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This issue's Test Lab focuses on seven dual-scan passive matrix color notebooks, each priced at under \$2,500. The quality of dual-scan displays is getting closer to that of their active matrix high-end brothers, and the \$2,500 price point has become a battleground for some very powerful, colorful machines.

One dual-scan notebook that wasn't available in time for our Test Lab report is the new IBM ThinkPad 360Cs. It wouldn't quite have made the price cut anyway, coming in just \$99 over our \$2,500 limit, but this machine is so notable in so many ways that I'd like to talk about it a little.

The 360Cs's standard configuration doesn't sound like anything to write home about. It is powered by a 25-MHz SL-enhanced 486SX CPU, comes with either a 170MB or a 340MB hard drive, and houses 4MB of RAM, expandable to 20MB. Video, as already noted, is dual-scan passive matrix display. Look beyond these ordinary numbers, however, and you'll find a machine with a personality.

The ThinkPad 360Cs has the same basic exterior design as its fore-runners, the 350 and 750. The machine is housed in a handsome, well-built black case, with black keys and a red pointing device. The most remarkable feature of the 360Cs is probably its keyboard, which it inherits from the earlier 350 and 750 machines. The layout is the best of any notebook on the market. Almost all the keys are full-size, and there are two Ctrl and Alt key pairs on either side of the space bar, as well as dedicated F1-F12 keys, cursor control keys (in an inverted T), and Page Up and Page Down keys. The only thing you give up with this keyboard is a separate numeric keypad.

The 360Cs uses IBM's TrackPoint pointing device, which looks like a little red eraser between the G, H, and B keys combined with two red buttons positioned on the edge of the case. After using a 747 full of portable trackballs, I'm convinced that the TrackPoint is the best portable pointing device going. It takes some getting used to, but it offers greater control than most small trackballs, and it takes up far less room.

The 360Cs's keyboard is remarkable in another way. To access the machine's internals, you unlatch the keyboard and lift it up. Underneath, you'll find the floppy drive, which can be removed and replaced with a second battery or wireless communications; the hard drive, which can be upgraded; and a section in the middle where you can insert memory upgrade IC cards.

Moving to the display, the dual-scan screen is unusually large—9.5 inches diagonally—and very bright. As far as the quality goes, I've found that when you put the 360Cs's dual-scan display beside an active matrix machine, the screen suffers by comparison. But when you look at the 360Cs by itself, the color and quality are quite good.



Another area where this computer really lights up a room is its power supply. I know—power supplies are boring, but once you see this one, you may change your tune. The machine's small power brick is on the end of the cord, rather than in the middle, and the power prongs are retractable. What a great idea!

The 360Cs has ports galore. A PC-MCIA Type III slot leads off a list that includes parallel, serial, PS/2, external VGA, and proprietary bus expansion slots.

The machines in this issue's Test Lab represent some real bargains, and compared with them, the 360Cs may be a little pricey. But its innovative design, superb keyboard and pointing device, and expandability may be worth the price. □



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WINDOWS WORKSHOP

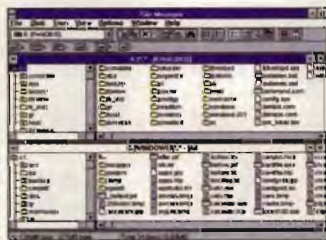
Clifton Karnes

INTERLNK

One of DOS 6's neatest features—especially for Windows users—is one you may have missed. It's Interlnk, and with it, you can transfer files from one PC to another and even create a miniature network.

In this column, I want to talk about how to use Interlnk, but before you can use it effectively, you need to understand two terms: *client* and *server*. These two words define a relationship between machines, which is usually expressed as client/server. In this relation-

With DOS 6's Interlnk, you can turn two PCs into a client/server network.



ship, one machine—the server—provides information to the other—the client. In most cases, the server simply appears to be one or more disk drives on the client computer. Interlnk establishes a client/server relationship between two PCs, and when the two PCs are connected, the server's drives appear as additional drives on the client.

Before using the Interlnk program, you're going to need two PCs and some way to connect them. With Interlnk you can use either a null modem serial cable or a parallel-port cable that's designed for two-way communication. The parallel-port cable is much faster, so try to find one of these. In fact, don't use a serial cable unless you have to.

After connecting the two machines with the serial or parallel cable, decide which machine is going to be the client and which is going to be the server. Let the machine you

want to work on be the client. If you're connecting a desktop and a notebook, you'll usually want to make the desktop the client, since desktops generally have better keyboards and monitors. Let's assume this configuration and make the desktop the client and the notebook the server. But you could easily reverse this configuration and accomplish the same thing; you'd just be working from the notebook.

Now for the software. First, on the notebook, go to DOS and run INTERSVR.EXE. This DOS executable turns the notebook into a server. Next, on the client, you'll need to add one of the following lines to your CONFIG.SYS file: DEVICE=INTERLNK.EXE or DEVICEHIGH=INTERLNK.EXE.

After adding the line, reboot the client (desktop) PC. It's best to run the server program, INTERSVR.EXE, before running the client device driver.

After booting the client PC, you'll have a new client drive for each of the server's hard and floppy drives (CD-ROM drives are not supported). These new drives are available in DOS and Windows, but since we're mostly interested in Windows, I'll concentrate on it.

In Windows, run File Manager on the desktop computer (the client), and you'll see the new drives listed in the Drives drop-down list box. Now, take a look at the server's screen. You'll see a list detailing which server drives are mapped to which client drives. When you access the server, an asterisk flashes beside the drive that's being used. Note that the server can't do anything else but act as a server—multitasking of any kind is out. Its entire being is now focused on giving you everything you ask for.

To test your new client/server relationship, copy some files from the notebook to the

desktop. Next, try copying in the other direction. If you're using a parallel cable, the transfer should be pretty fast.

Next, find a Windows EXE on the server's hard disk—like CALC.EXE (in the WINDOWS directory)—and double-click on it. You'll run the program. If you want to make sure that you're really running Calc from the server, temporarily change the name of the client's CALC.EXE to CALC.BAK.

You're probably starting to get the idea that this client/server thing is a relationship worth cultivating. Instead of dumping your notebook in the closet when it's not being used, you can, for example, leave it permanently linked to your desktop as a server. Use it to store some extra files you don't have room for on your hard disk (assuming there's room on the notebook's drive).

Or you can simply link the machines when you need to update one or the other. The important thing about this relationship is that with Interlnk, either machine can be the client. You simply decide which computer you want to work on and make that one the client.

Is there any situation where you'd want to make a notebook the client? Yes, there's an important one. You see, Interlnk not only makes a server PC's drives available to another PC but also makes the server's parallel ports available. You can, for example, connect the notebook to your desktop and print using the desktop's printer. Naturally, the desktop will need to be connected to a printer, which may be tough if you're using your only parallel port for your Interlnk connection. Oh, well. You can't have everything.

For more information on Interlnk, look up *Interlnk*, *INTERLNK.EXE*, and *Intersvr* in DOS 6's Help. □

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FEEDBACK

Edited by Robert Bixby

Embedding printer codes, crossing wires, counting to 50, avoiding the letter Y, finding really big files, buying a wave-table sound card, and downloading our tic-tac-toe game

Sneaker Net

In the office where I work, there are several printers with varying capabilities, and the nature of my job has me utilizing different printers from day to day. In addition, I use simple word processor and spreadsheet programs, as they are the simplest to use in going from printer to printer. This brings me to the problem. Sometimes I want to make use of printer capabilities that aren't supported by the software. Is there a simple way to embed command codes in text to make use of these printer codes?

CHARLES T. HUTH
TIFFIN, OH

In a word, no. There's no simple way to embed printer commands in ASCII text files. But that's no reason not to do it. The difficult thing is getting a list of codes that the printer responds to. There are two ways to do this. You can either get the printer manual and look up the codes for what you want to do or print a formatted document to disk using a word processor that supports the special formatting you want to use and then examine it for the codes by using an ASCII file viewer or by using Type to type the file to the screen.

Most printers use the Esc character (ASCII character 27) to notify the printer that the characters that follow are not characters to be printed but a command to the printer. The Esc character might be followed by a B to turn on bold text. Then, later, you might enter an Esc character followed by an N to return to normal text. The tough part will be entering the Esc character. Pressing the Esc key probably won't do it. Instead, you'll have to turn on the Num Lock, hold down the Alt key, and type 027 on the numeric

keypad to enter the Esc character (check your word processor manual to be sure).

Remember that most special formatting has to be turned off once it's turned on. If, for example, you turn on underlining in the beginning of a long report and forget to turn it off, the whole report will be underlined.

Fried Chips

In the July "Hardware Clinic," Mark Minasi writes, "The white wire connects the hot side of the wall outlet to the power switch. . . . The black wire connects the return side of the wall outlet to the power switch." In fact, these connections are the other way around. The black wire is always the hot lead, and the white wire is always the common or return lead."

In the June "Hardware Clinic," Mark Minasi writes, "I can't wait to pop [a DX4] in my 33-MHz 486DX server and watch it fly." Watch it fry is more like it. Intel was quick to point out that the DX4 is a 3.3-volt chip while the DX is a 5-volt chip. Although voltage regulators are available to provide the proper voltage for the DX4, they aren't intended to be installed by end users. Don't buy a DX4 expecting to just pop it into your DX2 socket unless you like the smell of burning silicon.

Also, the toll-free number for ARES Microdevelopment was left out of the July "News & Notes" column, under the heading A Multimedia Brute. It's (800) 322-3200.

THE EDITORS
GREENSBORO, NC

When a 50 Is a 50

Is Sprite's 486-50 a true 486-50? What's the difference between DRAM and SIMM chips (besides the price)? Could I use an old Commodore model 1702 monitor with my AT, using an RGB vid-

eo card? If so, would software requiring an EGA or a VGA monitor work with it?

EARL RUSSELL SMITH
PICTOU COUNTY, NS

You should check with Sprite to find out which chip was used. Intel has made a full-fledged 486DX-50, but most 50-MHz 486s are actually 486DX2-50s. There's actually not much difference in performance. The 486DX-50 has an iCOMP rating of 249, while the 486DX2-50 has an iCOMP rating of 231. DRAM chips (actually called DIPs in the trade—for Dual In-line Package) are set in sockets in the motherboard, and SIMMs (Single In-line Memory Modules) are set in special brackets. They are not interchangeable. SIMMs are much easier to upgrade and replace. Actually, all PC memory chips are DRAM (Dynamic Random Access Memory), but DIPs are generally called DRAMs.

A quick search of the COMPUTE equipment graveyard didn't yield a 1702 monitor, and I don't remember whether it includes an RGB input. If yours has a D connector, it will probably work with your CGA. (I assume you're referring to CGA when you say "RGB video card.") Some CGA cards include a composite output, which you could connect directly with the composite input on the 1702. The main problems you'll have will involve software. You'll probably have problems running most modern software with CGA. Windows and other software that requires EGA or VGA probably won't work with CGA, though text-based software will probably run properly.

Make RM Work

I'm having trouble getting your RM.BAT program to work (from the December 1993 issue). After typing it in,



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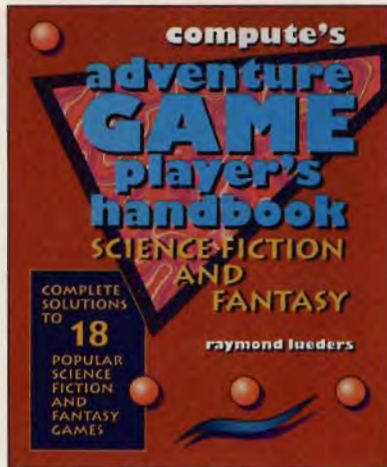


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FEEDBACK

I keep getting fast-moving lines of the letter Y. I think the culprit is the piping symbol. I don't think you're supposed to type it in. Can you assist me in this?

TONY BRUNO
NEW YORK, NY

Richard C. Leinecker replies: The line that's giving you trouble is ECHO Y I DEL %1. The piping symbol is between two commands, the ECHO Y and the DEL %1. The piping symbol answers the question by echoing the Y keypress to the question sometimes posed by the delete command, so you don't have to type it in every time.

You must have the piping symbol in the line for this batch file to work correctly. Type in all batch files, Debug programs, and BASIC programs exactly as they appear in "Tips & Tools."

Cleanups

I want to locate all the really big files on my hard disk in order to get rid of them. How can I do that?

CARL SMITH
CHICAGO, IL

I usually clear directories rather than files, wiping out whole applications and their document files. I have been known to clear 50MB in a few minutes with this technique. However, there may be huge files hidden away in your directory structure that you could get rid of and save some space. Here's a BASIC program that identifies all files above a certain size (you could easily write a batch file that performs similarly).

```
bigfile=1000000
SHELL "dir *.* /s>\tempfile"
OPEN "\tempfile" FOR INPUT
  AS #1
OPEN "\tempfil1" FOR OUTPUT
  AS #2
WHILE NOT EOF(1)
LINE INPUT #1, a$
IF VAL(MID$(a$, 13, 10)) >
  bigfile THEN
PRINT #2, a$
END IF
WEND
CLOSE
```

As you can see, by changing the value of bigfile from 1000000 to some other figure, you can make the program search out files that are of any size. Run the program using QBASIC and type tempfil1 to see a list of all of the files on your hard disk that are larger than 1 million bytes in size. Most of these will be applications, but you'll occasionally find a scanned bitmap or other data file of

enormous size. If you can live without it (or copy it to a floppy), you can use that space for other purposes.

Doomed XT

I'm considering getting a hard disk for my XT, but local dealers are asking \$400-\$600 (Canadian) for a hard disk and controller, which is expensive, considering that the computer is worth about half that. Do you know where I could get a hard disk for less?

ANDREW DALGARNO
NEWDALE, MB

I don't know where you'd buy a new one for less, but you might advertise. Someone might have an old hard disk lying around and be willing to sell it for not very much money just to get rid of it. On the other hand, consider this: If you buy a good IDE hard disk with large capacity and quick access, you could eventually swap that hard disk into a more modern PC, should you decide to purchase one later on. That would turn the hard disk into both a boon in the present and an investment in the future.

Neverland

Never say "never." I read with interest your reply in "Feedback" in March to the question by Jason Black asking how to get INKEY\$ to accept input of function keys. I've been doing it for years. In fact, INKEY\$ can be used to read every key on the keyboard. Here's a program that uses the technique.

CLS

```
PRINT "USING INKEY$ TO GET
KEY INPUT"
PRINT
PRINT "KEY CODES FOR ALT+B,
F1, F2, Down Arrow, Up Arrow,
PgUp, PgDn, Home,"
PRINT "End, Esc, and Enter have
been programed in. Any other
key pressed will"
PRINT "print the ASCII Character
Codes needed for programing
them in. But be"
PRINT "forewarned that pressing
any control keys might result in"
PRINT "an action you don't want.
(Use with caution!) Press ESC to
quit."
PRINT
PRINT "Press Any Key"
DO
I$ = ""
DO WHILE I$ = ""
I$ = INKEY$
LOOP
LOCATE 23, 1: PRINT SPACE$(80)
LOCATE 23, 1
SELECT CASE I$
```


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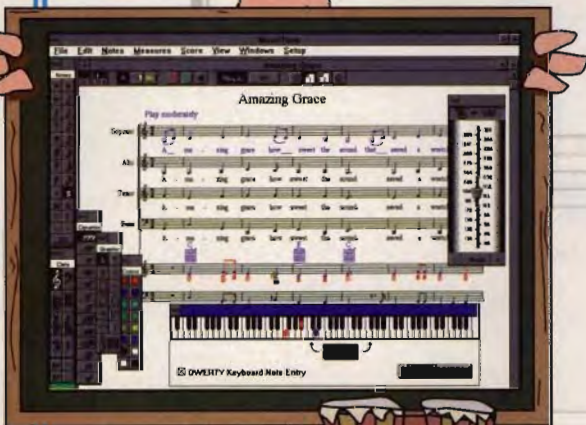
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FEEDBACK

```

CASE IS = CHR$(0) + CHR$(48)'Alt
B
PRINT "You pressed ALT + B"
CASE IS = CHR$(0) + ":",F1
PRINT "You pressed F1"
CASE IS = CHR$(0) + "<",F2
PRINT "You pressed F2"
CASE IS = CHR$(0) + "P"Down
Arrow Pressed
PRINT "You pressed the Down
Arrow."
CASE IS = CHR$(0) + "Q"PgDn
Pressed
PRINT "You pressed Page
Down."
CASE IS = CHR$(0) + "O"End
Pressed
PRINT "You pressed End."
CASE IS = CHR$(0) + "H"Up
Arrow Pressed
PRINT "You pressed the Up
Arrow."
CASE IS = CHR$(0) + "I"PgUp
Pressed
PRINT "You pressed Page Up."
CASE IS = CHR$(0) + "G"Home
Pressed
PRINT "You pressed Home."
CASE IS = CHR$(13)'Enter
Pressed
    
```

```

PRINT "You pressed Enter."
CASE IS = CHR$(27)'Esc pressed
PRINT "You pressed ESC. Do you
want to quit? (Y/N)"
DO
IIS = UCASE$(INPUT$(1))
IF IIS = "Y" OR IIS = "N" THEN
EXIT DO
BEEP
LOOP
IF IIS = "Y" THEN END
LOCATE 23, 1: PRINT SPACES(80)
CASE ELSE'ASCII CODES ARE
PRINTED HERE
LOCATE 23, 1
PRINT "("; I$; ")" KEY = CHR$(I$);
LTRIM$(STR$(ASC(I$))); "(";
IF ASC(I$) = 0 THEN
PRINT " + "; CHR$(34);
CHR$(SCREEN(23, 3)); CHR$(34);
PRINT " Or CHR$(0) + CHR$(I$);
PRINT LTRIM$(STR$(ASC(CHR$(
SCREEN(23, 3))))); "(";
END IF
END SELECT
LOOP
    
```

JOHN SIMONE
TRAVERSE CITY, MI

I am most grateful for your correction and your ingenious solution. And thanks, also, to the many others who wrote to correct me.

Mini Maxi MIDI

I'm considering buying a sound card, and I'm definitely going to buy a wave-table sound card. I want one with a DSP and a SCSI interface, but I have a few questions. Are all wave-table synthesizers compatible (Aria, Ensoniq, Pro Sound, ADI, and Oak Mozart)?

SAM FLUTA
ELLINGTON, CT

David English, our multimedia guru, responds: In theory, all the wave-table cards should be General MIDI compatible. With DOS programs there might be some quirks, but with Windows programs they should work the same—though they wouldn't sound identical.

The wave tables themselves would distinguish the cards. Some might sound rich, others mellow, and still others tinny, depending on the quality of the instrument sampled, the recording technique, and the technology used for playback.

Tic Tac

This month's extra program is mainly for fun. Some time ago, I received a letter from a person who, for whatever reason, wanted to create a tic-tac-toe game and was having trouble doing so. In response, I wrote this month's program—a program that plays tic-tac-toe against you. Although it's virtually impossible to beat the computer, I did build in a frailty that will allow you to beat it if you make the right moves. See if you can find the program's vulnerability.

To find the program, click on the Tips & Tools button in the COMPUTE area of America Online. Locate the September "Feedback" column and double-click on its listing. The column will open up. Simply copy the program out of the column into QBASIC and run it. Or you could compile the program using QuickBASIC. Have fun.

Remember that every month you'll find something extra in the COMPUTE area of America Online that wouldn't fit in the magazine—extra tips, extra tools, extra columns, and sometimes an extra feature.

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 can't provide personal replies to technical questions. □

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INTRODOS

Tony Roberts

DOSKEY MAKES DOS FLY

Doskey is a command line editor that's included with DOS 5 and above. If you don't have Doskey installed and you do any work at all at the DOS prompt, you're missing out on an incredible tool.

Simply type *doskey* to install the program or, better yet, include the command `DOSKEY /INSERT` (to turn off overstrike) in your `AUTOEXEC.BAT` file.

To use Doskey, press the up- and down-arrow keys to move through a list of previously issued DOS commands. When you find one you want to reissue, just press Enter.

Have you ever made a typo while entering a long path and filename? When DOS tells you it can't find the file you've specified, just press the up-arrow key to recall the bad command, and then use the left- and right-arrow keys to move to your typo. Make the correction and press Enter again, and your command will be executed without any further difficulty.

Although command line retrieving and editing are Doskey's most useful features, this program has other tricks up its sleeve.

Doskey also permits the creation of DOS macros which can be loaded into memory and executed as required. One of the provisions of the macro feature makes a useful command line resource: issuing multiple commands on a single command line.

Let's look at how a macro is created. The following line creates a macro we'll call Tidyup. This macro copies all of the `.DOC` files in the current subdirectory to another subdirectory for safekeeping; then it removes all the `.BAK` files from the current subdirectory.

```
DOSKEY TIDYUP=COPY *.DOC  
C:\SAFETY & DEL *.BAK
```

Executing this command creates a new command called Tidyup, which will carry out both the copy and the delete functions at the same time. This command will stay in memory until Doskey is turned off or the computer is reset. Note the paragraph symbol (¶) that separates the two commands. This symbol, entered using the key combination Ctrl-T, is used to tell where one command ends and another begins.

Even if you don't use Doskey to create macros, you can use the Ctrl-T separator to enter several commands on a single command line. I often pop out of Windows and use this feature when I need to perform a series of time-consuming tasks. For example, a couple of times a week, I need to download several large PostScript files to my laser printer for proofing. Since these files usually are 2MB-3MB in size, this process can take a while. Then I compress the PostScript files into archives that fit on a single floppy disk.

To handle this chore, I use the Ctrl-T separator to enter all of the necessary commands onto one command line; then I can go to lunch or to a meeting, leaving the computer to handle the work while I'm away. The command I use looks something like this.

```
PCSEND BROCHURE.PS &  
PCSEND NEWSLETR.PS & PKZIP  
OUTPUT *.PS
```

If you ever find yourself waiting for your DOS prompt to come back, try using this feature to issue all of your commands at once.

Another interesting feature of Doskey is that you can use

its command line history function to create a batch file from a series of commands you've just issued.

Batch files are quick and simple, but if you've ever written one, you know how easy it is to leave out a step. Using Doskey ensures that commands will be entered in the correct sequence.

Let's say you've just stepped through a complicated series of commands to perform a function and you realize that you're going to have to repeat that function regularly. Perhaps this is a monthly or quarterly routine that you'd like to automate.

You can view your entire Doskey command line history by typing *doskey /history*. You can capture that same history to a file; redirect the output to a file by typing *doskey /history > routine.bat*.

Once the command line history has been captured in a file, use the DOS Edit program or another text editor to edit out any unwanted commands in the text file, including the last line, which will be the command you issued to create the batch file.

Before you save your batch file and put it away until you need it next quarter, be sure to add some documentation so that you can remind yourself how, and under what conditions, to execute the program. Do this by adding a few REM statements to the file. Any line in a batch file that begins with REM is considered to be a remark and will not be executed by the computer.

If you know ahead of time that you're going to want to capture a series of commands from the Doskey history to a batch file, press Alt-F7 before you begin. This clears the Doskey history buffer so you can start your recording with a clean slate. □

Doskey automates writing batch files, makes macros, and speeds your command line work.

began to fade away with the advent of 3½-inch 200MB hard drives, faster parallel ports, and PCMCIA (see "PCMCIA Card Expansion" section below) network cards. So why the comeback? Multimedia. Docking stations allow users to easily hook up a CD-ROM drive and a sound card with stereo speakers. All you do is slide the notebook into the docking station, and you've got a full-featured computer, complete with expansion slots.

PCMCIA Card Expansion

In 1989 the PCMCIA (Personal Computer Memory Card International Association) was formed to solidify hardware standards and software interface requirements for removable memory cards and their receptacles.

There are currently three PCMCIA card formats: Types I, II, and III. All three formats measure 54 mm (2.13 inches) by 85.6 mm (3.37 inches). Type I cards are 3.3 mm thick, Type II cards are 5 mm thick, and Type III cards are 10.5 mm thick. Any card will fit into its own type slot or a larger type slot. The PCMCIA standard also specifies connector configurations so that you can plug and unplug the cards in an active, or hot, slot.

Theoretically, PCMCIA cards are interchangeable among all machines that support the standard and card type (I, II, or III). However, this has not proved to be the case. The technology is still maturing, and, apparently, vendors aren't doing extensive tests of one another's cards. Depending on the kind of PCMCIA card you are trying to use, you can expect different levels of compatibility. Fax modems seem to be the most compatible, with SCSI cards being the least compatible. As PCMCIA technology matures, you'll do well to use cards manufactured by the maker of your notebook. This isn't possible, of course, if your manufacturer doesn't provide an option. If you buy a third-party PCMCIA card,

make sure you get a money-back guarantee.

All but one notebook in this roundup, the Texas Instruments TravelMate 4000e, supports PCMCIA card technology, though types supported vary among the others. The TravelMate lets you use conventional internal or external devices for modems and a docking station for other expansion options. When looking at a notebook computer, consider whether you'll benefit from PCMCIA expansion.

Color on the Road

Color really is a necessity. Windows practically demands color—especially on portable displays. Otherwise, it's just too difficult to discern small objects. There are two major types of color screens: active-matrix and passive-matrix. Active-matrix provides the best, clearest display and truest colors. But it's expensive. As long as manufacturing yields on active-matrix screens remain low, prices will remain high. For the frugal buyer, dual-scan passive-matrix technology—in which the top and bottom halves of the screen are refreshed independently at twice the normal refresh rate—provides an excellent alternative to the high end. Dual-scan screens deliver richer colors with less smearing than single-scan passive-matrix screens.

All of the computers in this review have dual-scan, passive-matrix screens, another reason vendors can bring them to you for so low a price.

Review Criteria

Our criteria for participation in this review were simple: Give us a dual-scan passive-matrix notebook with a hard disk larger than 120MB and with a street price less than \$2,500. In addition to the above criteria, we also asked vendors to equip each notebook with 8MB of RAM. The BAPCo tests contain a WordPerfect for Windows session that does not run reliably in 4MB RAM (which is

the standard configuration for most notebooks). In some cases, the extra 4MB RAM kicked the price over our \$2,500 cutoff. If you're not running memory-intensive applications, however, 4MB of RAM is sufficient.

The seven vendors here were the first to meet our requirements. However, many other manufacturers had new machines in development but couldn't meet our deadline. Notebooks from Ambra and Compaq arrived too late to be included in this roundup, but you'll find stand-alone reviews of these products in the Reviews section of the magazine. By the time you read this, there will be many fast color 486s available.

Our Tests and Evaluation

To test the speed of these computers, we used the Business Applications Performance Corporation (BAPCo) test, discussed in the sidebar "Our Testing Procedure." While speed is important to all computer users, it is more important to some. Graphics artists, for example, require more brute processing power than word processing and spreadsheet users. When looking over the speed-test results, weigh them against the other features and options offered with each notebook.

In addition to performing speed tests, I also carried these machines around for a while and used them to do some of my daily work. Included in the review are some of my not-so-scientific observations about the notebooks. I evaluated the keyboard layout, the clarity of the display, energy-saving utilities, ease of use, and battery life. The following reviews combine descriptions of conventional speed and battery life test results and my humble, subjective observations. You'll also want to check out the Features table for side-by-side comparing. Now's a great time to buy a color notebook, and the facts, figures, and analysis in Test Lab can help.

WILLIAM HARREL

TEST LAB

AUSTIN DUAL SCAN POWER

Built around the Intel 486DX2-50, the Austin notebook is the second fastest computer in this review, second only to the MidWest Micro Elite. The Austin performed particularly well on the graphics test, with a whopping SYSmark score of 131. In fact, it's the 131 graphics performance that kicks it into the second-place spot. And if that's not enough to recommend it, at 6.3 pounds, it's also one of the lightest of these machines. You get all this power without wearing out your shoulder!

Speed isn't the only thing to recommend this computer, though. For the \$2,499 price tag you get a 262MB hard disk and a 256-color display. Frankly, I was quite impressed with the colors and clarity on this computer,

A NOTE ON PRICES

With computer technology changing more rapidly than ever before and with options more plentiful than ever before, computer prices can be a tricky business.

It pays to keep the following points in mind:

Computers are available in a variety of configurations, each with a slightly different price. Also, because of the rapid changes in this market, a computer manufacturer may change system components, software, or prices between the time a review is written and the time the magazine hits the stands.

Remember, too, that you're buying support in addition to the computer. Find the support policy that meets your particular needs.

At COMPUTE, we make every effort to verify prices. This month, unless we note otherwise, the price that appears with each review is for the review configuration. It's a good idea, however, to call the manufacturer or vendor to make sure that the configuration you want matches the price you have in mind.

—MIKE HUDNALL

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Pros: fast performance; lightweight; large hard disk; great buy for graphics, layout, and presentations
Cons: hard-to-manipulate trackball

even though it has only a 9.5-inch screen (measured diagonally). You also get a graphics adapter that can display resolutions up to 1280 × 1024 on an external monitor. I connected it to my 20-inch Sony Multiscan HG and was impressed with the quality. However, you won't get true color out of this one's graphics adapter, as you can with the MidWest Micro Elite; and you don't, of course, get the speed of a Windows accelerator. But if you're working with true-color images, you shouldn't be thinking about using a notebook, anyway.

Expansion options include a PC-MCIA slot that can accept either one Type III card or two Type II cards, which means you can run two cards, say a modem and tape backup, at the same time. Austin also offers a docking station, a high-capacity NiMH battery for prolonged road time, and a sound card. With the sound card and a SCSI PCMCIA card to connect a CD-ROM drive, you can have multimedia on your desktop from your portable. And this computer is fast enough to handle multimedia reasonably well.

One of the few things I don't like about the Austin notebook is its small, front-mounted trackball. For me, the device's position (in the middle below the keyboard) makes accessing it a little awkward, and I find it too small to manipulate with ease. Trackballs are convenient to use when you



can move the ball with your thumb and click with a finger. I think that the best trackball for this type of operation is the side-mounted Microsoft BallPoint shipped with the Toshiba Satellite and Texas Instruments TravelMate. The one on the Austin is easier to get to if you use your middle and index fingers. If you use your pointing device often, as I do, this seems a little unnatural.

Another small problem is the Austin documentation, which is not as extensive as the documentation for some of the others. For example, there's no index to help you find specific topics. And the illustrations are hand drawn and unattractive.

These minor inconveniences aside, this is a hot computer. If you don't need true-color display capabilities, it has a lot to recommend it. You'll especially like it if you need a lot of power for, say, working on graphics at home and writing letters on the road.

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GATEWAY 2000 COLORBOOK DX2-40

Built around a 40-MHz Intel 486DX2, this ColorBook is a nice-looking, powerful computer. It's also the lightest notebook (5.7 pounds) reviewed here and has one of the largest screens (10.3 inches). The DX2-40 CPU placed it just within our cutoff price. However, you can get the same machine with a DX2-50 or a DX4-75 chip in the same configuration for a little more money.

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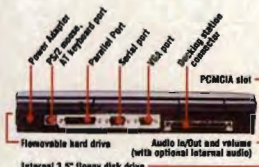


WinBook

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LONGER BATTERY LIFE WITH TEN-CELL 2500mA NiMH BATTERIES



Upgradability

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PCMCIA Expansion

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- 120MB Hard Drive

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the ColorBook are its slim 1.7-inch depth and its incredibly light case. Picking it up and carrying it are a breeze. However, its light construction also raises some concerns about its sturdiness, as does the slight hard disk rattle when you start the machine or after the drive has sat idle for a while. But then Gateway

Gateway 2000 ColorBook DX2-40
Direct price: \$2,495 with 4MB RAM,
\$2,764 with 8MB RAM
Warranty: one year

GATEWAY 2000
(800) 846-2000

Pros: lightweight, large hard disk,
inexpensive external keyboard and
monitor package
Cons: hard-to-manipulate trackball,
construction that feels a bit flimsy

warrants the ColorBook for a year. If anything's going to go wrong, it'll happen before then.

While Gateway does not sell a docking station for the ColorBook, the company does offer what it calls a Combo Pack, which consists of the famous Gateway CrystalScan monitor and AnyKey keyboard. Gateway also

offers a PCMCIA SCSI card for connecting to CD-ROM drives and removables, as well as a PCMCIA tape backup unit.

Speaking of monitors, you can connect the ColorBook to a 1024 x 768 display for one of the clearest displays I've seen from a notebook's external SVGA. You can also operate both the ColorBook's screen and an external monitor at the same time, which is ideal for presentations. I teach PageMaker classes from a notebook that cannot use its display and an external source at the same time. It's a real hassle having to operate the pointing device with my neck craned to see the same screen the audience uses.

I didn't find the ColorBook's minuscule trackball very effective. At first I was impressed with the way it tucks unobtrusively under the

OUR TESTING PROCEDURE

Granted, speed is not the single most important consideration when you're shopping for a notebook computer, but some people really need a lot of horsepower. Besides, it's always interesting to compare computer speeds. To test the notebooks in this month's roundup, we used the Business Applications Performance Corporation's (BAPCo) SYSmark93 benchmarks. The tests run a series of Windows applications in six categories. The categories and applications are as follows:

Word Processing
 WordPerfect 5.2, Word for Windows 2.0, Ami Pro 3.0

Spreadsheet
 Lotus 1-2-3 4.0 for Windows, Excel 4.0

Database
 Paradox 1.0

Desktop Graphics
 CorelDRAW! 3.0

Desktop Presentations
 Freelance Graphics 2.0, PowerPoint 3.0

Desktop Publishing
 PageMaker 5.0

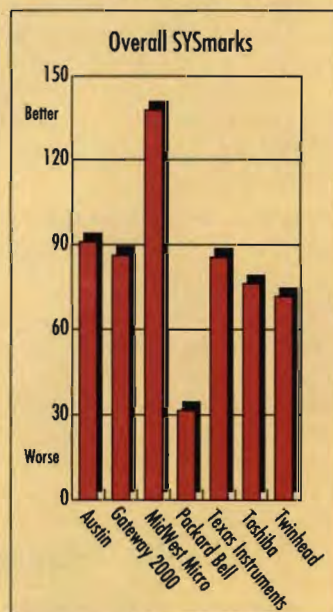
The computers are graded with SYSmarks. As you can see, the notebooks turned in scores between 35

and 140 SYSmarks. These scores are compared to the calibration system, which is a 33-MHz 486-33 with 8MB RAM. The calibration system runs at 100 SYSmarks. As the tests show, only one of these notebooks, the Elite, runs as fast as or faster than the calibration system.

