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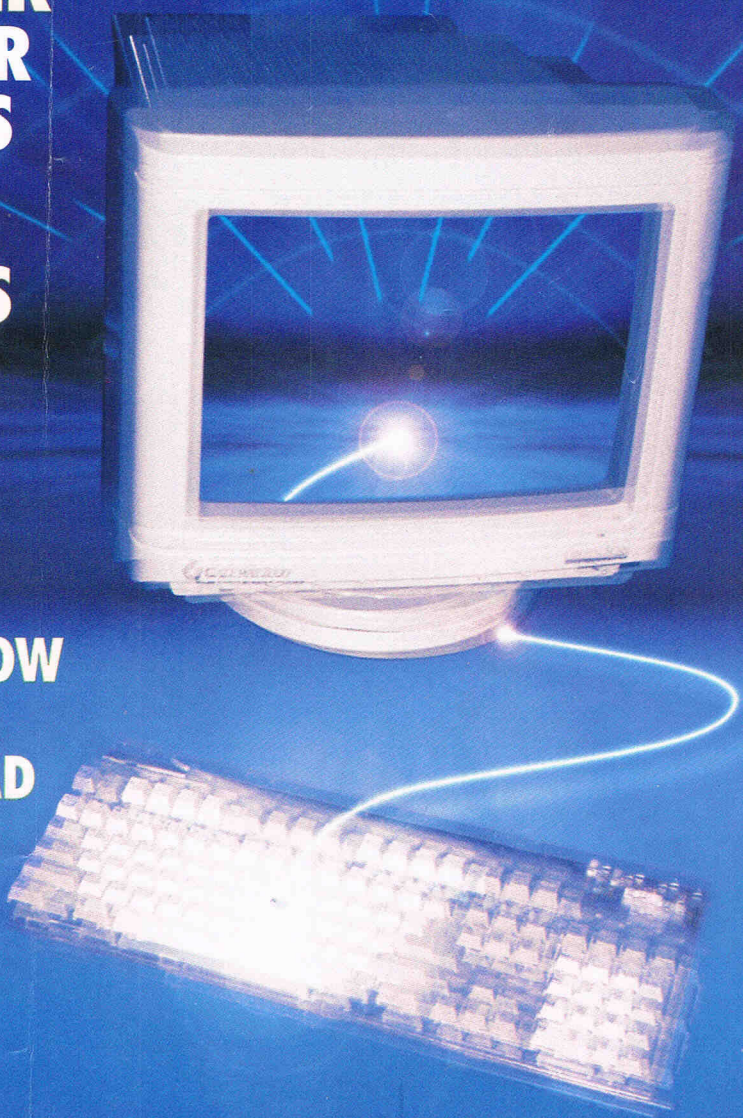

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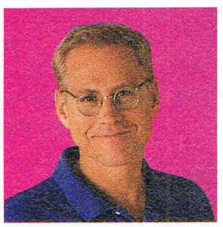

I crank out for her causes. My built-in fax/modem seldom rests. Neither does the AST 24-hour support line.

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Clifton Karnes

This is your chance to change COMPUTE. Twice a year—in January and July—we publish a readership survey, asking you all kinds of questions about the hardware and software you own and plan to buy, the topics you like to read about, and what you like and don't like about the magazine.

You'll find this issue's readership survey on page 66, and I urge you to fill it out. We use the results of these surveys every day to determine what products, how-to information, and general topics to cover in COMPUTE. Besides, the results of the surveys are just plain interesting. Following are a few of the highlights from the January 1994 survey that I think you'll find interesting.

If you own a 486 with a Super VGA video system, you're in good company. About 50 percent of our readers have systems configured this way. This number is up from 22 percent just a year earlier.

Another interesting statistic is that one-third of you are planning to buy notebook computers this year. Just six months before that, only 5 percent were interested in notebooks. This shows how rapidly notebook technology is improving.

Use of multimedia equipment—which includes sound cards, speakers, and CD-ROM drives—has been growing like crazy in the last year. In this survey, almost half of you (45 percent) have sound cards, with speakers (41 percent) and CD-ROM drives (30 percent) close behind.

One piece of equipment many of you own came as a real surprise. A full 43 percent of you own fax modems. This number is up from 33 percent just a year before. That explains why so many of you are faxing in your readership survey forms!

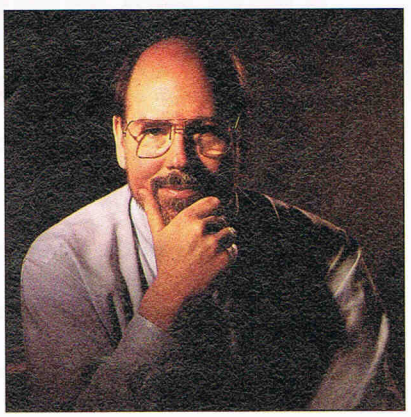
The operating systems of choice are clearly DOS, with a 75-percent share, and Windows, with a 62-percent share. Obviously, a large number of you use both Windows and DOS.

Looking at the parts of the magazine you like most, "Tips & Tools" is at the top, followed closely by "Hardware Clinic" and "Windows Workshop." Hot on the heels of these top picks are reviews, "News & Notes," COMPUTE's Getting Started With, and features.

Looking at your favorite topics, this list is much like the year before. New computer technologies is at the top, followed by how to upgrade your PC, new hardware, disk management and DOS, Windows, and entertainment.

Where do your fellow readers use their PCs? Well, as you might guess, almost all of you use PCs at home, but about 43 percent use them at work too. And what do you connect your PCs to? Here, the numbers are spread pretty evenly among America Online, Prodigy, and CompuServe, with other services like DELPHI, BIX, and the Internet turning in substantial gains over last year.

So there you have COMPUTE's readers in a nutshell. At least, that's what you looked like six months ago, when we did our last survey. Let us know



what you're doing and thinking today, though, by filling out the readership survey form. You'll help us make sure COMPUTE covers the info and products you want to read about.

* * *

In April, COMPUTE bundled a one-chapter excerpt from my book *Essential Windows Tools* with issues of the magazine that appeared *on the newsstand only.* Several subscribers have expressed an interest in receiving the excerpt too, so we've arranged to make it available. Simply send an SASE with $.52 postage to EWT, COMPUTE Publications, 324 West Wendover Avenue, Suite 200, Greensboro, NC 27408. Our supply of excerpts is limited, so write soon if you're interested. ❐

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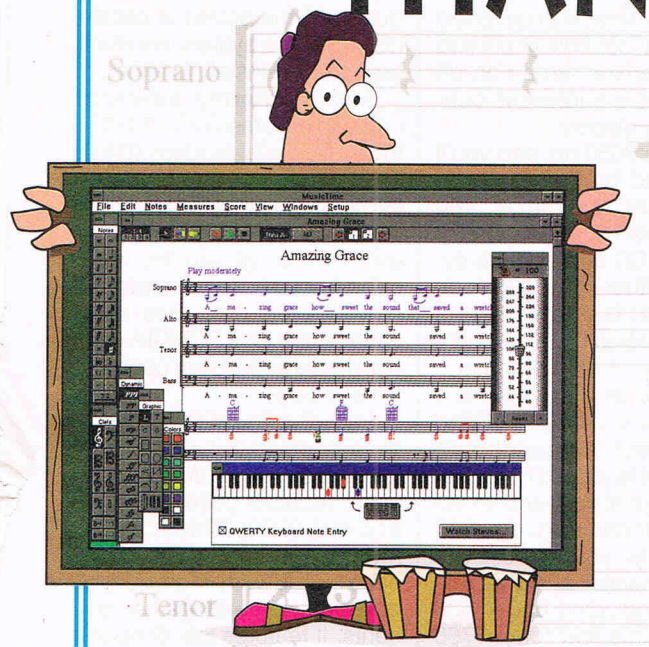

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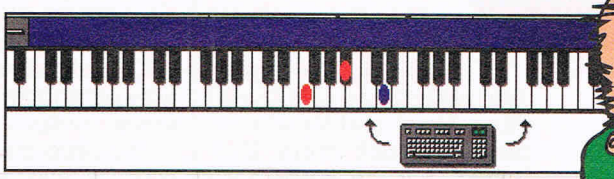

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WINDOWS WORKSHOP

Clifton Karnes

TRAVELING COMPANIONS

Looking for the perfect Windows notebook computer is my hobby. The problem is that once I find the perfect machine, Windows programs start demanding more powerful hardware, and my search begins again.

Two years ago, I found the ideal Windows notebook: the NCR Safari. It was a cutting-edge 25-MHz 386SX with 4MB of RAM, an 80MB hard disk, an external 1.44MB floppy drive, a PCMCIA slot, and a monochrome backlit LCD. At the time, this was the most advanced hardware you could get, and, to top it off, the machine was beautifully designed, with the best fit and finish I'd ever seen in a notebook.

You won't find a better portable Windows machine than the Sharp 8650.

I loved this computer. Today, however, its hardware is underpowered—especially the CPU, hard disk, and display. The new versions of Microsoft Word, Excel, and Visual C++ demand much more CPU speed. And an 80MB hard disk, even when it's enhanced with Stacker or DoubleSpace, is too small. Color, too, is becoming more important.

For the last few months, I've been reluctantly looking for a replacement for the Safari, and I may have found one: the Sharp 8650 (Sharp Electronics, 201-529-9593, $3,299). The 8650 is a 33-MHz 486DX with 4MB of RAM, a 200MB hard disk, a 1.44MB internal floppy drive, one PCMCIA 2.0 slot, and an 8.4-inch color active matrix display. The bundle weighs just 6.4 pounds.

The fit and finish of the Sharp rival the Safari's. The case is a handsome dark gray with monochrome LCD indicators. When you open the machine, you'll find a layout that's simplicity itself. The keys are nearly full-size, are colored in two shades of gray, and include 12 function keys and cursor keys in an inverted T. The only controls you'll find on the machine are an on-off switch and a brightness control for the display.

Turn the 8650 on, and you'll be amazed by the quality of the display. It's 640 × 480 with 256 colors, and it's one of the best LCD screens I've ever seen. Other options include an internal fax/data modem and a trackball that snaps onto the front of the computer.

Looking at the machine's ports, you'll see everything you'd expect: a parallel port, an external keyboard PS/2 connector, a serial port, and an external monitor port. As with many LCDs, you can use the external monitor at higher resolutions, including 800 × 600 with 16 colors and 1024 × 768 with 16 colors. These display resolutions can be switched using software, and the internal LCD can be either active or inactive when you're using an external monitor.

I've used this machine on two trips, and when my desktop system at work failed recently, I used it for two weeks as my main computer. Through all this it's performed superbly. On the road, the battery life is about two hours for full-blown Windows computing, which is about average. If the 8650's too pricey for you, consider Sharp's dual-scan passive matrix model with a slightly larger 9.4-inch screen for $2,999.

I want to talk about three traveling companions that have made working with this Sharp notebook more productive and more fun. The first is the DSP Solutions Portable Sound Plus (DSP Solutions, 415-494-8086, $199). This wonderful 16-bit Sound Blaster–compatible sound system plugs into your parallel port and turns any notebook (or any desktop, for that matter) into a real sound machine. The quality of the sound is excellent, and the system couldn't be easier to install.

Another worthy traveling companion is the GVC 14.4 PCMCIA fax/data modem (GVC Technologies, 201-579-2954, $299). I simply slip this tiny card into the 8650, and I can get online at almost any speed—and send and receive faxes. For size and ease of use, this PCMCIA modem beats a serial port connector any day.

Last, I've found the perfect case in which to carry all this stuff. The Tamrac World Traveler Executive 2886 (Tamrac, 818-407-9500, $249.95) is a handsome computer briefcase made with high-quality ballistic nylon and leather accents. It features lots of pockets and storage compartments and can carry almost any accessory you can imagine. It was designed to have all the features of a traditional briefcase plus the storage of a computer carrying case, and it achieves this goal admirably. It boasts three very large pockets that I use for the power supply, mouse, and extra phone and power cords. In a different compartment, it has smaller pockets you can use for airline tickets, sunglasses, and an address book. You'll find several pen pockets, too, plus storage for disks and lots of compartments that can hold papers, folders, and manuals. After the computer itself, this Tamrac case is my most important piece of equipment. It's by far the best computer case I've ever seen. ❐

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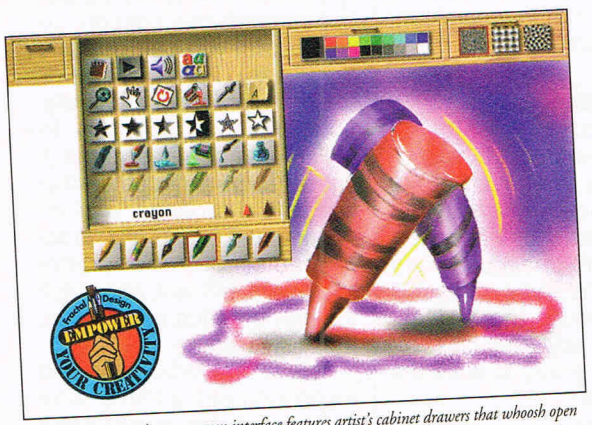

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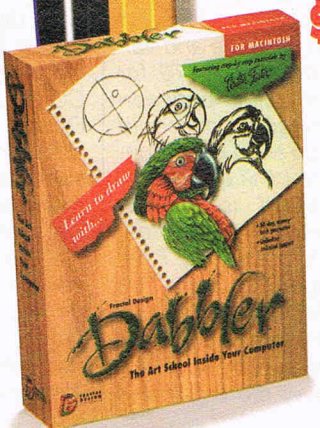

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FEEDBACK

Edited by Robert Bixby

Becoming pixelated, sending a tree, and healing a printer

Pixel Logic

I'm 18 years old, and I'm just starting in computer studies. I need to know what a pixel is, exactly. And what's a 66-MHz DX2 computer?

CRAMER STYVES
QUEENS VILLAGE, NY

A pixel is the smallest unit of your computer screen that can be controlled by the computer. Try this little QBASIC program.

```
SCREEN 12
TOP:
PSET (320,240),m
SLEEP 1
m = m XOR 15
GOTO TOP
```

That blinking dot in the center of your screen is a pixel. If you're using a color monitor, the pixel is composed of three dots: red, green, and blue in equal intensity. If you use a magnifying glass, you'll probably be able to see the individual dots of phosphor that make up the pixel. Now exit from the QBASIC program and use your magnifying glass to look at letters on the monitor screen. They're composed of individual dots as well. Each of these dots is a pixel. Your monitor screen is like a Cartesian grid 640 pixels wide by 480 pixels high (most likely). By substituting values between 0 and 639 for the first value between the parentheses following PSET in the program example and values between 0 and 479 for the second value between the parentheses, you could cause any pixel on your monitor screen to blink on and off.

An 80486DX is an advanced form of the 80x86 series of CPUs offered by Intel. Its advantage over the 80286 and the 8086 is that it's a 32-bit chip while these earlier versions are 16-bit chips. Its advantages over the 80386 are that it's considerably faster and it has an on-board math coprocessor. A 66-MHz model is one that can operate at 66 million cycles per second. That's not quite as impressive as it sounds, since some instructions can take several clock cycles to process. DX2 *is a special designation that means the chip is actually a 33-MHz CPU running in a 33-MHz system, but its speed is doubled so that when it isn't accessing anything outside the CPU, it actually runs at double speed—66 MHz. A DX2 system doesn't really run at its rated speed because some of the time it's operating at 33 MHz. But it is significantly faster than an ordinary 33-MHz machine.*

Smarter Deletes

I have a puzzler for a batch file programmer. I'd like to remove a file from each of my subdirectories. My antivirus program puts a file called CHKLIST.MS in almost every directory and subdirectory. I'd like to delete these files, along with any BAK files. Also, is there a way to send the tree to a file?

R. L. CRAWFORD
ROCHELLE, IL

Hereabouts, we prefer BASIC to batch language, so we created a QBASIC program that will delete any files you designate from every subdirectory on a disk. Unfortunately, it's far too long to publish in the magazine. It's available in the COMPUTE area on America Online. But it might not be so smart to delete those checksum files. Your antivirus program uses them to detect infection.

If you want to turn your tree into a word processor document, type this at the command line: tree /f > filename.ext. *Most commands that provide output can have their output redirected into an ASCII file which can be loaded into the DOS editor or most word processors and then formatted to your heart's content and printed out.*

One additional note: If you want to exclude the antivirus checksum files from your tree listing, the smart delete program can also set the hidden attribute of these files, generate the tree as a text file, and then reset the hidden attribute. This will prevent the checksum files from being displayed in your tree printout, but they will remain on disk.

Printer Woes

You have come to my aid before through this column, so I'm hopeful you can help me again. My Panasonic KXP 1023 printer works erratically. Sometimes it responds to LPRINT, and other times it doesn't. My inadequate solution is to disconnect and reconnect the brand-new printer cable, put the printer through its self test, and jiggle the online switch a few times. It usually works.

The DOS Mode command responded with a *Printer error* message during one of these episodes. If you fail to help, my next move will be to bring an Indian shaman to sing some powerful chants.

ARNOLD MOSS
BRONX, NY

You wrote your letter to "Tips & Tools," but it seemed to fit better in "Feedback." Richard C. Leinecker responds:

Begin by trying another printer port. If you're using LPT1, then plug the printer cable into LPT2 and try it. If that doesn't work, try a new cable. Borrow one if you have to. Even a brand-new cable can be defective.

Check your emulation. You might have accidentally set the printer to emulate some other

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printer, and some of your printer drivers might be incompatible with that printer emulation.

Borrow a printer and try it with your setup. There might be something going wrong inside your computer on your parallel interface or in software.

You'll have to work a little harder if things are still going awry. Remove all of your TSRs and device drivers that aren't absolutely essential. It's possible there's an IRQ conflict that causes the printing process to flake out once in a while.

My last suggestion is to take the printer to a friend's house and try it on his or her computer. If you still have trouble, the printer probably needs repair. Take it to a repair shop and have it checked out.

Checking a program line, deleting OS/2, and downloading a charts and graphs program

Old Climber

When I run Climber 5 (from the August 1987 COMPUTE!), I get an error message stating *Subscript out of range in 190.* Why am I getting that message? I've enclosed the program listing.

ALAN R. KENNEDY
COLUMBUS, GA

A Subscript out of range *error message indicates that an array has been incorrectly dimensioned or hasn't been dimensioned at all. Therefore, we traced back through your program listing to see where the arrays were dimensioned, and sure enough, the arrays used in line 190 and several other lines in the program were never dimensioned in your listing (though they were in the listing published in the magazine).*

Here's the line from Climber 5 on page 50 in the August 1987 COMPUTE!. It dimensions the arrays used in the rest of the program.

```
110 DIM LASR(37),
  RT1(15),LT1(15),
  RT2(15),LT2(15),
  CL1(15),CL2(15),
  WPC(16),WPS(11),BL(7)
```

Load your program into GW-BASIC and list this line. Edit it so that it matches the line above and press Enter. (Pressing the Enter key with your text cursor on a line in GW-BASIC causes the line to be entered into the program. If you fail to do this, the line will never be made part of the program.)

Since this line is incomplete, it's possible that other lines in your program are also incomplete. You should check your program against the listing line by line.

Dimensioning an array ensures that BASIC will set aside enough space in RAM to accommodate the array. BASIC will automatically dimension an array of 11 elements if you don't use the DIM function, but it's good programming practice to dimension arrays of any size because if your array is less than 11 elements, you'll be wasting precious RAM by allowing BASIC to use the default.

The Ghost of OS/2

I can't delete OS/2 from my hard disk. I deleted the files and ran Dosshell, and they're still there.

RAY WHETSELL
PHOENIX, AZ

Our resident OS/2 expert, Bradley M. Small, replies:

Exit from Dosshell. Log on to the root directory. Type attrib -r -h -s *.?sf and press Enter. Type* del *.?sf and press Enter. This should get rid of all of the OS/2 system files in your root directory. Next, type* attrib -r -s -h os2*. *and press Enter. Type* del os2*. *and press Enter. Then delete everything in the following directories (including subdirectories): OS2, DELETE, DESKTOP, MMOS2, NOWHERE, and SPOOL. Finally, use RD to remove these directories.*

If DOS gives you an error message when you attempt to remove a directory, it's probably because there are hidden or read-only files or subdirectories in the directories you're attempting to remove.

Another possibility (if you have already performed all of the steps outlined above) is that Dosshell isn't rereading your disk to make sure its directories are current. Press F5 to refresh the directory listing in Dosshell.

This Month's Premium

This month a BASIC program that draws graphs is available online in the COMPUTE area on AOL. You can use it to create bar graphs, line graphs, or pie charts using values you enter from the keyboard or in a text file. Since it's in BASIC, you can also modify the program, but don't forget that it's copyrighted. Use it for your own graphs, but don't pass it around. Anyone who wants it can download it. Each month we add something extra to the "Feedback" column uploaded to AOL to make it worthwhile for you to download it.

And don't forget to take a look at COMPUTE's "Personal Productivity" column on AOL each month.

ROBERT BIXBY
GREENSBORO, NC

Do you have a question about hardware or software? Or have you discovered something that could help other PC users? If so, we want to hear from you. Write to "Feedback" in care of this magazine. Readers whose letters appear in "Feedback" will receive a free COMPUTE baseball cap while supplies last. We regret that we cannot provide personal replies to technical questions. ❐

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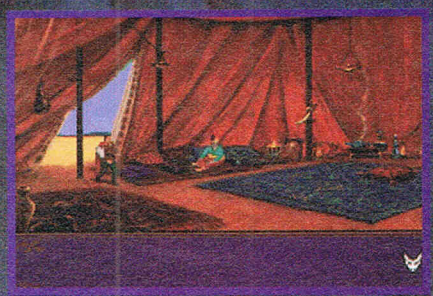

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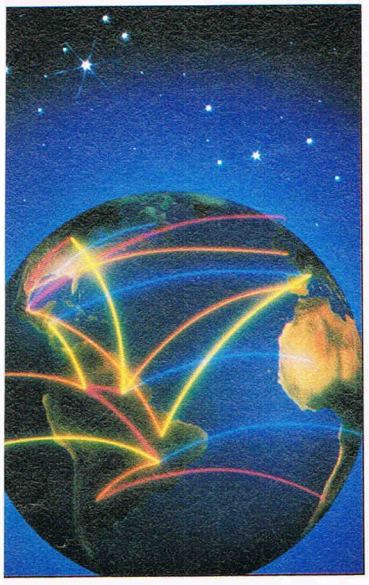

A few weeks ago, I received notice that Hayes Microcomputer Products was marketing a 28,800-bps V.Fast Class (also called V.FC) modem for $579 (list price). "ITU-T (the international board that approves telecommunications standards) hasn't approved V.Fast yet," I thought. "Who would buy technology that might be nonstandard?"

When I called Hayes to ask that question, Joe Fuller, manager of business development, told me that Hayes has been working for some time on what will be the next standard in telecommunications: V.34 (also known as V.Fast). The standard was supposed to be approved in 1992 and then in 1993, but it still hasn't been approved as this goes to press (approval is expected in the second half of this year). Meanwhile, the market has been demanding a faster standard than the current 14,400 bps. High speed is important for remote LAN access, sending large files (like graphics and desktop publishing files), and other large-scale data transfers. Some modem manufacturers have responded with what is known as V.32terbo (this is a bit of a pun, since in French, *bis,* as in *V.32bis,* means "second" and *ter* means "third"). This is a proprietary 19,200-bps technology that is expected to fade away in the face of the V.34 standard.

Also in response to this market pressure, Hayes and Rockwell developed their own V.Fast Class standard because, according to Fuller, "we have a good handle on what the standard will look like." The basics are already in place: speed, modulation scheme and use of multidimensional trellis coding, and line-probing techniques for adjusting the modem signal to the phone line signal quality. Hayes and Rockwell and 125 other modem manufacturers (all of whom use the Rockwell chip set in their modems) lined up to make the V.FC available. All of the modems being released with this new standard also feature upgradability, so when the standard is eventually in place, you'll be able to overcome V.FC's incompatibilities with some sort of upgrade—probably in the form of software or a new chip to insert on the modem board. You won't have to buy a whole new modem.

The effort necessary to upgrade will depend on the divergence of the V.FC and the V.34 standards, but many manufacturers claim that the upgrade will cost no more than $50. Hayes has guaranteed that its upgrade will be "less than $100."

You might recall that modern modems have built-in compression, which multiplies their stated bps ratings. For most modems the V.42bis compression standard provides 4 : 1 data compression, so a 28,800-bps modem can actually transmit 115,200 bps. But by taking advantage of special options in the V.42bis compression, V.FC Hayes modems interacting with other V.FC Hayes modems can transmit up to 230,400 bps, for about 8 : 1 compression (that's about 23K per second).

Once the V.34 standard is in place, if you buy a modem that uses a Rockwell V.34 chip set, that modem will be backward compatible with a V.FC modem. In other words, you'll be able to exchange data at 28,800 bps with either a V.34 or a V.FC modem.

Now for my cool report. The coolest thing I've heard about this month in telecommunications involves a Radish.

Have you ever been talking to someone on the phone and suddenly needed to send him or her a fax? It happens often enough to me—usually when I'm talking to a person who wants to tell me something confidential but can't because we don't have a nondisclosure agreement (NDA). We hang up. A few minutes later, the NDA comes out of the fax machine down the hall. I sign it and fax it back. A short while later, the phone rings, and our conversation continues.

You might not deal with industry secrets, but you might be a doctor who needs a release to send a patient's records to a hospital, or you might be contracting for a service from a company that needs your signature on a paper before it can deliver.

Radish Communications Systems has come up with something that eliminates the awkwardness of voice and data communication. If both you and the person you are speaking with on the phone have a modem with Radish's VoiceView protocol, you can send a fax (or data) over the same connection you're using for your conversation.

This technology is already on the market in the form of the ViewBridge, a Radish product, which costs $595. It connects in series between the phone and the wall jack. According to Jackie McDonald at Radish, VoiceView works with analog and digital phones. (Digital and hybrid systems require a special interface to the handset of the phone.) A serial connection links the ViewBridge to the PC. To switch between speech and data, you click on a button on your computer screen.

U.S. Robotics, Hayes, and Intel have all licensed the technology. According to Radish, a modem using VoiceView may be available in the second half of 1994. ❐

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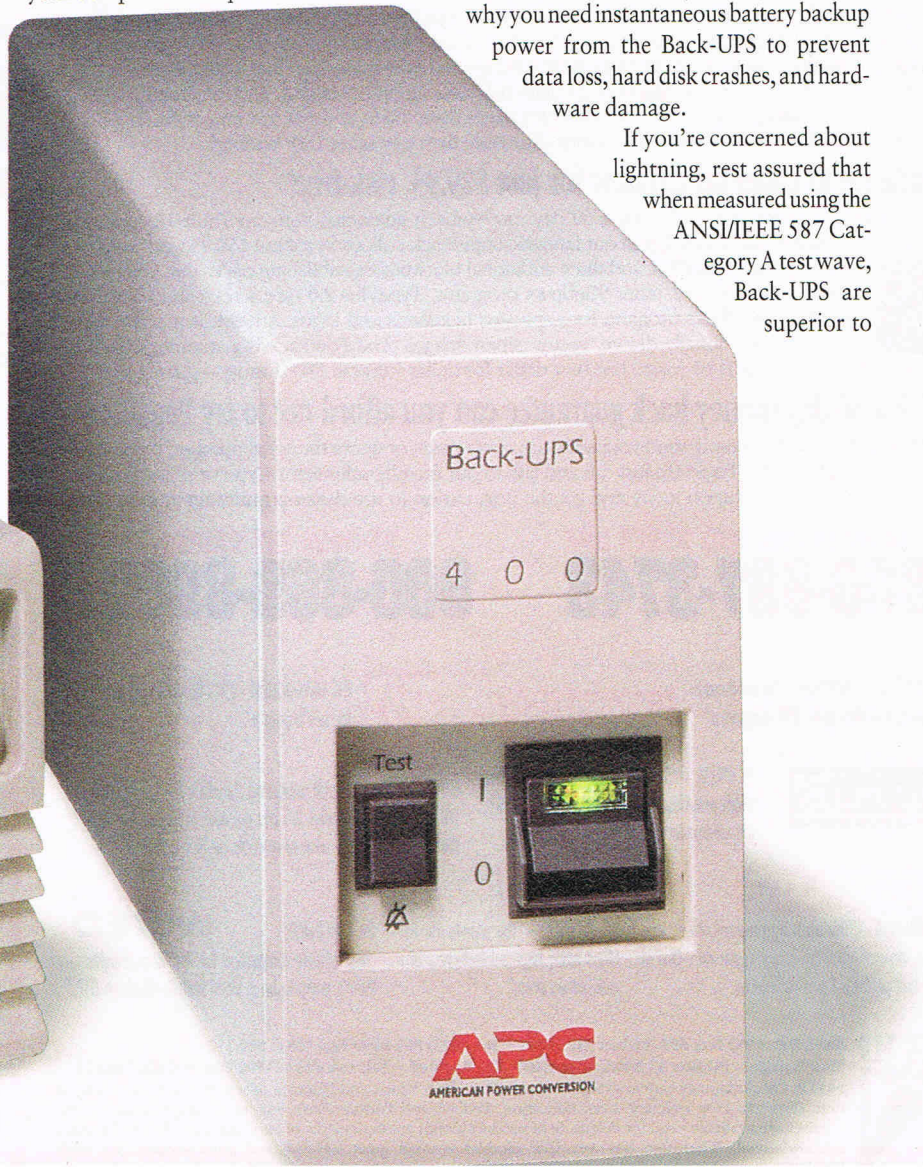

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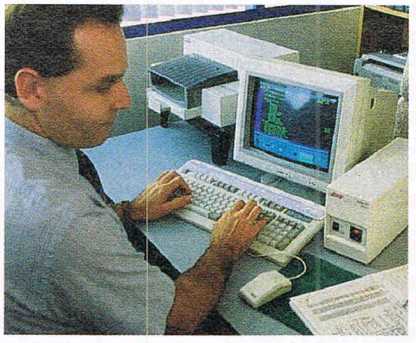

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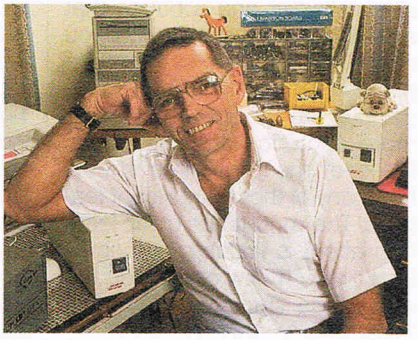

Don Traux knows first hand about Back-UPS reliability: "It ought to be against the law to buy a computer without an APC Back-UPS 250. I recently had a direct lightning hit right outside the house...my computer never blinked. Each morning I get a surge down the line and both APC's hate it - they simultaneously 'holler 'n clamp' while my 'Brand T' quietly sleeps in. I've relegated that unit to non-critical household stuff like my VCR."

Andrew Wargo, Manager at Baxter Land Company, tried two other brands before Back-UPS. "One lasted a few days, a second one went up in smoke after 48 hours, a third lasted less than 24 hours! I then bought my Back-UPS for less than half of what I had paid for the others. We've purchased three more Back-UPS and for the past 14 months they've been just hummin' away on the same power line that was eating the other brands alive!"

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Dept. 05

WINDOWS SPREADSHEET SOFTWARE

Edited by Mike Hudnall
Reviews by Richard O. Mann

The action in today's spreadsheet market is in Windows. This month's Test Lab examines the current crop of Windows spreadsheets, consisting of the three traditional spreadsheets from the biggest players in the software industry, the paradigm-shifting Lotus Improv, and a single low-priced sheet aimed at the home and small-office market. Add to the mix reviews of two fascinating specialized spreadsheet-based programs and a few sidebars on related products, and you have a report on the current state of the Windows spreadsheet market.

The Big Three sheets—Microsoft Excel 5.0, Lotus 1-2-3 Release 4.01 for Windows, and Quattro Pro 5.0 for Windows—are all new versions with so many features that no one will ever use them all in daily work. After years of leapfrogging (the newest release was almost always the best spreadsheet, having copied all the new stuff in the other sheets and upped the ante with innovative new features), these three sheets have achieved near parity.

Recent years brought such clever ideas as notebook-style tabbed sheets for quick navigation between pages; shortcut menus that pop up next to the current cell at the click of a right mouse button, showing menu items needed for that cell; drag-and-drop moving and copying; automatic filling of series data such as month names; resizable graphs that fit right on the spreadsheet; the ability to size the information to fit a single page automatically; and a button that automatically figures out what you want added and creates the appropriate @SUM formula. That's just a sample; the list goes on, getting more esoteric with each item. None of the Big Three sheets lacks any of these significant features. The importance of the leapfrog effect is waning as innovations in each new generation become less significant. The Big Three clearly stand ahead of the competition, however, so they appear first in the reviews.

Like those who advised closing the Patent Office because everything possible had already been invented, you might feel tempted to think that spreadsheets have reached their limits. They haven't, but the rate of innovation has slowed enough that buying a current spreadsheet no longer feels like investing in instant obsolescence.

Lotus markets Improv 2.1 as a multidimensional dynamic spreadsheet—something new and different, not competing with its flagship 1-2-3 sheets but augmenting them. Check out Improv; it's a refreshingly different business tool that may meet needs you didn't know you had. (Excel and Quattro Pro offer some of Improv's functionality with their pivot-table features, but they don't begin to match all the features of Improv.)

In the accompanying features grid and reviews, I have tended not to focus on the basic set of features that all the programs share but on the things that differentiate them. If a standard feature is missing, I'll mention it.

For home and small-office users, the Big Three, with their burdensome hardware demands, may be overkill. You'll need 4MB of RAM to even consider running these behemoths. For heavy use, you'd better have 8MB or more—or be unusually patient. They consume staggering amounts of hard disk space; 8MB gets you only the stripped-down program (no help files, templates, or tutorials). A full installation runs to 23MB, while an average non-networked configuration occupies about 16MB. Data compression, here we come.

If you need the high-powered sheets, consider buying a software suite; each of the Big Three comes in a suite, which includes a market-leading word processor and a database. Microsoft and Lotus suites include a presentation graphics program, and Lotus gives you a personal information manager. For less than the price of two programs, you get from

three to five major programs designed to look alike and operate similarly, lessening the learning time. They also share data easily, almost automatically. Only Microsoft Office supports OLE 2.0.

If you don't need the high-powered sheets, consider Lucid 3-D, reviewed here, or a Works program. Works programs—most notably Microsoft Works for Windows, ClarisWorks, WordPerfect Works, and PFS:WindowWorks—provide a simple spreadsheet along with a word processor, a graphics program, and often a few other goodies. While they won't give you all the heavy-duty functions and features of the mainline programs, they're often perfectly adequate for normal demands.

I tested these spreadsheets on a 486DX2-66 desktop computer with 8MB of RAM, which was adequate to run them all without irritating delays, though more RAM would make them zippier. I also ran them on a 486DX-33 Zenith Z-Note 433Lnc+ notebook computer with 4MB RAM. All the programs ran acceptably, but loading, calculating large sheets, and other memory-intensive tasks were noticeably slow.

With so few choices in high-end Windows spreadsheets and relative parity among them, you can't go wrong with any of them that your hardware can handle. Check out the related products, too; they may meet your specialized needs.

RICHARD O. MANN

THE BIG THREE

LOTUS 1-2-3 RELEASE 4.01 FOR WINDOWS

Lotus 1-2-3 Release 4.01 for Windows
Suggested retail price: $495

Minimum requirements: 286 PC (386 recommended) with 4MB RAM, Windows 3.1, 15MB hard drive space

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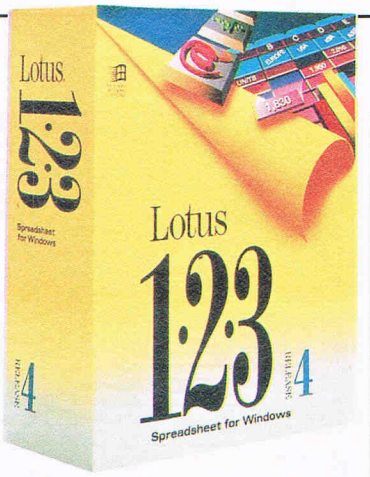


Release 4.01 of Lotus 1-2-3 for Windows is a completely redesigned, truly Windows-native spreadsheet with an intuitive, easy-to-use interface that both respects Windows conventions and offers new, common-sense touches that delight the user. With this release, the product finally loses the stigma of its previous versions' lackluster use of the Windows environment. And if you are among the millions of us with the old 1-2-3 slash-key menus permanently burned into our brains, you'll be glad to know that the 1-2-3 Classic function responds to those commands just as you'd expect. In addition, most of your old macros from all previous versions of 1-2-3 will work in the new Windows version.

New to this version are many interface innovations, including in-cell editing on the face of the spreadsheet (rather than only in the control panel); the ability to store the worksheet in a single file (previous versions had a separate format file); a pull-down listing of the most frequently used @ functions that can be expanded to show all functions, together with brief advice about how to use them; and a series of nine customizable SmartIcon bars that mimic those used in Ami Pro whenever possible.

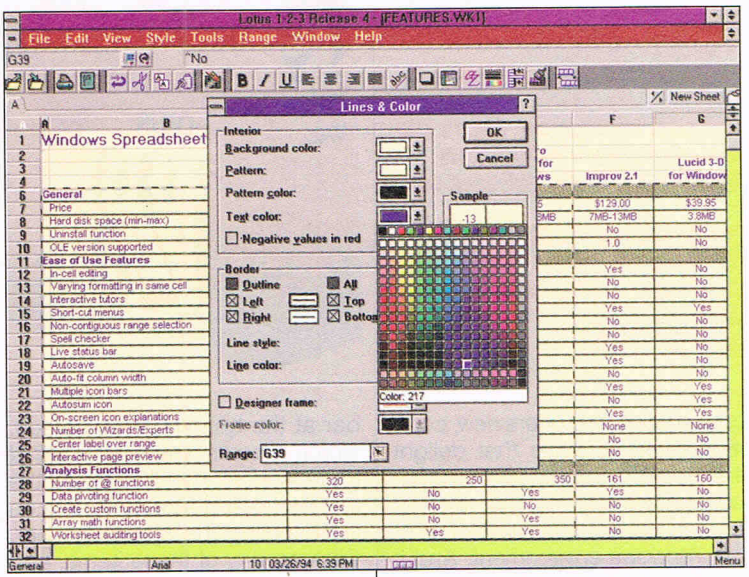
Little touches can mean a lot: Consider the cursor used to drag and drop cells. Rather than using an uninformative pointer, 1-2-3 makes the cursor an open hand when it lingers over a cell or draggable object. Holding the mouse button down to grab the cell closes the fingers of the hand, letting you know you've got hold of it.

Another gem is the live status bar at the bottom of the screen, which shows the cell format (date, currency, and so forth), the font name and size, and an icon representing the SmartIcon bar. Click on any of these items, and a pop-up list appears, allowing you to change that attribute. You always know where you are and how to change things quickly.

The Navigator is a small icon and panel that shows the current range. Click on the icon to see a listing of all named ranges. Click on a range name to go there on the worksheet. The fill-by-example function (type *Jan,* highlight a range from there, and the program fills in the rest of the months) covers the normal series and allows you to set up your own frequently used series for instant access. With the new intelligent data entry, you highlight the range into which you'll be putting data. Then, as you fill the cells, hitting the Enter key moves you to the next logical cell. (In other worksheets, you need to specify your direction with an arrow key.)

Lotus likes to promote its "WYSBYGI" function—What You See Before You Get It—that shows examples of formatting choices in the dialog box before you apply them to the worksheet. It's a common function in Windows programs for font selections, but Lotus applies the principle to fonts, colors, and all other visual matters whenever possible.

This version of 1-2-3 provides "designer frames," decorative bor-



ders that you can place around cells, ranges, text boxes, or other objects. They include drop shadows, beveled edges, Post-it notes, and other visual delights. And 1-2-3 lets you rotate text within a cell to any degree you wish. Unusual visual effects are easy.

The interface features are important, but the star of the 1-2-3 show has to be the Version Manager. Beside it, the what-if function managers in Excel and Quattro Pro are weak indeed. Spreadsheets are ideal tools for testing the effects of changing variables. Budgets and projections are the easiest to visualize. Let's say that, after creating your budget, you want to see the results if sales were 10 percent higher—or lower. The Version Manager lets you store alternative sets of values in the same cells, then saves each version, noting time, date, creator, short name, and comments. After mixing your various assumptions in many combinations, you can call any of them up for review through the Version Manager or print the contents of certain cells for each version. Once you've used it, nothing else will do.

Querying external databases is also much easier in this release of 1-2-3. Instead of the cumbersome and user-hostile system of old, you get a new dialog-box-based query system that takes the pain out of the process. For database work within the worksheet, it's not in Excel's class, but for external database connections, it's better.

Because Lotus provides masterful multidimensional analysis in its separate Improv program, there has been no effort to add pivot-table features to 1-2-3 to match similar features in the competition. And anything Lotus could put into 1-2-3 would seem inadequate when compared to Improv.

This version of 1-2-3 is also available in a multimedia edition on CD-ROM for the same price. (But your manuals are all on the CD-ROM; paper books cost an extra $50.) The multimedia edition adds slick and entertaining animated guided tours, QuickMovie animations, a ScreenCam feature that lets you record your own multimedia help movies within 1-2-3, and a new Reader function that reads your spreadsheet back to you aloud for proofreading purposes.

Lotus 1-2-3 Release 4.01 for Windows is a fine spreadsheet, suitable for users at all levels. If your work runs to multiple scenario evaluation, 1-2-3 is clearly the sheet for you. If you're an old 1-2-3 jockey who doesn't want to give up the old slash-key menu commands, you'll enjoy the many new capabilities of the program while still being able to use your old, faithful commands. Lotus is once again in the forefront of spreadsheet technology in the new world of Windows.

Circle Reader Service Number 371

MICROSOFT EXCEL 5.0

As the most recently released spreadsheet, Excel 5.0 has the most complete set of new features, matching the competition in almost every respect. It offers a set of truly dazzling ease-of-use enhancements, clever application of Microsoft's "IntelliSense" technology to let the computer do as much thinking for you as possible, and a complete re-

TEST LAB PICKS

The Test Lab pick as the finest Windows spreadsheet that money can buy is clearly Microsoft Excel 5.0, though not by a large margin. As the most recently released of the Big Three, it's had time to match the competition's latest innovations and add a few of its own. It's a superb spreadsheet, suitable for anyone with hardware powerful enough to run it.

The best buy is Quattro Pro 5.0 for Windows, hands down. At one-fifth the price of the other megasheets, with a rich feature set that's only slightly out-belled and -whistled by Excel, and with several unusual strengths of its own, Quattro Pro has to be the sheet of choice for anyone wanting to conserve precious financial resources.

