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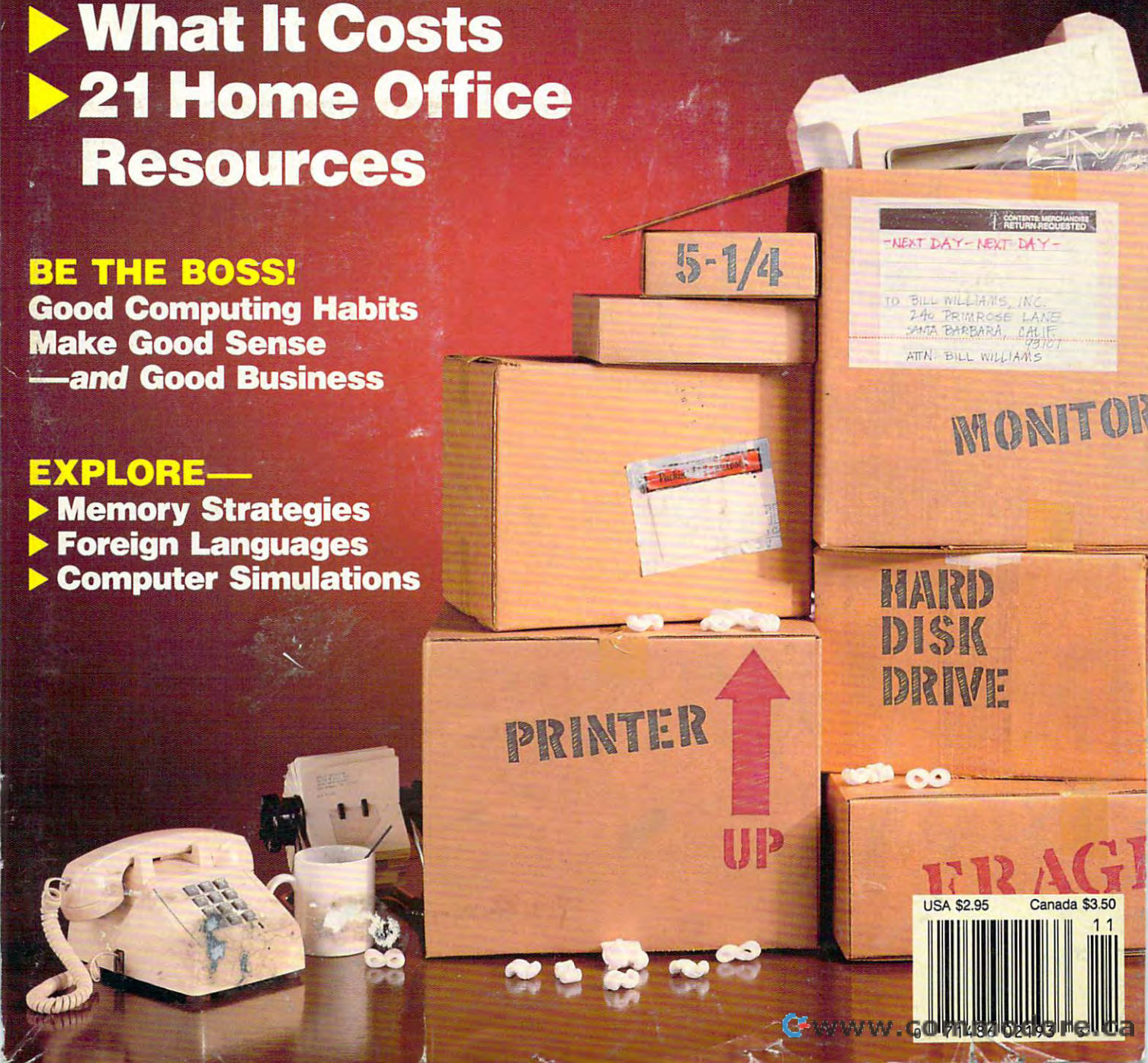

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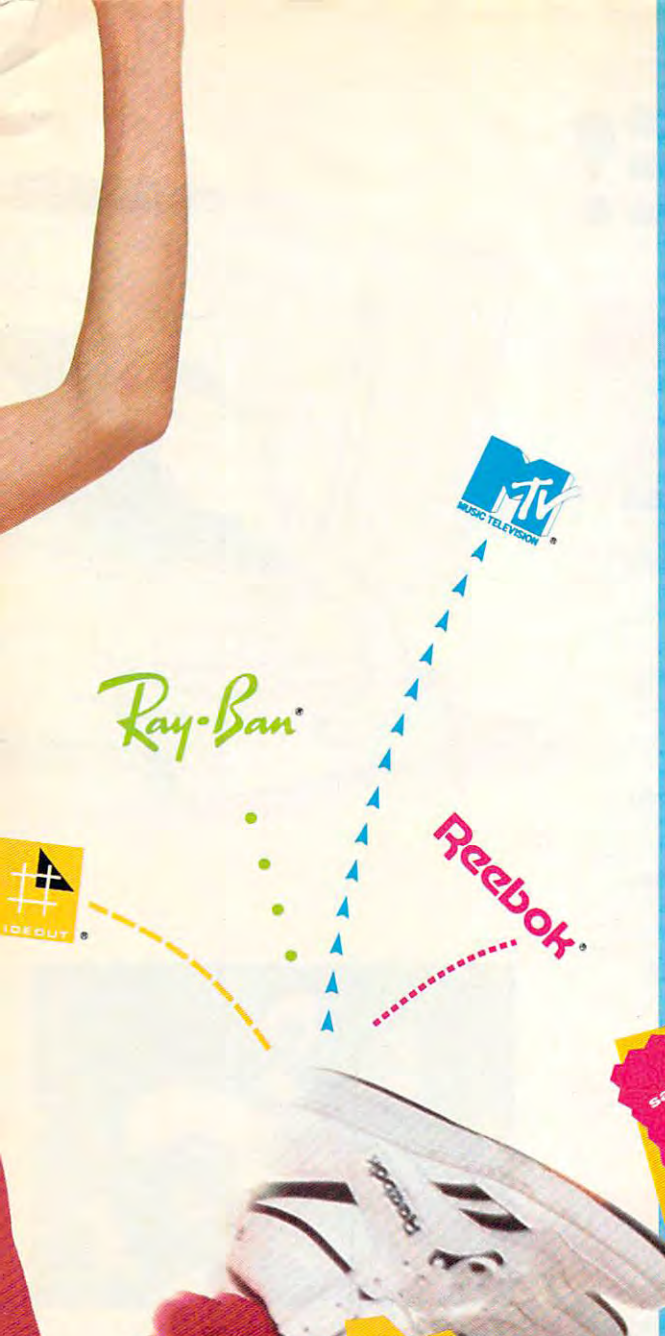

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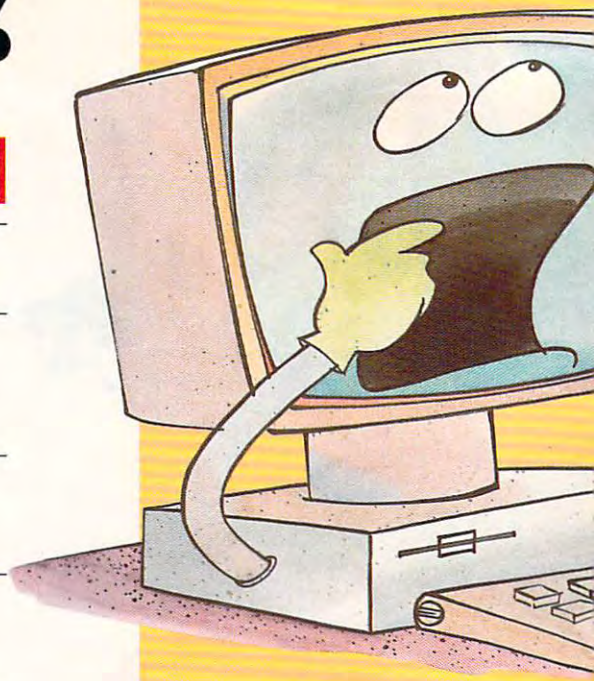
COMPUTE!

THE CHOICE OF HOME PC ENTHUSIASTS SINCE 1979

CONTENTS



IN FOCUS: YOUR HOME OFFICE

YOUR HOME OFFICE: DRESSED FOR SUCCESS /24/ NEIL RANDALL

Nine smart scenarios for setting up your home office within your budget.

MY VIEW /38/ PAUL AND SARAH EDWARDS

The personal computer makes the home office a possibility for millions.

TAKE FIVE /42/ KEITH FERRELL

Sometimes the best thing you can do with your home office computer is to turn it off.

BUYER'S GUIDE /50/ CAROLINE D. HANLON AND JEFF SLOAN

Home Office Sampler: Get to work with these packages.

COMPUTE!'S NOVEMBER SHAREPAK DISK /62/ DON WATKINS

An electronic checkbook and a contact manager for your personal and business needs.

RESOURCES /64/ EDITORS

An informational guide to home office computing.

DEPARTMENTS

NEWS & NOTES /6/ EDITORS

Macworld Expo '89, a little Zenith, computer detectives, and more of what's new and interesting.

LETTERS /10/ EDITORS

Wills by the book, C64 defense, and a screen-shot dilemma.

REVIEWS /116/

NEW PRODUCTS /148/ MICKEY McLEAN

HOTWARE /152/ SOFTWARE BESTSELLERS

COMPUTE! SPECIFIC

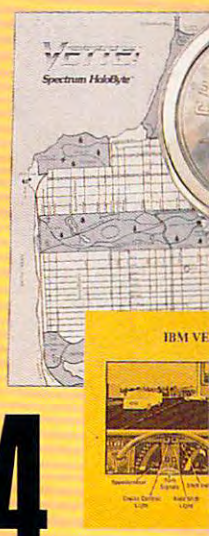
MS-DOS /11/ CLIFTON KARNES AND JACK NIMERSHEIM

Commodore 64/128 /13/ NEIL RANDALL

Apple II /13/ GREGG KEIZER

Amiga /16/ DENNY ATKIN

Macintosh /16/ HEIDI E. H. AYCOCK



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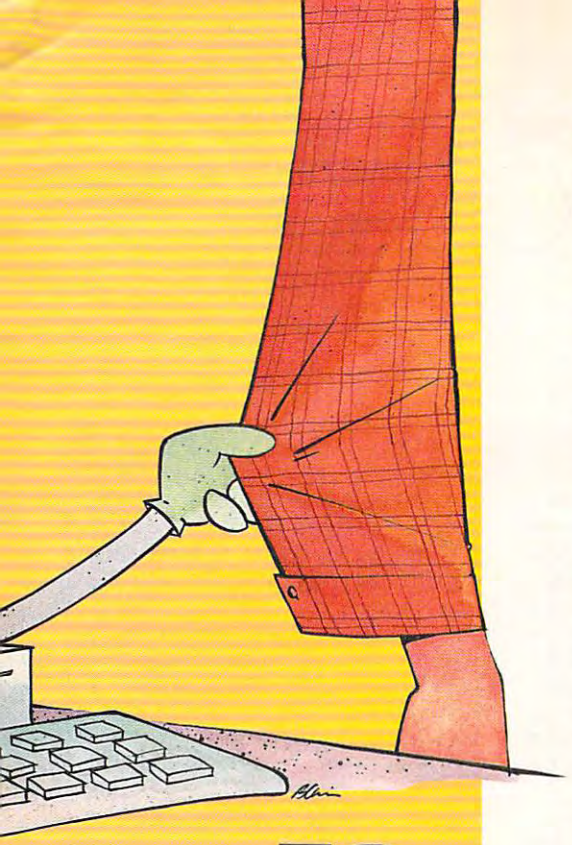

76

9

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.

LEARNING

COMPUTE! CHOICE /102/ JOEY LATIMER
Version 3.0 of *The Music Studio* teaches music composition to budding Bachs.

SPEAKING IN TONGUES /108/ TOM NETSEL
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.

ENTERTAINMENT

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.

COLUMNS

EDITORIAL LICENSE /4/ PETER SCISCO
A price tag is no measure of your home computer's worth.

IMPACT /72/ DAVID D. THORNBURG
Computer simulations make you wonder what's real anymore.

DISCOVERIES /106/ DAVID STANTON
Computers—powerful research tools.

GAMEPLAY /88/ ORSON SCOTT CARD
The best of the new games call for more than just reflexes.

CONVERSATIONS/18/ KEITH FERRELL
It's all software to Les Crane of Software Toolworks.

OFF LINE /146/ DAN GOOKIN
With its planned product line, Apple is really cooking.