Notice also (from the other charts) that some of the notebooks are more adept at certain types of applications than others. Think about the kinds of uses you would have for a notebook and then look for one that meets your needs. If you need an overall business machine, select one that performed strongly across the board.

The BAPCo software is currently available for an introductory price of \$99. Write to Business Applications Performance Corporation, 2801 Northwestern Parkway, M/S NW1-20, Santa Clara, California 95051. You can call the company at (408) 988-7654.

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machine, but my fascination was short-lived. Its small size and position made it difficult for me to manipulate, and for me, it just didn't control the cursor very well. I had to do a lot of fiddling around to get the pointer to cooperate. According to Gateway, this problem has been solved with the installation of textured balls for better traction. The improved traction should certainly remedy part of the problem.

One real advantage of the ColorBook is its excellent documentation. Not only is the hardcopy manual well illustrated and easy to read and follow, but there is also an online Help file that covers the notebook well, pointing out key features and providing useful information on using the machine. While this notebook isn't as fast (it ranked third on our tests) and fancy as some of the others, it's a good buy and has some features to recommend it. It's ideal if you do presentations on the road often.

Circle Reader Service Number 372

MIDWEST MICRO ELITE DUAL-SCAN COLOR SOUNDBOOK

Now here's a powerful, feature-rich notebook for the bargain hunter. Built around a screaming 75-MHz 486DX4, the MidWest Micro Elite flew past the others in our speed tests. It's as much as four times faster than the slowest of the bunch. And, in addition to

**MidWest Micro Elite Dual-Scan
Color SoundBook**
Direct price: \$2,499
Warranty: one year

MIDWEST MICRO
(800) 728-8582

Pros: really fast performance, very large hard disk, true-color external monitor support, built-in sound, ergonomic wrist support, tremendous value
Cons: hard-to-manipulate trackball

DX4-75 processing power for under \$2,500, you also get several extras not found in any of the other machines reviewed here.

The Elite comes with built-in sound capabilities. You can use its small speaker or plug stereo speakers into the back. With the Elite, all you need is a SCSI PCMCIA card with a CD-ROM drive, and you're multimedia complete. But the real beauty of having a sound-ready notebook is that you can include sound in your presentations for the road and show them anywhere, even the restaurant table during a

power lunch. You can also use the built-in record function to narrate your presentations.

Another terrific feature of the Elite is its built-in true-color graphics card that shows 16 million or 32 thousand colors at 640 × 480 resolution. It can also drive high-resolution monitors up to 1280 × 1024. However, you won't want to run it that high for very long; the flicker can vibrate your eyes out. The Elite uses a 32-bit local bus adapter for external video, but it doesn't support high refresh rates.

MidWest Micro offers a docking station for \$499 and a car adapter that lets you use and charge the unit in your vehicle. I'm not big on working in my car, but it is nice to be able to charge the battery between appointments. And if you're really a high-tech sort, you'll get a big kick out of sending faxes from your car cellular phone.

It's difficult to find something to knock this computer for, but here goes. It has a tiny (16-mm) trackball set into the front wrist rest. (By the way, this is the only

TEST LAB PICKS

You really can't go wrong with any of these computers. Unless you work with high-end graphics or multimedia applications, all will serve you well. However, a couple of these notebooks do stand out as exceptional values. What you buy depends, of course, on how you'll use it.



The hands-down high-end winner is the MidWest Micro Elite Dual-Scan Color SoundBook.

You just can't beat this deal, and it will handle all of your computing projects—even multimedia. MidWest Micro offers a docking station, but this computer's expansion options, built-in sound card, and true-color display capa-

bilities put it head and shoulders out in front of the others reviewed here, especially those that sell for the same price.



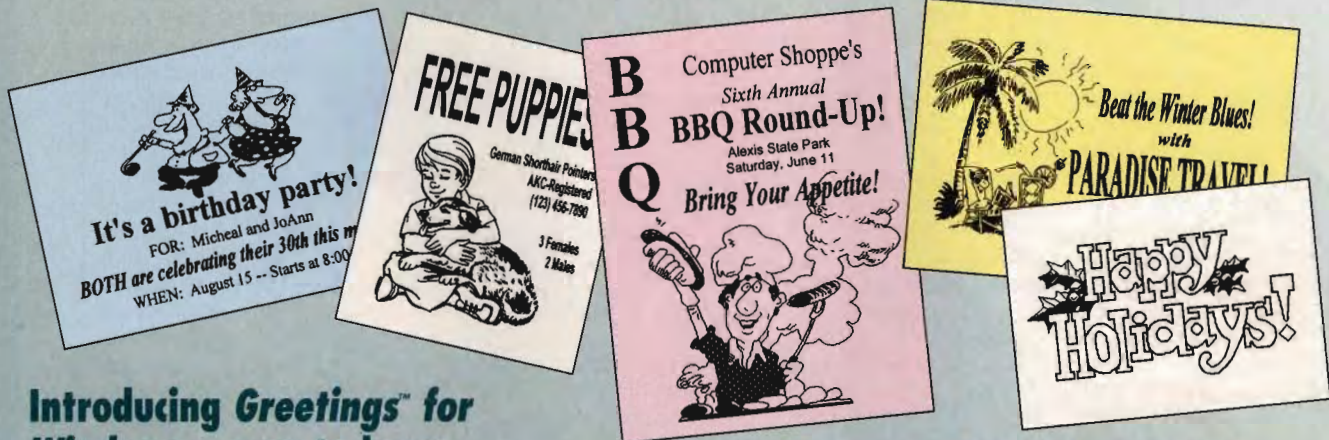
If you need a computer for the road, don't want to spend a lot, and don't require a tremendous amount of graphics horsepower or 256 colors for presentations, check out the Satellite T1910CS from Toshiba America Information Systems. It displays only 16 pure colors, but it's fast for an SX and has a great trackball. Overall, this is a sturdy machine, and Toshiba offers a number of expansion options. However, there isn't a docking station, so you should consider it only as a travel system.

—WILLIAM HARREL

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machine here with an ergonomic wrist support, which can prevent the carpal-tunnel-causing effects of excessive keyboard banging.) While the trackball is not as tough on the wrist as the Gateway and Austin models (as well as some of the others not discussed yet), it's still not as easy to use as the BallPoint. It doesn't really lend itself to the thumb-forefinger action I'm used to, but it's workable.

This is the ideal notebook for anyone who computes on the road. It's fast, has sound, comes with its own carrying case, sports a big hard drive (340MB), boasts reasonably good battery life (I got just under three hours with normal use), and is a great bargain.

Circle Reader Service Number 373

PACKARD BELL STATESMAN PLUS 200C

The Packard Bell Statesman is built around the 486SLC2-50, which is an SX chip with power-saving features but no math coprocessor. In our tests, the Statesman lagged far behind the others, especially the DXs, but then speed isn't everything. This is an economy model and plenty

Packard Bell Statesman Plus 200C
Estimated street price: \$2,295 with 4MB RAM, \$2,695 with 8MB RAM
Warranty: one year

PACKARD BELL ELECTRONICS
(800) 733-5858

Pros: relatively low cost, good display

Cons: comparatively slow performance, no trackball, limited external monitor support

of computer if your on-the-road computing needs are average.

What I particularly like about the Statesman is its sturdy construction. Strong and solid, it looks as if it can take a beating. It also has an attractive LCD screen that displays 256 colors in much brighter and truer tones than some of the others reviewed here. You can hook it up to an SVGA monitor and achieve a resolution of 800 x 600 with 16 colors. With a Type II PCMCIA slot (and an SCSI card to go into it), this notebook offers plenty of opportunity for expansion.

Another plus when purchasing Packard Bell products is that they are sold and supported virtually everywhere. Repair centers are numerous, and parts, such as batteries and memory, are easy to



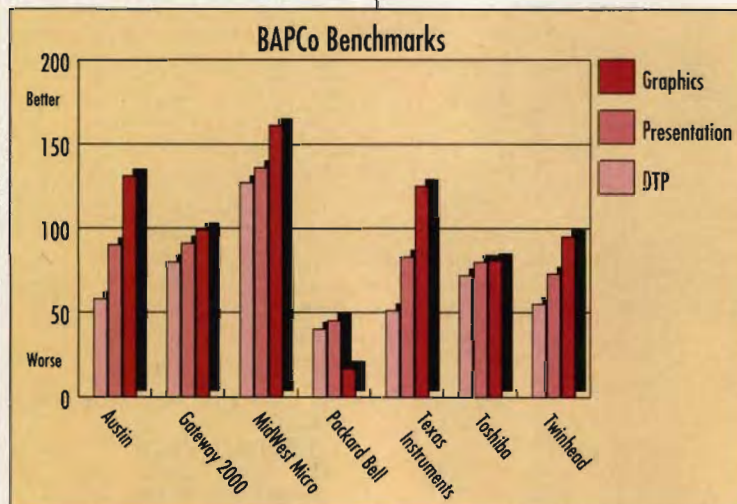
find. And since this is a department- and electronics-store item, pricing competition is fierce. Packard Bell says the estimated street price is \$2,295 (with 4MB of RAM), but I've seen this model in a local discount warehouse for \$2,000.

There are a couple of things I didn't like about this machine. One, it supports a mouse, rather than a trackball. Granted, I've knocked trackballs right and left in this roundup, but when you're on a plane, park bench, or the beach, mice are a nuisance. Trackballs seem to be the indicated pointing device for notebooks. However, Packard Bell addresses this problem by providing a solution called J-Mouse. A software-hardware solution, the J-Mouse allows you to use the keyboard as a pointing device. Keys on the typist's home row become directional keys, and the J key is the primary mouse (or "click") key—hence the name J-Mouse. This is a peculiar solution that takes a lot of getting used to.

Two, Packard Bell doesn't offer its own expansion options for this machine, which means you'll have to depend on third-party PCMCIA devices. Be sure to get a warranty when you buy these devices because they're part of a still-maturing technology.

Packard Bell specializes in entry-level computers, and the documentation reflects this market strategy. The manual with the Statesman is clear and helpful, but it doesn't provide a lot of technical information. If you need a graphics workhorse, this isn't the one to buy. But it's great for word processing, small databases, and spreadsheets. It's easy to use and inexpensive.

Circle Reader Service Number 374





TEXAS INSTRUMENTS TRAVELMATE 4000E WINDX2/50 DSC

Built around a screaming 50-MHz 486DX2, this is a fast (fourth in the speed test), capable machine. However, its lack of a PCMCIA slot makes it less than ideal for some applications. Modems and memory upgrades must be installed in the conventional manner, by opening up the computer. (Texas Instruments does offer an external modem.) But if you're looking for a computer strong on graphics, this one flew on that portion of our speed tests.

The TravelMate's 10-inch display supports up to 256 colors, and you can hook up a high-resolution monitor for up to 1280 x 1024 resolution with 16 colors. The computer is small and light, and all of the controls and indicator lights are easy to find. (Some of these machines are so fancy that you can't figure out how to turn them on without going to the manual.)

My favorite feature on this machine, other than the fast performance and great display, is the side-mounted Microsoft BallPoint pointing device. Granted, it's not built into the computer, and you must carry around an additional piece of equipment. But it's a joy to use—especially if you do a lot of mousing around in your documents. The BallPoint is designed so that you can manip-

Texas Instruments TravelMate 4000e WINDX2/50 DSC
Estimated street price: \$2,500 with 4MB RAM, \$2,700 with 8MB RAM
Warranty: one year

TEXAS INSTRUMENTS
(800) TI-TEXAS

Pros: fast performance, large screen, great colors
Cons: No PCMCIA slots

ulate the ball with your thumb and click with your forefinger. Your wrist doesn't have to go through any unnatural gymnastics for you to use the pointer.

OK, so you're thinking that you'll just buy a BallPoint for your notebook. Well, it's not that easy. The computer must have a factory-installed jack on the side, called a QuickPort, to use this version of the BallPoint. Of all these notebooks, only the Toshiba and Texas Instruments support the QuickPort version of the BallPoint, which, as the name suggests, is quick and easy to attach or detach. (Microsoft does offer a BallPoint, however, that plugs into a serial or PS/2-style port.)

While most of these machines had similar battery performances, this one lasted longer than the others—a whopping 3.15 hours. If you're like me, you can't work longer than that on any flight, no mat-

Toshiba Satellite T1910CS
Estimated street price: \$2,099—\$2,199 with 4MB RAM, \$399 more with 8MB RAM
Warranty: one year

TOSHIBA AMERICA INFORMATION SYSTEMS
(800) 334-3445

Pros: reasonably fast performance, great trackball, great bargain
Cons: lack of 256-color support at 640 x 480, relatively small hard drive

ter how long the trip.

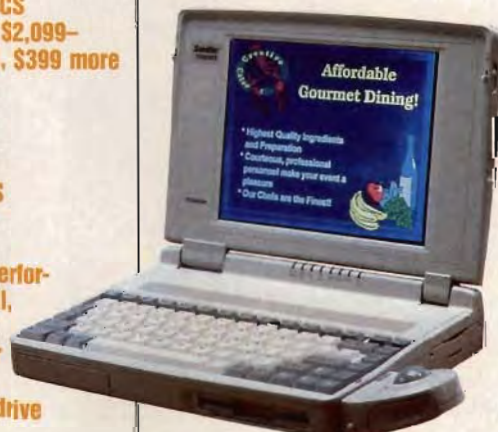
Texas Instruments makes good products, and this one is no exception. I especially liked the manual, which goes into great detail about configuring the notebook and installing hardware and software. The manual also covers most of the expansion options, such as the \$399 docking station, the SCSI expansion card, and even the battery charger/discharger. The discharger is a great idea, because the nicad batteries that these computers use last much longer if you fully discharge them now and then, which is difficult in the notebook.

OK, so this machine is a little behind the times in expansion options. You still can't buy a more durable, dependable computer. It's fast and easy to use, and it's backed by a great company.

Circle Reader Service Number 375

TOSHIBA SATELLITE T1910CS

The Toshiba Satellite runs a little slower than some of the other notebooks and is not as feature rich, but it's a good value. Toshiba says it has a street value price of around \$2,100, but I saw it at a local computer discount store for less than \$2,000. For that price you get a completely functional computer with respectable speed



TEST LAB

and PCMCIA expansion options.

Off the bat, this is one of two computers in our roundup (Texas Instruments is the other) with the QuickPort version of Microsoft's BallPoint pointing device, making it a breeze to use. However, the Satellite keyboard is a bit strange. The Alt, Ctrl, and Del keys aren't where you'd find them on most keyboards, which means you'll find yourself looking for them until you get used to their peculiar placement.

Toshiba offers a wealth of expansion options, including PCMCIA modems and memory. I tested both and found them easy to install and highly compatible. However, they are quite expensive if you order them through Toshiba. The 4MB memory card, for example, sells for \$399, as compared to MidWest Micro's \$219. Modems and other options are equally expensive. You'll be better off experimenting with third-party options or looking for a Toshiba dealer.

Another drawback is the T1910CS's lack of support for 256 colors on an external monitor. And though it supports 256 colors on the LCD screen with 320 x 200 resolution, the other notebooks support 256 colors at 640 x 480. With only 16 colors at 640 x 480 on the screen or an external monitor, this is not a good graphics machine, and I would use it for only the most rudimentary presentations. I would not, however, hesitate to take it on the road for word processing, faxing, and E-mail.

This computer comes with several manuals, an online tutorial, and several utilities, including a nifty power monitoring and management program and a Windows-based application for managing PCMCIA cards. The surprising thing about this machine is that it has the slowest processor here but still runs faster than two of the others. This is probably due to Toshiba's superior design and a good hard disk. Also, the display

Twinhead Slimnote 486E 486DX/33S
Estimated street price: \$2,495 with
4MB RAM, \$2,695 with 8MB RAM
Warranty: one year

TWINHEAD
(800) 995-8946

Pros: large hard disk, good expansion options
Cons: lack of high-resolution external monitor support, second slowest performance



TWINHEAD SLIMNOTE 486E 486DX/33S

system does not have to spend time generating a lot of colors.

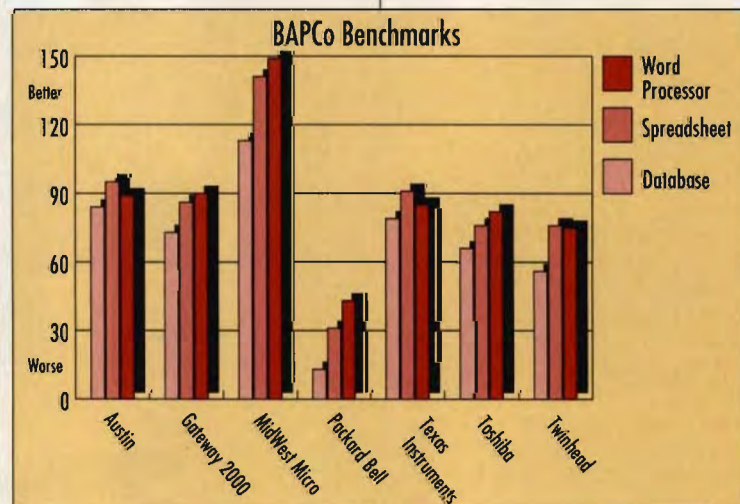
All this is not to say the Satellite is a bare-bones machine. It provides more expansion options than the faster Texas Instrument offering. However, since it's an SX rather than the power-miser SL, battery life isn't anything to rave about. In my normal-use tests, the battery lasted just over two hours, which means you might want to carry an extra battery pack when you're traveling.

Granted, this is not a power user's computer. But, hey, it's quite appropriate for on-the-road computing. Consider this one if you're happy with your desktop machine and need something dependable and convenient to take on the road.

Circle Reader Service Number 376

The Twinhead 486E comes in several configurations up to a DX2-66. The one I looked at was a 33-MHz DX. While it's the second slowest computer here, it's still a solid buy. You get a good computer with decent expandability at a good price. One thing I particularly liked was the Slimnote's thin 1.8-inch case—hence the name Slimnote.

While there is nothing particularly exciting about this machine, it does have everything you need, such as 256 colors, a VGA port, and all the trimmings. The Slimnote's docking options are also impressive. When you get back to the office, you don't have to waste time plugging in a mon-

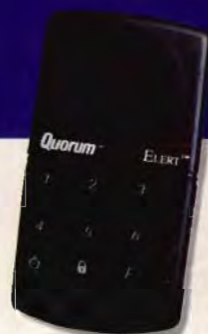


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Features	Austin	Gateway 2000	MidWest Micro	Packard Bell	Texas Instruments	Toshiba	Twinhead
Configuration							
486 CPU-clock speed	DX2-50	DX2-40	DX4-75	SLC2-50	DX2-50	SX-33	DX-33
Minimum/maximum RAM	4MB/32MB	4MB/20MB	8MB/20MB	4MB/12MB	4MB/20MB	4MB/20MB	4MB/20MB
Hard disk manufacturer/size	Western Digital/262MB	Gateway/250MB	Toshiba/340MB	Seagate/200MB	Seagate/200MB	Toshiba/120MB	Toshiba 200MB
Weight with battery	6.3 lbs.	5.7 lbs.	6.7 lbs.	6.5 lbs.	7.2 lbs.	under 7 lbs.	6.3 lbs.
Dimensions	11.1" x 8.6" x 2"	11.7" x 8.5" x 1.77"	11" x 8.5" x 1.9"	11" x 8.5" x 2.1"	11" x 8.5" x 2.1"	11.7" x 8.4" x 2.1"	8.6" x 11.1" x 1.8"
Screen size	9.5"	10.3"	10.3"	9.5"	10"	9.5"	9.4"
Number of colors supported	256	256	256	256	256	256 ³	256
Maximum resolution/colors of external monitor	1280 x 1024/16	1024 x 768/16	1280 x 1024/16 ¹	800 x 600/16	1024 x 768/16	640 x 480/16	1024 x 768/256
Battery life	2-4 hrs.	2-3 hrs.	2-4 hrs.	2-3 hrs.	3-5 hrs.	2-3 hrs.	2-3 hrs.
Battery charge time	1.5 hrs.	2 hrs.	1.5 hrs.	2-3 hrs.	3 hrs.	1.4 hrs.	2 hrs.
I/O ports	parallel, 2 serial, SVGA, keyboard	parallel, serial, SVGA, PS/2, keyboard	parallel, serial, SVGA, PS/2, sound, keyboard	parallel, serial, SVGA, mouse, keyboard	parallel, serial, SVGA, PS/2, mouse, keyboard	parallel, serial, mouse, keyboard, VGA	parallel, serial, VGA, mouse or keyboard, expansion
PCMCIA slots and type	2 Type II or 1 Type III	2 Type II or 1 Type III	2 Type II or 1 Type III	1 Type II	None	2 Type II or 1 Type III (or larger)	1 Type II
32-bit disk access	no	no	no	no	yes	no	yes
Bundled software	DOS 6.2 & Windows 3.1	DOS 6.2	Windows 3.1	MS Works	DOS 6.2	Windows 3.1	Lotus Organizer
Pointer device type	built-in 17-mm trackball	built-in 12-mm trackball	built-in 16-mm trackball	J-Mouse	MS BallPoint	MS BallPoint	built-in 16-mm trackball
Upgrade options							
Memory configurations in megabytes	4, 8, 16, 32MB	4, 8, 12, 20MB	4, 8, 12, 16, 20MB	4, 6, 12MB	4, 8, 20MB	4, 8, 16, 20MB	4, 8, 20MB
Cost of memory upgrades	4MB-\$279, 16MB-\$1,299	Call for prices.	4MB-\$219, 8MB-\$469, 16MB-\$979	Determined by retailer.	4MB-\$279, 16MB-\$1,999	4MB-\$399, 8MB-\$679, 16MB-\$2,549	4MB-\$219, 16MB-\$1,199
Hard disk options	127 or 524MB	None	260, 340, 520MB	None	None	120 or 200MB	340MB
Modem/fax options	2400/9600-\$199, 14.4/14.4-\$299	2400/9600-\$149, 14.4/14.4-\$249	2400/9600-\$149, 14.4/14.4-\$229	2400/9600 ⁴ , 14.4/14.4 ⁴	2400 send-\$199, 14.4/14.4-\$329	2400/9600-\$219, 14.4/14.4-\$329	14.4/14.4-\$299
Other upgrade options							
1	docking station-\$299	Combo Pack keyboard and 15-inch monitor-\$499	docking station-\$499	none	docking station-\$399	battery recharger (with adapter)-\$175	docking station-\$519
2	high-capacity NiMH battery-\$149	SCSI adapter-\$199	car adapter-\$59	none	SCSI adapter-\$369	Universal AC adapter-\$89	port replicator-\$129
3	PCMCIA network card-\$220	network adapter-\$159	PCMCIA network card-\$159	none	network adapter-\$469	network adapter-\$225 (10BaseT) \$240 (10Base2)	spare battery-\$119
4	PCMCIA sound card-\$299	PCMCIA tape backup card-\$295		none	external charger/discharger-\$149	105MB PCMCIA disk drive-\$599	
Warranty length	1 yr.	1 yr. ²	1 yr. ²	1 yr.	1 yr.	1 yr.	1 yr.
¹ Supports HiColor and true color at various resolutions.							
² Extended warranty available.							
³ At 320 x 200 only.							
⁴ Cost determined by dealer.							

TEST LAB

itor, keyboard, and printer; instead, you can use Twinhead's I/O Slice. The I/O Slice, Twinhead's port replicator, connects to the docking station plug on the Slimnote, automatically connecting all your devices, even the modem.

Twinhead also offers a full-featured docking station with two drive bays, a battery charger, and three 16-bit bus slots so you can add sound, CD-ROM, and other devices to your notebook. There's also a PCMCIA Type II slot for other expansion options. And there is an optional 14.4-Kbps internal modem. The benefit of using an internal modem with this machine is that it frees up the PCMCIA card slot for other options.

I've got the same complaint

about the Slimnote's trackball that I have with some of the others' trackballs, though. This one is up on the panel in front of the screen, and the button is on the right, which is different from anything I've seen or used. I had a tough time getting acclimated to reaching there and using the button to the right. I could live with this pointing device but wouldn't like it much.

The Slimnote also supports simultaneous LCD and CRT displays, making it good for presentations. It weighs only 6.3 pounds, so carrying it around won't break your back. The 200MB hard drive is also respectable. With that much storage, you can wait much longer before feeling the need to compress the

data on your hard disk to make room for more.

Sleek, light, and powerful are words that describe the Slimnote. While its lack of high-resolution external display disqualifies it as a graphics and layout desktop machine, it's a suitable road warrior.

Circle Reader Service Number 377

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"Do you have one so simple even a *parent* could beat it?"

PROGRAMMING POWER

Tom Campbell

CONTINUING EDUCATION

It's more important than ever to spend your learning time wisely. With the advent of Windows and a few killer apps like Excel, FoxPro, and Win-Word, people's expectations have risen. And writing good Windows software in C takes a lot of work.

One way you can make the most of your learning time is to restrict your programming to the Win32 API, a set of conventions that will allow your program to run properly under Windows NT, Windows for Workgroups, Windows 3.1, and the upcoming Windows 4.0 (or Chicago, or whatever it's going to be called). This is a more significant achievement than you might think.

Windows 3.1 is essentially a 16-bit operating system with memory management that takes some advantage of the 386's 32-bit design. Windows for Workgroups is an extensive retooling of Windows 3.1 with a rewritten file system that also requires a 32-bit processor. Windows NT looks almost nothing like Windows 3.1 internally and has scores of new function calls, but the old ones will work with a little re-writing and judicious use of some new macros. Windows 4.0 will resemble Windows NT internally much more than Windows 3.1.

When DOS changed, there were often serious compatibility problems, some of which were never properly resolved. It seems quaint now, but it took years for some applications to adapt to the change from the floppy-disk, no-directory file system in DOS 1 to the subdirectories in DOS 2. The primitive file system in DOS 1 lives on today in DOS 6, totally useless except for the tens of thousands of older applica-

tions that use the old function calls for file access.

Even more painful has been the transition to networked computers beginning with DOS 3 in 1984. You don't have to be a network user to be affected, either: Visual Basic 3.0 Professional won't let you use its own native files (the Access file format) unless Share is running, but its own Setup Wizard doesn't work properly with Share. Omitting network features in the operating system was a horrible mistake on IBM's part, especially considering that this company was collecting vast sums of money from its customers in the name of connectivity, which meant that you paid extra—a lot extra—for the privilege of getting computers using IBM's disparate operating systems to work together.

Finally, there's a crying need for real multitasking in professional application development. Again, you may not think you need multitasking. That's because you haven't used an advanced operating system like Windows NT—or AmigaDOS. The Amiga has boasted a preemptive multitasking OS for years, and it means among other things that Amiga users almost never wait for the hourglass: not while formatting a disk or while waiting for an application to start or while saving a two-megabyte file in a word processor. While Windows does a good job of fake multitasking, it relies on all the programs running to be willing to interrupt themselves at crucial times. They don't always do that, and it can be a real pain to write them that way.

Win32 gives you all these things and a great deal more. While some of its features are faked in its Windows 3.1 and Windows for Workgroups implementations, you can still use the Win32 API to get your pro-

grams ready for Windows 4.0. Better, they will work with future versions of Windows with virtually no changes. One of the main reasons is that an int, which up until Windows 3.1 was often assumed to be two 8-bit bytes with the more significant byte first, has become 32 bits. That's bad for compatibility. Stick to the Win32 programming guidelines, and that problem goes away. Seemingly innocuous data types such as int and long have been replaced with more precise macros such as WORD and DWORD. This will pay off later, when Windows moves to 64-bit processors and beyond.

Ready to sell your software to users in Israel or China? Good, but if you don't use Win32 guidelines, you won't be able to take advantage of Unicode and the new Windows text-handling routines. Hebrew goes from right to left. Chinese goes from top to bottom. Try writing those text-handling routines yourself. The Hebrew alphabet is about the same size as ours, but Chinese requires at least 5000 characters, a tad too many for the 255-character ANSI limitation. Unicode gives you a cool 64K of new characters (actually, only about half are assigned at this point, but they already represent virtually every language known to the world's computer users).

Win32 uses the new TCHAR type natively; some clever macros route the appropriate text-related calls to new entry points. The Microsoft Win32 manuals are worth the \$100 they'll cost you over the street price of \$400 or so for a CD-ROM—only edition of Visual C++—but they don't cover the Microsoft Foundation Classes. That's the best way for you to get Win32 compliance if you're a C++ programmer, and it's a lot easier than programming in C. □

Windows' fake multitasking relies on all the programs running to be willing to interrupt themselves at crucial times.

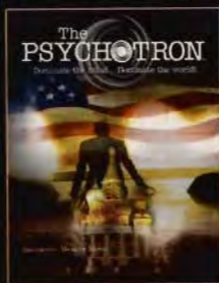
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TIPS & TOOLS

Edited by Richard C. Leinecker

Lock Your Windows

These tips are for users of Windows 3.1. Mainly, they're intended for people who want to restrict users from doing too much on their systems. Network administrators could use these tips to prevent staff members from doing things that might mess up their setups or cause problems. Office managers could use the tips to prevent employees from using their computers for unauthorized purposes.

Many times, people move program groups around and then can't find the applications or files they need. Program groups are the windows that contain the icons for the programs and files with which you run your Windows applications.

It can be annoying when you let someone use your computer and then can't find anything the next time you run Windows. There's a way to prevent people from changing group files.

Begin by making sure you know the names of the group files you want to protect. If you're not sure, you can find out by making a window active and selecting Properties from the Program Manager File menu. It'll show you the group path and filename in the second editable field in the dialog box that appears. Once you know the filenames, quit to DOS.

Make sure you're in the directory containing the group files (it's almost always the Windows directory). For each group you want to protect, type *attrib filename.grp +r*. The Attrib command makes the file read-only when you use the +r switch. That means that Windows won't be able to update the file and that changes to the group window information won't be saved to disk.

If you ever want to change

the disk information, use the Attrib command from DOS. Type *attrib filename.grp -r* to remove the read-only attribute from the directory flag.

You can also set some restrictions by editing the PROGRAM.MAN.INI file. The first thing you'll need to do is add the line [restrictions] to the PROGRAM.MAN.INI file (if it doesn't already exist). This tells Windows that system restrictions will follow.

By the way, any changes you make to the lines in the PROGRAM.MAN.INI file won't take effect until the next time you run Windows.

Here's a list of useful items you can add:

NoRun=1 disables the Run command.

NoClose=1 disables the Exit Windows command.

NoSaveSettings=1 disables the Save Settings on Exit command.

NoFileMenu=1 removes the File menu from Program Manager's main menu.

EditLevel=0 sets no restrictions on Program Manager access.

EditLevel=1 prevents creating, deleting, and renaming of groups.

EditLevel=2 includes level 1 restrictions and prevents creating and deleting items.

EditLevel=3 includes level 2 restrictions and prevents changing command lines for program items.

EditLevel=4 includes level 3 restrictions and prevents changing any program item information.

DARREN MACASKILL
FREDERICTON, NB

Intruder Alarm

I read with interest the tip from Rebecca Libby on intruder alerts in the October 1993 issue. After installing this on my computers, I found that I did not like the fact that I had to exit by issuing a Ctrl-Break after the alarm sounded. It dumped me into the QBASIC program ALARM.BAS and stopped the loading of the rest of AUTOEXEC.BAT until I exited that program.

I modified the program to terminate when I press the 1 key, even after the screen turns red and the alarm sounds. My modified program follows. An indented line is a continuation of the preceding line.

```
100 FOR X = 1 TO 12: PRINT:
    NEXT X
110 PRINT SPACE$(13); "STAND
    BY FOR SECURITY CLEARANCE"
120 FOR X = 1 TO 12: PRINT:
    NEXT X
130 PLAY "MN L8 03 T75"
140 FOR X = 1 TO 10
150 PLAY "C4"
160 A$ = INKEY$
170 IF A$ <> "1" GOTO 190
180 SYSTEM
190 NEXT X
200 SCREEN 1
210 COLOR 4, 15, 15
220 FOR X = 1 TO 11: PRINT:
    NEXT X
230 PRINT SPACE$(10);
    "INTRUDER ALERT!!!"
240 PRINT: PRINT
250 PRINT SPACE$(6); "Yankee
    Intruder Detected!!!"
260 FOR X = 1 TO 11: PRINT:
    NEXT X
270 A$ = INKEY$
280 IF A$ = "1" GOTO 180
290 FOR X = 440 TO 1000 STEP
    10: SOUND X, .5: NEXT X: GOTO
    270
```

JAMES A. JONES JR.
HAYSI, VA

Even Odds

I thought Farid Ahmad's tip for a Microsoft Word macro to

Print odd or even pages was

Locking
windows, alarming
intruders,
double-sided printing
in Word

a good idea ("Tips & Tools," April 1994). I have one that works even better. I've used it quite a few times.

```
<Shift Ctrl Esc><Esc>
«MESSAGE»
«SET ECHO="OFF"»
<Ctrl PgDn>
«SET choice=0»
«WHILE choice<>1 AND
choice<>2»
«ASK choice=?1.odd or 2.even»
«ENDWHILE»
<Ctrl Esc>JP
«SET maxpage=field»
«SET count=choice»
«WHILE count<=maxpage»
«SET ECHO="ON"»
«MESSAGE Printing page «count»
of «maxpage»»
«SET ECHO="OFF"»
<Shift Ctrl Esc>PO
<Down 4>P
<Right>«count»
<Enter 2>
«SET count=count+2»
«ENDWHILE»
<Shift Ctrl Esc>PO
<Down 4>A<Enter><Esc>
```

Type this in, highlight the entire text, activate the Copy command, and give the macro a name such as ODD-EVEN.MAC^<Ctrl P>E. This will allow the user to activate the macro by pressing Ctrl-P, then E. Be sure to quit Word with the Quit command so that the glossary containing the new macro will be saved.