Lotus 1-2-3 Release 4.01 for Windows doesn't lag far behind. For those who can run the old slash-key menus of the DOS versions of 1-2-3 in their sleep, the Classic menu feature here may tip the scales in favor of 1-2-3 for Windows. Its unusually versatile Scenario Manager makes it the sheet of choice for those who frequently perform involved what-if analysis.

—RICHARD O. MANN

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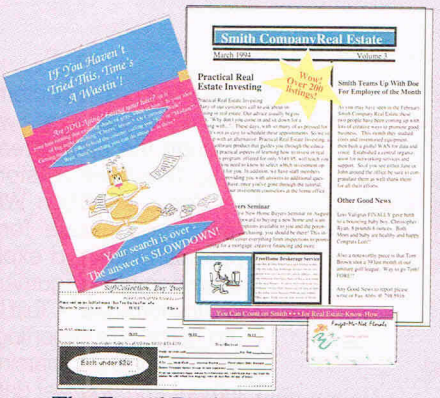

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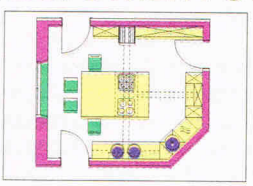

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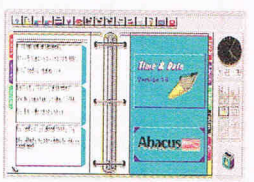

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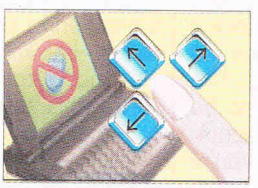

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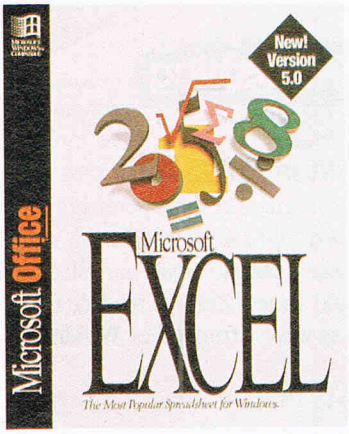

Microsoft Excel 5.0
Suggested retail price: $495

Minimum requirements: 286 PC (386 recommended) with 4MB RAM, Windows 3.1, 9MB hard drive space (17MB for typical installation)

MICROSOFT
One Microsoft Way
Redmond, WA 98052
(800) 426-9400
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working of its menus to match those in Microsoft Word for Windows 6.0—eight of its nine menus are the same as Word's. In addition, Excel now shares Word's spelling checker.

But the best news of all is that Excel finally has standard three-dimensional worksheets with notebook-style tabs for each page, correcting the biggest weakness of earlier versions.

All the structural changes (menus, 3-D tabs) mean that faithful Excel 4.0 users will have to unlearn certain behaviors (unless they elect to turn on the Excel 4.0 menus). Macros from version 4.0 will also present problems. The changeover should prove to be worth the temporary disorientation, however, especially if you're also using Word.

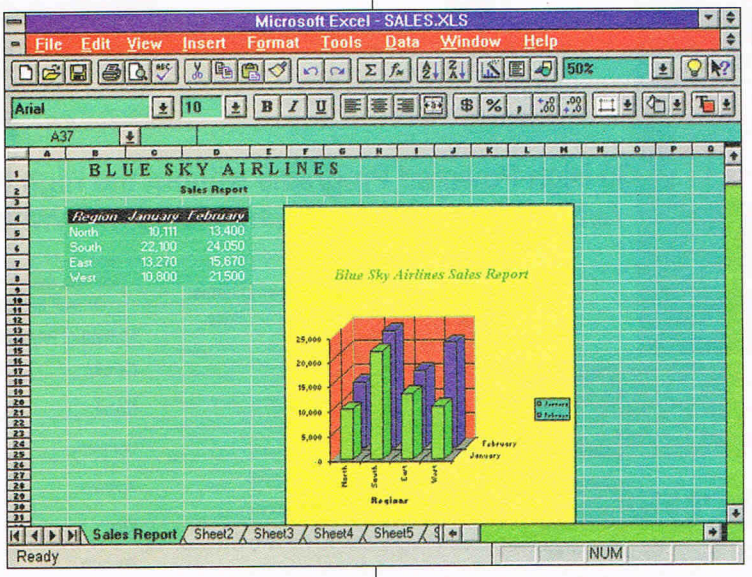
You'll enjoy the intelligent functions. AutoSum—a button that reads the sheet to determine what you probably want added—is old hat, but Excel's new version detects subtotals in the range and automatically compensates for them. It also sets up a collapsible outline based on the detected subtotals. Or try the Sort icon: It reads the columns around the active cell, determines what needs to be sorted, and performs the sorting in those cells automatically—a process that used to require a half dozen steps of specifying parameters and ranges. Excel even knows to sort text dates chronologically, not alphabetically. It all seems magical, though it's not uncommon to find that Excel has not quite guessed your intentions accurately, due to unusual items in your data.

To really light up your eyes with wonder, however, try the AutoFilter function on a multicolumned list (which you could accurately call a database). Excel analyzes the database, recognizes the column headings as field names, and creates drop-down lists for each column showing all the values for that field. Click on the value or values you want to see, and Excel filters out all other items. Considering how hard this used to be—involving setting up criteria and output ranges and so forth—this seems a true miracle.

Excel users have enjoyed the Chart Wizard, an automated tutorial function that walks you through the chart creation process. The new version now includes a Function Wizard that helps you create formulas by prompting for and explaining the often complex arguments that go into the formulas. A Text Import Wizard helps with importing data from other formats and parsing it into columnar spreadsheet data. The Pivot Table Wizard walks you through the involved process of setting up multidimensional models that borrow some of the most attractive features of Lotus Improv.

The Tip Wizard is a fascinating idea: It watches what you do with Excel, analyzes it, and pops up tips to help you do the same things more quickly or directly. It supposedly learns your style and doesn't repeat itself too much, but I found only about half of its suggestions to be valuable and turned it off after a week or so. During that first week, however, I learned dozens of new things it would probably have taken months to discover on my own—and I suspect I never would have discovered some of them. It's a good feature to have, especially while you're learning Excel 5.0.

Excel changed its macro lan-



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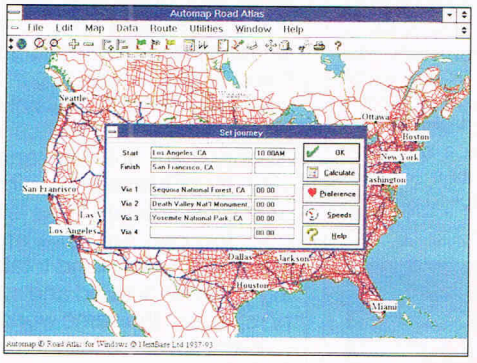

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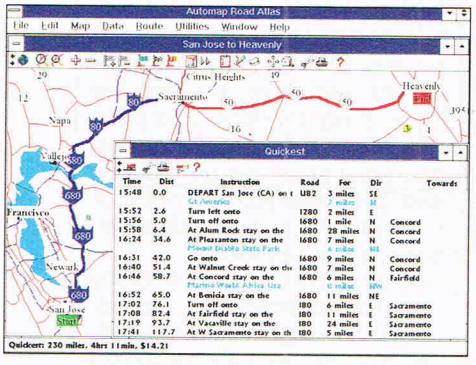

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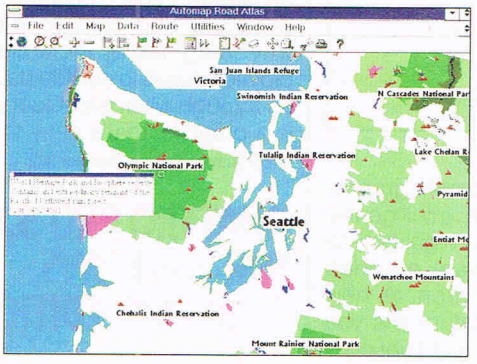

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10:32	At Woodland stay on the	I5	19 miles	N	Tacoma
10:49	At Kelso stay on the	I5	10 miles	N	Tacoma
10:59	At Castle Rock stay on the	I5	28 miles	N	Tacoma
11:25	At Chehalis stay on the	I5	3 miles	N	Tacoma
11:27	At Centralia stay on the	I5	24 miles	N	Tacoma
11:49	At Olympia stay on the	I5	22 miles	N	Tacoma
12:10	Turn off onto	S512	2 miles	E	(Parkland)
12:11	At Parkland stay on the	S512	9 miles	E	(Puyallup)
12:20	At Puyallup go onto	S167	8 miles	N	Renton
12:27	At Algona turn right onto	S18	3 miles	E	(Auburn)
12:29	At Auburn stay on the	S18	23 miles	E	(Issaquah)
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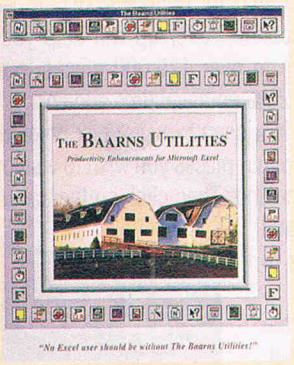
Circle Reader Service Number 137

THE BAARNS UTILITIES 5.0 FOR MICROSOFT EXCEL

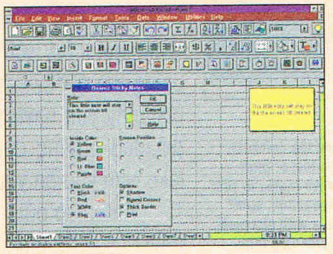
The Baarns Utilities provides 23 helpful utility functions Microsoft somehow forgot to include in Excel's more than 20 megabytes of program. There's some pretty handy stuff here, including a beefed-up autosave function that saves up to nine incremental copies, an express math function that allows you to apply a math operation to every item in a row or column, and a save-as-icon feature that sets up an icon with both Excel and the open files in place next time you run the program.



A template Wizard called Baarns New creates a library of spreadsheet templates to which you can assign longer, 31-character names. Baarns Zoom pops up a slider control to allow you to display your worksheet quickly at any level of magnification you choose.

The Baarns Utilities will paste various formats of date and time into spreadsheets, warn you of up to 12 timed reminders, cleanse a worksheet of all print parameters, dial any phone number in the worksheet, and fix Excel so that it naturally opens files in full-screen windows. And there are a dozen or more additional functions.

As powerful and packed with features as Excel is, there's still room for improvement. The Baarns Utilities provides features that, once seen, you won't want to be without.



The Baarns Utilities 5.0 for Microsoft Excel—$89.95
Minimum requirements: any system that runs Excel 4.0 or 5.0

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guage completely, adopting Visual Basic for Applications (VBA), although it still supports the XLM macro language from previous versions. VBA, a subset of Microsoft's Visual Basic programming language, will eventually be the macro language for all Microsoft Windows applications. Excel still records macros as you work, so you won't need to learn this programming language unless you want to do something fancy.

Charting is powerful, with more than a dozen graph types available, including a set of 3-D graphs. The Wizard walks you through the process, but may not be necessary for simple graphs, which Excel creates intelligently. All you need to do is highlight the data range you want graphed and click on a button. A new "drag and plot" feature lets you add to a graph by highlighting a new range and dragging it onto the existing graph.

Charting is so powerful now, however, that it can be overwhelming, even with the Wizard's help. A few of the more exotic graphing features were unintelligible at first, even with the Wizard's usually helpful dialog boxes.

Other notable features include the ability to edit a cell's contents on the spreadsheet rather than up in the control panel and rich cell formatting, which lets you apply formatting to parts of cell contents. Not only does the status line display an explanation for whatever is under the cursor, but if you let the cursor linger on an icon, a small label explaining the icon appears near the cursor.

Worksheet outlining analyzes your data's hierarchy and creates an outline structure in the left margin. You can collapse and expand at subtotals and totals, giving you both detailed and summary reports in the same worksheet.

Excel supports Microsoft's new OLE 2.0 specification, which effectively lets you embed not only Excel's data and format in a Word (or other OLE 2.0–compliant application) document, but also the Excel program itself, complete with its own menus and operating characteristics. It's an exciting idea, but unless you have 16MB or more of RAM in an ultrafast machine, it's glacially slow.

Excel abounds with both flashy new features and quiet, almost-unnoticed elegant new ease-of-use touches. Microsoft also has enhanced Excel's powerful number-crunching abilities in every way imaginable, including improved access to outside databases through Microsoft Query. This is a program that's easy to love.

Circle Reader Service Number 372

QUATTRO PRO 5.0 FOR WINDOWS, STANDARD EDITION

Borland invented many of the best-loved and most-imitated features of Windows spreadsheets in its groundbreaking first release of Quattro Pro for Windows, including tabbed notebook pages, right-button mouse clicks for shortcut menus, and many graphing features. Although imitated, Quattro Pro retains its lead with its masterfully mature implementation of

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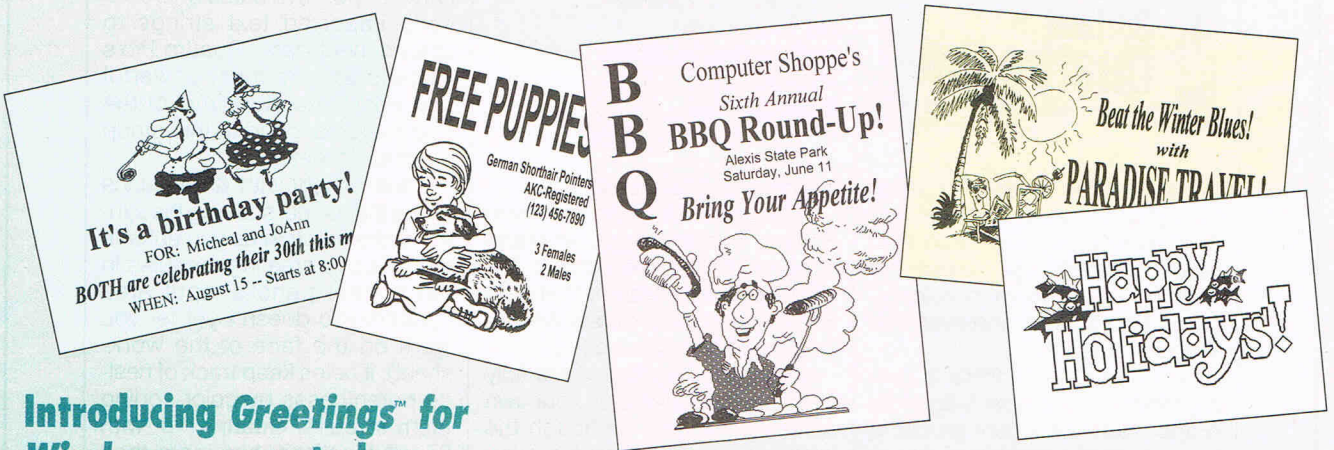

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Quattro Pro 5.0 for Windows, Standard Edition
Suggested retail price: $99.95

Minimum requirements: 386SX PC or higher with 4MB RAM, Windows 3.1, 10MB hard drive space

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100 Borland Way
Scotts Valley, CA 95066
(800) 331-0877
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these features. Notebook tabs, for instance, are more useful in Quattro Pro: You can drag and drop them to change the order of pages, include them in selectable named groups, and even use them in formulas.

Similarly, Quattro Pro's graphing module is superior, with more graph types, intelligent graphing that determines graph type by analyzing the number and nature of data sets, a light table for sorting slides, and slide shows with dazzling transition effects.

Quattro Pro reflects Borland's practice of price cutting (and with a vengeance): The standard version (reviewed here) is priced at $99.95 (after a several-month introductory period at $49.95!). The other major players are priced at $495. Is the competition five times better? No way. Many would argue that the competition is not better at all. There is absolutely no question that Quattro Pro is an outstanding value. (There is a $495 version: Quattro Pro 5.0 for Windows, Workgroup Edition.)

Quattro Pro's features prove its value. You can get help for every object on the screen, including the dozens of cryptic icons, by clicking on them with the right mouse button. A brief explanation window appears with a button to call up the full help screen. Help—the right help, not just the contents screen—is never more than two clicks away. Brief explanations for most onscreen objects also appear on the status line as the cursor passes over the objects.

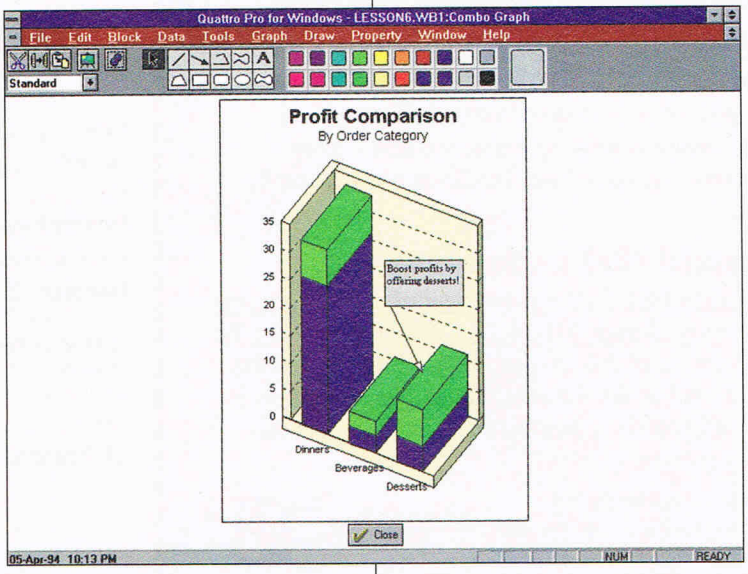
Because of a court decision, Borland had to remove its direct support for the old Lotus 1-2-3 slash-key menu. Macros from 1-2-3 files now require substantial editing to work in Quattro Pro.

Quattro Pro's tutorials are fully interactive. You work on your own spreadsheet data (although the program supplies samples if you want) while the tutorial program instructs you and makes sure you do the right things. It's excellent as far as it goes, but it covers only elementary matters.

Five interactive Experts (similar to Excel's Wizards) hold your hand through the processes of creating graphs, scenarios, and consolidations as well as determining if compiling your formulas would help (the Performance Expert). The Analysis Expert offers instruction on 19 advanced functions, including miniapplications that create a mortgage amortization table and evaluate possible mortgage refinancing. The noninteractive Parse Expert evaluates and converts imported text strings to spreadsheet data. Quattro Pro's Experts are the most powerful and easy to understand of the help features found in this group of spreadsheets.

There's help with @ functions on the status line, showing the syntax of the function as you enter it. While you're creating formulas in the control panel's input area (Quattro Pro doesn't yet let you work on the face of the worksheet), it helps keep track of nested parentheses by color-coding them in pairs. Quattro Pro, with 373 @ functions, has more than any other program.

All this dragging and dropping of cells that spreadsheet users love can be dangerous, especially to someone with a less-than-sure hand on the mouse. It's easy in 1-2-3, for instance, to accidentally overwrite the contents of a cell by releasing the mouse button in the wrong place. Quattro



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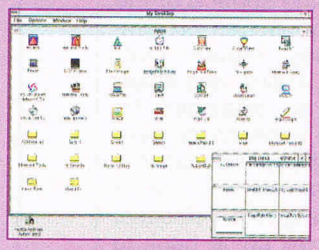

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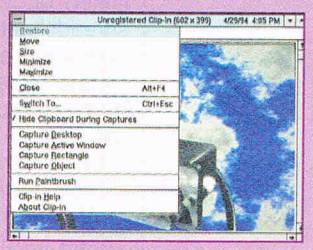

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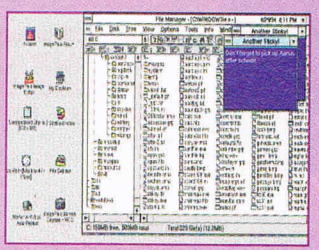

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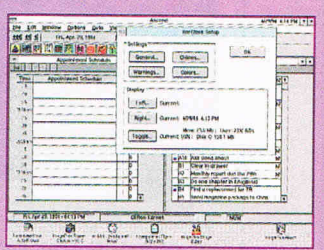

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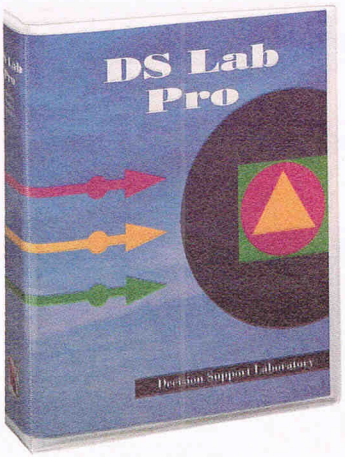


DS Lab Pro 2.0
Suggested retail price: $1,495 (1000 elements and 2048 steps), $295 for DS Lab Standard 2.0 (100 elements and 366 steps; 500 pages of documentation supplied only on disk)

Minimum requirements: 286 PC with 2MB RAM (4MB recommended), DOS 5 or higher, Windows 3.1, 2.5MB hard drive space

DS GROUP
5 Whitney Dr.
Greenwich, CT 06831
(800) 828-8760
(203) 531-9043

Pro prevents this by prompting you for permission before it overwrites cell contents.

The Scenario Manager is not as far-reaching as 1-2-3's, but it's considerably easier to use and more flexible. The Data Modeling Desktop is a separate, linked application that provides multidimensional modeling. It's not as powerful as Improv nor as easy to use as the Wizard-assisted pivot table in Excel, but it works well. The Data Desktop is a similar application that provides access to outside database files. You need Quattro Pro's Workgroup Edition to reach beyond your own hard disk into networked files.

Quattro Pro isn't perfect: Its menu structure seems cluttered and somehow different from the style of most Windows applications, for instance. The installation routine warns you to be sure nothing else is running, even asking you to boot with stripped-down configuration files. It also wants Share installed with certain specific parameters. On my system, the change in Share subtly fouled up other Windows applications until I undid the parameter changes. Professional software should not be that persnickety.

But blemishes and all, Quattro Pro is a powerhouse of a spreadsheet that will meet almost anyone's needs for years to come—at one-fifth the price of the competition. It's a best buy.

Circle Reader Service Number 373

MORE SPREADSHEET OPTIONS

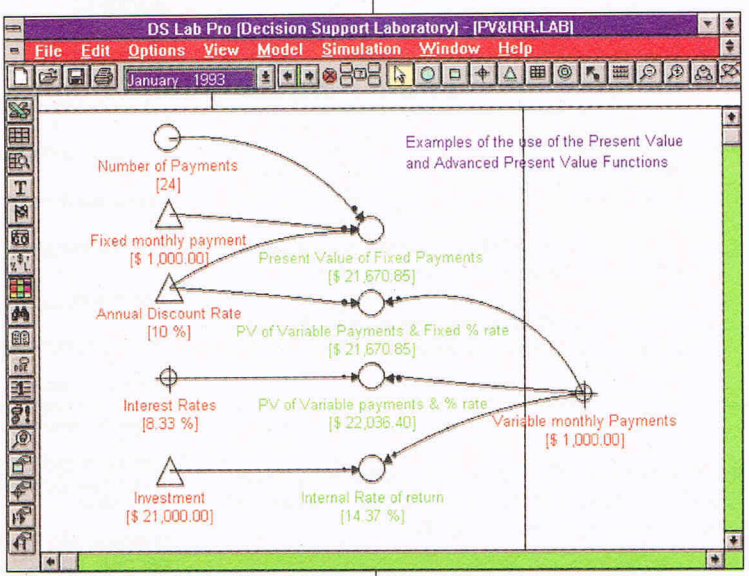
DS LAB PRO 2.0

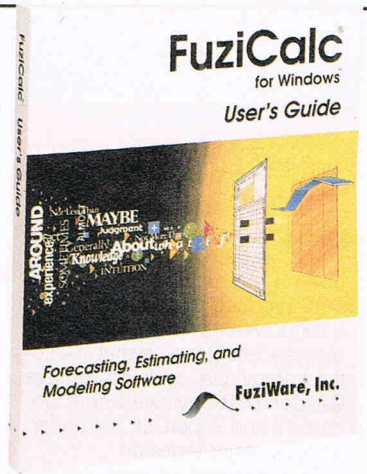
Called "the visual spreadsheet," DS Lab Pro 2.0 creates spreadsheets without cells, columns, or rows. Instead, you work with symbols, arrows, and text placed on a white free-form background. It's like a computerized cocktail napkin or whiteboard after a productive brainstorming session.

DS Lab's building blocks are elements (represented by symbols) and connecting arrows linked under the surface of the spreadsheet by formulas. Six symbols—variables, inputs, constants, tables, series, and shadows—provide the data points for the model. To understand these terms—*variables, constants, tables, series*—remember your math and algebra classes. These terms will come back to you. Shadows are elements set up to be exact copies of other elements elsewhere on the worksheet. Change the original element, and the shadow reflects the change automatically.

Drag these elements from the palette onto the drawing canvas, type in a name, and connect them with other symbols. Once the flow of information and logic is defined, go back to define the connections by providing formulas.

A clever dialog box listing all available elements, variables, and functions lets you click formula parts into place, separated by mathematical operators (plus, minus, and so forth). When you





activate the model, it asks for the specified inputs and displays the results at each step of the way.

You can print the flow diagrams, move the images to other Windows programs through the Clipboard, and paste the spreadsheet data into Excel for further work, such as the creation of graphs. While DS Lab stands alone, it has a special relationship with Excel, making possible one-step export and DDE links.

Consider a simple model where the gross sales figure equals units sold times unit price. In DS Lab, you'd start with a variable input triangle for units sold and a square for a constant unit price, and you'd draw arrows from each of them to a circle representing the resulting variable, gross sales. Gross sales would have a formula created in a dialog box to record that it results from multiplying the two other factors. When you ran the model, you'd input a figure for units sold, and the gross sales amount would appear on the screen. You don't need a flow diagram for a simple two-element formula like this, but complex relationships are more easily understood from this visual presentation.

DS Lab is a brainstorming tool best suited to answering questions of "How much?" through visual analysis of a process. Use it when the logical flow of data is not apparent in a traditional spreadsheet and when communication of the process itself is part of the objective.

Circle Reader Service Number 374

FuziCalc 1.11 for Windows
Introductory price: $99

Minimum requirements: 386 PC with 4MB RAM running in enhanced mode, Windows 3.1 or higher, 2.3MB hard drive space

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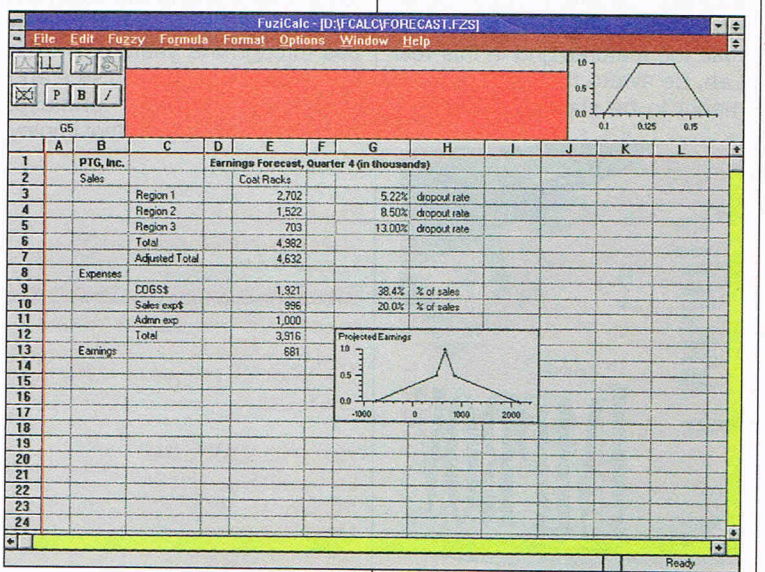
FUZICALC 1.11 FOR WINDOWS

One problem with spreadsheets is that they require precise numbers when many of the situations we use spreadsheets to analyze are anything but precise. Budgets and projections are prime examples—they deal with probability ranges, not clean, crisp predictions. Elaborate tools such as Lotus 1-2-3's Version Manager are the best means spreadsheets have to compensate for this uncertainty. They require you to enter each combination of variables you want to evaluate—a tedious and ultimately impossible project.

Enter FuziCalc for Windows. Using the principles of "fuzzy" logic and "fuzzy" mathematics, this wondrous spreadsheet lets you quantify your expectations in rough ("fuzzy") ways, then calculates the most likely outcome. You can elect to treat each data item on the spreadsheet as a crisp or a fuzzy number. If you "fuzzify" it, you'll specify minimum and maximum likely values and either a single most likely value or a small range of most likely values. FuziCalc displays this information as a "belief graph" and uses it in the calculations that follow. Belief graphs are simple, easily learned representations of your best guesses of potential outcomes. You may think, for example, "Sales could be as high as $1.8 million next year, but certainly no lower than $1.2 million. The most likely value is $1.6 to $1.7 million." A single fuzzified cell accepts all this information.

Fuzzify as many numbers as appropriate for your model—they can all be fuzzy, if you want. Build the model just as you would any other spreadsheet, perhaps multiplying sales by a fuzzy percentage to estimate cost of sales, and so forth. At the end of the sheet, the calculated figures will be the "centroid" values resulting from all



the fuzzy calculations—in essence, your best guess as to the most likely outcome. You can also examine the belief graph for the outcome, which shows you the range from lowest likely to highest likely values with the most likely range highlighted.

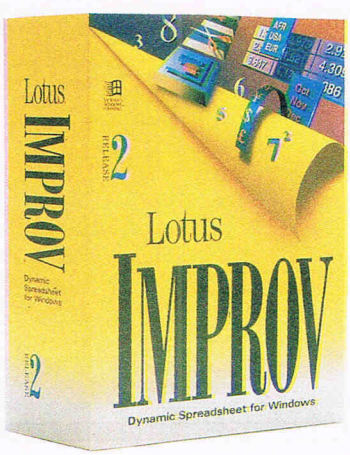
As a spreadsheet, FuziCalc is pretty graceless, lacking most of the interface niceties discussed in the other reviews. It's best to create the models using another spreadsheet program, then write the sheet out to a SYLK-format file. Read that into FuziCalc, fuzzify the appropriate numbers, and the job is done.

FuziCalc's robust calculus evaluates all this data in ways that would take hours and days with pencil and paper, even if we knew how to attack fuzzy math. It's a powerful tool for dealing with the numbers of reality, not the imaginary precise numbers found in ordinary spreadsheets. People who deal with forecasts, budgets, and other models involving guesses and ranges of uncertainty will find FuziCalc to be a godsend.

Circle Reader Service Number 375

LOTUS IMPROV 2.1

Lotus's remarkable Improv 2.1 is mightily different from other spreadsheet programs. As you peruse the features grid in this Test Lab, be aware that Improv is not meant to be stacked up feature for feature against the Big Three.



Improv is a multidimensional data-modeling tool. To understand that mouthful of technospeak, you need to see how Improv works. First, the data isn't kept on a spreadsheet in row and column cells. Instead, Improv stores the data out of sight in a central database. Data points are not row and column references but rather bear a name built from the row and column headings. A number in the October row and the Sales column would be "Sales:October" throughout the model. No matter how you move the rows and columns through Improv's multidimensional workspace, that number will be wherever Sales and October meet. If you add a 3-D page for years, it might become "1994: Sales:October."

The power of this method becomes obvious when you start playing with the data. If you laid out monthly rows and budget category columns stacked in neat pages by year, you'd have a fairly common spreadsheet file. With Improv, however, you can grab any category's label and drag it elsewhere. Swap the row and column tags, and all the data moves to the right places. Pull the year label down from the next page and put it next to the months, and the sheet will show a list of months that continues through the years down the page. The ways you can slice and dice the data are endless, especially considering that Improv handles up to 12 dimensions.

As you move the data around your virtual Rubik's cube of spreadsheet faces, you may find new and revealing relationships.

Of course, there's more to Improv than supermalleable data presentation. Working with formulas is a new adventure as well. You don't write formulas with cell references; you write them in English, using the row, column, and page names to define the data points. Formulas don't appear on the face of the sheet; they're in a separate pane below the main sheet. It doesn't matter how you twist and rearrange the data presentation; the formulas remain valid and without change.

Improv creates collapsible outlines. If your expense for utilities includes the costs of water, sewer, and electricity, you can show the collapsed total for utilities on one line or expand it to show all three components. A sheet can hold an incredible amount of data without overwhelming you if you collapse it into subtotals.

Lotus Improv 2.1
Suggested retail price: $129

Minimum requirements: 20-MHz 386 PC with 4MB RAM (33-MHz 386 with 6MB RAM recommended), VGA, Windows 3.1 or higher, 12MB hard drive space

LOTUS DEVELOPMENT
55 Cambridge Pkwy.
Cambridge, MA 02142
(800) 343-5414
(617) 577-8500

WHATEVER HAPPENED TO SUPERCALC AND CA-COMPETE?

Computer Associates' main spreadsheet, SuperCalc, has always been a superb but little-known DOS product. Its CA-Compete is a Windows-based multidimensional spreadsheet, somewhat like Lotus Improv. CA declined to have CA-Compete reviewed here because it and SuperCalc are undergoing a major redesign.

The new product, due later this year, will be CA-SuperCalc for Windows. CA promises that this will be a blending of a special Improv-like approach (including multidimensional modeling, a central database, and natural language formulas) with a full-featured Windows spreadsheet comparable to one of the Big Three.

The price has not yet been set for this ambitious product. CA can be reached in Islandia, New York, at (516) DIAL-CAI.

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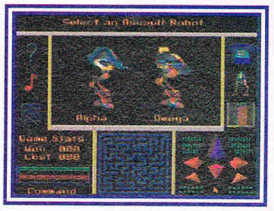

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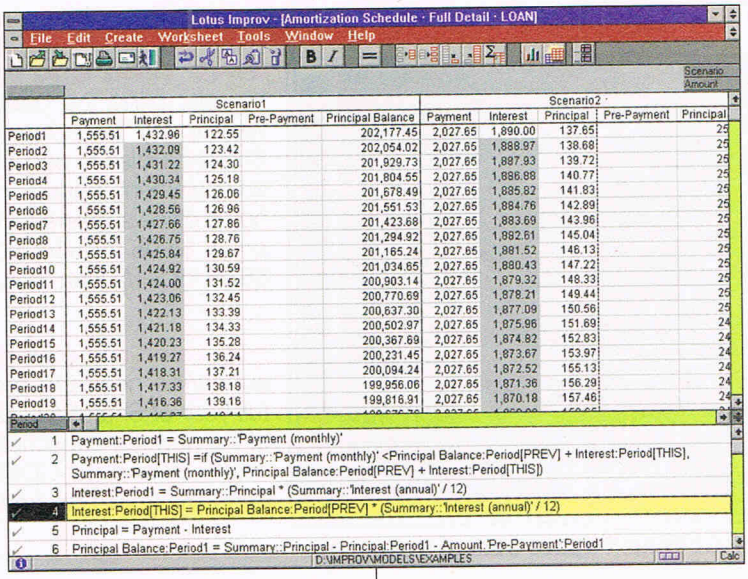

The interface is generally consistent with that of other new Lotus Windows products, including its use of the live status bar, which both informs you of fonts, cell format, and so forth and allows you to change these elements quickly. A tiny icon at the end of the status bar pulls up a small dialog box that controls every aspect of cell formatting in one simple place. Improv has all the latest spreadsheet ease-of-use features—indeed, Lotus proudly points out that the original version of Improv written for NeXT computers invented right-button clicking for speed menus and SmartFill for intelligent filling of ranges.

Improv includes Lotus Chart, a graphing utility similar to that in 1-2-3, as well as Lotus Script, a macro language that is also used in other Lotus Windows products.

Improv is a whole new breed of program. Excel's pivot tables and Quattro Pro's Data Modeling Desktop mimic the ability to rearrange your data, but neither feature comes close to providing the power and flexibility of Improv's similar feature. You'll probably want to hang on to your regular spreadsheet for straightforward work with rows and columns, but get Improv to really explore the relationships in your larger models.

Until this spring, Improv was a $495 stand-alone spreadsheet-plus program. Now that the competition is including Improv-like features in their basic spreadsheets, Lotus has decided to treat Improv more like an add-on to its basic Windows spreadsheet. The price has dropped to $129. At this price, Improv is a remarkable bargain.

Circle Reader Service Number 376

GLOSSARY

add-in. A special subprogram that can be brought into the main program to perform a particular operation. The Baarns Utilities, for example, is an add-in to Excel.

@ functions. Formulas in spreadsheet cells that compute various items such as sums, interest rates, payments, dates, and so forth. In spreadsheet parlance, these always start with an "@" sign to signal the program that these are special functions. Example: @SUM(A1..A20) would add the contents of cells A1 through A20 and put the result in the cell where the formula is written.

data pivoting. Moving rows and columns of data around the sheet, converting them between rows and columns at will.

DDE. A Windows term, short for *Dynamic Data Exchange*. A method for automatically passing information between programs so that when a change is made in one application's file, it's reflected in the other application's file automatically.

in-cell editing. Editing and working with cell contents in the spreadsheet grid rather than in the control panel at the top of the screen.

macro. A series of keystrokes recorded within a spreadsheet that can be replayed at any time by the user. Usually keyed to Alt-key or Ctrl-key combinations.

OLE. Short for *Object Linking and Embedding*. Another Windows term, OLE refers to taking a piece of one application's information and "embedding" it in another application's file. With OLE, if you embed an Excel spreadsheet in a Word document, you can work on the spreadsheet using Excel menus and commands while in the Word document.

rich cell formatting. Most spreadsheets allow assigning formatting options such as fonts and colors only to whole cells. With rich cell formatting, you can assign these characteristics to individual characters within a cell.

scenarios. A spreadsheet can be a model—a series of relationships between data elements. If you change a basic input, the rest of the sheet changes as a result. Scenarios are these multiple iterations of the sheet with different input values. Working with these scenarios is called what-if analysis.

slash-key menu. The original Lotus 1-2-3 menu was brought up by hitting the forward-slash key. Even the latest Windows version of 1-2-3 still responds to the original slash-key menu commands because so many millions of users know them by heart.

what-if analysis. See **scenarios.**

Wizard. An automation feature that uses artificial intelligence to lead you through a complex process. Also called Expert.

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5403-0794

LUCID 3-D 1.15 FOR WINDOWS

Lucid 3-D 1.15 for Windows
Special price: $39.95 (suggested retail price: $109.95)

Minimum requirements: 386 PC with 4MB RAM, Windows 3.1 or higher, 4MB hard drive space

LUCID
101 W. Renner Rd., Ste. 450
Richardson, TX 75082
(800) 925-8243
(214) 994-8100

Aimed at homes and small offices, Lucid 3-D for Windows is a full three-dimensional spreadsheet that leaves out the more exotic features of the Big Three megaspreadsheets. While it's a robust Windows spreadsheet in its own right, it does not attempt to compete with the Big Three. Though many of us wouldn't be caught dead without the latest version of a high-tech spreadsheet on our hard disk, a surprising number of us never need anything Lucid 3-D doesn't provide. Newly priced at $39.95, it's a good fit for its intended market.

Lucid 3-D has the standard 256 tabbed pages, formatting options galore, multiple icon bars, a healthy graphing function, drag-and-drop capabilities, intelligent autofill functions, 160 @ functions, right-click shortcut menus, and built-in links to palmtop computers such as the Casio B.O.S.S. and Sharp Wizard. It imports files from Excel 4.0 and the DOS versions of Lotus 1-2-3, but it doesn't export in those file formats.

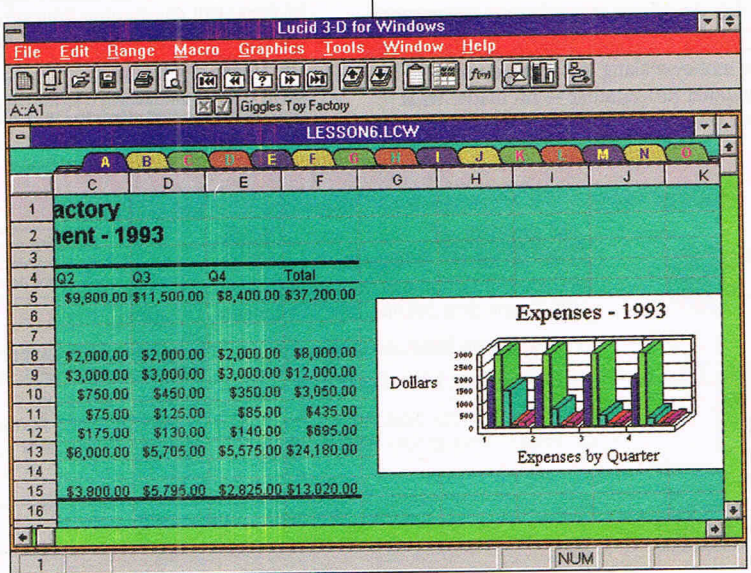
With an eye to the home user, Lucid 3-D includes 50 FastForms—spreadsheet templates of commonly used forms, such as expense reports, purchase orders, and a home inventory. Forms to compute baseball batting averages and keep a video inventory add a personal flavor. While these forms save time, they're just bare templates with little intelligence (an elegant telephone area code lookup table is the exception here). Compared to the applications you can develop with the Big Three sheets, these are minor-league.

Lucid 3-D takes only 3.8MB of hard disk space. Its documentation is, well, lucid. The only function I missed during limited testing was a fit-to-the-page printing option. Some will miss the DDE and OLE support that won't be in Lucid 3-D until the next version, due in the fall of 1994. The next upgrade will also import and export more file formats.

Unfortunately, I had trouble importing simple Lotus 1-2-3 Release 2.2 files with Allways formatting. Files often came in with some data garbled enough to crash the system when I tried to save the file.

Lucid 3-D is a surprisingly capable spreadsheet—unless its bugs are acting up—for home and small-office users with limited needs. It comes with a 30-day money-back guarantee, so you can find out without risk if it's going to work with your particular computer.