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

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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. ⊡

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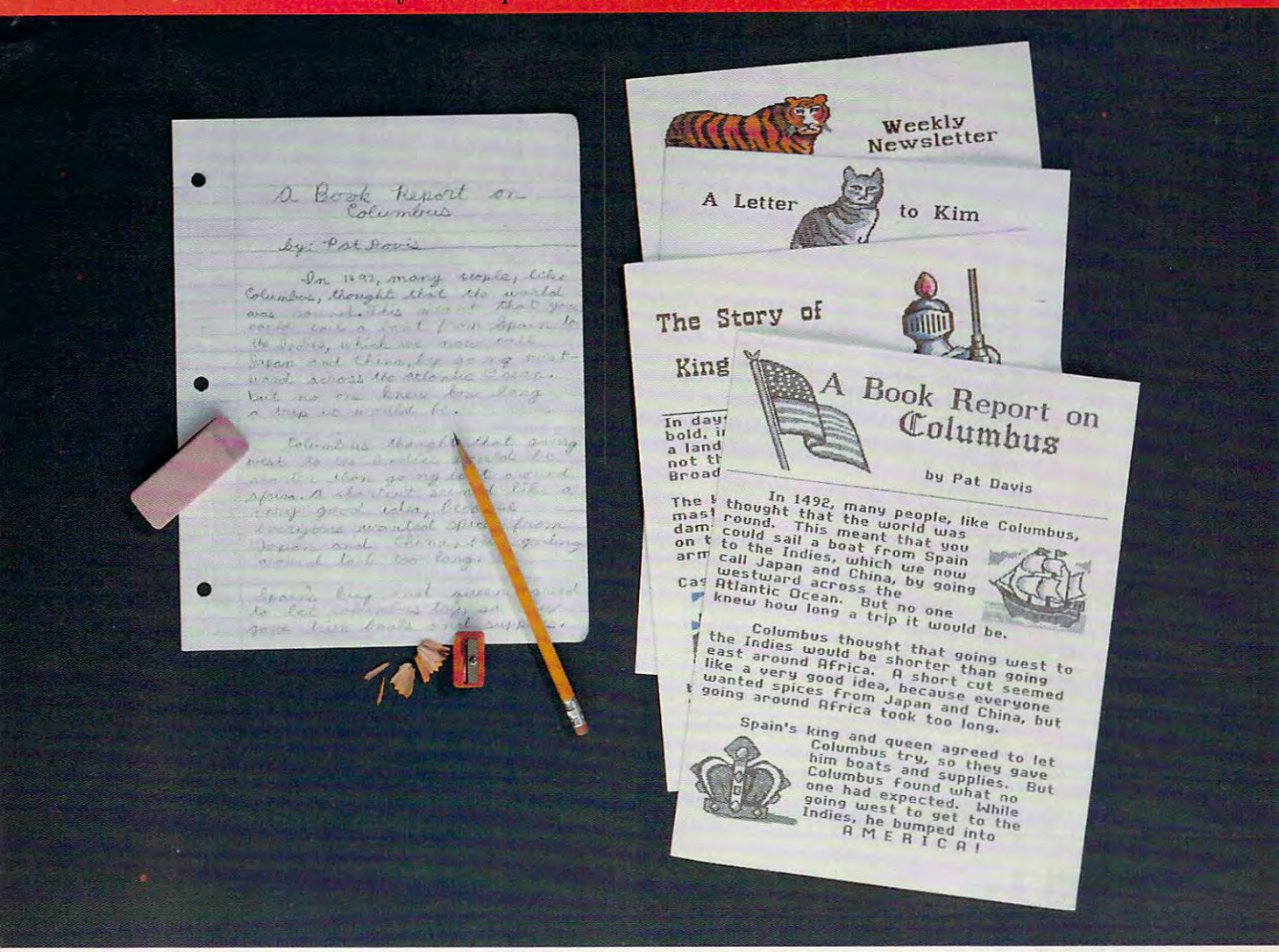

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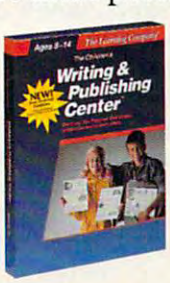

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NEWS & NOTES

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

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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

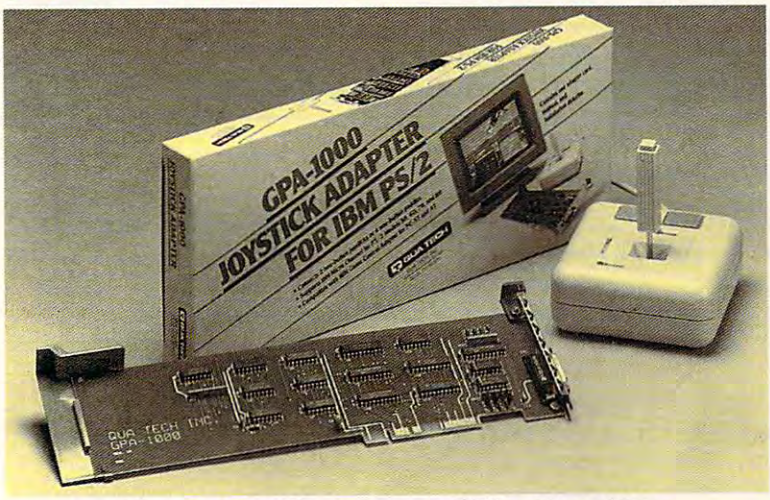
Mix graphics and fonts with the updated version of *ProWrite*.

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

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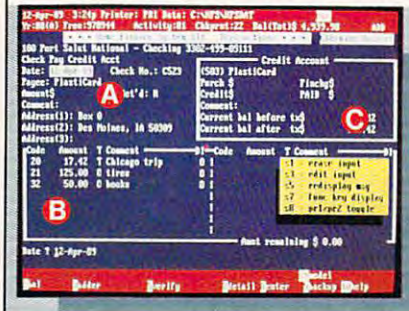

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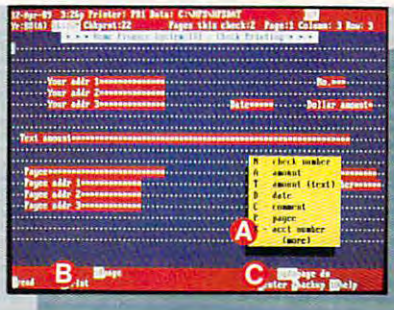

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5 sure steps to a fast start as a high-paid computer service technician

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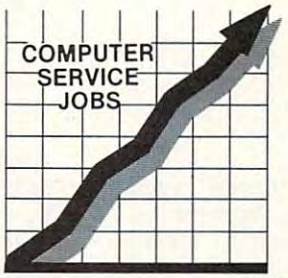

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LETTERS

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. ⊡

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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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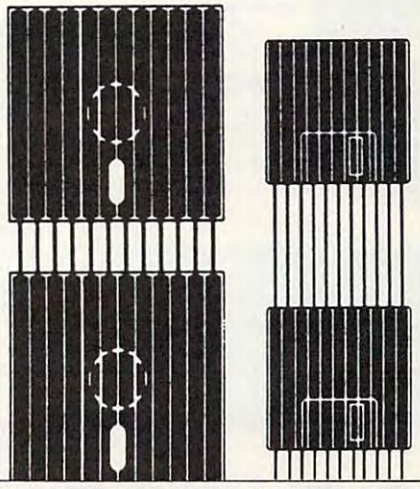

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64/128

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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- ☐ **PC-Art** (509)—A color graphics painting/drawing package. CGA.
- 2 **Epson Utilities** (514,515)—Enhance the print quality of your Epson-compatible printer. (2 disks)
- 4 **PC-Key Draw** (520–523)—Powerful CAD design system. Works with mouse or keyboard. (4 disks) CGA
- ☐ **City Desk** (525)—Simple desktop publishing for newsletters.

MISC. APPLICATIONS

- ☐ **Weight Control** (302)—Let this program help you get fit.
- ☐ **Personal Biorhythm** (310)—Will display or print a personal chart
- 2 **KwikStat** (314,315)—A professional statistics package. (2 disks)
- 4 **Wisdom of the Ages** (316–319)—Great quotes from the greatest minds of history. Quick access to 6000 quotations in several categories. (4 disks).
- ☐ **Make My Day** (627)—Puts you in control by organizing your time! Keeps track of appointments and deadlines.
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GAMES

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GAMES CONT.

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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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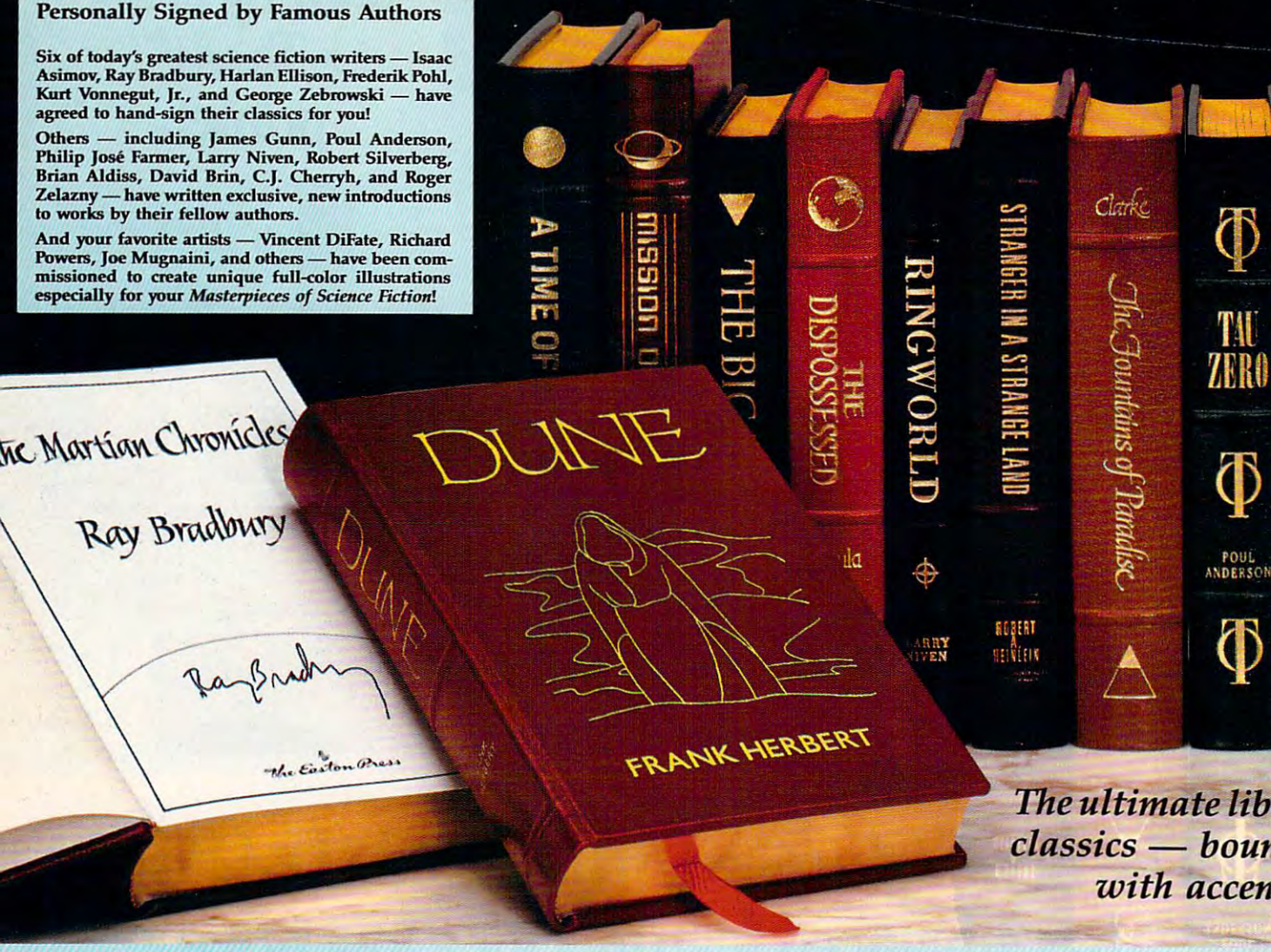

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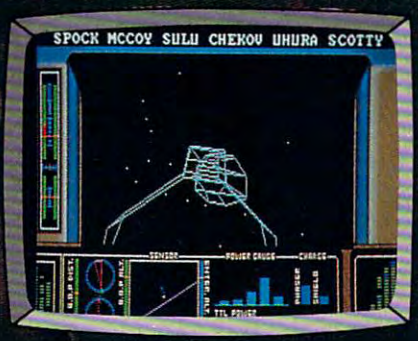

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NEIL RANDALL

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. ▷

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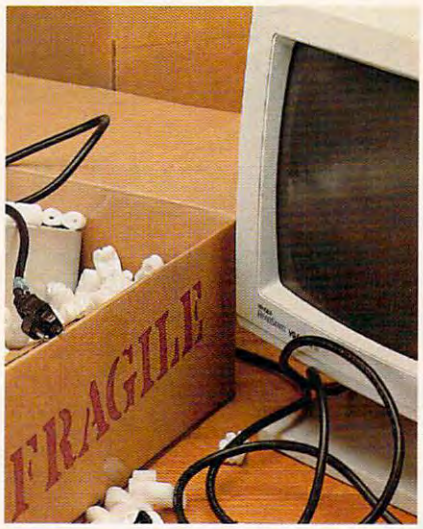


$1500

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

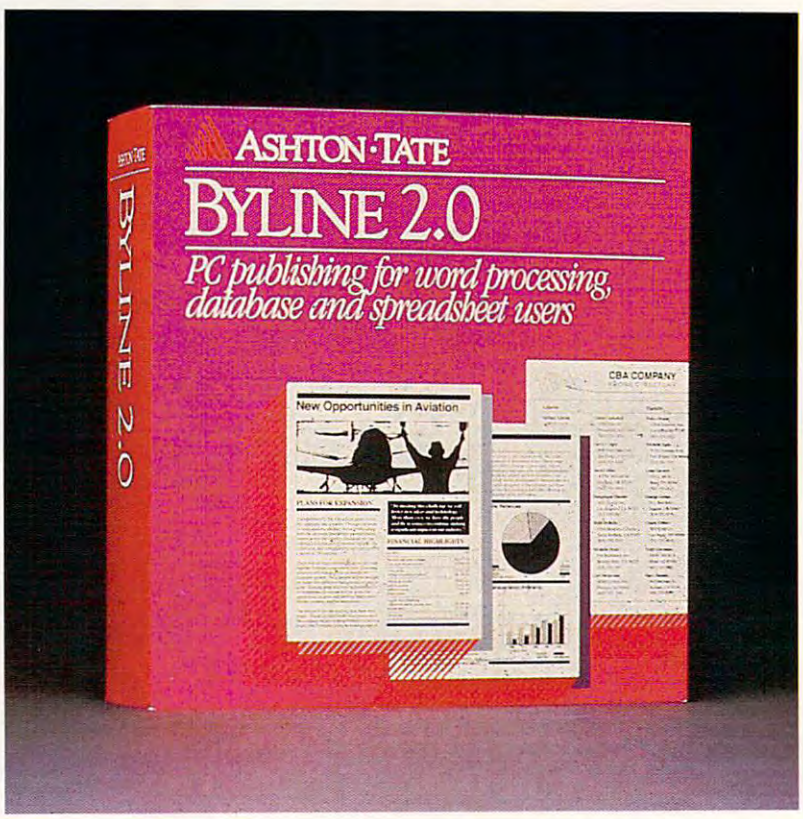
Modems are also useful in developing contacts. Telecommunications services such as CompuServe and GEnie offer public forums from which you can uncover freelance possibilities. A 2400-baud modem (about $150), makes access to these services more efficient.