STEPHEN WHINIHAN
SEATTLE, WA

Check Your Zip

I have found your publication very informative ever since I began purchasing it back in October 1991. Although I enjoy most of the magazine, "Tips & Tools" remains my favorite column. I've always enjoyed creating and modifying files, especially batch files.

I have some of my own creations that I'd like to share. They simplify several tasks I perform frequently. They all re-

quire that PKUNZIP be in your path.

Here's VZIP.BAT. It views the contents of zip files quickly. To use it, type *vzip filename*. The filename should not have an extension.

```
@ECHO OFF
IF "%1"==" " GOTO USAGE
CLS
ECHO Viewing "%1.zip"
ECHO.
ECHO Reading "%1.zip"
ECHO Please wait . . .
PKUNZIP -v %1| MORE
GOTO END
```

```
:USAGE
ECHO Usage: VZIP [filename]
ECHO You can use wildcards
in the filename,
ECHO but make sure there is
no ZIP extension.
```

```
:END
```

Here's TZIP.BAT. It checks the integrity of zip files quickly. To use it, type *tzip filename*. The filename should not have an extension.

```
@ECHO OFF
IF "%1"==" " GOTO USAGE
CLS
ECHO Testing "%1.zip"
ECHO.
ECHO Reading "%1.zip"
ECHO Please wait . . .
PKUNZIP -t %1| MORE
GOTO END
```

```
:USAGE
ECHO Usage: TZIP [filename]
ECHO You can use wildcards
in the filename,
ECHO but make sure there is
no ZIP extension.
```

```
:END
```

LIES WEBB
MAPLE RIDGE, BC

Bonus Programs

This month's bonus programs will appeal to a wide variety of people. One is a Windows program that produces chaos

music through a Sound Blaster, and the other is a set of library files for QuickBASIC that will let you play SND, VOC, and WAV files through your Sound Blaster from your own BASIC programs.

Chaos Music is a Windows program that lets you set a wide variety of parameters and explore the world of chaos through music. Several chaos theories can be chosen to produce different types of music sequences. You can adjust the pitch range, dynamics, and meter of the six available music voices. I can't release the documentation, since it's a chapter in a book I wrote called *Making Noise*. But the program is easy to use, and you'll have fun with it.

If you love to write QuickBASIC programs and have a Sound Blaster card, here's your chance. A set of libraries and example programs will give you what you need to play sound files through your Sound Blaster card. A number of functions give you plenty of power to dress up your programs like the pros. You can even record sounds and play them back.

The "Tips & Tools" bonus programs are available in the COMPUTE area on America Online. Just click on the button marked Software.

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. □

**Viewing your
zipped files and
looking up
the bonus programs**

HARDWARE CLINIC

Mark Minasi

TECHNET TO THE RESCUE

This month I want to tell you about a not-to-be-missed service that supports Microsoft products. But first, some coming attractions.

In the next few months, I intend to talk about networking. Networks have become so inexpensive and so attractive that most small businesses either have one or are thinking about getting one. Some people are even considering a network for their homes, according to the E-mail I'm getting. Therefore, starting next month I'll begin telling you all about affordable networks.

Now let's talk about Microsoft support. Like most of you, I do a lot of work with Microsoft products. They can be big, ugly, complicated beasts, but they are also powerful, which is why I use them in the first place. Unfortunately, Microsoft (like many other companies) is facing some serious problems with customer support. Getting help with Microsoft products has grown tougher with each passing year.

This is not intended to be a criticism of Microsoft—at least not entirely. If you buy Microsoft Office, a package that contains Word for Windows, Excel, PowerPoint, and Mail, you'll pay about \$300 for four powerful pieces of software. It's hard for any company, Microsoft included, to sell software for \$75 a copy and have enough margin to pay for phones, computers, and people to staff a support service. As a result, it's tough to get Microsoft support on the phone.

For some products, you can't get Microsoft on the phone at all unless you're willing to pay. For example, if you have NT Advanced Server, Microsoft's flagship network op-

erating system, the only numbers you can call are an 800 line, where you'll have to come up with a credit card number before anyone will help you, or a 900 number. Each call you make costs \$150. That's not a typo.

Besides phone lines, Microsoft provides support in many other ways. It offers professional seminars, white papers, its various Resource Kits, and something wonderful called the Knowledge Base. I can best describe why the Knowledge Base is so wonderful with a quick story.

A couple of years ago, I was teaching a Windows technical support class for a big client. One participant asked this question: "When I exit Windows, my machine hangs. The drive light runs for a second, but the blinking cursor stays up in the corner after that, and the PC doesn't do anything."

"Is it a PS/2?" I asked.

She said that it was a PS/2, so I told her, "Try adding the line `PS2MOUSEATEXIT=FALSE` to your `SYSTEM.INI`, in the `[386enh]` section."

She went to her machine at lunch, inserted the line, and returned to report success.

She had a PS/2-type mouse, and Windows tried to reset it on exit, as it always resets mice when you exit. A PS/2 mouse, however, can take a minute or two to reset, making the system look as if it has hung. If she had waited a couple of minutes, the Windows reset routine would have been completed. But who wants to wait two minutes to get out of Windows? No one. So Microsoft included a command in Windows, `PS2MOUSEATEXIT`, that can tell Windows not to bother trying to reset the mouse. The downside is that not resetting the mouse can make the mouse not work right in DOS applications after

you've exited Windows.

The company had placed a few techie guru types in the class to make sure I didn't say anything wrong—they were slumming, you might say. They grabbed me at the next break.

"Where'd you find out about that mouse command?" they asked. "It's not in any book we ever read, it's not in the Windows documentation, and it's not in the Windows Resource Kit." I was tempted to tell them that I'd discovered it while running a protected mode debugger on the Windows kernel or some other kind of bafflegab, but I fessed up.

"I found it in the Knowledge Base," I told them.

The Knowledge Base is an insanely large database of all the bugs found in Microsoft products and the fixes and work-arounds Microsoft has found for them, along with useful tips and tricks. It's so large that a search for articles related to Windows for Workgroups yields 1075 hits. It's not the final word on all Microsoft products, but it's mind-bogglingly useful.

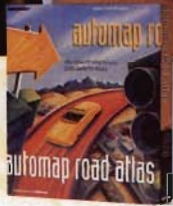
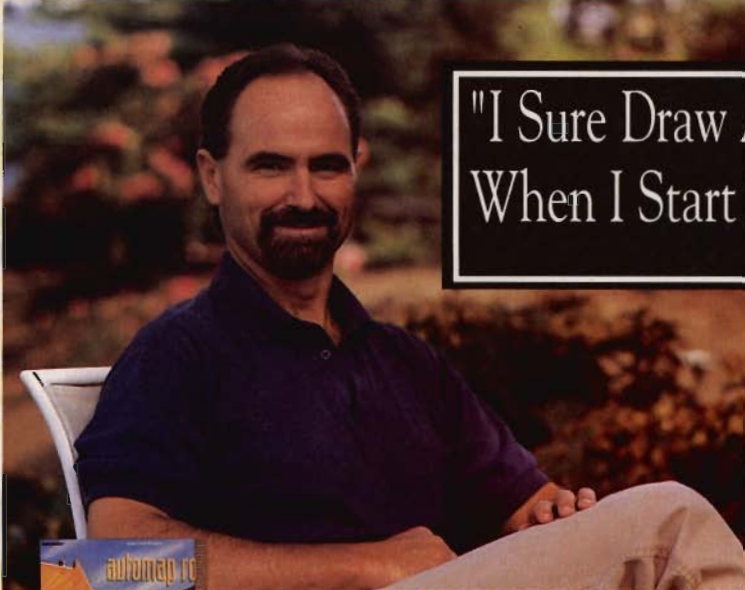
Now how, you may ask, do you find this Knowledge Base? One way is to get onto CompuServe and type `GO MSKB`. (And once you're in the Knowledge Base, you can really run up a tab searching it.) The Knowledge Base is so useful that for about six months back in 1992, I was using a communications program and a macro to download the whole thing and keep it on my hard disk. It took up all kinds of space, however, and was a real pain to keep up-to-date. Searching it was a chore, as well.

The other way to get the Knowledge Base is to subscribe to Microsoft's TechNet service, a little tool I call my sorcerer's apprentice. It's a serv-

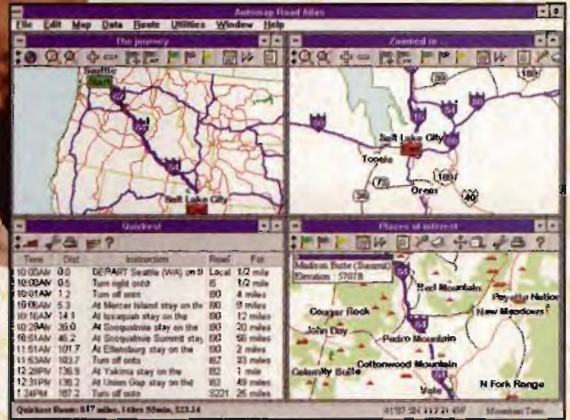
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TechNet replaces the various Windows resource kits, and you can search it electronically.

ice that gives you about 16 CD-ROMs per year containing the entire Knowledge Base, any of Microsoft's white papers, the complete text (and most of the illustrations) of its Resource Kits, the course books that you'd get if you signed up for Microsoft's \$1,500 seminars—including the PowerPoint slide show that the Microsoft instructors use—as well as conference proceedings, the text of *Microsoft Systems Journal*, Microsoft FastTips, and corporate backgrounders.

About once a quarter, TechNet comes on two CD-ROMS. The second CD-ROM is called Patches and Drivers. The March 1994 edition's Patches and Drivers disc is 148MB of updated Windows, Windows NT, and DOS drivers, as well as "fixer" programs. You could download them from CompuServe and pay big connect charges, or you could just slip this CD into your drive and get the file that you need.

How expensive is it? The cost is \$295 per year (plus \$15 shipping and state sales tax; for more information, call 800-344-2121). That's more than most home users can afford, but small businesses or even home-based businesses should consider TechNet when making software purchases. As I've indicated, just using the March TechNet CD has saved me hours of CompuServe connect time.

It's even saved me hard disk space. Now and then I'll run across an updated driver that I don't need right now but that looks useful. So I download it, and it sits on my hard disk taking up valuable storage space. With TechNet, I just zap those old files and reach for the CD when I need an updated driver. The entire Windows NT Resource Kit costs around \$100. There's no need to buy it (or the Windows

Resource Kit or Windows for Workgroups Resource Kits) when you have TechNet, and, even better, you can search the books electronically.

Let's try an example search of TechNet to get a feel for how it works. Suppose you have a Novell Netware network and you have the following problem. Sometimes—only sometimes, which is the maddening part—you'll be working in Windows, and you'll try to start up a DOS session. The screen clears so that the DOS session can start, and a blinking cursor appears in the upper left corner of the screen. At that point, the system is locked up. What should you do?

Start up the TechNet software. On the opening screen, one of the menu options is Search, so click on that. A field marked Query: opens up. You want to see what it knows about Novell and DOS, so type in *novell and dos*. Click on the button marked Find, and the CD-ROM drive chugs away. The search program reports *812 articles found*. Holy guacamole! That's way too much to look through! Typing *novell and dos* located every article where the words *Novell* and *DOS* both appear. Instead, I can type *novell near dos*, which will give me only those articles where the word *Novell* appears near to the word *DOS*. (What does *near* mean? By default, *near* means "within eight words." You can redefine *near* to whatever distance you like.)

This search narrows things down—to 238 articles. You'll see a dialog box that shows you a one-line description of each article, and you can then read each article online, or you can print it. If you see an article that looks interesting, you can put a bookmark in the CD-ROM reader software so that you can return to the article anytime you want.

But still, 238 articles is a lot, so let's narrow it further.

A check box labeled refine search allows you to type in new criteria and thus conduct a search within a search. Check that and ponder what keywords to use to narrow the search. This Novell problem is sometimes called the Black Screen of Death, so let's try the word *black*. Refining the search with *black* reduces the number of articles to a mere three. One article turns out to be about FoxPro developers, and Black happens to be the name of a FoxPro developer. The other two articles, however, look promising. The title of the first is "System Hangs with MS-DOS Applications and Novell NetWare." The document turns out to be several pages of information about the Black Screen of Death, with the following suggestions:

First, remove any extraneous TSRs and device drivers from your AUTOEXEC.BAT and CONFIG.SYS. (Everybody tells you to do that.)

Second, don't load any programs automatically on Windows startup. (Ditto.)

Third, add the lines IN-DOSPOLLING=FALSE and TIMERCITICALSECTION=10000 to your [386enh] section of your SYSTEM.INI file. (Somewhat more technical information.)

Fourth, get the latest Novell drivers.

Fifth, replace your VIPX.386 and *vtd drivers with updated drivers, found right on the CD.

I've tried this fix on a friend's machine that had the Black Screen of Death, and it worked. The search took about five minutes, and the TechNet software copied the files onto my hard disk for me.

If you're a DOS, Windows, or NT support person, think about picking up TechNet. It'll turn you into a guru. ☐

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GET RICH QUICK!

By David English

Catchy title, huh? Now you expect me to tell you how to make a pile of money in practically no time at all. Well, I'm going to tell you how to make a lot of money—and it's a sure thing—but it will take some years for it to work. On the other hand, because you'll be doing it the slow, proven way, your chances of success are virtually assured. But first a few facts.

The first fact is about you: You're not saving enough money. I don't care if you're 20, 40, or 60, making \$15,000, \$55,000, or \$155,000 a year—it's almost certain that you're not saving enough. I've read that most people in the workforce are only saving at about 30 percent of the rate of previous generations. It's time to wake up. Who do you think is going to pay for your first house, your kid's education, and your retirement? Your parents and grandparents learned to save, and you can, too.

I know—you're not making enough money now to save anything. Maybe later. Sorry, but it doesn't work that way. The longer you wait, the harder it will be to save those large sums of money. If you save \$1,000 each year for 40 years and get a return of 10 percent each year, you'll have \$486,851.81. If you wait 10 years to start, you'll have \$180,943.42 in 30 years. But if you wait 30 years to start, you'll only have \$17,531.17 in 10 years. While \$17,531.17 may sound like a fair piece of change, it shrinks to a pittance when you factor in inflation and taxes.

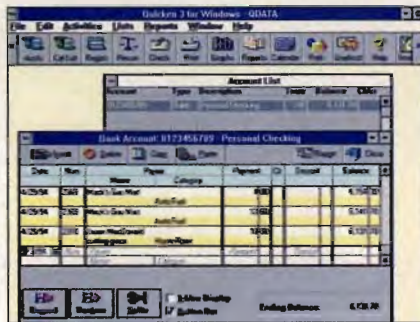
That's it for the sermon—you get the idea. So what can you do? Get money smart and do it right away—while you can still make a big difference. Since you own a computer, one of the best things you can do is use your computer to help you save money. And that brings us back to the focus of this article. To help you save the money you'll need later in life, we'll look at three categories of money-smart software.

- Personal finance programs
- Investment programs
- Retirement-planning programs

With the help of these software packages, almost anyone can become more financially secure.

Calling in a Specialist

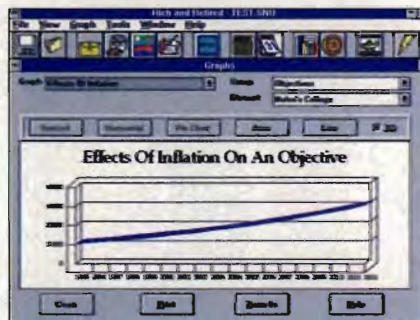
Personal finance programs grew from what used to be called checkbook programs. Today, these programs do



Personal finance programs like Quicken help you get control of expenditures.



Learn to invest wisely with a program like Windows on WallStreet.



Planning is much easier when you have a tool like Rich and Retired.

much more than help you balance your checkbook. They can balance multiple checkbook and credit card accounts, let you pay your bills electronically, track a portfolio of investments by downloading the latest prices from an online service, remind you to pay recurring monthly bills, let you access your bank accounts online, send your financial information directly to your tax program, and help you plan for your retirement. If you're just starting to put your financial house in order, there's no better place to start than with a personal finance program. By tracking and categorizing your spending, you can cut your expenses enough to start saving some money each month.

The best-selling personal finance program is Quicken, which comes in

three versions for the PC: Quicken (which is DOS based), Quicken for Windows, and Quicken for Windows: CD-ROM Deluxe Edition. Version 7 of Quicken for DOS and version 3 of Quicken for Windows share a similar feature set. Both have a Getting Started Guide and Qcards to help you begin the process of entering your financial data. Both let you type in a few characters of repetitive data and have the rest fill in automatically; both include graphs that let you understand visually where your money goes; and both can track checks, bills, bank accounts, credit card accounts, investments, loans, and savings budgets. The most recent versions include a stronger home inventory module, beefed-up financial-planning tools, and better investment tracking.

An add-on package for Quicken for Windows, called Quicken Companion (\$34.95), features a tax estimator that you can use throughout the year; a stock price quote module that lets you go online to track your investments instantly; and a tips, tricks, and shortcuts section that can help you delve deeper into the program. Quicken for Windows: CD-ROM Deluxe Edition includes both Quicken for Windows and Quicken Companion, as well as The Wall Street Journal Video Guide to Money and Markets—CD Version (which helps you learn about different kinds of investments), The Wall Street Journal Personal Finance Library (which provides answers to common financial questions), Tradeline Electronic Stock Guide (which contains one-page snapshots of over 6000 stocks and market indexes), electronic versions of 20 U.S. government publications that cover various aspects of personal finance, and the manuals for both Quicken for Windows and Quicken Companion in electronic form. I think it's fair to say that the CD-ROM version of Quicken is the single best personal finance program available.

While Quicken is the best all-around personal finance package, there are other strong packages that have developed their own special strengths. Managing Your Money has always been the leader among the personal finance programs in managing investments. The current versions of the program are Managing Your Money: 1994 Edition for DOS and the new Managing Your Money for Windows.

Like Quicken, Managing Your Money can track your income and



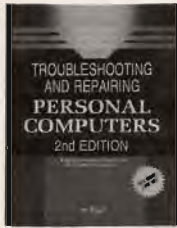
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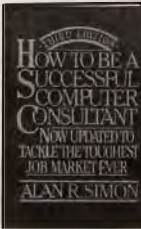
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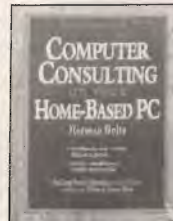
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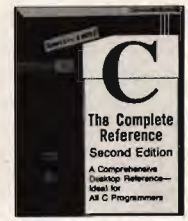
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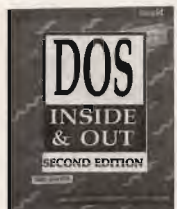
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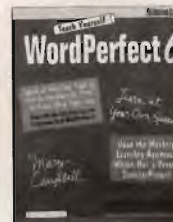
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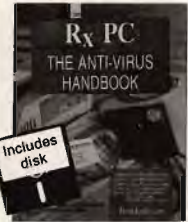
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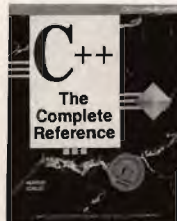
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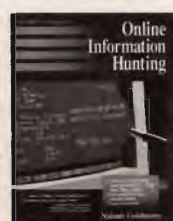
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expenses, pay your bills electronically, categorize your spending, and print your checks. However, *Managing Your Money: 1994 Edition* for DOS goes further than Quicken in helping you with your taxes (by including a data-linked Form 1040 and Schedules A through F), tracking your investments (by providing an Asset Allocation Module, a Rental Properties Module, a Life Insurance Organizer, and more), and helping you plan for your retirement (by incorporating a Social Security Estimator, tracking your net worth history, and providing useful tools to help you reduce your debt burden). If a rigorous set of financial tools is more important than the superior ease-of-use features you'll find in Quicken, you should consider choosing *Managing Your Money*.

Microsoft Money 2.0 also offers the usual account tracking, electronic payments, spending categorization, simple investment tracking, automatic data filling to help eliminate repetitive data entry, and a variety of reports with charts and graphs. In addition, Money has two unique features. The first is online banking, which lets you use your PC to view your bank and credit card account records and even transfer funds between accounts. (Unfortunately, you can't make cash withdrawals to your computer's printer.) Currently, this outstanding feature can only be used with three regional banks (First Chicago Bank, Michigan National Bank, and U.S. Bank), though Microsoft is working to add other banks by the end of the year. The second unique feature, at least for a personal finance program, is *Microsoft Wizards*, a set of interactive templates found in several Microsoft packages. In Money, the Wizards make it much easier to calculate a loan, plan a mortgage, estimate interest, and calculate savings.

Kiplinger's CA—*Simply Money 1.5* (Computer Associates, 800-225-5224, \$39.95) should be shipping by the time you read this. Like the other personal finance programs, it tracks various kinds of accounts, prints checks, lets you pay bills electronically, and generates dozens of reports. This latest version beefs up Kiplinger's *Financial Advisor* (with three times the advice found in version 1.0), adds three financial calculators (Adjustable Rate Mortgage, Life Insurance, and College Costs), and offers improved check printing.

MoneyCounts for Windows offers

Death and Taxes

The two things you can't avoid are death and taxes. However, you can make both easier to live with (so to speak) with specialized software programs.

Most tax programs—such as Intuit's TurboTax, MECA's TaxCut, and Parsons Technology's Personal Tax Edge—can import your relevant income and expense data from most personal finance programs and many financial-planning programs. For example, *Managing Your Money: 1994 Edition* for DOS can export data for Form 1040 and Schedules A-F, while WealthBuilder can export data for Schedules B and D. Unless your taxes are overly complicated, you should consider doing your own taxes each year with the aid of a computer program, as the process of doing your own taxes can help you later in your financial planning.

No one likes to think that he or she will die unexpectedly, but it happens. Now that you've used your personal finance, investment, and retirement-planning programs to figure what your assets are worth, you might as well go the whole distance and figure who gets your stuff when you're gone. WillMaker 5 (Nolo Press, 510-549-1976, \$69.95) is the leading will-writing program, and the wills it creates are valid in every state except Louisiana. Even if you have only a few valuable assets, a will can make the legal process much easier for those you leave behind.

the usual set of checkbook and electronic payment features, as well as a choice of five predefined sets of income and expense categories (home, business, farm, church, and rental property), a plain-English accounting guide, and a built-in Address Book/Mail List Manager. The program has a strong reports section that includes 22 predefined reports and more than 30 different 3-D charts and graphs.

Is it really worth the trouble to maintain a personal finance program by regularly typing in your checkbook and credit card information? To begin, you could go back 6-12 months and put the data in after the fact. Then you

would be able to run reports immediately and see the patterns in your spending and income. It took me seven hours to enter all of my financial data for the last eight months, but the time was worth it for me. The other strategy would be simply to begin with the next set of statements that comes from the bank and take it one month at a time. With this method, it would be months before you'd be able to run most of the useful reports, but the task wouldn't seem so daunting. Either way, you'll find that with each new month the value of your program will continue to grow. If you've ever wondered where all the money goes, here's your chance to find out.

Decisions, Decisions

You've used your personal finance program to tame your wild spending habits and have even begun to put some savings away each month. Then you discover that the banks don't pay much interest on savings accounts, and you think you may be ready to put a portion of your savings into more rewarding investments.

For general financial advice, you might turn to Charles J. Givens *Money Guide*. Givens offers advice from his three best-selling books, *Wealth Without Risk*, *Financial Self-Defense*, and *More Wealth Without Risk*. There is a CD-ROM version as well as a floppy-based Windows version. Both versions contain over 70 financial applications, worksheets, and figures; over 800 answers to financial questions; and a financial section with 17 custom tools. The CD-ROM version adds 130 video clips of Givens presenting his financial strategies.

If you plan to do your own research, there are a number of online advisory and financial data services. One of my favorites is the Investor's Forum (type *GO INVFOR*) on CompuServe. There you'll find hundreds of investment-oriented programs you can download, an active message area that's open to all (novices as well as experts), and many speciality sections, such as an area devoted to users of MetaStock (more about MetaStock shortly).

Over on America Online, you can access the latest facts and figures on hundreds of mutual funds in the Morningstar Mutual Funds area (keyword: *Morningstar*). This respected publisher of mutual fund newsletters is putting the essential information from

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"WealthBuilder is the best choice... offers specific advice on where to put your money, and can be used, via Reuters Money Network, to download on-line research and stock pricing data."

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"This program is the choice for active investors."

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The road to financial security has many obstacles. WealthBuilder® by Money Magazine helps you avoid the pitfalls and get you where you want to go — safely. It helps you map out your financial future with a Nobel Prize** winning Asset Allocation model — the same

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Even the best strategy is useless—unless you act. That's why Reuters Money* Network, the world's leading online investment service, is included FREE with WealthBuilder! As your personal investment assistant, it effortlessly connects you to the quotes, news, fundamental research data, online brokers, and timely reports that you need, and much more. Plus, the customized alert system monitors the market for you—like a broker who never sleeps. All for a low, flat monthly fee with no connect time or other communication charges, so you can dial in as often as you like.



It's Easy

Almost 200,000 people already use WealthBuilder — it's that easy to install and use! A simple "interview" format asks the same questions that a good financial planner would—about your resources, risk tolerance, obligations and even your dreams. Straight-forward suggestions, graphs and more show you how to achieve your financial goals. The new Windows™ interface and integrated help screens will answer most of your questions. Friendly member service representatives help with the rest.

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Order today and receive 3 special offers. First, get WealthBuilder for Windows™ (reg. \$99.95) for the special introductory price of just \$49.95 (plus \$7.50 s/h) with a 30-Day Money Back Guarantee. As a bonus, you also get Reuters Money* Network (reg. \$24.95) absolutely FREE — and you get a FREE month of online membership.

Plus, if you subscribe to Reuters Money* Network when you call, you can get a special 6-month introductory subscription to our basic plan — the Gold Plan — (reg. \$119.40/year) for just \$49.95. That's 7 months of membership for less than \$7.14/month—for the best online investment service in the world! Like PC Magazine says: "You can't lose."

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Quotes are 15 minute delayed. Personalized News Clipping Service is an option, available at \$9.95/mo. Prices and specifications subject to change without notice. Versions available for Windows, DOS and Macintosh; certain technical requirements apply. ** The Nobel Committee has not yet reviewed or endorsed Reality's WealthBuilder by Money Magazine.

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its newsletters online, including an overall rating, risk rating, and purchasing data for each mutual fund. While there are no guarantees that past performance will match future performance, Morningstar can give you a head start on picking the best mutual funds.

Almost all of the major online services, including Prodigy, DELPHI, GENie, Dow Jones News/Retrieval, Telescan, CompuServe, and America Online, offer financial data that can help you learn about your investment options and select the investments that are best suited for your individual needs.

If you're a Quicken user, you ought to check out the Windows-based Reuters Money Network Version for Quicken Users. It plugs you and your Quicken data into a dedicated financial online network. You'll be able to access online data on 18,500 invest-

ments, including CDs, mutual funds, stocks, bonds, and indexes; create an online personalized news clipping service; and analyze your Quicken investment portfolio to determine which investments are making money, which investments are losing money, and where you should invest next. The software package includes one free month of online membership, with additional access starting at \$9.95 a month. Reality Technologies also offers a similar DOS package, called Reuters Money Network, which doesn't offer the Quicken links but does include an investment portfolio manager (the Quicken version uses Quicken's own portfolio manager).

WealthBuilder has one foot in the investment-planning camp and the other foot in the retirement-planning camp. The two go hand in hand, so combining them into a single program makes a lot of sense. WealthBuilder begins by asking you questions about your net worth, risk tolerance, and investment preferences. It then creates an investment strategy that you can use as your financial plan. The program is heavily weighted toward mutual funds and asset allocation, though many financial planners would recommend a similar strategy for long-term savings. You also get a built-in portfolio manager and a copy of Reuters Money Network. In addition, the program can import portfolio and budget data from Quicken, Managing Your Money, and other personal finance programs.

If you're really serious about analyzing stocks and mutual funds, you should take a look at MetaStock 4.0, the top technical-analysis program. While fundamental analysis studies the financial data for an investment, technical analysis limits itself primarily to the price movement of an investment, in an attempt to predict future price swings.

Thousands of individual investors use MetaStock each day to analyze the price movement of their investments, using such esoteric technical tools (called indicators) as Japanese Candlesticks, Relative Strength Index, Volume Rate-of-Change, Bollinger Bands, and Time Series Forecast. They also draw lines to extend price patterns, using equally strange methods, such as Fibonacci Retracements and Gann Fans. Does technical analysis really work? It seems to help predict whether an investment is likely to

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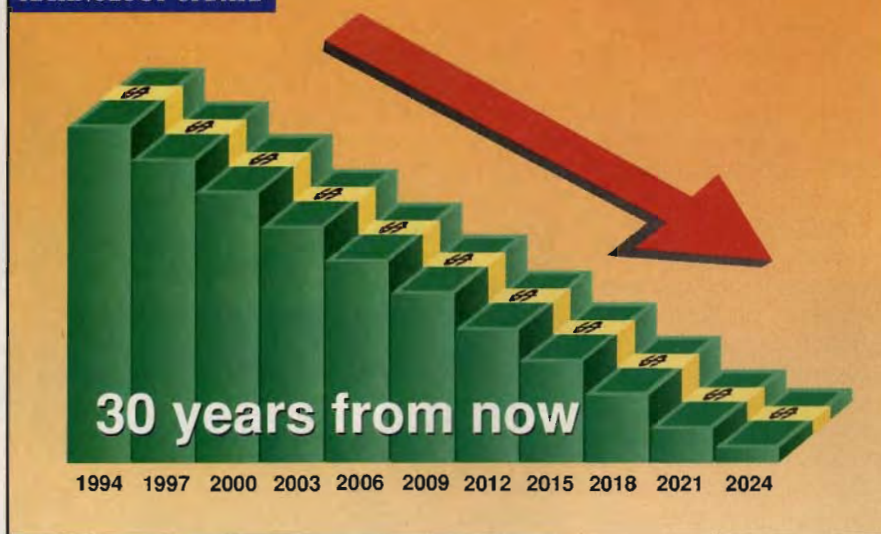
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TECHNOLOGY UPDATE



Don't let your money run out before you do!

Easy-to-use software tells you what to do now in order to be secure in your retirement years.

By Charles Anton

Someone once said, "old age is not for sissies." In fact, retirement years can be fun. But not if you ignore your health—or your financial security!

To help you plan for retirement, a team of leading financial planning experts and computer programmers got together over the last three years to create Destiny—a computer program that lets you take control of your own financial destiny.

Top planners. The Destiny team, working with a major retirement association, talked to hundreds of people from all walks of life. People as young as 30 years old, were beginning to worry about financial security for their retirement years.

While Destiny's calculations are sophisticated, running the program is as easy as one, two, three. You are prompted to answer some key questions and asked what expectations you have. Within a few seconds a spreadsheet and a series of graphs materialize with all the planning done for you. Destiny will project up to 60 years.

The government pension myth. Most people know you can't rely on social security alone to meet retirement needs. Destiny can answer this problem and many others. It uses information such as age, the assets you already own, your investment strategy and expenses

you might have along the way, such as tuition for your children. If you are already retired, Destiny can show you how much you can safely spend each year.

Can my money work harder? As recently reported on CNN, the most common mistake people make in managing their savings is being too conservative. Destiny allows you to see the impact of following a more aggressive savings strategy at a comfortable level of risk.

By answering easy prompts on your monitor, the program stores essential information such as your age, your income, your investments and your assets. Then it tells you what you can expect to have in real dollars to take care of your security. If you would like to change what the figures and graphs reveal for your future, you must go back

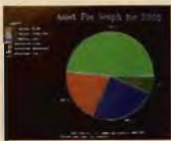
Your own portfolio manager.

With this program you can elect to have the personal Portfolio Manager take over. Whether you choose an aggressive approach, a standard approach or even a more conservative approach, the manager automatically selects



a relatively more conservative one as you get closer to retirement.

Through Sector Management, the Portfolio Manager maintains a balance among high, moderate and low risk assets according to the allocation strategy that you choose. To maintain the right balance of investments, the manager adjusts your portfolio as time goes by. No other program incorporates these sophisticated calculations.



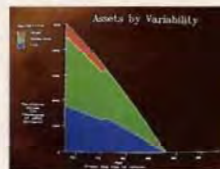
to your original input and experiment with more 'put aside' money so that future income will be adequate to your wishes.

And inflation? Unfortunately, inflation is a fact of life. Inflation can be set at whatever level you estimate for the future in any plan you decide to follow.

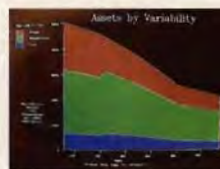
The results can change in seconds to colorful graphs that tell exactly what to expect for each year of the future. Your retirement time, instead of being gray and uncertain, suddenly becomes cheerful, predictable and secure.