Circle Reader Service Number 377



NEXT MONTH: COLOR PRINTERS

Windows Spreadsheet Features	Lotus 1-2-3 Release 4.01	Microsoft Excel 5.0	Quattro Pro 5.0 for Windows	Lotus Improv 2.1	Lucid 3-D 1.15 for Windows
General					
Hard disk space (min–max)	8MB–16MB	8MB–23MB	7.5MB–18MB	7MB–13MB	3.8MB
OLE version supported	1.0	2.0	1.0	1.0	no
Ease-of-Use Features					
In-cell editing	yes	yes	no	yes	no
Varying formatting in same cell	difficult	yes	no	no	no
Interactive tutors	no	yes	yes	no	no
Spelling checker	yes	yes	no	no	no
Live status bar	yes	no	no	yes	no
Autosave	yes	yes	no	yes	no
Autofit column width	yes	yes	yes	no	no
Autosum icon	yes	yes	yes	no	yes
Onscreen icon explanations	yes	yes	yes	yes	yes
Number of Wizards/Experts	0	5	5	0	0
Center label over range	yes	yes	yes	no	no
Interactive page preview	yes	yes	yes	no	no
Analysis Functions					
Number of @ functions	250	320	350	161	160
Data-pivoting function	no	yes	yes	yes	no
Create custom functions	no	yes	no	no	no
Worksheet auditing tools	yes	yes	yes	no	no
Multivariable backsolver	yes	yes	yes	no	no
Onscreen function explanations	yes	yes	yes	yes	yes
Graphs, Charts, and Presentations					
Automatic table formatting	yes	yes	yes	no	no
Rotate text in cell	yes	*	no	no	no
Word-wrap in cell	yes	yes	no	yes	no
Onscreen slide show	no	yes	yes	no	no
Drag and plot	yes	yes	yes	no	no
Compatibility					
1-2-3 Classic menu support	yes	yes	no	no	no
Imports/exports					
Lotus 1-2-3 for DOS formats	yes/yes	yes/yes	yes/yes	yes/yes	yes/no
Quattro Pro for DOS formats	no/no	yes/yes	yes/yes	no/no	no/no
Excel 4.0 and earlier formats	yes/no	yes/yes	yes/yes	yes/no	yes/no
Quattro Pro for Window formats	no/no	no/no	yes/yes	no/no	no/no
Lotus 1-2-3 for Windows R2.1	yes/yes	yes/yes	yes/yes	yes/yes	no/no
DBF database files	yes/yes	yes/yes	yes/yes	yes/no	no/no

*90 degrees rotation only

PROGRAMMING POWER

Tom Campbell

VISUAL BASIC 3 AND THE BEAUTY OF GRIDS

Microsoft has made some minor missteps on its way to earth-shattering success with Visual Basic.

Microsoft has made some minor but interesting missteps on its way to earth-shattering success with Visual Basic, a language that made the most spectacular debut since Turbo Pascal's in 1983. One of them was with Grid, which provides the barest feature set of a spreadsheet in the form of a drop-in custom control. Grid wasn't quite ready for prime time when Visual Basic made its very auspicious debut, so someone at Microsoft quietly uploaded a version of it to CompuServe and other online services shortly after Visual Basic's introduction.

Grid gives you an interface that looks like a spreadsheet in Excel. It has a matrix of cells that can be navigated using either the keyboard or the mouse. It has optional horizontal and vertical scroll bars; optional "fixed" rows and columns that appear gray at the top row and leftmost column of the grid, allowing you to have row and column titles; and the ability to let you resize rows and columns simply by dragging the mouse (this last one is a feature that earned Excel for the Macintosh rave reviews years before there was a Windows version).

I'm sure Microsoft wouldn't have released it if the people there had understood what it would mean to let that particular genie out of its bottle. But there was just too much demand for a custom control that would allow users to present data in a row-and-column format. Besides, it looks really cool to have what looks like a mini Excel built into your app.

Grid is also known to have its problems. It's not data aware, so you can't use it out of the box to browse databases or to read in a few records at a time because it reads all of its contents into RAM. There's no way to enter data into a cell, so you have to fake it using a floating edit box (not difficult, though, and the VB manuals have an example showing how to do it that incidentally illustrates VB's amazing flexibility). As it turns out, some of Grid's "features" could legitimately be regarded as design problems, as you'll see in a moment.

The drop-in routine available online for this month's column is called FillGrid, which you'll find in the TPHONE.ZIP distribution. I've made it generic so you can just add it to any Visual Basic project as a module. Just open a database and a table; then pass FillGrid the name of the grid, the name of the table, and a third parameter that allows you to use FillGrid's local error handler if you wish. Unlike other example programs you'll see which hardcode the name of the control into the example, this will let you view any table up to 2000 rows—Grid's limit—without writing a line of code yourself. I've included it as part of a nifty little phone book application so you can see it in action.

FillGrid shows some useful concepts, notably using the Windows API to figure out how wide each column of the grid should be. It uses the ever-handy GetTextExtent API routine to determine how wide each field should be by computing its width in logical units and ANDing that value with &FFFFH because GetTextExtent also returns the height of the character in the upper two words. FillGrid also does you the courtesy of making the field the width of the field name if the name has more characters in it than the field; otherwise, a Boolean field named, for example, Present would look like *P* in the grid. FillGrid's brevity is a tribute to Visual Basic. The C code required to implement a grid would be overwhelming; using the Grid VBX with Visual C++ is also quite a bit more work, although much more manageable than it would be in C.

Of course, you'd like to see more features. The most obvious one is the ability to edit the database by inserting and deleting records, but that brings up some interesting issues. Visual Basic's database engine is designed to be multiuser. What happens if someone deletes a record from the same table you're using? Since your program isn't informed of this, the contents of your grid become invalid without your knowing it. Much more complicated is the idea of selecting a record in the grid and connecting that selection with a record in the table. You'd have to read the record's position—in essence, its number in the grid—and somehow relate that record number to a record number in the table. But the Visual Basic database engine doesn't think in record numbers, again because they make no sense in a multiuser environment.

The best way to handle this situation is to replace Grid with a data-aware custom grid control. In later issues we will examine the best of the best, although for now, you might just want to look toward FarPoint Technologies' Spread/VBX. Spread/VBX will give you many true spreadsheet functions, including formulas and Clipboard support. Or you may want to try FarPoint's lower-cost Grid/VBX, which gives you a topnotch, data-aware grid without the spreadsheet-specific features. Contact FarPoint at (804) 378-0432 or (804) 378-1015 (fax). Both of these products are excellent. ❐

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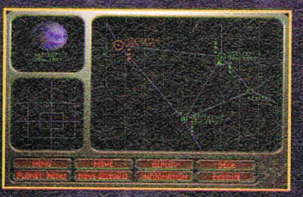

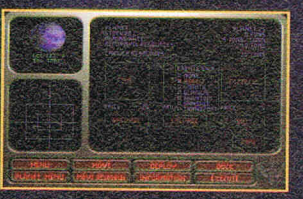

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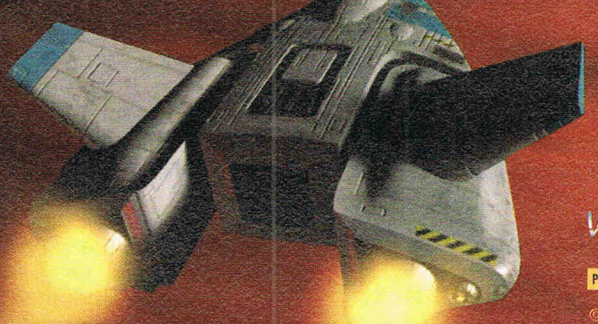

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Circle Reader Service Number 160

TIPS & TOOLS

Edited by Richard C. Leinecker

Finding super tips online and sorting out your directory display

Bigger, Better Tips

This month, we're going to start something different in "Tips & Tools." Several programs that are too big to be printed in the magazine will be uploaded to the COMPUTE section of America Online. I'll describe them in the column, and you can decide whether you want them or not.

The first thing you need is the America Online software and an account. You can get the software and a password certificate by calling (800) 827-6364. You'll get a free copy of the software and a certificate for your initial connect time.

Once online, find the COMPUTE area with the keyword *COMPUTE* (press Ctrl-K; then type *compute* in the box). Then look in Software Library for Tips & Tools Collection.

Not only will you get larger, more useful programs, but you'll get the source code. All of the programs we upload to Tips & Tools Collection will include source code and instructions for turning the source code into a program.

This month, three programs are waiting for you. One, named DELEXT.EXE, deletes files with a given extension. It works for any directory (and, optionally, its subdirectories) or for the entire drive. Another program, named ONCEADAY.EXE, remembers performing tasks so that they get done only once a day. The third program, named GETLINE.EXE, allows users to input a line of text and then assign it to an environment variable or a disk file.

Any of you are welcome to send me your own programs that might be too big for the column. Unfortunately, we can't pay you for their use; the fee we pay is reserved for items that appear in the magazine. Sharing programs that you've created and found useful, though, may be reward enough.

RICHARD C. LEINECKER
REIDSVILLE, NC

Better File Displays

I created a batch file that allows files to be displayed in certain orders. It's better than simply using the Dir command because it has more flexibility. I named the batch file SHOWBY.BAT.

```
@ECHO OFF
REM First, check to make sure
REM we have a parameter; then
REM go to the appropriate batch
REM file label.
IF "%1"=="" GOTO USAGE
IF "%1"=="name" GOTO NAME0
IF "%1"=="NAME" GOTO NAME0
IF "%1"=="type" GOTO TYPE0
IF "%1"=="TYPE" GOTO TYPE0
IF "%1"=="size" GOTO SIZE0
IF "%1"=="SIZE" GOTO SIZE0
IF "%1"=="date" GOTO DATE0
IF "%1"=="DATE" GOTO DATE0
ECHO Invalid Parameter!
GOTO USAGE
:NAME0
DIR |SORT |MORE
GOTO END
:TYPE0
DIR |SORT /+10 |MORE
GOTO END
:SIZE0
DIR |SORT /+13 |MORE
GOTO END
:DATE0
DIR |SORT /+23 |MORE
GOTO END
:USAGE
ECHO Usage:
ECHO To view file by name, type,
ECHO size, or date,
ECHO SHOWBY [option].
ECHO Option can be name, type,
ECHO size, or date.
:END
```

STEVE CHENG
LONG ISLAND CITY, NY

Access Macros

I'd like to thank you for the advice you give readers in the "Tips & Tools" column. This information has been very helpful to me. Good work!

I have some advice for Microsoft Access users. When writing Access macros, it's helpful to enter the comment lines before you actually enter the macro commands. First, think about the sequence of commands you need for the macro. Next, type in the comments for each line, describing in plain English what you want to accomplish. Finally, enter the commands next to the comments. In this way, the macro is fully documented, and you have a guide for entering the commands. This is especially helpful for long and complicated macros.

CARL SILVESTRI
CORAOPOLIS, PA

QBASIC Command Lines

I write a lot of programs using QBASIC. I used to be frustrated with the fact that the programs could not accept command line parameters. This is because, unlike QuickBASIC, QBASIC is not equipped with the COMMAND$ function. I got around this shortcoming by creating a batch file that accepts command line parameters, assigns the values of the parameters to environment variables, and accesses them in the QBASIC environment via the ENVIRON$ function. The following program and batch file illustrate the technique.

The example addresses a DOS problem I needed to solve. Often, when I'm finished working with a particular program, I have another task which requires another program. Usually, that program resides in another directory, and I'm forced to change to that directory before executing the program. While this is fairly easy, it can grow tedious. Rather than appending the directories to my already long path, I wrote this QBASIC program, which lets me run a program from any di-

rectory on the hard drive. It's called EXECPATH.BAS, and the batch file is called AUTO.BAT. Here is EXECPATH.BAS. An indented line is a continuation of the preceding line.

```
cmd$ = ENVIRON$("DUMMY")
CHDIR "\"
SHELL "dir/s/b" + cmd$ +
  ">temp.fil"
OPEN "\temp.fil" FOR INPUT
  AS #1
INPUT #1, strng$
CLOSE
FOR n = LEN(strng$) TO 1 STEP -1
IF MID$(strng$, n, 1) = "\" THEN
strng$ = LEFT$(strng$, n - 1)
n = 0
END IF
NEXT n
CHDIR strng$
SYSTEM
```

Here is AUTO.BAT, the batch file that reads the command line.

```
@ECHO OFF
SET DUMMY=%1
QBASIC /RUN
  C:\DOS\EXECPATH.BAS
%1
```

People with QuickBASIC can modify the first line to read cmd$ = COMMAND$. The program can then be compiled into an executable called EXECPATH.EXE. The batch file should then be modified as follows.

```
@ECHO OFF
EXECPATH %1
%1
```

Place both files in a directory that's in your path. I use my DOS directory, since it also contains QBASIC.

JUDD RICHARDS
PROVO, UT

It's the Humidity

How many times have you shocked yourself by touching the doorknob of your computer room? That spark of static electricity is an indication of how dry your computing space is. Simply by walking across a carpet, you can accumulate thousands of volts of electricity in your body. This electricity is relatively benign to you, but it can be deadly to your PC and its internal parts. For example, most CPUs are designed to operate at 5 volts. A few are now available that operate at 3.3 volts. If you discharge your static to one of the connectors on your motherboard, you could fry a delicate electronic part. There are many solutions to the static problem, including touching the power supply or case before touching any internal part. This will work fine. You can also attempt to eliminate static (or reduce it) by humidifying the air. Air with a high relative humidity will suppress the tendency of fibers in your carpet to produce static electricity when your shoes brush across them. There are basically two kinds of humidifiers—one that speeds up the rate at which water evaporates and one that sprays a fine mist into the air. The former is preferred for use around computers because humidifiers that mist the air can also produce a fine white dust from the calcium in hard water. This dust is bothersome when it coats a monitor screen, but it can also get into moving parts and floppy disks and abrade them, resulting in shorter useful lives.

ROBERT BIXBY
GREENSBORO, NC

Annual Checksum

Once a year, we run Checksum for our new readers. To make sure you haven't entered a typo while entering one of the Debug scripts that appear in "Tips & Tools," type *checksum filename.com*, and a number will appear on your screen. Compare that number with the checksum that accompanies the listing. If they are the same, you've typed in all of the numbers correctly. Here is the Debug script for CHECKSUM.COM. Make sure the DOS program called Debug is in your path or the current directory. In these examples, the italic text is what the computer prints; the roman text is what you should type.

```
debug checksum.com
File not found
-e 100 bd 70 01 be 80 00 ac 0a
-e 108 c0 74 61 ac 3c 0d 74 5c
-e 110 3c 20 74 f7 8b d6 4a ac
-e 118 3c 0d 74 04 3c 20 75 f7
-e 120 c6 44 ff 00 2b ff 8b f5
-e 128 b8 00 3d cd 21 72 3d 8b
-e 130 d8 b4 3f b1 01 8b d5 cd
-e 138 21 0a c0 74 06 8a 04 03
-e 140 f8 eb ee b4 3e cd 21 8b
-e 148 c7 bb 10 27 8b fd 2b d2
-e 150 f7 f3 04 30 aa 52 2b d2
-e 158 8b c3 bb 0a 00 f7 f3 8b
-e 160 d8 58 0b db 75 e8 8b d5
-e 168 b4 09 cd 21 b4 4c cd 21
-e 170 00 00 00 00 00 0d 0a 24
-RCX
CX 0000
:78
-W
Writing 0078 bytes
-Q
```

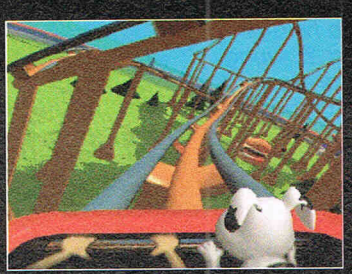
The checksum value is 13907.

RICHARD C. LEINECKER
REIDSVILLE, NC

If you have an interesting tip that you think would help other PC users, send it along with your name, address, and Social Security number to COMPUTE's Tips & Tools, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408. For each tip we publish, we'll pay you $25–$50. All tips submitted become the property of General Media International. ❐

A logical way to write Access macros, reading the command line in QBASIC, and more

On the seventh day, the Lord said: "I'm pooped. You build the theme park."



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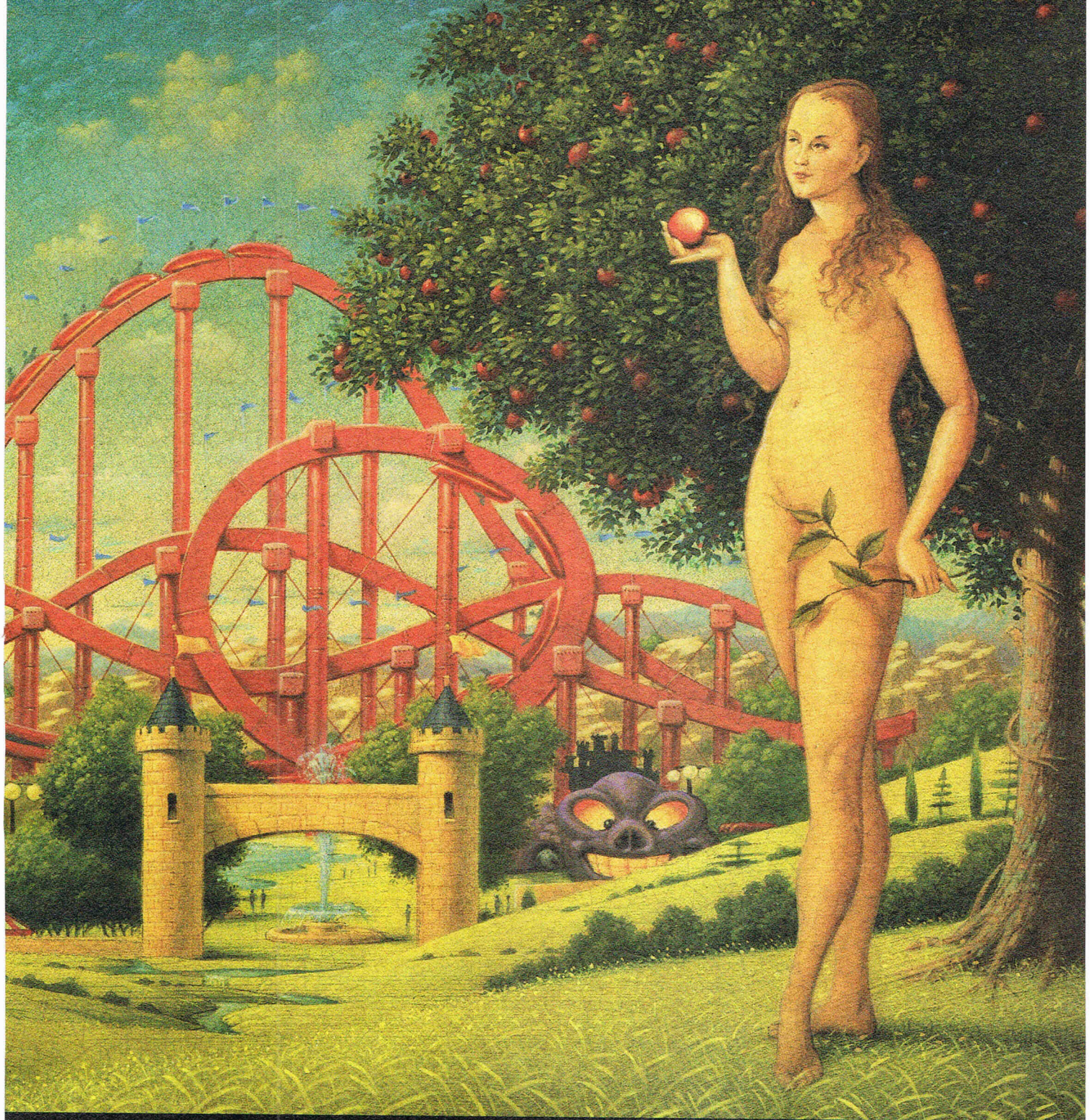

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Circle Reader Service Number 272

HARDWARE CLINIC

Mark Minasi

PC BRAIN TRANSPLANTS MADE EASY

You don't have to be Dr. Frankenstein to perform a successful brain transplant.

I had just a few minutes before I had to leave for the airport. I was installing Freelance for Windows, and I removed one of the installation floppy disks from my PC. That's when I noticed that the floppy was a mite warm.

I reached behind the computer, and—sure enough—the fan wasn't blowing any air. The last time that happened, I had to replace the motherboard because the heat had weakened various components. I didn't relish replacing a 50-MHz 486DX, a local-bus accelerator, a 500MB hard disk, a VideoSpigot, a Sound Blaster, dual 16550 UARTs, and an Ethernet card.

I shut down the computer and left on my trip, cussing.

I wasn't cussing about the potential damage to the PC; I was pretty sure that I'd discovered the dead fan soon enough to shut down the PC before any damage had occurred. I was cussing about finding a replacement power supply for my tower PC.

Until recently, power supplies were fairly generic things. But towers and the newer desktop cases have power switches on the front, away from their power supplies. That presents the problem of how to put a power switch for the power supply away from the power supply.

The answer is often to build some kind of combination of proprietary case and power supply, which is unfortunately what the makers of my tower PC had done.

As a result, I couldn't get just a new power supply; I had to get a whole new combination—case and all. I had to do a PC brain transplant.

I popped down to my local PC parts place and picked up a new case. It has a turbo switch; turbo, power, and disk drive lights; and a reset switch on the case, as well as a power switch up front (can't argue with progress, I guess). In order to create a small footprint, it has only two half-height 5¼-inch drive bays and a lone 3½-inch drive bay turned on its side. Inside, there is another 3½-inch drive bay that has no opening to the front.

The idea with the drive bays is that you're supposed to put a 1.2MB floppy drive in one of the 5¼-inch bays, a CD-ROM drive in the other, a 1.44MB floppy drive in the first 3½-inch bay, and a 3½-inch IDE drive in the last bay. It's not an optimal arrangement, in my view, as the 3½-inch bay is off-center and rotated 90 degrees from its normal orientation, leading most users to assume that the 5¼-inch drive is the A drive. Also, there's no place for a second hard disk. But it's an acceptable case, and indeed, it's the case that's most popular among cloners these days for a desktop PC.

Much of the brain transplant was routine removal of boards and drives from the tower case and insertion of boards and drives in the new case. The tough part turned out to be connecting all the switches—which is what I want to explain this month.

If you're taking the time to mount a PC motherboard in a case, you may as well do it right and hook up all the lights and switches. I'll assume that you've got the documentation on the motherboard somewhere in the pile of papers that came with your computer. Find the connections on the motherboard for the reset switch, keylock/power-on LED, turbo LED, speaker, and turbo speed settings.

Before going any further, however, make sure that you've got the power wires hooked up right. It turns out that the new cases make it possible for you to burn down your house if you hook up these wires incorrectly.

As I've already said, many modern PCs do not use a power switch mounted on the right rear, as do older PCs with AT-type cases. Instead, newer PCs bring in the 110-volt line current to the PC front panel through a thick black cable. The cable extends from the power supply to just behind a switch on the front panel. The switch has four flat connection points, called spade lugs, on it, and there are four wires inside that cable. These wires are black, blue, white, and brown. Your job is to connect the correct wires to the proper contacts.

AC power doesn't include positive and negative wires. Instead, there are hot and return wires. Ordinarily, the white is the hot, and the black is the return. Older power supplies connect white and black wires to the power supply from the wall socket. The big red on/off switch mounted toward the right rear of the PC connects or disconnects both the black and the white lines simultaneously when you flip the switch.

If you put the power switch on the rear of the case so that you can incorporate it directly into the power supply, the big red switch is all that's needed—but the needs of the new power supply's front-panel switches change all that. (Actually, old power supplies also include a third wire—a green one—for ground, but it's not important for this discussion.)

In order to build a front-panel switch, manufacturers drag both the hot wire and the return wire to the front of the

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Circle Reader Service Number 237

case, and then send them both back into the power supply.

- The white wire connects the hot side of the wall outlet to the power switch.
- The brown wire connects the hot side of the power supply's power input to the power switch.
- The black wire connects the return side of the wall outlet to the power switch.
- The blue wire connects the return side of the power supply's power input to the switch.

When you turn the switch on, you connect black and blue, providing a return AC connection for the power supply, and you connect white and brown, providing a hot AC connection for the power supply.

If you disconnect the black, blue, white, and brown wires from the front-panel switch, you should be able to see from the previous discussion how important it is to diagram your connections. This is one situation in which, if you reconnect things backward, you could end up directly connecting hot from the wall socket right into return from the wall socket. That would cause a short circuit that could make your computer catch fire, or—if your fuses or circuit breakers aren't up to snuff—your house could catch fire.

If you look at the front-panel switch, you'll see four spade lugs where you can connect or disconnect the white, black, brown, and blue wires. You'll notice a very low ridge on the connector and two spade lugs on either side of the ridge. Before disconnecting the wires from the switch, notice that the black and the blue are on one side of the ridge and the white and the brown are on the other side. The ridge is just a reminder about which wires go with which other wires. Just keep the white and the brown on one side and the black and the blue on the other side, and all will be well. The way I remember it is that one side is black and blue.

If you have any doubts, however, it would be best to enlist the aid of a friend who's knowledgeable about AC power and voltmeters. You really can do some damage if you wire these switches wrong.

Once the power is hooked up, you can concentrate on the other connectors. It would be nice if there were some kind of standard wiring color for the turbo switch, the turbo light, and the like. Since there isn't such a standard, here's the approach that I take to figure out the keylock, turbo switch, reset switch, and turbo light. I'm assuming that you're trying to figure out which switch or LED on the front of the PC case goes with which wire-and-connector combination inside the case. Then you can plug that connection into the

appropriate place on the motherboard that you're installing. Your best tool for this job is a voltmeter.

The easiest of the connections to identify is the reset switch. It will have only two wires attached to it. Find a two-wire connection; then set the voltmeter on Rx1. Apply the leads to the two wires. Nothing will happen if it's the reset connection. Then press the reset button on the front of the case. If the needle jumps on the voltmeter, you've found the reset switch.

At this point, you should mount the motherboard inside the case and connect the power and speaker to it. If you turn the PC on, you should get a series of beeps from the speaker. (The speaker connection is easy to find, as you can usually follow the wires back to the speaker. Speaker connections are usually keyed so that they attach only one way, but actually, there is no single right way for PC speaker connections.) You can now test the reset switch by attaching it to the motherboard: Turn on the PC, and when the beeps begin, hit the reset switch. If the beeps stop exactly when you hit the reset switch, you'll know you correctly wired the reset switch.

Next, attach the turbo switch. It's the only connector with three wires on it. Most motherboards have only two pins for this function, but the turbo switch has three wires—quite confusing. Just plug two of the connector's holes over the pins (either the two to the left or the two to the right), and the turbo switch will work.

What's the difference? Attached one way, the PC will be in turbo mode when the switch is in the in position and in non-turbo mode when the switch is in the out position. Attached the other way, it works in reverse.

Now you can attach the turbo LED. You can find it because there will be only two two-wire connectors—the hard disk LED and the turbo LED—and the hard disk LED will have a red wire and a black wire on it. Attach the turbo LED's connection to the motherboard, and examine the LED. If it doesn't light up, disconnect the connector, reverse it, and reattach it to the motherboard's turbo LED connection. You should then be able to click the turbo button and see the turbo LED change color. If this does not happen, however, don't panic just yet; some BIOS's won't allow the CPU speed to change until the system has booted.

The keylock/power LED is the last connector. It usually has four or five wires on it, and it's usually keyed so that it will attach only one way. Try plugging it in and powering up the motherboard, and you should see the power LED on the case come right on. Once you've got that done, congratulations! You've done a professional installation job! ❐

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Microsoft Home

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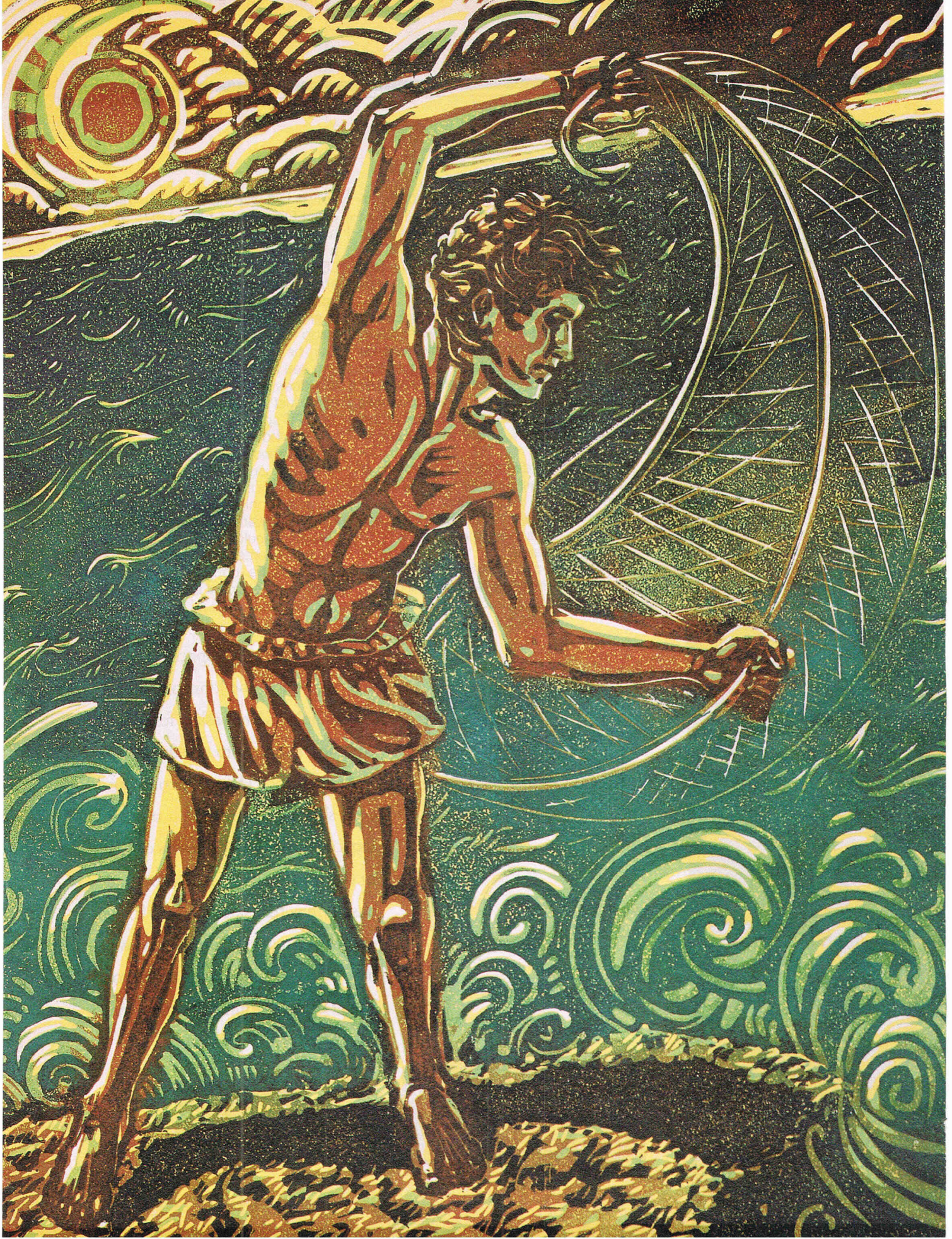

Casting the Net

A world of information awaits you on the Internet. But how will you find it?

By Rosalind Resnick

Imagine New York City without street signs, the Kalahari Desert without a map, hieroglyphics without the Rosetta stone. Now you're beginning to see what it's like to journey the Internet, a worldwide network that's spreading like kudzu throughout cyberspace with no end in sight. According to reliable estimates, more than 20 million people worldwide tap into the Internet today. And that number is growing by 150,000 users a month.

What is the Internet? It's a collection of thousands of interlinked computer networks that communicate with each other using a common computer language, or protocol. By accessing the Net, as it's popularly known, users can exchange E-mail, chat live, log on remotely to other computers, and download copies of files from other computers to their own machines.

But the Internet is far more than that. It's also a virtual community—a living, breathing place where some of the sharpest minds on the planet swap notes and do battle over topics as varied as medieval English literature, artificial intelligence, male-female relationships, and Star Trek trivia.

John Perry Barlow, the lyricist for the Grateful Dead who cofounded the Electronic Frontier Foundation with Mitch Kapor of Lotus, described the Internet as "a state of minds."

"It's almost certainly the most important thing to happen to information since Gutenberg let words out of the abbey," Barlow wrote in a foreword to *NetGuide,* a newly published directory of cyberspace services and destinations. "I increasingly suspect it may alter what it is to be human more than any technological development since the capture of fire."

Heady stuff, to be sure. But, for all its many marvels, the Internet is still not quite ready for prime time. Unlike commercial online services such as Prodigy, CompuServe, and America Online, the Internet has no 800 number to call to get a starter kit, very little point-and-click navigational software, and no technical support staff to call with problems or questions. What's more, Internet computers communicate in UNIX terms, with which DOS and Mac users may have only a glancing familiarity.

And if something goes wrong on the Internet—if the system crashes, a hacker pilfers your password, or a computer in Helsinki neglects to forward your mail—there's nobody to call up and complain to.

"The advantages of the Internet are that it's very widespread and very flexible," says Steve Souza, a home-based computer consultant with WestWorld Engineering in San Jose. "The disadvantages are that it's not a product, it's not a company, it's not a service. If it's broken, tough beans."

If the Internet's infrastructure is quirky, you can thank—or blame—the U.S. government. Set up in 1969 as a way to link the U.S. Defense Department with university researchers working on sensitive government projects, the Internet has no central computer that stores its gigabytes of information. That's because the government feared that all its valuable military data could be destroyed in the event of a nuclear attack if the data were housed in one place. As a result, the Internet became a decentralized network with data stored on each of the thousands of computers throughout it—even though government traffic is now only a small part of the data that flows back and forth.

Consider Internet E-mail. When an Internet user in Chicago wants to send a message to an Internet user in Budapest, the Internet doesn't send that message directly from point A to point B. Though the Internet carries its data over phone lines like commercial services, the network has more in common with the post office than the phone company. Unlike the phone system, which wires every home and business into its network, the postal-like Internet takes your electronic letter, mixes it in with everybody else's mail, and shoots it off to another online post office, which sorts it again and sends it on until your mail finally reaches its destination. Instead of nine-number zip codes, the Internet uses E-mail addresses and protocols (or rules) that tell each computer along the route where to send your mail.

Surprisingly, the whole process typically takes no longer than several minutes—and is so efficient that CompuServe, Prodigy, and the other commercial online services have informally adopted the Internet as the mail delivery system of choice for users of the various services to communicate with one another.

Even so, the Internet's decentralized structure can be frustrating and confusing for modem users accustomed to the relative ease of use that commercial online services offer. Unlike with CompuServe's CIM or WinCIM, for example, you can't click on a little traffic light that represents the "Go" command and type in the keyword, *work,* to visit the Working from Home Forum. Unlike with America Online, you can't click on an icon with two faces to zap you over to the part of the system where you can engage in live chat. On the Internet, there are thousands of discussion groups, known as mailing lists, that won't even let you in unless you subscribe—using the Internet address, of course.

So why even attempt the Internet—especially when the commercial online services are so easy to use and offer the full range of news, sports, and weather plus hundreds of bulletin boards and access to Internet mail? There are many good reasons to access the Internet.

- Price. Depending on how much time you spend online and what you like to do there, the Internet can be a lot cheaper than the commercial online services. Most dial-up Internet access providers offer unlimited Internet access for a flat fee of from $15.00 to $30.00 a month. While that's more than the $9.95 a month that America Online charges for access, you can stay online as long as you like; DELPHI Internet Services, the first with the most in terms of commerical Internet access, offers 20 hours of access per month for $20 ($1.80 an hour for access over 20 hours; another rate structure is also available). America Online charges $3.50 an hour after the first five "free" hours are up. And, unlike with CompuServe and Prodigy, there are no extra charges to access special-interest bulletin boards and other premium features.

- Variety. Even though the commercial online services offer a wide range of special-interest bulletin boards on topics ranging from computers to pet care to food and wine, the Internet offers access to thousands of Usenet "newsgroups" (the equivalent of bulletin boards) and mailing lists on topics as esoteric as German TV cartoon characters and UFO sightings. And, if you don't find what you're looking for in an existing newsgroup or discussion group, you can start your own. Usenet newsgroups about Star Trek, for example, include rec.arts.startrek.misc (which covers Star Trek in all its generations and media), rec.arts.startrek.current (Star Trek gossip, jokes, and production information), and rec.arts.startrek.reviews (reviews of Star Trek books, episodes, and films).

- People. Taken together, the five largest U.S.-based online services—Prodigy, CompuServe, America Online, GEnie, and DELPHI—have roughly 4 million subscribers, most of them in the United States. The Internet, by contrast, has 20 million users all over the world, from Tasmania to Milan. Also, the primary language of the commercial online

services is English; on the Internet, people from all over the world chat live and exchange messages in dozens of different languages.

• Accessibility. Though CompuServe and GEnie offer some direct-dial access overseas (primarily in Europe), Prodigy and America Online are available only by placing a very expensive international call. The Internet, by contrast, offers local dial-up access worldwide.

• Databases. Arguably the world's largest library, the Internet lets you access the Library of Congress card catalog, the New York Public Library Online Catalog, and millions of pages of U.S. government data, all without paying a dime. The Internet's Wide Area Information Servers (WAIS) tool lets you search multiple databases at the same time, a help if you're not sure where to find what you're looking for.

Things to Do, Places to Go

The Internet offers a cornucopia of culture, both high and low. Here's a sampler of Internet destinations to get you started.

Rome Reborn: The Vatican Library and Renaissance Culture. An indefinite online exhibit of more than 200 of the Vatican library's most precious books, manuscripts, and maps. Includes images of each work and the text captions as displayed at the 1993 exhibit held at the Library of Congress. Available via FTP at seq1.loc.gov.

Chaucer Discussion Group. An open forum for discussion of medieval English literature. Subscribe to listserv@siucvmb.siu.edu.

rec.arts.animation. Discussion about animation with a focus on cartoons. Available via Usenet.

alt.cult.movies. Covers favorite cult movies like *The Rocky Horror Picture Show, Plan 9 from Outer Space,* and *Reefer Madness.* Available via Usenet.

alt.fan.howard-stern. For fans of Howard Stern. Available via Usenet.

alt.elvis.king. Speculate about Elvis's whereabouts. Available via Usenet.

rec.arts.startrek.misc. Covers Star Trek in all its generations and media. Includes periodic postings of several lists: "Star Trek: The Next Generation," and "Deep Space 9" episode synopses and trivia; starships by type and episode; actors by episode; the Star Trek Comics Checklist; Star Trek books on tape. Also includes information on Internet sites with Star Trek GIFs and sound files. Available via Usenet.

alt.tv.twin-peaks. For those who can't forget the TV show "Twin Peaks." Available via Usenet.

alt.folklore.computers. Stories and anecdotes about computers. Available via Usenet.

Internet Baseball Archive. Includes simulated-baseball software, major-league schedules, GIFs of team logos, playing rules, major- and minor-league stats, and ticket information. Available via FTP at eucalyptus.cc.swarthmore.edu.

rec.sport.football.pro. Forum for discussing professional football. Available via Usenet.

rec.pets.herp. Interested in snakes? If so, this forum is for you. Available via Usenet.

Bookware

Want to bone up on the Internet? Here are some books to get you started.

Dern, Daniel P. *The Internet Guide for New Users.* New York: McGraw-Hill, 1994. ISBN 0-07-016511-4.

Fraase, Michael. *The PC Internet Tour Guide: Cruising the Internet the Easy Way.* Chapel Hill, NC: Ventana Press, 1994. ISBN 1-56604-084-1.

Fraase, Michael. *The Windows Internet Tour Guide: Cruising the Internet the Easy Way.* Chapel Hill, NC: Ventana Press, 1994. ISBN 1-56604-081-7.

Step by Step

Here is how to send E-mail over the Internet.

1. Connect to your Internet access provider and log on to your account.
2. At the prompt (%), type *mail* followed by the recipient's Internet address and press Enter. For example, to send me E-mail, type *%mail rosalind@harrison.win.net.*
3. When prompted for the subject of the message, type several words describing your message and press Enter. For example, you might type *navigating the net.*
4. Type the body of your message.
5. When you've finished composing your message, press Ctrl-D to send it. (If for some reason you wish to cancel your mail message, hit Control-C twice.)
6. At the Cc: prompt, type the E-mail addresses of any other people to whom you want your message sent. If you don't want to send out any copies, press Enter. (Not all systems have the Cc: function.)
7. After you've sent your message, the % or & prompt will appear on your screen.

If you find an area that's of interest to you, you might want to subscribe to a mailing list in order to receive all communications about that particular subject.

Each Internet mailing list has a different E-mail address. Here's how to subscribe to net-happenings, a list that serves as a clearinghouse for new products, services, and activities of interest to the vast majority of the Internet community.

1. Connect to your Internet access provider and log on to your account.
2. At the prompt, type *mail listserv@is.internic.net* and press Enter.
3. There's no need to fill in the subject line because the subscription command is placed in the body of the message, so at the Subject: prompt just press Enter.
4. In the body of the message, type *subscribe net-happenings firstname lastname.* For example, you might type *subscribe net-happenings jane doe.*
5. Make sure there are no other characters in the message, then hit Control-D to send it. You will be returned to the system prompt.
6. After a short time, you will receive two messages. One message will confirm that you now subscribe to the list; the other one will contain introductory information. Once these messages arrive, type *mail* at your prompt and press Enter. To read the messages, press Enter at the mail prompt or type in the number corresponding to the message you want to read and press Enter. If you need help with commands at any point, type *?* and then press Enter. When you are done, type *q* and press Enter to quit.

To stop receiving messages from the mailing list, send a message to listserv@is.internic.net. In the body of the message, type *unsubscribe net-happenings firstname lastname.*

SPEAK UP!

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alt.cyberpunk. Covers virtual reality, the fiction of writers like William Gibson and Bruce Sterling, and the convergence of cyberpunk with mainstream culture. Available via Usenet.

sci.virtual-worlds. Discuss all aspects of virtual reality. Subscribe to listserv@vmd.cso.uiuc.edu.

soc.singles. Men and women currently not involved in relationships talk to each other. Available via Usenet.

alt.conspiracy.jfk. Theories about the assassination of JFK. Available via Usenet.

alt.politics.correct. Discussion about political correctness, particularly terminology issues and stereotypes. Available via Usenet.

ADND-L. All aspects of Dungeons and Dragons and Advanced Dungeons and Dragons covered, including new spells, new monsters, and more. Subscribe to listserv-@pucc.bitnet.

Source: Peter Ruttan, Albert Bayers, and Kelly Maloni. *NetGuide*. A Michael Wolff Book. New York: Random House, 1994. ISBN 0-679-75106-8.

Netiquette

The folks on the Internet can be unforgiving of people who break their rules. The trouble is, unlike the commercial online services, the Internet has no central authority to cast its rules in stone. Break the rules, however, and punishment will be swift: Transgressors will almost certainly be flamed

Getting Access

If you don't have free access to the Internet through a university or research institution, you can pay from $15 to $30 a month for what's known as a dial-up account from an Internet access provider. This lets you dial up the Internet just as you would a commercial online service or a bulletin board and gives you unlimited access to Internet features such as E-mail, Gopher, WAIS, World Wide Web, Telnet, FTP, and IRC.