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.

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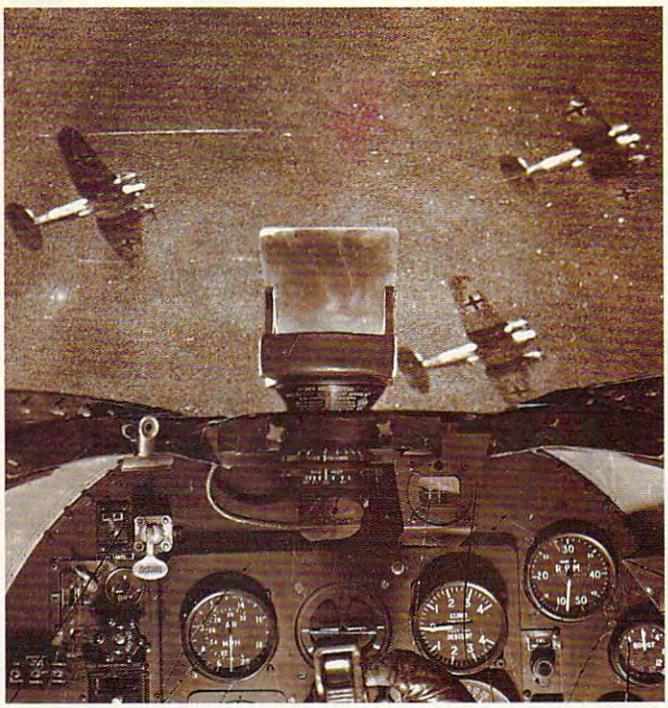

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Take on the Luftwaffe in a tough little RAF Hurricane or fabled Spitfire. Or test your skills at the controls of the Spitfire's nemesis, the formidable Messerschmitt 109. Pulverize ground installations from your Messerschmitt 110 fighter/bomber or your screaming Stuka. Or fly as pilot, bombardier or gunner in a Junkers 88, Dornier Flying Pencil, or Heinkel Spade.

Your success in each mission impacts the next one: knock out a radar installation today, and you'll breathe easier tomorrow. Who knows—you might even change history. And if you don't like the odds, *Their Finest Hour* lets you change sides.

LUCASFILM™ GAMES

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

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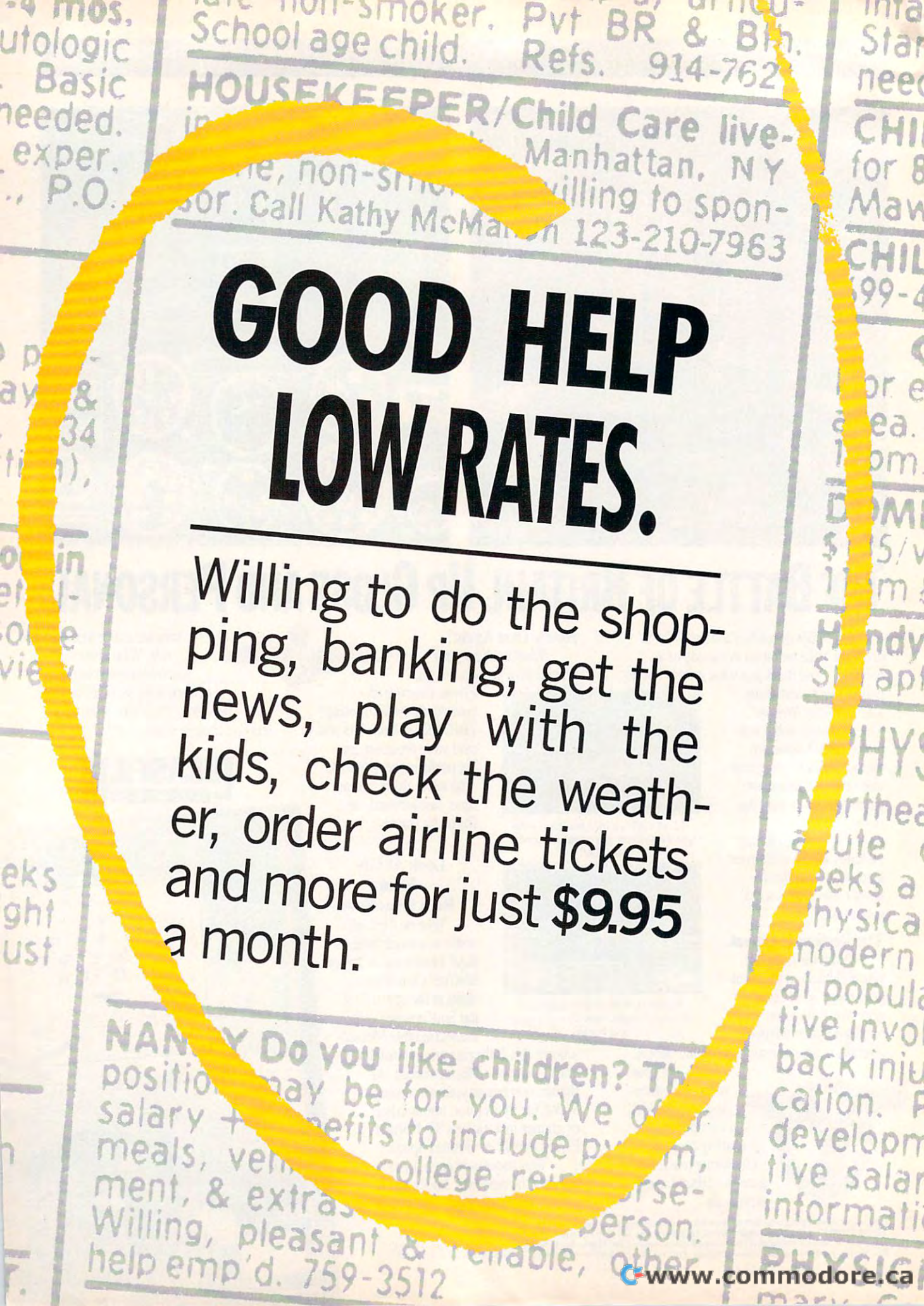

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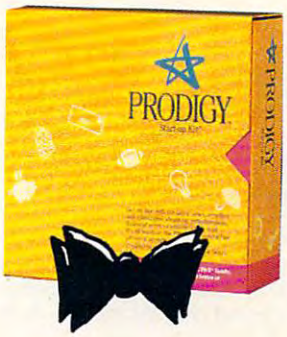

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Circle Reader Service Number 109

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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. ▷

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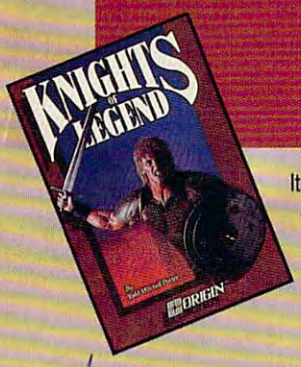
KNIGHTS OF LEGEND™



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IBM/COMPATIBLE VERSION

APPLE VERSION

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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.**

Circle Reader Service Number 104

www.commodore.ca

$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.

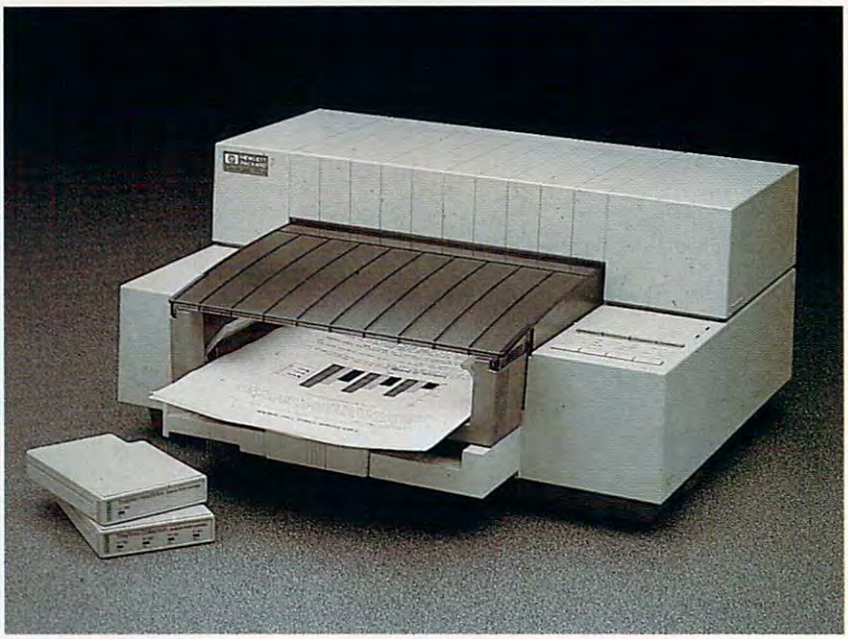
Consultant/Researcher

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

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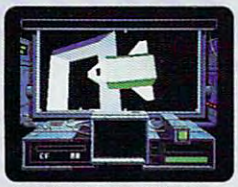

IBM/COMPATIBLE VERSION

IBM/COMPATIBLE VERSION

APPLE VERSION

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

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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.

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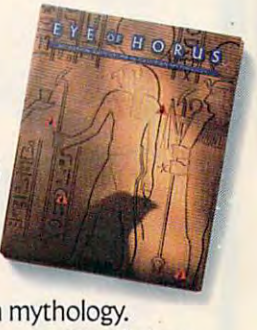
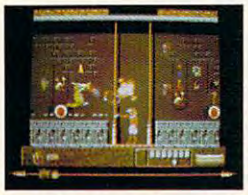
His mummy don't dance and his daddy don't rock and roll.





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

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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
Redmond, WA 98052
(800) 426-9400
(206) 882-8080

LC-890 Printer
MultiSync 3D monitor
NEC Home Electronics
1255 Michael Dr.
Wood Dale, IL 60191
(312) 860-9500

FX-89 fax board
KXP-1124 printer
Panasonic
Two Panasonic Way
Secaucus, NJ 07094
(800) 742-8086
(201) 348-7000

GrafixPro VGA Adapter
Multiview Monitor
Princeton Publishing Labs
Advanced Electronic Publishing Hardware
19 Wall St.
Princeton, NJ 08540
(609) 924-1153

Complete Statistical System
StatSoft
2325 E. 13th St.
Tulsa, OK 74104
(918) 583-4149

SupraModem 2400
Supra
1133 Commercial Way
Albany, OR 97321
(800) 727-8772

GrandView
Symantec
10201 Torre Ave.
Cupertino, CA 95014
(408) 253-9600

Ventura Publisher 2.0
Xerox
Desktop Software Division
9475 Business Park Ave.
San Diego, CA 92131
(800) 822-8221

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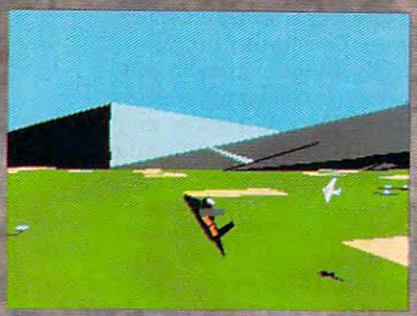
To start, you can choose a training mission where enemy weapons have no effect, or a



"no-crash" mode that protects you from fatal errors. You can even select easy landings or weak enemies. As you sharpen your skills, you can take on the toughest missions in the world.

No flight simulator gives you more views of dogfights and bombing runs. Tactical View keeps both your plane and your target in view at all times, whatever your position.

Inverse Tactical View shows your target up close with your F-19 approaching in the distance. And TrakCam locks onto and magnifies targets. All with the hottest Super 3-D Graphics you've ever seen!

You'll have detailed maps and a keyboard overlay, so you'll spend less time finding

features and more time playing the game. And the F-19 manual psyches you for combat with incredible detail on training and equipment, stealth tactics, strategy, and real world situations.

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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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1st Prize: $5,000. **2nd Prize:** A complete entertainment center featuring big screen TV, stereo and CD (VCR not shown). (2 Winners!) **3rd Prize:** ABC's Monday Night Football pinball game from Data East Pinball. (3 Winners!) **4th Prize:** ABC's Monday Night Football 20th anniversary videocassette featuring the greatest plays from the past two decades. (1,000 Winners!)

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 the prize symbol shown here exactly matches one of the prize symbols found on specially marked packages of Data East MVP Sports ABC's Monday Night Football Games, you win the prize indicated.

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Address _____

City _____ State _____ Zip _____

Telephone _____

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prize symbol

See Official Rules for details.

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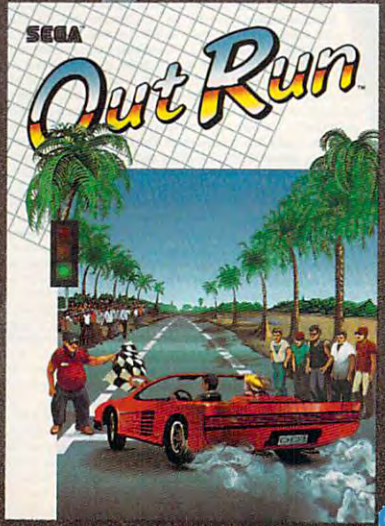
GO FOR THE DRIVE OF YOUR LIFE!