Each projection could cost \$1000. To have this personal information forecasted for any given situation by a financial advisor could cost up to \$1000.

However, because this program is a moveable feast, forecast-wise, you can have as many projections as you like at one low price.



Before. Without a plan, you could run out of money.



After. Careful planning lets you live comfortably, even in your later years.

This offer is not available anywhere else in the U.S. To introduce it to the public, Comtrad is offering Destiny complete with program disk, operator's manual and workbook for the low introductory price of only \$99 plus \$6 shipping and handling.

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Order Destiny, and we'll send you the "Retirement Planning Workbook" absolutely free. It's not just another book about financial planning; its purpose is to increase your understanding of financial planning concepts. You'll also get an operator's manual and access to a technical question hotline.

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go up or down, and when it's combined with fundamental analysis to select the investments, an individual investor can increase his or her odds of beating the market. (Stocks, by the way, have increased over the long term at about 10 percent a year. This is why the stock market has traditionally been a great place for long-term investment.)

In addition to creating charts and letting you analyze them with an array of indicators, MetaStock provides three outstanding features: Custom Formulas, The System Tester, and The Explorer. With Custom Formulas, you can have as many as 250 different custom formulas, either ones you create yourself or ones you download from places such as the Investor's Forum. With The System Tester, you can combine one or more indicators into a trading system and test that system against the historical data for an individual security. You can then optimize your trading system to improve the results. With The Explorer, you can perform in-depth analysis on multiple securities across multiple directories and generate a performance report that ranks the securities according to your analysis.

Nirvana Systems has a terrific series of add-on products for MetaStock, including four volumes of trading systems that you load directly into MetaStock (\$49 each, \$79 for any two, or \$149 for all four); a set (called Journeys!) of explorations and templates that let you quickly display the results of each run of The Explorer; and four utility packages that make it easy to find the best trading systems for your particular investments. A basic package with the first volume of trading systems and the three most popular utility packages is \$169, or \$390 when purchased with MetaStock 4.0.

Windows on WallStreet 2.1 is similar to MetaStock in that it lets you perform technical analysis on stocks, bonds, mutual funds, commodities, and indexes using a variety of indicators. You can even import MetaStock price data and custom indicators. It also features a profitability tester similar to MetaStock's System Tester and a SmartScan feature similar to MetaStock's Explorer. Windows on WallStreet improves on MetaStock by including context-sensitive help, a built-in module that lets you automatically download price information (currently supporting CompuServe, GENie, Dow Jones News/Retrieval, and Dial/Data), and a built-in communications program that lets you research company financial information (for fundamental analysis). Until Equis's long-awaited Windows version of MetaStock arrives later this year, Windows on WallStreet is clearly the Windows technical-analysis program to beat.

Mighty Oaks from Acorns Grow

Let's assume that you've used your personal finance program



to learn how to save and you've explored various investment options. How will you know when you've saved enough? How can you save for a house, your kid's education, and a comfortable retirement if you don't know how much to set aside each month and how much t h a t

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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.



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DUAL-SCAN COLOR NOTEBOOKS UNDER \$2,500

Edited by Mike Hudnall
Reviews by William Harrel

Until recently, low-cost notebooks were too slow and the screens too hard to see for long hours of sustained work, the kind of work you do in the office or at home. About all they were good for was typing correspondence and sending and receiving faxes and E-mail. Until just a few months ago, machines capable of processing graphics, presentations, and large spreadsheets—say, a 486SX with a color monitor and large hard disk—cost upwards of \$4,000.

The times they are a changin'. Because of price wars in the PC industry, notebook prices are plummeting. In addition, new technologies—such as low-energy-consuming CPUs, dual-scan color screens, docking stations, and PCMCIA expansion—have catapulted notebooks to new heights in power and functionality. Today's notebooks are powerful enough for all but the most intensive, high-end desktop publishing and graphics applications. And these notebooks cost less than \$2,500!

Energy and Economics

The heavy power consumption of the most powerful CPUs has prevented their being built into battery-powered notebook PCs weighing less than eight pounds; however, the arrival of the power-saving microprocessors, such as the 3.3-volt DX2 and DX4 chips, means that notebook vendors can now manufacture the fastest, most power-efficient portable computers we've ever seen. Intel's DX2 and DX4 chips for notebooks are spurring on the production of a slew of powerhouse portable computers capable of speeds more impressive than those of some desktop 486DX machines. Several of the notebooks reviewed here, all 486s,

take advantage of this clock-doubling and -tripling technology. In our BAPCo speed tests (see the "Our Testing Procedure" sidebar), machines built around DX2 and DX4 chips ran circles around the two using the 486SX technology, which lacks a math coprocessor.

In addition to being fast, these new chips are energy misers. The results of the battery tests varied widely between clock-doubled chips and the SX chips but remained pretty constant in each class (see the Features table). Power consumption, however, really depends on how you use the computer. Applications such as graphics programs, which access the hard disk often, use more power than, say, word proc-



essors. Still, the DX2s and DX4s, combined with Microsoft's DOS-based power-saving utility (and the additional utilities that ship with most of these computers) turned in some impressive battery lives. The Texas Instruments TravelMate 4000e WinDX2/50, for example, lasted three hours and 15 minutes. Never before have notebook users been able to get that much computing power for that long off one battery charge.

Coming in for a Landing

These great gains in performance and capability are terrific, but are high-end notebooks actually usable for day-to-day work? After all,

the Austin machine, which is feature-rich and incredibly easy to use, has a gorgeous dual-scan passive-matrix display—but it's only 9.5 inches. Compared to the 15-inch CRT on most of our desks, it clearly falls short when you need big-screen clarity. And many of us are accustomed to 17-inch or 20-inch monitors.

Who's going to do high-end graphics and desktop publishing on a notebook? Nobody. Notebook screens are suitable for travel only. Even the largest display—the MidWest Micro Elite's 10.4-inch screen—gives you headaches after a few hours of graphics work. Most of the machines reviewed here are capable of 256 colors at 640 × 480 resolution. All except two (the Toshiba Satellite and Twinhead Slimnote support only standard VGA) support an external Super VGA monitor in one fashion or another. For long hours in a graphical interface, you need an external monitor. A few, such as the MidWest Micro Elite and Austin Dual Scan Power, support resolutions up to 1280 × 1028. The Elite even supports true color at some resolutions.

Another prolonged-use impediment is the small keyboards lacking separate number pads. While all the keyboards I tried offer adequate tactile feedback and key travel, you may want to take advantage of the option of plugging in an external keyboard. All of these notebooks allow you to plug in full-size keyboards for easier, less cramped data input and more comfort. Simply set one of these road warriors on your desktop, plug in a keyboard and a monitor, and you've got a quite workable computer for lots of applications.

Meanwhile, docking stations are alive and well. Once used primarily to house a big hard drive and connect to the network, they

money will grow over the years? Most personal finance programs have a simple module that lets you quickly figure how much you might need to save, given your goals and current financial circumstances. But for a true estimate of what it will take, you'll need a d e d i -

cated retirement-planning program. A dedicated program can account for income that varies each year, determine if you'll have to sell assets to eliminate any yearly shortfalls, and let you perform elaborate what-if scenarios, such as how the year you retire would affect the amount you need to save, how a change in the tax rate would affect your retirement income and Social Security, and how higher inflation would cut into the buying power of your retirement funds.

Rich and Retired is a full-featured retirement-planning program. It can handle assets that you plan to buy in the future, calculate how your assets and taxes will change if you inherit property, factor in the percentage of your assets that can be sold to support your retirement, and automatically adjust your yearly savings rate to keep up with inflation.

Retirement reports include Yearly Shortfall Report, Yearly Cash Flow Summary, Yearly Overview, Detailed Report for Specific Year, and Lifetime Overview. Fortunately, this

Windows-based program is relatively easy to use and has an extensive help system. Once you've entered the data—which is no small feat if you want to get the full benefits of the program—you can quickly view the effects of any changes on your projected net worth.

Two other retirement-planning programs, both DOS based, are RetireASAP and Destiny. RetireASAP produces a number of useful reports, including Overview Report, All Income—Non-Investment: Now and During Retirement, and Year-by-Year Contributions Guide. The program also includes an online investment guide, called The ABC's of Investing. A Windows version should be available by the time you read this. Destiny, developed by MacKenzie Systems but sold through Conrad Industries, includes a built-in portfolio manager and retirement-planning workbook. The 65-page workbook is an excellent introduction to tax-deferred savings, investment diversification, inflation-adjusted savings, risk management, and asset allocation.

From Here to There

The time to think about the future is now. Save money, invest intelligently, and take the opportunity to learn the secrets of money management from the experts. That's it. With the help of these programs, you could soon be on your way to a more financially secure future. They're designed for nonaccountants like you and me, so don't feel you won't be up to it. You will have to think about what you want out of life and spend some time organizing your financial data. But once that's over with and you see the results, you may well agree that buying money-smart software is one of the best investments you could ever make. □

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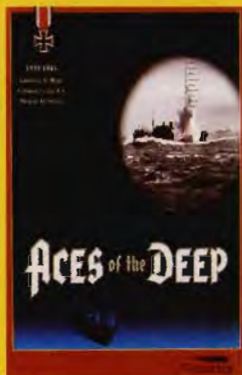
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UPGRADING YOUR PC

WHY UPGRADE YOUR PC?

Maybe you've had this experience: You bring home your new hot software purchase, sit down to the computer, load the program, and finally type in the command to run it. Nothing happens. Or you get an error message stating that there's not enough memory to run it. Or the computer ties itself into knots curable only by rebooting.

Other times, you don't even get that far. Perhaps the installation routine looks at the available space on your hard drive and snootily informs you that you don't have enough space. Or it snarls itself up trying to find and test your sound card. Or it could be any of a hundred other nasty ways that modern software has to frustrate your efforts to run it on anything less than absolutely modern, state-of-the-art hardware.

Even if you're lucky and it runs, you're not out of the woods. You may find the voices and sound effects lagging well behind the screen action, or the video may come in sporadic jerks, or the program may run so sloooooowly that it's just not usable.

These things happen all the time. Software developers seem to aim at the leading edge of the hardware wave and assume that you have the latest in a high-powered computer. So to run today's hot software, you're faced with a choice: Buy a new computer or upgrade your existing machine.

Upgrading can make sense—unless you're replacing everything inside the case. If you're still running a 386 of any variety, you're



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COMPUTE's Getting Started with Upgrading Your PC was written by Richard O. Mann.

probably hitting limitations regularly. Depending on the software you want to run, upgrading a few components can give you a capable new machine. If you have an old 286, upgrading the motherboard and chip (and probably the hard drive) can do the job for you, although

you should carefully evaluate the comparative costs of buying an entirely new machine. Remember that the old parts you don't upgrade may not be long for this world.

Keep in mind throughout this series of articles on upgrading that all but the

most lavish 486 screamers are really quite reasonably priced. Further, if you buy a new computer, you'll still have the old one around for limited duty. As the sixties became the era of the two-car family, the nineties are becoming the era of the two-computer family.

WHAT SHOULD YOU UPGRADE?

Boyd Peterson, president of DeskTop Media, a Salt Lake City mail-order firm, has counseled hundreds of computer owners anxious to modernize their computers by upgrading. "Find the bottleneck in your system," Peterson advises, "and attack it first. If you work primarily in Windows, the first thing to do is upgrade to 8MB of memory. Even with older computers, the extra memory often speeds everything up to tolerable levels."

Sometimes, the bottleneck is obvious—the software tells you why it won't run. You generally know when you've filled your hard drive. When the computer locks itself up tight, you'll probably have to work with knowledgeable friends or tech support in order to identify the problem. Once you do, you'll know what needs to be replaced—if outdated equipment is the cause.

The most common upgrade impetus, however, is the need for speed. Here's where bottleneck elimination can pay big dividends. To find the cause of your slowdown, take note of exactly when you're waiting for the computer. What's happening at that moment? Is the hard drive light flashing as the computer loads programs or reads data? Are you waiting for the com-

UPGRADING YOUR PC

puter to redraw complex screens? If you're in Windows, is the hard drive running all the time as your applications continually swap memory out to disk? Is the computer crunching numbers or doing large data sorts or manipulations?

If the problem is mountains of data clogging up the works, a new motherboard with a faster and wider bus is the answer. If it's raw processing power (number crunching, sorting, processing vector graphics), a simple chip upgrade is called for. If it's screen redraws, a new video card may do the trick. If Windows is grinding your hard drive into an early grave, you need more memory. Or you may require a combination of these things.

If you decide to upgrade, it's going to take some planning and care, but it isn't unreasonably difficult—even for the mildly fumble-fingered among us. Upgrading is such a common activity these days that the upgrade component makers are now skilled at providing adequate instructions and tools, when needed.

HOW TO UPGRADE YOUR PC'S PROCESSOR

One way to drag your old hardware out to the leading edge of technology is to pop out its outmoded old horse-and-buggy-days CPU (Central Processing Unit—the brain of the computer) and slide in a new chip. A 486DX4-100 sounds good or maybe a Pentium, right?

For some, it's almost that easy; for others, the whole chip upgrade scenario can become a nightmare. Yet others can forget it entirely; their aging computers weren't built to allow

upgrades. Most of us fall somewhere in between.

Can I Upgrade My Processor?

The first step is to determine if a chip upgrade is even possible. Many of the larger clone makers purposely make their computers non-standard enough to force you to buy upgrade components directly from them—at prices well above street prices for normal upgrade hardware. Packard Bell, Leading Edge, Epson, and Hyundai fall into this group.

Other clones tend to be more standard, but the only way to be sure is to talk to your computer vendor (or perhaps the upgrade chip vendor) to see if your particular machine is capable of accepting an upgrade chip. (This advice applies to motherboards, as well.)

If you have a 486SX or DX running at 16, 25, or 33 MHz, you're in luck. Upgrading these newer chips is usually much easier than upgrading earlier CPUs—the upgrade fever had hit before these machines were made, and manufacturers often made allowances for upgrades.

How Far Should I Upgrade?

Once you know you can upgrade your chip, the next question is how far into the future to go. Two factors will determine this: price and desired performance boost. Price, of course, is a judgment call that only you can make. Note, however, that competition from Cyrix and AMD has brought the price of all 486 chips down rapidly, making the upgrade route more attractive than ever.

Considering the performance boost you'll get from the various chips available

is a little more of a challenge. Remembering the bottleneck analysis mentioned above, you may put a speed demon chip in your computer without much effect—because of other speed-limiting components of your system. With a slow hard drive and a 16-bit bus, for instance, the fastest chip may still take long minutes to load Windows.

You need to balance the chip's speed with the capabilities of the rest of your computer. A Pentium OverDrive chip in a slot where a 486SX-25 once held court would still be limited by the 25-MHz bus moving only 32 bits of data at a time. You'd be missing out entirely on one of the major advantages of the Pentium—its 64-bit bus. It would still be faster than the old chip, of course, but not as fast as it could be.

If you're not comfortable with discussions of bus width (16 bits, 32 bits, or 64 bits) and bus speed (16 MHz, 25 MHz, or 33 MHz), you may need to find a helpful dealer who can tell you how the new chip will perform with your existing setup.

At this writing, Pentium upgrade chips for the OverDrive sockets found in many computers manufactured since mid 1992 are still not available. Code-named P24T, the chip uses Pentium technology inside (including a 64-bit data bus) but communicates with the outside world through the 32-bit bus that exists in 486 systems. Early tests with the first P24T chips found that they not only didn't work in some computers but actually destroyed them. Following many delays, Intel now promises the Pentium OverDrive chip by the end of the year.

In the meantime, Intel has released the clock-tripled 486DX4-75 and 486DX4-100 chips, which communicate with the computers at 25 MHz and 33 MHz respectively, while operating internally at the previously unheard-of speeds of 75 and 100 MHz. According to Intel, these chips deliver entry-level Pentium speed.

Installing a New Chip

For some, installing a new chip is as easy as removing the old chip and plugging in a new one. For others, it can be an experience on a par with root canal work.

Removing the old chip is often easier said than done. Upgrade kits usually supply a many-toothed chip-puller tool that allows you to gently work the nearly two hundred pins of the old chip out of their sockets. If the computer was well designed, you'll have access to the chip area to do this. In too many cases, though, the chip is hidden under a half-dozen other components that you'll have to remove to get at the chip. In some cases, it's nestled into a secure home covered by a nonremovable part of the casing.

Wherever it is, it has to come out before you can put in the new one—unless you have one of the newer computers with a separate upgrade socket.

Installing the new chip must be done with exquisite care. You don't want to bend or break one of its scores of pins—the little legs that must fit precisely into their proper holes in the socket. Considering the cost of this little bit of silicon and metal, you want to be very, very careful as you ease it into its new home.

The word "DOOM" is rendered in large, 3D, metallic letters. The letters are hollow, revealing a complex circuit board pattern inside. The "II" is smaller and positioned below the "O"s. The background is a fiery orange and yellow sky over a dark blue city skyline with various buildings and a tall antenna tower.

DOOM II

DOOM'S DAY

Monday, October 10TH, 1994

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UPGRADING YOUR PC

Be sure it's seated securely in the socket before applying power.

Flip the power switch, listen for frying noises, and watch for smoke. Absent smoke and flame, you've probably done it right. If the power switch sets off your own little electrical storm—well, you really should have opted for a new system anyway, right?

Seriously, you should be moderately confident of your ability to work with these precious components before tackling a job where mistakes are so costly. But if you exercise appropriate

caution and follow the directions, you'll usually come out of the experience with new confidence and a wonderfully souped-up, like-new PC.

HOW TO UPGRADE YOUR COMPUTER'S MEMORY

The simplest upgrade you can make inside the computer case is system memory. A few potential complications lurk here, but all you usually do is locate the sockets and plug in new SIMMs (Single In-line Memory Modules). You do,

of course, have to open up the case to do this.

When Does More Memory Help?

The primary need for increased memory comes when you adopt Windows or OS/2. Windows by itself uses more memory than most 286s ever had. Run a modern Windows application, and your memory is quickly gobbled up.

Microsoft would have you believe that a 4MB machine runs Windows without difficulty. That's basically true. With 4MB, you can successfully run many Windows

applications, but virtually any major application released in the last year or so really needs 6MB to 8MB to run at an acceptable speed. Don't even try to run WordPerfect for Windows 6.0 with anything less than 8MB. (I finally took it off my 4MB laptop—it was so slow that it was totally unusable.) You'll get the same results with almost any recent main-line application.

Recent research proves what many already knew: There's a "sweet spot" for Windows 3.1 at 8MB of memory. Performance speeds improve dramati-

HOW TO UPGRADE YOUR MOTHERBOARD

Upgrading your computer's motherboard: Now there's a scary thought. It has to be extremely difficult and expensive, right? Not so. Installing one isn't the easiest mechanical feat in the world to pull off, but it's not beyond the abilities of most of us. The cost is down in the \$150 range—sometimes less. And the benefits can be dramatic.

What's on a motherboard? You can buy your CPU chip with the board, but for now we'll discuss the CPU separately. Your computer's motherboard is the home of its data bus, in the form of the expansion slots where you plug in boards and cards as well as the on-board circuitry. It has memory sockets, a CPU socket (and maybe an upgrade or OverDrive chip socket), BIOS chips, the memory cache, and the chip set (the rest of the necessary circuitry for running the computer). Your present motherboard may also

have additional functions built in, such as the video adapter, drive controllers, and so forth. Upgrade boards generally don't have such built-ins.

As with CPU chips, not every computer will accept an industry-standard upgrade motherboard. Many proprietary clone makers make theirs sufficiently different to prevent the use of any new board except their own. Packard Bell, for example, charges \$850 for a 386-40 upgrade motherboard that would otherwise cost around \$129.

If you're going from a 386 to a 486 or Pentium, it will almost always pay to get a new motherboard in the process, according to Boyd Peterson of DeskTop Media in Salt Lake City. This way, your data bus can match the speed of the faster processor, and you're ensured that the BIOS and other components are new and compatible.

The primary issue in selecting a new motherboard is the type of data

bus. The choices are the old Industry Standard Architecture (ISA), VESA Local Bus (VLB), and Intel's new Peripheral Component Interconnect (PCI) bus. The motherboard will have standard expansion slots and two or more VLB or PCI slots.

Local bus and PCI operate at much higher speeds and bandwidths than the old ISA bus, dramatically speeding up the movement of data through the computer. As computer makers decide whether to adopt VESA's new version 2 specification or PCI over the next half year, the winner will emerge.

In any case, get one or the other—forget the outmoded ISA bus. Peterson recommends local bus because the only cards currently available for PCI are video adapters and hard drive controllers. He also points out that only PCI-specific cards can plug into PCI slots—they're not backward compatible as local-bus slots are.

Another issue is built-in functions on the motherboard. Peterson warns that built-ins commandeer a set of hardware interrupts (the dreaded IRQs and DMAs you hear about) that may conflict with other cards, such as sound cards, video cards, and even parallel ports and game ports. Even when you can turn off the built-in functions, you don't get back access to those interrupts.

You may want to get a ZIF (Zero Insertion Force) upgrade socket on your new motherboard—it's usually a \$10 to \$15 option—to allow for future chip upgrades.

And finally, dealers warn against looking for the absolute lowest price in upgrade motherboards. These bargain-basement wonders often use outdated BIOSs and chip sets as well as physically inferior materials. A decent motherboard isn't that much more expensive; go for high quality in such an integral part of your computer.



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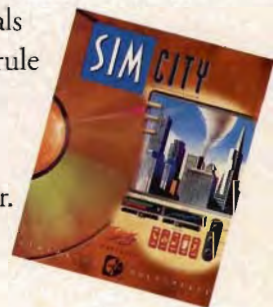
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cally as you go from 4MB to 8MB. Further improvement as you move to 12MB and 16MB and beyond slows to almost none. You won't need 16MB or more with today's Windows applications (I make no promises for next year's software, however), unless you're working with ultralarge files (such as 10MB graphics or desktop publishing files) or you regularly need to run four or five large Windows applications simultaneously. OLE 2.0, the Windows feature that essentially embeds a whole application within another through linked objects, also benefits from memory beyond 8MB.

Types of Memory Chips

You'll need to know which kind of memory sockets your motherboard has. The quickest way to find out is to have someone knowledgeable look inside the case, but your computer manual should tell you—if you can find it. A call to the computer vendor with serial number in hand should also net you the needed info.

If it's an older machine, you may have DRAM chips, which you have to remove and replace with higher-capacity DRAM chips in the same sockets. To go above 4MB in my old Northgate 386, I had to buy an expansion board to hold 1MB SIMMs after replacing the original DRAM chips.

If your motherboard has empty SIMM sockets, upgrading is a snap—just pop new SIMMs in, and you're done. If there are no empty sockets, you'll need to pull the existing SIMMs and replace them with higher-capacity SIMMs.

Another question is memory speed, quoted in



Your Windows programs can run significantly faster when you add a Windows accelerator card.

nanoseconds. Lower numbers are faster. Older machines use 100-ns memory; newer ones use 70-ns SIMMs. Boyd Peterson of DeskTop Media in Salt Lake City recommends buying 70-ns chips even if your computer has slower memory now. The 70s will slow down to match the rest of the memory, and you'll have fast chips should you later decide to upgrade your system further.

Memory currently runs about \$45 to \$50 per megabyte, making the move to 8MB an expensive proposition—especially if you're starting from 1MB or 2MB. If you're planning serious work with Windows, bite the bullet and write the check for the full 8MB.

The Easiest Way to Upgrade Memory

If screwdrivers scare you and you're not sure which kind of memory chips you have or need, take the coward's way out. Find a helpful dealer and bring your computer case in. Have the dealer open it, figure out

what kind of chips are needed, sell you the memory, and install it. The dealer can fire up your computer and make sure everything works before you leave the shop.

HOW TO UPGRADE YOUR PC'S DISPLAY

Your computer's display is really two components, the video card and the monitor. If you're moving from EGA or VGA to Super VGA (SVGA), you'll need both. If you're already running SVGA, you can upgrade one or the other or both.

Monitors

A year ago, there were a lot of technical questions about monitors, such as interlaced versus noninterlaced, multi-scan versus single scan, and VGA versus SVGA. Today, most of those questions have quietly slipped into obscurity, along with the older, less desirable technology. In other words, all monitors today are multi-scan, and only ultracheap monitors are interlaced. And, of course, VGA is

thoroughly dead—all regular PC monitors are SVGA.

The only questions left are dot pitch (a measure of how precise and sharp the picture is), screen refresh rate, and screen size. Higher refresh rates do away with any hint of flicker in the screen image.

Look for a dot pitch of 0.28 or smaller; images with a larger dot pitch can strain your eyes. Standard refresh rates of 68 or 70 Hz are OK; a 72-Hz screen gives you a bright, crisp image under almost any circumstances.

Screen size is totally dependent on how much you want to pay. Using Windows at higher resolutions (800 x 600 or 1024 x 768) on a 14-inch monitor can strain your eyes. A 15-inch monitor gives a significant increase in size and is easier on the eyes. Larger screens are generally needed only for highly detailed graphics work. During the last year, many computer sellers have gone to the 15-inch monitor as their standard.

Video Cards

If you don't have a Windows accelerator card or other high-speed local-bus video card, you're leaving an unnecessary speed bottleneck in your system. Installing the video card is a simple operation, though it involves opening the computer case and swapping the existing card for the new one. You'll also have to deal with installing video driver software, but that's usually a fairly straightforward process.

Things to look for when selecting a new video card are speed (get local bus or PCI, depending on your computer's data bus) and memory, with its accompanying color and resolution

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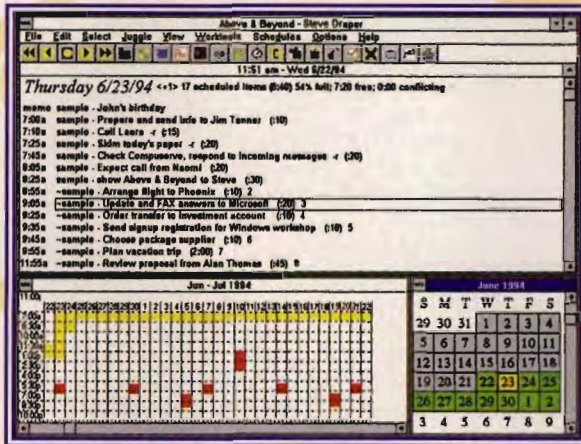
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9/94

UPGRADING YOUR PC

capabilities. You'll also want to deal with an established vendor.

Each video card requires its own video driver software for Windows. The card will come with a Windows 3.1 driver, but when the next version of Windows arrives, you'll need a new video driver. Microsoft may not provide the driver, and since the video card manufacturer already has your money, you can't depend on the manufacturer to send you the new software. You'll need to be able to find the driver yourself. Dealing with an established company that posts its drivers on CompuServe or its own BBS is the safest course.

Video memory runs from 512K to 2MB. You'll want a practical minimum of 256 colors at 800 x 600, which requires only 512K of video memory. Another 512K of video memory (for a total of 1MB) buys you 65,000 colors at 800 x 600 or 256 colors at 1024 x 768, which will be enough for anyone without a megascreen monitor. You absolutely need 256 colors at 640 x 480 (the standard DOS-sized screen and resolution) to run any modern multimedia or game software, so don't get less.

HOW TO UPGRADE YOUR HARD DRIVE

"This is a *great* time to buy hard drives," says Salt Lake City mail-order dealer Boyd Peterson of DeskTop Media. "Prices are less than a dollar a megabyte—way down from even a year ago."

If your hard drive is getting crowded, now is the time to act. (Mann's First Law of Hard Drives: *All* hard drives, no matter how big, have less than 2MB of empty space.)

Although the industry is

settling in with 200MB to 250MB for the basic hard drive in new computers, many lower-priced systems come with 170MB drives. Even two years ago, that sounded like a lot. In today's Windows-dominated world, 200MB will fill up so fast that you'll be looking for Stacker in no time.

With DOS itself taking over 6MB, Windows taking upwards of 20MB, and any self-respecting application at all running to 5MB or more, hard drive real estate becomes scarce amazingly fast. If you do Windows (and who doesn't, these days?), serious applications routinely run over 20MB. CorelDRAW!, fully installed, is the biggest I've run across, at 62MB. Trust me: If you're any kind of a software junkie, your hard drives are perennially full. And heaven help you if you're a game player—the graphics and sound files fill hard drives like tribbles filling the *Enterprise*.

Upgrade Options

The average person can simply buy a new drive and install it alongside the old drive inside the computer case, but there are a few complications to bedevil owners of older computers.

Hard drives come in just a few basic types. Older drives are RLL or MFM types (never mind what the letters stand for—it's not important). Neither type will work in tandem with a new drive, so if you have one of these drives, you'll have to replace it and its hard drive controller card. (If you're not sure what type your old drive is, open the computer case and look at the drive. The type will almost always be on a label on the drive. If not, check the number of

data cables per drive. RLL and MFM drives have two, while a newer drive has only one.)

Most drives sold in the last few years are IDE drives, which work fine in tandem with other drives, including the other current drive type, SCSI (pronounced "scuzzy").

SCSI drives cost a little more, so unless their particular talents are needed, most people stick with IDE. Because IDE drives are presently limited in size, buy SCSI if you need a really large drive (though there's nothing wrong with buying multiple IDE drives to get the same capacity). If you need heavy throughput, you should be aware that SCSI drives can deliver up to ten megabits per second of data transfer, while IDE drives max out at four megabits per second. A newer generation of higher-capacity and faster IDE drives will be available soon, so be sure to shop around.

Older drives are slow by today's standards, but the new drives you can buy are all fast enough to keep you happy. Consider a 13-ms access time as your slowest acceptable speed.

Physical Considerations

A new hard drive fits in a 3½-inch drive bay—if it's bigger than that, it's old technology, and you don't want it. Drive bays are cagelike affairs in your computer's case. You'll need a bay to hold each drive, unless you get a half-height drive to share a bay with another half-height floppy or hard drive. Most computer cases have enough drive bays for two or more hard drives. Unfortunately, many

Packard Bell and Tandy computers (among others) come with only three bays, which can really cramp your style if you want more than one hard drive and both sizes of floppy drives, to say nothing of a CD-ROM drive or tape backup unit. Half-height drives and external units may be the solution here.

You can also buy an internal hard drive, known as a hard card, which plugs into an expansion slot on the motherboard rather than fitting into a drive bay. Hard cards are fast and reliable, but they cost more than traditional drives. If you're fresh out of drive bays, a hard card can be the answer.

If all else fails, you can also buy a new computer case and transfer all the innards of your present machine into a roomier new case.

HOW TO UPGRADE YOUR PC TO MULTIMEDIA

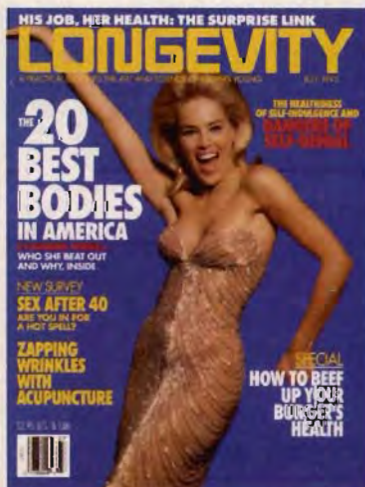
Multimedia computing is a fairly recent development. While an increasing number of computers sold for home use today are equipped for multimedia, millions of computers await the happy day when they get a multimedia upgrade.

What Is Multimedia?

Multimedia refers to using more than one medium to present a message. In the PC context, that means adding sound and video to the usual text and graphics. Multimedia software is everywhere these days, usually in the form of CD-ROM programs filled with glorious music, sound effects, and voices along with full-motion color video.

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UPGRADING YOUR PC

Spend a few minutes in the multimedia section of this magazine for a taste of what's going on in this exciting field.

Basic Hardware

The components you need to add to a basic computer for multimedia compatibility are a CD-ROM drive, a sound card, and stereo speakers.

The Multimedia Marketing Council has defined standards for multimedia PCs. The current version is MPC-2, which calls for a minimum of a 486SX-25 with 4MB of RAM; a 160MB hard drive; a video card capable of 640 x 480 with 65,000 colors; a high-density 3½-inch floppy drive; a 16-bit sound card; and a CD-ROM drive capable of sustained throughput of 300 kilobytes per second. That standard, issued in May 1993, is a little out-of-date. Experience says that a 486DX-25 with 8MB of RAM and a much bigger hard drive is required to run a lot of today's multimedia software successfully.

If you have the basic computing power, all you need to do is add the extra components to turn your humdrum PC into an interactive entertainment center.

Upgrade Components

There are two ways to get the necessary stuff for your upgrade project. One is to buy the components separately and install them. The other is to purchase a prepackaged multimedia upgrade kit. Kits are put together by sound card and CD-ROM drive manufacturers to make your life easier. If you buy the components separately, you run the risk of not getting a fine-tuned compatibility. Kits are



If you already have a sound card, you can upgrade to multimedia by purchasing a CD-ROM upgrade kit.

almost always less expensive than separate components and usually include a bundle of outstanding CD-ROMs.

Unless you have some overriding reason to buy separately, I recommend buying a kit. I do have some advice on selecting a kit, however, that I'll present component by component. This will be highly summarized information; COMPUTE has covered choosing CD-ROM drives and sound cards at some length in recent months. (The full text of these COMPUTE articles is available on America Online for normal connect charges.)

CD-ROM Drives

The rules here are pretty simple. Get double speed (which means a transfer rate of 300 kilobytes per second), match the interface with your sound board (SCSI, IDE, and proprietary interfaces are available), and choose between a caddy-based system and a drawer-based system. Speed is everything.

Surprisingly, the new triple-speed drives don't seem to give much speed advantage for normal multimedia work, although the speed really shows in pure data transfer work, according to Boyd Peterson of Salt Lake City's DeskTop Media.