Down the road, however, you may find yourself (or your company) wanting a full Internet connection that can run multiple sessions at the same time, allowing you to, say, download a file while you're accessing a Gopher site. When you access the Internet through a SLIP (Serial Line Interface Protocol) or a PPP (Point-to-Point Protocol), the modem on your computer or on your local area network connects to the Internet provider's host computer, which is connected directly to the Internet. A SLIP connection generally costs about $160 to $250 a month with a one-time installation fee of $1,500.

Here is a partial list of Internet access providers (a more comprehensive list can be obtained from Susan Estrada's *Connecting to the Internet: An O'Reilly Buyer's Guide*).

AlterNet
UUNET Technologies
Falls Church, VA
(800) 488-6384
(703) 204-8000
info@uunet.uu.net
U.S. and international

BARRNet
Palo Alto, CA
(415) 723-3104
info@nic.barrnet.net
Northern and central California and western Nevada

CERFnet
San Diego, CA
(800) 876-2373
(619) 455-3900
info@cerf.net
U.S. and international

Connected
Kirkland, WA
(206) 820-6639
kmoore@hebron.connected.com
Northwestern U.S.

Global Enterprise Services
Princeton, NJ
(800) 358-4437
(609) 897-7300
market@jvnc.net
U.S. and international

Iowa Network Services
Des Moines, IA
(800) 546-6587
info@ins.infonet.net
U.S.

NEARNET
Cambridge, MA
(617) 873-8730
nearnet-join@nic.near.net
Northeastern U.S.

NorthWestNet
Bellevue, WA
(206) 562-3000
info@nwnet.net
Canada and northwestern U.S.

PSINet
Herndon, VA
(800) 827-7482
(703) 709-0300
info@psi.com
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Sprint
SprintLink
Herndon, VA
(800) 817-7755
info@icm1.icp.net
U.S. and international

THEnet
Austin, TX
(512) 471-2400
info@nic.the.net
Texas

WinNET Mail and News
Computer Witchcraft
Louisville, KY
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(verbally attacked).

Here are some basic tips to help you duck the flamethrowers.

- Don't type your public messages in all capital letters. On the Net, that means you're shouting (and it's considered quite rude).
- Avoid profanity and abusive language.
- Be brief and to the point. Don't waste bandwidth with a wordy diatribe.
- Think before you write. Once you've cast your words upon the Net, you can't take them back.
- Respond to a public posting only if you have something meaningful to say.
- Don't plagiarize. If you're quoting from another source, give credit where credit is due.
- Stay on point. Don't stray from the newsgroup's or mailing list's stated purpose.
- Don't advertise or send junk mail. It's illegal on government-controlled portions of the Net, and even in those places where it is allowed, it will probably annoy the very people you're trying to entice.

Internet Tools and Features

Here are the useful tools you'll find on the Internet for dealing with data.

E-mail. The Internet makes it possible for users to exchange electronic mail with other users around the world in addition to subscribers to commercial online services such as CompuServe, GEnie, America Online, DELPHI, and The WELL. In addition, you can subscribe to mailing lists that let you post and receive E-mail about a wide variety of topics. There's also the electronic journal (or E-journal). E-journals are either distributed to a list of subscribers as an E-mail text message or retained in a particular area for downloading.

File Transfer Protocol (FTP). Another widely used feature of the Internet is its ability to transfer files from one Internet-connected computer to another. FTP allows Internet users to search for, list, and retrieve files; the Internet's Archie service indexes files from over 900 FTP sites.

Finger. The Internet's Finger command lets you access identifying information (such as full name and postal address) about anyone with an Internet mailing address.

Gopher. Gopher, a project of the University of Minnesota, is a menu-driven service that lets users browse the Internet's resources, read text files, and retrieve files of all kinds.

Internet addresses. Internet mail addresses consist of three parts: a computer name, a location, and a domain (or type of site) name. Here is a sample address:71333.1473@compuserve.com. Here, *71333.1473@* is a CompuServe address and takes the place of the computer name. (If this weren't an address on a commercial service, an actual computer's name would be listed.) The next part of the address, *compuserve,* is the location (another example would be *AOL* for *America Online* or *UWA* for *University of Washington*). The last part of the address, *com,* is the domain name; *com* stands for *commercial* (another example is *edu* for *education* or *gov* for *government*).

Internet Relay Chat. Popularly known as IRC, Internet

ACCESS Brings You a Virtual World Interactive Movie!

What Reviewers are Saying:

"Lots of games claim to be pushing the envelope—*Under a Killing Moon* blows it to **smithereens!**"
—William Trotter, *PC Entertainment*

"*Under a Killing Moon*...the **most elaborate** graphic adventure to date. A ground breaking CD adventure!"
—Joyce Worley, *Electronic Games*

"*Under a Killing Moon* combines the best elements of movies and computer games and creates an amazing interactive experience that's **better than either of them.** It literally pulls you into the screen."
—Denny Atkin, Entertainment Editor, *Compute Magazine*

This category-creating Interactive Movie from ACCESS Software goes light years beyond any other product labeled "interactive." *Under a Killing Moon* takes you to the streets of post World War III San Francisco and casts you into the role of Tex Murphy, Private Investigator, who first appeared in *Mean Streets*, then *Martian Memorandum. Under a Killing Moon* is a Virtual World full of people and places so richly detailed, you'll feel like you're actually there.

Relay Chat is the Internet's worldwide, multilingual chat board—like CompuServe's CB Simulator and America Online's People Connection but bigger and more chaotic. IRC is divided into hundreds of categories, where users talk live around the clock about everything from Russian politics to true romance. Like the commercial services, IRC lets you go private to chat about things that you don't want the whole Net to know about.

Telnet. Telnet, or remote log-on, enables a computer user in one location to use the Internet to tap into another computer somewhere else. Once the connection is made, the remote user can use that system as if that computer were part of his or her own network. Telnet can be used to access everything from bibliographic databases (primarily library catalogs) to computer bulletin boards and interactive role-playing games.

Usenet. Not officially part of the Internet, Usenet is a collection of millions of E-mail messages organized by subject categories called newsgroups. They are the Internet equivalent of the special-interest bulletin boards available on the commercial online services, though much more specialized. There are two kinds of newsgroups: official (voted in by a majority of Internet site administrators) and alternative. Official newsgroups contain the prefix *comp* (for computer-related topics), *news* (for topics related to Usenet itself), *rec* (for recreation, hobbies, and the arts), *sci* (for science and research), *soc* (for society and culture), *talk* (for issues and debate), or *misc*. Alternative newsgroups, which start with the prefix *alt*, can be started by anyone. There are more than 2500 alt newsgroups.

Wide Area Information Servers (WAIS). A joint project of Thinking Machines, Apple Computer, Dow Jones, and KPMG Peat Marwick, WAIS is a powerful searching tool that lets users search over 300 Internet sources with a single keyword.

Whois. Though there's no comprehensive directory of Internet mail addresses, the Internet's Whois feature provides a limited directory of Internet users and a utility for searching it.

Getting Online

Right now, the biggest obstacle to exploring the Internet is that it is difficult to use. Dozens of software developers are pioneering Windows interfaces that offer point-and-click access to the Internet's E-mail, Gopher, WAIS, Telnet, FTP, and other features. And some of the books now coming on the market—such as Michael Fraase's *PC Internet Tour Guide: Cruising the Internet the Easy Way*—come with easy-to-use interfaces bundled on disks.

What's the future of the Internet? Some experts predict that it will swell to 100 million users worldwide over the next five years, with people logging on from their television sets, their screen phones, and their personal digital assistants. Others speculate that the Internet will be paved over by corporate communications giants eager to build an information superhighway.

But whatever the future may hold for the network of networks that is called the Internet, the virtual community that it has spawned will almost certainly live on—and prosper. ❑

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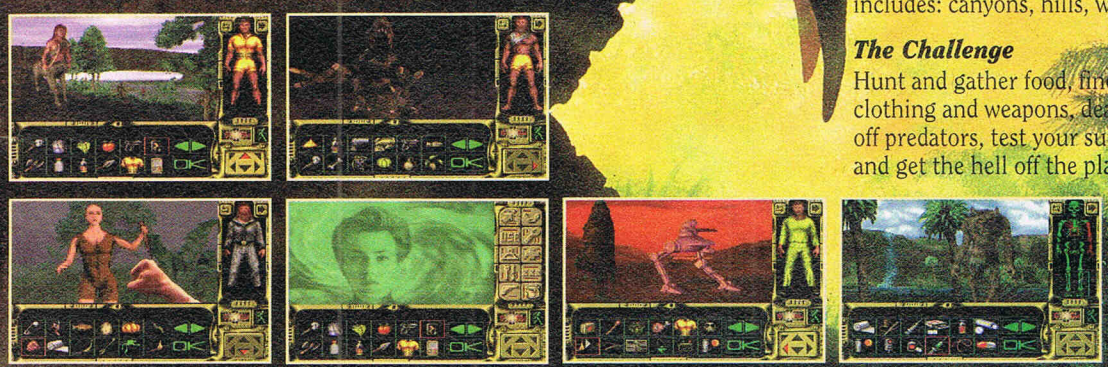

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HOME COMPUTING

WHAT IS HOME COMPUTING?

Having a computer in your home—as 25 million of us do—is a whole different adventure from using a PC in your workplace. For one thing, there's your family to worry about. You'll need to work out ways to share computer time among them, teach them how to use it, and protect it from them. (Have you ever seen a keyboard gummed up by a spilled root beer float? Pray you never do.)

Whole new worlds of software open up to you: games, educational programs, edutainment programs, reference works, home productivity programs, personal finance managers, religious software, and scores of wonderful things for your hobbies and other away-from-the-workplace interests. (There are thriving markets for scout troop management software and bowling league secretaries' programs, for example.) You'll also want to run your business software at home. After all, why learn a whole new word processor when you're already proficient with WordPerfect or Microsoft Word?

Buy a modem and sign up for America Online, CompuServe, or Prodigy, and a raft of new concerns will hit. Online time is billed by the minute, and even the least expensive services can run up appallingly large bills when teenagers and other susceptible persons (like you and me) get hooked on the network habit. And your phone's always busy—an irritating rarity in this era of call waiting service.

Other interesting problems await you. You're going to run out of money for software in no time, and—depending on how long it takes you to run out of money—you're likely to find your hard drive filling up faster than you ever imagined it would. Your kids are likely to discover the neighborhood shareware grapevine or start downloading shareware programs from local bulletin board services. When this happens, wave bye-bye to your hard drive space and gear up for virus detection and prevention.

While I've warned of impending problems, they're more fun than irritation (except for the part about running out of money). Integrating a PC into your home and family is a grand adventure, an opportunity to learn for everyone.

In the articles that follow, I'll offer assistance with these problems—make that *growth opportunities*. I'll discuss some basic guidelines for choosing the right computer (covered more thoroughly in COMPUTE's Getting Started with Buying a New PC in our February 1994 issue) and help you with strategies for finding software that does the job without totally draining your financial resources. I'll discuss how to set up the computer for effective family use—insulating the uninitiated from unpleasant DOS matters, for instance. I'll offer some tips on peaceful family coexistence with the PC, as well as maintaining and protecting your computer. When you're finished here, you'll have some useful ideas for living with a home PC.

Welcome to a journey of discovery and enlightenment (with minor side trips into frustration and brushes with poverty). Welcome to the world of the home PC.

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COMPUTE's Getting Started with Home Computing was written by Richard O. Mann.

HOW TO CHOOSE A HOME COMPUTER

Buying a computer for the home can be a daunting assignment, especially if it's your first venture into this fascinating area of personal technology. You're facing a jungle of odd jargon, even more choices of machines and options than breakfast cereals in the supermarket, and probably conflicting advice from those around you. It's so complicated that I can't begin to tell you everything you'll need to know in the short confines of these articles. This time around, I'll concentrate on the most frequently asked questions and considerations involved in buying computers specifically for the home, which is certainly an art unto itself.

HOME COMPUTING

How Much Should You Spend?

The first step in the process is to determine how much you can spend for this new addition to your home. You can buy excellent if somewhat Spartan computers for about $1,000, or you can spend as much as $4,000 if you feel you need the latest model, the fastest chip, and all the possible options. (Writing about prices is always scary; the PC market changes so fast that there's no telling what will happen in the two months it takes to get these words into print—except that prices will go down.)

The best advice I can give is to buy as much computer as you can reasonably afford. It often seems that all the hot new software products require state-of-the-art equipment. If you buy slightly out-of-date hardware today, by this time next year, you'll find yourself unable to run many of the great new programs that I'll be writing about here. In other words, don't buy a 386SX computer unless you're sure you want to run only last year's software, and you won't be catching upgrade fever.

And if possible, consider getting a chip-upgradable computer in case the upgrade pressure becomes unbearable.

Should You Get Multimedia?

Yes. That one was easy. Why get multimedia? Without it, you'll be on the outside looking in. You'll be unable to use much of the best of the new software. Multimedia software today is pretty spectacular, but I have the feeling that we haven't seen anything yet. Don't miss out.

A multimedia PC is your best choice for a home computer.

Another good reason to include the CD-ROM drive and sound board as part of your computer purchase is that it's much easier that way. Until the planned Plug and Play standards become reality—at least a year, probably longer—installing a CD-ROM drive and sound board in an existing computer can be an exercise in frustration. Even if the thought of taking screwdriver in hand to open the computer case doesn't give you a mild case of the shakes, you're likely to have problems. IRQs conflict, DMA channels get crossed, tiny jumpers must be moved, and DIP switches must be changed.

Let your dealer worry about all that—buy the computer with everything installed and working. Happily, it's often less expensive to buy the multimedia kit built in. (But be sure that you know which components you're getting and that they're the ones you want. Many built-ins are old technology.)

How Important Is It to Match Your School's Hardware?

Often, one of the main reasons you're buying a home computer is to be sure your children aren't left behind in the virtual dust on the information superhighway. How important is it to have the same kind of computer the kids use at school?

Opinions vary. Kids are generally versatile creatures, able to switch mental gears as they move from old Apple II's still found in some schools to Amigas, Macintoshes, and IBM compatibles. They consider the varieties of computers to be part of the landscape and aren't fazed by the need to know how to use different varieties of tools. Get the computer that you know how to use; the kids will adjust without difficulty. That's my advice. Others may advise differently.

(Because this is a PC magazine, I'll assume that—after careful consideration—you've decided on an IBM compatible for your home.)

Can't Kids Get Along with a Smaller, Slower Computer?

Yes, but they won't like it. Kids will want the latest games, which are notorious for stretching your hardware to its limits. Current games often require absolutely the fastest, most RAM-rich hardware you can buy to play at even a decent speed. If that doesn't bother you ("My kids are going to use the computer only for educational programs," you say), be aware that reference titles and other educational programs are now on CD-ROM with fancy full-motion video clips that play slowly even on today's fastest computers.

Even if the computer is only for the kids, get at least a 486SX-25 with 4MB of RAM and a 120MB hard drive. That's the bare minimum. Even for a second machine, I wouldn't buy anything less than a 486DX-33 with 4MB of RAM and a 200MB hard drive. If I anticipated heavy Windows use (and I do), I'd get 8MB of RAM if it were in any way possible. Those are the minimums.

Would You Be Better Off with Two Computers?

Many families are finding it necessary to have two computers. Usually, this happens as a longtime comput-

HOME COMPUTING

er owner buys a newer, more modern computer. The old one is then relegated to the kids. (But Dad and Mom often find themselves doing their word processing on the old machine because the kids need the CD-ROM–equipped computer to do their schoolwork or play their games.)

At the Mann Mansion, it's not unusual for our family of four to be happily working away on four separate computers. (We own two and usually have several systems in for review.) Having at least two is an absolute necessity around here.

If you think you may need two computers for your family, consider making one of them a laptop computer. Today's laptops (primarily notebooks and subnotebooks) are surprisingly capable computers at relatively affordable prices. The minimum configuration mentioned above is fairly standard for notebook computers. (Give it another year or two, and you may even be able to afford a color-screen notebook computer.)

Where Should You Buy Your Computer?

Deciding where to buy your computer can be difficult. As I've advised dozens of friends on their home computer purchases, I've found that two factors seem to take a controlling role in the decision: price and available financing.

Local furniture stores do a brisk business in computers because they offer easy credit and many buyers already have accounts there. Little or no money down, immediate delivery, and easy payments carry a lot of weight.

Others who can afford to buy outright or charge the computer to a credit card usually go for the lowest price from a nationally known mail-order vendor (often Gateway 2000). Others search the local dealers for the best price and features, looking forward to having locally available service and advice—an excellent idea. The warehouse stores are also doing a brisk business in low-priced PCs.

Buying a computer for your home can be a lot of fun. Involve the family, after explaining the basic constraints, and have fun sharing the anticipation of having one of these tool-and-entertainment-device combinations in your home.

Add multimedia to your PC with a multimedia upgrade kit.

Create rainy-day projects with Brøderbund's Kid Cuts.

HOW TO SET UP YOUR HOME COMPUTER FOR THE FAMILY

Not everyone in the family will have the same ability to control the computer. You, as the master of the computer, may want to assist family members by making it easy for them to get to the programs they want to run. You may also want to limit the things they can do. A well-meaning child set loose in the Windows Program Manager can wreak unlimited havoc on your carefully designed layout, for instance.

There are many tools to help you with this. If your concern is merely to make it easy for everyone to run the programs on your hard drive, you can write brief batch files to run the programs. Add a master batch file that lists the names of the other batch files, and you have a homemade menu system. It doesn't limit users from doing whatever they may want to do, but it does make it easy to run your programs.

To limit access only to programs that you've specifically set up for each family member, you need a menu program. In the days before Windows hit it big, menu programs were big business. Things have gotten lean for these companies now, but they persist, and first-class menu programs are still available. PC Dynamics' MenuWorks Advanced 2.0 (the one I use), is an extremely easy-to-use yet high-powered program. It offers passwords and security levels, logs all programs as they're run, and has a full-featured disk and file manager built in. You can limit any user's ability to shell out to DOS, thus effectively preventing him or her from installing new programs, monkeying around with your directory structure, erasing files, and so on. Fifth Generation Systems' Direct Access Menu offers similar features.

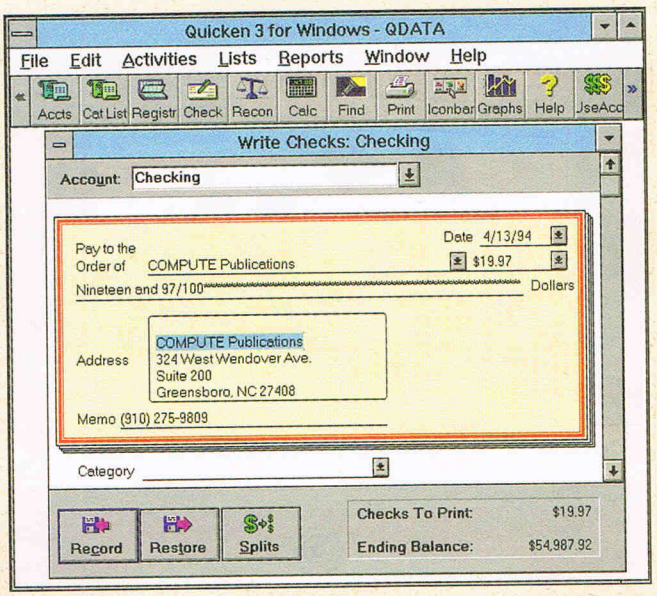
But what about Windows? The icon-filled Program Manager screen is designed to be the menu—you just double-click on any program's icon to run it. The problem with this is security. There isn't any. Anyone can run programs from icons, as well as add icons, delete

icons, drag them around the desktop, and create all kinds of disarray. And anyone can even change your drivers, monkey with the WIN.INI files, and totally destroy your ability to run Windows. As if that weren't bad enough, clicking on the DOS icon gives a person access to the DOS programs.

There is a way to limit access while still running Windows: Fifth Generation Systems' Direct Access Menu for Windows, which offers the same features as the DOS menu program. It adds the ability to nest your menus (which you can't do with the Windows Program Manager), but it can put only a dozen or so programs on a single screen's menu. If the folks who'll be using your computer's Windows programs are well behaved, you probably don't need this extra layer of menu protection. If they're likely to be a little wild, however, you may want to maintain control with Direct Access Menu for Windows.

HOW TO CHOOSE SOFTWARE FOR THE HOME

Having a computer at home opens a new world of wonderful software to you, programs your employer would never allow you to put on the computers at work. Your biggest problems will be picking from the wealth of interesting programs, finding a way to pay for everything you'd like to buy, and fitting it all onto your hard drive after you bring it home. I can't help you with the running-out-of-money problem, but I can give you a quick overview of the kinds of software that are available and pass along some advice.



Organize your personal finances with Quicken for Windows.

The Year of the Home Computer

There's a lot of excitement for home computing among the giant software developers. Both Microsoft and WordPerfect have established major product lines with scores of products, heavy advertising support, and hopes of getting their products into most of the homes in the country. After all, with over 25 million households (27 percent of all homes) owning computers and 40 percent more planning a computer purchase, there's a multibillion-dollar market there waiting to be tapped.

Maybe all this attention will make this the year of the home computer.

A Basic Home Software Portfolio

You'll need a few basic programs as the core of your home computer's repertoire. In today's market, much of what you need will come bundled with the computer. You'll have a hard time, for example, buying a new computer without Windows already installed along with DOS. Beyond that, software bundles will differ.

A works program is often included in computers aimed for home use. Works programs, such as Microsoft Works, ClarisWorks, and WordPerfect Works (also referred to as integrated programs), combine a basic word processor, spreadsheet, database, communications program, and often a graphics program into a single package. You can do most of the work a typical home needs (homework, correspondence, light household data tracking) quite well with these programs. If you didn't get a works program with your computer, one of them would be an excellent choice to give you a lot of power for your money, across the spectrum of basic computer tools. (On the other hand, many of us need our word processors and spreadsheets, for instance, to match up with what we use at work. Be sure to explore the licensing of these programs; many companies have agreements with the software companies allowing employees to legally make copies for use at home.)

Beyond that, a basic portfolio of software might also include home productivity software, games, school or educational programs, work software brought home, hobby-related programs, home business applications, and communications software—in order from most to least frequently used, according to a recent study. Let's run through a brief overview of the categories we haven't already covered.

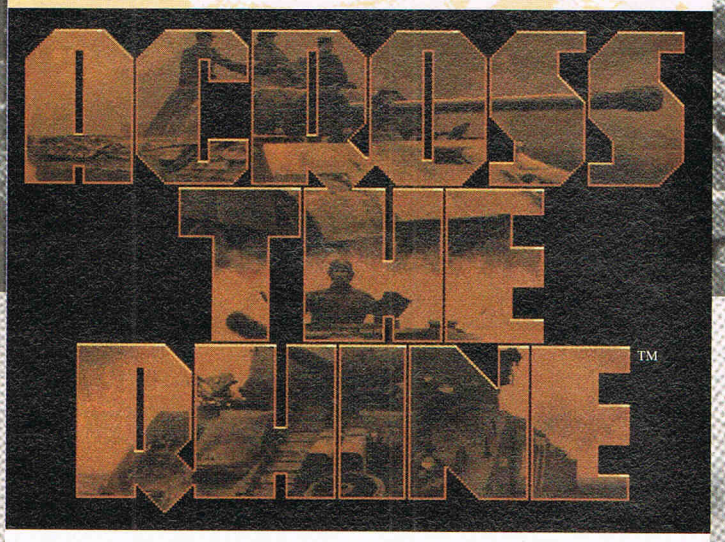
Productivity Software

Aside from the works programs, you'll find copies of several standard sorts of programs on most home computers. A few programs have been around since the beginning of the DOS era, continually upgraded and as common on home computers as Cheerios or Kleenex are in our homes. Take Power Up Software's excellent Calendar Creator Plus, for example. We've all seen those omnipresent monthly calendars created by this program—they come with PTA bulletins and church newsletters and are on countless company bulletin boards. The program is currently available in both DOS and Windows versions.

Another popular program is Brøderbund's Print Shop Deluxe. The company has sold over 6 million Print Shop products since its introduction years ago. Print Shop makes signs, cards, and banners, and its various companion products add many additional graph-

In 1944, This Was The Only Heavy Metal Touring Europe.

American M4 Shermans. Tigers of the Third Reich. These were the tanks that rocked Europe from D-Day to the fall of Berlin in World War II. The same armored juggernauts that you'll command in the explosive new game **Across the Rhine** from MicroProse.



Jump into history's most famous tanks and experience the fierce combat and tough decisions that gripped World War II tank commanders. Take command of U.S. or German forces. Control single tanks or entire Companies. And blast your way through enemy units across the war-torn landscape of Europe.

Across the Rhine from MicroProse. And you thought heavy metal started in the 70's.

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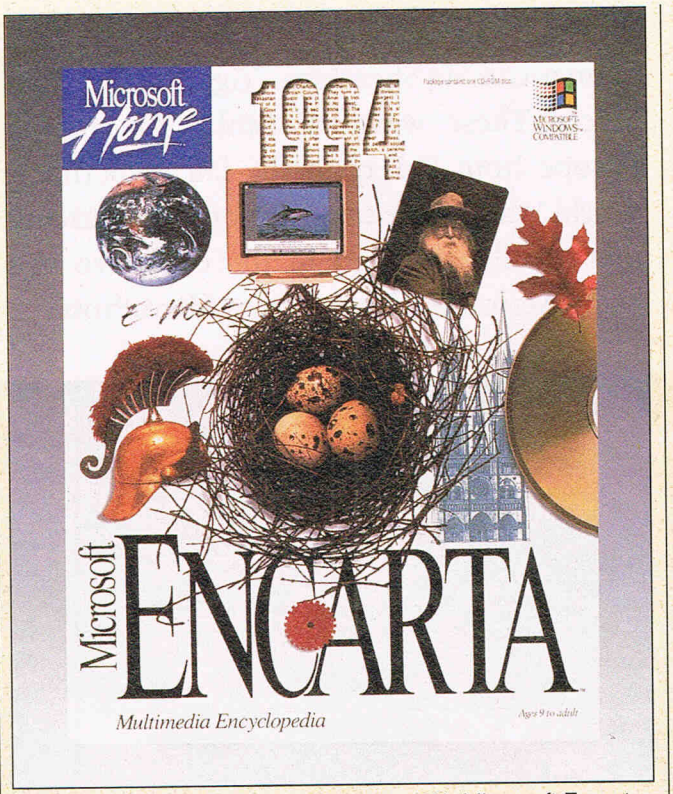
HOME COMPUTING

ics and fancy features, such as text art. Most of us are familiar with the old dot-matrix printer version; today's Windows version prints first-class color graphics, laser-quality images, and other high-quality graphics.

Several million copies of Intuit's outstanding personal finance program, Quicken, grace home computers. With it or other programs like it, you can control your checkbook, bank cards, and total financial situation. Quicken leads that market because of its single-minded pursuit of ease of use throughout the program.

Productivity titles run the gamut, from aardvark information (The Software Toolworks' Animals) to zymurgy (The Random House Unabridged Dictionary). You'll find drawing programs for creating graphics (Micrografx's Windows Draw), desktop publishing (Microsoft Publisher is the current bestseller), tax preparation packages (Meca's TaxCut for Windows or for DOS), home legal helps (Parsons Technology's It's Legal), address books (Power Up's Address Book Plus), language-teaching and translation programs (Road Scholar's Spanish Scholar for Windows), cookbooks (Arion Software's MasterCook II), gardening programs (Voudette's FLOWERscape), home building and remodeling design (Brøderbund's 3D Home Architect), genealogy programs (Banner Blue's Family Tree Maker for Windows), and, of course, the traditional items such as word processors, spreadsheets, and databases of all types and descriptions. The list goes on and on.



Bring an encyclopedia into your home with Microsoft Encarta.

Utilities

Personal productivity programs include the general category of utility programs, which are both popular and necessary. For those with hard drives that are getting crowded, Stac Electronics' Stacker 4.0 can stuff up to twice as much data as normal onto your drive through a process called disk compression.

In addition, you'll want a virus checker, though you can get an adequate one with DOS 6.21. LapLink V from Traveling Software comes with a cable that allows you to quickly move data between two computers—used most frequently with laptops, but handy whenever you want to transfer large quantities of data quickly.

General utility packages are perennial bestsellers. Symantec's Norton Utilities 8.0, Central Point Software's PC Tools 2.0 for Windows, and PC Tools Pro 9.0 for DOS combine nearly every useful utility known to man into a single package. They provide excellent tools for diagnosing hardware problems, finding and solving hardware and software system conflicts, recovering from and preventing system crashes, and recovering lost or damaged files. You'll want one of these on hand at all times.

Windows users may want to investigate Symantec's Norton Desktop for Windows 3.0, a utility that improves on and expands the basic Windows Program Manager, as well as adding other utility functions. Hewlett-Packard's Dashboard provides a no-nonsense, streamlined Windows interface.

Windows users will also want a screen saver. These wonderfully entertaining programs put changing images on your PC's screen when you haven't been working at the computer for a set time—ostensibly to prevent image burn-in. They've become incredibly popular over the last two years, spawning dozens of wonderful packages.

Of note is Berkeley Systems' fine After Dark series, which includes the famous flying toasters, a separate set of Star Trek screens with sound, and animated Disney scenes.

Second Nature Software sells an inexpensive series of 31 fine art sets, ranging from breathtaking photos of mountain splendor to classic aircraft to Monet and Renoir paintings. Each disk contains 22 images. A share of the profits is donated to environmental groups.

Go ahead and get a wildly fun screen saver. Chances are the boss won't appreciate Disney or Star Trek scenes at work, so let your spirit of fun run free at home.

Windows users will also want to explore TrueType fonts. Almost any Windows program can access any TrueType font, printing it in scalable sizes on virtually any printer. Swfte International offers 100 fonts in each of its Typecase I, II, and III packages, along with a font manager that helps keep the Windows overhead associated with these fonts under control. Ares Software's Font Chameleon and Altsys's Font-o-matic let you create your own fonts

HOME COMPUTING

by altering or combining existing ones. Font-o-matic offers wacky options such as Swiss cheese, cactus, and cow spot effects.

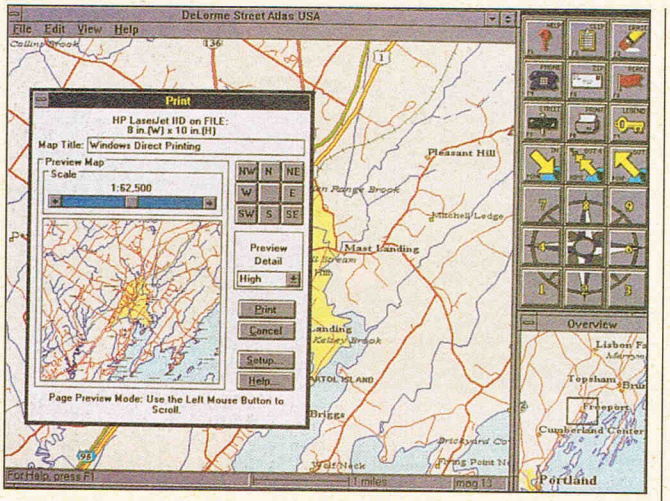
Reference Titles

Falling under both the personal productivity and the school and educational categories are computerized reference programs. Nowadays, most of these great programs come on CD-ROMs, where vast amounts of storage allow freedom to include massive amounts of data. The three major encyclopedias—Microsoft Encarta, Grolier's Multimedia Encyclopedia, and Compton's Interactive Encyclopedia—are good examples. All include sound recordings, full-motion video clips, and thousands of color photos.

Of particular note in this category are Random House's Random House Unabridged Dictionary, Second Edition (the first American unabridged dictionary in decades), DeLorme Mapping's Street Atlas USA 2.0 (street maps of the entire country) and Global Explorer (detailed maps of the entire planet, though not quite down to street level), and Microsoft Cinemania '94 (a database of thousands of movies including sound and video clips and thousands of still photos).

Games

I'm not going to be able to tell you much about games—there are just too many. Even listing the categories would take a full article. Go into any software store and scan the shelves—you'll see four or five racks of productivity software, lots of computer books, and the rest of the store full of games.



Explore the U.S. from your kitchen with Street Atlas USA 2.0.

Parents, a few cautions are in order. Computer games run the gamut from innocent Mickey Mouse games that teach reading all the way to gory, violent, and (to some) disgusting games with little apparent redeeming social value. Most kids go directly to the least desirable programs, so you'll need to exercise some parental discretion here.

If you have gentle sensibilities, don't let the flood of fighting, shooting, killing games turn you against the whole category. Literally hundreds of intriguing puzzle games, card games, and other unclassifiable but delightful games are aimed straight at us mature folks who like a little relaxation now and again. My current favorite is Access Software's flagship game, Links 386 Pro, which provides gorgeous photorealist golf courses (Pebble Beach, Firestone, and so on) to test your talents.

School and Educational

Reference titles come into play here, as do many games designed to educate children on the sly. MECC's SuperMunchers games are always popular with the kids and are in most schools. You can count on Davidson & Associates' line of games, including its steady best-seller, Math Blaster: In Search of Spot, to be fascinating to the kids. Davidson also provides Your Personal Trainer for the SAT for teenagers preparing for college entrance exams. And Davidson's Cruncher is, of all things, a powerful Windows spreadsheet for kids, which should open many small-fry eyes to the logic and patterns of working with numbers.

Brøderbund's series of exploration programs, including The Playhouse and The Backyard, provides hours of fascination to preschoolers. The company's fabulously successful Carmen Sandiego series of educational games has even spawned its own television series. The latest incarnation is Where in Space Is Carmen Sandiego?.

Games from The Learning Company provide playful entertainment, subtly delivering educational values. The company's well-known Reader Rabbit and Math Rabbit games are now available in Windows versions, too.

Hobbies

If you bowl, help with a scout troop, garden, cook, write poetry, do genealogy, participate in any of a hundred hobbies, or collect coins, stamps, or videos, there's software available to help you be more effective in pursuing your interests. Unfortunately, you won't always find these programs in the software store or advertised by the major mail-order houses. Check your specialty magazines and club publications, and talk to your fellow hobbyists—you'll find something useful for sure.

Communications

Using the computer and a modem to communicate electronically over the phone lines is great fun. The major online services provide a rich source of information, computer assistance, news, and other services, as well as making up an electronic community of friends.

You'll need software for this. Some of the online services provide their own software (Prodigy and America Online, for instance); others work through your standard modem programs. DataStorm Technology's Procomm Plus is the champion in this arena; it's the easiest to use of any of the mainline programs. The Windows version is also excellent.

Conclusion

There's no way I can do more than give you a quick survey of the most popular software that's available. There's so much out there that you'll never get to see

everything that interests you, but look on the bright side—you'll never be bored.

HOME COMPUTING DOS AND DON'TS

Bringing a personal computer into your home creates a whole raft of interesting new problems and opportunities. You'll want to encourage the whole family to use it and become computer-literate, but then you have to deal with occasional logjams when everyone needs the computer at once. You want the kids to enjoy using it, but you don't want them to become so enthralled that they abandon everything else. Kids want to try every new shareware game they find, but you want to keep viruses off the system. It's a real balancing act. Here are a few dos and don'ts to help you through the problems of family life with a new computer.

DO make family computer rules. Contention over who gets to use the computer is best handled by deciding ahead of time what kinds of things take priority. In the Steve and Susan Tufts family of Burley, Idaho, the rules say that homework is the number one priority. Susan had to finish writing her uncle's obituary at Steve's office, because 16-year-old Mark needed the computer for homework. They follow the rules.

In the Wayne and Jeanie Wood family of Salt Lake City, a more primitive system is in force. Wayne jokes that he's at the top of the food chain, so when he needs the computer, he gets it. When the youngest daughter can convince a larger family member (Dad is the most effective) that she needs the computer, the pair of them can put the figurative bite on a lower-order family member.

Play golf in your living room with Links 386 Pro from Access.

Whatever system you devise, having priorities set out from the start can prevent a lot of quibbling and hard feelings. Other effective methods of sharing computer time are sign-up sheets for scheduling the computer, daily allocations of time, and the use of prerequisites, such as no computer games until homework is completely done. Involve the family in setting the rules, and you'll get much better voluntary compliance.

DO find the right place in your house for the computer. The computer needs to be in a cool, dry place out of direct sunlight. Avoid areas with a lot of dust or other airborne particles and stay out of heavy traffic patterns. On the other hand, recognize that it's possible that a family member may spend long hours at the computer. If the system is tucked away in the far corner of the basement, that person may soon feel estranged from the family while computing.

You'll need to balance opposing factors here. You want the computer near centers of family activity to keep the user feeling like part of the family, to allow parental monitoring of computer use and possible squabbling over whose turn it is, and to allow ready access at all hours of the day. On the other hand, you want it isolated from the family to allow a quiet, thoughtful environment for working and studying; to conceal the clutter that often accumulates around the computer; and to protect you from the raucous noise that many computer games generate.

I spend so much time writing that my family voted to bring the computer up from the basement so they could see me occasionally.

DO teach everyone in the family to use the computer. Teach your kids (or have them teach you) the basics of computer use. If there are reluctant family members, find a way to draw them into computer use, perhaps by getting a program that helps with some strong interest. Take classes, read computer books, and, of course, read COMPUTE magazine.

DO take steps to safeguard your physical health relating to the computer. Carpal tunnel syndrome comes from long, frequent keyboard use. A simple wrist-rest pad in front of the keyboard can help significantly. Get a good, comfortable chair and provide good lighting, angled to avoid reflection off the computer screen. Teach the family to take frequent breaks from the computer and exercise their eyes.

DON'T ignore the dangers of computer viruses. Kids have a penchant for trading shareware games and other programs through the neighborhood, each coming into your computer from a disk made on another computer. Computer viruses (programs designed to harm your computer) are spread in exactly this way. Establish rules and teach the kids how to run the antivirus program on every disk before running disk-based programs.

DON'T lose your work or data because you failed to make backups. Making backup copies of the programs and data on your hard drive requires seemingly superhuman effort. It must—why else would so many of us fail to do it? As reliable as hard drives are, they all fail eventually. When yours no longer responds to you, will you lose important work and information because you were too lazy to make backups? Buy a good backup program and use it. Consider a tape backup system if you have

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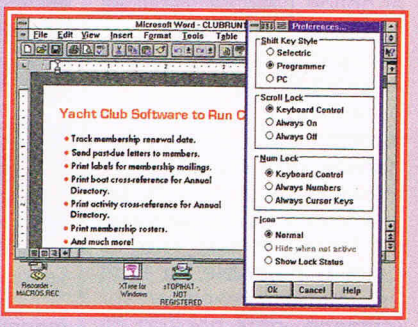

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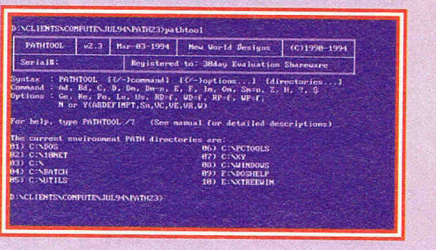

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lots of information that you can't afford to lose.

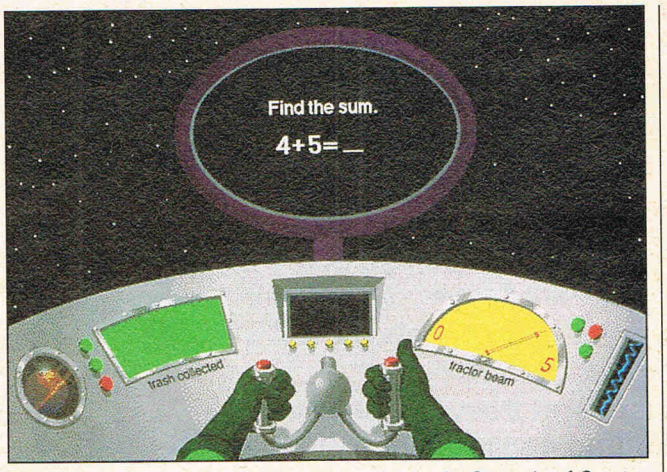
DON'T let modem use get out of hand. You can connect to local bulletin board services (BBSs) and national online network services (such as America Online, CompuServe, GEnie, and Prodigy) through your computer and a modem. The information, services, games, and camaraderie available there are both fun and useful. These services bill by the minute. They're quite reasonable for light use, but if a teenager, for instance, gets hooked on them, astronomical bills can result. Several divorces are on record caused by adults who grew too dependent on BBS contact. By all means, use these marvelous services, but stay in control.

DON'T fail to plan for replacing the computer someday. In three to five years, you're going to need a new computer. Start planning for it now. You might need it sooner than that; if your family takes to the computer like many do, a second computer may be necessary.

A little self-education, planning, and family discipline can make welcoming this new little intruder into your home a painless experience, just as failing to plan can result in all sorts of unpleasant little problems. Think things through and make family rules, and your computer will be a successful addition to your home.

HOW TO MAINTAIN AND PROTECT YOUR HOME COMPUTER

Your home computer represents a substantial investment of more than just money. It takes a lot of time and work to set it up, load programs, create data, and create useful information from that data. It's also well worth a little of your time and effort to keep your computer happy and healthy.



Teach your kids math with Math Blaster: In Search of Spot.

Physical Safeguards

First, a simple family rule that will save you a lot of grief: absolutely no food or drink at the computer. Crumbs, drops of liquid, and inadvertent bits of this and that can get into your keyboard and computer and wreak havoc. Even worse is the danger of a spill—imagine the sizzling light show that you'd get from spilling a mug of pop or coffee into the guts of your computer.

Dust and other airborne contaminants (such as cigarette smoke) are your computer's biggest enemies. It may take a while, but these little particles will find their way into your computer's hard drive and floppy drives, into the guts of your printer, and into other places they shouldn't be. Minimize exposure to these problem-causing materials as much as possible. In particularly dusty or drafty environments, you may want to consider a dust cover to put over the computer when it's not in use.

Power Problems

Protect your computer from injury that comes in through the power lines. I've seen the insides of computers and monitors burned out by momentary power surges. Buy a surge protector—a unit that plugs into the wall, providing protected outlets for you to plug your sensitive equipment into. Computer dealers, office supply dealers, and Radio Shacks have them in a variety of prices.

If you have a modem or fax machine, be sure to protect the phone line as well. I lost a fax/data modem and a stand-alone fax machine when lightning struck in front of a neighbor's house. Don't let this happen to you.

The Three-Finger Salute

Unfortunately, things will go wrong as you work with your computer, requiring you to reboot. When this happens, your first line of attack to cause the reboot should be the three-finger salute: holding down the Ctrl, Alt, and Delete keys together. This resets things and starts the computer over again, just as if you'd just turned it on.

If the computer has really tied itself in knots, as it sometimes does, that won't work. The next step is the computer's reset button—most computers have them now. Without shutting the power down completely, this button causes the computer to reboot.