Sit down and grab on! You're driving the fastest and most beautiful machine on 4 wheels! So kick up the engine revs, downshift the gears, hear the tires squeal and grab the pavement—on your computer!

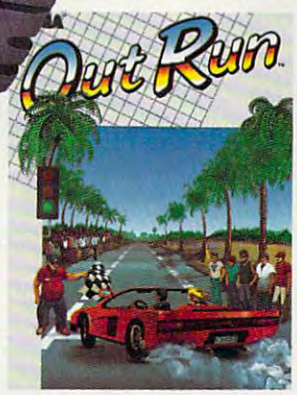


Hot car. Hot music. Hot scenery—beaches, cities, snowy mountains, deserts and the blonde next to you will tempt you to take your eyes off the road. At close to 300 KPH, our advice to you is a 4-letter word. DON'T.

3 SMASH ARCADE HITS NEW FOR YOUR COMPUTER!

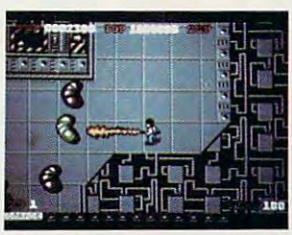
SEGA™

UNLEASHES ARCADE ACTION ON YOUR HOME COMPUTER!



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.

Space Harrier. You are Harrier, the extra-terrestrial warrior. Space is your battlefield. Your mission is to save the Land of Dragons from the vicious followers of the vile one-eyed mammoth. Grab your laser blaster because this game is 100% action, non-stop clashes, powerful combat scenes.



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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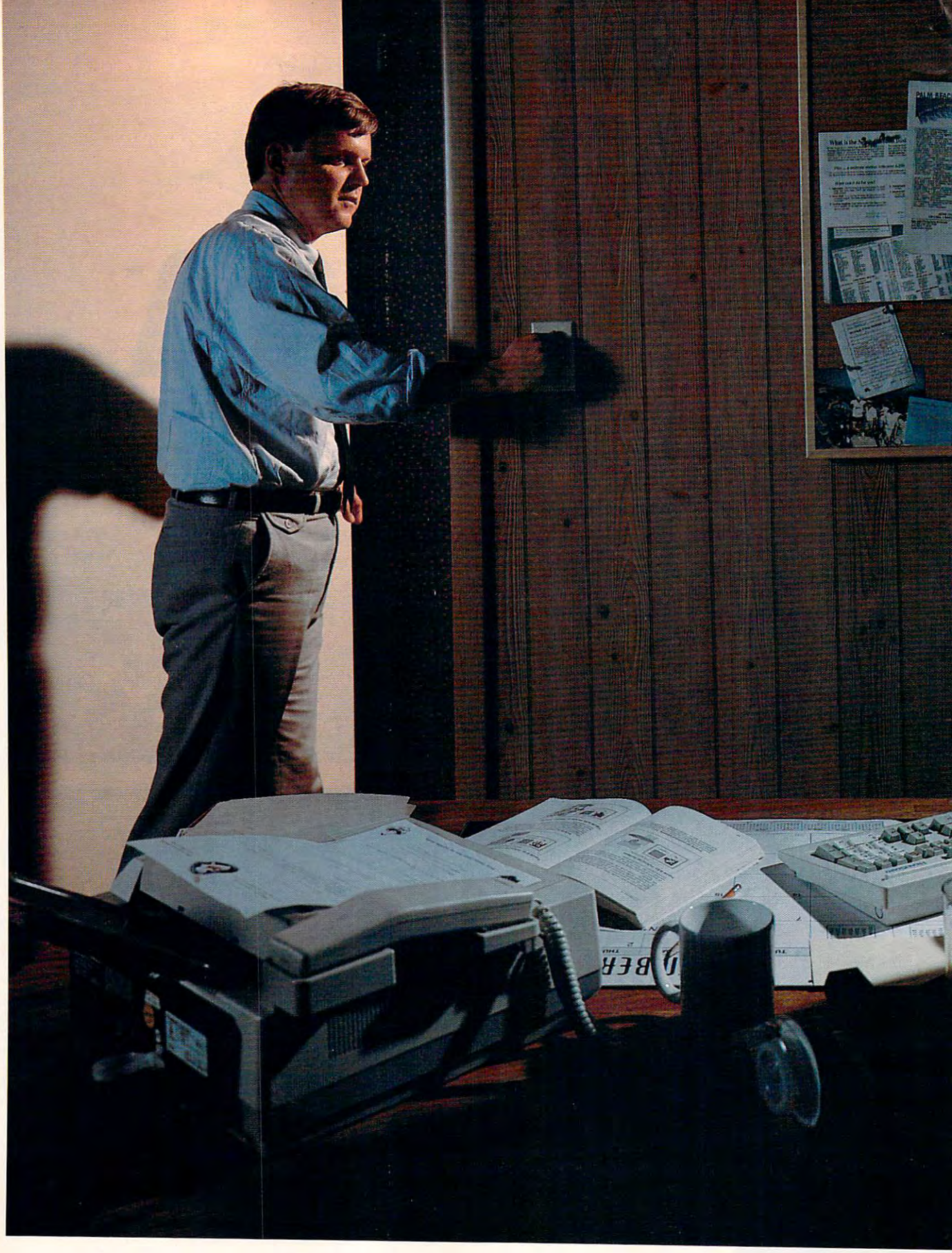

Turn off your computer and

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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

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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!

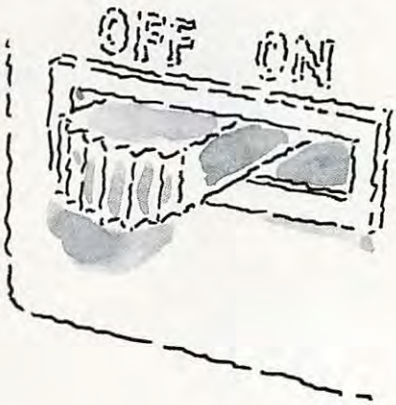
Sometimes the most important business aspect of your computer is the power switch. Sometimes the most important thing you can do for your business is to get up from your desk, leave your office, and take a walk—especially if you're one of those home office workers who becomes more enamored of the computer 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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Take Five

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.

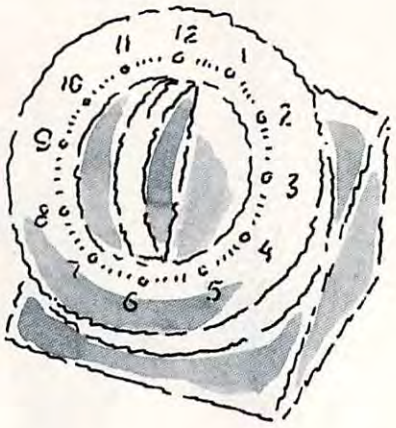
Graphics and fonts are more complex, but common sense again has a lot to offer. The best-looking desktop publishing materials in the world aren't going to help a proposal that has nothing to offer. Nor will a conservative and careful presentation harm a dynamite idea. In business—even in American business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

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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.

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

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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.

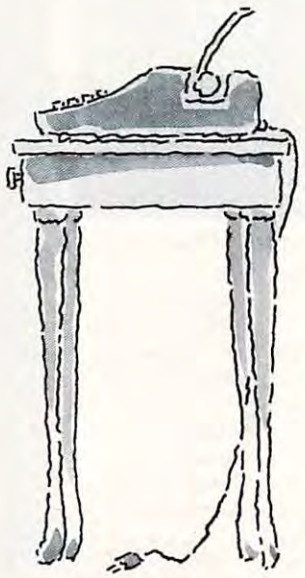
(And when you've finished your brainstorming session, save your materials, turn off the computer, and go for a walk. Your juices will still be flowing, and, freed from the keyboard, you may find even larger insights than you produced at your desk.)

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.

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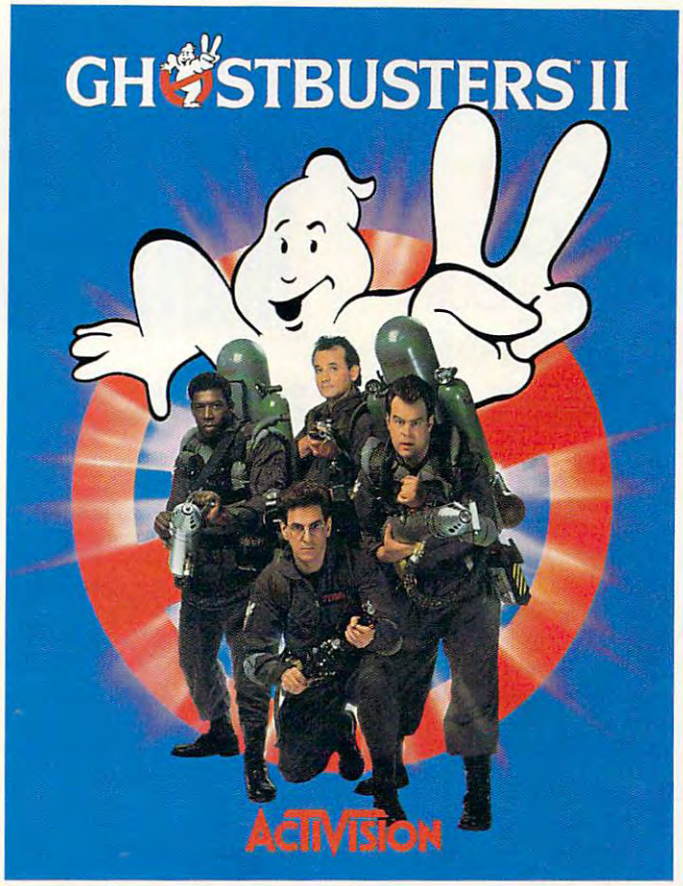
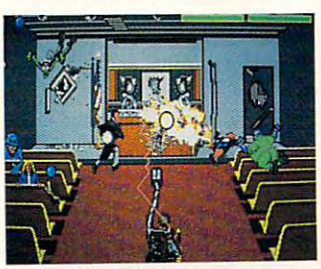
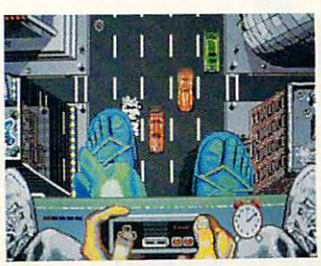
Bustin' Makes You Feel Good!



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.

©1989 Activision Software. Software ©1989 Dynamix Inc. Ghostbusters™ II logo ©Columbia Pictures Industries. All rights reserved.

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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.

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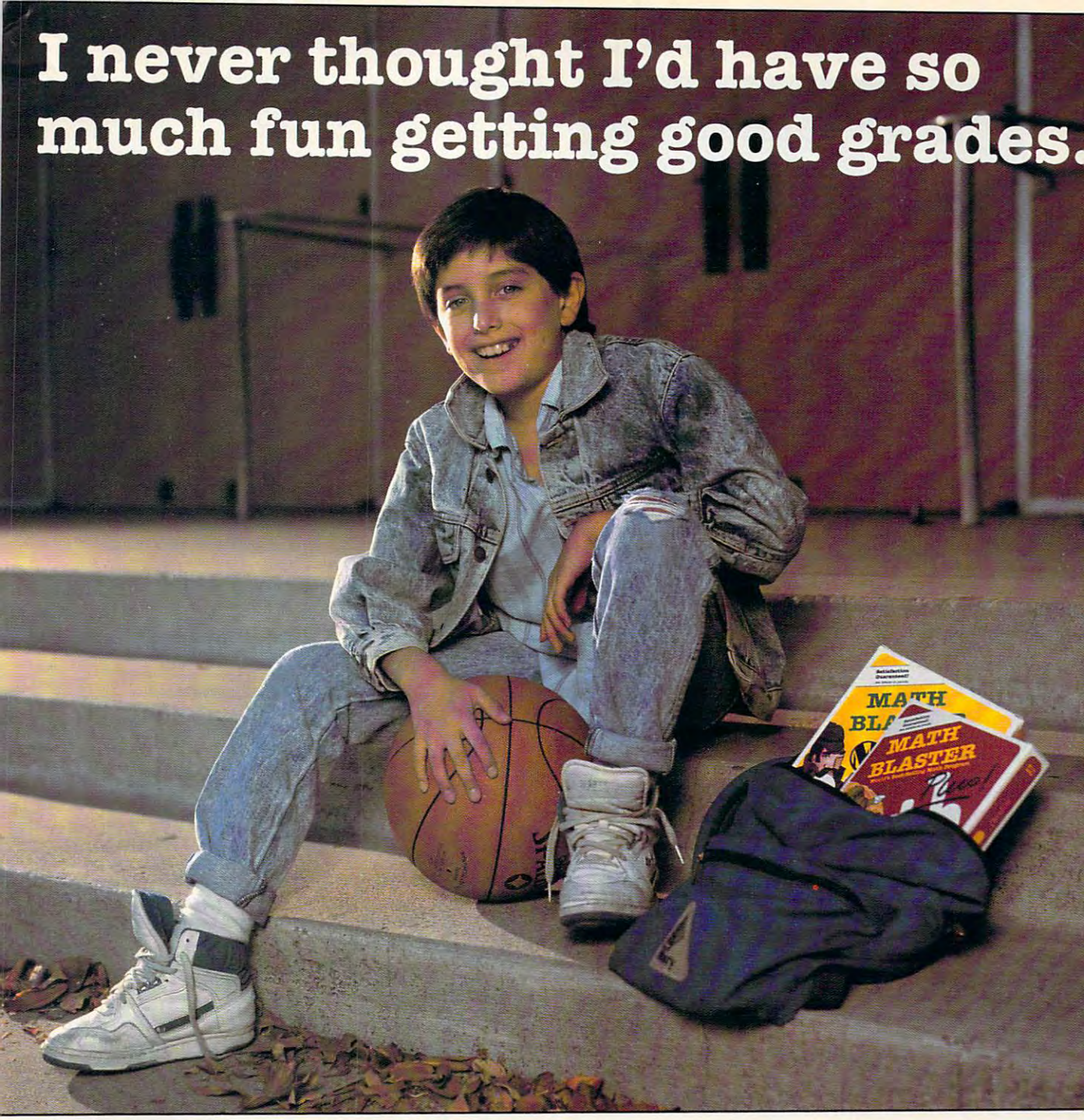
I never thought I'd have so much fun getting good grades.