The drive needs to match the CD-ROM drive controller interface on your sound card. I would recommend a SCSI interface because it's the industry standard and it allows you to swap the drive or sound card at any time for newer, better hardware. If you get a proprietary interface, your upgrade options will be more limited.

Whether to put your CD-ROMs into a caddy before putting them into the drive is a matter of personal preference. Caddy-based system vendors tell us that while fussing with the caddies is more trouble, the innards of the drive remain out of harm's way. With drawer-based systems, a drawer full of drive mechanism comes out to accept the CD-ROM directly.

Sound Boards

Hundreds of sound boards crowd today's market, confusing things with various proposed standards and different ways of doing things. Be sure your board uses 16-bit technology (virtually all of them do) and is Sound Blaster compatible. The sound board usually has the CD-ROM drive controller hardware built in, so be sure the board you choose has the same interface as the drive you buy.

The newest thing in

sound cards is wave-table MIDI sound, which is light years ahead of the previous FM synthesis technology. If you decide to pay a little more for the outstanding quality of wave-table sound, be sure to get a board that's fully backward compatible with Sound Blaster sound—or you won't get sound out of many older programs.

Speakers

These are usually an afterthought, though they're important to the overall quality of the multimedia experience. Kits come with adequate basic speakers, with fancier desktop speakers coming as a later upgrade. For late-night work, a personal headset keeps the sound from bothering other family members.

Installing the Upgrade Kit

Whether you go with a kit or individually purchased components, installing multimedia on your computer is a mixed bag. If you're lucky, it goes without a hitch. However, you will need to do some screwdriver work and spend some time with your software drivers and system files.

Our first multimedia kit took many hours over three days to install; the last one took about 20 minutes (I had the dealer do it). Until the promised Plug and Play standards come to life in the next year or so, any multimedia installation will involve working with IRQs and DMAs to resolve potential conflicts, so be prepared for potential frustration and calls to tech support—just in case. I always recommend installing potentially difficult things at a time when tech support is open. □

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Get to the top with your family and friends!



Ernie Hemple's PROFESSIONAL OFFICE is based on his philosophy of Relationship-Centered Life Management. Life is more than being organized. It is about people. It's about knowing who they are and what they want out of life. It's about making others feel important. It's

about being able to identify, review and respond to any event in the lives of employees, clients, vendors, friends and family. Professional Office is a program designed to help you get and stay organized. It will increase your productivity and the productivity of all those who surround you. It will help you stay focused on the needs of others and as you do, you will prosper and enjoy your life more fully. Put the forces of success to work for you by ordering Professional Office today. Order today.

Listed below are some included features:

1. Daily Scheduler

A. To do list • Items may be added on a one time, daily, weekly, monthly and yearly basis • Items may be automatically postponed to the next day • A TO DO LIST may be printed for any specific day

B. Appointment list • Items may be added all at once, or on a daily, weekly, monthly and yearly basis • Keyword search for appointments with a specific person • User-defined, color-coded prioritization for appointments • A comment section for appointment notes • Alarm clock can be set to remind you of appointments • Daily appointments may be printed out Also includes: Notepad, Daily Quote, and Small Calendar

2. Journal

A. Daily Journal • A text box for daily entries

B. Search • Keyword search through the journal database to find matching entries and list the matching dates and the first few words of the entries

C. Small Calendar • The day in the journal is changed by clicking on different days

3. Calendar

A. Monthly Calendar • A monthly calendar is shown with the number of appointments for each day shown on the corresponding day

B. Appointment List • A list of the times and appointments for the selected day on the monthly calendar is shown

4. Goals

A. Long term Goals • A register showing your long term goals is shown. Clicking on any goal in that register will pull up all information about the goal including expected completion date, and steps to complete the goal. You may add, edit or delete goals

B. Short term Goals • Same as long term goals

C. Relationship Goals • A name register taken from the people database will show a list of goals for the person selected. Goals can be added, deleted and edited for each person in the people database. Goals also includes the expected completion date and a "What I Can Do to Help" comment box.

5. Travel section

• Quick access travel information will be stored. The company name, and telephone number will be stored for airlines, hotels, trains, travel agencies, rental car agencies, and misc. ways of travel.

6. Gift Section • Different categories of gifts will be shown, such as flowers, clothing, jewelry, gourmet foods, travel packages, gift certificates, sporting goods, electronics, music, etc.

7. Ideas/Projects

• Allows user to define multiple topics, people involved in these topics, the ideas associated with them and expected completion dates.

8. Family

• Lets people keep track of family activities and family members and helps user schedule future quality activities with family.

9. Proposals

• Templates of different types of business letters, including proposals, contracts, and templates of resumes and fax-cover sheets

The screenshot displays the Professional Office software interface with several windows open:

- People**: A window for adding, updating, and viewing specific information about a person, including name, address, phone, birthday, anniversaries, spouse, children, associated people, gift register, relationship register, company name, etc.
- Travel**: A window listing travel agencies such as Airbag Airlines, Econo Airlines, Ernie's Air, Southernthern air, and Earhart Airlines, along with their phone numbers.
- Daily Schedule**: A calendar view for June 9, 1994, showing a daily quote and a list of appointments for the day, including "Meeting with the Bank", "Take a nap", "Mr. Price from Airways", and "Joel Seamore at the club".
- To do List**: A window for managing tasks, with a "Flight 143 from gate 4a arrives in Chicago at 9:30" listed.
- Accounts**: A window showing a list of personal and business accounts, including checking, savings, and credit cards from various banks.
- Ledger**: A window displaying a list of payments and receivables with columns for date, category, amount, and description.
- Calculator**: A standard Windows-style calculator window.
- Appointment Notes**: A small dialog box for setting an alarm for a specific appointment.

10. People

A. People Information • A screen to add, update and view specific information about a person including name, address, phone, birthday, anniversaries, spouse, children, associated people, gift register, relationship register, company name, etc.

B. Upcoming Events • Upcoming events in the lives of people are shown as well as upcoming holidays • Different categories of events can be shown, such as all birthdays, weddings, anniversaries, special events and holidays

C. Holidays • A listing of major holidays are personalized by deleting uncelebrated holidays, adding personal holidays, or adding personal messages on a specific date

D. Search • Search different groups or companies to find people by classification, gender, priority, or type of entry

E. Interest • Look at people's interests from a list of editable interest boxes. Store information on favorite places, food, collectables, sports teams, musical instruments.

11. Tools

A. Billing Timer • Enter Client name and reason for billing • Enter billing rate by hour or minute • Set maximum and minimum charges • Select currency symbols • Transfer information to an invoice & a receivable ledger. Also includes: Alarm Clock, Calculator, Auto-Dialer, and Conversions Tool

12. Money

A. Accounts Register • Check writing and printing • Keeps track of checking, savings, credit, accounts, etc. • Maintains a transaction register for each account.

B. Budget • Allows the creation of budgets (eg. yearly, monthly, daily, company party, family vacations, etc.) • Provides full-color graphs of budgets.

C. Invoices • Creates, stores, and prints invoices

D. Ledger • Keeps track of payables & receivables.

E. FAX Ordering • Keeps track of credit card #'s, P.O. #'s and shipping addresses. Makes sending gifts to personal and business relationships as simple as a click of a mouse button.

Guarantee your success.
Order Ernie Hemple's Professional Office with all of the above features and more. Get your life focused and organized for an introductory price of just \$99. + 6.50 S&H.

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System requirements:
Windows 3.1,
4 MB RAM,
10 MB HD,
3 1/2" disk



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HOT NEW MULTIMEDIA FAST FORWARD PRODUCTS FROM COMDEX

BY DAVID ENGLISH

The temperature wasn't the only thing heating up at the recent COMDEX in Atlanta. Much of the computer show was devoted to the hottest growth area in computing: multimedia software and hardware.

On the software side, 7th Level (214-437-4858) threw a big COMDEX party to launch Monty Python's Flying Circus's *Secret to Intergalactic Success [Earth Edition]*. The CD-ROM is full of clips from the popular television series, as well as animation from Python animator, Terry Gilliam. The highlight of the evening was the crowd's singing "The Lumberjack Song" in sync with the program.

Back on the floor of the show, Virgin (800-874-4607) demonstrated *The 11th Hour*:

Sequel to *The 7th Guest*, which contains twice as much full-motion video as its predecessor. *Living Books* (800-521-6263) previewed two new *Living Books*: *Ruff's Bone* and *Little Monster at School*. *Ruff's Bone* grew from a collaboration between Brøderbund and (Colossal)Pictures and is the funniest *Living Book* so far. Like the first *Living Book*, *Just Grandma and Me*, *Little Monster at School* is based on a children's book by Mercer Mayer. Grolier Electronic Publishing (203-797-3500) demonstrated 1994 Guinness Multimedia Disc of Records (\$49.95), which includes the paperback version of *Guinness Book of Records*.

Other new CD-ROM titles at COMDEX included *Medio Magazine* (Medio Multimedia, 206-867-5500, \$9.95 per issue or \$59.95 for a 12-month subscription), a family-oriented CD-ROM magazine with special emphasis on news, entertainment, and education; *Millennium Auction* (Eidolon, 718-884-7095, \$69.95), a futuristic art auction game with highly realistic 3-D characters; *Lower Your Score with Tom Kite* (IntelliPlay, 800-357-5237, \$79.95), a golf-training CD-ROM that features professional instruction through live-action video; and *CD-ROMANCE* (Romulus Productions, 800-266-4557, \$49.95), a CD-ROM-based singles magazine with photos, video clips, and profile screens of eligible men and women.

Disk-based multimedia software at COMDEX included the multimedia presentation program *Action 3.0*

(Macromedia, 800-756-9603, \$199.00 for the disk version and \$299.00 for the CD-ROM version with 230MB of ClipMedia), which now includes an outliner, spelling checker, and 300 templates; *MediaStudio* (Ulead Systems, 310-523-9393, \$349.00), which includes video capture, video editor, audio editor, image editor, morph editor, media management, screen capture, and file conversion modules in a single package; *MediaShop* (Motion Works, 415-541-9333, \$299.00 with Visual Basic and \$249.00 without Visual Basic until August 31, 1994, and then \$695.00 and \$595.00, respectively), which adds

a complete set of multimedia tools to Visual Basic, Visual C++, and other popular languages; and *Melody Maestro* (Blue Ribbon Software, 404-315-0212, \$79.95), which lets you sing into the included microphone and have the program convert your melody into a full MIDI-based song using a variety of musical styles.

On the hardware side, TEAC (213-726-0303) introduced its SuperQuad 4X AT CD-ROM drive, a quad-speed CD-ROM drive with a list price of \$750. MediaMagic (800-624-8654) announced the Telemetry-32 (\$399), a combination audio, modem, and telephony board that uses a new AT&T DSP chip for truly simultaneous audio, voice, and data functions. Creative Labs (800-988-5227) previewed an expansion board that lets you play 3DO software on a standard MPC Level 2 IBM-compatible PC. It should be available this

winter, though no price was announced.

Roland (213-685-5141) showed its Roland SoundCanvas DB (\$229), a wave-table MIDI daughterboard for Sound Blaster 16 sound cards; it offers a dedicated microprocessor for more expressive sounds. ALR (800-444-4ALR) showed a similar wave-table daughterboard, called the ALR Kurzweil Wave Express Module (\$399). It uses the Kurzweil chip set, which has the best MIDI piano I've heard. And Turtle Beach (800-645-5640) demonstrated the Turtle Beach Daytona (\$499). It's a high-end PCMCIA sound card that includes 16-bit audio, 128 wave-table General MIDI sounds, and the ability to sample WAV files and use them as MIDI instruments. □





MULTIMEDIA PC

By Scott A. May

For the first time in generations, something new and exciting has been added to students' typically boring back-to-school shopping lists: CD-ROMs. From preschoolers to postgraduates, today's multimedia educational software is changing the way we learn.

But is it truly a new way to learn? Or is it simply a new twist on old audiovisual teaching tools? Any way you look at it, there's no doubt that multimedia makes learning fun. Students love it because it lets them advance at their own pace. This new technology can also be a teacher's best friend, easing the load in overcrowded classrooms. Though never meant to be a surrogate parent or teacher—or a replacement for textbooks—multimedia software gives students dynamic one-on-one instruction that they might not otherwise get.

What follows is just a small sample of multimedia's growing number of educational titles. By combining traditional text with elements of sight and sound, these CD-ROM titles help make learning more fun and rewarding.

Early Explorations

Most people agree that the first few years of informal learning are crucial to a child's educational development. Little minds are like sponges, eager to absorb the sights and sounds of the world that surrounds them. Children respond immediately to cute and colorful characters, interacting in settings they can identify with. Once a personal connection is made, the door swings wide open to new worlds of learning.

Introduce preschoolers to

a miniature world of interactivity with four titles based on the work of renowned children's author Richard Scarry: *Busytown* (\$49.95) and *How Things Work in Busytown* (\$59.95) from Paramount Interactive (418-813-8055), and *Busiest Neighborhood Ever* (\$49.95) and *Best Neighborhood Ever* (\$49.95) from Activision (800-477-3650). *Busytown* is designed for children 3 to 7 and contains 12 discovery-oriented areas in a cartoonlike town. The program's 13 original songs are tied directly to the activities the children see on the screen. While *Busytown* teaches children how to perform individual tasks, *How Things Work in Busytown* shows them how to combine tasks to create a working community. Children learn to count, recognize words, and solve problems by participating in a variety of activities, including harvesting wheat and assembling machines.

In *Busiest Neighborhood Ever* and *Best Neighborhood Ever*, kids 3 and up are once again encouraged to discover the animated avenues of *Busytown*, where characters work and play in a flurry of friendly activity. Shops of all varieties open their doors for close, hands-on inspection: bakery, doctor's office, TV station, music store, produce market, art studio, and many more. Included here are memory exercises, music appreciation, problem solving and creative thinking, and simple math and geometry. Language comprehension and word recognition are also heavily stressed, using expressive verbal reinforcement. Just as important, the programs help kids grasp basic social concepts

and how people—or dogs, cats, and pigs, in this case—can live and work together as a community.

Learning to Read

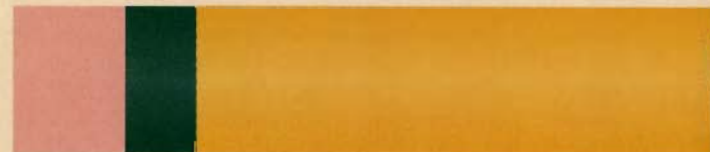
Simply put, learning to read with multimedia software is a match made in heaven. Expecting a child to launch into books on his or her own isn't fair, but let's face it—some families find it difficult to devote enough time to this extremely important stage of development. CD-ROMs, on the other hand, are tireless readers and thrive on the repetition kids need to learn word association, pronunciation, sentence structure, and story forms. Toss in colorful animation, speech, music, and sound, and you have the makings of some powerful teaching tools. The following are excellent examples of what educators call whole language learning.

Take a solid first step toward reading with *Sound It Out Land 1 and 2* (Conexus, 800-545-7677, \$49.95 each), a pair of early learning software titles for Windows, aimed at preschool- and kindergarten-aged children. With its carnival setting and

friendly cartoon characters, each program gently introduces kids to the basics of consonant, vowel, and whole word pronunciation. The first volume sticks to simple three-letter words, while the second tackles slightly more complicated four-letter words, with an emphasis on enunciation. Your tour guides in both titles are Vowel Owl, Singalong Sam, Reading Robot, and Tucan Read, who reinforce their lessons with songs and interactive games.

Who Wants Arthur? (Media Vision, 800-684-6699, \$39.95) is just one title in an extraordinary series of early learning software called Professor Gooseberry's I Can Read Club. Here, you'll meet Arthur, a lively but lonely little brown dog, who will try anything to find a loving home. Children navigate the story in one of four modes. Look and Listen reads the story out loud, without text or interactivity. Read with Me adds onscreen text and slows the narration, allowing kids to better follow the words, pronunciations, and story flow. Think About the Story presents an interactive exercise in word recognition, associa-

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tion, and meaning, as kids advance the story by filling in missing words. Finally, You Read lets you read alone, with optional spoken assistance for difficult words and phrases.

Another good example of whole language learning is *Sitting on the Farm* (Sanctuary Woods, 800-872-3518, \$59.95), a multicultural Windows product with your choice of English, French, or Spanish. Written by Bob King and illustrated by Bill Slavin, the whimsical short story tells about a little girl's picnic that's disrupted by a wacky parade of hungry farmyard animals. In addition to the standard Listen-Along and Read-Along play modes, the program offers something unique: Sing-Along, a mini karaoke-style feature that lets you record and play back your voice—using a microphone plugged into your sound card—accompanied by the audio-CD musical soundtrack. The program's most advanced section, Write-Along, lets kids modify key words of the existing story and then encourages them to create their own tales set in one of six exotic locations.

Perhaps the best-known collection of multimedia reading products is the outstanding Living Books series for Windows from Brøderbund/Living Books (800-521-6263). One of the top picks of the bunch is *The New Kid on the Block* (\$39.95), a sensational introduction to poetry, featuring the offbeat verse of Jack Prelutsky and delightful illustrations by James Stevenson. From leaking babies to dancing bananas, the disc's 18 poems will have you laughing so hard that you might not realize you're learning sophisticated word associations, rhyming patterns, and narrative structure. Other first-rate titles include *Just Grandma and Me* (\$39.95), based on Mercer Mayer's classic *Little Critter* books and featuring narration in English, Spanish, and Japanese; *Aesop's The Tortoise and the Hare* (\$39.95); and *Arthur's Teacher Trouble* (\$49.95) by Marc Brown.

Let your imagination run wild with *Wiggins in Storyland* (Media Vision, \$59.95), a creative writing tool for Windows that lets kids produce their own illustrated books. *Wiggins the Bookworm* guides

you through the step-by-step process of choosing animated backgrounds, characters, and props, each available in dozens of mix-and-match varieties. Once the setting is depicted on the right-hand page, the Word Duck offers suggestions for descriptive nouns, adjectives, and verbs to use in constructing your story on the left-hand page. Having trouble getting started? Writer's block is no problem in *Storyland*—just click on the Idea Light Bulb for help with opening sentences. There's even a recording studio where you can add personal narration to the story. Books can be printed in a variety of fonts, with the option of rendering pictures in high contrast to produce a coloring book. Expertly constructed, the program delivers an exciting hands-on, multimedia introduction to grammar, story structure, and creative thinking.

Discovering the World

It's a big world out there, filled with more interesting people, places, and things than most of us could fit into five lifetimes. When curiosity beckons, today's multimedia software answers the call, with dynamic presentations of sight, sound, and informative text. The following titles attempt to fully address a particular topic of interest and are suitable for middle-school-aged kids to adults.

Visit the world-famous San Diego Zoo with *The Animals* (Software Toolworks, 800-234-3088, \$59.95), a firsthand look at more than 300 exotic exhibits. The program's colorful 3-D overhead map makes park navigation a breeze, dividing species among their natural biocli-

matic zones, or biomes: tropical forests, deserts, grasslands, savannas, polar regions, islands, and more. Each biome contains dozens of exhibits, featuring photographs, authentic animal sounds, movies, and text. Just like the real San Diego Zoo, this disc is exceptionally well organized, encouraging both sequential tours and random information safaris. More than just a collection of animal pictures, the program strongly promotes global ecological responsibility.

In a similar vein, although slightly less ambitious, is *Mammals: A Multimedia Encyclopedia* (National Geographic Society, 800-368-2728, \$99). Choose your subjects by name or order from the mouse-driven menus. Each listing summons an animal fact sheet, with information on the animal's habits, population status, average size, average weight, and average lifespan, as well as the food it eats. The disc contains hundreds of lo-res photos, maps, animal sounds, and 45 full-motion video clips from National Geographic's TV specials.

Take a multimedia plunge into *Oceans Below* (Software Toolworks, \$49.95), a fascinating tour of our underwater world. Visit key coastal areas around the globe—from the Fiji Islands to the Red Sea—in search of exotic fish, mammals, and plant life. Keep your eyes peeled for shipwrecks and buried treasure, too. The MPC presentation is breathtaking, featuring hundreds of video clips (ingeniously framed by a diver's mask), colorful photos, and informative narration.

Turn your CD-ROM drive into a time machine with

SCHOOL

MULTIMEDIA



MULTIMEDIA PC

Microsoft Dinosaurs (Microsoft, 800-426-9400, \$64.95) and Prehistoria (Grolier Electronic Publishing, 800-285-4534, \$69.95), two equally stunning multimedia expeditions for Windows. Both titles offer detailed descriptions and beautifully drawn illustrations of hundreds of prehistoric creatures, sorted into 11 time periods and seven species—and cross-referenced. Tongued by those colossal creature names? Both programs feature onscreen audio prompts to let you hear each name clearly pronounced. Dinosaurs offers narrated guided tours but encourages spontaneous browsing via “hot” words and phrases that provide links to related topics. Grolier’s effort is far more academic and perhaps more useful as a reference source. Both allow you to copy text and dinosaur pictures to the Clipboard or save them to disk. Though Microsoft boasts the better audio and video quality, Grolier is the hands-down multimedia winner, with more than 60 minutes of fascinating videos and animations, many hosted by renowned paleontologists.

From weird to wonderful, Science Adventure II (Knowledge Adventure, 800-542-4240, \$79.95) offers a nearly perfect example of edutainment. Coauthored by the late Isaac Asimov, this is easily the publisher’s best title to date—a mind-expanding tour de force of science fact and fiction, augmented with superb narration, video clips, and cutting-edge graphic animation. Designed as a virtual-reality science laboratory, the program includes Dr. Zoom’s Jail of Bogus Science, a multimedia micro-

scope, a science theater, and numerous interactive experiments. Beyond the program’s inherent educational qualities, its greatest success is its ability to spark imagination and encourage further exploration of its diverse subject matter.

Picture Atlas of the World (National Geographic Society, \$99) is your passport to a multimedia journey around the globe. As you’d expect

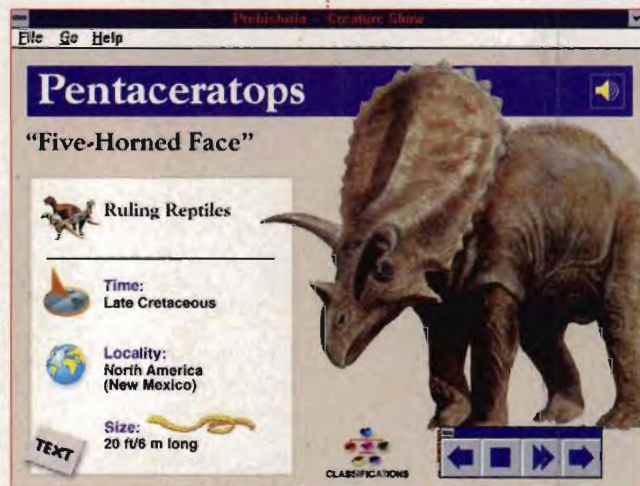
ers can’t appreciate what they don’t understand, music scholar Robert Winter hosts an interactive journey through the life of Austrian composer Wolfgang Amadeus Mozart, using his String Quartet in C Major as the musical centerpiece. The product is informative and surprisingly entertaining, successfully conveying the passion of the man and his music.

electronic publications that archive three months of *Newsweek* magazine—12 issues—with full text and topic search functions. This DOS-based program utilizes Super VGA graphics to create a stunning multimedia presentation, including more than four hours of radio interviews, videos, and even commercials. It’s all extremely well designed and perfect for classroom instruction. Multimedia features in the first issues include *Unfinished Business*, a lively discussion of worldwide ecological problems and solutions; *Globocop*, an interactive look at America’s latest role as global peacekeeper; *Behind the Screens*, the art of Hollywood special effects; and *What Ails Us*, an in-depth look at the current healthcare debate.

Preparing for College

When CD-ROM technology emerged, one of its top selling points was its potential for interactive, multimedia reference guides. With data storage exceeding 600MB per disc, we imagined how smart we’d become, with volumes of sights, sounds, and text at our command! Guess what? This vision not only has come true but, in many cases, has exceeded our wildest dreams. Combined with Windows’ multitasking and data-sharing capabilities, the following MPC titles are invaluable tools for research and reference.

Leading the pack, in terms of sheer quality of presentation, is Microsoft Encarta (Microsoft, \$99), a multimedia encyclopedia bursting with style and vitality. Based on the Funk & Wagnalls 29-volume reference library, the package dazzles the senses



Learn about ancient creatures with Grolier's Prehistoria.

from its source, this DOS-based title is packed with over 1200 expressive photographs, along with more than 800 interactive maps, ethnic music, and speech samples of more than 100 languages. Ideal for social studies, the disc presents updated statistics for each nation’s population, economy, religions, climates, industries, and more.

Experience “the most sublime form of communication” with Multimedia Mozart: The Dissonant Quartet (Microsoft, \$64.95), the third offering in a series that takes you behind the scenes of the world’s most timeless music. Working from the theory that modern listen-

Passion and whimsy of a different sort come alive in Twain’s World (Bureau of Electronic Publishing, 201-808-2700, \$39.95), a celebration and study of American author and humorist Samuel Clemens. Included here are the complete works of Twain, both fiction and nonfiction, as well as various biographical pieces describing his life and inspirations. You’ll also see rare film clips of the author, narrated passages from famous books, and a slide show of his colorful characters.

To gain sharper focus on more current events, turn to *Newsweek Interactive* (Software Toolworks, \$29.95 each), an ongoing series of

**Award of Merit Winner
NewMedia INVISION
1994 Multimedia Awards**



**Award Winner
Game Bytes Magazine**

Jutland

Ships of Steel, Men of Iron

"Jutland provides an object lesson in what CD ROM sims can achieve."

- PC Entertainment

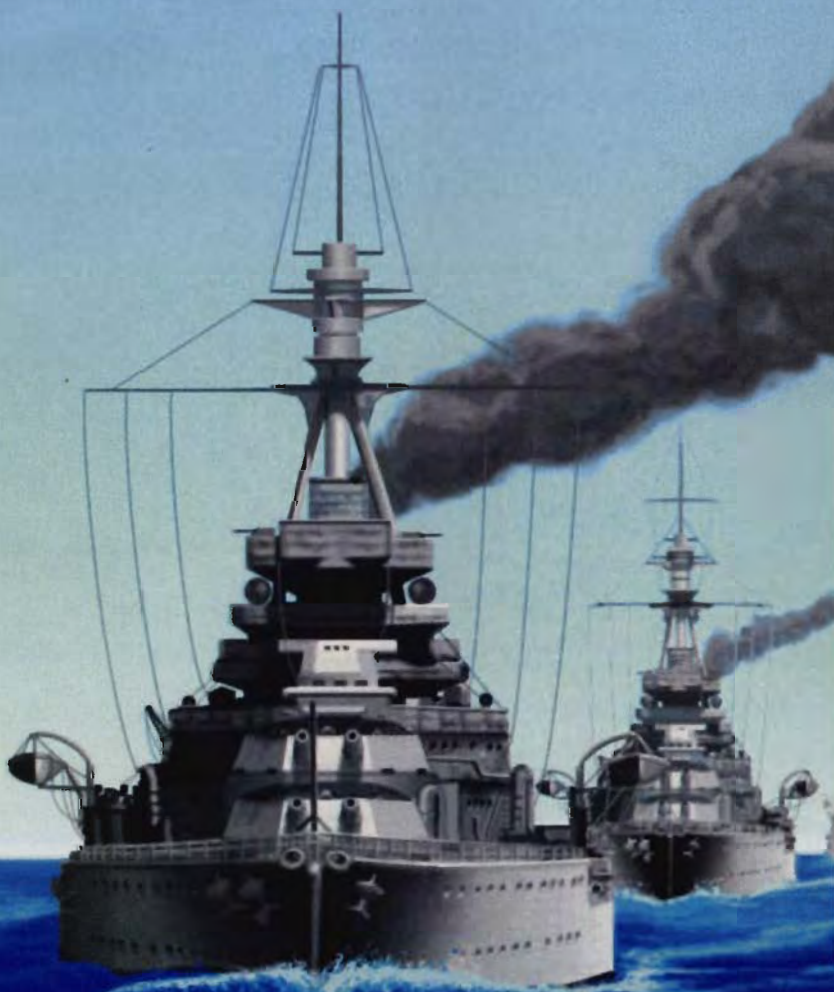
"Jutland is an impressive game. . . . another of my top ten games of the year!"

- Computer Game Review

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MULTIMEDIA PC

with more than eight hours of 16-bit sound, hundreds of film clips and animations, nearly 8000 Super VGA photographs and illustrations, charts, a dictionary, a thesaurus, an atlas, time lines, and full-length updated articles. Almost any text or graphics can be printed or copied to another Windows application. Multiple search engines let you pinpoint articles or topic groups in a flash. The program encourages thoughtful browsing, however, with a branching display structure that caters to our natural curiosity.

Another solid choice for college-bound students is Compton's Interactive Encyclopedia (Compton's New Media, 800-216-6116, \$149). Like the previous title, Compton's product makes outstanding use of multimedia bells and whistles, featuring hundreds of high-quality video clips, animations, sound files, and slide shows. Based on the publisher's own 26-volume hardcover encyclopedia, the CD-ROM boasts several innovations unique to the genre, including Info Pilot, a sensational topic search function that automatically finds three levels of information subsets for each primary topic. Another terrific feature is Virtual Workspace, which, depending on your computer's available memory, can simulate a desktop area a few dozen feet square—like spreading a stack of open books on a large library table. Also included are a world atlas, graphic time line, dictionary, and thesaurus, all integrated with hypertext jumps, intelligent searching, and full Clipboard support for outside applications.

A third comprehensive reference source is New Grolier Multimedia Encyclopedia (Grolier Electronic Publishing, \$395). Though it lacks the visual panache of its peers, the program earns high marks for blazing speed and depth of information. The bulk of the material here—based on the publisher's 21-volume *Academic American Encyclopedia*—unfolds as a series of cascading text windows and deeply nested topic trees. As a source for encyclopedic research, this product may be the most academically pure, with full print and Clipboard support for external applications. Beneath its rather austere facade, however, lurk some surprising multimedia gems, such as the full-length Knowledge Explorer audiovisual essays and animated Multimedia Maps, as well as hundreds of video clips and sound files.



Media Vision's *Who Wants Arthur?*

If any title merits must-have status for college-bound students, it's Microsoft Bookshelf '94 (Microsoft, \$99), the ultimate multimedia reference collection. Just a listing of its seven integrated works—all recently updated—is enough to sell this impressive package: *Roget's Thesaurus*, *American Heritage Dictionary*, *The Concise Columbia Encyclopedia*, *Hammond Intermediate World Atlas*, *The Columbia Dictionary of Quotations*, *The*

People's Chronology, and *The World Almanac and Book of Facts*. Bookshelf functions great as a stand-alone reference library or integrates seamlessly within almost any Windows application. Multivolume searches are extremely fast, with full Clipboard support for both text and pictures. Multimedia features include more than 80,000 spoken pronunciations, dozens of audio clips, national anthems, animations, and full-motion video. An invaluable tool—and quite a bargain. It just doesn't get much better than this.

Turn your PC into an instant literary archive with Library of the Future, Third Edition (World Library, 800-443-0238, \$149.95), featuring unabridged text from over 1750 titles. A showcase for CD-ROM's incredible storage capacity and database functions, this latest edition features the complete works of Aesop, Hans Christian Andersen, Aristotle, William Cullen Bryant, Lewis Carroll, Arthur Conan Doyle, the Brothers Grimm, John Keats, Rudyard Kipling, Edgar Allan Poe, William Shakespeare, Oscar Wilde, and dozens more. Despite its size, the CD-ROM performs speedy searches using as many as eight different criteria. Text can be read onscreen, printed, or copied to other applications. New to the Third Edition are movie clips based on literary classics.

If you love books, you'll also enjoy reading between the lines with Monarch Notes for Windows (Bureau of Electronic Publishing, \$79.95), a multimedia study guide to the works of 226 famous authors. Included are critical essays, detailed biographies,

notable excerpts, synopses, and bibliographies. Multimedia embellishments include hundreds of narrated passages, author photographs, and some of the best-quality video clips of any product mentioned here.



Monarch Notes for Windows

Whether you're out to write a best-selling novel or simply your next term paper, good typing skills are essential. Learn from an expert with Mavis Beacon Teaches Typing (Software Toolworks, \$59.95), a celebrated computer tutorial available in an MPC version. Once you determine your goals and set your pace, follow Mavis's suggested lesson plan to develop speed and accuracy. The program automatically generates bar charts to track your progress and pinpoint weak areas needing more practice. Appealing to all age groups and abilities, this program is essential for students preparing for college, as well as for anyone needing an edge in the competitive job market.

Earning Your Diploma

As you can see from the variety and depth of these titles, educational and reference CD-ROMs can be an excellent supplement to a formal education—beginning with preschool and kindergarten and continuing all the way through college and post-doctoral studies. □

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NEW MULTIMEDIA PRODUCTS

EDITED BY POLLY CILLPAM

Kids Go Multimedia

Here's a product that lets you create published documents and multimedia presentations using video, photos, sound effects, music, and printed elements. Intended for students ages 10 and up, The Multimedia Workshop has

presented on a computer or exported to videotape. It can also be used to produce desktop-published newsletters, fliers, greeting cards, illustrated reports, and magazines. For example, students could create a video year-book combining school



Create your own multimedia with Davidson's Multimedia Workshop.

three integrated components: The Writing Workshop, The Video Workshop, and The Paint Workshop. It also lets you create five libraries of sounds or images with categories such as history, the family, holidays, food, animals, around the world, and sports.

"The Multimedia Workshop follows The Cruncher in Davidson's line of 'Power Tools.' These tools are designed to empower students to think, analyze, and communicate," says Jan Davidson, president and founder of Davidson & Associates. Its goal is to build writing, creativity, planning, and communication skills.