Why not just turn the power off and back on? Doing so unavoidably causes your delicate computer components some extremely wearing shock. The hard drive motor, for instance, tries to grab already-rotating disk platters to start them spinning again. It's hard on the machine. Always try the other ways first and teach your family to stay away from the power switch.

For the same reason, don't be turning the system on and off all day. You'll use a little bit of extra power leaving it on, but it'll pay off in increased life for your computer.

Software Utilities

The major utility programs (such as Norton Utilities and PC Tools) include preventive maintenance and diagnostic routines that can be extremely helpful. Chief among them are the hard drive–defragmenting programs. There's also one in DOS 6.*x*. To be safe, defragment your disk somewhere between weekly and monthly, depending on your usage patterns.

A Stitch in Time

Take the time and effort now to take care of your home computer, and it'll serve you long and faithfully. ❑

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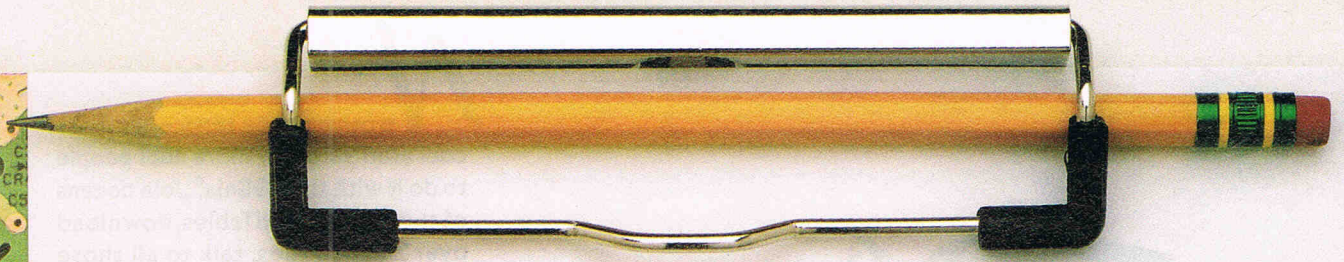

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We want COMPUTE to be as useful and interesting as possible and to provide you with the coverage you want. Please help us by taking a moment to fill out and send us this questionnaire. You can mail the completed questionnaire to us (photocopies are fine) or fax it. Send to COMPUTE Readership Survey, 324 West Wendover Avenue, Suite. 200, Greensboro, North Carolina 27408; (910) 275-9837 (fax).

What computer(s) do you own or plan to buy?

Own	Plan to Buy	
❑	❑	8088/8086, brand_____
❑	❑	80286, brand_____
❑	❑	80386, brand_____
❑	❑	80486, brand_____
❑	❑	Pentium, brand_____
❑	❑	Notebook/laptop, brand_____
❑	❑	Macintosh, model_____
❑	❑	Game system, brand_____
❑	❑	Other _____

Which video display system(s) do you use?

- ❑ Monochrome
- ❑ Hercules
- ❑ CGA
- ❑ EGA
- ❑ VGA
- ❑ Super VGA

Which peripheral(s) do you own or plan to buy?

Own	Plan to Buy	
❑	❑	5¼-inch disk drive
❑	❑	3½-inch disk drive
❑	❑	CD-ROM drive
❑	❑	Dot-matrix printer
❑	❑	Fax modem
❑	❑	Hard disk
❑	❑	Laser printer
❑	❑	MIDI device
❑	❑	Modem
❑	❑	Mouse
❑	❑	PostScript printer
❑	❑	Sound card
❑	❑	Speakers
❑	❑	Tape backup system

How much memory does your computer have?

- ❑ 640K or less
- ❑ 1MB
- ❑ 2MB
- ❑ 4MB
- ❑ 8MB
- ❑ 16MB or more

Which operating system(s)/environment(s) do you use?

- ❑ DR DOS version _____
- ❑ Microsoft Windows version _____
- ❑ MS-DOS version _____
- ❑ PC-DOS version _____
- ❑ OS/2 version _____
- ❑ Other _____

Which parts of the magazine do you like the most?

- ❑ COMPUTE's Getting Started With
- ❑ Editorial License
- ❑ Fast Forward
- ❑ Features
- ❑ Feedback
- ❑ Game Insider
- ❑ GamePlay
- ❑ Hardware Clinic
- ❑ IntroDOS
- ❑ Multimedia Spotlight
- ❑ New Multimedia Products
- ❑ News & Notes
- ❑ Online
- ❑ Programming Power
- ❑ Reviews
- ❑ Test Lab
- ❑ Tips & Tools
- ❑ Windows Workshop

Which of the following computer-related topics do you like to read about?

- ❑ Databases
- ❑ Desktop publishing
- ❑ Disk management and MS-DOS
- ❑ Education
- ❑ Games and entertainment
- ❑ Graphics (paint, draw, or CAD)
- ❑ How to upgrade your PC
- ❑ Integrated software
- ❑ Local area networks (LANs)
- ❑ Money management
- ❑ Multimedia
- ❑ New computer technologies
- ❑ New hardware
- ❑ Pen computing
- ❑ Programming
- ❑ Spreadsheets
- ❑ Telecommunications
- ❑ Windows
- ❑ Word processing
- ❑ Other _____

Where do you use your PC?

- ❑ Home
- ❑ Work
- ❑ School
- ❑ Other _____

Where did you get this copy of COMPUTE?

- ❑ Subscription
- ❑ Newsstand
- ❑ Other _____

How long have you been reading COMPUTE?

- ❑ Less than two years
- ❑ Two years or more

If you have a modem, which online service(s) do you use?

- ❑ America Online
- ❑ BIX
- ❑ CompuServe
- ❑ DELPHI
- ❑ GEnie
- ❑ Internet
- ❑ Prodigy
- ❑ Other_____

Comments

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MULTIMEDIA FAST FORWARD MEGASHOW

BY DAVID ENGLISH

This year's *inter*media show was bigger than ever. In fact, so many multimedia companies wanted to exhibit at the show that there wasn't enough space for all of them.

Among the most exciting CD-ROM titles at the show were five new ones from DK Multimedia (212-213-4800), a new multimedia division of Dorling Kindersley Publishing, the company that supplied most of the graphics for Microsoft Dinosaurs and Microsoft Musical Instruments. The five titles are The Way Things Work, based on David Macaulay's best-selling book of the same name; Stephen Biesty's Incredible Cross-Sections Stowaway!, based on *Stephen Biesty's Cross-Sections Man-of-War,* which shows, in intricate detail, the sections of an eighteenth-century English fighting ship; My First Incredible, Amazing Dictionary, a lively 1000-word dictionary designed for children ages 4 to 7; The Eyewitness Encyclopedia of Science, based on Dorling Kindersley's excellent Eyewitness series of books for kids; and The Ultimate Human Body, which includes 3-D imagery and detailed microphotography. All five titles look great, but prices weren't announced, and the titles won't ship until fall.

Of course, Microsoft (800-426-9400) isn't standing still. It announced five new CD-ROMs: Microsoft Bookshelf '94 ($99.00), which brings one-click access to its seven reference books; Microsoft Complete Baseball ($79.95), which lets you add daily baseball statistics by going online; Dangerous Animals ($79.95), which features 250 animals, 100 videos, and 1000 informative articles; Ancient Lands ($79.95), which lets you explore the ancient worlds of Egypt, Greece, and Rome; and Multimedia Strauss ($79.95), which includes full recordings of "Don Juan," "Death and Transfiguration," and "Till Eulenspiegel."

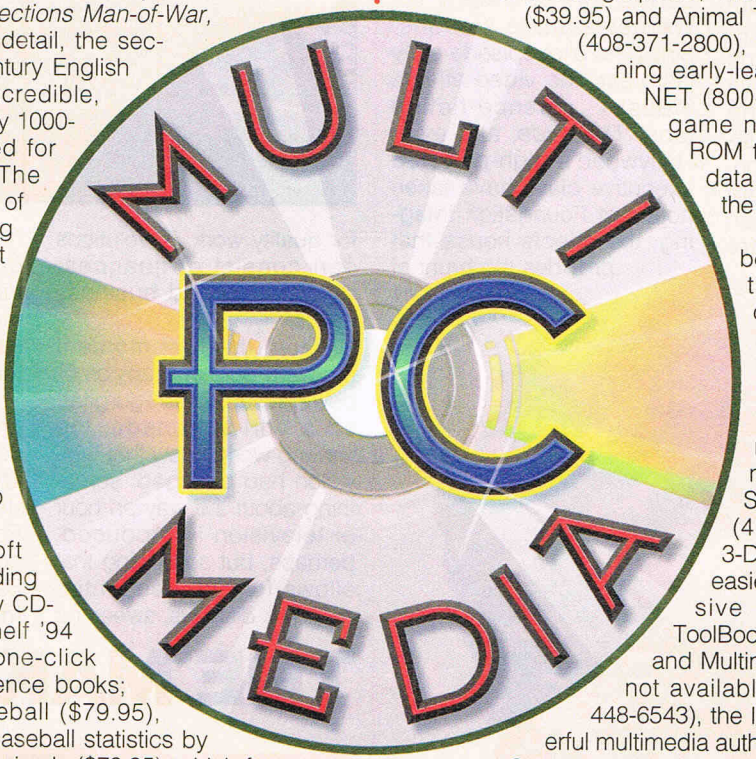
Media Vision (800-845-5870) added three new titles to its growing list of CD-ROMs. They are Grammy's Interactive (price not available), which features performances from 35 years of Grammy Awards telecasts; Road Scholar ($59.95), which tests your knowledge of the different regions of the United States; and Wiggins in Storyland (price not available), a writing program for young children.

A longtime leader in CD-ROM titles, Compton's New Media (619-929-2500) announced two new titles: a John Lennon CD-ROM ($69.95), which is scheduled to ship sometime in the fall, and Babylon 5—The Universal Encyclopedia (price not available), which provides background information on both the fictional universe and the production of the popular science-fiction television series.

Other new CD-ROM titles at *inter*media included MegaRace ($59.95) from The Software Toolworks (415-883-3000), a fast-paced car race that features excellent 3-D–rendered graphics; The Big Bug Alphabet Book ($39.95) and Animal Tales ($49.95) from Avtex (408-371-2800), based on two award-winning early-learning books; and MPG-NET (800-GET-GAME), an online game network that uses a CD-ROM to minimize the amount of data that has to be sent over the phone line.

Along with the large number of new CD-ROM titles, there were quite a few disk-based multimedia applications, including MusicTime 2.0 ($149) from Passport (415-726-0280), an easy-to-use music composition and notation program; trueSpace ($795) from Caligari (415-390-9600), a powerful 3-D modeling program that's easier to use and less expensive than 3D Studio; and ToolBook 3.0 (price not available) and Multimedia ToolBook 3.0 (price not available) from Asymetrix (800-448-6543), the latest versions of the powerful multimedia authoring programs.

On the hardware side, Axonix (800-466-9797) announced the CardStation ($400–$800, depending on the configuration). It plugs into any Type II PCMCIA slot and lets you add various combinations of drives and ISA cards to most notebook computers. Logitech (510-795-8500) announced its new video and audio capture board, which sells for just $299. In addition to capturing video, it functions as a Windows sound board and includes Adobe's Premiere for Windows 1.1. And multimedia audio took a giant leap forward when SRS Labs (714-442-1070) auditioned its SRS 3-D sound technology. It works with both mono and stereo sound and doesn't require the listener to sit in a specific location to hear the effect. ❑



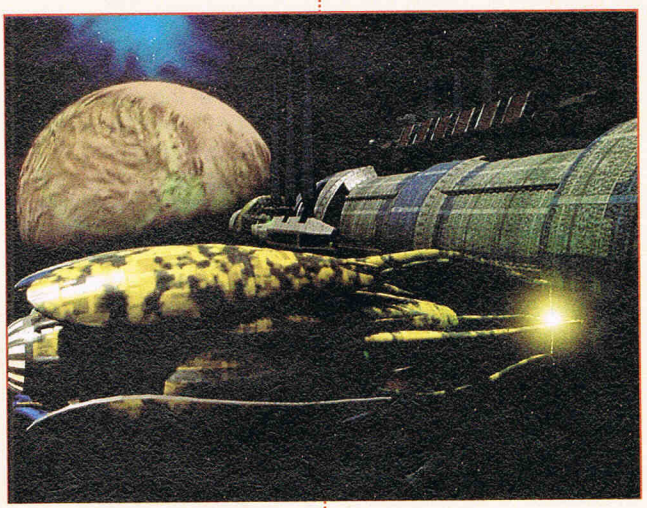
THE MAKING OF BABYLON 5

By David Sears

Digby demands attention. An insistent yellow-haired hound of indeterminate purpose, he has covered my writing hand with friendly saliva. Wet, organic, unexpected—much like the computer graphics the people here create. Scratching Digby's head gives me a moment to bask in the modest aura of Foundation Imaging's unpretentious Valencia, California, offices and to wonder just how this team came together from what seemed nowhere with no money and managed to win an Emmy for outstanding technical achievement within its first year of operation. Digby knows, but in the noncommittal way of an office mascot, he's more concerned with talking to the animators than this transient reporter. Ron Thornton, Foundation Imaging's visual effects director, ambles in to take Digby's place.

Thornton doesn't lick my hand but for all intents and purposes seems just as amiable. Who wouldn't be with a show reel of Foundation Imaging's caliber?

To understand Thornton's success, you must also know something of "Babylon 5," a revolutionary science-fiction television series airing weekly on Warner-affiliate stations. Since the pilot episode early last year, the video effects industry, science-fiction fans, *TV Guide*, and even Hollywood's high-powered executive class have taken notice of Foundation Imaging, the effects house that provides the brunt of computer graphics for the show. What the series and Foundation Imaging prove in tandem is that you simply don't have to spend millions of dollars for quality work. Revolutions can consist of nuances, detail work, and business ethics.



From the first moment the warp gate in "Babylon 5" powered up and regurgitated a Vorlon armada, the viewing world knew that television had changed: something about the way an hour of television is produced, perhaps, but something that allows for unprecedented graphics displays, sweeping dramas, and intense acting, all on a shoestring budget. Overnight, "Babylon 5" was canonized by the pursuants of the desktop video faith.

"There," they said. "It's all done with Amigas and Video Toasters." They also muttered, "I could do that. I can do that. Maybe I will do that."

Anyone interested in producing world-class special effects should talk to Thornton and his partners in the impossible. The Foundation Imaging trinity, consisting of Thornton, Paul Beigle-Bryant as computer imaging director, and

BABYLON 5

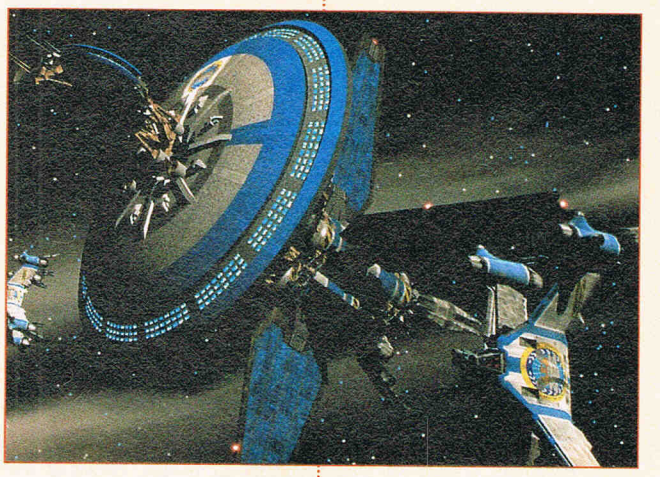
Shannon Casey as producer, has its collective head together when it comes to generating the average of 6000 frames of CG (Computer Graphics) animation seen in each "Babylon 5" episode.

Thornton takes me upstairs to hold council and introduces me to the team. They wax philosophically on the video effects industry, Commodore computers, and attitudes good and bad. Digby soon joins us, flopping languorously on a nearby sofa. He's heard it all before, but he recognizes the importance of being there. Things are afoot at Foundation Imaging—revolutionary, quiet things that echo throughout the entire "Babylon 5" series. There's a reason that Foundation Imaging and everyone else involved with "Babylon 5" share a vision of what the series can accomplish, a reason firmly rooted in their attitudes.

The vision began five years ago when Michael Straczynski—the show's executive producer and creator—put together the initial necessary components for a pilot—script and art included—and made the studio rounds. Eventually, Warner bought into the property and agreed to the proposed budget—a budget far smaller than anyone expected. Could anyone produce a film demanding the level of detail "Babylon 5" required without spending enormous sums of money? Obviously, yes.

Straczynski admits that stringent budgets enforce conservative scripting. For this reason, "Babylon 5" shows us a realistic space station largely unadorned and reserves special effects for special occasions. This logic works well within the milieu of be-lievable space fiction, of course, but it doesn't entirely overrule one-upmanship volleys at "Star Trek: The Next Generation"—the closest thing to a kindred spirit, at least on television.

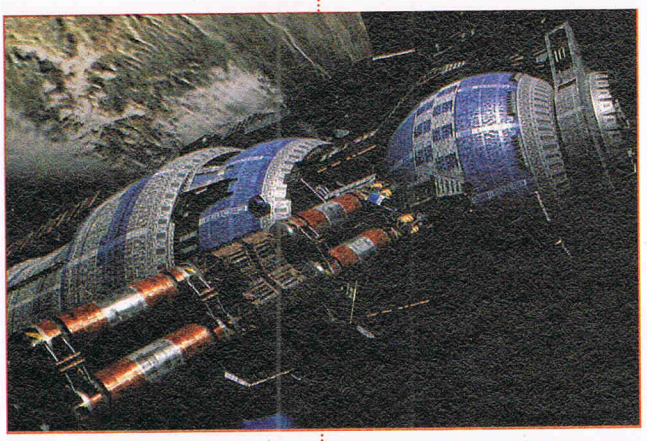
Take the now-classic Vorlon armada, for instance. We never see more than 12 ships onscreen during "Star Trek: The Next Generation," and those are static models. The Vorlon armada numbers in the hundreds, and the ships fly at varying speeds in mesmerizingly disparate directions, a veritable swarm of unearthly alloys and mystery.



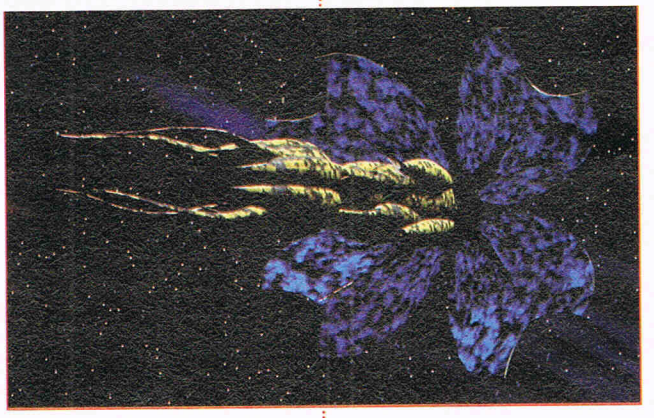
Thornton had immediately seen possibilities well beyond a simple and limited number of looming war craft. A fleet is a fleet, and that's what Foundation Imaging delivered. This constant intent to overkill, to ignore the technology envelope and do what hasn't been done—that's Thornton. And to do it on a limited budget (the golden rule of "Babylon 5" production), Thornton needed inexpensive hardware. He found that in the Amiga, Commodore's multitasking wonder baby, and NewTek's Video Toaster, an add-on graphics card. Thornton, a special-effects designer, renounced physical model construction and embraced CG.

Foundation Imaging houses 24 Amiga 2000s, 16 of which serve as dedicated rendering engines. Each of the 16 packs 32 megabytes of RAM, a Fusion 40 accelerator, and a Toaster. All the Amigas share data through a Novell network and offload data to a 12-gigabyte 486 PC file server. Beigle-Bryant's home-brew task manager parcels out rendering work to each of the Amigas in the rack and ensures that no machine sits idle. Thanks to his clever resource management, the

rendering time for a frame of "Babylon 5" animation averages 45 minutes, not too much more than that required for the less complex models used in the pilot episode. A true technologist, Beigle-Bryant takes pride in the fact that no machine sits through a day without working. Even the animation workstations double as serious data crunchers when the animators themselves take a break.

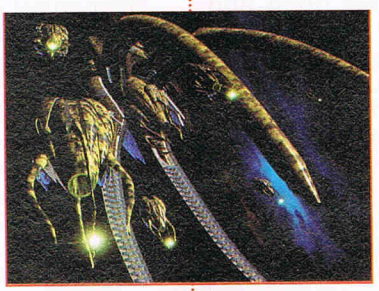


On the sensitive issue of the Amiga's future, Foundation Imaging's opinion is realistic and familiar. "Commodore as a company doesn't exist," says Beigle-Bryant. "There's no new technology coming from Commodore . . . and we have to look at the general market for platform availability." On the other hand, Foundation Imaging doesn't throw away equipment, either, and the team's love of the machines is obvious. The Amigas and Toasters already in place will continue to process graphics data alongside whatever other boxes join them. Foundation Imaging would change a few things about its Amigas, but most notable is the speed of each animator's workstation. Even accelerated, the machines can perform sluggishly at times, leaving the animators to read novels or romp with Digby. Perhaps this is less a deficiency and more a built-in license for good-natured distractions. After all, as Beigle-Bryant points out, to increase the speed of the animators' interface would dump more tasks on the rendering network. As things stand, work progresses at a comfortable pace.



This discussion raises serious concerns about NewTek's future. Its Toaster, after all, works only with Commodore Amigas. Foundation Imaging makes it clear that NewTek is a forward-looking company and is aware of the steps it must take to succeed.

This leads me to inquire as to just how eager Foundation Imaging is to invest in new technologies, perhaps PC based, or even to use high-end Silicon Graphics workstations. As for the PCs, Beigle-Bryant notes that data is data and the network taskmaster could be tweaked to support parallel processing on a network made up of PCs and Amigas. Currently, NewTek's Lightwave software requires a Video Toaster to run; it could conceivably be rewritten to run on any machine. As to whether NewTek has begun such a project, Beigle-Bryant can't comment, but industry scuttlebutt has long predicted a PC-compatible version of the Toaster. So why not a PC Lightwave package? Furthermore, NewTek's very sexy rendering engine, the Screamer—though still living a beta-version existence—promises Silicon Graphics power at a reduced price. This hardware, too, has found a home at Foundation Imaging.



Is Foundation Imaging otherwise satisfied with its Amiga-Toaster assembly? Not entirely. The company's overwhelming desire to break the rules of what can and cannot be done for television has led the team to believe that a major upgrade to the network will have to occur in the next five to six months.

According to Thornton, the overall look for the series may be set, but the things Foundation Imaging intends to do beggar description. More CG-generated interiors, more sophisticated models still. The hardware direction Foundation Imaging will take remains off the record, but Thornton admits to using PCs and Macintosh computers for various effects seen in the show and for touching up some Amiga-generated images. What probably won't happen, unless Silicon Graphics starts giving machines away, is an upgrade to Silicon Graphics workstations. Prohibitively expen-

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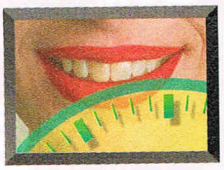
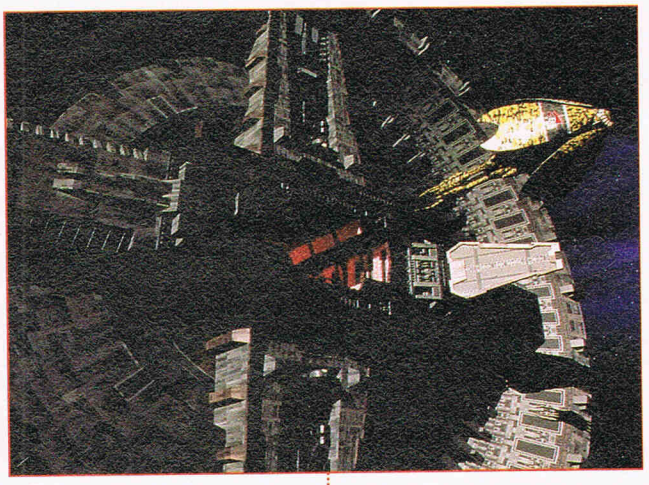


sive, that hardware could break a rough-and-tumble outfit such as Foundation Imaging. The team is quite proud of the fact that its entire stock of personal computers costs less than a single Silicon Graphics Reality Engine and that the results are nevertheless remarkable.

Admittedly, no one will mistake the CGI (Computer Graphics Interface) space sequences in "Babylon 5" for the real thing. Ships gleam with an unearthly sheen—but the believability factor depends on how the craft moves, and Foundation Imaging can squeeze a great deal of motion out of Video Toasters and Lightwave software.

"The goal wasn't to make it look not CGI, but to make a cool shot. Design should come first. If it looks cool, great," says Thornton. For an upcoming episode, Foundation Imaging outdid expectations yet again by tackling organic modeling—creating a functional (and dangerous) creature bent on eating brains. This is only the second time that an entirely computer-generated beast has appeared on television; "seaQuest DSV" takes pioneering honors for its squid. It's worth noting, though, that the "seaQuest DSV" team used Amigas and Toasters to create its creature in much the same way that Foundation Imaging created its brain feeder.

Selling the "Babylon 5" crew on the concept of a fully CG monster wasn't easy. Thornton began pitching the idea many months ago and, even after convincing everyone involved that Foundation Imaging could do the job, still had to contend with a bit of trepidation. In effect,



the director kept the actors largely in place, forgoing what he feared was too much motion for the special effects to handle. In the end, the brain feeder looks believably sinister and moves much like any one-legged parasite would. The actors appear a bit silly because they don't move with as much frenzied activity as the creature. With this lesson learned, however, we can expect more daring experiments from Foundation Imaging and "Babylon 5."

In essence, Foundation Imaging isn't so much a CG house as an effects house. Its motto distills to Whatever It Takes, and the team at Foundation Imaging believes this. Thornton has no problem combining physical models or arrangements with CG images. A CG planetscape often looks ridiculous when viewed from space. Why bother, reasons Thornton, when you can scan a picture of a model and expect it to yield believable results? The same holds true for machine textures—just build a miniature and scan away. This saves the art team a remarkable amount of time, and the product looks great. Of course, these down-and-dirty methods upset some Hollywood types. Foundation Imaging has lost jobs because the team wouldn't agree to follow unnecessary procedures and waste valuable computer time. Perhaps the ability to save money frightens adherents to the high-end status quo; perhaps the results of ingenious modeling efforts and superior art direction have startled a slumbering Tinsel Town into a predictable arrogant panic. Perhaps.

What's certain? Foundation Imaging does work of superior quality on dreadfully slim budgets. If Warner renews "Babylon 5" for another season, Foundation Imaging intends to generate more stunning CG effects than any other television series. If not, the company will find work doing great things its own way, with people who recognize the team's vision for what it is: breathtaking. ❑

Babylon 5—The Universal Encyclopedia

Want to learn more about the universe and production of "Babylon 5"?

Compton's NewMedia and Warner Bros. Consumer Products are teaming up to release Babylon 5—The Universal Encyclopedia. This CD-ROM contains multiple pathways, including The Universe of Babylon, which describes the space station and its inhabitants; Aliens, which provides an encyclopedic description of the aliens and their home worlds; and Technology, which includes technical specifications for the high-tech tools used throughout the show, as well as the space station itself.

You can also step outside the fictional world of "Babylon 5" and explore how the series is created. You can choose Special Effects, which gives you a look at Foundation Imaging's Emmy-winning visual effects, or Behind the Scenes, which offers a peek at the actual production of the show.

An original bound "Babylon 5" encyclopedia will accompany the disc. The title should ship sometime this fall.

—DAVID ENGLISH

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NEW MULTIMEDIA PRODUCTS

EDITED BY POLLY CILLPAM

I Spy

Activision will develop and publish a series of interactive espionage thrillers under the direction of William Colby, the former director of the CIA. The first CD-ROM title is scheduled for early 1995.

"His firsthand experience makes him the key to successful, one-of-a-kind, true-to-life espionage thrillers," says Bobby Kotick, CEO of Activision. "The William Colby line will have all the elements of a major motion-picture release: high-quality Hollywood production values, recognized talent, feature-film-quality sound effects and music, and an intriguing script by a well-known screenwriter."

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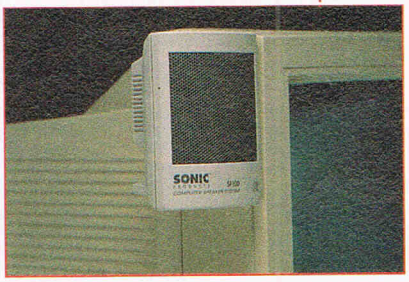

SP100 Computer Speaker System

Supersonic

How about a pair of speakers for your PC that combine great price, magnetic shielding, and easy installation? That description fits the SP100 Computer Speaker System from Sonic Products, which costs only $14.95. Most speakers aren't magnetically shielded and, therefore, aren't designed to be used with computers—their magnets can distort your monitor. And when a speaker's magnet gets too close to a floppy disk, it can cause irreparable damage to your files.

The SP100 speakers use your sound card's amplifier. Every major sound card has a built-in amplifier, so why pay more for amplified speakers when your sound card has that feature built right in? Installation is easy because all the cables and connectors you need are included. Simply plug the speakers into your sound card and adjust the card's volume, and you're ready to go. No batteries or power adapters are required.

This speaker system works with all mono, stereo, 8-bit, and 16-bit sound cards, including Sound Blaster, Pro AudioSpectrum, and Windows Sound System. You can even use your SP100 speakers with a consumer audio device, such as a Walkman or CD player. Simply plug the speakers into the headphone jack.

The Reno Personal CD-ROM Player plays audio CDs, too.

Sonic Products
(415) 948-0500
$14.95
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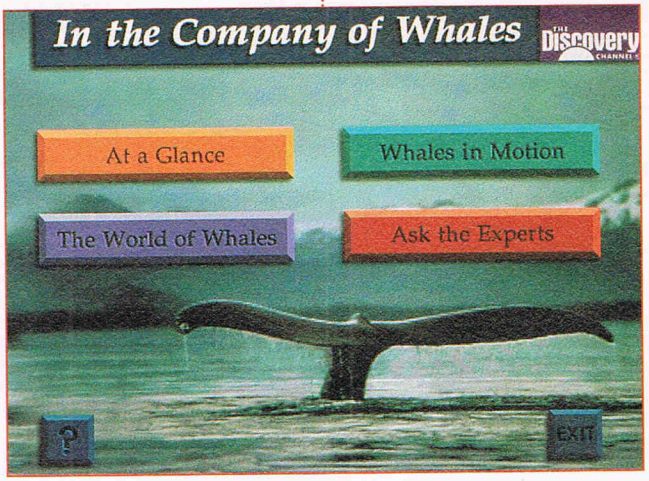
Whale Watching

Did you ever want to go whale watching but were afraid it would be too risky? With the computer program In the Company of Whales, you can watch the whales and not even get wet!

This program is the first in a new series of CD-ROM products and represents the cream of the crop of Discovery Channel specials. The program consists of hypertext glossary words, 45 minutes of exclusive video, and more than 200 still images and graphics, allowing viewers to probe and explore the world of this spectacular species. It's narrated by actor Patrick Stewart and provides video segments of four experts and their thoughts on a variety of questions.



In the Company of Whales lets you swim with the gentle giants.

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(301) 986-1999
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Portable Multimedia

Media Vision recently introduced the Reno Personal CD-ROM Player, which is a high-performance double-speed external CD-ROM drive that can operate with either nicad batteries or AC power. Reno lets desktop and notebook PC users play CD-ROMs or standard audio CDs in their offices or homes, or on the road.

The strength of the Reno is its versatility. When it functions as a stand-alone audio CD player, it can play musical CDs either when it's stationary or while it's being carried. Lightweight and compact in size, the Reno player can be easily transported by hand, in a shoulder bag, or inside a briefcase.

When connected to a notebook or desktop computer via a SCSI connection, it can also function as a CD-ROM drive. As such, it offers high performance and reliability and meets the MPC Level 2 specifications.

Media Vision
(510) 252-4472
$349–$549
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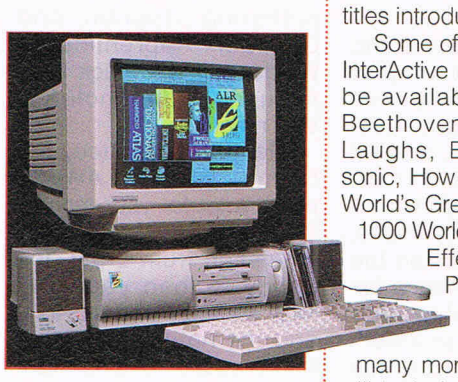
A Multimedia Bargain

How about a 50-MHz 486DX2 multimedia computer for a song? Or close to it at $1,995! The new ALR MULTIMEDIA EXPRESS includes 4MB of RAM, local-bus video, a 250MB hard drive, four CD-ROM titles, a two-button mouse, and a 14-inch color VGA monitor.

The EXPRESS exceeds the MPC Level 2 specifications, so it will be compatible with the next generation of multimedia software. Included are a multisession (Kodak Photo CD–compatible) double-speed CD-ROM drive, a state-of-the-art 16-bit stereo audio



ALR's MULTIMEDIA EXPRESS

card, and external stereo speakers. The advanced audio card uses a DSP (Digital Signal Processor) to accommodate future software upgrades, including wave-table synthesis, QSound multi-dimensional sound placement, and MPEG audio encode/decode compression. The audio card is also compatible with Sound Blaster, Ad Lib, and Windows Sound System.

In addition, the EXPRESS's hard drive comes preloaded with Windows 3.1, DOS 6.2, Voyetra Multimedia Sound Software, and HSC Interactive Special Edition. The four CD-ROM titles are Microsoft Bookshelf, Great Wonders of the World (Volume 1), The San Diego Zoo Presents: The Animals, and Where in the World Is Carmen Sandiego? (Deluxe Edition).

Advanced Logic Research
(714) 581-6770
$1,995
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Product Onslaught

InterActive Publishing has announced that it will introduce 50 CD-ROM titles before the end of the year and predicts that the industry as a whole will see 10,000 titles introduced by 1996.

Some of the products from InterActive Publishing that will be available this year are Beethoven's 5th, A Million Laughs, Eternam, Supersonic, How Things Grow, 250 World's Greatest Music Clips, 1000 World's Greatest Sound Effects, Interactivity Packs, Teddy's Big Day, Ask About Dinosaurs, and many more. The categories will include education, multimedia utilities, "Intertainment," and knowledge enrichment.

According to InterActive Publishing's chairman, Harry Gos, "From 1986, when CD-ROM drives were first introduced, through the end of 1993, fewer than 10 million units had been sold worldwide. We project that in 1994 alone 12 million units will be sold—with half of the total installed base in the hands of consumers. We further project that it will take until the end of this century for CD-ROM drives to achieve an 80-percent household penetration. By 1996, media superstores will regularly carry over 10,000 CD-ROM titles in various formats."

InterActive Publishing
(914) 426-0400
Prices vary.
Circle Reader Service Number 535

Meet Wanda the Worm Woman in The Freak Show.

A Freak Adventure

If you've always wanted to hang out with some true freaks, here's your chance. The Freak Show is an interactive comic book illustrated with animation, graphics, original sounds and music, startling characters, and unique stories. It's the first CD-ROM release by The Residents, the notorious San Francisco performance group. The artwork has a three-dimensional interface and was designed by award-winning computer graphics artist Jim Ludtke.

The Freak Show begins at a circus tent entrance. The Residents' iconic eyeball logo appears on the screen and lures you into the tent. Once inside, you interact with the freaks by clicking on five elaborate stages. For example, click on Wanda the Worm Woman's platform to call her from behind the stage curtain. Wanda then emerges to perform her worm-eating act. Other featured characters are Benny the Bemp, Jelly Jack, and Harry the Head. If you're the adventurous type, you can explore the freaks' trailers outside the main tent by sneaking past a NO ADMITTANCE sign. The trailers contain access points that are revealed by the eyeball icon. If you click on items within the trailers, you can discover the many eccentricities that shape the freaks' personal lives.

The Residents are known for their innovative music and their experimentation with film, video, and new technologies. They have released more than 20 albums as well as several video works, TV and commercial music scores, and a graphic novel.

The Voyage Company
(212) 431-5199
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MULTIMEDIA SPOTLIGHT

By David English

SOUND BLASTER AWE32

With so many sound cards available, it takes a lot to make one card stand out from the others. Creative Labs' new top-of-the-line sound card does just that. It includes a powerful E-mu Systems DSP (Digital Signal Processor), lets you load your own MIDI samples to the on-board 512K of RAM (upgradable to a whopping 28MB), and features the best text-to-speech engine you're likely to hear on a PC anytime soon. In short, this is one feature-packed sound card.

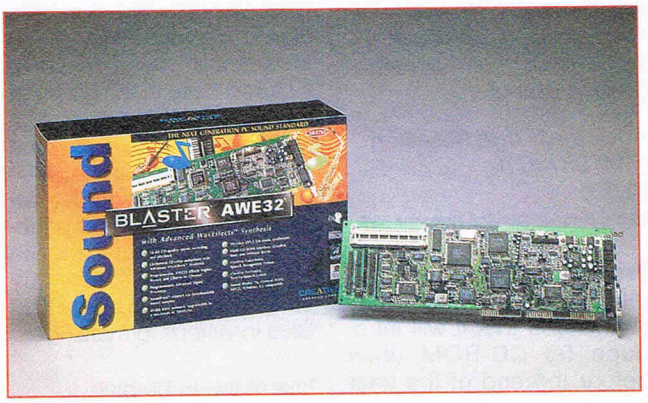
First, the basics: In most respects the Sound Blaster AWE32 is a standard Sound Blaster 16. It performs both 8-bit and 16-bit stereo sampling and playback; has a standard four-operator, 20-voice stereo FM synthesizer; features a built-in amplifier; and includes the usual ports and interfaces for microphone, stereo line-in, CD audio, speaker, stereo line-out, joystick, MIDI (with an optional $79.95 MIDI kit), and CD-ROM drive (currently Sony, Mitsumi, and Creative Labs drives—but no SCSI drives).

You also get Creative Labs' ASP (Advanced Signal Processing) chip, which is available now as an option on most of the company's 16-bit sound cards. The ASP chip functions as a DSP, letting you add sound effects such as QSound, which lets you place sounds anywhere along a 180-degree space.

The Sound Blaster AWE32 also has an E-mu Systems EMU8000, a chip new to the Sound Blaster line. Creative Labs owns E-mu, so it's no surprise that Sound Blaster cards are starting to use audio technology from this outstanding keyboard-synthesizer manufacturer. The E-mu chip is yet another DSP that lets you add what Creative Labs calls Advanced WavEffects. With Advanced WavEffects, you can turn your AWE32 into a standard General MIDI card, a Roland Sound Canvas, or a Roland MT-32. You can also add reverb, chorus, and pan to your wave-table MIDI instruments (features that aren't currently offered with the Wave Blaster, Creative Labs' General MIDI daughterboard). The instrument sounds are excellent, as you would expect from E-mu, but you can also load your own sampled sounds into the card's RAM, essentially turning your AWE32 into a music-sampling workstation (the kind that cost about $2,000 just five years ago). Allowing you to bring the on-board RAM up to 28MB means this board will attract serious attention from professional musicians.

The other major improvement is AWE32's TextAssist programs. These are five text-to-speech programs that use Digital Equipment's innovative DECtalk technology. Most text-to-speech programs sound too robotic and mispronounce too many words to be of much use. The TextAssist programs feature realistic voices and are significantly more accurate than other systems running on PCs.

How realistic are the voices? They actually have names and personalities. The package ships with nine voices: four adult female, four adult male, and one child. For example, Dennis has a breathy male voice, Wendy has a whispery female voice, and Kit has a child's voice. In most cases, you wouldn't confuse them with real voices, but if you didn't listen too closely and there was a fair amount of background noise, you could be fooled. The voices really are that good.



The Sound Blaster AWE32 features a new E-mu Systems DSP chip.

The five TextAssist programs that ship with the AWE32 are all Windows programs. They are Texto'LE, which lets you embed text-to-speech objects into OLE client applications; TextAssist Reader, which can speak text files out loud; Talking Scheduler, which verbally reminds you of your appointments; TextAssist Control Panel, which lets you create new voices, customize old voices, and associate voices with your Windows applications; and TextAssist Dictionary, which lets you customize the pronunciation of words. (By the time you read this, the TextAssist programs should be shipping with all Sound Blaster 16 cards that have the ASP chip. Current owners of Sound Blaster 16 cards with the ASP chip can order the TextAssist upgrade kit for $29.95.)

The package also contains a strong selection of audio applications and utilities, including Creative VoiceAssist, an easy-to-use speech recognition system; Creative WaveStudio 2.0, a Windows-based WAV file–editing program; HSC Interactive (Special Edition), a scaled-down version of the powerful multimedia authoring program; and Cakewalk Apprentice for Windows, a 256-track MIDI sequencer that includes staff notation.

Despite the price, the Sound Blaster AWE32 offers a lot for your money. The versatile General MIDI emulation from E-mu, the ability to load your own MIDI samples into memory, and the natural-sounding text-to-speech engine make this card a great choice for anyone looking for state-of-the-art PC audio.

Creative Labs
(800) 998-5227
$399.95

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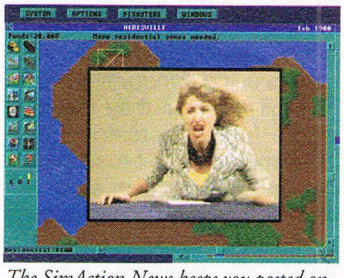
"Welcome to SimCity® CD-ROM!"



The SimAction News keeps you posted on daily disasters and other headline news.

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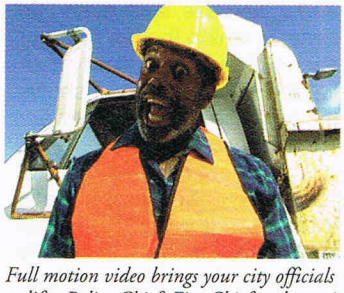

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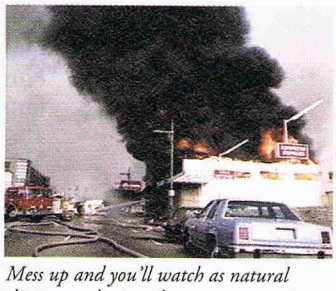

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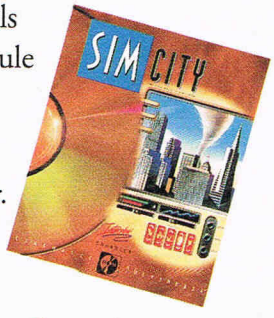

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PRODUCTIVITY CHOICE

This powerful Windows database manager is fully Mac compatible and awesomely easy to use.