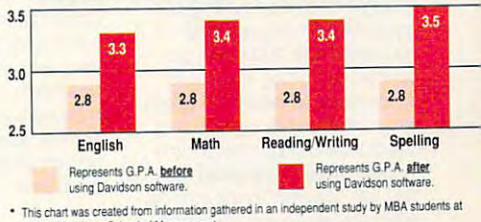


Davidson Software Age Level Guide

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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kids can have fun and improve their grad

800/556-6141 213/534-2250 (CA

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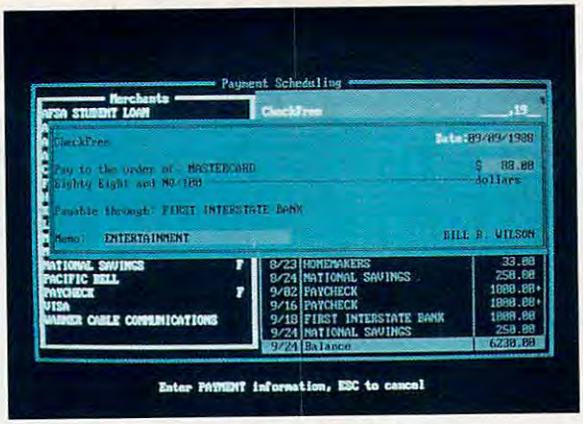
Davidson.



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.

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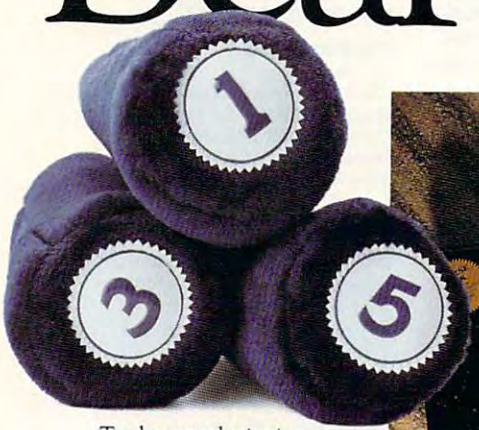
The Bear Essentials.



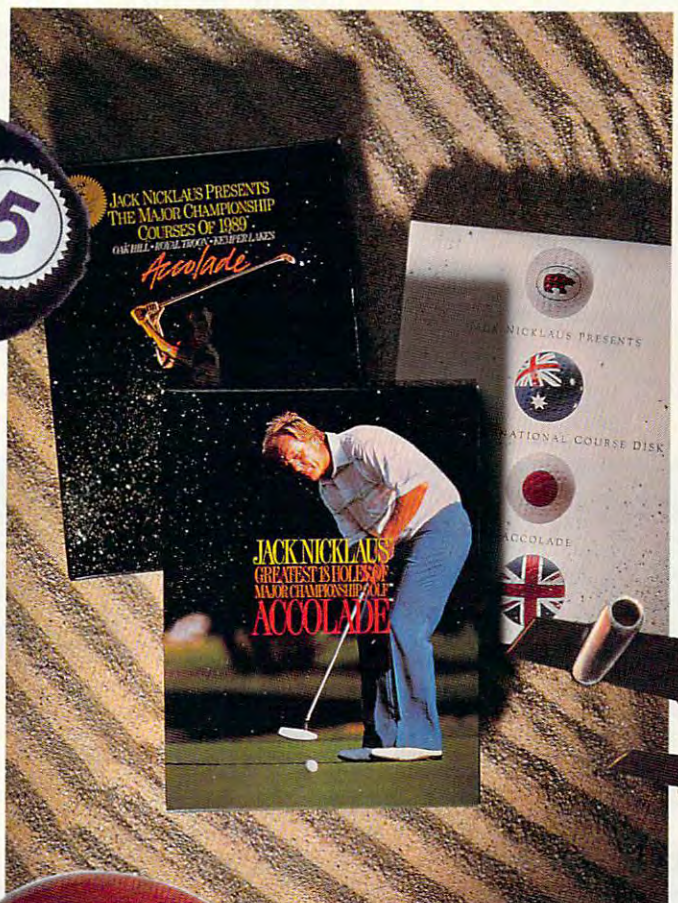
To play award-winning computer golf, you need a great set of clubs.

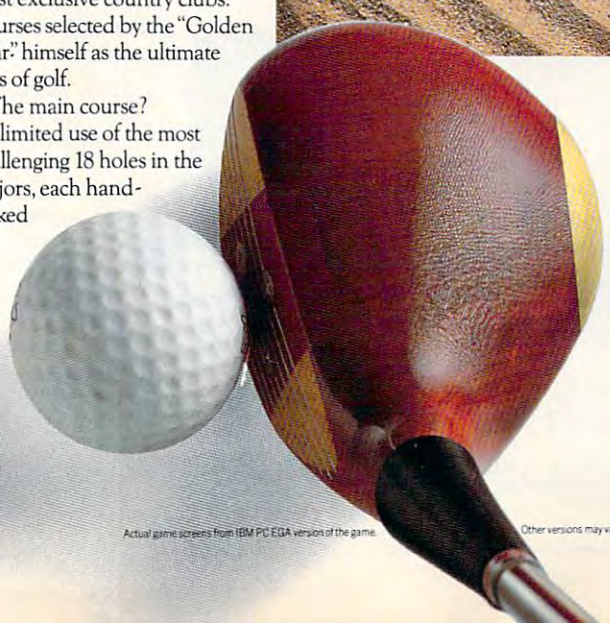
Country clubs.

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.

Circle Reader Service Number 179

www.commodore.ca

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

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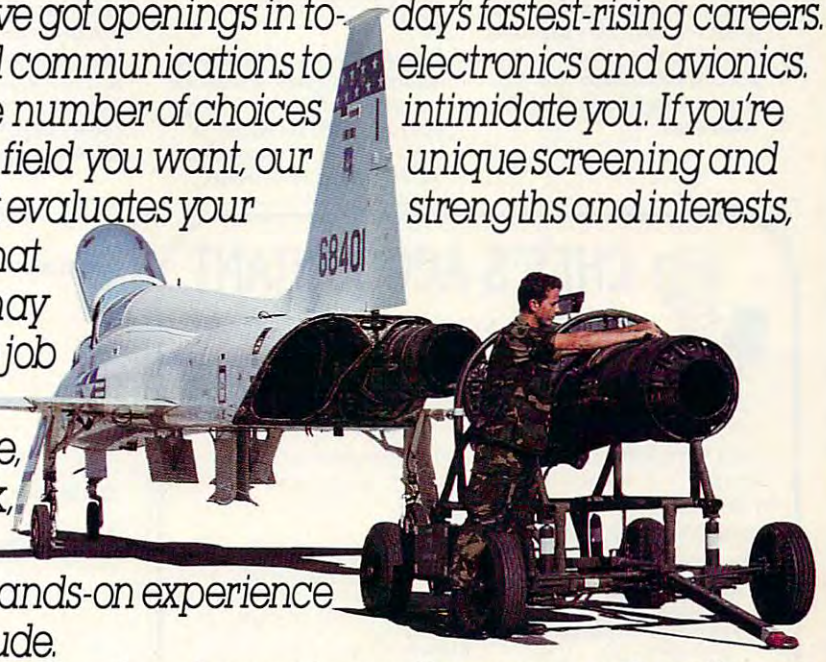
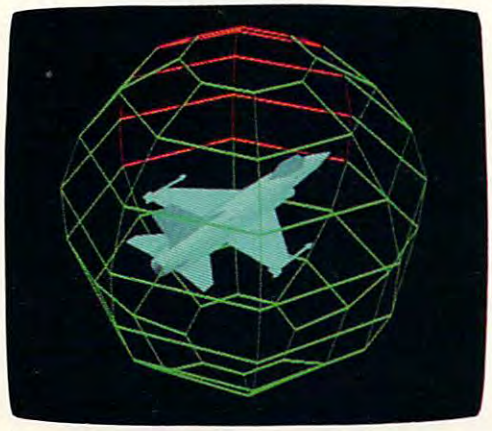
PERHAPS YOUR FUTURE'S UP IN THE AIR. AND YOU JUST DON'T KNOW IT.

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.

Circle Reader Service Number 126

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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.

CHEF'S ACCOUNTANT

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:

Recipe Manager
- 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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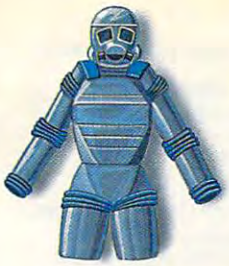


BOMB BLAST SUIT
Shields you from explosions.

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.

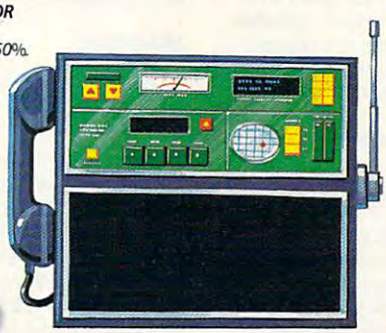
BERETTA M92F
Single action hand gun. Silencer optional.

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.

MINE DETECTOR
Discovers location of enemy mines.

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

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

GRENADE LAUNCHER
Launch deadly grenades into strategic locations.

PLASTIC EXPLOSIVES
For perfectly timed explosions.

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 equipment 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

Metal Gear is now available for IBM and Commodore. Available for Amiga in 1990. ULTRAGAMES® is a registered trademark of Ultra Software Corporation. METAL GEAR™ is a trademark of Ultra Software Corporation. IBM® is a registered trademark of International Business Machines, Inc. Commodore® is a registered trademark of Commodore Electronics Ltd. Amiga® is a registered trademark of Commodore-Amiga, Inc. ULTRAGAMES, 900 Deerfield Parkway, Buffalo Grove, IL 60089-4510. Game Counselors can be reached at (312) 215-5111. © 1989 Ultra Software Corporation.

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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.

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- Find the hostages; get them out safely

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Visit your retailer. To purchase by mail, send your credit card number and expiration date, or send a check or money order to Mindscape Inc., P.O. Box 1167, Northbrook, IL 60065. C64™/128™: $29.95; IBM®, Tandy®, & Apple® IIGS: $39.95; Amiga™, Atari® ST, & Macintosh™: $44.95. Please add $3.00 handling and allow 3-5 weeks for delivery. Lawyers like this part: Copyright © 1989 Infogrames. C64 and 128 are trademarks of Commodore Electronics Ltd. IBM is a registered trademark of International Business Machines Corp. Tandy is a registered trademark of Tandy Corp. Apple is a registered trademark of Apple Computer, Inc. Amiga is a trademark of Commodore-Amiga, Inc. Atari is a registered trademark of Atari Corp. Macintosh is a trademark of Apple Computer, Inc. All rights reserved.

Circle Reader Service Number 156

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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. ⊡

PUBLISHERS' NAMES AND ADDRESSES

For more information about any product in the buyer's guide, contact the publisher at the address and phone number listed below.