The program can be used to create video book reports and photo essays, where the photos, video clips, sound, music, and narration can be

events, a theme song created by the music department, narration by faculty and students, and title slides and illustrations from the art department. Similarly, you could use the program to chronicle a field trip, create a family-history year in review, or prepare a birthday greeting.

Davidson & Associates
(310) 793-0600
\$79.95

Circle Reader Service Number 530

The Thrill of Victory

Talk about instant replay. Now you can view 1993 sports events again and again. Sports Illustrated 1994 Multimedia Sports Almanac is the first multisport CD-ROM with 40 minutes of entertaining highlights and an entire year of *Sports Illustrated* magazine.

View highlights from the Super Bowl, World Series, NBA finals, and NCAA Final Four. In addition, there's a sports almanac with more than 1200 pages of team and individual records, statistics, and trivia, as well as over 450 color photos from *Sports Illustrated* photographers.

You'll see Michael Jordan lead the Chicago Bulls to their third world championship, as well as the personal triumph of New York Jets player Dennis Byrd as he walks back onto the gridiron after having been paralyzed ten months earlier. You can also test your knowledge of sports with a sports trivia game.

StarPress Multimedia
(415) 274-8383
\$59.95

Circle Reader Service Number 531

and stimulate discussion about the MPC platform.

One of the key features found in this forum is Multimedia PC Titles Catalog. It offers descriptions and screen shots of more than 150 MPC titles and includes audio and video demos of many of them. The forum also offers information about the MPC Level 1 and 2 specifications, Council and MPC licensee news, and product announcements. Plus, it provides bulletin boards that you can use to post technical questions, offer comments about MPC issues, and make suggestions about the future of the MPC specification.

Multimedia PC Marketing Council
(202) 331-0494

Circle Reader Service Number 532

Multimedia on America Online

MPC Headquarters is one of the newest electronic forums on America Online. Sponsored by the Multimedia PC Marketing Council, it's designed to answer questions

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Listen up, radio fans. Now you can use your computer screen to tune in your favorite songs. With RadioActive, you can listen to your favorite radio station while working on your PC.



Sports Illustrated 1994 Multimedia Sports Almanac.

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NEW MULTIMEDIA PRODUCTS

Through an easy-to-use graphical interface, this product features point-and-click



Transform your PC into a radio.

control for all functions, such as volume control, manual or autotune, the ability to store as many as 100 radio stations and display each station's name and frequency, eight preset station buttons for your favorite radio stations, a mute function, clock or frequency display, and a fine-tune adjustment.

RadioActive's scheduling function can be programmed to turn on and tune in to your favorite station at a certain time, and when the window is minimized, the icon displays the radio station that's currently being played.

The product consists of a half-size internal circuit card, which fits into any available slot in a PC. The software interface provides all of the user controls and radio features. RadioActive won't interfere with other applications or slow down your system.

Novex Technologies
(918) 459-8001
\$49.95

Circle Reader Service Number 533

That's Entertainment

Now you can follow the cartoon adventures of Bugs Bunny, Popeye, and Porky

Pig from your desktop. QuickToons II: What's Up, Disc? from Wayzata Technology brings a compilation of classic cartoons to your PC. It contains six digitized cartoons, complete with audio, for a total of 74 minutes of film.

Included on the disc are Falling Hare, The Case of the Missing Hare, Parlez Vous Woo, Cooking with Gags, Toyland Caper, and Who's Who at the Zoo. Pull up your ergonomic chair and travel back to yesteryear!

Another product from Wayzata Technology, Sound Library Pro, is a compilation of more than 1200 digitally recorded sounds, featuring a vast array of media effects. Navigate your way through a myriad of high-quality digitally recorded sounds that are easy to copy and copyright-friendly.

The disc features six main sound categories (animals, household, instruments, nature, special effects, and voice) and over 30 subcategories with 300 megabytes of sound. It can enhance your desktop presentations, or you can use it to create a more enjoyable Windows audio environment.

A third product from Wayzata Technology brings you the latest in computer animation. Tony Quinn's Virtual Worlds is a journey to the limits of computer animation. It contains full-screen animations in 2-bit, 4-bit, 8-bit, and 24-bit color versions that are designed to push the limits of your desktop.

This CD-ROM has an easy-to-use interface which connects you to hundreds of digitally created color illustrations and animated sequences. While traveling through Virtual Worlds, you

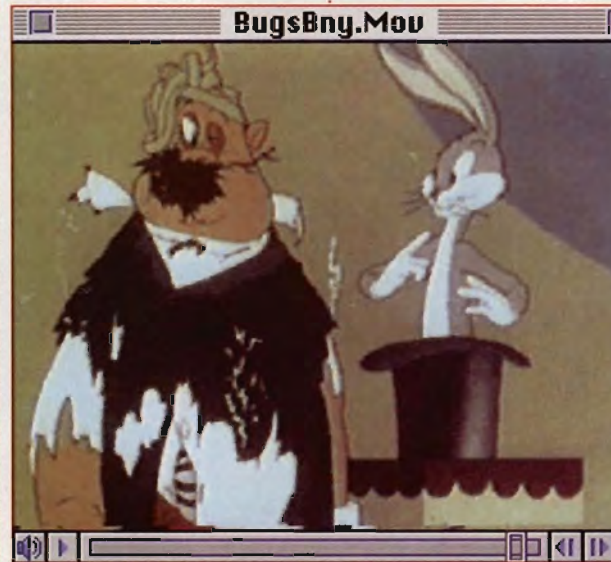
can view three-dimensional images, fly through virtual landscapes, visit the robot planet, and experience the limits in computer animation.

Wayzata Technology
(218) 326-0597
\$25 each

Circle Reader Service Number 534

Although the booklet written on a technical level that should be easily understandable for those new to CD-ROM and multimedia, there are also revealing insights for even the most technically sophisticated readers.

"Too many people think



Watch cartoons on your PC with QuickToons II: What's up D

Free Advice

Everything you always wanted to know about buying a CD-ROM drive—but were afraid to ask—is now answered with a free booklet called *15 Questions to Ask Before Purchasing a CD-ROM Drive*. It's designed to give you an objective guide through the myriad of choices you face as a buyer.

The booklet provides a detailed discussion of questions that CD-ROM drive shoppers need to ask, including the following: Does the drive use a SCSI or proprietary interface board? What's the data transfer rate of the drive? Does the drive use a tray or caddy mechanism?

a CD-ROM drive as a general item. But with single-speed, double-speed, triple-speed, and soon quad-speed drives on the market, nothing could be further from the truth. Throw in the need to consider standards such as MPIO, SCSI-2, Photo CD, and more, and you're left with a situation where consumers could easily become confused. Don't wind up buying the wrong drive for all the wrong reasons," says Plextor's vice president, Robert Tatar.

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MULTIMEDIA SPOTLIGHT

By Denny Atkin

PENTHOUSE INTERACTIVE: VIRTUAL PHOTO SHOOT

Like the VCR before it, the CD-ROM drive got an initial sales boost through the availability of a wide variety of adult-oriented titles. Also like the VCR, most of these titles consist of poor-quality, inexpensively produced material shoveled onto the new format. In the case of CD-ROM, that generally means megabytes of GIF pictures copied wholesale onto a disc or adult films digitized into tiny AVI files. Even so-called interactive titles have often been little more than movie clips that let you choose which part of the film to view next.

This isn't all the fault of the CD-ROM producers—the linear nature of digital video and slow CD-ROM access limit the amount of traditional interactivity. While other titles give in to these limitations or awkwardly try to work around them, Penthouse Interactive: Virtual Photo Shoot simply takes advantage of the nature of CD-ROM movies and creates a new type of interaction.

You take on the role of a photographer for *Penthouse*, the well-known men's magazine from COMPUTE's parent company, General Media. Your assignment is to photograph three beautiful *Penthouse* models for *Penthouse* publisher Bob Guccione. After you've shot and edited your photo portfolio, Guccione himself appears onscreen and rates your photographic prowess.

You first decide which *Penthouse* Pet to photograph. This first disc

includes digital video of three Pets: amber-haired Dominique St. Croix, brunette 1993 Pet of the Year Julie Strain, and blond January 1993 Pet of the Month Natalie Lennox. Clicking on a Pet's name brings up a short video introduction. Once you select a model, you're ready to begin the photo shoot.

The well-designed interface sports a quarter-screen "video display" window in the center, with a VCR-style

control panel below and a series of thumbnail images on each side. These thumbnails are used to direct the model—you choose actions such as Tilt Head, Lick Lips, or Head Poses, as well as more adult actions such as Gyrate, Show Behind, and others I probably shouldn't go into here. (The poses and angles are definitely of an adult nature but, like the magazine, lean much more toward the sensual than the anatomical.) There are more than 110 video clips—more than 90 minutes in all.

Clicking on a thumbnail starts a video sequence. As the model goes through her poses, you click on the camera icon in the center of the control panel to take your photos. Each photo is transferred to a filmstrip for later editing. Many of the video sequences offer two camera angles which you can jump between by clicking on the A and B buttons.

At any point you can click on the filmstrip icon to view and edit your photographs. You can view them in sequence as a slide

ing forward to seeing more from you." But if you've only taken a few pictures or if you concentrated too much on a single type of pose, you're more likely to hear "Nice try, but I wouldn't quit your day job if I were you."

There's even a little humor thrown in: If you wait too long without doing anything, a Pet will pop up and make a comment such as "What do I look like, a screen saver?" Or Guccione might appear and say, "It's a good thing we're not paying you by the hour."

The quality of the video clips in *Penthouse Interactive* is equal to the best I've seen in an MPC title. The QuickTime videos look good on 256-color SVGA screens and fantastic on 15-bit, 32,768-color screens. Video playback from a double-speed CD-ROM is a smooth 15 fps, even in HiColor mode (although the title will work on a single-speed drive, a double-speed one is recommended). The models were filmed against black backdrops, so the screen doesn't jump when the camera pans. Each video clip has a rocking background soundtrack.

Of course, the images of Dominique settling onto a brass bed, Julie lying seductively across a chair, or the perfectly toned, beautifully muscular Natalie working out on gym equipment are likely to distract you from such mundane matters as frame rates and audio quality anyway.

Penthouse Video
(800) 466-9435
\$99.95

Circle Reader Service Number 550



Test your photographic skills with *Penthouse Interactive*.

control panel below and a series of thumbnail images on each side. These thumbnails are used to direct the model—you choose actions such as Tilt Head, Lick Lips, or Head Poses, as well as more adult actions such as Gyrate, Show Behind, and others I probably shouldn't go into here. (The poses and angles are definitely of an adult nature but, like the magazine, lean much more toward the sensual than the anatomical.) There are more than 110 video clips—more than 90 minutes in all.

Clicking on a thumbnail starts a video sequence. As

show or pull up thumbnail filmstrips to select individual photos. Save photos as bitmap images, delete them, or tweak them by pulling up the original video and moving through it frame by frame until you get exactly the pose you're looking for.

After you view the final pose session for a model or click on the Quit button, Bob Guccione appears in the video display window and rates your work. If you have a good selection of poses, you'll get a comment like "Hmm. You obviously know what makes a good *Penthouse* layout. I'm look-

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PRODUCTIVITY CHOICE

This contact manager renders tattered appointment books and piles of collected business cards obsolete, making you a more efficient and conscientious businessperson.

Richard O. Mann

ACT! 2.0 FOR WINDOWS

If your business day includes telephone calls, meetings, or other people-intensive interactions, you're a natural prospect for a contact manager program. With a good contact manager, you take a quantum leap in effectiveness as you dump your ragged pile of old business cards, your appointment book, and your briefcase full of odd notes on napkins and backs of envelopes. Your memory suddenly seems improved, and your ability to follow up on commitments you've made and those made to you is limited only by your time. All you need is a computer and a good contact manager.

Symantec's Act! 2.0 for Windows could well be the contact manager of your dreams. The newest release in an honored family of best-selling Act! programs, Act! 2.0 for Windows deserves respect. It combines a friendly ease of use, a common-sense approach, and powerful customizable features into a program you'll be itching to use.

Although you'll probably want to customize Act!'s database, it's usable right out of the box. For each contact, the program displays two full screens of data; you toggle between them with the F6 key or a clickable icon. You get 76 fields, 11 of which are system monitored, such as the date of last contact, edit, and merge. The standard fields in the default database include company name, contact name, address fields, three phone numbers, title, assistant's name, E-mail address, and a variety of other fairly



standard items, including 15 user-definable fields. Date, time, and descriptions of the first of your meetings, scheduled calls, and to-dos for each contact also appear.

So far, Act! sounds like a big address book. There are three hidden data sets for each contact, however, that transform it from an address book into a serious contact manager. First and foremost is the note field. Press F9 or click on the notepad icon to bring up a half-screen window already marked with the current date, ready to accept whatever notes you enter. New notes appear at the top of the window; saved ones proceed down the screen in reverse chronological order. The note window is essentially a linked word-processing document that you can search, print, or use however you want; there are no length limits.

Second is the related task list. For any contact, you can enter single-line tasks as calls, meetings, or to-do

items. Assign dates, times, and priorities to these tasks; Act! alerts you when the appointed time arrives. Review your open tasks by contact or by day, week, or month. This replaces your appointment book and ties each task to a single contact whose information will be immediately at hand when the computer reminds you of the task.

As you mark these tasks done (or not done), they go into the third data set—a history file—along with any directly entered calls, meetings, or to-dos. A quick click displays the history for each contact—handy for those many events that don't call for a longer text entry in the note window.

Chances are you'll want to change some of the fields and the screen layout. Changing a field name and type (text, phone number, numerical, date, and so on) is a snap, making it simple for you to build the exact database you need. There's a drawback, though: You aren't really changing the database; the

program retains the original field names and merely displays your aliases on screens and reports. If you want to query by field or design a report, you must know the original name of that field. Thus, if you declare field USER-1 to be BIRTHDAY, your queries to find all birthdays in July will have to refer to USER-1. You'll probably want to keep a chart of field names to track this.

Act!'s interface is standard Windows, but it lacks many of the newer features found in the latest high-end programs, such as right-button clicks for speed menus and displayed function descriptions as the cursor passes over icons. The icon bar across the top of the screen has a good selection of the most commonly used functions and has room for a half-dozen custom icons.

In an era when many mainline Windows applications balk at anything under 8MB of memory, it's refreshing that Act! 2.0 is zippy with only 4MB. Version 2.0 also vastly improves the printing capabilities, adding a suite of day, week, and month calendar reports that challenge those of dedicated time managers. They print in all the standard day-planner book sizes. And Act! automatically rolls over uncompleted tasks each day.

Act!'s time management features don't rival those of full-scale personal information managers (PIMs), but the program is quite effective for persons whose tasks are primarily time related. It's less effective if your day includes prioritizing long lists of tasks that you can do in any order.

Included in Act! is an uninspired but serviceable word processor for writing letters,

and other documents that automatically grab the contact data from the database. Mail-merge operations are easy to set up and use.

If you have the fax software WinFax Pro, you don't even have to exit Act! to use it. Also, you can create a template form letter for the fax and mail-merge a broadcast fax to multiple recipients automatically.

Act!'s database is a DBF file in standard dBASE IV format, making it easy to access from other programs. The files grow large rather quickly; my 285-name database occupies over 2MB of hard disk space.

Although file size complicates matters slightly, it's fairly easy to use Act! on a desktop computer and a laptop simultaneously. You can either copy the entire database between machines (if only one set of files has changes) or merge the two databases. The intelligent merge compares two databases and adds only the new data to the existing database.

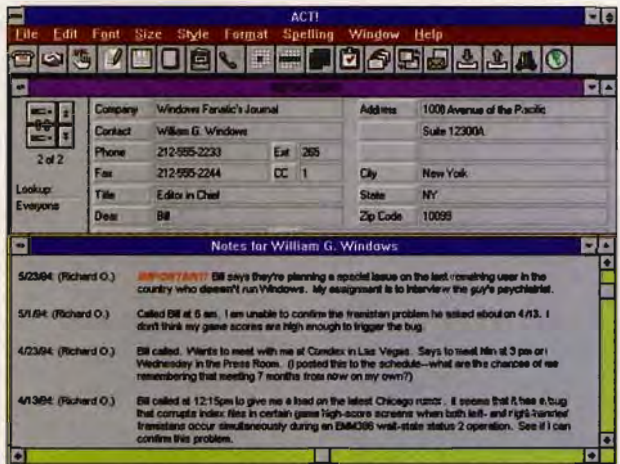
Version 1.1 users may wonder if 2.0 offers enough new features to merit the cost and trouble of upgrading. The primary improvements lie in networking ability, E-mail enhancements, and reporting. Version 2.0 is network ready. E-mail enhancements allow you to send and receive E-mail messages directly from Act! through Lotus cc:Mail, Microsoft Mail, and CompuServe (although CompuServe users report difficulty in getting the connection to work without tech support's help).

But there are even more reasons to upgrade. About half the items on my version 1.1 wish list are in 2.0, along with several other small (but wel-

come) improvements. For instance, in 1.1 the alphabetical lookup Window takes you to the nearest contact to a letter you type—but only one letter. Version 2.0 tries to match whatever you type.

Unfortunately, the new version brings its own new frustrations. For example, the automatically supplied date in the note window also adds your user name on every note en-

IBM PC or compatible (80386 compatible), 4MB RAM, hard disk with 5MB free, Windows 3.1 or higher—\$279.95



try, which is fine for a network installation but incredibly wasteful for a stand-alone version. There's no way to turn off the feature. Similar glitches mar an otherwise admirable program.

Act! is simply much more than the sum of its parts. As soon as you see it, you'll see how useful it can be. The pop-up note window gives you all the flexibility you need to record lengthy text information or short notes. You'll find the program comfortable and responsive. Unless your contact management needs go beyond the norm, Act! 2.0 for Windows makes capturing and using your contact information pleasant—even exciting. □

**SYMANTEC
10201 Torre Ave.
Cupertino, CA
95014
(800) 441-7234**

Circle Reader Service Number 391

Robert Bixby

FAX AND FIGURES

Sending a fax may not be the first thing that comes to mind when you hear the words *online communications*, but it ought to be. It represents the bulk of nonvoice interpersonal communication by wire.

Many people think of faxing as a means of rapidly transmitting text information over the telephone. If it were as simple as that, faxing would be a lot faster and more economical. But the fact is that faxes are entirely graphical in nature. Basically, a fax machine scans a sheet of paper at 100 or 200 dpi, compresses the monochrome graphical data, and sends it to a remote machine where a printer mechanism uses electrical impulses to turn dots on treated paper black so that that paper represents a facsimile of the original—*facsimile* being the root of the word *fax*.

Canon and Ricoh now have inkjet fax machines, and some companies (notably Okidata with its DOC-IT) now have laser fax machines capable of transmitting and receiving faxes at up to 400 dpi. But no matter how clear the fax is, it is always graphical.

Graphics files have several drawbacks. They take up a lot of space on your hard disk, and you can't simply cut and paste text out of them for use in other documents. A great many fax software companies have hitched up with OCR companies to make products that read faxes as they come in, turning them into ASCII text files to save disk space and to provide for easy editing. For example, Eclipse Fax with OCR is available for a list price of \$84.95. Eclipse is now a part of Phoenix Technologies (846 University Avenue, Norwood, Massachusetts 02062; 617-551-4000).

Another problem with fax-

ing is that it ties you to a location. Generally, fax machines are huge, bulky objects that require line current to operate and a telephone connection to communicate. Wouldn't it be great to have the ability to fax while on the move? Dead time spent riding in taxis or waiting for planes could be used for issuing communiqués to coconspirators around the globe.

Laptops now come with tiny fax modems. A hookup is even available for sending faxes over pay telephones (by sending audio signals through the handset). But why should you put up with being wired to a grid? That was the question that launched a thousand communicators.

Remember the recent excitement about hand-held communicators? One by one the major computer and software players trotted out their exciting new technologies, only to be repulsed by a cosmic yawn. Who could have guessed that people would prefer a keyboard on the desktop to a pen on the palmtop?

One of the main problems—or at least the most broadly reported problem—with palmtops is that handwriting recognition is still in its infancy. But the most important problem is much more basic than this. Although the machines were initially sold as pocket communicators, they generally don't communicate at all. Some require additional purchase of very expensive proprietary hardware to allow them to communicate, and others are shipped with no more than a promise that someday they'll be able to communicate. Only at their own peril do companies bet on consumers' ability to defer gratification.

Undeterred by the failures of other companies, Motorola has introduced an interesting product called the Envoy. Motorola is about the oldest

name there is in telecommunications, and true to its history, the company has brought out a product built around communications rather than having communications added on. Using the ARDIS wireless communications network (available in 400 U.S. cities), Envoy can send and receive E-mail or faxes from any location. If you and a companion both own Envoys, you can also exchange data between them over an infrared communications link.

RadioMail, one of the ARDIS-connected services available to Envoy users, provides Internet as well as commercial E-mail access. You can also make use of the Official Airline Guides service. Envoy comes with a built-in spreadsheet that's 1-2-3 and Excel compatible, and it may have a Quicken-related product, though that is still under discussion as this piece goes to press.

For more information, contact Motorola Wireless Data Group, 1201 East Wiley Road, Suite 103, Schaumburg, Illinois 60173; (800) 535-5775.

One area of online communications that doesn't get a lot of press is fax back or fax on demand. If you need to get a lot of information out in a hurry, fax on demand is the way to do it. The system works like this. You publish a fax-on-demand number for potential customers to call. When they call that number, they are asked what information they need and what fax number to send it to. As soon as the customer hangs up, the information is faxed. This service would allow a person to distribute routine or rapidly changing information without tying up a human operator. If you're interested in learning more about the technology and the technique, contact Fax on Demand, 15101 Surveyor Boulevard, Addison, Texas 75244; (800) 329-1777. □

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DISCOVERY CHOICE

Banging drums, designing birds, and building with moving blocks, kids develop thinking skills as their imaginations run wild.

Peter Scisco

THINKIN' THINGS

It's amazing the things kids think about. That's why you won't find a more aptly named software program for kids than Thinkin' Things by Edmark. This collection of six learning activities offers over a half-dozen things for children to think about. Each section of the program exercises young minds with ideas ranging from making music to crafting comparisons.

Take the Fripple Shop, for example: Orders stream in by phone and fax; the inventory bounces and hops. Sound like a retail nightmare? Maybe, but it's a heck of a lot of fun, especially when you're selling fat little purple-spotted creatures with straight hair and little eyes.

Each time a customer places an order, kids must distinguish among the many different Fripples in stock. But this is more than just visual identification. Kids also get a basic lesson in logic, since Thinkin' Things employs the words *and*, *not*, and *or*, terms that adults familiar with computerized databases might recognize from Boolean logic. Used during information searches, these terms enable us to expand or narrow choices by grouping the information pool in different ways.

It's the same with kids selecting Fripples. They soon learn the difference between a Fripple that has "spots and big eyes" from one that has "spots and big eyes but not curly hair." All of the instructions and requests in the Fripple Shop are spoken; some of them are accompanied by visual cues. As kids become more proficient in their logical thinking, the program poses

more difficult choices. Parents can also adjust the skill level manually from the game's Adult section.

When they get tired of minding the store, kids can jump into the jam with a funky monkey (ape, actually) or a yammering bird called Toony Loon. The ape's name is Oranga Banga, and he's a wild-haired drumming demon. During their play, kids create auditory patterns by clicking the mouse on Oranga's percussion instruments. They can tap the snare drum, stomp the bass drum, or play a cymbal, chimes, a cowbell, or a gong. By selecting the create button, children are free to develop their own patterns. After they've finished, they select the play button, and Oranga Banga beats out the rhythm they've built.

The Question & Answer activity flips the action by asking kids to repeat a pattern after Oranga plays it. As kids get better at remembering and repeating the pattern, which requires them to distinguish

among the different sounds that the instruments make, the patterns get longer and more sophisticated. The ultimate challenge comes when kids turn off the lights and listen to Oranga play in the dark. With only the sound of the instruments (and Oranga's eyes) as a guide, kids must remember the pattern and play it back (the lights come back on at this point).

Playing with Toony Loon is similar, but pitch is added as part of the musical pattern. This crazy bird plays a xylophone, but kids can choose what the keys are made of: standard metal bars, glasses, rubber bands, or hollow wooden cylinders. Each material makes a different sound, but all are arranged in a scale. With a little practice, kids can create their own tunes. Like Oranga Banga, old Toony Loon will play a sequence of notes and ask the player to repeat them. Alternatively, kids can make up their own sequence of sounds and ask their funny feathered friend to



play it back to them.

Speaking of feathered friends, that's the name of a fourth Thinkin' Things activity. During this game, kids run a baby bird factory. Feathered Friends is in some ways an extension of the Fripplle Shop. While playing in the create mode, kids can build any kind of baby bird they want by selecting a body color and pattern, a hat, and a shoe. If they like, they can match the bird that appears on the factory floor, or they can create a totally different bird.

The Question & Answer activity poses a more difficult problem. While playing this part of the game, kids must identify a pattern and then create the bird that fits it. For example, the conveyor belt may contain baby birds: a blue one, followed by a green one, followed by a blue one. When asked to create a bird that fits the pattern, kids must build a green baby bird. All of the bird building and design takes place by selecting buttons, which activate different parts of the factory and finally deliver the baby bird from an egg laid by a robot chicken. I'll bet Colonel Sanders never did it this way.

To finish the day, kids can create animated scenes with the program's two design modules. They're easy to use (just drag shapes onto the drawing board and then set them in motion with the press of a button). Designs can be built as spheres or as two-dimensional shapes.

Flying Spheres is designed to enhance perception skills, particularly when it comes to spatial relations. Parents really have to see this part of the game in action to appreciate its fantastic images. Children

explore the illusion of depth as spheres grow larger and smaller on the screen, passing over backgrounds of different colors.

Starting a moving sphere sculpture is as simple as dragging a sphere to the background screen and then setting it in motion with the mouse. Musical accompaniment encourages children to develop creative skills as they build kinetic displays which reflect the mood of the background music. They also get to experiment with motion and speed as they set spheres flying in all directions. An added plus: The background screen can be enlarged to cover the entire screen, allowing kids to exhibit their creations without the design toolbox interfering with the visual display.

Flying Shapes is similar, so kids will be able to move back and forth between it and the Flying Spheres activity without having to learn more about working the program. This activity sounds simple—the child drags a shape onto the design board and then sets it into motion—but these simple tools allow for very sophisticated and imaginative games.

For example: Using certain shapes, kids can create a rocket ship that moves from the bottom to the top of the screen. They might create a car, complete with spinning wheels, that moves across the screen. As a shape reaches the edge of the screen, it bounces back in the opposite direction. Kids will soon be laughing at their "cartoons," as their cars collide into the side of the screen and return a jumbled mix of shapes.

Kids can change the size

of each shape. Unlike Flying Spheres, the Flying Shapes game doesn't have musical accompaniment. Instead, each shape has its own sound. On computers equipped with an audio card that has recording capability and a microphone, kids can record their own voices or sound effects for each shape.

Overall, Thinkin' Things boasts a fine, intuitive design

IBM PC or compatible, 640K RAM, VGA, hard disk, mouse; Sound Blaster or compatible sound card strongly recommended—\$59.95



that encourages play and learning. Parents have a lot of control over setting skill levels in the four Question & Answer games (Oranga Banga, Toony Loon, Feathered Friends, and Fripplle Shop). Likewise, parents can set overall system rules so that kids can't exit the program to get into the family hard disk (and accidentally erase important household files).

For kids from four to eight years old, this exploration of shapes and sounds will provide many hours of delight. Parents will also find it difficult to resist, turning time at the family computer into shared experience, where learning and fun take center stage. □

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GAME INSIDER

Peter Olafson

ULTIMATE APOGEE

Wolfenstein 3-D was a defining moment in the history of Apogee Software, and now Shadow Warrior 3-D may be another. It's the first in a series of about a half-dozen free-scrolling action games expected to be produced under the premier shareware label's new 3-D engine, which Apogee execs feel is superior to that used in Id's Doom.

Among its features are the ability to look up and down, to jump and duck, and to crawl through narrow passages.

Apogee says Shadow Warrior 3-D can do everything Doom can—and a whole lot more.



Whole rooms can move and transform. Light can be at any of 64 diminishing levels (four times the number in Doom) and can strobe, flicker, fade, and spill out of rooms into hallways. Doors can slide open in any direction, swing open, swing back and forth, or revolve. Any surface can be animated, and the player can be at any elevation on the map. In Shadow Warrior 3-D, enemies jump over you and drop down from ceilings; some are smart enough to peer around corners, fire at you, and duck back to safety.

"In short, we can currently do every single thing Doom does plus some additional things," says Apogee cofounder George Broussard. "And we're not finished yet. Every week, we seem to add some cool new feature that pushes the engine farther and farther away from Doom."

Shadow Warrior 3-D is slated for Christmas release, in close company with the Indiana Jones-like Ruins 3-D (work-

ing title). And a third game, Duke Nukem 3-D, slated for the first quarter of 1995, sounds like the most sophisticated yet.

As the hero of two prior Apogee platformers, you'll climb ladders, use a jet pack to fly around L.A. (which has been turned into a maximum-security prison à la *Escape from New York*), pilot futuristic vehicles, shoot down aircraft, and use security cameras to spy on parts of other levels.

Look for some games initially planned for development under the Wolfenstein engine to make the transition to the new one. And Apogee's developers are already working on a next-generation engine that will afford players even greater freedom of movement.

Of course, before Wolfenstein, the Texas-based label was known for platform and arcade games, and that strain hasn't given out. The last release was the dazzling vertical-scroll shoot-'em-up, Raptor—a high-gloss incarnation of Major Stryker.

And by the time you read this, Hocus Pocus, Wacky Wheels, and Mystic Towers should all be available. Hocus Pocus is a 32-level, 256-color arcade adventure with elevators, switches, warp spells (you play a young wizard), and even a princess to save. Wacky Wheels is a racing game said to be in the style of Super Mario Carts, with a split-screen view and modem play. And Mystic Towers, an adventure game using a tilted point of view, emphasizes puzzle solving along with critter blasting as you progress through six castles.

Violent Vengeance—a beat-'em-up in the Streetfighter 2-Mortal Kombat mold—is slated for third-quarter release. It has 12 characters, each with its own moves, and you can play against the computer,

with a friend, or in a story mode that pits you against multiple opponents at the same time.

Later in the year, we can expect the return of Alabama Smith in a long-awaited platform game appearing under the new title Realms of Chaos, as well as Tom, Dick, and Harry—an arcader with up to 13 levels of parallax scrolling (a feat previously performed only on the Amiga and dedicated game consoles).

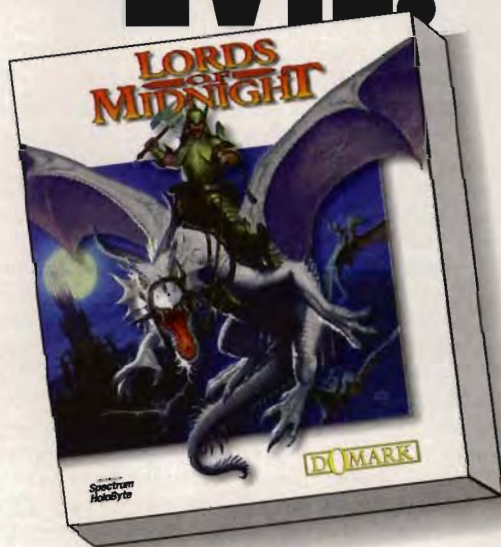
And oh, yes—look for two final games using variations on the Wolfenstein game engine. Blake Stone: Firestorm (a retail-only product due in the fourth quarter) is to the original Blake Stone what Spear of Destiny is to Wolfenstein, with new graphics, 20 new levels, and new features like a zoomable map, full lighting effects, and textured floors and ceilings.

Rise and Tide (working title), also aimed at the retail market, is being assembled under a rewritten version of the Wolfenstein engine, and the specs suggest it's logged some time in the fridge beside Doom and Apogee's would-be Doom-buster.



Look for diminished lighting, fog effects, the ability to look up and down, and "maskable" walls (semitransparent, like those used for jail cells). It will also feature a military theme and digitized characters. "In fact," says Steve Blackburn, Apogee's vice president of operations, "you'll see some recognizable actors [Apogee staffers] in there and [politically correct worrywarts won't like this part] have a chance to kill them." □

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ENTERTAINMENT CHOICE

The chomping, slurping, burping members of the Horde in this hot new CD-ROM game are among the most entertaining and formidable foes around.

Scott A. May

THE HORDE

Recent years have shown us how devastating floods, earthquakes, blizzards, and tornadoes can be. Yet even Mother Nature's fury is calm compared to the voracious and totally disgusting appetite of the Horde. Doubters should take a cautious step into the muck-lined boots of Sir Chauncey, the beleaguered hero of Crystal Dynamics' outstanding foray into PC entertainment, *The Horde*.

As with so many other twists of fate, the protagonist just happens to be in the right place at the right time. An orphan raised by a herd of kind cows, Chauncey becomes a lowly servant in the court of Winthrop the Good. One day, during a royal banquet, High Chancellor Kronus Maelor amuses the guests with his usual egocentric boasting. Suddenly, between belly laughs, the king begins choking. Only Chauncey has the clear mind to rush to the king's aid, dislodging a lump of turkey from his majesty's windpipe. The king declares Chauncey a hero, knights him, and rewards him with a tract of land in the Shimto Plains. He also hands over his trusty sword, the Grimthwacker, to help Chauncey defend his plot of earth from the evil, ravenous Horde.