Tom Campbell

FILEMAKER PRO 2.1

FileMaker Pro 2.1 from Claris is that rarest of creatures in the database world: a program that gives you substantial power and a blessedly short learning curve. Indeed, this is probably the best Windows database product a nonprogrammer can buy. And it's equally ideal for programmers weary of learning new languages every time they want to accomplish a task of low-to-medium complexity.

Like many database managers, FileMaker is feature-laden, but like no others, it has a design that makes those features so easy to use that it's hard to imagine they could be implemented any other way. This isn't surprising given FileMaker's lineage: Claris is an Apple-owned software company that develops uniformly excellent products with the kind of interface that made the Mac so popular. Its brilliant Windows products retain both compatibility with the Mac versions and the fit and finish that brought the Mac software such renown.

Creating a database with FileMaker is easy. You don't have to worry about creating indexes or setting maximum lengths for text fields—you don't even have to worry about numeric format. Yet if you're interested in constraining data to values in a list, pulling it out of another database, or calculating numeric, text, or date values, FileMaker lets you do so without a lick of programming.

Creating a data entry form is a snap, and it makes fantastic use of what appears to be a minimal tool set. You can create as many forms as you need, and you can attach actions to graphic objects on the forms.

FileMaker does so many things right that it's caused me to rethink the standards I use to measure the usefulness of other software. Most database managers have form designers you use to create the data entry screens and separate query modules for constructing the filters you need to locate data in a meaningful fashion. With FileMaker, you won't even find the word *query* in the index. To find a record, you simply click on the mode selector at the bottom of the screen and choose Find; a duplicate of your data entry form comes up. You enter the values and click on the Find button, and a subset of records matching your criteria pops up. This is one of those obvious features that other products are now only beginning to offer.

The powerful text-editing abilities set more new standards. FileMaker is the only database manager I know of that lets you use more than one kind of typeface or text style in a field. In most other database managers, you have rudimentary text editors using Windows' built-in capabilities—but they impose single font/style restrictions. This limitation has broad implications: You can't underline or italicize words in a cover letter, much less employ different typefaces. FileMaker lifts all those restrictions and surpasses expectations. Not only do you get unlimited fonts and text styles in a single field, but you also get strikeout, double underlining, small caps, upper- and lowercase, and even title case, in which the first letter of each word is automatically capitalized. The font menu shows the typeface names in their actual typefaces.

You also get the benefit of a spelling checker, one that's integrated logically into the day-to-day operations of the database. It can check selected text, a single word, the current record, all the records found in a query, or the entire database. It can, if you want, check as you type, beeping or flashing the menu bar when you err. The dialog box

avoids the word you're checking, positioning itself in a screen section away from where you're typing.

In any database manager there's a wall in application development, a point at which your needs can be met only with a programming language. Most of the time, you'll do just fine without programming, but as your needs grow, so does the likelihood that the database manager won't do something you need it to do. If the database manager doesn't have a programming language, you're hosed. If the language is too complicated and you're not a programmer, you're greatly inconvenienced (at least), having to rely on a friend's help or hire a consultant. Claris has redefined the problem neatly with its automated ScriptMaker.

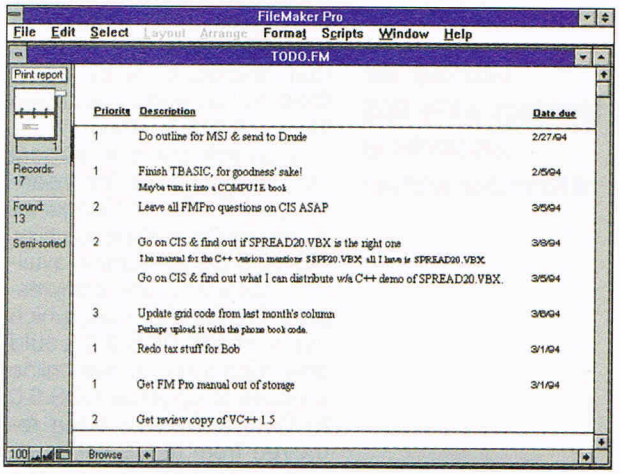
Using ScriptMaker, you construct a command sequence by choosing commands from a list box and attaching them to a button or a menu. When you add a command to your script, its options appear in the ScriptMaker dialog box, and you check them off or enter parameters from a supplied list. As a programmer I'm naturally somewhat skeptical of this approach, but ScriptMaker does a fine job of meeting most of my programming needs.

Interestingly, there are tasks the ScriptMaker programming facility makes harder than they have to be. For example, there's no convenient way to put up a dialog box with a user-defined message and caption with a single OK button, or to put up such a dialog with a line for data entry. In C, Visual Basic, or C++, this is literally a one-line program statement. In FileMaker, you must simulate it using the program's form designer to create a form, add a graphic box and text over the box to create a button, use a ScriptMaker command to display the form and put up the message, and then use another ScriptMaker command to hide the form. It would be nice if my dialog for entering a log-in name could be a built-in script element.

Creating a command button is also harder than it has to be. You have to draw it yourself using the square, circle, or rounded square tools; put a picture on the button if you like; and then add the text to the button. While this can be great in that you can create an infinite variety of cool-looking buttons, you aren't given access to the standard Windows command button that virtually any programming environment treats as a given.

But overall, FileMaker's astounding use of the Windows user interface to keep you away from programming goes a great deal further than I had expected it would. The Entry Options dialog, which allows you to set conditions and perform operations on data entered into a field, allows you to do things with a few mouse clicks that I would have sworn required programming. That ability, I think, is at the heart of FileMaker's genius: Not only is the programming facility about as far from programming as it could be, but you seldom need to dip into it at all.

The FileMaker documentation is well written and gorgeously produced. One unique feature is a small manual detailing the sample applications, called templates. Most other programs' sample apps fall pitifully short of meeting real-world needs, but FileMaker's are terrific. The Contact Manager template, for example, gives you a call log, an automatic fax creation for the selected customer, a label maker, envelope printing and Avery label support, and a cover letter. The Products template contains a catalog of products replete with images, a vendor listing, and an order form. And the Expense Accounting template generates a tax form, has a spreadsheetlike data entry form, and gives you a monthly deposit summary. Network support is extensive, complete, and so well implemented that you won't even know it's there.



FileMaker is easy to use, grows with your needs, comes with a great selection of sample files, and comports itself well in a multiuser environment. If you want Mac compatibility, look no further—the Mac and PC versions are virtually identical and even support the same picture formats. FileMaker is not the least expensive database manager, but it's worth every cent. ❐

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INTRODOS

Tony Roberts

IN THE CLOUDS

Counting our blessings while DOS succumbs to internecine warfare

At this writing, there are clouds all over the DOS horizon. By the time you read this, the haze may have cleared, but here's a rundown of the current state of confusion.

A jury has decided that the DoubleSpace disk compression utility found in MS-DOS 6.*x* infringes on two patents held by STAC Electronics, the maker of Stacker, also a disk compression product. The same jury also found that STAC had borrowed an idea about advanced preloading from Microsoft. The result is that Microsoft owes STAC $120 million and STAC owes Microsoft $13.7 million.

Microsoft plans to appeal the judgment, but in the meantime, MS-DOS will no longer include the DoubleSpace utility. MS-DOS 6.2 will remain available, just without disk compression. The StepUp files, which users of MS-DOS 6.0 could download from various online services to upgrade DOS 6.0 to DOS 6.2, have been removed from those services. End users who already own MS-DOS products containing the DoubleSpace utility are not affected by the judgment.

In a related development, IBM, which had scheduled an announcement about the release of its PC-DOS 6.3, circled the wagons and delayed its news conference for an unspecified period. PC-DOS 6.3 was expected to be functionally equivalent to MS-DOS 6.2.

And on another front, Novell is sending out upgrade notices for Novell DOS 7, the latest incarnation of DR DOS. DR DOS is the Rodney Dangerfield of the DOS world, getting very little respect even though, feature for feature, it's usually a step ahead of MS-DOS and PC-DOS. The upside for Novell, at this time, is that Novell DOS 7 uses Stacker disk compression, so that distribution of its product apparently isn't affected by the STAC/Microsoft suit.

Other features of Novell DOS 7 are: built-in peer-to-peer networking; DOS protected mode services; preemptive multitasking; and a set of Windows utilities, including file backup, virus protection, and LAN administration.

One of the nifty features MS-DOS 6.*x* provides is the ability to bypass or to step through your startup files when initializing your computer. When you switch on the machine, you normally hear a beep as MS-DOS begins taking control. Press F5 within two seconds of that beep, and you're at the DOS prompt in a flash. No waiting while CONFIG.SYS and AUTOEXEC.BAT do their respective dances. This is known as a clean boot.

Press F8 to step through the commands in your startup files one by one. As each command is displayed onscreen, you press Y or N to tell the computer whether you want to execute the command or ignore it. This procedure is called an interactive boot.

It's also possible to have DOS prompt you regarding the execution of individual commands as it works its way through the CONFIG.SYS file. This is done by appending a question mark to the command on the left side of the equal sign. If you have a scanner, and sometimes you want the scanner driver loaded, but other times you want to conserve that memory, use a command like DEVICE?=SCANNER.SYS, and DOS will prompt you for instructions each time you boot up.

Having this control over your startup files is an indispensable benefit when you're trying to see why an error message keeps popping up. As you step through each command, you have plenty of time to examine and analyze the results. Being able to skip the startup commands entirely is perfect when you want to defrag your hard disk, a chore that's best done when the system's set up in bare-bones fashion with no TSRs competing for attention.

Helpful as it usually is to have this control over your startup files, sometimes it becomes a problem. In some situations, you don't want users to be able to take control of the system. Perhaps you require users to enter a password when they start the computer, or you like to limit users to certain options displayed in a menu. How can you keep them from pressing F5 or F8 to take control of the system? Insert SWITCHES=/N anywhere in the CONFIG.SYS file, and the F5 and F8 options will be disabled.

If you want to accelerate your boot-up, add the command SWITCHES=/F to CONFIG.SYS. This eliminates the two-second delay that occurs before MS-DOS starts executing. As mentioned previously, this two-second delay gives you time to press F5 or F8 before MS-DOS starts executing the startup files. However, if you use the multiple configuration commands to create a CONFIG.SYS menu, your system will pause at the menu, so the delay is superfluous.

Finally, those who've installed MS-DOS 6.2 may be dismayed by the long memory test that runs when the Himem program is executed from within the CONFIG.SYS. This test is more complete than the typical power-on self test, but it can take a while to perform, especially if you've installed megabytes of extra memory. You can disable the test by adding the command /TESTMEM:OFF to the end of the DEVICE=HIMEM.SYS line. ❐

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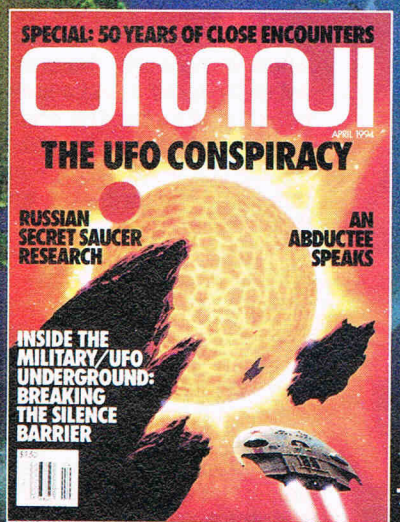

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DISCOVERY CHOICE

This isn't the same old song and dance—it's simply one of the best interactive discovery programs available for young children.

Peter Scisco

TUNELAND

Saturday-morning cartoons were never like this. Take one stand-up comic with childlike wonder; mix with great traditional kids' songs, classic nursery rhymes, and topnotch animation; and put it all in a technically sophisticated program that's as easy to use as a push button. TuneLand, from 7th Level, is without a doubt one of the best multimedia discovery programs yet created for children.

TuneLand is kid country, through and through. Children start the game in the barnyard, from which they can see all of the game's eight different locations. Moving from one place to another is as simple as clicking the mouse. Shortcut keys are also available (Shift-P to visit the pond, for example), so parents can take kids quickly to places they want to go.

Each scene, from the barn to the train station and everywhere in between, features a set of characters and a songbook full of tunes. The charm of the program pops out in the complete interactive nature of the characters and their surroundings.

But the emphasis here isn't on moving from one place to another. Rather, the real play happens when kids are free to explore TuneLand however they see fit. They get plenty of direction along the way in the form of cartoon-character guides, who introduce themselves when kids enter a scene for the first time. After that, when kids want to move to another scene, they just click on their guide, who whisks them away.

At each location, a mouse click causes the game's characters to break out singing or to act out traditional children's verses like "Jack and Jill" and "Hey, Diddle, Diddle." Hot spots launch clever little animated bits that will have kids squealing with delight.

The disc is packed with wonderfully produced music. Each song is tied to a specific scene, according to its theme. When kids visit Grandma's kitchen inside the farmhouse, they can sing along with such classics as "Three Blind Mice," "I'm a Little Teapot," and "Hickory, Dickory, Dock." A jazzed-up version of "Pat-a-Cake" is worth the price of admission. Not only will kids start singing, but they'll also clap their hands to the beat when the gingerbread man encourages them to join in.

Each of the other seven scenes includes as much song and dance as the farmhouse. Down at the pond, the fish and frogs and other animals belt out songs like "Row Your Boat" and "A Sailor Went to Sea." For real high-flying, hoedown, hootenanny action, go inside the barn. Buck Owens and Roy Clark don't have anything on the chickens, turkey, and horse who live there. They do some pickin' and grinnin' for "Turkey in the Straw," "Shoo Fly," and "The Old Gray Mare," among others.

Toddler train lovers will enjoy the train station, with that old pufferbelly favorite "Down at the Station." And clicking on the engineer sends the locomotive up the mountain. You can guess who'll be coming 'round the mountain, driving six white horses. Those six goofy horses will send kids around the bend with the giggles. On the mountain, kids can meet Jack and Jill, who make their ill-fated trip for that troublesome bucket of water.

Out in the pasture, the dish runs away with the spoon, and the moon politely dips down so that the cow can make her famous leap. A little girl named Mary and her pet sheep make an appear-

ance in the pasture's open field, as does that twinkling wishing star.

The program even has a jukebox mode, which lets parents and kids play the songs without running the main program. Families facing another bleak night of television can choose kid karaoke instead. Because the CD-quality music is piped directly from the CD-ROM, it can also be played on an audio-CD player. I don't recommend that, though—without a listing of musical tracks, it's hard to pinpoint where the music is on the disc.

The music and the charming characters are enough to make TuneLand a fine program, but there's more. During their explorations, kids can discover new ways to use the characters they meet. The trees at Grandmas's house, for example, play music. Some of them make bell sounds or hip-hop percussion when activated with a mouse click. By clicking on different trees, kids can create their own mixes.

And a game of hide-and-seek threads its way throughout the entire game. TuneLand's chief guide, Lil' Howie, is a young bear who can find the most unlikely places to conceal himself. Kids and parents alike will get a kick out of chasing him from one screen to the next. The voice characterization of Lil' Howie is performed by Howie Mandel—now that's an entertainment trivia question not likely to find its way into any board game.

Animated sequences and humorous bits grace the program. As with other interactive CD-ROM titles, children are free to click wherever they like on the screen. If they hit a hot spot (and the program is loaded with them), they get a visual snack. Clicking on a rocking chair plays an electric guitar riff and the voice of Wolfman Jack. (Not the real Wolfman—the voice impressions are performed by a studio of voice actors.)

In the barnyard, there's a bluesy chicken standing near the fence (jazz fans will get the reference to Yardbird). It's these little touches—delighting kids while entertaining parents—that make TuneLand so remarkable. It sure beats glazed eyes staring at the latest video release.

In general terms, TuneLand outshines its kids' multimedia competitors from a technical angle. Each animated tidbit is accompanied by excellent sound effects, which are broadcast through the computer's audio card. Because the music is reserved for the CD-ROM drive, it's not necessary to have a 16-bit audio card to enjoy the program. A less expensive 8-bit card reproduces the zany sound effects and character voices without any major sacrifices in quality.

All of the songs and some of the narration are piped right from the CD-ROM, giving exceptional clarity. For that matter, the entire program runs fine from a single-speed CD-ROM drive (within the MPC Level 1 specifications). Owners of double-speed drives may appreciate better synchronization between the animation and the sound, but single-speed owners won't be disappointed in the effects.

The look of TuneLand is radically different from that of most of the other programs in this genre because it uses cel-based animation, such as that used in animated feature films. The result is readily familiar to anyone raised on Disney cartoons. The props, scenery, and moving characters are sharply defined on the screen, without rough edges or quirky angles.

Installation and operation are trouble-free and simple enough for the most inexperienced computer owner. The program's pedigree can be traced back to George Grayson, among others. The significance relates to Grayson's experience at Micrografx, a graphics-software publisher that was one of the first supporters of Microsoft Windows during the late 1980s, before that operating environment was reborn in its present easy-to-use form. Considering the problems some kids' multimedia titles can bring to parents (video anomalies, no sound, conflicts with other PC components, and invasion of hard disk space, to mention a few), it's a truly welcome event when a publisher does it right all the way down the line. ❐

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GAME INSIDER

Peter Olafson

THIS DIAMOND IS A GEM

Take me in for the ball game. I've glimpsed the future of the Great American Computer-Game Pastime, and it is Front Page Sports: Baseball. Due this summer from Dynamix, this touch-all-the-bases sports simulation promises to lend the same sparkle to the diamond that Front Page Sports: Football and Football Pro provided to the gridiron.

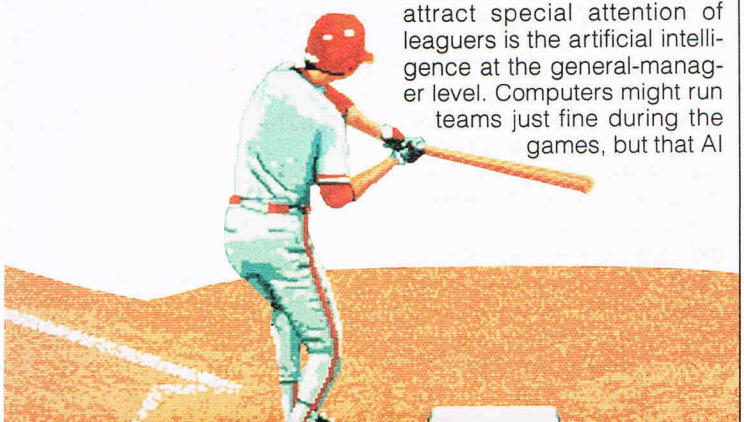
I could devote an entire column to the game's features, which include career play (players age and eventually retire), more than 450 statistics per player, situational ratings (how a batter performs versus lefty and righty pitchers, in clutch situations, and on a month-by-month basis), and all-star games (with players selected by you or the computer). Weather is even simulated, and rainouts may be rescheduled as doubleheaders.

And if you just want to play an uncomplicated game, the pitcher-batter interface offers splendid graphics, fluid movement, and an intuitive feel. The 3-D ball fields have a physical presence I haven't sensed in any baseball game since the disappointing Earl Weaver Baseball II.

One other element likely to attract special attention of leaguers is the artificial intelligence at the general-manager level. Computers might run teams just fine during the games, but that AI skill typically doesn't extend into larger management issues. It does in FPS: Baseball, though. The computer-controlled general managers draft free agents, demote players to the minors, and rule on human-proposed trades. They even propose trades themselves.

The farm league. Another baseball game—one with a lighter touch—is coming from those old baseball hands at MicroLeague Interactive. It's a diverting Windows product called TimeOut Sports: Baseball. In addition to practicing batting and fungo fielding, you'll be able to try out such skills as sign calling, brushback throwing, and umpire arguing. The beta version is well crafted and fun.

Dynamix brings the diamond to the front page with its latest sports simulation.



New friends. Computer games are fun. They're also big business, as we've been rather forcefully reminded recently by a couple of major deals. In one, Electronic Arts and Brøderbund Software have agreed to merge in a stock transaction valued at about $400 million. The deal stands to give EA (which recently added Origin to its stable) a more potent educational and productivity software wing, while offering Brøderbund access to EA's distribution and advanced technology. The deal is subject to shareholder approval, but if all goes well, it should kick in before you read this.

In other hot news, corporate giant MCA has made a significant investment in Interplay Productions (and acquired options to increase that minority share), becoming Interplay's sole outside investor. The details of the transaction weren't disclosed, but it has provocative implications. Skip Paul, MCA's executive vice president, said in a press release that MCA's involvement won't be passive. "We will be working through our newly formed Universal Interactive Studios unit to develop MCA properties with Interplay," he said. "Not only will we be a bridge to the motion picture, music, and theme park businesses, but we will also provide access to Interplay for Matsushita's technology."

On the import shelf. The newest free-scrolling blaster from overseas, Blue Sphere's In Extremis, feels like a cross between Wolfenstein 3-D and Doom. The green alien blood that spatters off your helmet when you dispatch the baddies is an interesting touch. The combat sequences in Battle Isle II (Blue Byte) have taken a huge jump. They've moved from a more rough-and-ready presentation in Battle Isle and the portraitlike depictions in The Great War to a realistic 3-D environment somewhat akin to Carrier Command's.

PC users can look forward to some games imported from the Amiga world. In the works are versions of Computer Third Reich, the classic Avalon Hill board game with spiced-up AI and graphics, and Fighter Duel Pro 2, Jaeger Software's silken (and very tough) dogfighting simulation. Also in the pipe is Thalion's Ambermoon, a role-playing adventure game with a unique 3-D viewing perspective that smacks of both Ultima VI and Legends of Valour. ❐

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ENTERTAINMENT CHOICE

Detailed interaction and sensational graphics and sound hook you into this full-scale simulation of carrier-based air combat.

Scott A. May

FLEET DEFENDER: THE F-14 TOMCAT SIMULATION

Few combat simulations allow you to experience the challenge and satisfaction of a total team effort quite like MicroProse's Fleet Defender: The F-14 Tomcat Simulation does. Armed with cutting-edge graphics and advanced flight dynamics, it should catapult the veteran simulation publisher to the crest of success.

Fleet Defender stands out from similar products for several exciting reasons. To begin, it's the first full-scale simulation of carrier-based air combat. Few sensations can compare to the adrenaline rush of a carrier launch—unless it's the dead-on accuracy you need to catch the 3-wire and land your 30-ton Tomcat on a flattop flight deck less than 300 feet long.

Flying the two-seater F-14 means you must pull double duty, serving not only as pilot, but also as RIO (Radio Intercept Officer). You'll also have increased reliance on and detailed interaction with your wingman, the better half of your two-ship CAP (Combat Air Patrol). Indeed, one of Fleet Defender's greatest strengths is total integration—within your multi-CAP squadron as well as among a wide variety of mission support craft. You get the exhilarating feeling that you're part of something much bigger. Rather than being the main focus, as in other combat sims, you're an invaluable part of the overall scheme.

Simulation purists will be pleased with the realistic flight model. At the game's highest difficulty rating, the aircraft's response is unbelievably true to the modeled forces of lift, thrust, drag, and gravity. Other points of interest are the effects of air density and weather (such as humidity) on aircraft and weapons performance, since the vast majority of your flight time is spent over water.

Combat purists, on the other hand, are asked to accept certain liberties taken with aircraft models and historic time frames. Here's the rub: Although the simulation is modeled on the F-14B, this upgraded version of the aircraft was not in service at the time of the featured campaigns. To achieve maximum realism, the designers would've had to model the older F-14A, with noticeable performance degradation. It's a slight compromise that most true fans of the genre can accept.

Instead of wasting time (as other sims do) with opening animations, Fleet Defender shoots you right into action. You can choose to enter either of two full-theater campaigns, or you may select Training or Scramble. This last option—involving a single sortie generator for quick-and-dirty flights—characterizes the game's overall sense of urgency. Between the pulse-pounding music and streamlined setup screens, there's definitely an air of frenetic energy that's passed directly to the cockpit.

Choose your mission-generating options: enemy type, skill, number, and formation; starting altitude and relative position; time of day; weather; and squadron (based on eight real-life Top Gun units). One of the mission generator's few limitations is the inability to face more than one enemy type from the more than 30 aircraft and helicopters available. A probable reason for this is to provide pilots as much fun and flexibility as possible without crossing the line into flights of fantasy.

Training occurs at the Oceana Naval Air Station in Virginia Beach. Although com-

pletely optional, it's recommended that all rookie pilots spend time in the Fleet Readiness Training program. Absolutely crucial is the wingman training, given the simulation's detailed interaction and the strategic importance of your wingman. While other games may use the wingman as mere cannon fodder to cover your six, most Fleet Defender scenarios will fail without effective teamwork.

Campaigns unfold in two large theaters of play: off Norway's North Cape and that perennial hot spot, the Mediterranean. Theaters are divided into three campaign scenarios, each containing multiple mission sets. They're based on both historical and fictionalized conflicts involving U.S., NATO, Israeli, and various Soviet-backed forces. Most intriguing and disturbing is the Mediterranean fantasy campaign, Carrier Duel. This frightening precursor to World War III pits an outgunned U.S. carrier force against an all-out Soviet assault just north of the Gulf of Sidra.

You begin each campaign with 20 Tomcats aboard the carrier. Every aircraft you lose during your tour has an immediate impact on future success. Lose too many planes, and in some scenarios, you won't be able to complete the campaign.

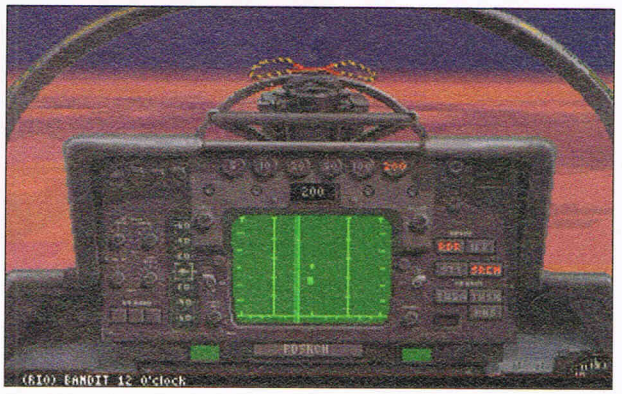
By nature, the F-14 is a support unit, so most missions require that you take a defensive stance, flying escort for specialized ordnance delivery or intercepting incoming enemy attacks on the fleet. Your main objective throughout is to protect your carrier at all costs. Successful missions earn points, medals, and promotions—advances which give you a higher grade of squad members and wingmen.

Fleet Defender boasts some of the most diverse and impressive military hardware of any recent combat simulation. You'll encounter over 30 enemy fighters, bombers, and helicopters. You must also contend with more than 30 types of air-to-air, air-to-surface, and surface-to-air missiles (both land and carrier based).

Fans of MicroProse's widely underrated F-15 Strike Eagle III will be pleased to find many of the same designers, programmers, and graphic artists on board this flight. Those who are familiar with the previous title's keyboard layout and setup will take off with minimal assistance. Others will appreciate the ability to run through the training missions with manual in hand, pausing the simulation to study instrument displays, toggle view modes, or test various key assignments.

The simulation comes with two manuals: gameplay instructions and campaign notes, both well written, nicely illustrated, and informative. The first covers initial game setup, hardware configurations, on-board controls, flight dynamics, cockpit displays, and basic avionics. The second explores basic and advanced combat maneuvers, details the simulation's campaign scenarios, and provides descriptive appendices on friendly and enemy aircraft, weaponry, and naval vessels. The five-page glossary is an invaluable reference for the simulation's amazing collection of acronyms and military slang. The only thing missing is a comprehensive index.

The graphics are phenomenal. Without doubt, these are the best MicroProse has yet produced. The same graphics technology used in Strike Eagle III is used, but with much greater success. Most remarkable are the new texture-mapped aircraft, a marvelous replacement for traditional flat-edged, shaded polygons. Enterprising pilots can conceivably customize the bitmapped graphics used to wrap the polygon models. Imagine creating your own squadron logo and having it appear on your aircraft! Other delights worth noting are fully functional multiscreen cockpit displays and sensational sky and water effects.



The sound is also unbelievable, particularly the stereo effect of missiles launching, the Doppler effect of passing aircraft, and the disconcerting change in pitch during a G-force redout. Your wingman contributes digitized speech.

Fleet Defender aims a little higher than most other combat flight simulators, not just in its scope, but in its entire approach. Perfectly structured for both novice and seasoned fighter pilots, this multilayered carrier-based simulation is bound to thrill a wide, receptive audience. ❐

Circle Reader Service Number 393

IBM PC or compatible (33-MHz 80386 or faster, 80486 recommended), 4MB RAM, DOS 5 or higher, 256-color VGA, hard drive with 14MB free, mouse; joystick recommended, supports Sound Blaster, Ad Lib, Roland, Pro AudioSpectrum, and compatible sound cards—$59.95

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GAMEPLAY

Denny Atkin

WAR IN THE SKIES

MicroProse raised expectations for PC flight simulations with the recent release of F-14 Fleet Defender. However, F-14 is no longer the standard-bearer, having been blown out of the sky by another simulation—also from MicroProse. A WWII air combat simulation, 1942: The Pacific Air War comes from Ed Fletcher, the designer of Task Force 1942.

I wouldn't have thought it possible, but the graphics in 1942: PAW are actually better than those in F-14. Every plane is texture-mapped in exquisite detail, and there's not a polygon in sight; you can even see individual struts on the complex landing gear of the Grumman Wildcat. A virtual-cockpit feature lets you use a second controller to pan your view freely about the cockpit. There's even smoke from your guns as they fire, as well as tall splashes when rounds hit the water. More than a graphics tour de force, though, 1942: PAW also features realistic flight models and computer pilots with superior artificial intelligence.

Defend democracy in 1942: The Pacific Air War; then eradicate it in Star Reach.

A wide variety of planes are simulated in the game. You might start out flying an F4F Wildcat, be reequipped with an F6F Hellcat, and finish out the war in the cockpit of an F4U Corsair. Air-to-ground aficionados will appreciate the chance to fly the Devastator, Avenger, Dauntless, and Helldiver. (If you want to fly for the Japanese, of course, you'll find the Zero, Val, Kate, and other IJN mainstays.) Flight models are realistic, and you'll quickly learn the advantages of each plane—and the disadvantages. One feature that adds to the fun factor is the ability to jump into the cockpit of another plane in your flight. If your TBF launches a dud torpedo, jump into the next plane and make another run. You can also choose to fly in the backseat of attack aircraft, defending your plane's rear with a machine gun while the autopilot handles the flying.

Although 1942: PAW is missing the close wingman coordination found in F-14, it addresses every weakness sim fans found in the latter product. There's a powerful replay facility for going back and viewing your battles, either from your plane's cockpit or from a free-floating camera. You can edit films, save favorite camera angles, and even jump into the cockpit at any point during the replay and change the course of history. The game also has one of the most complete mission builders ever to grace a PC sim, allowing you to re-create historical battles not included with the game or create all-new challenges.

This is more than just a flight simulation, though, as you might expect from Fletcher. You can also act as commander of the naval task forces, sending ships on patrols, launching recon and attack flights, and dedicating aircraft to Combat Air Patrol. As the battles heat up in this realtime naval simulation within a simulation, you can hop into the cockpit of a plane heading into combat or choose to sit out the fighting in the safety of the aircraft carrier's war room.

Reach out and disintegrate someone. "Oh, boy!" I thought. "Another space game!" Then I glanced at Star Reach's documentation as I was installing the alpha version, and my mood darkened. "Oh, boy. Yet *another* space conquest and resource management game," I thought. But once I started the game up, I realized this was something different.

Don't get me wrong—Star Reach isn't very original, and it owes a *lot* to predecessors such as Reach for the Stars, Star Control, and Masters of Orion. It's a space conquest game where your goal is to conquer planets and then use the resources of those worlds to build your fleet, giving you the power to reach out and grab even more territory. Along the way you'll allocate planetary resources to production, use supply lines to spread resources out, and build bigger and better spaceships.

Where Star Reach differs from antecedent games is in *how* it's played. Previous games worked on a turn-by-turn basis. Ship-to-ship combat was in realtime in some of them, but for the most part you had time to stop and really consider your strategies. In Star Reach, everything's in realtime. While you're sitting there deciding whether or not it's a good idea to strip-mine Pluto, your opponent may be launching her deadly invasion fleet. This brings an incredible level of new excitement to what otherwise may have been a case of the same old stuff. Although you can challenge computer players, this game is likely to be at its best against a human opponent.

Coming soon from Interplay, this is the game to put some excitement back into the lives of interstellar despots bored with day-to-day space conquest. ❐

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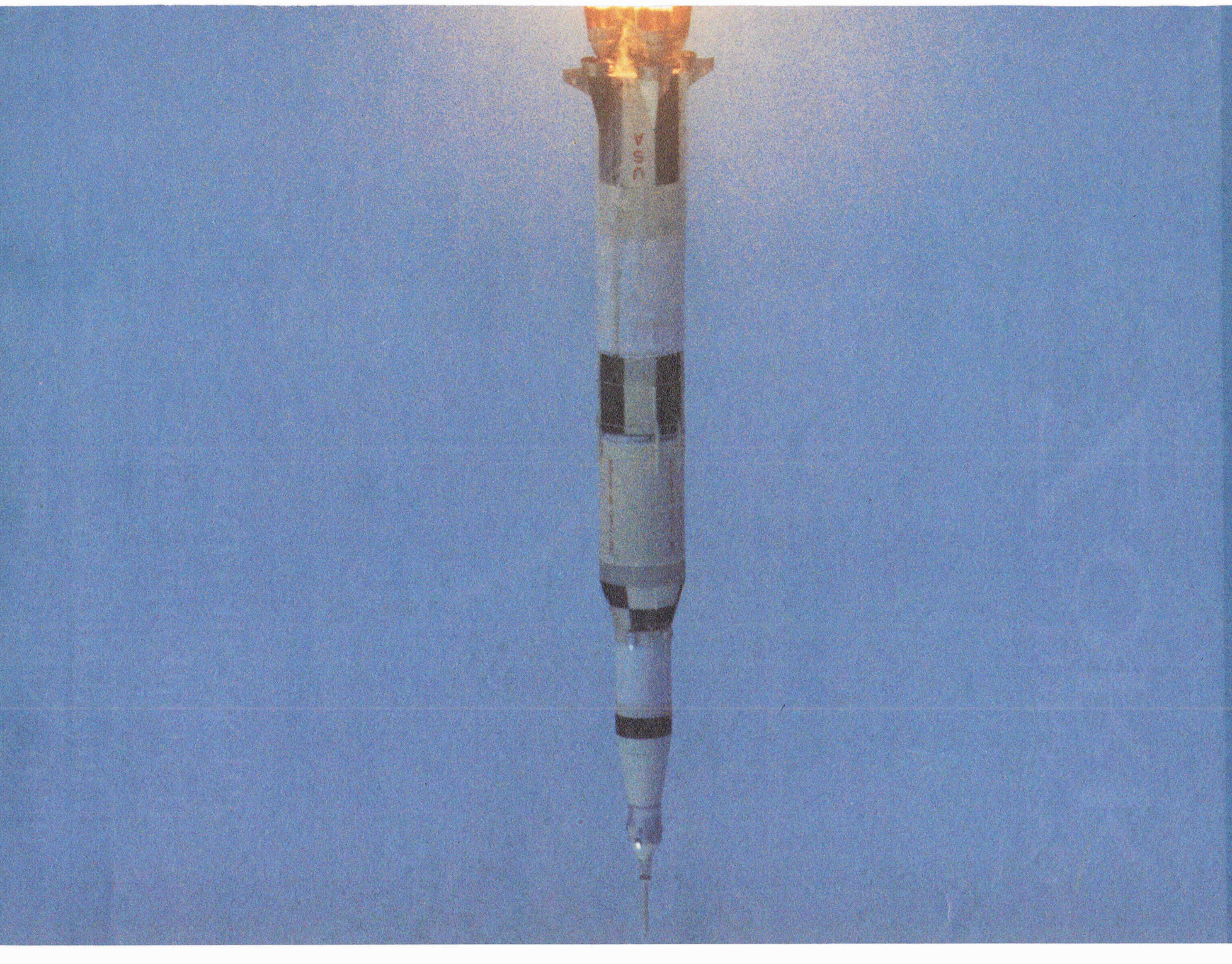
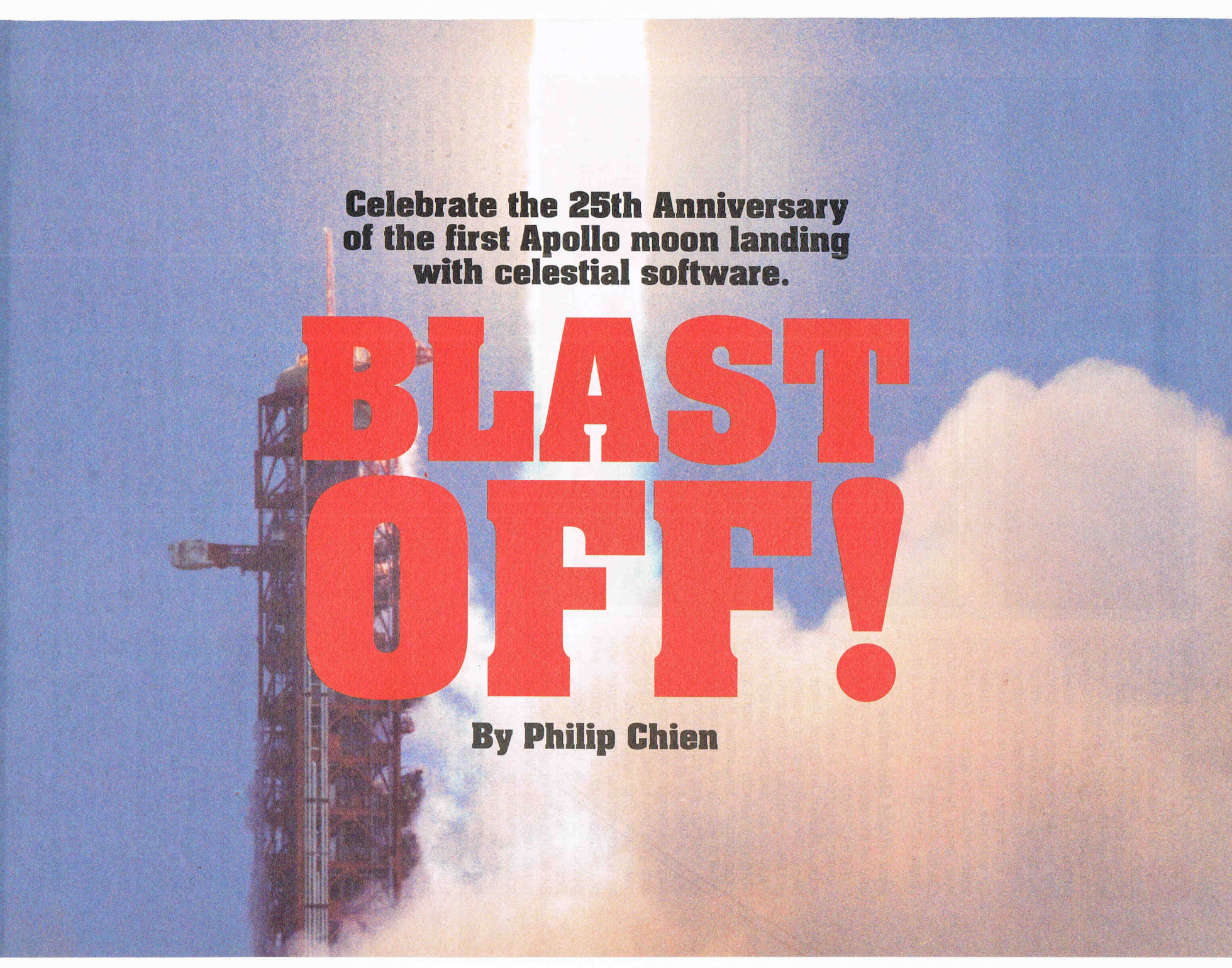




Celebrate the 25th Anniversary of the first Apollo moon landing with celestial software.

BLAST OFF!

By Philip Chien

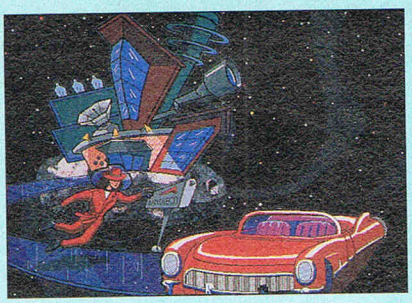
On July 20, 1969, Neil Armstrong took one small step and forever changed the scope of exploration. In the 25 years that have passed since the first manned moon landing, man hasn't physically ventured farther than the earth's moon. Although humankind hasn't moved out into the universe, personal computer technology has allowed much of the universe to come down to earth where we can explore it in the comfort of our own homes. There are dozens of space-related programs that let you learn about the heavens, pilot historical spacecraft, or carry manned space exploration on to its next step.

Spaceflight Simulation

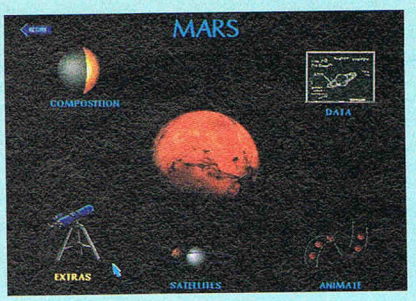
One of the earliest space simulation programs was the classic Lunar Lander program created by high-school student Jim Storer. It was a relatively simple 40-line program with no graphics. You typed the amount of thrust to use, and the program calculated your velocity and height as your lunar module descended. If you landed at a velocity of less than 1.2 mph, the mission was considered a success. A velocity of less than 10 mph was considered a survivable landing, and anything higher would create a new crater. The concept was refined as a commercial arcade game with black-and-white, 2-D graphics and joystick control. A 1980 Apple II version of the arcade Lunar Lander by Bill Budge (of Pinball Construction Set fame) was one of the first fact-based space simulations.

We've come a long way since those early space games. With the massive storage offered by CD-ROM, the realistic graphics provided by SVGA, and the greatly increased processing power of new PCs, modern space programs are the next best thing to being there.

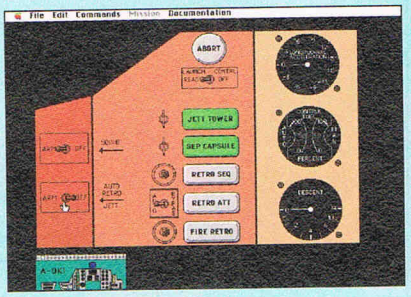
Return to the Moon ($49.95), a CD-ROM application from Lunar Eclipse Software, includes an updated graphical version of the lunar landing simulator. This one is far different from its text-only predecessor, though, with the lander's windows featuring video based on actual Apollo footage. The package has a database which includes an atlas of lunar features, including landing sites of U.S. and Soviet lunar probes, as well as hundreds of photos, video clips, and sound bites from the moon race. There's even a Lunar Academy feature, which includes quizzes on the moon and space exploration, but unfortunately, there are some mistakes here. True to its name, the package also includes information on current proposals for returning manned spacecraft to the moon.