Abacus
5370 52nd St. SE
Grand Rapids, MI 49508
(616) 698-0330

Avery
818 Oak Park Rd.
Covina, CA 91724-3624
(818) 915-3851

Barry A. Watzman
1206 Canteberry Ln.
Mansfield, OH 44906
(419) 756-5295

BLOCPublishing
800 SW 37th Ave.
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(800) 888-2562

Brøderbund
17 Paul Dr.
San Rafael, CA 94903
(800) 527-6263
(415) 492-3500

CheckFree Technologies
720 Greencrest Dr.
Columbus, OH 43081
(614) 898-6000

Data Easy
18 Hector Ln.
Novato, CA 94949
(415) 883-2300

Delrina
10 Brentcliffe Rd.
Suite 210
Toronto, Ont.
Canada M4G 3Y2
(416) 423-0456
(716) 835-0405

EZX
P.O. Box 58177
Webster, TX 77598
(713) 280-9900

Intracorp
14160 SW 139th Ct.
Miami, FL 33186
(800) 468-7226
(305) 252-9040

Intuit
540 University Ave.
Palo Alto, CA 94301
(415) 322-0573

Jay Gold
P.O. Box 2024
Des Moines, IA 50310
(515) 279-9821

Kerner Software
3 Katonah Trail
Andover, NJ 07821
(201) 539-8804

Lotus
55 Cambridge Pkwy.
Cambridge, MA 02142
(617) 577-8500

MECA Ventures
355 Riverside Ave.
Westport, CT 06880
(203) 226-2400

Monogram
531 Van Ness Ave.
Torrance, CA 90501-1420
(213) 533-5120

Parsons Technology
375 Collins Rd. NE
Cedar Rapids, IA 52402
(319) 395-7300

Peter Norton Computing
100 Wilshire Blvd.
9th Floor
Santa Monica, CA 90401-1104
(213) 319-2000

POP Computer Products
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Evergreen, CO 80439
(303) 674-0200

Power Up
P.O. Box 7600
San Mateo, CA 94403
(800) 851-2917

Publishing International
333 W. El Camino Real
Suite 222
Sunnyvale, CA 94087
(408) 738-4311

Reality Technologies
3624 Market St.
Philadelphia, PA 19104
(800) 346-2024
(215) 387-6055

Sierra
P.O. Box 495
Coarsegold, CA 93614
(209) 683-6858

Sir-Tech Software
P.O. Box 245
Charlestown Ogdensburg Mall
Ogdensburg, NY 13699
(315) 393-6633

SoftView
4820 Adohr Ln.
Suite F
Camarillo, CA 93010
(800) 622-6829

Software Toolworks
13557 Ventura Blvd.
Sherman Oaks, CA 91423
(818) 885-9000

Timeworks
444 Lake Cook Rd.
Deerfield, IL 60015
(312) 948-9200

Traveling Software
18702 N. Creek Pkwy.
Bothell, WA 98011
(206) 483-8088

Useful Software
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Woodland Hills, CA 91364
(800) 521-7225, ext. 5
(800) 321-7645, ext. 5
(in California)

Varteck
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Livingston, NJ 07039
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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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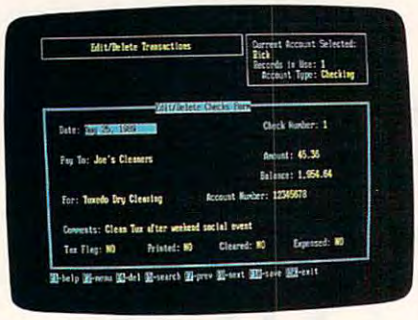
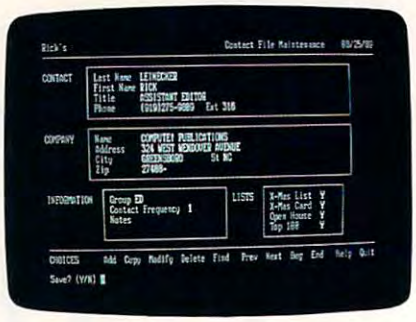


CheckMate Version 1.70

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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Shareware Agreements

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.

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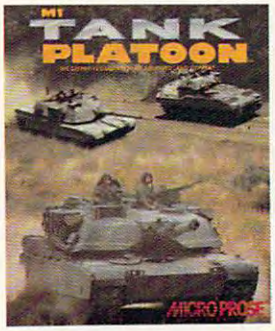

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RESOURCES

TAP THE WEALTH OF HOME OFFICE INFORMATION

ONLINE SERVICES

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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The Complete Football Game For Real Football Fans

Co-designed by John Madden, including over 160 plays from the actual playbooks of John Madden. If that's not enough, you can design your own plays for both offense and defense.

Take to the field, launching the long bomb or bursting across the line of scrimmage as full field graphics bring the excitement of live football onto your screen.

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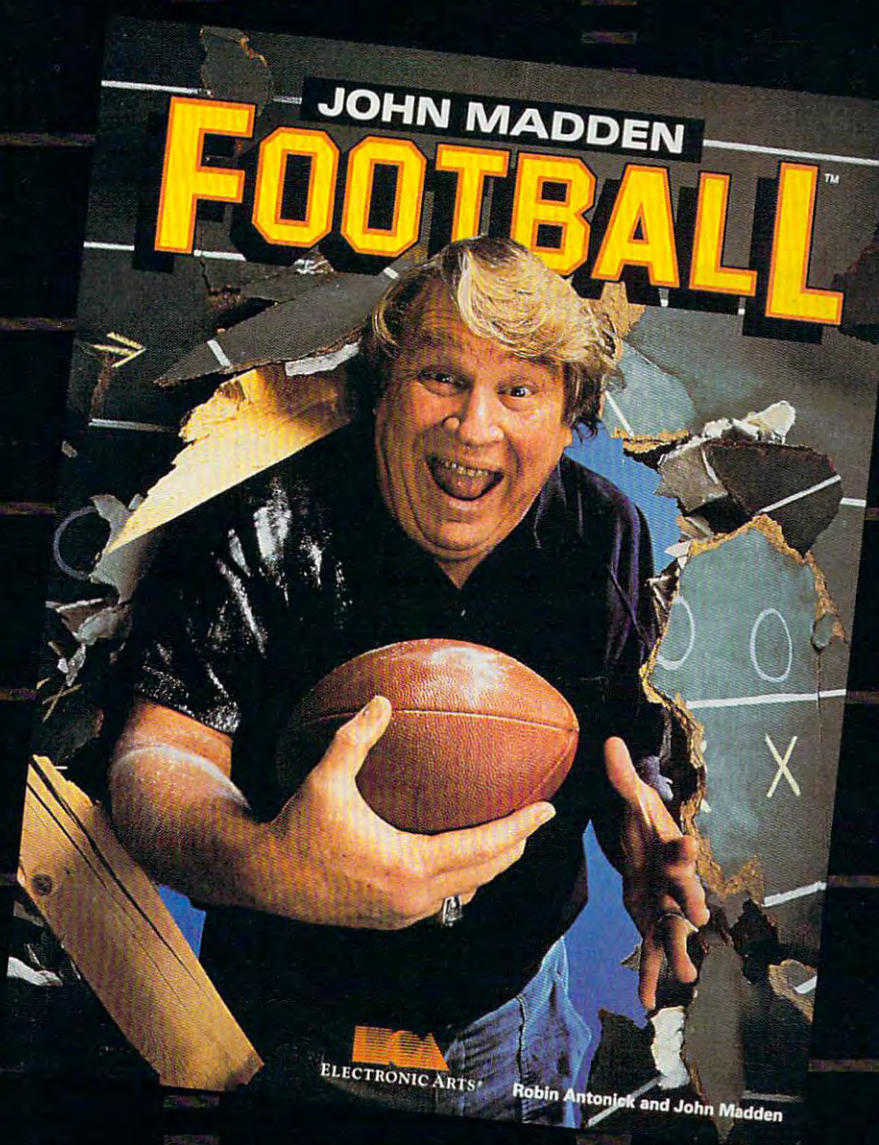
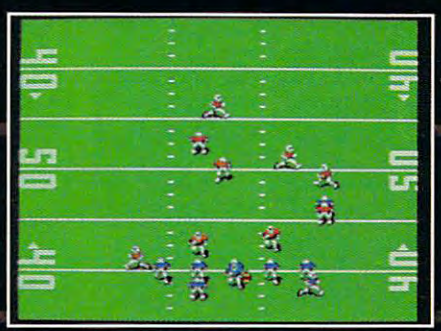
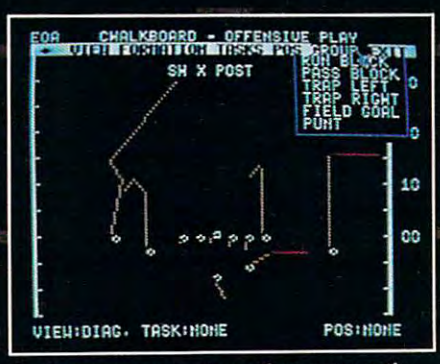
Look for the NFL Players Association Players Disk™ for John Madden Football. Crash through the line of scrimmage as your favorite superstar. Challenge a friend...your favorite football team against his.





Cut back against the grain. The yardage you gain is affected by everything from ball carrier skills and defensive formations to turf and weather conditions.

Choose your line-up with the Madden Report, a head to head comparison of important match-ups; everything from speed and fatigue to passing accuracy.



Design your own plays, then put on the pads to see how they work against different defenses.

ELECTRONIC ARTS®

How to Order

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MONEYCOUNTS 6.0

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MONEYCOUNTS' smart account balancer makes fast work of even the toughest bank statements.

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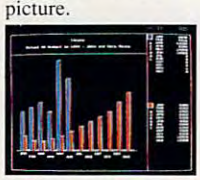
All reports can be displayed to screen and easily viewed using vertical and horizontal title locking.

3-D pie charts let you quickly visualize your complete financial picture.



3-D bar charts let you easily compare your actual and budgeted results.

	MONEYCOUNTS*	QUICKEN*	MANAGING YOUR MONEY*	DOLLARS & SENSE*
Version	6.0	3.0	5.0	3.1
Manufacturer	Parsons Technology	Intuit, Inc.	MECA Ventures, Inc.	Monogram Software, Inc.
Suggested Retail Price	**$35.00**	**$59.95**	**$219.98**	**$179.95**
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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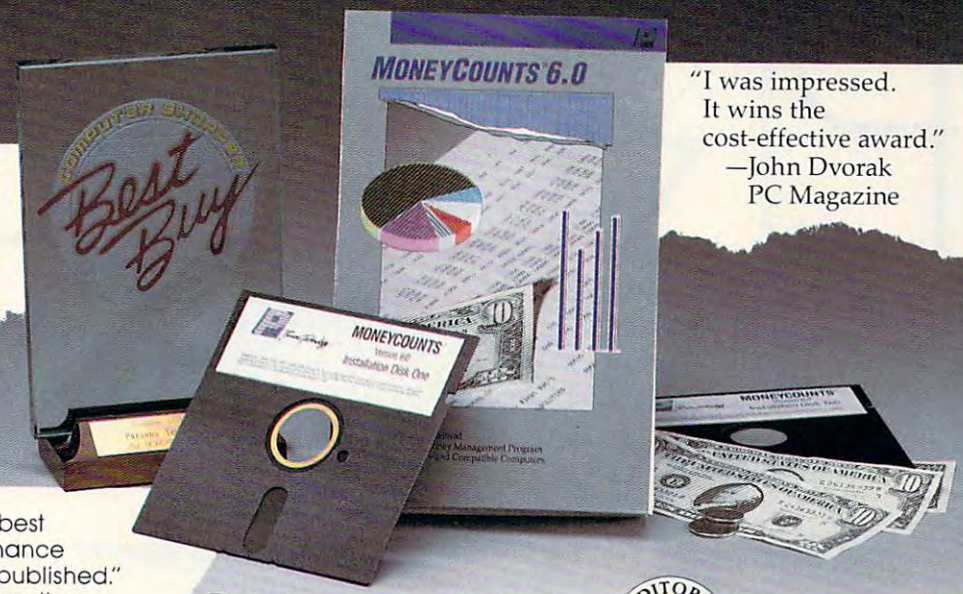

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PRODUC

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.

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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

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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.

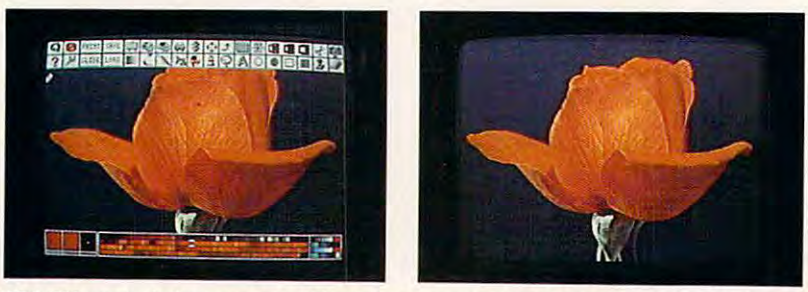
I also used the board to deliver signals to different televisions and video monitors. On a Sharp color TV equipped with a video/TV switch, I was able to produce an acceptable picture, with crisp graphics and colors. Unfortunately, text definition suffered somewhat. When I used my regulation color set (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.

SIMULATIONS MAKE YOU WONDER **WHAT'S REAL ANYMORE**

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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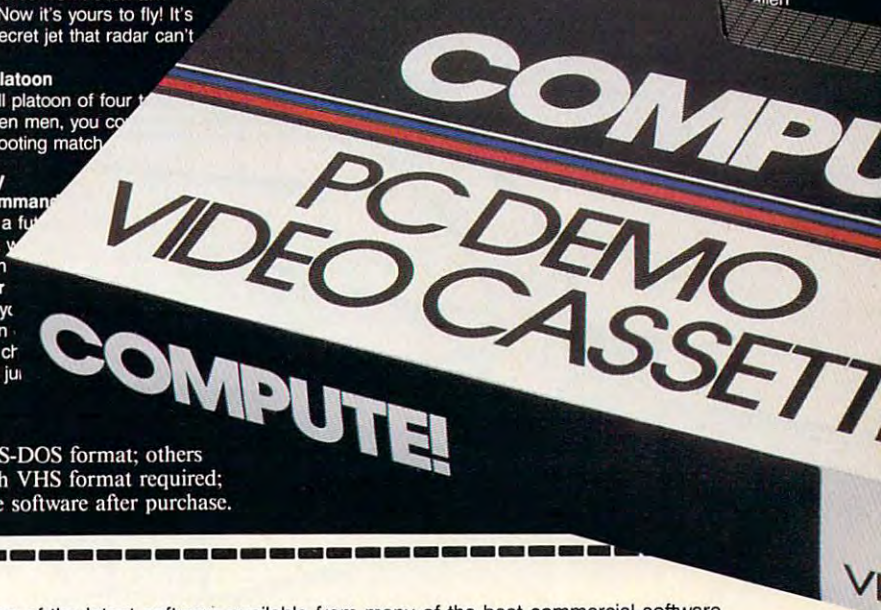