And you, as Chauncey, will need it to overcome the Horde, the most vile, hideous, and comical race of fantasy creatures to emerge since the Grues infested Zork. The members of the Horde have no qualms about making their presence known as they stomp, hop, giggle, snort, and burp a blue streak. When these brainless brutes

get down to business, they eat and destroy everything they can lay their nasty little claws on.

Hordlings come in eight revolting types, each indigent to certain types of terrain. Blowgun-toting Forest Hordlings hide in trees and plot their attack. Desert Hordlings burrow like moles, making them extra difficult to detect. The massive Juggernaut Hordlings won't let anything—even the strongest fence or wall—get between them and food. Ice Hordlings, armed with snowballs and insatiable hunger, are similarly tenacious. Of special concern are the Shaman Hordlings, whose magic tricks include teleportation, deadly fireballs, and the ability to regenerate their dead friends.

The object is to cultivate your barren plot into a thriving community. Gameplay unfolds in seasonal phases, each lasting two minutes in real-time, where you can plant trees, cultivate the soil, buy cows, and prepare yourself

for the inevitable attack.

Members of the Horde come in various numbers and from all directions, with one goal: destruction of everything you own. Cows, your top money makers, are the Hordlings' prized food staple. Luckily, although the Hordlings are ravenous, they're also easy to dispose of. Moats and spiked pits provide your first line of defense, followed by walls and fences closer to the village. When all else fails, whack 'em with your mighty Grimthwacker. One slice of your sword sends most Hordlings exploding like overripe tomatoes—complete with a sickening, yet satisfying, "sploosh," leaving only eyeballs swimming in a wet pile of red goo.

As your territory expands, your ability to patrol the entire village is severely limited. Hire knights and archers to guard your borders with spiked maces and Horde-bursting arrows. As your finances grow, visit the castle shoppe to buy more powerful



tools and weapons, including flamethrowers, bombs, teleportation rings, healing rocks, and spells. You can even buy bait to lure Hordlings to their demise.

You also need to be aware of the one creature worse than the Horde: the vengeful High Chancellor Kronus Maelor. He'll do everything in his power to make your life miserable, from raising taxes beyond reasonable limits to destroying or confiscating your property under the guise of a fictitious royal decree. As the game progresses, you're given additional tracts of unreal estate, each more inhospitable to humans yet perfect breeding grounds for new strains of Hordlings. Life as a land baron sure isn't what you had imagined.

Released exclusively on CD-ROM, *The Horde* has multimedia tricks and techniques that rank far above average. Rather than simply augmenting gameplay with shallow video segues, the full-motion sequences are tastefully short, seamlessly integrated, and crucial to the story line. Unlike many lesser efforts in this burgeoning medium, *The Horde* boasts unusually high production values and professional acting.

The Hollywood connection includes Kirk Cameron as Chauncey and Michael Gregory as the delightfully malicious Maelor. Michael McCarthy is jolly good as the kindhearted, but hopelessly dense, King Winthrop. But it's Henry Crowell Jr. who repeatedly steals the show as Herald, the wisecracking FNN newscaster. His hilarious reports help ease the sting of the Hordlings' bite or Maelor's dastardly deeds. Crowell also serves as narrator and makes a brief

appearance as one of Maelor's torture victims.

Over 35 minutes of live-action video fill the disc, rendered in one of three user-selected modes: high definition (small window), low resolution (full screen), and a unique "exploded" view that combines the advantages of each.

Game graphics are exceptionally colorful and eloquently detailed, featuring stunning 3-D texture-mapped animation of all major characters. Villagers' movements are incredibly fluid, and the tiny cows bob their heads and graze with amazing realism. The biggest kick, of course, is the wild, unpredictable antics of the various Hordlings. Especially impressive are the hulking Juggernauts, whose brainless advances exhibit some of the game's most sophisticated animation.

Sound also plays an important role. Interestingly, there's no setup routine—the program is apparently smart enough to automatically detect and utilize your hardware configuration. Beyond the obvious inclusion of digitized speech, the game features a large number of sample sound effects. Players with 16-bit sound cards will thrill—and cringe—at the call of the Hordlings, rendered in bone-chilling stereo. Sound effects also alert you to Hordling attacks. Juggernauts pause between noisy bites to exclaim, "Oh! Yum-yum!" They're so cute, in a revolting sort of way, that you almost hate to run them through.

Game speed is acceptable on a 33-MHz 80386 machine, although the controls exhibit a slight response lag. When the game is run from a single-speed CD-ROM drive, video

quality suffers. Given the full power of today's latest multimedia machines—80486, 8MB RAM, and double-speed CD-ROM drive—performance is exceptionally smooth. Although the manual warns of potential problems with compressed drives and third-party memory managers, the program seems well behaved even under such configurations. Mouse control is accept-

IBM PC or compatible (33-MHz 80386 or faster, 80486 recommended), 4MB RAM, 256-color VGA, CD-ROM drive (double-speed recommended),



able, but a joystick is preferred. A stick that emulates digital input, such as the Gravis PC GamePad, works best.

Clearly, *The Horde*'s greatest attribute is its careful balance of streamlined—if not comfortably repetitive—gameplay and an enticing, gradually increasing challenge. Like most classic designs, it proves instantly accessible, yet enjoyably difficult to master. Likewise, it appeals equally to arcade and strategy players. Toss in generous amounts of outrageous humor, sprinkled with some of the best video sequences in recent memory, and you've got the makings of a truly original multimedia hit. □

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GAMEPLAY

Denny Atkin

COOL FALL KNIGHTS

Lords of the Realm is the latest entry in the "medieval warlord tries to conquer England" genre, which includes such classics as Defender of the Crown and Castles II. You start as mayor of a county; of course, you're not satisfied with one territory—you want to be king of the land. You'll raise armies and move across the land, attempting to steal territory from the Knight, Baron, Earl, and Countess, and up to three other human players.

This isn't just a war game. Along with managing your armies, you also build your territories' economies and keep the people fed. You decide whether to plant grain or hops on a patch of land or use it to

Make your fortune in the art world with Eidolon's Millennium Auction.



raise cattle or sheep. You'll have to allocate some workers to mining, some to collecting stone or timber to build castles, and others toward weapons development. Economic and social decisions abound: Do you use the newly harvested grain to feed your people, or do you trade it for goods and risk a peasant revolt?

Once you have your economy established, you'll start building castles, making it

much more difficult for others to conquer your territories. A number of predesigned castles are included, but the fun comes in designing your own.

Of course, along with managing your own territories, you must send your armies on the road to annex even more land. Neutral territories can be conquered without a fight; if another player owns the territory, you'll have to battle the local army or peasants. Combat can be handled automatically, or you can control the battles in realtime. Your strategy will depend on whether your army is equipped with hand-held weapons such as swords or axes or with projectile weapons such as crossbows. Don't count on winning just because your army is bigger. If it's hungry or unhealthy (finally, a medieval game that factors in disease!), morale will be down, and your forces won't fight well. If there's a castle in the territory, you'll have to lay siege to it first, filling in moats and using catapults, ladders, and other tools to try to gain entry to vanquish enemy forces.

Merit promises to add modern support in the release version. A hybrid of the best aspects of war games and Civilization, Lords of the Realm is definitely worth a look.

Eidolon's bid. A complete change of pace from typical PC game fare, Eidolon's Millennium Auction aims to attract an adult audience as the first "artstech" game. This CD-ROM game of strategy and deception should appeal to folks who enjoy the bluffing aspect of poker as well as those who've always wanted to attend high-society art auctions.

The game lets you choose one of seven characters, ranging from a sardonic German art critic to a Japanese cyberpunk entrepreneur. (Kudos to Eidolon for offering male and female characters of vari-

ous cultural backgrounds.) The characters are animated 3-D ray-traced figures that resemble a weird combination of Disney animatronics and the puppets from the old *Thunderbirds* TV series.

You'll start by examining the portfolios of your fellow bidders, trying to get a handle on their backgrounds and goals. Then you'll spend some time exploring the gallery and looking at the items up for sale. Despite the odd-looking characters, the graphics in Millennium Auction are among the finest ever to grace a computer screen. You won't believe there are only 256 colors—the portfolio and gallery scenes are true-color quality.

Then it's off to the bidding room to battle for art works. If you've paid close attention to news reports and other information, you'll know which *objets d'art* will fetch the highest resale values, and you'll be able to spend your money wisely. Some of the objects you'll bid on are classic pieces of art. But this game's set in the future, so other objects are humorous guesses as to what may appeal to future collectors. These include a plaster cast of Amy Fisher as well as a mainframe computer made by an old company called IBM (the portfolio notes that a tiny remnant of the company still exists, producing mailing labels for Microsoft). The winner is the bidder who's amassed the most personal worth at the end of the auction.

Played solo against computer opponents, Millennium Auction loses its appeal once you've figured out the best bidding strategies and seen all the items up for sale. But the game supports up to four human players, and that's where it shines. Get a couple of friends to play, and you'll find Millennium Auction encourages the same kind of fun social interaction as *Pictionary* or *Scruples*. □

DOOM

"The graphics are superb, with lighting effects and art that could only come from dark and demented minds."
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Canadian customers call 1-800-661-7383.



Requires a 386DX PC compatible or better; hard disk drive; VGA graphics; 4 Megabytes of memory. A 486 is recommended. Multiplayer options require a network which uses the IPX protocol, a modem, or serial link. Digitized sound effects require a 100% Sound Blaster™ compatible card, Gravis Ultra Sound™, or Pro Audio Spectrum™-16. DOOM is a trademark of id Software, ©1993. Other trademarks are the property of their respective companies.

MODEM

Screaming out of a clear blue sky in your Sopwith Camel, machine guns blazing, wind whipping your scarf into a frantic dance, you pepper the enemy's fuselage with hot lead. He's hit! His plane bursts into flames and spirals toward the ground, a wake of thick black smoke trailing behind. Victory is yours.

Ho hum. Another preprogrammed, computer-controlled, artificially intelligent Red Baron bites the dust. As any self-respecting Klingon might say, "Winning a battle against a computer has no honor." True glory comes from the conquest of a living opponent, even one you've never met. Plus, it's a lot more fun.

So it's time to fire up the modem and get online. With the proper software and a few dollars to spare, you can dogfight with Chuck from Seattle in the skies over Europe, shoot 18 holes of golf with Bob from Ann Arbor, or double-down at the blackjack tables with Sara from Baton Rouge. Live competition awaits you in some very exciting places.

Just raise your modem's sails and dial the nearest online port. America Online, CompuServe, GEnie, the ImagiNation Network, Prodigy—all the major services feature online gaming in one form or another. In most cases, they provide everything you need: the necessary game software, the modem link, and the means to meet opponents. While it's true that many commercial and shareware games have play-by-modem features built in, to play, you must first buy the game, find someone else who owns a copy, and pay the phone bill charges for connecting to his or her computer—which can be a very expensive endeavor if your partner isn't local.

Clearly, gaming à la the online services is the way to go. Here's a look at some fun spots along the entertainment superhighway.

America Online

The country's fastest-growing online service also includes one of the smallest selections of online games. That may change as AOL gets a grip on its recent population explosion and focuses on expanding service offerings. In the meantime, role-playing gamers, avocational stock bro-



BY RICH

COMBAT

kers, casino gamblers, and trivia buffs can find a handful of enjoyable diversions.

AOL's main attraction is *Neverwinter Nights*, an *Advanced Dungeons & Dragons* game that's an offshoot of Strategic Simulations' *Forgotten Realms* series. As such, it looks a lot like the older *Wizardry* and *Bard's Tale* games—with EGA graphics and PC-speaker sound effects to boot. Despite these shortcomings, *NWN* attracts a large following. Role-playing games are quite popular, and *NWN* delivers realtime, interactive, multiuser play.

Except for standard connect charges, the game is free. It operates while you're connected to AOL and requires front-end software—also free—which you download from the service to your PC. When activated, the software drops you to DOS (if you're running AOL from Windows) and loads the game. From there it plays like a standard AD & D role-playing adventure, complete with monsters, hit points, treasure, and the like. The difference, of course, is that during an expedition you might bump into Fred, a magic user from Cleveland, or Joann, a dwarf fighter from Tulsa—real people sharing space in the virtual dungeon. The level of interaction is up to you: Fight them; join them; ignore them. Ask them directions to the blacksmith's.

By incorporating other humans into the familiar solitude of role-playing games, *Neverwinter Nights* makes for a good time. If you're willing to overlook the mediocre graphics and sound, it's well worth playing.

The same holds true for AOL's other fare. *RabbitJack's Casino*, which also requires you to download front-end DOS software, seats you and other gamblers at Vegas-style bingo, poker, and blackjack tables. Like *NWN*, *RabbitJack's* sound and graphics are nothing special; it's the human interaction that adds the flavor. Playing blackjack alongside Joe from Phoenix is surprisingly fun compared to playing blackjack against your own computer.

AOL's in-service offerings—which require no downloading—include *Bulls and Bears*, a single-player stock-market game based on the performance of actual stocks (fortunately, you play this market with virtual money), and

ROIDA

realtime trivia games accessible through AOL's People Connection.

CompuServe

Although one of the most expensive online services, CompuServe offers an amazing array of game options—including an entire forum devoted to modem play. But what really puts this service on the gaming map is that users around the world can play commercial and shareware modem games using CompuServe as the link—which is no small trick.

Say you want to play Falcon 3.0 with someone who lives on the other side of the country. You could go bankrupt from the long-distance bills before you get your landing gear up! CompuServe, however, charges just \$6 per hour for connect time in its Modem-to-Modem Game Lobby—not bad for realtime play against another person. What's more, you can play the games you want, not just what the service offers. (Of course, you and your opponent must already own the software.)

There are a couple of drawbacks: Access to the Game Lobby is limited to 2400 bps, thereby excluding games that require 9600 or above (like the already classic Doom). Moreover, the MTM Challenge Board—a database of user profiles you can use to search for game-specific opponents—is badly out of date. (Is anyone still playing Vette or Command HQ?) So, while you can play almost any modem-supporting game in the Lobby, the Challenge Board provides little help finding partners for newer games.

CompuServe does have a handful of respectable in-service games. As with America Online, CompuServe requires you to download front-end software (and charges a few bucks for the privilege). Titles include StarSprint, a space combat game, and there are also checkers, backgammon, and chess.

GEnie

GEnie (General Electric Network for Information Exchange) is poised to become the next big thing in online services. In fact, where games are concerned, only the ImagiNation Network rivals it. GEnie offers more than a dozen multiuser games, many of which utilize digital sound and gorgeous high-resolution graphics. Gameplay is free as part of GEnie's



CompuServe links modem game players around the world.



Familiar Sierra On-Line characters dot the ImagiNation Network.

standard service plan; as with other services, you're required to download front-end software for some of the games.

The most exciting of GEnie's offerings, and probably the best multiplayer game to date on any online service, is CyberStrike—a virtual-reality combat game that casts you as pilot of a heavily armored two-legged tank, or CyberPod. As part of a color-designated team of CyberPods, you try to wrest control of the CyberCity from other teams out to do the same.

Action packed and easy to play, CyberStrike eschews complicated rules and controls. The premise is simple: Your CyberPod's main need is power, which comes from relay towers that correspond with your team's color. The farther you go from your towers, the weaker your pod gets. Fortunately, you can request additional towers and build a network of them around the city. Of course, the other teams will be building their own networks and, at the same time, fire-bombing yours.

The game never really begins or ends; you simply become a part of ongoing events when you join in. Your view is from inside your pod's cockpit, and one of the silly joys of CyberStrike is when you stand toe to toe with another pod. You can't help but think, "There's a human in there." It's multiplayer virtual reality at its best.

Other notable multiplayer games



Prodigy subscribers can enter a portal to the ImagiNation Network.



AOL's Neverwinter Nights is an Advanced Dungeons & Dragons adventure.



Action-packed CyberStrike is a favorite among GEnie subscribers.

on GEnie include Air Warrior—a Super VGA air combat simulator—and MechWarrior, which is based on the popular commercial game of the same name.

ImagiNation Network

Online gaming is the ImagiNation Network's bailiwick. Formerly the Sierra Network, INN has the distinction of being the most entertainment-oriented service in the roundup. As such, its stunning graphical interface looks like something out of King's Quest V—and it's remarkably easy to use. The main screen depicts a town map; just point and click with the mouse to visit CasinoLand, SierraLand, MedievalLand, or the ClubHouse, among other places. Each area includes appropriate types of games, most of which are played against or alongside other users.

For each area you visit, you must

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What You Need to Get Online

Ready for the good news? Your current computer equipment will probably serve you just fine for getting online. You won't need to replace this or upgrade that; all the online services reviewed here work flawlessly with a minimum of hardware.

You will, of course, need a modem—and, ideally, a 386 or better processor, at least a couple of megabytes of RAM and hard disk space, and a VGA monitor. All five of the major services can be accessed with minimalist DOS software, although four of them, INN being the exception, also have Windows interfaces available.

As for the modem itself, choose one capable of 2400 bits per second (bps) or better—preferably a 9600 or 14,400 model. None of the services currently support access speeds greater than 9600, but they will in the future. If you're shopping, a modem capable of 14,400 bps is the smart buy. Prices have plummeted in recent months, and many of the models include faxing capabilities.

first create an onscreen representation of yourself using INN's clever face-builder utility. It's a surprisingly fun one-time activity, and seeing cartoonish caricatures of your opponents certainly adds to INN's intimacy compared with other online services.

The most exciting action here is found in SierraLand, which contains a terrific collection of multi- and dual-player games. The most prominent—and popular—of these is Red Baron, a graphical marvel that's also an exact replica of the best-selling Dynamix game. Red Baron lets you challenge others in one-on-one dogfights or join a squadron for multiplayer combat. If you thought the computer-controlled pilots were too easy, here's your chance to fly against the real thing.

SierraLand also features the impressive 3-D Golf, one of surprisingly few online sports games, and the classic board game Stratego. Budding artists and hooligans will enjoy Graffiti, a very clever drawing program that lets you join together in painting (defacing?) the same canvas. Trivia buffs should check out NTN Trivia, a

nationwide nightly trivia contest.

For role-playing gamers, the place to go is MedievalLand, home to two commercial-quality RPGs: The Shadow of Yserbius and its sequel, Fates of Twinion. If you enjoy commercial titles like Betrayal at Krondor and Eye of the Beholder, you owe it to yourself to try MedievalLand's fare.

CasinoLand is an adults-only den of blackjack, roulette, poker, and slots. Chat content is virtually unrestricted in CasinoLand, and things can get wonderfully raunchy in Lefty's Bar—an online hangout that's also home to games like Liar's Poker and Truth or Dare.

And finally, the ClubHouse features classic card games like bridge, cribbage, checkers, and chess, as well as board games like Go and backgammon. Like all of INN's games, these are graphically superb and easy to play.

Prodigy

Though Prodigy boasts the largest membership of all the online services, it includes no head-to-head multiplayer games. What Prodigy does have is a portal to INN: For \$3.60 an hour, you can play most INN games—including Red Baron and Shadow of Yserbius, the two most popular. If you're already a Prodigy subscriber, this will definitely work to your advantage. Instead of paying for a second online service, you simply pay an extra hourly rate on your existing service. Better still, because Prodigy has such a large base of local-access numbers, chances are good that you'll avoid toll charges. (INN has a comparatively limited selection of numbers; you could wind up paying toll charges on top of service charges.)

Prodigy also has a large selection of respectable one-player games. GUTS, which Prodigy claims has the most players of any online game in the country, gives you seven minutes to answer seven trivia questions once a week for seven weeks. Winners get a free sweatshirt and have their names posted online. There's also an online version of the best-selling Where in the World Is Carmen Sandiego? series, featuring a new mystery each week.

Prodigy features a popular pay-per-season fantasy baseball game called Baseball Manager as well as a pay-per-game empire-building adventure called Rebel Space. Both are played against other Prodigy members, but not in realtime.

Playing at a Computer Near You

If the prospect of tackling nationwide competition seems a bit overwhelming, you might want to start locally on one of the thousands of privately run, local bulletin board systems (BBSs) available across the country, most of which offer at least a few online games. Granted, they'll probably have limited graphics (if any), no sound, and one-turn-per-day access, but that doesn't mean they can't be fun. Two of the most popular BBS games are Global Wars, which is like Risk, and Trade Wars. Ask a local computer guru to help you find some BBS phone numbers; then check them out. BBSs are a good place to start if you want to get your online gaming feet wet, and best of all, they're free.

Entertainment to Go

All things considered, gamers looking for new challenges (and opponents) really can't go wrong with any of the online services listed here. Each has merits and drawbacks, and each offers competitive access charges. One thing is certain: The human element in computer gaming is vastly underrated—so get yourself online and find out why. Rick from Northville is waiting for you! □

Online Services

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(703) 448-8700

CompuServe
P.O. Box 20212
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Columbus, OH 43220
(614) 457-0802

GEnie
P.O. Box 6403
Rockville, MD 20849-6403
(301) 251-6415

The ImagiNation Network
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TECHNOLOGY UPDATE

900 MHz breakthrough!

New technology launches wireless speaker revolution...

Recoton develops breakthrough technology which transmits stereo sound through walls, ceilings and floors up to 150 feet.



Breakthrough wireless speaker design blankets your home with music.

By Charles Anton

If you had to name just one new product "the most innovative of the year," what would you choose? Well, at the recent *International Consumer Electronics Show*, critics gave Recoton's new wireless stereo speaker system the *Design and Engineering Award* for being the "most innovative and outstanding new product."

Recoton was able to introduce this whole new generation of powerful wireless speakers due to the advent of 900 MHz technology. This newly approved breakthrough enables Recoton's wireless speakers to rival the sound of expensive wired speakers.

Recently approved technology. In June of 1989, the *Federal Communications Commission* allocated a band of radio frequencies stretching from 902 to 928 MHz for wireless, in-home product applications. Recoton, one of the world's leading wireless speaker manufacturers, took advantage of the FCC ruling by creating and introducing a new speaker system that utilizes the recently approved frequency band to transmit clearer, stronger stereo signals throughout your home.



Crisp sound throughout your home. Just imagine being able to listen to your stereo, TV, VCR or CD player in any room of your home without having to run miles of speaker wire. Plus, you'll never have to worry about range because the new 900 MHz technology allows

150 foot range through walls!

Recoton gives you the freedom to listen to music wherever you want. Your music is no longer limited to the room your stereo is in. With the wireless headphones you can listen to your TV, stereo or CD player while you move freely between rooms, exercise or do other activities. And unlike infrared headphones, you don't have to be in a line-of-sight with the transmitter, giving you a full 150 foot range.

The headphones and speakers have their own built-in receiver, so no wires are needed between you and your stereo. One transmitter operates an unlimited number of speakers and headphones.



Recoton's transmitter sends music through walls to wireless speakers over a 75,000 square foot area.

stereo signals to travel over distances of 150 feet or more through walls, ceilings and floors without losing sound quality.

One transmitter, unlimited receivers. The powerful transmitter plugs into a headphone, audio-out or tape-out jack on your stereo or TV component, transmitting music wirelessly to your speakers or headphones. The speakers plug into an outlet. The one transmitter can broadcast to an unlimited number of stereo speakers and headphones. And since each speaker contains its own built in receiver/amplifier, there are no wires running from the stereo to the speakers.

Full dynamic range. The speaker, mounted in a bookshelf-sized acoustically constructed cabinet, provides a two-way bass reflex design for individual bass boost control. Full dynamic range is achieved by the use of a 2" tweeter and 4" woofer. Plus, automatic digital lock-in

tuning guarantees optimum reception and eliminates drift. The new technology provides static-free, interference-free sound in virtually any environment. These speakers are also self-amplified; they can't be blown out no matter what your stereo's wattage.

Stereo or hi-fi, you decide. These speakers have the option of either stereo or hi-fi sound. You can use two speakers, one set on right channel and the other on left, for full stereo separation. Or, if you just want an extra speaker in another room, set it on mono and listen to both channels on one speaker. Mono combines both left and right channels for hi-fi sound. This option lets you put a pair of speakers in the den and get full stereo separation or put one speaker in the kitchen and get complete hi-fi sound.

Factory direct savings. Because of our commitment to quality and our factory direct pricing, we sell more wireless speakers than anyone! For this reason, you can get these speakers far below retail with our 90 day "Dare to Compare" money-back guarantee and full manufacturer's warranty. Through this limited time offer, the Recoton transmitter is only \$69. It will operate an unlimited number of wireless speakers priced at only \$89 and wireless headphones at \$59 each. So take advantage of this special offer to fill your home with music. Your order will be processed in 72 hours.



These wireless stereo headphones have a built-in receiver.

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Built-in receiver and amplifier:

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4" woofer
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Channel Separation: 30 dB
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Recoton's Design and Engineering Award



WINPRO ENTERTAINER

When the IBM-clone market erupted in the mid 1980s, Leading Edge was one of the first popular mass-market brands. Alas, it was also one of the first famous casualties, and when the company folded, the Leading Edge brand name became the property of Korea's Daewoo Electronics. Now, after several years' absence, Leading Edge PCs are once again available, including the WinPro Entertainer, or 486e, a high-performance multimedia PC from the reconstituted Leading Edge.

With its 66-MHz CPU, VESA local-bus graphics, and double-speed Sony CD-ROM drive, the WinPro is powerful enough to handle the most demanding multimedia applications. The 16-bit Creative Labs sound card delivers its sound through small but functional Labtec speakers or headphones, both included with the 486e. And now that memory is becoming more and more important as Windows programs keep getting larger, the WinPro Entertainer's 8MB of RAM and 260MB hard drive put it a notch above the baseline for budget PCs.

A selection of preinstalled software helps to sweeten the deal. In addition to the usual operating software—DOS 6.2 and Windows 3.1—the WinPro Entertainer includes Microsoft Works, version 3.0; Microsoft Money; and the Windows Entertainment Pack game collection; plus four CD-ROMs: Grolier's New Multimedia Encyclopedia, the Time Almanac (unfortunately, a 1993 edition), Dr. T's Sing-A-Long, and the



With a 66-MHz CPU, VESA local-bus graphics, and double-speed Sony CD-ROM drive, the WinPro is fast and powerful.

Multimedia Audio Collection.

This all adds up to a well-equipped system with above-average value, but there are a few loose ends and cut corners. My keyboard keys tended to rattle and didn't give any tactile feedback, and a sharp edge on the underside of the mouse tended to snag on my mouse pad. The local-bus video adapter worked well for multimedia software, but buyers looking to run a wider range of programs might wish the WinPro had an accelerated video board instead of the plain SVGA card. Applications that display complex, highly structured screens, such as desktop publishing and illustration software, will suffer most from the lack of graphics acceleration.

Like many new systems with preloaded software, the WinPro doesn't include floppy copies of the preinstalled programs—not even DOS or Windows. A Windows-based disk utility program can re-create the floppies, and it's worth using for safety's sake. But buyers will

have to provide all the blank disks for this operation.

When it arrived for testing, the WinPro Entertainer also had a subtle configuration glitch. Windows wasn't loading an important multimedia device driver, which meant several popular CD-ROM programs couldn't access the audio tracks on their discs. I've become accustomed to dealing with problems like this—they're fairly common when you upgrade an existing PC with an add-on multimedia kit—and the fix to this one was fairly simple: I edited the SYSTEM.INI configuration file to load the drivers in a different order. But factory-integrated computer packages are supposed to spare you these hassles. When you buy a ready-to-run multimedia system, you have a right to expect the manufacturer to sort through this stuff for you ahead of time.

The WinPro Entertainer combines ample processing power, adequate storage, and name-brand multimedia components to easily han-

dle the demands of CD-ROMs, games, and educational programs—reasonable value for the money. And while it's good to see Leading Edge computers back on the shelves, Daewoo might pay closer attention to the details if it hopes to regain Leading Edge's former status.

TIM VICTOR

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Circle Reader Service Number 434

IN THE BLACK

It never ceases to amaze me how some of the most useless software is priced at \$900, while the most useful is often as low as \$90. In the Black falls into the latter category. For a mere \$89 you get all the accounting and contact management functions you need for your small business or personal use.

At first I was skeptical about In the Black because I've never found a contact manager or an accounting package that would satisfy my business and personal needs—not one that would justify the space it took up on my hard drive anyway. But after installing In the Black, which takes up 11,250 bytes of RAM, I realized what power I had just placed at my fingertips.

One plus I found was in the ability to choose which type of language I wanted: accounting or nonaccounting. Being a nonaccountant, nonaccounting is what I chose. I then ran the software through my no-documentation test, which it passed with flying colors. I was able to install the software, run through the tutorial, and set up my bank ac-

count and general ledger account, all without looking at the documentation. On-line help comes to the rescue when you need it.

Another plus was the way In the Black told me I was doing the wrong thing. When I attempted to set up an account in Accounts Receivable, I was instantly popped into the contact manager to set up the contact. The only sticky point was when I tried to add more than one contact name in a file in the contact manager, but I clicked around on a few buttons until I found the one that worked.

Overall, I found In the Black to be a power-packed product for two reasons: First, you can do things like track bank accounts, print invoices and mailing labels, and graph any set of data you choose; second, you'll never outgrow In the Black. Because it's based on Microrim's R:BASE database, there's no limit to the amount of data you can store. And Microrim plans to release add-on products, such as inventory and payroll modules, to keep your software growing right along with your business.

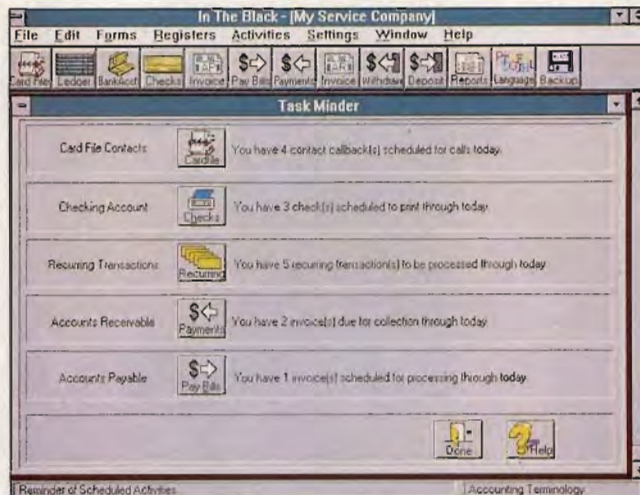
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Circle Reader Service Number 435

RETURN TO ZORK

It's ba-ack. The best-selling text adventure from Infocom (a division of Activision) that revolutionized computer gaming 16 years ago has been reincarnated under the title Return to Zork. But other than the name and a few superficial similarities, any relationship to the original is purely coincidental.



For a mere \$89, In the Black gives you all the accounting and contact management functions you'll probably need.



Return to Zork could best be described as an interactive movie adventure starring digitized full-motion film sequences.

Gamers expecting to find a CD-ROM version of the original Zork series are going to be disappointed: This is a whole new game. RTZ could best be described as an interactive movie adventure starring digitized full-motion film sequences. Professional talent, colorful costumes, authentically detailed sets and locations, and a theatrical-quality soundtrack make it look and play like a Hollywood movie.

A lot of effort went into the production of RTZ, and it shows. Too bad the same effort didn't go into the actual game. Intellectually, RTZ is beyond difficult, bordering on the impossible. A few puzzles echo the old Zorkian humor, but many are merely obscure or completely unfathomable. True, the game does provide hints and clues, but the plot is so muddy and the clues so vague that they just add

to the confusion.

The easy-to-use interface is completely icon driven—all you do is point and click. Animated icons and picture menus illustrate all the available options. Movement is also mouse controlled. Instead of exits being displayed or described, the cursor changes into a red navigation arrow that points in different directions as it's moved around the screen. For all its simplicity, though, this system has a big flaw: There's no text interface. People accustomed to the speed and flexibility of a text-only parser are going to feel handcuffed.

There are some neat features that help make up for the textless interface, however. One is a camera that lets you take pictures of everything you encounter; another is a tape recorder that automatically records all your conversations. You show the pictures to characters so they'll give you clues, and you use the recorder to track the clues—a nice touch.

RTZ isn't completely non-linear, but you can tackle puzzles in almost any order and backtrack to pick up things you might have missed. This is an important feature, since the game will let you go all the way to the end without much of a clue that you're missing a critical item. In other words, you're going to have to backtrack a lot.

While the CD version of RTZ is an audio-visual treat, the disk version is a weak facsimile. It's a bit like the old book-and-movie cliché: Don't see the film if you've read the book. In this case, don't play the disk version if you've seen the CD-ROM. All the full-motion film sequences and scene transi-

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Follow my simple directions, and you can make more money sitting in front of a computer working only a few hours a day, than most people make all year long. I should know, I practically own every money making system in this entire country; from those \$10 systems to the \$250 TV courses that you see advertised late at night. Nothing I bought seemed promising enough to make me a ton of money, so I looked around and noticed how these average people are making thousands of dollars. Right out of their own home, they are generating a fortune just using their computer. What could be easier? Once you get it going, a few hours a day and you could be set for life. And remember, my Computer Cash System will get you started immediately. In a matter of days you'll learn:

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TESTIMONIAL

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If you want thousands of dollars in your pocket for doing practically nothing, order my Computer Cash secrets today. They will only be available for a limited time. But if you order them before the deadline on the coupon, I'll include a FREE BONUS that will get you a computer for about one-fourth the price a new computer would cost. Over 45 models of desktop and notebook computers, 386's and 486's starting at \$399.00!! This alone will pay for the course ten times over. Any way you look at it, you'll have thousands of dollars in the bank using my secrets, with absolutely no risk on your part. If you are not completely satisfied, you can return my material within 30 days for your money back. No questions asked! To receive your bonus, you must order before the deadline.



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tions are missing, characters talk with a simple hinged-jaw animation, and the audio seems thin and scratchy in comparison.

