighter jet; and *Frightmare,* which takes you through 80 different levels of your worst nightmare. All three have suggested retail prices of $14.95.

Accolade, 550 S. Winchester Blvd., Suite 200, San Jose, CA 95128

Circle Reader Service Number 205.

New Tune from Emerson Radio

Emerson Radio has introduced a new user-interactive personal computer line designed to make computing more personal by instructing users with a simulated human voice.

The Emerson 8000EC, a line of 10-MHz 8088-powered XT compatibles, comes equipped with 768K of RAM and an 8087 math-coprocessor socket. In addition, the 8000EC line offers built-in CGA or Hercules graphics, room for two 3½-inch or two 5¼-inch disk drives, DOS 3.3 in ROM with voice instructions, a parallel and a 9-pin serial interface, a 101-key AT-style keyboard, bundled applications software, and hard disk expansion options up to 40 megabytes.

Joining the Emerson 8000EC will be the 8286EC AT compatibles, which feature a 16-MHz 80286 processor with a math coprocessor socket along with 1MB of RAM, expandable to 8MB on the motherboard. Other features include DOS 3.3; Borland's *Turbo Pascal* 5.0; a 32-voice/music and male/female voice-synthesizer chip; a built-in floppy controller that supports two devices; and room for one 3½- and three 5¼-inch disk drives. EGA, VGA, and Hercules video graphics and two 9-pin serial ports are available as options.

Emerson's PCs feature instruction by voice.

Emerson's 8386EC model includes all the features of the AT-compatible computer while offering additional power with a 16-MHz 80386-SX processor complete with a socket for an 80387SX math coprocessor and a Phoenix BIOS with disk cache and diagnostics.

The suggested list price for the Emerson XT line is $999. The AT list price is $1,599, and the suggested price for the 386EC is $1,999.

Emerson Radio, One Emerson Ln., N. Bergen, NJ 07047

Circle Reader Service Number 206.

MicroProse Gets Tanked

MicroProse has hit the battlefield running with the release of *M1 Tank Platoon,* a combat simulation that puts you in charge of four tanks and 16 soldiers.

Based on the 63-ton M1 Abrams tank, the simulation allows you to call infantry, helicopters, jets, artillery, and other tanks for assistance in covering a 16,000-acre battlefield. As commander, you have 12 sets of orders to assign your personnel, all of whom have distinct personalities and differing levels of ability.

The rolling terrain resembles West Germany and is presented through filled polygons that create 3-D graphics effects. The hard disk–installable pro-

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gram is available for IBM PCs and compatibles and supports VGA/MCGA, EGA, CGA, Tandy 16-color, and Hercules graphics. The program requires 384K, and a joystick is optional. The suggested retail price is $69.95.

MicroProse, 180 Lakefront Dr., Hunt Valley, MD 21030

Circle Reader Service Number 207.

How to Survive College

College Bound and *College Life* focus on, respectively, preparation for and adjustment to college life.

These two MCE releases cover many facets of the collegiate experience, though not those of the *Animal House* crowd. *College Life* describes college classes and offers tips on writing papers and taking tests. *College Bound* takes a more social approach, offering advice on how to cope with homesickness, roommates, and finding new friends.

Both packages include a program disk, backup disk, and teacher's manual. Priced at $82.50 each, they are available for Apple II's and IBM PCs and compatibles.

MCE, Lawrence Productions, 1800 S. 35th St., Galesburg, MI 49053-9687

Circle Reader Service Number 208.

Three Steps to a Complete Home Office

Encore Software has released a line of software designed to provide a complete home office environment.

Home/Office Plus handles eight office tasks: word processing, database management, single-page publishing, drawing, diary entry, mailing-list maintenance, rolobase use, and dictionary access. The program retails for $59.95.

Home/Office Publisher is a page-layout program that allows you to creatively design and edit single pages or produce long documents with an automatic makeup feature. The program features a WYSIWYG graphics display and supports laser and dot-matrix printers. It retails for $49.95.

Home/Office P.A.L. is a nine-disk collection of over 500 low- and high-resolution art images. The program's combination of Paintbrush, .PCX, and .PCC formatting makes it compatible with a variety of desktop publishing, presentation, and graphics software. The program retails for $39.95.

All three programs are available for IBM PCs and compatibles.