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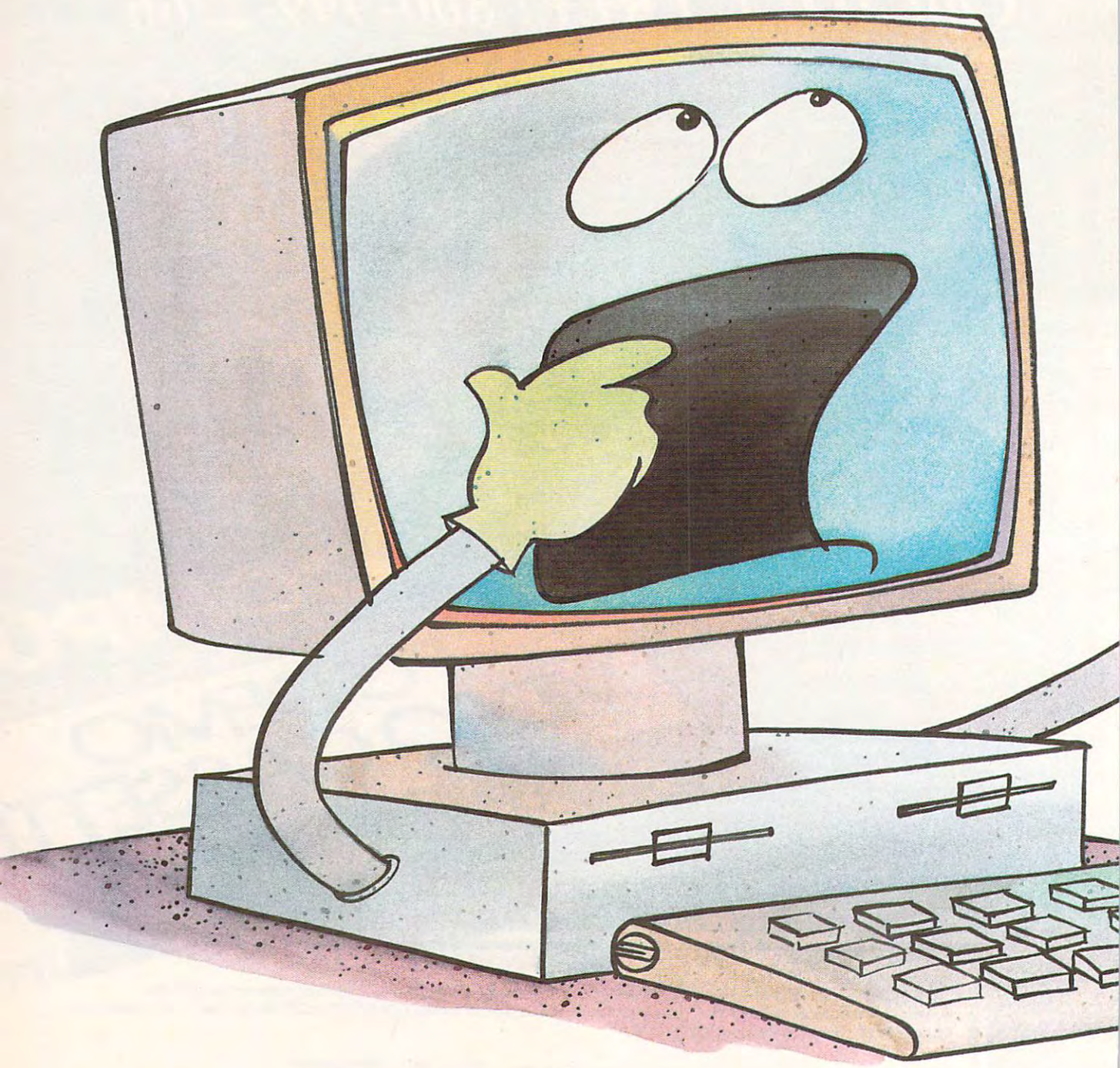

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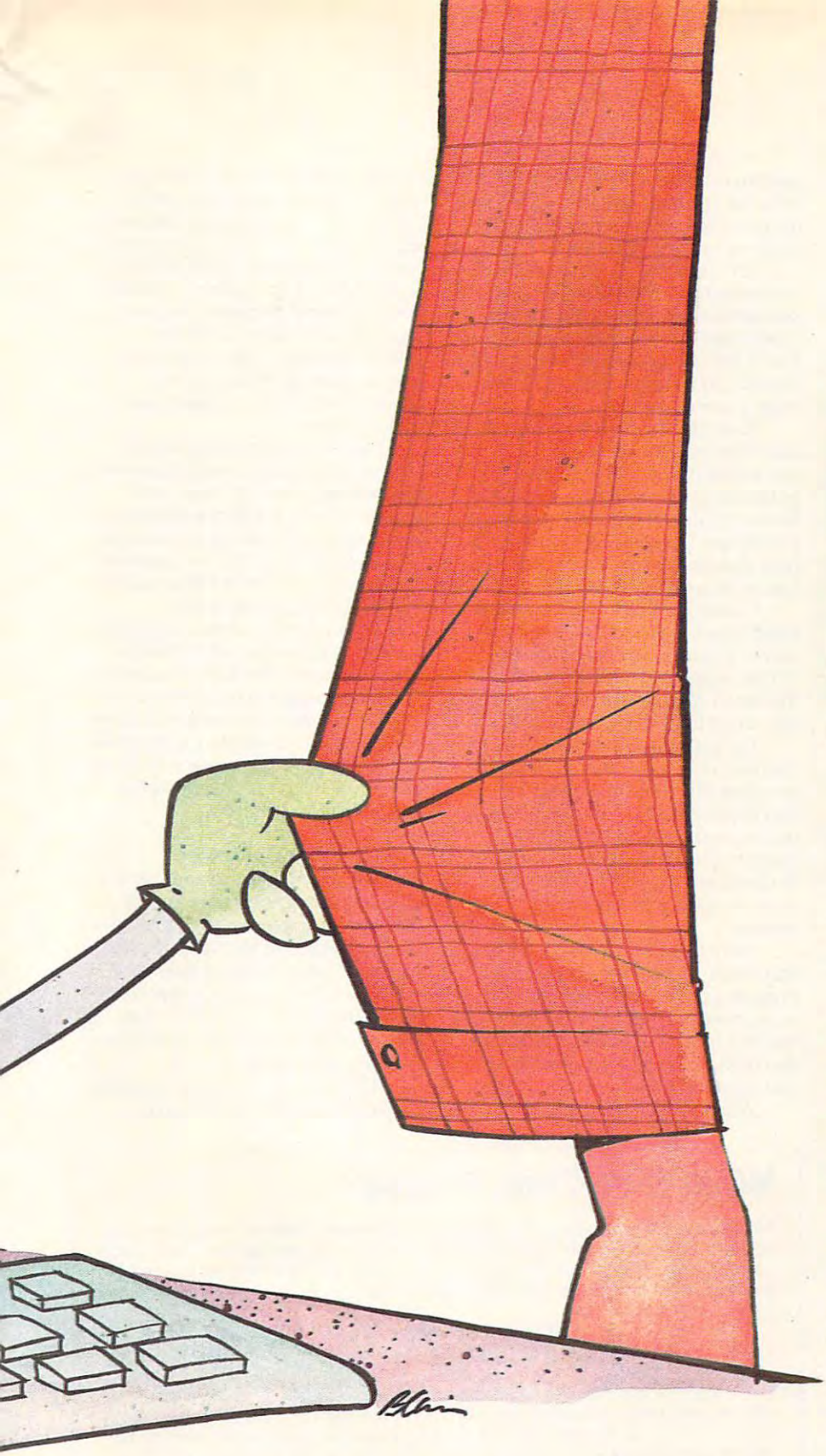

SOME MEMORY CHIPS

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

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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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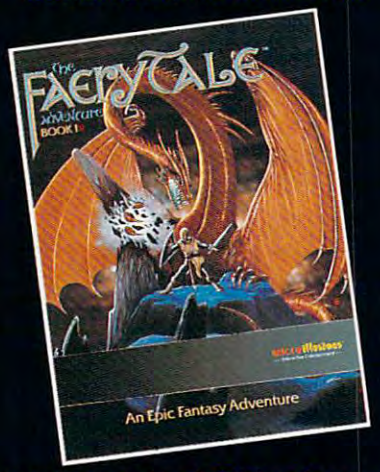

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board: You can plug the memory chips directly into socketed holes on the motherboard, or you can plug in a tiny card of chips called a *SIMM*. SIMM is an acronym for Single In-line Memory Module. SIMMs can be more convenient and easier to install than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

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

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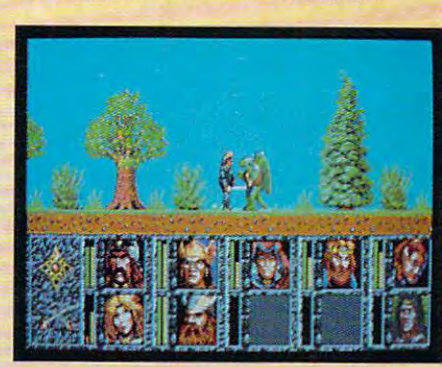

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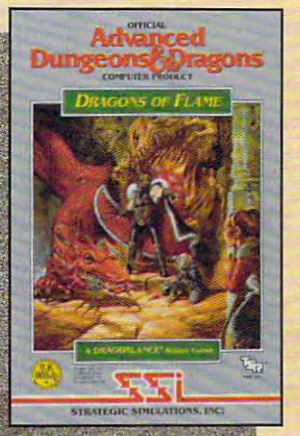
CAN YOU STAND THE HEAT?



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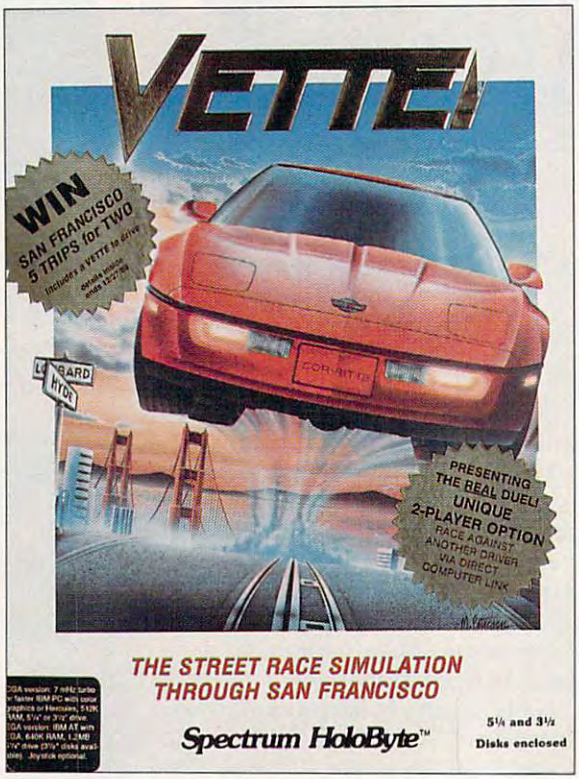

PETER SCISCO

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

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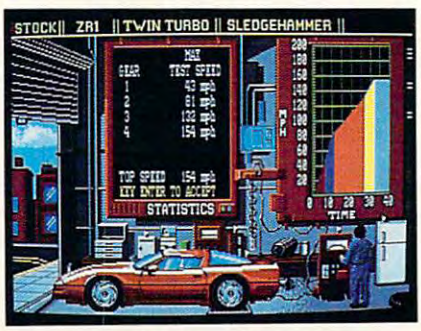
INMENT

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

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

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

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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Satisfied SimCity players say it best...

Great game! I'm hooked • I've got SimCity syndrome! • I find SimCity to be the most addicting, educational, and the best game I have ever played! • Amazing! • I may quit my job so I can play more... well, nah • You guys are Maximum Pinheads • SimCity is not just a game, it's a way of life • Simply the best computer game I've ever played! • SimCity should be outlawed!! It's addictive • Fantastic! I've been playing almost non-stop for 4 days! • Excellent game! But I've been losing a lot of sleep since I bought it • Wow!! • It's a blast! • TERRIFIC! FANTASTIC! • Awesome!! • Super!!! • The airplane pilots are psychotic • Amazing—all mayors need to understand this too; mine doesn't • It's like an electronic ant farm • Outstanding! • What a fantastic program! • My 4 year old loves it too! • Excellent program! Learning can be fun and addicting • Best game ever for the Amiga • My wife and I really love this software • I stay up until 2 a.m. playing it everyday! • Thank you for a piece of intelligent, educational and thought-provoking software • Absolutely wonderful idea and program • Excellent product, I wish I'd thought of it!! • I've never seen a program like this • Make more Sim games, nothing even comes close • On a scale of 1-10 this one's a 20!!! • This is a totally different, stimulating, engrossing and visually enjoyable program. • Spiffy! • Great, Great and Great! •