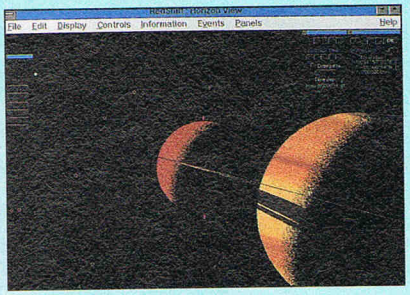
Where in Space is Carmen Sandiego?



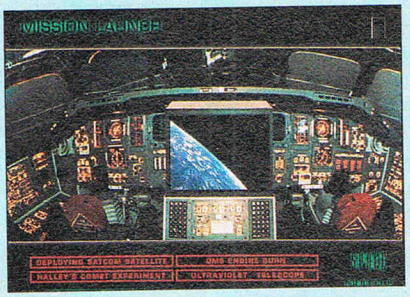
Discover Space



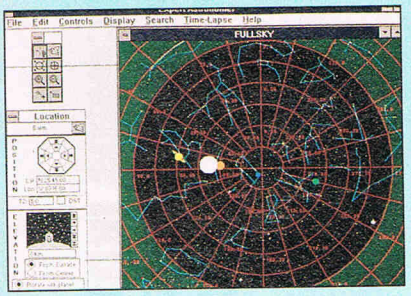
A-OK!, The Wings of Mercury



Redshift



Space Shuttle



Expert Astronomer

Shuttle: The Space Flight Simulator ($39.95), from Virgin Games, is very likely the most complex flight simulator designed for personal computers. Available for the PC and the Amiga, Shuttle puts you on the flight deck of the most advanced, complicated machine ever designed, NASA's Space Shuttle. Every aspect of an actual shuttle flight, from launch to the gliding landing, is simulated in exacting detail. You'll deploy and repair satellites, run SDI experiments, and deal with in-flight emergencies. Although the program's over two years old, it still stands out as the most authentic spaceflight simulation available for the PC.

Two upcoming simulations will try to wrest that distinction from Shuttle. A-OK!, The Wings of Mercury from Innovative Technologies is a full simulation of the original Mercury space capsule. The developer says it's an absolutely faithful replication of the first American space capsule, with the 95 switches and controls, 22 status indicators, and 21 gauges all functional. The program is currently available only for the Macintosh, but a PC version could follow if there's enough interest. (Send electronic mail to nastasi@aol.com for more information.) The other contender, Microsoft Space Simulator, has been kept under tight wraps by the developer. However, it promises to accurately simulate both past and future space systems, and if the company's Flight Simulator is any indication, this program may set new standards.

This spacecraft simulator unfortunately isn't available for microcomputers. PILOT (Portable In-flight Landing Operations Trainer) runs on a Panasonic Solborne, the portable equivalent of a 25-MIPS Sun 2 workstation. PILOT simulates the view out the shuttle's windows, as well as the primary flight gauges for a shuttle landing from the time the commander takes control through landing. Astronauts have used PILOT on long missions to refresh their skills before they have to land the shuttle in real life. I got a chance to try PILOT and landed it suc-

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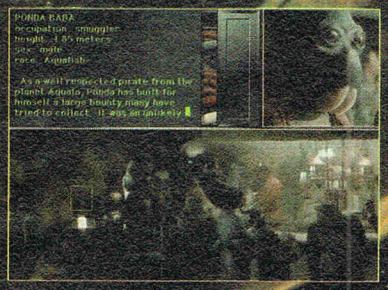

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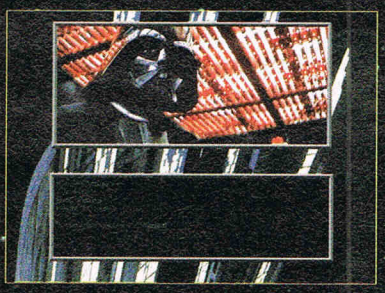

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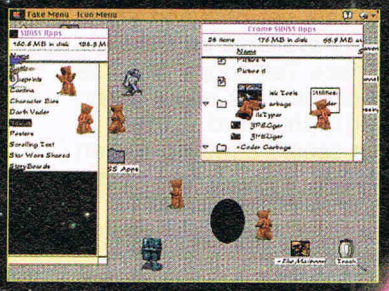

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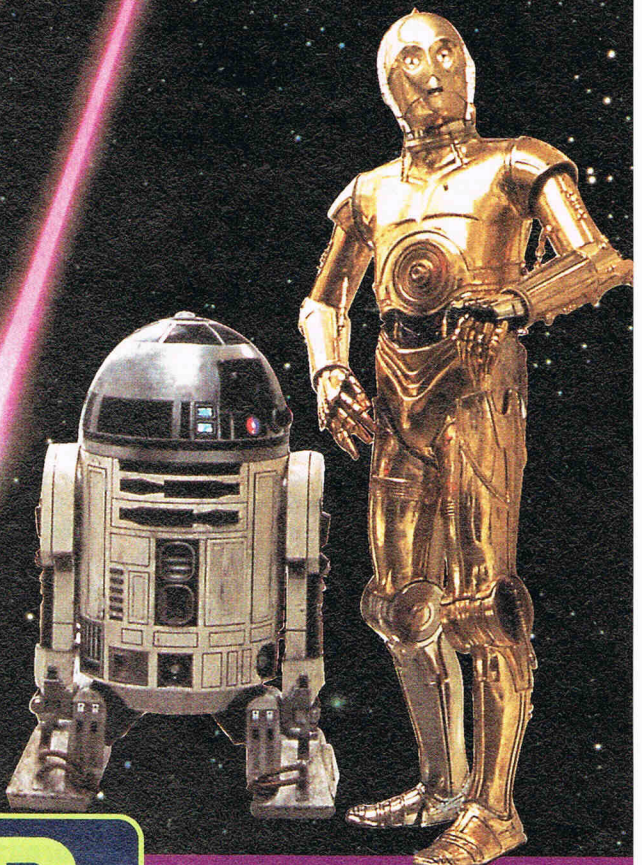

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cessfully twice, but I'm embarrassed to say that I also crashed it twice.

Sim (Space) Cities

For a look at what life on the moon might be like after man does return there, check out Lunar Command ($49.95), from Mallard Software. This is an updated version of Wesson International's Moonbase simulation, and it puts you in the role of administrator of a lunar colony. You have to decide how to allocate your fixed resources toward building new structures and mining raw materials, all the while hoping for technology breakthroughs. The program includes an excellent novella which describes your roles and responsibilities.

Similar in concept, but far more advanced in execution, is Sierra's Outpost CD. You're in charge of a space fleet containing the last survivors of a destroyed earth. You have to find a suitable planet, determine the best spot to settle down in, and then create and manage a colony on the surface. Although the program is set in a distant, technologically advanced future, all of the theories and technologies used in it are based on actual space exploration research, including NASA data.

Stellar Education

Brøderbund proves that entertainment and education can go hand in hand without being preachy with its classic Carmen Sandiego series. Where in Space Is Carmen Sandiego? ($79.95) sends Carmen out into the solar system. This time, Carmen's henchmen are cartoonish aliens, and she's stealing actual planets and moons. You fly a Cosmohopper 911 Turbo space vehicle and use a VAL 9000 computer to track Carmen down, viewing beautifully rendered images of the various celestial bodies you visit. The program comes with a pocket astronomy guide to help you determine where Carmen has fled.

Interplay's Buzz Aldrin's Race into Space ($69.95) is a historical strategy game based on the American/Soviet race to the moon. You're the head of the U.S. or Soviet space program, and you can compete against another player or the computer. The CD-ROM version, which features more sound and actual digitized video, also lets you play via modem or mail. Your must make decisions regarding hardware purchases, astronaut training, research and development funding, and testing or cutting corners to stay ahead of your adversary. The game's universe has made minor changes to history to keep the game manageable. Four different NASA centers have been integrated into one supercenter, with astronaut training combined with purchasing, designing, and assembling launch vehicles. There are some minor technical and historical mistakes, but the program still gives an excellent historical perspective of the difficult moon race.

Spacey CD-ROMs

Media Clips' Worldview CD-ROM ($39.95) contains 100 still images, 100 audio clips, and 25 QuickTime movies covering various aspects of the space program. The movies include launches, lunar spacewalks, and President Kennedy's moon speech. Each photo includes a short accompanying musical score and a description. The audio clips include important speeches and sound bites.

Space Shuttle ($49), from Software Toolworks, is a database of the first 53 shuttle missions. It features information on astronaut training, the shuttle program's history, video clips, and digitized pictures from each of the first 53 shuttle missions. Don't try to access the mission data for classified shuttle missions, though—the program will stop you! Unfortunately, the CD-ROM has some problems. It doesn't note that there were unclassified military shuttle missions, it identifies many pieces of hardware incorrectly, and it includes errors in its narration. Still, it's an interesting overview of the shuttle program, and it would be superb if an error-corrected update were made available.

If you have access to a computer interfaced to a videodisc player (many schools have such equipment), consider NASA's 12-inch Pioneer video laser disc containing earth observation images taken by shuttle astronauts. A 2MB text file on the disc includes descriptions of the pictures. All together, there are about 91,500 video resolution images from the first 44 shuttle missions! The laser disc retails for $55.

Stargazing

If your interests lie more in the bodies in the heavens than in the machines that explore them, you should check out the many excellent planetarium simulators available. These will show you not only what the night sky looks like outside your own house but also what the sky looked like in ancient times. Some even let you see what the sky would look like from a spot on another planet! There are many such programs available, including Orbits, Dance of the Planets, Expert Astronomer, and Distant Suns.

One of the most impressive is Redshift ($99), a Windows CD-ROM from Maris. The program has an extremely powerful celestial simulation engine programmed by former Russian spacecraft controllers. You can put yourself anywhere in the solar system and show the sky view in several different coordinate systems. The disc includes digitized photos of solar system objects, stellar targets, and other astronomy-related topics.

Raw Data

If you're looking to dig deep into learning about the heavens, you can obtain the actual data obtained by NASA's science satellites and view it on your PC. NASA stores spacecraft scientific data at the National Space Science Data Center (NSSDC) at the Goddard Spaceflight Center in Greenbelt, Maryland. CD-ROMs available from Goddard include data from the Magellan Venus radar mapper, the TOMS ozone mapper, the Extreme Ultraviolet Explorer, the Viking Mars mission, and Voyager's encounters with the outer planets. The CD-ROMs sell for about $20 each, and most include a viewer right on the disc.

Unfortunately, the pictures and instrument readings from the Hubble Space Telescope—some of the most fascinating data yet obtained about space—aren't available on CD-ROM yet. The Space Telescope Science Institute is cooperative about giving out photographs and slides of images, but seems unwilling to part with the actual data so far. Here's hoping for a CD-ROM packed full of images from the newly rejuvenated space telescope soon.

There is a Hubble-related CD-ROM. Hubble requires a large database of guide stars to point it at its targets. The entire sky was mapped from ground-based observatories, creating a database containing the locations of 18 million stars. The Hubble Guide Star Catalog is sold on a pair of CD-ROMs by the Astronomical Society of the Pacific for $52.95. That's less than $0.000003 per star!

Splashdown

Whether you're a frustrated astronaut wannabe, a space program watcher, an astronomy fan, or a parent concerned about science education, you'll find a wealth of space-related software out there. So load up your favorite space program and prepare to blast off into a universe of fun and learning. ❑

Editor's note: Portions of this article were contributed by Denny Atkin.

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MULTISPIN 4X PRO

Progress is swift throughout the computer industry, and the CD-ROM market is no exception: NEC introduced double-speed drives in January 1992 and followed them in late 1993 with a triple-speed line. NEC's latest achievement, the 4X *Pro* quad-speed drive, is an indication of just how quickly CD-ROM technology is evolving.

The drive's raw performance ratings are impressive, but even with a four-times speed-up the drive doesn't approach the speed of a hard disk; it has an average track access time of 180 milliseconds. This represents only a slight improvement over the average access time of the fastest 3X unit. The 4X *Pro*, however, moves data at a sustained rate of 600K per second. The sum effect of these increases makes for CD-ROM performance that many will find worth the extra cost.

On my 33-MHz 486 system, the drive showed exemplary throughput. In a purely subjective test, running side by side with a low-end double-speed drive, the quad-speed did indeed feel significantly faster. Performing identical search and media-playback requests using The New Grolier Multimedia Encyclopedia as a benchmark, the 4X performed noticeably faster, though not quite twice as fast.

In the area of motion video, however, the unit really shone. Video clips played back on the 4X *Pro* appeared more fluid and lifelike, because the increased throughput led to significantly fewer dropped frames. Multimedia aficionados may find the premium price worth it for this capability alone. When combined with ATI's latest Graphics Ultra+ video card, which has built-in support for Video for Windows, multimedia titles ran with remarkable fluidity in full-screen glory.

The 4X *Pro* is a solid unit, and as a bonus has a full set of controls on the front for listening to audio CDs. However, the price may keep all but the most committed multimedia fans at bay for the time being.

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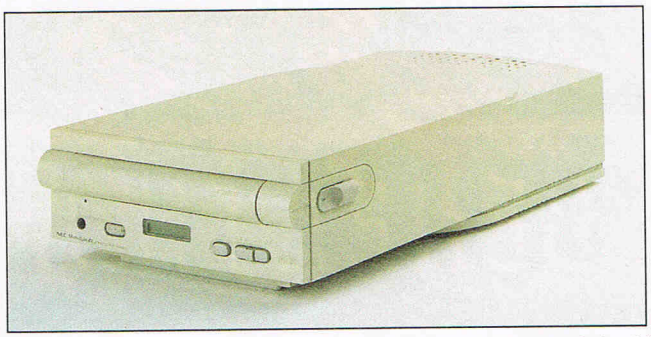
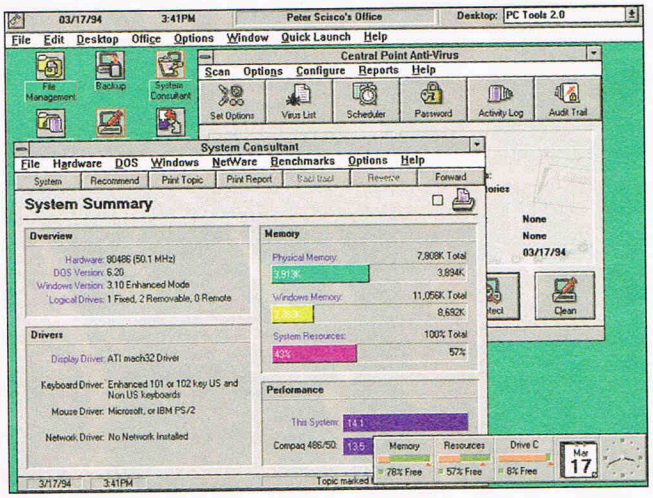


If you're looking for blazing CD-ROM speed, the NEC MultiSpin 4X Pro is one of the fastest drives on the market.



PC Tools for Windows 2.0 includes System Consultant, which can automatically optimize your system settings.

PC TOOLS FOR WINDOWS 2.0

You might as well face it—you're addicted to tools. Before Windows, all kinds of little DOS utilities littered your hard disk. Central Point Software was there to help integrate all those utility functions with PC Tools, and it hasn't abandoned you now that you've moved on to the world of Windows.

The first version of PC Tools for Windows (PCTW) gave users extensive control over their work environment. From enhanced file management to virus protection and disk backup, it was as much an improvement over Windows as Windows was over DOS.

Version 2.0 continues that trend—not with small steps, but with substantial improvements and even more tools for the savvy Windows user's arsenal. Chief among them is better protection against system crashes. The CrashGuard system monitors system resources, free memory, and disk space. As CrashGuard's warning needle moves toward the redline, you can back away from potential crashes by closing inactive applications.

If you've used Windows for any time at all, you've probably experienced the nightmare of sifting through your system's various INI files. PCTW makes the job a little easier with plain-English descriptions of each INI line that it can recognize (it recognizes the majority of INI entries, but some strange anomalies escape identification).

Want better performance from your machine? Ask the PCTW System Consultant. In this improved version, you get more than just suggestions. You can click on the Do It button and have the changes made automatically. Suggestions range from defragmenting your hard disk to editing the system files.

One of the most attractive features of PCTW 1.0 was its reorganization of Windows into working desktops, complete with folders and file drawers. But the original Desktop required a lot of maintenance; as you moved files from directory to directory (as you're apt to do in the never-ending struggle to stay on top of your hard disk), the folders didn't reflect those changes. Ver-

sion 2.0's AutoSynch option accurately recognizes all changes, either automatically or at your command. But the matches go only one way, and changes made in the Desktop interface aren't passed back to the filing system—you can't move a file from one directory to another by dragging its icon from one folder to another. Two steps forward, one step back.

The new File Manager replacement improves on an already robust module. Viewers for more than 100 different formats, and PKZIP 2–compatible compression make it easy to manage any disk. However, the PCTW 2.0 file viewer isn't interactive; that is, you can't copy portions of the viewed file to the Clipboard for use in other applications. The addition of that capability would make this the perfect file manager.

If you lose a file because you misplace it somewhere on your new 340MB hard disk, the PCTW 2.0 file finder, SmartFind, lets you locate it by name or by searching for a bit of text within the file. If you lose a file because you accidentally drop it into the electronic trash can, the program's Undelete feature retrieves and smooths out your virtual rumpled paper wad.

Disk optimization gains speed in the new version, but the module defragments only standard DOS format and DoubleSpace—there's no Stacker support. Central Point Anti-Virus 2.0 is an integral part of the mix, as is Central Point Backup for Windows, with support for tape backup, SCSI, and networks all part of the package.

Central Point has addressed almost all of the major complaints and suggestions from PCTW 1.0 users. The company continues to make Windows truly useful by capitalizing on its graphical nature and enhancing the interface between us and our machines.

PETER SCISCO

Central Point Software
(800) 873-7409
$179.95
$49.95 (upgrade from previous version or any vendor's file management program)

Circle Reader Service Number 435

MORTAL KOMBAT, BODY BLOWS

A game buyer's dilemma: Acclaim's Mortal Kombat or MicroLeague's Body Blows? It's a tough choice. They're both terrific, and functionally, they're the same game: Two fighters—one controlled by you, the other by the computer or a friend—square off toe-to-toe and try to beat each other's brains out. Bruce Lee would be proud.

The differences in the two are purely stylistic. Mortal Kombat—here superbly translated from the arcade smash—strives for realism, with digitally rendered warriors and enough blood to warrant a warning label on the box. Body Blows, though not of arcade origin, employs cartoonish characters, wham-splat fisticuffs, and more than a casual resemblance to the popular Street Fighter II. Twin games in different dress.

In both, the combatants stand about half a screen tall and wage their battles in front of a variety of beautiful backdrops. Appropriately, MK's scenery is photorealist, while BB's is colorfully painted. MK fighters are a bit on the mutant side, with

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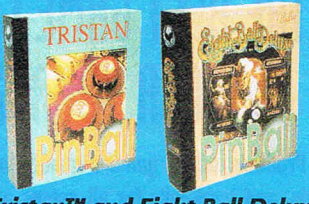

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Circle Reader Service Number 260

REVIEWS

names like Sub-Zero and Rayden, while BB's tend toward the street-punk variety. In both games, the characters share a common set of moves—punches, kicks, flips, and so forth—controlled by the keyboard or joystick. To make things interesting, each character has his or her own powerful special moves which inflict more damage. When fighters take enough hits to completely drain their energy, they're down for the count.

Learning all the moves is part of the fun and challenge. BB includes a handy three-sided stand-up reference card displaying each character's standard and special moves. MK could use something similar, as it has more basic moves to learn.

The best way to play either game is with a friend, although with practice you should be able to beat the computer-controlled fighters. A second joystick is ideal for two-player melees, but both games support joystick-keyboard combinations. MK supports four-button joysticks, while BB features elimination tournaments for up to eight players.

Both games feature outstanding background music. What's missing is digitized sound effects—a satisfying "heeyah!" with a karate chop or "thwack!" when it connects would be nice. MK lost these sounds in its translation from the arcade game; BB simply lacks them.

Otherwise, these are two fun, playable games. (I'm going to refrain from adding my two cents worth on the violence issue.) If you enjoy the arcade version of Mortal Kombat, Acclaim's PC translation won't disappoint you. If, on the other hand, you prefer the traditional arcade-style slugfest, Body Blows will go the distance for any budding brawler.

RICK BROIDA

Body Blows lets you practice kicks, punches, slaps, and backflips without hurting your friends or your computer.

Mortal Kombat
Acclaim
Distributed by UltraTech
(212) 941-1224
$69.95

Circle Reader Service Number 436

Body Blows
MicroLeague
(302) 268-9990
$19.95

Circle Reader Service Number 437

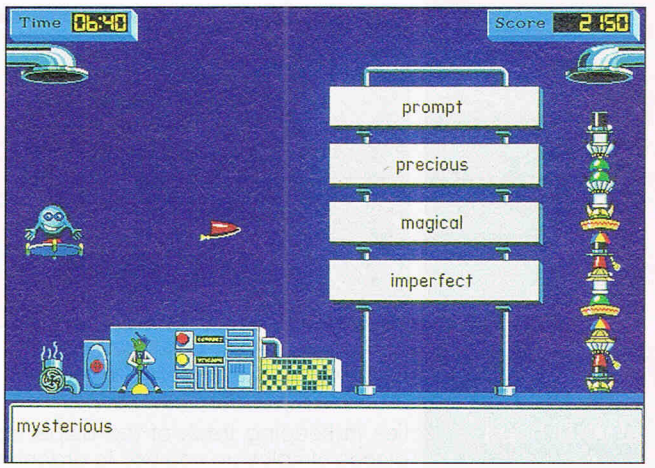
WORD ATTACK 3

When I was in school, I had to write vocabulary words and definitions over and over again to memorize them. Today, students can be spared that tedium by playing Word Attack 3, a fun vocabulary builder from Davidson and Associates.

Over 3200 words and definitions help students from fourth grade through college improve their vocabulary. Divided into seven categories, the word lists increase in difficulty by grade levels. The most advanced categories help students pre-

pare for the SAT and learn Greek and Latin roots and prefixes.

Although the package focuses on five games, Word Attack 3's strength lies more in its ability to be an aid to teachers or parents. You can create custom word lists, not only in English, but also in Spanish, French, and German. Print out certificates, tests, crossword puzzles, flashcards, and word-search puzzles, saving yourself the hours it would take to create these study aids manually. You can even keep track of your students' progress onscreen and print out cumulative records, helping you evaluate the class's progress.



Word Attack 3 is a fun, action-packed way for kids to practice spelling and build their vocabularies.

Your sound card lets Word Attack 3 pronounce all the words used, so students learn to say the words as well as read them. Even your customized lists will be pronounced during gameplay—and you can alter pronunciation of your custom words if necessary.

Three of the games use static screens. In Presentation Activity, students unscramble words that match definitions and are used in sentences. Tile Game has them match definitions to words on overlapping tiles. Correct matches make the words disappear; to win, a player must clear the screen before time runs out. Crossword Puzzle is played just like the pen-and-paper game; it's the only game that will truly challenge the oldest students.

Maze Game and Hat Game are action games. Maze Game has the player move M. C. along series of platforms, eating words, treats, and bugs. Hat Game challenges players to fire M. C.'s wild hats—ranging from a Viking helmet to a Shriner's cap—through words whose definitions appear at the bottom of the screen.

Children in the lower grade levels will be challenged and entertained by all five of Word Attack 3's games. Older students, however, may not find them as engaging, primarily because the gameplay doesn't increase in difficulty as the word lists grow more advanced. If the action games would speed up, growing in tension as the word difficulty increased, even adults would be captivated by them.

Still, Word Attack 3 offers a lot for the money. It will save teachers time preparing tests and activity sheets, and students will spend hours having fun as they learn the meanings and usages of words. Word Attack 3 is a great way to learn new words, and it's a great way to learn new words, and it's a lot more fun than flashcards.

KAREN LEE SIEPAK

Davidson and Associates
(800) 556-6141
$39.95

Circle Reader Service Number 438

AMTEX OUTDOOR ADVENTURES

Imagine arriving at the lake as the morning mist starts to burn off the quiet waters. You stop at the bait shop to select your rod, reel and lures, thinking you'll try for some walleye this morning. You load the boat and consult your map. It's the end of August and its getting colder, the walleye will be feeding in shallower waters to prepare for winter. You remember a spot your fishing buddy told you about and set out. You arrive at the location, check your sonar and position yourself near the edge of that underwater shoal. The peaceful solitude is broken only by the waves lapping at the boat and the loons haunting call echoing across the lake. After a few casts, you feel a sharp tug and your rod bends suddenly towards the water, this must be the big one! With a quick jerk you manage to pull him towards the boat but he gets another burst of energy and speeds towards the deeper water, it's a good thing you had the drag set correctly on the rod! After a strenuous and exhausting battle you pull your quarry to the side and net him into the boat. What a beauty! You can't wait to get back and see your name proudly displayed in the fishing lodge for all the other anglers to look at with envy.

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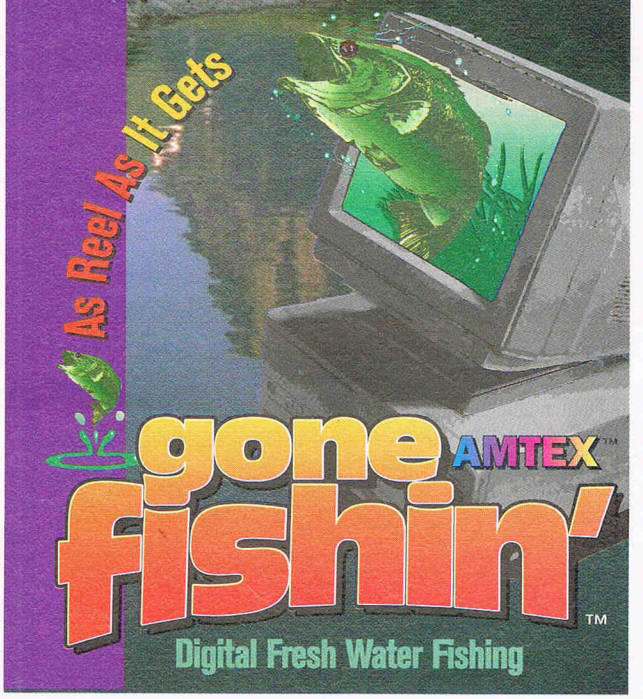

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PLAY OUR GAME AND WIN BIG!

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Three elimination rounds based on speed and accuracy of your answers result in the Grand Prize Winner's choice of a 1.3 million dollar Bucks County, Pennsylvania mansion (pictured below) or $500,000 in cash. Ninety-eight other winners will be awarded cash prizes totaling $122,500!

How do you begin? Simply fill out the coupon below and return it to us with $7.00. We'll send you an introductory package and all the necessary information about the Win A Mansion contest (you're under no obligation to enter). So don't delay! Enter now and you might just win big!

A minimum of 22,000 entries are needed for the game to begin. If COMPUQUEST™ does not receive the minimum number of entries by Dec 31, 1994, all entry fees will be returned. No more than 60,000 entries will be accepted. $100.00 entry fee is required to play and will be held in escrow by a major bank until the game begins. The $7.00 Introductory Package includes a computer disk with a demonstration of the game, complete contest rules, entry application and the communication program for the type of computer (DOS or MAC) that you will use to compete.

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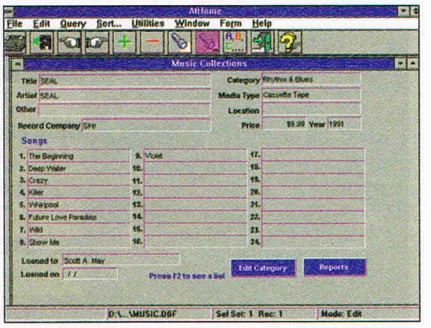
REVIEWS

AT HOME

Computers can be marvelous tools for tracking the parts and pieces of our daily lives. The programs themselves can make formerly tedious tasks such a breeze that the biggest difficulty now



At Home is a simple database that can help you organize household info.

lies in keeping track of the disparate pieces of software you use to organize everything. That's the simple beauty of Ace Software's At Home household organizer for Windows. Everything you need to collect, sort, and store the important information in your life is here, smartly displayed in a series of integrated databases. Learn to use one, and you've mastered them all.

The package includes nine database categories, suitable for both household and home office use: Auto Maintenance, Trading Cards, Medical Records, Favorite Places, Personal Phone Book, Home Inventory, Video Collection, Music Collection, and generic user-defined collections. The only category without universal appeal is Trading Cards, but who knows? This may inspire you to start a collection.

Items common to each database module include a top pull-down menu and associated icon toolbar with such functions as print, save current record to disk, move forward or backward, add or delete a record, search, and sort. Record searches let you specify one or more fields, while sort options allow ascending or descending lists of up to three different fields. All modules offer online help, automatic data backup, and user-defined report printing. Although you switch instantly between database modules, only one can be open at a time.

Data entry is virtually identical in each module—simply a matter of supplying information in the predefined field boxes. In many cases where the requested information seldom varies from one record to the next, special drop-down lists appear to speed data

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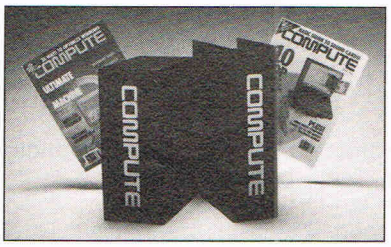

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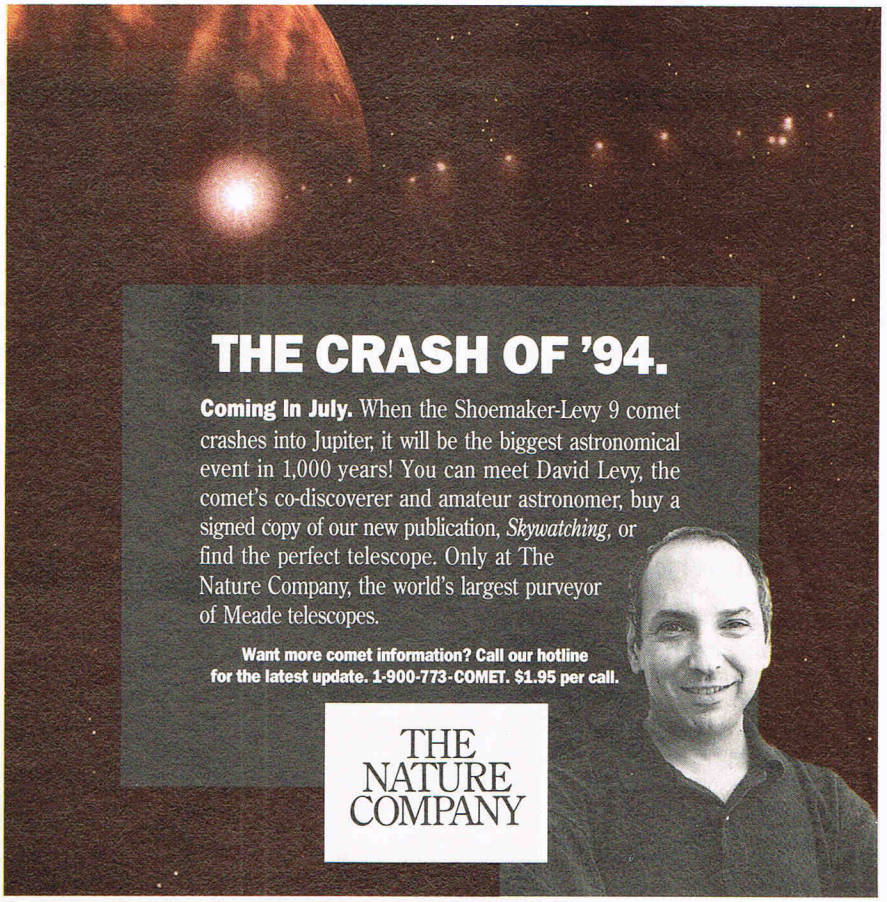


Circle Reader Service Number 265

entry. These predefined lists are simply text files which can be easily changed or expanded. Some modules, such as the excellent Medical Records, contain additional screens for more detailed information on topics such as allergies, vaccination history, medications, and emergency instructions. Another feature of selected modules is a scrolling name list, which functions as a hypertext index to related records. When new records are added, the lists are updated with appropriate keywords.

Of the various modules, highlights include Favorite Places, Personal Phone Book, Home Inventory, Video Collection, and Music Collection. An index for restaurants, hotels, parks, theaters, or any number of special places you like to go, Favorite Places lets you make a note of rates, phone numbers, contacts, descriptions, distance, and detailed travel directions. Personal Phone Book also performs well as a contact manager, although the lack of a built-in autodialer is an annoying omission. Home Inventory offers additional screens for maintenance and warranty info. Video Collection provides ample space for long movie descriptions, while Music Collection lets you not only record song titles, but print rudimentary cassette labels; CD-audio support would have been nice.

Suggested improvements for future editions of the program would include the ability to view report results before printing and the ability to multitask modules. One of the advantages to the Windows environment is the ability to share and link data between different applications. This program won't even allow such freedom within itself. There's also no provision for importing or exporting data, either to a commonly used database format such as DBF or as delineated ASCII files. In fact, beyond wholesale deletion of records, there are no editing or Clipboard functions available. Finally, it would be nice for the designers to lift the hood on their database engine and incorporate a simple field editor for constructing more personalized modules.

At Home's strength lies in its effortless learning curve and its diversity of design. You can find more complex and expensive free-form database programs, but few that'll have you up and organized as quickly and efficiently.

SCOTT A. MAY

Ace Software
(408) 451-0100
$29.95

Circle Reader Service Number 439

METAMORF

If you've always wanted to tinker with image morphing but couldn't justify shelling out big bucks for a professional package just to satisfy your curiosity, check out MetaMorf. At $29.95, it's inexpensive, capable, and loads of fun.

Morphing, as you probably know, is a computer-based technique that performs feats of graphical magic, smoothly changing one person or object into another. Remember *Terminator 2,* in which the T1000 transmogrified right before your eyes? That's morphing.

MetaMorf doesn't have that kind of power, but it can do some nifty stuff. You can generate an animation of one image morphing into another; warp two identical images to create exaggerated or distorted features; produce a single-frame morph cell which can be exported for use in, say, a desktop publishing package; or create a filmstrip of morphs with each frame of the animation saved as a separate graphics file. (The most-fun application? Morph two photos of the same person, one as a child and one as an adult. Then watch the animated aging!)

This mouse-driven DOS program is as simple to operate as it is to install. The top half of the screen is divided

down the middle, with the starting image on the left and the ending one on the right. The bottom half contains all morphing controls, which are intuitively arranged and easy to operate. Creating an animated morph is a snap: Load the two images (they must be in GIF or TGA format—a conversion utility is included), generate a matrix (a set of horizontal and vertical lines used to define specific morphing areas), and click on the Go button. Variables such as the speed of your computer, the number of animation frames you've predefined, and the resolution of the images dictate how long the process will take.

The result? An FLI-format animation which may be viewed using a built-in utility. The effects can be pretty neat, save for an unfortunate limitation to the FLI format—its maximum resolution is a grainy 320 × 200. If you create a morph using, say, 640 × 480 images, you'll wind up with a filmstrip morph that can't be played as an animation.

Simple yet powerful, MetaMorf is a great entry-level package for inquiring morphing minds.

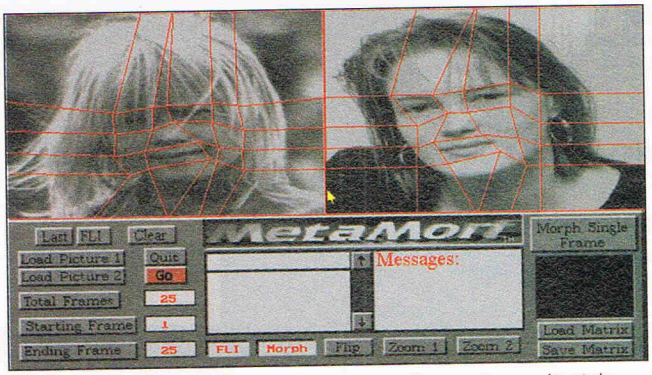
RICK BROIDA

Villa Crespo
(708) 433-0500
$29.95

Circle Reader Service Number 440

FLIGHT SIM TOOLKIT

Flight Sim Toolkit is an absorbing and truly groundbreaking product that is a must-have title for every die-hard flight sim fan. Domark has combined a solid flight simulator engine with a collection of Windows-based tools that let you create or modify almost any objects and characteristics in the simulation. You can create your own planes to fly in, as well as custom worlds to fly over. Combine these with custom scenarios to create an infinite variety of flight simulation challenges for you and your friends.



MetaMorf's intuitive interface lets you easily create movie-style morphing animations from your images.

There are five editors included in Flight Sim Toolkit: World, Shape, Color, Cockpit, and Model. The World editor allows you to lay out the topography of your simulation carefully, creating worlds as large as 25 million square kilometers. You're most likely to enjoy the Shape editor, which lets you create 3-D models of the objects which will occupy the world. Flight Sim Toolkit comes with 144 such objects to use and manipulate, everything from the requisite variety of military hardware to St. Paul's Cathedral.

The remaining editors add depth and detail to the simulation. For example, you can use any bitmap as the basis for the cockpit design, then add working gauges with the Cockpit editor. You can even manipulate the aerodynamic models used in the simulation with the Model editor.

My criticisms are primarily limited to the features Flight Sim Toolkit lacks. The ability to fly missions in tandem with computer-controlled allies is sorely missed. Experienced flight sim fans will also hunger for better artificial intelligence on the part of opponents. This shortcoming is particularly troublesome given that no modem play is yet provided. (Domark promises head-to-head modem play in a future update.) Perhaps the biggest problem is the manual, which is shallow and vague; you'll learn more by just experimenting with the editors than by reading the manual.

The amount of control you have over your simulation is nothing short of remarkable—you can even have custom WAV sound files play when certain events occur. Flight Sim Toolkit supports both VGA and sharp SVGA graphics, but you'll need a fast 486 to enjoy the latter.

Best of all, you can share your creations with others—Flight Sim Toolkit includes a runtime feature that lets you create stand-alone games that you can freely share with friends who may not own the program. Flight Sim Toolkit can turn any patient sim fan into a topnotch game designer.

DAVID GERDING

Domark
(800) 695-4263
$89.95

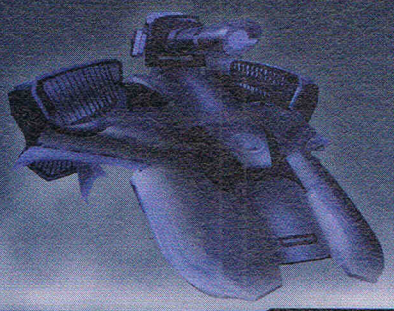
Circle Reader Service Number 441

NEOPAINT 2.2

If you have a PC compatible and want high-quality art or image-editing software, you need Windows, right? Wrong! Before you nail the coffin lid on all DOS applications, check out NeoSoft's NeoPaint 2.2, a powerful art studio for DOS 3.1 or higher that rivals many comparable Windows products which cost five times as much. From detailed photographic work to desktop publishing and fine arts, there's little this full-featured program can't do, at a price that will astound you.

NeoPaint allows editing of multiple images in 2, 16, or 256 colors, as well as gray scale, and supports Hercules, EGA, VGA, and Super VGA cards with image resolutions up to 1024 × 768. The program reads three file formats (GIF, PCX, and TIFF) and can easily convert images between any two color palettes, video resolutions, or formats, with special dithering options for color reductions. The main screen setup is attractive and intuitively arranged with a Windows-like interface, featuring pull-down menus, tool icons, resizable image windows, a scrolling color palette, and pattern fill and line style selectors. In addition to 40 predefined fills, a simple pattern editor lets you create and save your own. Other goodies include a stand-alone screen capture utility and a clip art library of more than 100 full-

PREPARE



To order *ZEPHYR* call (800) 325-8898.

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color stamp-brush images, with a built-in editor for making and saving new stamps of your own design.

The wide array of drawing tools includes multiple brush shapes and point sizes; an airbrush with adjustable spray patterns; 2-D or 3-D scalable rectangles, circles, pyramids, ellipses, and Bézier curves; a cloner; and a color highlighter. This latest version of the program also adds some terrific natural media effects, such as charcoal, crayon, watercolor, smudge, and blend. Of special interest is the Fill tool, with its outstanding creative effects such as flood fill, picture tiling, two-color gradient, and color replacement. Image-editing tools are equally numerous, including rectangle, polygon, and freehand scissors; cut, copy, and clipboard paste; color eraser; multilevel zoom; undo; and color sampling.

Other effects, available from the top menu, can be applied to either selected areas or entire pictures. These include image flipping, rotation, distortion, skewing, adjustable contrast, and user-defined color palettes. There's even an assortment of adjustable image-processing effects, such as blur, screen, pixelize, smear, fade, lattice, and streak. The program comes with 12 high-quality fonts, each available in multiple sizes and styles, although its overall text handling is limited. Also worth noting is the NeoPaint Pro Pack, available on both floppy disk and CD-ROM, that bundles this product with NeoShow Pro, an impressive DOS-based multimedia presentation program.

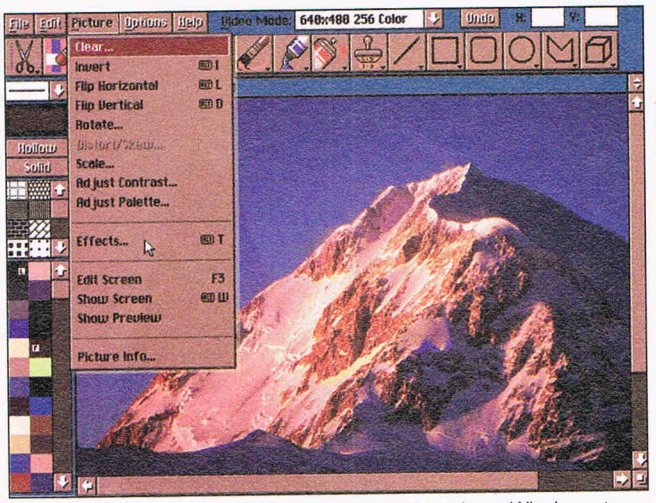
The product's few weaknesses include an incredibly slow halftone printing utility and a far too narrow range of image file formats. NeoPaint proves itself as a functional alternative to Windows, but that's no reason to exclude interactivity with a broader selection of image types such as BMP, WMF, RLE, DIB, or LBM. Another problem is local versus global image manipulation, limiting the range of pattern fills, color replacement, and other special effects to only the portion of a picture that's visible in the on-screen window. This forces you to scroll the image in the window manually, then repeatedly reapply the effect in order to change the entire picture. It's both tedious and frustrating, especially when the editing must be pixel perfect.