Encore Software Publishers, 1237 E. Warner Ave., Santa Ana, CA 92705

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HOME LEARNING

1. Mavis Beacon Teaches Typing
Learn to touch-type.
Electronic Arts
Apple II, Apple IIgs, Commodore 64/128, IBM, Macintosh

2. Where in the World Is Carmen Sandiego?
Chase Carmen around the world.
Brøderbund
Amiga, Apple II, Apple IIgs, Commodore 64/128, IBM, Macintosh

3. Where in the USA Is Carmen Sandiego?
The chase moves to the USA.
Brøderbund
Amiga, Apple II, Commodore 64/128, IBM, Macintosh

4. Math Blaster Plus!
Teaches basic math concepts.
Davidson & Associates
Apple II, Apple IIgs, IBM

5. Learning DOS
Learn the ins and outs of DOS.
Microsoft
IBM

6. Reader Rabbit
Helps children learn to read.
The Learning Company
Apple II, Commodore 64/128, IBM, Macintosh

7. Think Quick
Children learn problem solving.
The Learning Company
Apple II, Apple IIgs, IBM

8. Children's Writing and Publishing Center
A desktop publisher for kids.
The Learning Company
Apple II, Apple IIgs, IBM

9. Math Rabbit
Builds children's early math skills.
The Learning Company
Apple II, Commodore 64/128, IBM, Macintosh

10. Mixed-Up Mother Goose
Kids fix jumbled rhymes.
Sierra
Amiga, Apple II, Apple IIgs, IBM, Macintosh

HOME ENTERTAINMENT

1. Flight Simulator
Head for the wild blue yonder.
Microsoft
IBM, Macintosh

2. The Duel: Test Drive II
Fast-paced car racing.
Accolade
Amiga, Apple IIgs, Commodore 64/128, IBM, Macintosh

3. 688 Attack Sub
Command a prowling sub.
Electronic Arts
IBM

4. Hardball!
Major-league action.
Accolade
Amiga, Apple II, Apple IIgs, Commodore 64/128, IBM, Macintosh

5. Space Quest III
Help Roger Wilco in space.
Sierra
Amiga, Apple IIgs, IBM, Macintosh

6. Falcon
Fly your own F-16.
Spectrum HoloByte
Amiga, IBM, Macintosh

7. King's Quest IV
Rosella must save her father.
Sierra
Amiga, Apple II, Apple IIgs, IBM

8. Indy—the Graphic Adventure
Indiana Jones' last crusade.
Lucasfilm Games
Amiga, Commodore 64, IBM

9. TV Game Shows
Compete in some of your favorites.
Share Data
Apple II, Commodore 64/128, IBM

10. ChessMaster 2100
Board strategy that isn't boring.
Electronic Arts
Apple II, Apple IIgs, Commodore 64/128, IBM

HOME PRODUCTIVITY

1. The Print Shop
Make banners and more.
Brøderbund
Apple II, Apple IIgs IBM; old version—Commodore 64/128, Macintosh

2. Calendar Creator Plus
Create many different calendars.
Power Up
IBM, Macintosh

3. Managing Your Money
Manage your checkbook and more.
MECA
Apple II, IBM, Macintosh

4. WillMaker
Get help in writing a will.
Nolo Press
Apple II, IBM, Macintosh

5. PC PaintBrush IV
Paint in every graphics mode.
Mediagenic
IBM

6. Art Gallery
Tons of add-ons for PFS:First Publisher.
Software Publishing
IBM

7. Print Magic
Design and print small documents.
Epyx
Apple II, IBM

8. Resume Kit
Help for landing the right job.
Spinnaker
IBM

9. PC Globe+
Explore world demographics.
Comwell Systems
IBM

10. PrintMaster Plus
Print posters, stationery, and more.
Unison World
Amiga, Apple II, Commodore 64/128, IBM

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BRITTANICA SOFTWARE
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___ B2 Archipelagos MS-DOS 3½
___ B3 Designasaurus MS-DOS 5¼
___ B4 Designasaurus MS-DOS 3½
___ B5 Jigsaw! (MCGA/EGA only) MS-DOS 5¼
___ B6 Jigsaw! (MCGA/EGA only) MS-DOS 3½

DATA EAST
___ D1 Heavy Barrel MS-DOS 5¼
___ D2 Heavy Barrel MS-DOS 3½
___ D3 Super Hang-On MS-DOS 5¼
___ D4 Super Hang-On MS-DOS 3½