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

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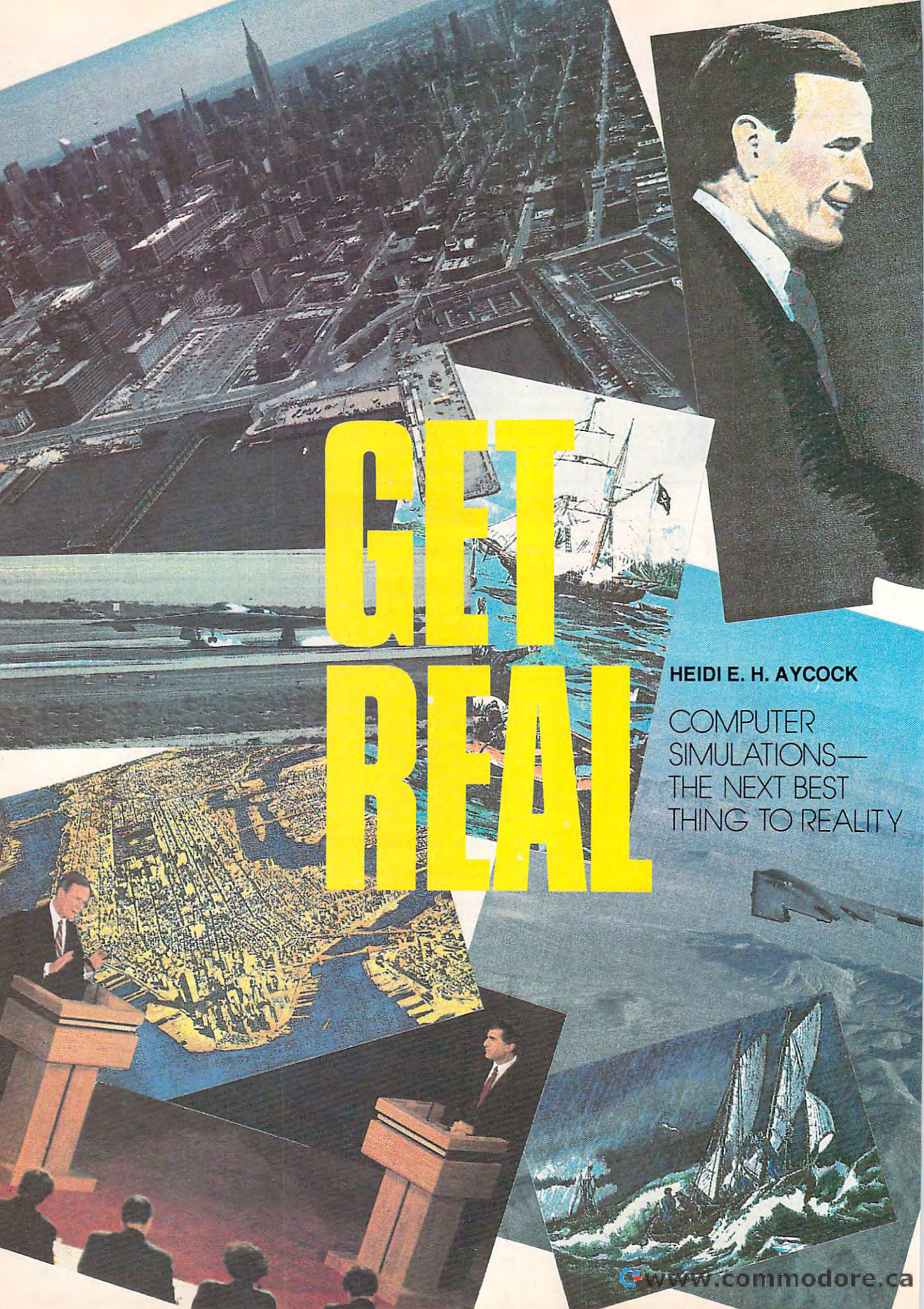

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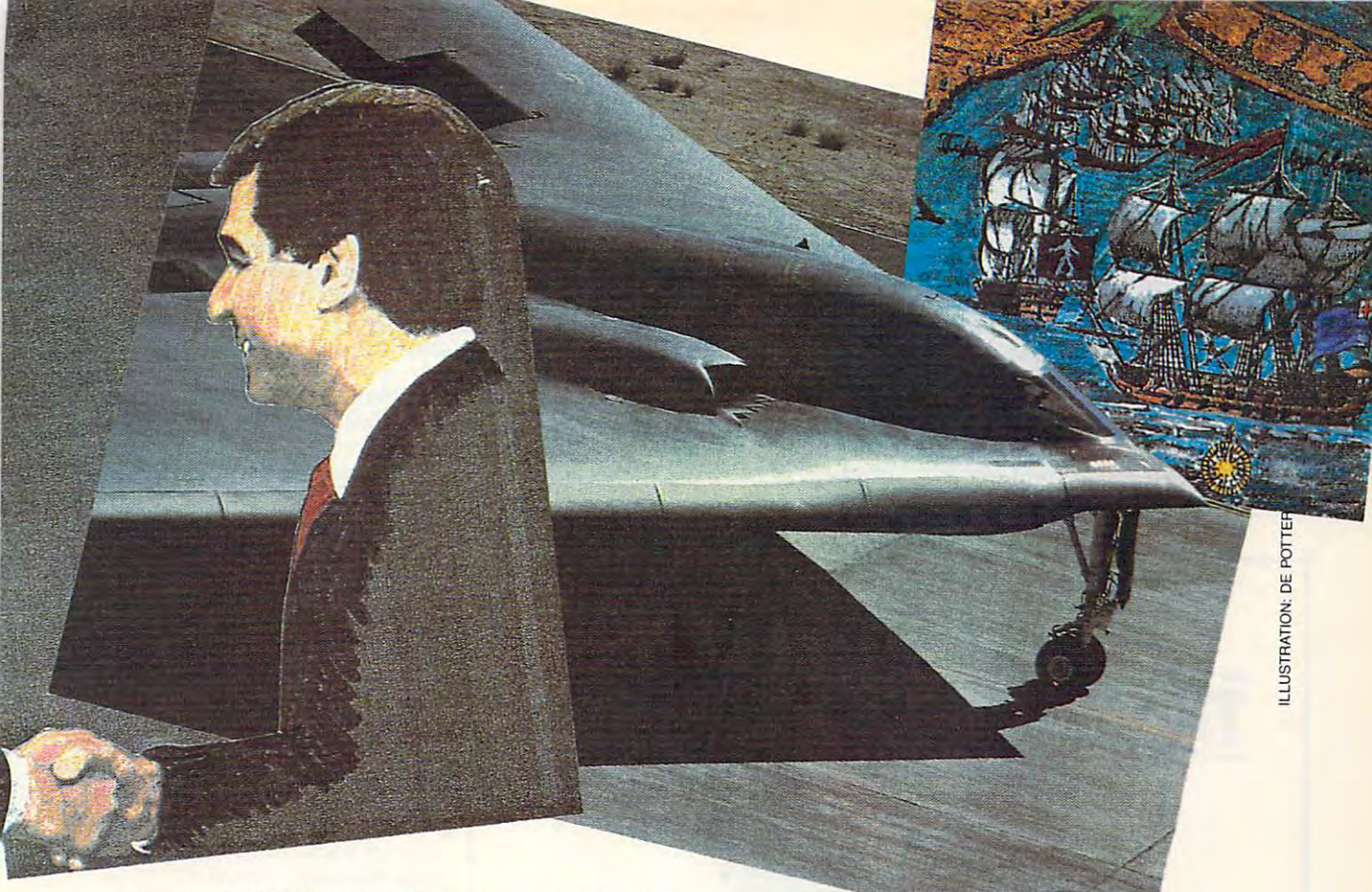

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July 1988: George Bush is 14 points down in the polls. Nelson Hernandez cranks up *President Elect,* his political simulation, and proclaims Bush as the November victor. He predicts the distribution of electoral college votes within 1 percent and the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

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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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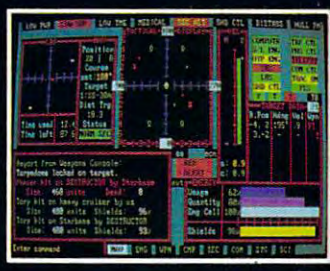

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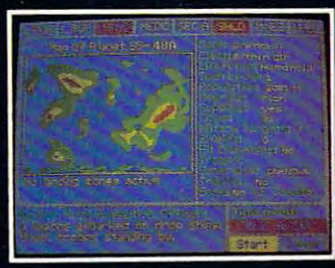

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Historical accuracy, crucial detail, realistic sound effects and advanced personal computer technology combine to make White Death a highly challenging and exciting wargame.

White Death is adapted from the GDW game of the same name which won, in the year it was released, the Game Designer's Guild Award and F&M's Best Operational Game Award.

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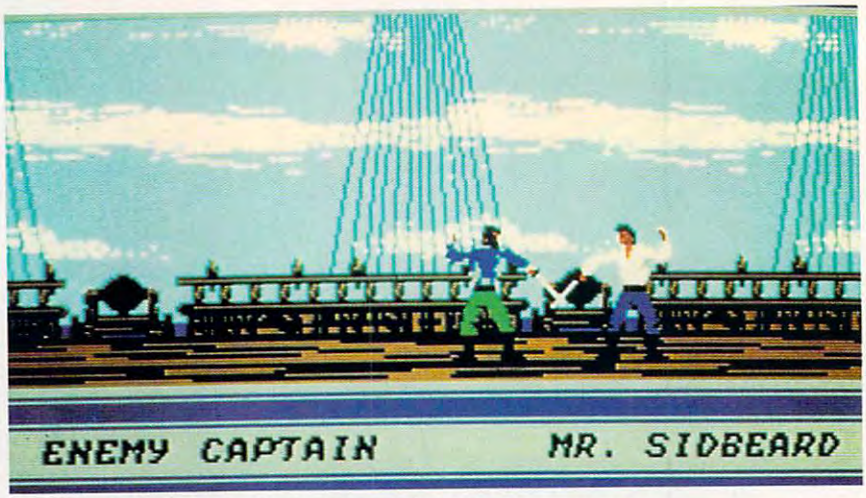
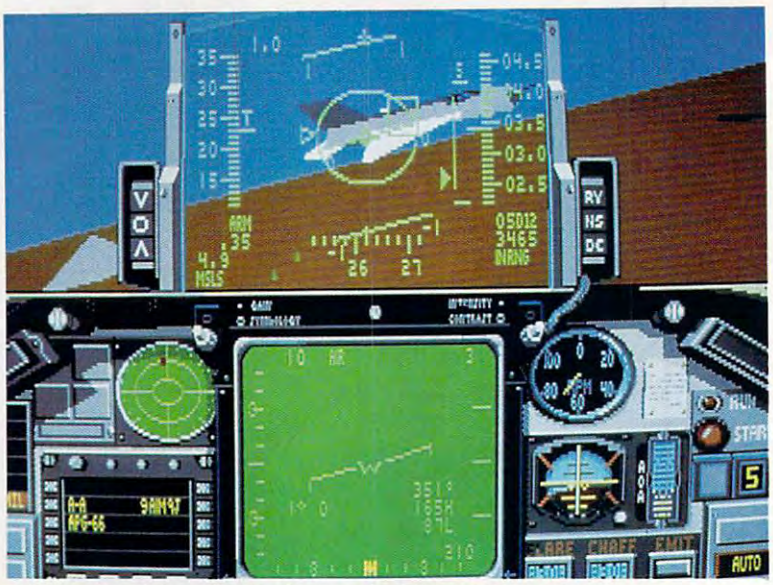


Role-playing features make the *Pirates!* simulation more engaging.



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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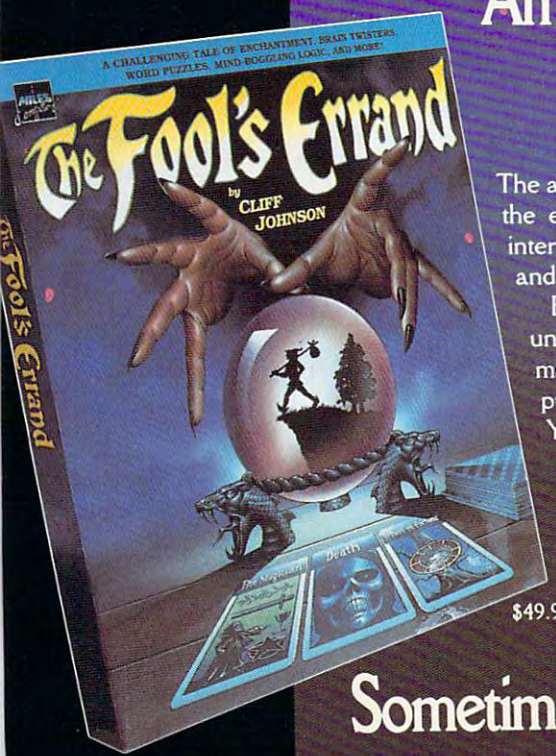

The award-winning *Fool's Errand* is a game like no other. It tells the enchanting story of the fool in his search for wisdom, intertwined with over 80 original puzzles: graphic, word, logic, and more.

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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.

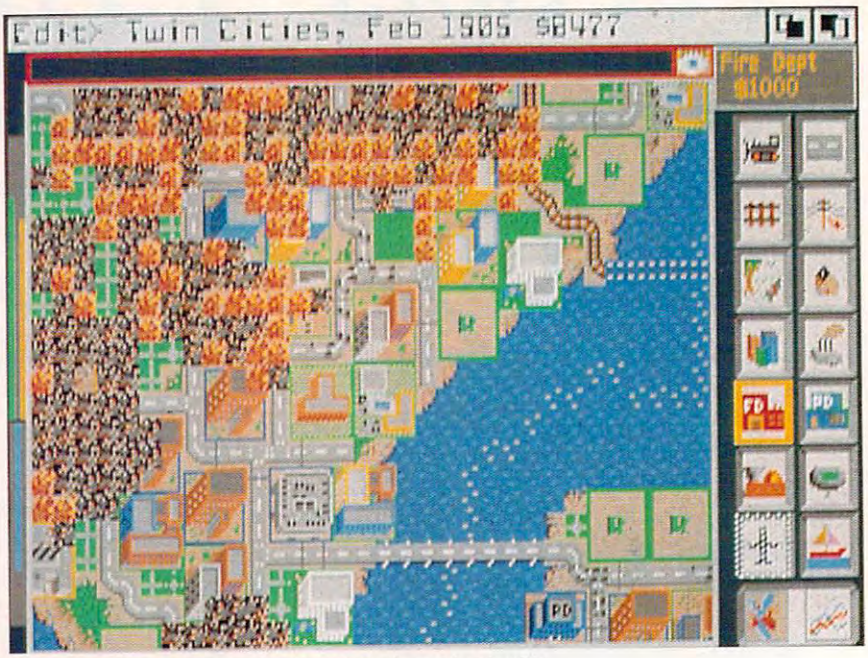
"If you set up properly, you can have a lot of things happen that the designer didn't even plan," Wright says. "It's called *emergent behavior*. It emerges as a result of the rules. It wasn't coded into the program. I think emergent behavior is something we should be striving for."

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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