NeoPaint 2.2 dazzles your senses without denting your wallet. Programs of this caliber prove the future's still bright for quality DOS-based applications.

SCOTT A. MAY

NeoSoft
(503) 389-5489
NeoPaint 2.2—$45
NeoPaint Pro Pack—$99

Circle Reader Service Number 442



NeoPaint proves that you don't have to upgrade to Windows to create top-quality graphic images on your PC.

C.I.T.Y. 2000

C.I.T.Y. 2000: London isn't meant to be a comedy, but I guarantee you'll get a few laughs out of it. This is the *Plan 9 from Outer Space* of CD-ROM games, a graphic adventure that tries to take itself seriously in the face of goofy acting and silly dialogue.

On the serious side, C.I.T.Y. 2000's premise of James Bond–style intrigue and espionage set on the streets of London seems interesting enough. Before the game begins, you're introduced to your character—American agent Jon Daring—with an impressive five-minute video clip of his latest spy episode.

Then the fun begins. While lounging in his spies-only flat, Daring receives a phone call summoning him to London. Apparently, evil drug lord S. Rooter has some nefarious plans for the city (the game's name is an acronym for *City In Trouble, Year 2000*), and Daring is England's first choice to do the thwarting.

You assume his role upon arrival at Heathrow Airport. From there you'll do the standard spy stuff: knocking around the city looking for clues, making contacts, drinking martinis, and so forth.

Movement within C.I.T.Y. 2000 is mouse-driven. The pointer becomes a left, right, or up arrow depending on which area of the screen you move it to. Most of the screen is occupied by a digitized color photo depicting where in London you are. ("Look, there's Parliament! There's Trafalgar Square! There's the Heathrow snack bar!" This might make a good tool for travel agents.) The game is little more than a collection of photos interspersed with the occasional live-action video clip. There's virtually no interaction with any of the scenes—you simply point and click your way from one photo to the next. What's worse, continuity between scenes is lacking. It's easier to get lost in the C.I.T.Y. 2000 version of Heathrow than in the real airport.

At the bottom of the screen are game-control icons for picking up objects, examining your inventory, talking with others, mixing chemicals, etc. Whenever you examine an item, you're treated to a nifty 3-D animation of the object and a verbal explanation of what it is.

What might have been a clever, interactive romp through London ends up as a hard-to-follow game that's so goofy you might actually enjoy it. This game can't help but make you smile on occasion, as long as you don't try to take it seriously.

RICK BROIDA

Aditus
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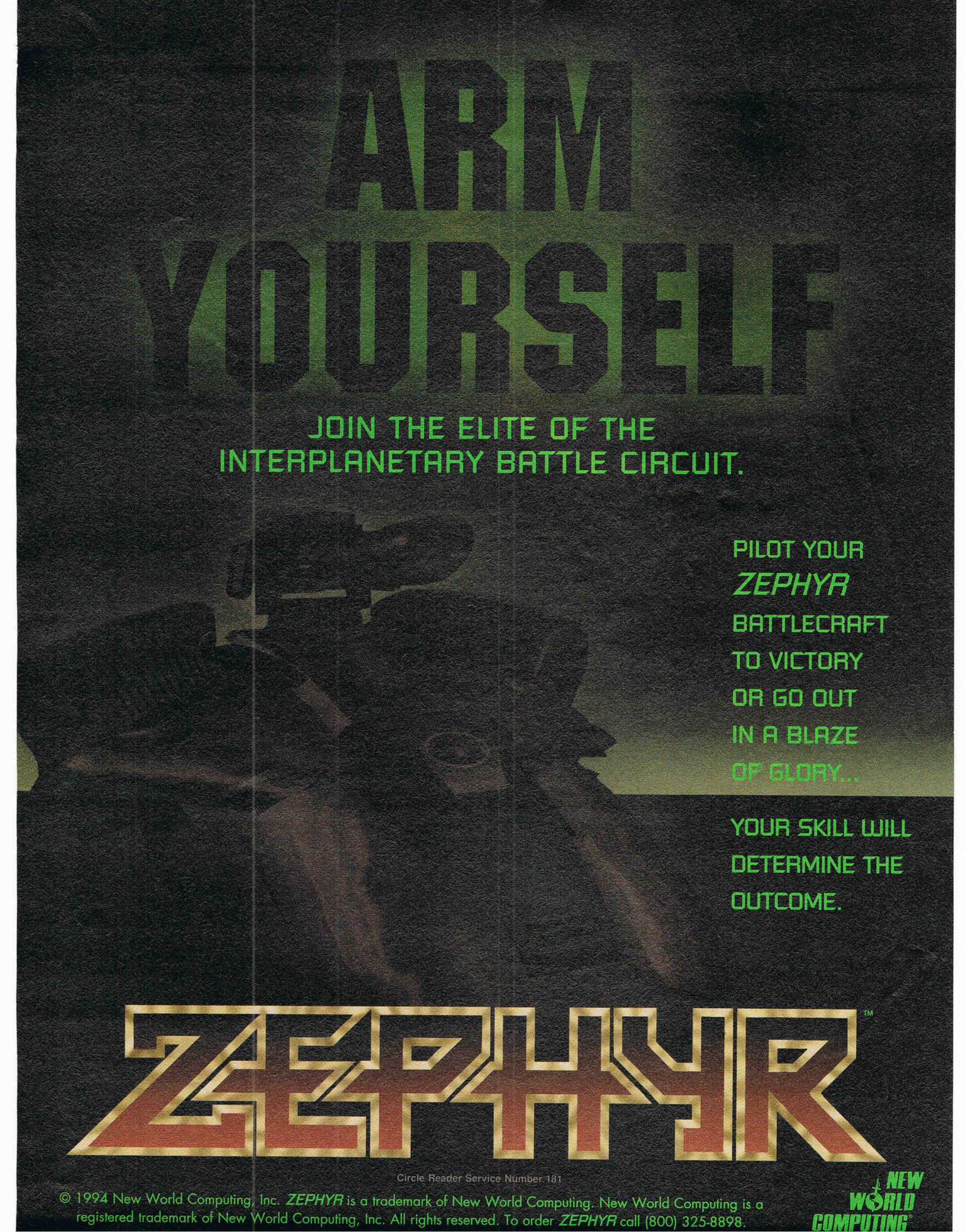
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XYWRITE FOR WINDOWS

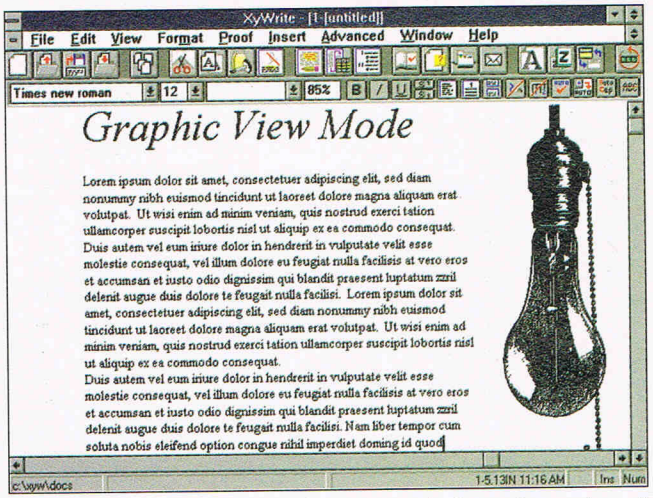
XyWrite for Windows is an ambitious attempt to bring to Windows the speed, efficiency, and extensive typesetting capability of XyWrite for DOS. The program offers maximum configurability, total keyboard control, and all the professional word-processing features of its major competitors—plus a few extras of its own. But however much XyWrite for Windows offers, its delivery suffers from a rough interface and complexity inherited from its DOS ancestor.

XyWrite is one of those DOS programs you never thought you'd see in Windows. It was designed to emulate Atex, the typesetting system used by many magazines and newspapers, and it's never gotten away from two-letter commands issued from the command line. It was a good program in its day, offering speed and powerful word-processing features to those who took the time to learn the program and used it regularly.

XyWrite for Windows has the potential for even greater word-processing power than its predecessor, with new and enhanced features such as drag-and-drop editing, text wrap, automatic capitalization, automatic word replacement, and redline editing. It can handle complex sorts and mail merges, track in-text references to chapters and pages, and create fill-in forms. But the program is still based on those anachronistic two-letter commands. While menus, toolbars, and dialog boxes can save you from some of the alphabet soup on the command line, you must memorize a number of the commands to truly understand the program and make full use of it.

Working with the program, you get a strong sense that it hasn't adapted to its new Windows habitat. XyWrite's semi-WYSIWYG Graphic view definitely needs improvement. It displays TrueType and Type 1 fonts, but it won't display justified text or graphics overprinted with type. The screen is slow to respond when you hold down the Delete or backspace key, making it easy to delete too much. Three non-WYSIWYG view modes—Page-Line, Draft, and Expanded (for viewing embedded codes)—use the Windows System font for faster typing and scrolling, but they're difficult to read.

The interface seems unrefined in some ways. Selecting text with the mouse is hit or miss; the insertion point frequently jumps to the wrong character. Dialog boxes cause a number of annoying glitches. They pop up unexpectedly, often with obscure messages, and it takes several clicks to make them go away. Formatting text to be overprinted by a graphic caused such an unexpected box to pop up. A minor file correction from tech support seemed to fix the problem for this review and allowed overprinting of type using the XyWrite printer driver for the HP DeskJet 500. Using the Windows driver locked up the system.



XyWrite for Windows is hampered by complexity and an awkward interface inherited from its DOS predecessor.

A problem with the program's installer may prevent import and export filters from being installed. XyWrite 4.11, an update to the first Windows release, only partially solves the problem, requiring some filters to be installed manually. But getting the filters installed is still only part of the solution. The Word and WordPerfect filters tested did import and export text, but the formatting was consistently incorrect. (Speaking of the next upgrade, the program desperately needs an undo command.)

If you're currently using XyWrite for DOS and would like the familiarity of the command line and embedded codes in a Windows word processor, XyWrite for Windows may be for you. But the quirkiness of its interface can be annoying, especially if you're familiar with other Windows applications. Unless you're already a XyWrite fan, you should probably consider one of the other Windows word processors that take less time to learn, have fewer glitches, and offer essentially the same features.

PHILLIP MORGAN

The Technology Group
(410) 576-2040
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$129 (upgrade from XyWrite for DOS)
$149 (competitive upgrade)

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ELEMENTS

Budget gourmets of arcade-style logic puzzles are in for a special treat with this low-cost, entertaining release from Villa Crespo. Designed by 16-year-old Avery Pack, the game challenges you to guide the onscreen Element (a sphere) through a series of multiscreen mazes, collecting points while avoiding pitfalls and traps. The game features seven levels of increasing difficulty, comprising nearly 50 puzzle screens. Passwords let you begin at the last uncompleted level, while a vanity board records your high-score achievements for posterity.

The object of each maze is simply to work your way to the exit, maneuvering past one-way corridors, black holes, and locked passages which require color-coded keys. Because each move drains your limited energy supply, the game forces you to employ think-ahead strategy in order to survive. Although there often appear to be multiple paths to choose from, red herrings and dead ends abound. Do you go for

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© 1994 New World Computing, Inc. Zephyr is a trademark of New World Computing. New World Computing and its distinctive logo are registered trademarks of New World Computing, Inc. All rights reserved. IBM screens shown. Actual screens may vary.

points, grab some energy tokens, or make a beeline for the exit? Actions taken—or not taken—in one maze often determine your success in the next. The game appears deceptively simple at first, but adds more puzzle objects and bigger mazes at higher levels.

The game's only drawbacks are its overall small size and lack of replay value. The publisher hints at a possible Elements II with a built-in puzzle construction set. Let's hope the sequel arrives—one taste of this brain-teasing delight will have you craving more.

SCOTT A. MAY

Villa Crespo
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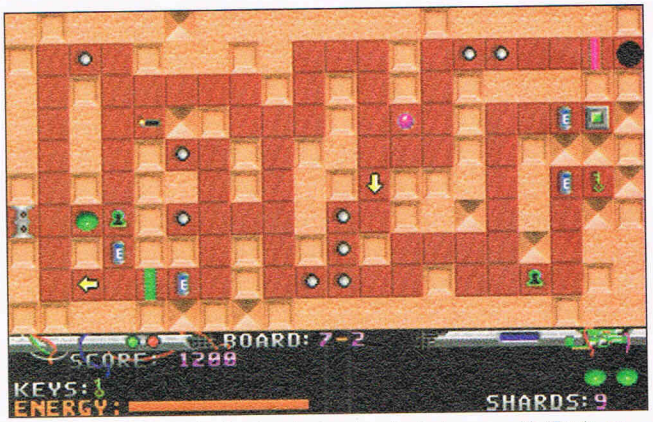
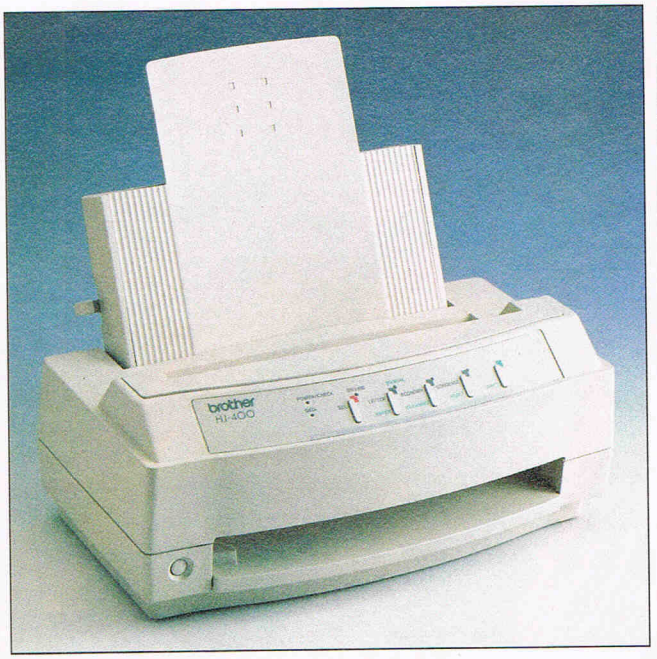


Elements is deceptively simple to play, but shares with Tetris an addictive quality that keeps you coming back.

BROTHER HJ-400

Bargain hunters looking for a new printer are no longer forced to settle for a noisy, near-letter-quality dot-matrix printer. Ink-jet printers offer entry-level prices and near-laser-quality printing. Brother's new entry in this nascent low-end category, the HJ-400, is particularly flexible, offering printer drivers for both Windows and the Macintosh and including both serial and parallel interface ports.



The Brother HJ-400 ink-jet printer sports a very small footprint, but it has an awkward sheet-feeder mechanism.

It also includes what might be the world's most awkward sheet feeder. According to the manual, you remove the printer's cover and the entire sheet feeder, flip levers, insert tabs in slots, and then reassemble the works every time you add paper. With practice, most of these steps can be skipped, but it's still trickier than it should be. Fortunately, the rest of the printer is much easier to use. Switching from the sheet feeder to manual feed in order to print an envelope is a one-button operation, and the ink cartridge can be replaced in seconds with no mess.

The HJ-400 has the sharp quality that's typical of most ink-jet printers. Its 360-dpi (dots per inch) output isn't noticeably sharper than 300-dpi output, but the extra resolution is a big plus if you use a modem to receive faxes. Doubling every other dot of a 200-dpi fax page to render it on a 300-dpi printer makes for coarse-looking images, and the HJ-400's extra resolution really helps to smooth things out.

Since it prints by spraying liquid ink on the page, an ink jet's print quality depends on the type of paper used: On thin or absorbent stock, the ink spreads, blurring the shapes of the characters. But Brother must have selected a very quick-drying ink—it isn't nearly as fussy about paper as some inks. Nor is it as prone to soak the page when you're printing solid black areas or to smear when you remove a freshly printed page from the output tray.

The HJ-400 isn't exactly a speed demon—it barely manages one page per minute with graphics, a pace that some ink-jet printers can double. But with above-par print quality, a compact and attractive package, and a price that makes it competitive with middle-of-the-line dot-matrix printers, this newcomer deserves serious consideration. And it's a natural choice in households with both Macs and PCs.

TIM VICTOR

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PLACES RATED ALMANAC, INFONATION

Like it or not, we live in an age of information overkill. Thanks to personal computers and the so-called information superhighway, we now have easier access to more data than most people can possibly absorb. As a result, a new cottage industry has popped up that creates software that sorts, compiles, and presents portions of this data in a manner we can understand. Two excellent examples are Places Rated Almanac from Paramount Publishing and InfoNation from Software Market-

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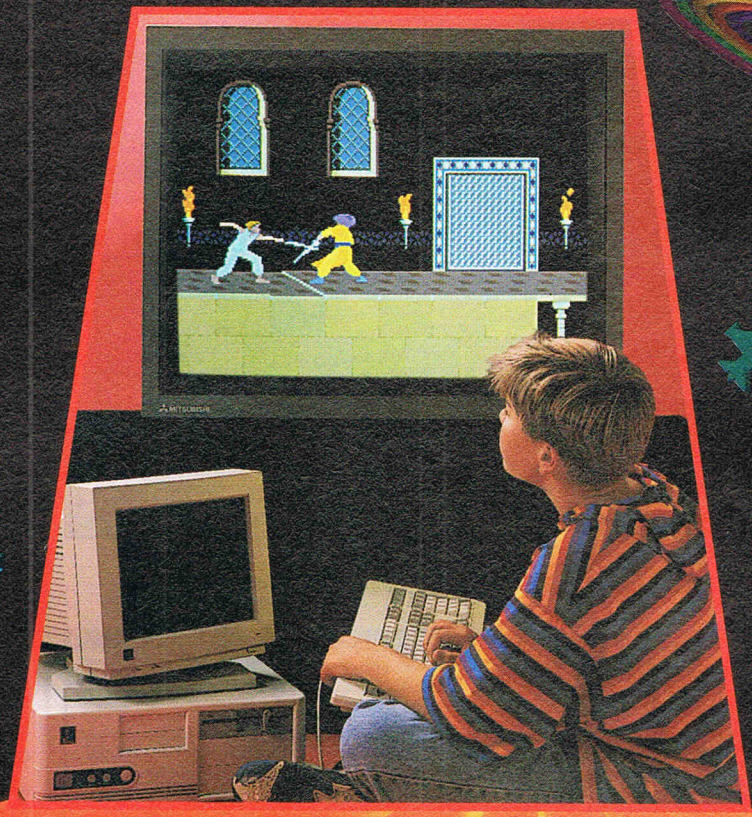

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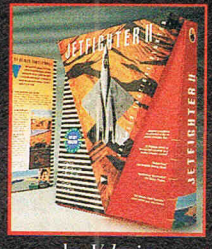

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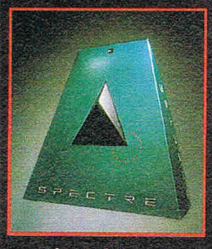

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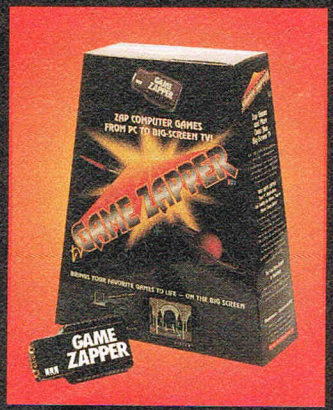

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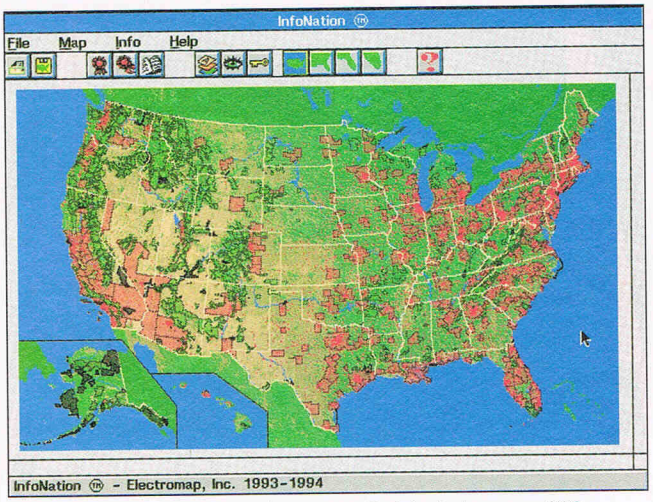
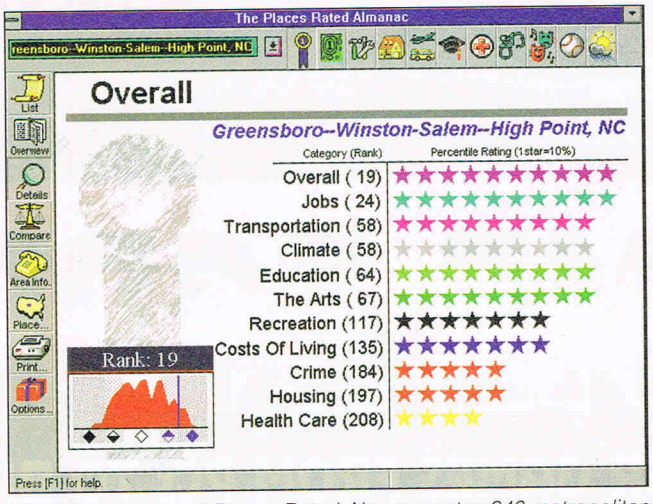
ing. Both products attempt to rate states and major metropolitan areas by quality of life. Whether you're looking to relocate your family, expand your business, or simply choose an ideal vacation spot, these programs are the next best thing to being there.

Paramount's title, based on the best-selling book by David Savageau and Richard Boyer, ranks 343 North American metro areas in ten basic categories: cost of living, healthcare, climate, job growth, housing, transportation, education, crime, the arts, and recreation. The Windows-based program displays the information using a variety of graphs, charts, maps, and text boxes. The program's main strengths are its clean presentation-style graphics and its easily understood interface. See at a glance where your favorite cities rate in the ten categories, or select multiple locations for direct side-by-side comparisons. You can also customize a random search function, rating the importance of each category, to produce a list of ideal locations.

InfoNation takes a more academic approach to the ratings game, so what little this DOS-based program lacks in presentation, it makes up for with remarkable depth. The designers utilized more than 40 government and private sources for their data, in most cases based on 1993 reports. In all, the product ranks 50 states and 303 metro areas on more than 600 topics. You can display data in a number of ways. Quick Rank compares cities or states on a single topic. The results can be viewed as a list, a statistical map, or a bar chart. You can also examine single states or metro areas by any combination of available topics, from birth rates and building starts to nearly every imaginable statistical dissection of the populace. Other notable features include excellent user-defined rank and filter settings, used by the program's search function to pinpoint your special interests. Also included are hi-res topographic satellite maps, featuring four levels of magnification, and custom overlays showing state lines, cities, national parks, rivers, lakes, and so on. Maps can be exported in PCX file format, and most other information can be output to a printer.



InfoNation is a DOS-based program that includes over 600 statistics on 303 metropolitan areas in all 50 states.



The Windows-based Places Rated Almanac rates 343 metropolitan areas by cost of living, climate, and other characteristics.

Both programs are perfect for education, business marketing, and other areas concerned with social and economic research.

Although ratings of quality of life fluctuate almost daily and category totals and percentages rapidly change, each product—particularly InfoNation—provides an overall analysis accurate enough to use in forecasting trends and making projections.

The products tackle similar topics, but from wildly different angles. If you're looking for fast, generalized rankings and attractive presentation-style graphics, Places Rated Almanac is sure to please. For those who are after more detailed resource material, though, InfoNation is the better choice.

SCOTT A. MAY

InfoNation
Software Marketing
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$39.95
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Places Rated Almanac
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Before TrueType and Windows 3.1, quality fonts were expensive and hard to find. Now TrueType fonts are ubiquitous and available at bargain prices, but the quality varies greatly. Fantastic Fonts for Windows is a CD-ROM–based collection with 365 TrueType quality fonts and 50 resizable borders. The borders aren't particularly impressive, but the font selection makes the disc a great bargain.

Many of the fonts contain virtually full character sets, so you won't get into trouble if you suddenly need to print characters with accents (on a résumé, perhaps). With 134 serif fonts, 77 sans-serif fonts, and 154 decorative fonts, the collection is all most would-be publishers will ever need.

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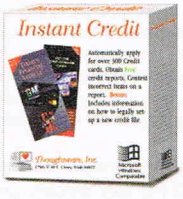

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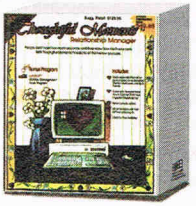

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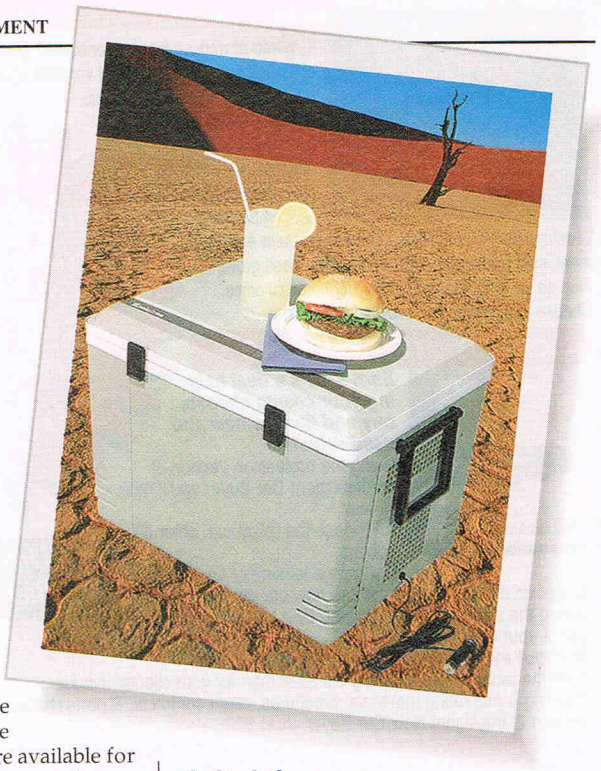
TECHNOLOGY UPDATE

500 miles from nowhere, it'll give you a cold drink or a warm burger...

NASA space flights inspired this portable fridge that outperforms conventional fridges, replaces the ice chest and alternates as a food warmer.



By Charles Anton

Recognize the ice cooler in this picture? Surprisingly enough, there isn't one. What you see instead is a Koolatron, an invention that replaces the traditional ice cooler, and its many limitations, with a technology even more sophisticated than your home fridge. And far better suited to travel.

What's more, the innocent looking box before you is not only a refrigerator, it's also a food warmer.

NASA inspired portable refrigerator. Because of space travel's tough demands, scientists had to find something more dependable and less bulky than traditional refrigeration coils and compressors. Their research led them to discover a miraculous solid state component called the thermo-electric module.

Aside from a small fan, this electronic fridge has no moving parts to wear out or break down. It's not affected by tilting, jarring or vibration (situations that cause home fridges to fail). The governing module, no bigger than a matchbook, actually delivers the cooling power of a 10 pound block of ice.

From satellites to station wagons. Thermo-electric temperature control has now been proven with more than 25 years of use in some of the most rigorous space and laboratory applications. And Koolatron is the first manufacturer to make this technology available to families, fishermen, boaters, campers and hunters– in fact anyone on the move.

Home refrigeration has come a long way since the days of the ice box and the block of ice. But when we travel, we go back to the sloppy ice cooler with its soggy and sometimes spoiled food. No more! Now for the price of a good cooler and one or two seasons of buying ice, (or about five family restaurant meals), all the advantages of home cooling are available for you electronically and conveniently.

Think about your last trip. You just got away nicely on your long-awaited vacation. You're cruising comfortably in your car along a busy interstate with only a few rest stops or restaurants. You guessed it... the kids want to stop for a snack. But your Koolatron is stocked with fruit, sandwiches, cold drinks, fried chicken... fresh and cold. Everybody helps themselves and you have saved valuable vacation time and another expensive restaurant bill.

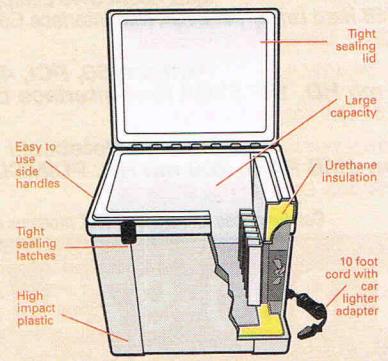
Hot or cold. With the switch of a plug, the Koolatron becomes a food warmer for a casserole, burger or baby's bottle. It can go up to 125 degrees.

And because there are no temperamental compressors or gasses, the Koolatron works perfectly under all circumstances, even upside down. Empty, the large model weighs only 12 pounds and the smaller one weighs just seven. Full, the large model holds up to 40 12-oz. cans and the smaller one holds six.

Just load it up and plug it in. On motor trips, plug your Koolatron into your cigarette lighter; it will use less power than a tail light. If you decide to carry it to a picnic place or a fishing hole, the Koolatron will hold its cooling capacity for 24 hours. If you leave it plugged into your battery with the engine off, it consumes only three amps of power.

The refrigerator from outer space.

The secret of the Koolatron Cooler/Warmer is a miniature thermo-electric module that effectively replaces bulky piping coils, loud motors and compressors used in conventional refrigeration units. In the cool mode, the Koolatron reduces the outside temperature by 40 degrees F. At the switch of a plug, it becomes a food warmer, going up to 125 degrees.



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The versatile Koolatron is available in two sizes. The P24A holds 30 quarts and the smaller P9 holds seven quarts. An optional AC adaptor lets you use them in your rec room, patio or motel room. They plug into any regular outlet.

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ISLE OF THE DEAD

Comedy was one of the subtler rewards of Wolfenstein 3-D, but it seems to have rubbed off on the game designers at Rainmaker Software. They've imbued their Wolfenstein variation, Isle of the Dead (distributed by Merit Software), with a wonderfully sick sense of humor—it's a sort of hack-'n'-laugh game. Alas, like many comedians, they ultimately find it hard to keep up the pace.

You're the lone survivor of a crash landing and find yourself stranded on a free-scrolling beach supplied with whatever you can grab from the plane wreckage. Once you move inland—a matter of using a machete on the right parts of the scenery—you discover that you're the hottest thing on the island (literally) and that everybody wants a piece of you (again, literally).

It's an unfriendly group occupying the island. The blank-eyed kid asking "Daddy?" in an squeaky voice? He's a zombie. The Muscle Beach expatriate in Ray-Bans bawling "Bummer, dude!" as he goes down? He's a zombie. The headless torso carrying its head as a weapon, and the fat guy with his guts hanging out like wind chimes? Um, you get the idea.

Of course, the zombies eventually get their pound of flesh, and we cut (gulp) to an animation in which you're ripped to shreds with the sort of unbridled, juicy enthusiasm that's usually reserved for unwrapping presents on Christmas morning. And that's what works best (and what your parents will like least) in this game: the over-the-top, grisly fun of putting these shambling comic-book horrors to the sword with a maximum dispersal radius for bodily fluids. The graphics aren't fantastic, and I've heard better intro music out of 8-bit computers. But this game is trying to evoke the mood of the old EC Comics horror magazines, and comic books don't require state-of-the-art specs to be fun.

The developers have tried to go Wolfenstein one better by tossing in graphic-adventure elements. You have the ability talk to other characters, there's an inventory screen that fills up with objects to use, and there are segments in which the free-scrolling action-oriented environment gives way to square-by-square adventure-style movement. These are nice touches, but they're not integrated quite as well as they might have been. You hack your way through long stretches of jungle and cavern overpopulated with enemies who have little variety, and the game has a tendency to descend into a bloodbath in which its previously light touch (much like our hapless adventurer) is simply overwhelmed by dead flesh. And by then, I'd already stopped laughing.

PETER OLAFSON

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EVERYWHERE USA TRAVEL GUIDE FOR WINDOWS

Everywhere USA Travel Guide for Windows is a two–CD-ROM program that lets you plan trips anywhere in the country, but it unfortunately isn't complete enough to substitute for a printed guide. It's a good place to find basic travel ideas, providing some interesting information in an easily accessible format, but it needs beefing up before it can be considered a complete travel planner.

After selecting a state to search, you can look for items within a certain distance of a town. The results are displayed as a list, a slide show, or a set of thumbnail pictures. The default list mode presents a photo and caption on the left, with descriptive text on the right (including contact info). The locater feature shows a map of the state, marking the current search radius, the major cities, and the location of the current item.

You may limit the listing to specific categories, such as parks and forests, or create a custom search for criteria such as free admission or days and months open. You can set bookmarks, print textual information, and look at short promotional videos. Unfortunately, while some of the visuals are great, many are ordinary or don't seem pertinent, while many towns I checked were missing pictures of major landmarks.

The program may improve if the publisher continually updates and refines the information. For now, it's a useful addition to printed travel material.

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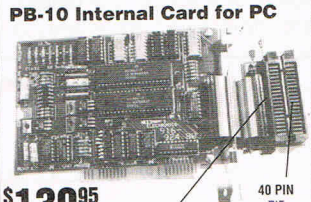

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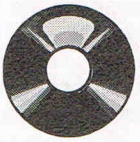

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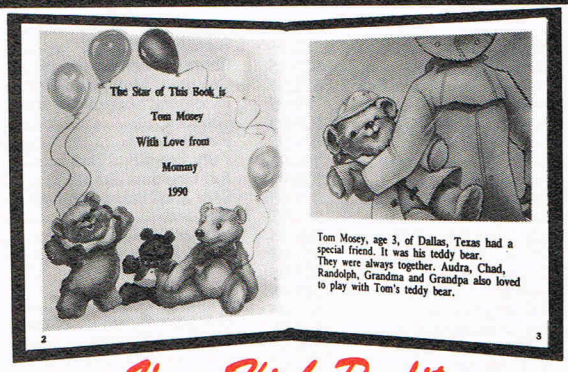

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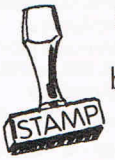

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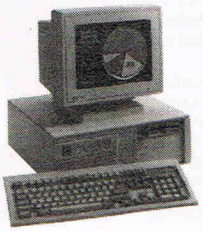

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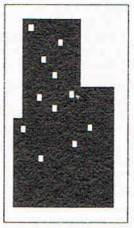

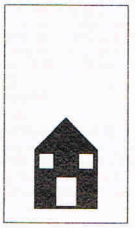

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(continued from page 128)
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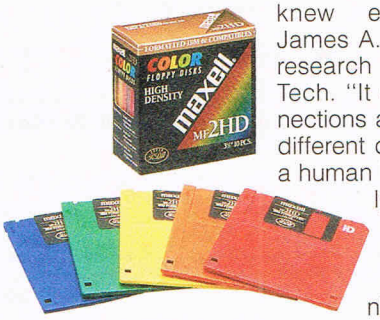

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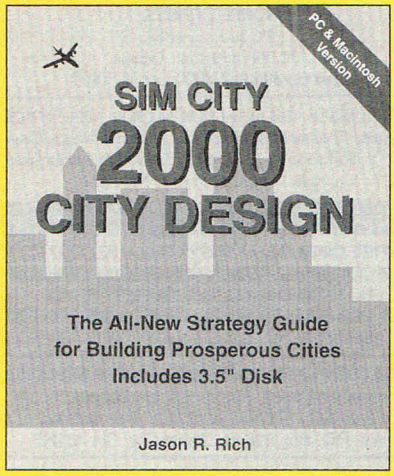

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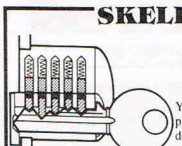

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NEWS & NOTES

Jill Champion Booth

Barbie Goes High-Tech

The world's most popular fashion doll is trying to change with the times—even to the point of entering the computer age. Hi Tech Expressions is offering three Barbie computer-game and videogame titles targeted specifically at girls between the ages of 5 and 11. In Barbie Super Model, players interact with Barbie in her quest to become the hottest supermodel in the world ($64.95 for SNES, $59.95 for Sega Genesis, and $24.95 for PC). In Barbie, designed exclusively for NES ($44.95), players explore three worlds of fun and fantasy while searching for the fashion treasures Barbie needs in order to attend the Fantasy Ball. Finally, in Barbie Game Girl (for the Game Boy, $29.95), Barbie discovers mysterious, powerful charms and makes some new friends while trying to find her way to the top of the Mall Maze, where she's meeting Ken for a date. OK, so she isn't exactly a nineties woman (she's a fashion doll, remember?); little girls *love* this stuff! Contact Hi Tech Expressions, 584 Broadway, New York, New York 10012; (212) 941-1224, (212) 941-1521 (fax).

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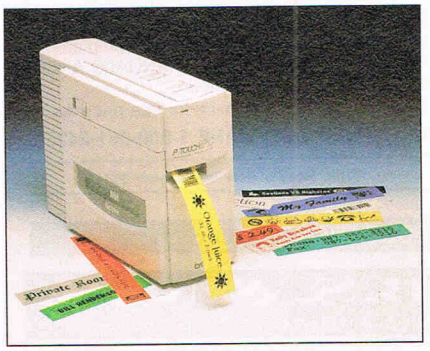

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A Multimedia Brute!

For sure, there's nothing wimpy about ARES Microdevelopment's new maxed-out multimedia system—except maybe its price. For $2,599, the Multimediares includes an i486DX2 processor running at 66 MHz, 8MB of RAM expandable to 64MB, a local-bus graphics accelerator with 2MB of RAM, a 420MB hard drive with Enhanced IDE, a 256K external RAM cache, a multisession double-speed CD-ROM drive, a 16-bit sound card with high-end stereo speakers, and a copy of TestDrive CD, which features more than $500 worth of free software. "People forget there's more to multimedia than just a CD-ROM drive and a sound card," says the company's president, Steve Wagstaff. You can bet ARES didn't forget. Contact the company at 23660-A Research Drive, Farmington Hills, Michigan 48335; (313) 473-0808, (313) 473-4450 (fax).

P-Touch PC Labeler

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Art of the Twenty-first Century

Just think of it as seeing 3-D without wearing glasses. The newest trend in computer-generated art is the "5-D" stereogram—what looks like colorful, but flat, abstract art until you stare at it. Once your eyes have adjusted to the pattern, a 3-D image pops out. Stereograms were created to study depth perception in humans, but now you can get them just for fun on greeting cards, calendars, and wall prints from Blue Mountain Arts, one of the best-known alternative greeting-card publishers around. Retail prices range from $3.00 each for cards to $11.95 each for calendars. Look for them in your favorite novelty, book, or greeting-card store.

Predicting the Future

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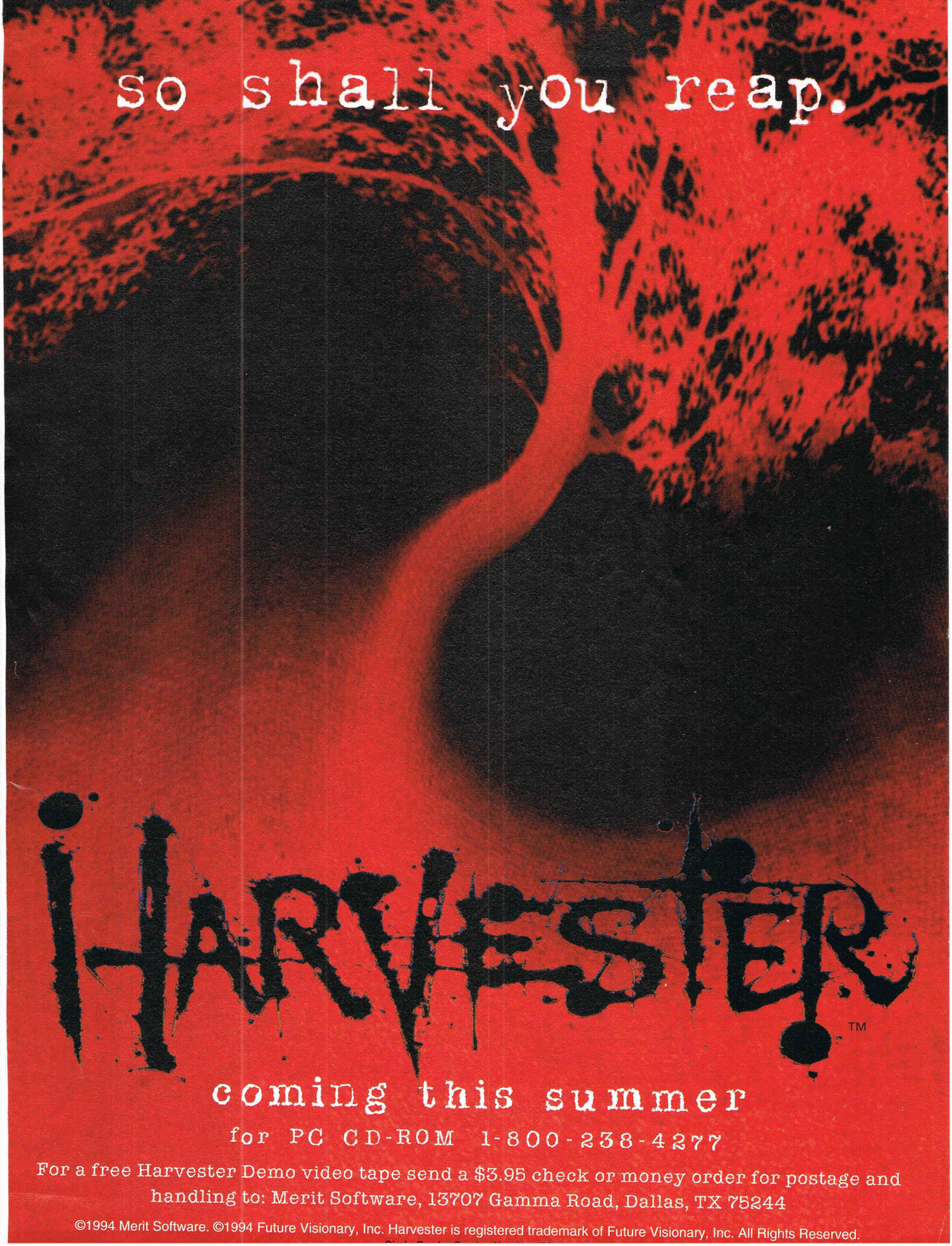
(continued on page 124)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