ELECTRONIC ARTS
___ E1 Abrams Battle Tank MS-DOS 5¼
___ E2 Abrams Battle Tank MS-DOS 3½
___ E3 Chuck Yeager 2.0 MS-DOS 5¼
___ E4 Chuck Yeager 2.0 MS-DOS 3½
___ E5 F-16 Combat Pilot MS-DOS 5¼
___ E6 F-16 Combat Pilot MS-DOS 3½
___ E7 Keef the Thief MS-DOS 5¼
___ E8 Keef the Thief MS-DOS 3½

LUCAS FILM
___ L1 Indy—The Graphic Adventure MS-DOS 5¼

MICROPROSE
___ M1 Airborne Ranger MS-DOS 5¼
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___ M4 Dr. Doom's Revenge MS-DOS 5¼
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___ M6 F-19 MS-DOS 5¼
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___ M8 Gunship MS-DOS 5¼
___ M9 Gunship MS-DOS 3½
___ M10 Gunship Commodore 64
___ M11 Pirates! MS-DOS 5¼
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___ M13 Pirates! Commodore 64
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___ M16 Red Storm Rising Commodore 64

ORIGIN
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___ O3 Times of Lore Commodore 64/128

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_____ (278)
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☐ PC Resource (281) ☐ Home Office Computing (282) ☐ COMPUTE!'s PC Magazine (283)
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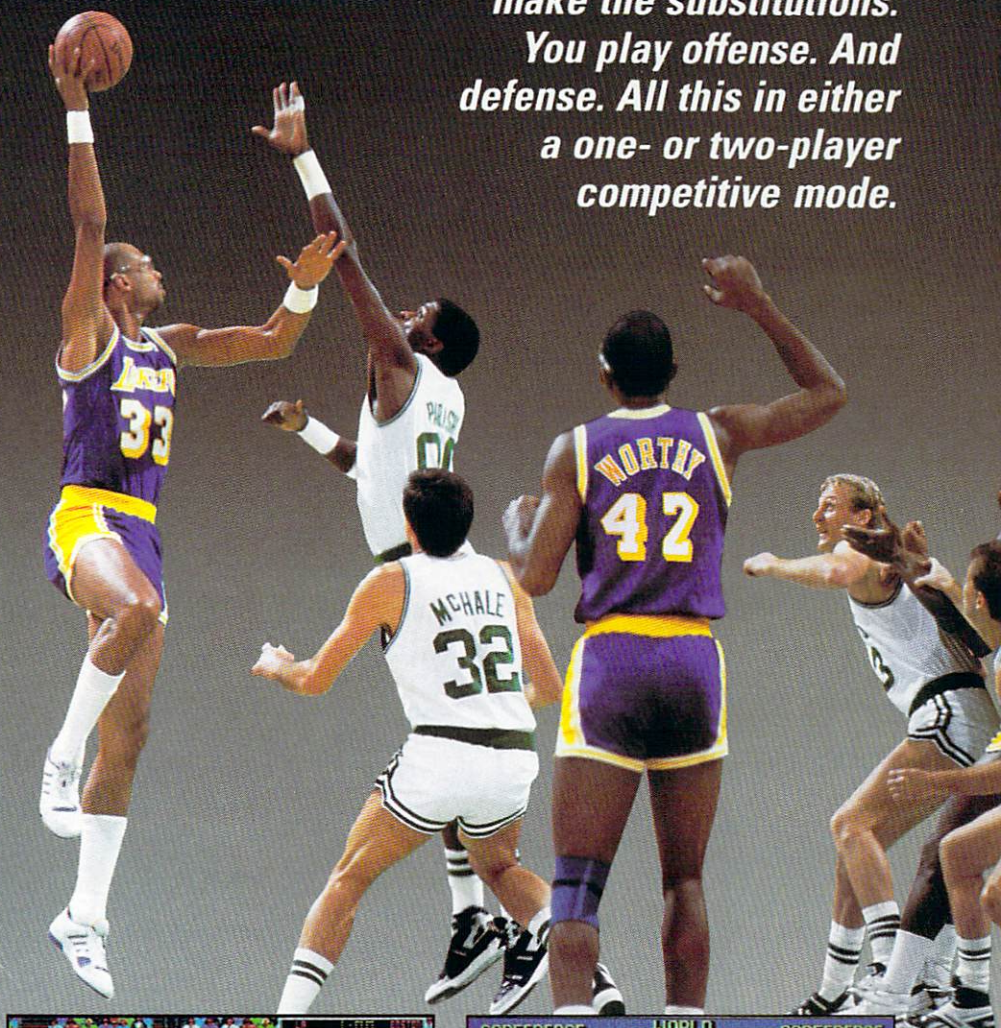

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