RTZ was definitely made for CD-ROM. If you want to survive it, take everything that isn't bolted down, photograph everything that moves, show pictures and items to everything that breathes, and save every chance you get. When you get frustrated, stab the mayor, blow up the incinerator, or aggravate a vulture. None of these actions will help you win the game, but you'll feel better. And RTZ can be a lot of fun as long as you don't play to win.

JAY KEE

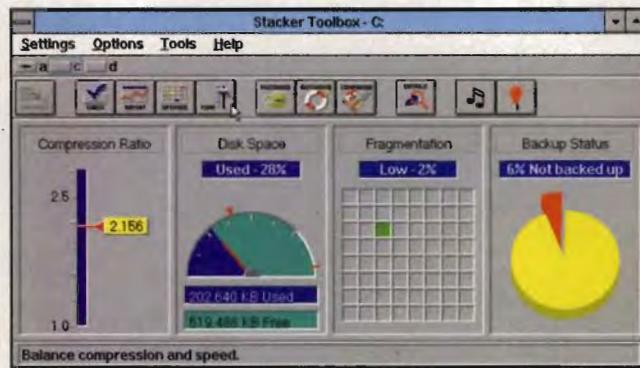
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Circle Reader Service Number 436

STACKER 4.0

Stacker 4.0, the latest version of the popular disk-compression utility, uses new SmartPack technology to give better than two-to-one compression on many drives.

How much additional compression this upgrade provides depends on the kinds of data you have on your hard disk. Two drives—one compressed with DoubleSpace and one with Stacker 3.1—went from 1.7:1 compression to 2:1 when I upgraded them to Stacker 4.0. Both drives had a nearly equal mix of data and applications. Another drive, which contained many database and uncompressed BMP graphics files, went to an amazing 2.5:1 compression ratio, storing 500MB of data on a 200MB hard drive. My home PC, packed almost exclusively



Stacker's enhanced Windows interface lets you view compression ratios, free space, fragmentation, and more.



With Harvard Graphics, you can add sound effects, including WAV files, MIDI music, and, in the background, CD audio.

with applications software and games, didn't gain any extra space when upgrading to 4.0, remaining at a 1.7:1 compression ratio.

Stacker 4.0 uses the Novell DPMS protected-mode memory driver and requires only 17K of memory below 1MB on DOS 6 systems. (If you're using the QEMM memory manager or DOS 5, though, you'll have to sacrifice 44K of memory for the driver, since Stacker's DPMS driver won't work with QEMM's DPMS driver.) As with Stacker 3.1, the driver loads before COMMAND.COM, so you don't

have to deal with swapping drives in your CONFIG.SYS file. Although you still use DOS to install and configure Stacker, an enhanced Windows interface lets you view compression ratios, free space, fragmentation, and the percentage of files you've backed up.

On a fast 486 using the best compression ratio, Stacker 4.0 didn't cause any noticeable change in hard-disk access speed. On an old 286 notebook, though, the drive was noticeably slower at highest compression.

I had no compatibility problems with Stacker 4.0.

Nearly all disk utilities, such as Undelete, work fine on compressed disks. A few don't—the disk optimizer in Norton Utilities 8.0 is one example—but they duplicate functions included with the Stacker package anyway.

Stacker 4.0 is a mature, reliable product that will come in handy for anyone who needs more disk space—and who doesn't?

DENNY ATKIN

Stac
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\$99.95

Circle Reader Service Number 437

HARVARD GRAPHICS

There's an old saying that you never get a second chance to make a first impression. You won't need a second chance with the help of Harvard Graphics; it puts flashy graphics power in the hands of nongraphical-oriented users.

One of this program's best features is its interface. From the customizable icon bar to the graphical dialog boxes, the interface is more than easy to use; it's actually convenient. You can create different icon bars by adding, deleting, and rearranging the toolbar icons; editing commands are simplified and streamlined; the often-neglected right mouse button is used to pull up menus appropriate to the current task; and dialog boxes dealing with graphics actually use graphics to show their purpose. Even better, the dialog boxes are visually interactive and show previews of planned changes before you alter your presentation.

Unfortunately, all Windows programs seem to be afflicted with icons whose functions are impossible to

guess—and Harvard Graphics is no exception. For example, the Open Symbol Library icon is a picture of a truck. How intuitive. But at least when you pass the pointer over an icon, its function appears in the title bar on top of the screen in a font that's readable even in high screen resolutions. Adding to the overall usefulness of the interface is context-sensitive help in the form of an onscreen Advisor column, a five-minute coach tutorial, and full OLE support.

Presentations are built around presentation styles—master templates that maintain a unified visual style throughout the entire slide show by making sure every screen has a similar look

and feel. There are 31 of these styles and 12 different slide types within each. The slide types contain 88 options, from different cover page layouts to bar graphs to organizational charts. All you have to do is type in or import your text and numerical data, and you have an instant slide show. Don't like the available templates or slide types? You can make your own.

Once created, slides can be further manipulated: They can be reordered in a special slide sorter view or an outline view, and you can add clip art from the more than 500 selections included or import pictures in GIF, TIF, PIC, Windows Metafile, and a host of other for-

ats. You can add text; graphs with imported data; and 51 transitional effects such as wipes, blinds, and irises; and you can alter the color scheme with palette changes.

To liven your presentation even more, Harvard Graphics includes a special-effects module called Harvard FX that lets you add or create structured draw images and add creative flourishes to existing art. Text can be embossed, backlit, extruded, shaded, shadowed, made metallic, twisted, curved, textured, and made three dimensional. Bitmapped art can be enhanced as well.

To further punch up presentations, Harvard Graphics

gives you some limited multimedia options. You can add audio directly through WAV sound effects and MIDI music and in the background through CD audio. The Hypershow tool lets you play back FLC, FLI, and MMM animation and AVI and Quicktime videos. Also, you can define buttons that will trigger screen-show effects during the presentation.

Your presentation can be run from the program or condensed into a runtime module that will run without Harvard Graphics. You can even run it from DOS on machines without Windows—something few Windows presentation packages can do. Screen shows can be conferenced—run across net-

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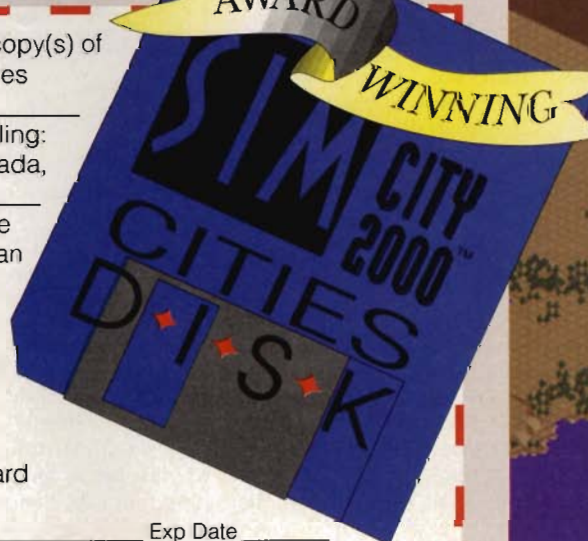
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works and modem connections—and users can draw onscreen during a presentation or look at slides out of sequence in response to audience input.

There's a lot to like about Harvard Graphics. While it's really no more powerful than other presentation programs (despite some unique features in Harvard FX), it has an ease-of-learning factor that's simply unbeatable. If you've never made a presentation before and you have to make one tomorrow, this program's for you.

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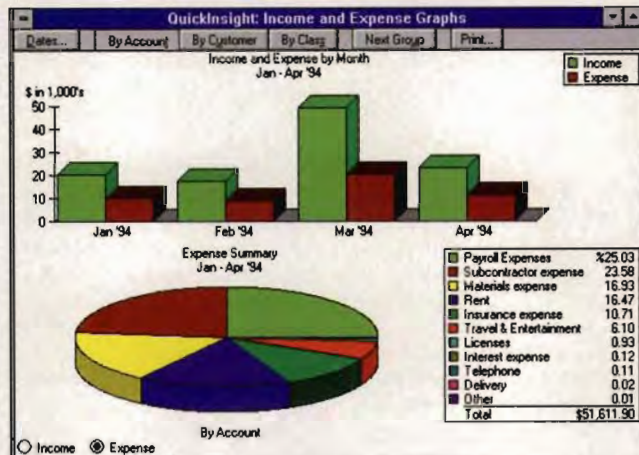
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QUICKBOOKS

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Quickbooks has 50 preset reports and graphs, or you can customize your own reports to suit your business needs.



This sophisticated, powerful laser printer is equally appropriate for individuals, work groups, and networks.

breeze. Invoices look like invoices, and checks look like checks. Simply enter your bills as you receive them. Each bill is assigned to an account or divided among as many accounts as you want. Quickbooks prompts you for any information needed about customers or vendors, and the information is saved in lists. When you pay bills and write checks, Quickbooks uses these lists to fill

in most of the information for you. After a while, you'll find yourself doing very little typing at all.

When your bills are due, Quickbooks prompts you with a reminder window. Then you can choose either to pay all the bills at one time or to make partial payments on some. Quickbooks also allows you the flexibility of multiple checking accounts and will even print

the checks for you. Simply pull up the checking-account ledger, double-click on the bill, and the checks appear written out for you. You don't have to print out your checks, however; you can continue to write them manually if you want or pay them electronically through Checkfree.

Whenever you're ready to see where you are, you can always pull up any of the 50 preset reports or customize your own reports to suit your business needs. If you prefer a little color, Quickbooks can create graphs as well.

But Quickbooks is much more than a glorified checkbook. It will also handle cash sales, create invoices, and receive payments. Quickbooks provides three different types of invoices and lets you track customers, assign credit limits, and accept payments in cash or by check or credit card.

QCards is another handy feature that's included. Tutorial cards appear with each window to explain how everything inside the window works. Once you've learned your way around the software, you can shut off QCards through Preferences. Quickbooks also includes a calculator, but you probably won't need it, since the software does most of the math for you.

Don't worry if you're not sure what a debit is or how FICA works: Quickbooks uses hardly any technical jargon; everything is written in plain English. You'll be amazed at how quickly your books fall into place.

BETH DUVAL

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Circle Reader Service Number 439

BROTHER HL-10H PRINTER

Brother International's new HL-10h ten-page-per-minute, 600 x 600 dpi LaserJet 4/PostScript-compatible laser printer offers a lot in a small-footprint package.

For one, the HL-10h comes network friendly with three types of interfaces: serial, high-speed bidirectional parallel, and an MIO (modular input/output) interface that ties into Novell, Ethernet, Token Ring, and other networks. Even if you don't need network capacity now, the HL-10h is ready when you do. The printer also senses and responds to changes in emulations, including LaserJet 4 and PostScript, and earlier modes like Epson FX-850, Diablo 630, and the IBM ProPrinter XL.

We tested the HL-10h by installing it to a 486SX-25 that's part of a Novell NetWare Lite network. We sent pages to the printer from a variety of Windows applications, both directly and from other computers on the network. The printer was fast and correctly sensed the emulation being sent. Applications printed flawlessly.

While the HL-10h's 600 dpi goes a long way in helping you achieve professional-looking documents by putting out near typeset quality pages, a lot of other powerful features assist you as well. An internal 20-MHz 32-bit microprocessor handles extensive graphics and text applications and automatically smooths out jagged edges on characters and figures, while an optimized Windows driver provides for greater throughput. Eighty-three resident fonts are included, as well as 256 shades of gray that make

for near photographic output. Paper sizes include letter, legal, A4, B5, envelopes, transparencies, and laser label sheets. The adjustable paper drawer holds 250 sheets of paper.

One major performance difference between the HL-10h and older laser printers is in sharpness of text and graphics. Moving from 300 dpi to 600 dpi isn't a simple doubling of resolution as you might expect: This printer actually produces four times as many dots on a page. We printed a number of examples, pushing the printer up to 100 lpi, and got excellent results.

We printed a wide range of Type 1 and TrueType fonts on the HL-10h, and it handled all of them with aplomb. An installer program is included for adding scalable PCL5 fonts, and there's a slot on the printer for LaserJet 4 font cartridges.

We think you should plan on upgrading the HL-10h's memory from its standard 2MB to a higher value to take full advantage of the printer's 600-dpi resolution. While a full page of text is no problem at 600 dpi, more complicated pages, such as photographs, tend to bog down or not print entirely. You can add up to 32MB of RAM (for a total of 34MB) internally, using standard SIMM memory chips. Or, use the external PC-MCIA slot to add a flash memory card. A total of about 6MB would be enough for most users.

The HL-10h's front control panel isn't as confusing as it can be on many laser printers, and its easy-to-read LED display scrolls through the various printer options. Documentation is a little better than what we've encountered for most printers.

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The second release in the Amtex Pinball Classic Series of adaptations of real pinball machines, Royal Flush brings the experience of REAL pinball to the computer.

Jokers are wild in this pinball poker delight as you try for your five card combinations by targeting nine drop targets, three kick-out saucers and three bonus rollover lanes. Wide open, fast paced and challenging!

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PinBall

AMTEX

The Brother HL-10h requires an IBM-compatible PC with a standard parallel printer port, serial interface, or Hewlett-Packard MIO-compatible interface. At a suggested retail price of \$1,695, this sophisticated, powerful laser printer is equally appropriate for individuals, work groups, and networks. We would choose it over the LaserJet 4.

RALPH ROBERTS

Brother International
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\$1,695

Circle Reader Service Number 440

BUG ADVENTURE

Finally, some bugs you won't mind having in your computer—especially if you're the parents of children three to eight years old (and perhaps a bit older). Youngsters will find Bug Adventure a fascinating journey—packed with short video clips and photographs of familiar and exotic bugs.

This CD-ROM or disk-based adventure for DOS and Windows includes the usual friendly interface found on all Knowledge Adventure products—an approachable full-color photograph overlaid with illustrations. Move the pointer (a bug, of course), using the mouse or arrow keys, to any of the objects on the screen, and text appears to tell you where you'll be heading if you press Enter or click the mouse. Most children will feel right at home using Bug Adventure's friendly interface.

Five activities make up the program's six parts. Can You Find Me? asks simple questions—Which bug is loudest? Which bug is longest?—and the child must select the appropriate



With its free-form design that allows you to roam and explore, Bug Adventure is like having your own bug museum.



Engaging and challenging, WordSmart helps you build your vocabulary with voice and sound effects.

picture. Honey Comb Theater includes 15 video clips featuring a variety of bugs. Other areas include Bug Storybook, Who Am I?, and 3-D Bug Basement. Picture and video-clip quality varies throughout, generally from good to excellent.

Richest, though least inspired, of the six parts of Bug Adventure is the Bug Reference. Here children can explore and learn about bugs through an encyclopedia-like reference.

Each entry includes a video of a bug along with text children can read (or have read to them).

With its free-form design allowing children to roam and explore, Bug Adventure is like having your own bug museum.

STEPHEN LEVY

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WORDSMART

Need vocabulary power? If you're equipped with Windows and a CD-ROM drive, check out WordSmart. This interactive program consists of a series of study drills on hundreds of words—thousands if you decide to purchase the nine other CD-ROM volumes available.

You choose between five study exercises; each one instructs in a different manner so that choosing Multiple Choice, for example, means listening to voice pronunciations, while Sentence Completion lets you key in a word for spelling practice.

The Multiple Choice option shows the true power of this program: A detailed audio discussion accompanies every word in a dictionary-entry type of format. Correctly matching similar terms enables you to view an extended definition, which also includes antonyms, synonyms, and derivations. A recorded voice reads the definition and even gives a brief history of the word or explains what a certain percentage of people believe the word means. You can repeat the recording or go to any part of it simply by clicking on the line in the definition. Laser Review and Flashcards include a timer to let you see how fast you're learning.

WordSmart records percentage scores on each study exercise and generates a study recommendation for which volume of words to review. Old and young alike will enjoy the program's easy interaction with simple mouse commands, and kids should have no trouble using the main menu. While WordSmart isn't a game per se, it does

present an entertaining challenge through its different drills and will keep you glued to the screen with music, sound effects, and human voice recordings.

WordSmart comes with volume C, which contains more than 200 words of average skill level and enough to keep you busy for a while. However, to enjoy the complete range of vocabulary, you'll have to purchase the nine supplementary CD-ROM volumes: A, B, and D-J. Each successive volume becomes more difficult: Volume A contains more common words, while J comes with words unknown to 90 percent of adults. Spend just one hour with WordSmart, and you may come to realize, no matter who you are, just how little you've been saying.

MATTHEW BYRD

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COMPAQ CONTURA 4/25C

If you're in the market for a strong, dependable, and relatively inexpensive notebook, perhaps you should check out the Compaq Contura 4/25c. This durable little computer has a power-saving 486SL-25 CPU, a 9 1/2-inch dual-scan passive matrix display that can show up to 256 vivid colors, and a 120MB hard disk. The basic configuration ships with 4MB of RAM and sells for \$2,099. However, to ensure that the machine would run COMPUTE's benchmark tests, we asked Compaq to equip it with 8MB (with the extra memory, the price is \$2,338).

To test the Contura's

speed, I ran the industry-standard BAPCo SYSmark test (see the notebook roundup in this issue for a description of the test). The test runs several real-world applications and compares the speed to that of a desktop 486DX-33. The Contura runs about 30 percent more slowly than the calibration system, which is good for an SL-25. Many of the notebooks I've looked at lately (even those with faster clock speeds) don't do that well.

Also impressive is the Contura's performance on the battery-life tests. To see how long the battery would last, I ran a macro that performs several commands repeatedly and accesses the hard disk often. The battery lasted almost three hours each time I ran the test. The Contura also has a hibernation feature that shuts it down to almost nil battery consumption when it's not in use.

Like most notebooks, however, the Contura isn't perfect. It doesn't, for example, support PCMCIA expansion, which has become quite popular for today's portable computers. PCMCIA makes connecting peripherals like modems, sound cards, and external hard disks much easier and expands compatibility for third-party devices. If you want to upgrade system memory or add a modem to the Contura, you'll have to open the system and install proprietary cards, which is neither fun nor cost effective.

The Contura's keys are firm and responsive, but the keyboard arrangement is a little strange. The Delete and Insert keys, for instance, are at the top on the same row as the function keys. It's hard to get used to looking for them there. Another draw-

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 on the fishing lodge for all the other anglers to look at with envy.

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back is the system's limited external monitor support. Many of today's notebooks support resolutions up to 1280 x 1024 with multiple number-of-color options up to 16.7 million. But the Contura allows you only standard VGA (640 x 480) with 256 colors, which is practically useless for working with graphics and page layout applications. This isn't the ideal notebook for a combination travel and desktop solution.

Unlike many other notebooks, the Contura does come with a great pointing device—a serial, side-mounted trackball. While this one isn't as convenient as the snap-in QuickPort MS Ball-Point trackballs used by some other notebook vendors, it's still large enough to be easy to use. Small, built-in trackballs are often difficult to manipulate; this one isn't.

Granted, the Contura 4/25c isn't on a par with some of the more recent DX4 notebooks with PC-MCIA expansion capability, large hard drives, and other valuable options, but it's a strong performer backed by a good company with an excellent support and warranty service record.

WILLIAM HARREL

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Circle Reader Service Number 443

MIG-29, HORNET

Spectrum HoloByte sets the skies ablaze with the release of MiG-29 and Hornet, two hot additions to the software company's impressive Electronic Battlefield series. MiG-29, available in two versions—a stand-alone model or an integrated add-on to



Strong, dependable, and relatively inexpensive, the Compaq Contura 4/25c boasts impressive performance and battery life.

the company's best-selling Falcon 3.0—sets a furious pace. Both of these versions offer advanced combat flight simulation fans the ability to pit these fearsome war machines head to head, either with remote modem play or with up to six pilots linked via a Novell local-area network. Whether you're flying solo or as part of a multiplayer squadron, it's an experience totally unique to this dynamic and exciting genre.

Veterans of Falcon 3.0 will feel right at home with the game's interface and main control panels. Just select Instant Action to jump right into the cockpit of the MiG-29 Fulcrum, the Soviet's most advanced fighter/bomber, for a no-frills, quick-and-dirty dog fight. This is also a great place for you to practice new combat maneuvers and other flight skills. Back in the War Room, you can choose Red Flag to run a series of training missions, each one carefully designed to hone one

of the many skills that you'll need to become an expert pilot. If you're an experienced player, you'll also want to use the Red Flag editor to design your own missions. Especially worth noting are the onboard flight recorder and the ACMI playback unit, which is a sophisticated training tool that you'll use for analyzing mission highlights from inside or outside of your aircraft.

Once you feel fully at ease with the abilities of the Fulcrum, take off in one of six multimission campaign scenarios, designed in counterpoint to selected theaters of conflict from Falcon 3.0 and its add-on mission disk, Operation: Fighting Tiger. Lead your Soviet squadrons against U.S., NATO, and Coalition forces in such hot spots as Iraq, Syria, Cuba, North Korea, and Pakistan. Remote or networked serial connections let you fly on opposite sides of the conflict or, even more exciting, as part of multipilot squadrons. Simply put, there's nothing else like this on the market. Should you choose to be a MiG-29 pilot, you'll enjoy a slight advantage in many areas because of the aircraft's extreme speed, agile handling, and stability during a high angle of attack. Other goodies include a sensational infrared tracking system that not only improves weapon accuracy but whose use of passive (nonradar) target acquisition also prevents enemy detection of missile or gun lock-on.

The third side to this scintillating series is Hornet, avail-

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Ohio man has 21-year tested formula to create multimillion dollar businesses from scratch, without bank loans, venture capitalists or selling stock

by John Whitehead

(CANTON, OH) A little over 21 years ago, a new entrepreneur, Benjamin D. Suarez, developed a true formula for making money called the Net Profit Generation System or NPGS.

With archaic conventional business methods which use primitive marketing mediums, it usually requires borrowing money or selling stock and takes 5 years to make a profit. With the NPGS it is possible to make a profit on a new business venture in a few months to a few hours and without borrowing or selling stock. No prior business experience is required. With the NPGS you can make money at the speed of light in "Cyberspace."

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Because of the NPGS, he is also one of the richest people in the nation. Unlike most other major entrepreneurs, he still owns 100% of his company and has no debt.

In 1978, Suarez wrote the best-selling book which revealed the NPGS formula, titled *7 Steps To Freedom — How to Escape the American Rat Race*. This book had over \$10 million in sales (\$20 million in today's money). This book created many other millionaires across the nation who used the NPGS to start new business from scratch.

Suarez has just completed a new revised book, *7 Steps To Freedom II — How to Escape the American Rat Race*, which includes many newly developed techniques learned over the past 12 years which make assembling a NPGS at least 10 times easier than it was in the 1970s. Readers will learn what no amount of present-day, formal education will teach them, even if they have numerous PHDs. They will learn how to make money.

With the NPGS Suarez found he could create new business from scratch at will. His company is now diversified into many different businesses.

The NPGS has been vastly improved since the 1970s. Included in these improvements is a software package developed by Suarez so a person can use a

personal computer to make assembling and operating a NPGS much easier. Also a PC enables you to use the ultra-fast, money-making medium Suarez calls ICECATS (Interactive Computerized Electronic Communications and Transaction System) popularly called "Online" and "Cyberspace."

You can produce a Net Profit Generation System from anywhere, your home, your office or while sitting on a beach on your vacation.

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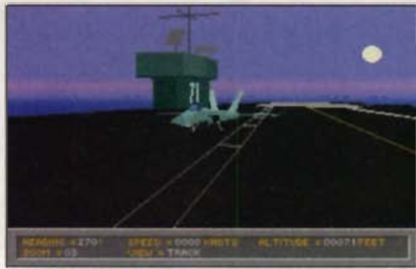
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REVIEWS



MiG-29 is a robust addition to Falcon 3.0 in the Electronic Battlefield series.

able only as an add-on accessory to both stand-alone versions of Falcon 3.0 or MiG-29. This one puts you in control of the F/A-18 Hornet, a multipurpose, fly-by-wire naval strike fighter. Somewhat similar in design to the F-16 Falcon, the Hornet is strictly carrier based. Though a superb air-to-air fighter, heavily used both for air defense and as a fighter escort, the Hornet's main area of expertise is air-to-ground missions, utilizing up to 15,500 pounds of deadly payload. In addition to duties as fighter escort and air defense, the simulation requires that you master carrier catapult launches and three-wire landings, complete with digitized voice communications with the on-deck Landing Signal Officer. The game follows the setup and control design of the previous titles and can be enjoyed alone or linked to Falcon 3.0 (as friend) and MiG-29 (as foe). In addition to two-player modem links, networked play can actually incorporate all three simulations. Hornet features only one theater of war, Bosnia-Herzegovina, but it's politically charged.

Both MiG-29 and Hornet come equipped with Spectrum HoloByte's typically outstanding documentation and support materials, including full-color campaign maps and quick-reference cards outlining HUD and cockpit layouts, as well as each game's extensive keyboard commands. The MiG-29 main manual weighs in at a hefty 491 pages, while the Hornet tips the scales at 110.

In combat culinary terms, MiG-29 serves as a robust addition to Falcon 3.0's main course, while Hornet whets the appetite for even greater glory. Those wishing to expand their Electronic Battlefield should consider MiG-29 a must-have and Hornet a should-get.

SCOTT A. MAY

Spectrum HoloByte
(800) 695-4263
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Circle Reader Service Number 444

TAKE-A-BREAK PINBALL FOR WINDOWS, EIGHT BALL DELUXE

Pinball is making a comeback, though not at your local arcade. A couple of new titles have hit the software shelves in recent months, each with a unique style of adapting the time-honored classic to your PC screen.

From Dynamix comes Take-a-Break Pinball for Windows, the only Windows-based game of the two and the one offering the most variety. Eight different tables complement the collection, each borrowing from a popular Sierra or Dynamix game. For instance, three "machines" have Space Quest themes, two have Nova 9, one has Leisure Suit Larry, and so on. Each table is visually superb, featuring cute animations (only in computer pinball can a flapping pterodactyl steal your ball), but music and sound effects are absent unless you own a Windows-compatible sound card, in which case they, too, are superb.

Pinball for Windows suffers from one fatal flaw: It's too hard to follow the ball. Because the game runs under Windows and displays the entire table on-screen, everything looks small. As a result, the tables look so colorful and complex that the ball gets lost. And while ball speed can be adjusted, even that doesn't do the trick. Pinball for Windows excels in every area except playability.

Amtex's Eight Ball Deluxe is based on the classic arcade game of the same name. Obviously, the game includes only one table, but what a stunning table it is! Everything is re-created in perfect detail, right down to the digitized voice: "Quit talking and start chalking." It looks, sounds, and even feels like the real thing, and the real Eight Ball Deluxe is one heck of a good pinball game.

Eight Ball Deluxe uses a scrolling playfield method. The combination of Shift key and space bar is employed for flippers and nudging, and up to four players can shoot.

It's also possible to control various game options, such as the playfield incline and the bumper voltage. The latter is important, because with the default settings, the ball gets bumpered down the side alleys almost every time. Once that's corrected, however, Eight Ball Deluxe is great fun and, like pinball, highly addictive.

Only one problem: Sometimes the game doesn't work. My machine perpetually locked up just seconds after loading the game. I fiddled with my memo-

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REVIEWS

ry manager, created a clean boot disk, even tried a different video card—all to no avail. Finally, I called Amtex's tech support and learned that the company is "aware of a lockup problem." Unfortunately, no solution was offered.

Luckily, the game worked flawlessly on a friend's machine, meaning it's pot luck for you. Hopefully, Amtex will have the problem worked out by the time you read this.

RICK BROIDA

Dynamix
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Take-a-Break Pinball for Windows—\$49.95
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Amtex Software
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AMBRA 486DX2-50 NOTEBOOK

The Ambra 486DX2-50 is a great example of the value available in notebook computers these days. For about \$2,000 (street price) you can get a screaming DX2-50 processor, a 200MB hard drive, and a 256-color dual-scan passive-matrix monitor.

The unit I tested had 8MB of RAM to assure it would perform COMPUTE's speed tests. The additional 4MB of RAM, which you really need if you plan to run WordPerfect for Windows or most graphics applications, will cost you an additional \$270.

In our BAPCo benchmark test (see this month's notebook roundup in Test Lab for a description of the test), this notebook ran about 85 percent as fast as the desktop 486DX-33 calibration unit. Granted, the Ambra machine sports a faster processor than the calibration computer, but there are several components in notebooks that cause them to run slower than desktops. The miniature hard disks in most portables don't run as fast as those in desktop computers, nor do the video cards. Some companies are now shipping notebooks with 32-bit local-bus video, which greatly enhances speed, but (as I write this) you can't get a local-bus notebook for less than \$2,000. (However, competition is stiff, and prices are falling almost as fast as my fingers can plunk out this review.) Still, this notebook is plenty fast enough for all but the most taxing graphics applications.

Equally impressive are the battery-life times turned in by the Ambra 486DX2-50. I ran a macro that per-

formed several common Windows functions, including accessing the hard disk often. Each of the four times I ran it, the battery lasted between 2½ to 3 hours. If all you plan to do is type or work with spreadsheets on the road, this one will get you through most flights. Neither application accesses the hard disk often, which conserves battery life.

The Ambra notebook has an easily accessible keyboard with an ergonomically correct wrist rest. You can type for a long time without fatiguing your arms and wrists, and all of the keys are located in the same positions they are on desktop keyboards, practically eliminating the need to hunt and peck. The trackball, unfortunately, is located by the screen behind the keyboard—an unnatural position from which to manipulate the pointer freely. I found myself resting my wrist on the keyboard while using the mouse, rendering the computer inoperable until I realized what was happening.

Another serious design flaw is the placement of the power button, which is right next to the left trackball button. More than once I inadvertently turned the machine off during my work, which, as you can imagine, can be disastrous. With this design, Ambra should have at least built in some kind of warning that allows you to back out of a shutdown. The Packard Bell Statesman, for example, gives you an opportunity to save your data before the machine powers down.

I also didn't care much for this notebook's small 8-inch screen. Many of the other dual-scan notebooks I've seen lately sport 9½- to 10½-inch LCDs. Notebook screens are hard enough to see; you need all the viewing area you can get. The screen on this one is adequate only for traveling. However, Ambra does offer a docking station for increased expansion, and you can hook the notebook up to an external monitor for 800 × 600 resolution with 256 colors. There's also a Type III PCMCIA slot for plugging in modems, sound cards, SCSI, and other expansion options. The slot holds one Type III card or two Type IIs.

This Ambra 486DX2-50 notebook provides raw speed, 256-colors, and expansion options galore at a great price. If you've been waiting for a good deal before buying a notebook, the wait is over.

WILLIAM HARREL

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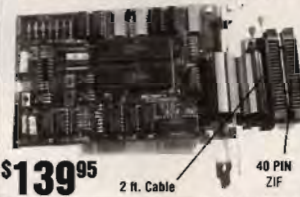
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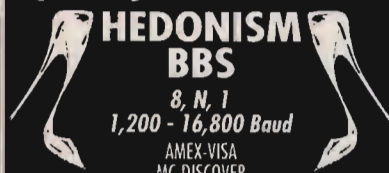
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On the Fast Track

Services should soon be speeding up for American veterans, as computer systems at 98 Veterans Affairs (VA) facilities are now contracted for upgrade. The existing VAX cluster computer systems are to be replaced with 64-bit DECpc AXP/150s, making for faster and more efficient data handling while maintaining compatibility with all VA operating systems. The \$27 million contract between the VA and Digital Equipment will make the Brooklyn VA Medical Center the fourth center to have this technology, which is slated for nationwide implementation.

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The Great Outdoors

Outside magazine, which reaches over 1.5 million active Americans, is projected to be offered online early in 1995, thanks to an agreement made with Starwave. The monthly magazine, which has been a staple for outdoor enthusiasts since the 1970s, will be offered on Ziff-Davis Interactive's Interchange Online Network.

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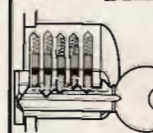


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NEWS & NOTES

Byron Poole

Safe at Home

If your kids are left at home to brave the savage elements without you, Digital Theater has a new toy to teach them how to hold down the fort. What Would You Do? At Home, the child safety multimedia adventure, is the first in an interactive series designed to teach kids how to handle tricky safety situations. There are eight lessons, each presented in a multimedia story where your child can create his or her own presentation. While encouraging creativity, these miniproductions can be played back (again and again), reinforcing the lessons learned. Lessons include what to do if a stranger comes to the door and if a neighbor's house catches on fire. Future categories in this series include What Would

Teach kids how to handle risky situations with the What Would You Do? series from Digital Theater.



You Do? First Aid, What Would You Do? School Days, and What Would You Do? On Your Own. Contact Digital Theater, 5875 Peachtree Industrial Boulevard, Norcross, Georgia 30092; (800) 344-8426, (404) 446-3580, (404) 446-9164 (fax).

Healthcare Solution

With all the talk about healthcare, it's about time for some emphasis to be put on

taking an active role in one's own health maintenance.

Great Bear Technology, which recently reduced prices in its Great Bear Software and Healthsoft product lines from \$69 and \$59 down to \$49, has introduced Family HealthTracker, an attractive Windows tool to help you stay on top of your health history. Arranged as a notebook that's separated into seven sections, Family HealthTracker assists you in keeping a diary of fitness activities, preparing a list of medical expenses for insurance and tax purposes, and maintaining a record of your child's allergies and vaccinations. You even get an address book and a collection of over 300 health resources to make dealing with medical problems easier. Inspiration is also part of the package: Advice provided by the program runs the gamut from encouraging you to eat better to recommending ways to reduce stress.

Contact Great Bear Technology, 1100 Moraga Way, Suite 200, Moraga, California 94556; (800) 795-4325.

Cybertrespassing

In an effort to bolster public trust in computing and information technology, a new nonpolitical entity has formed: the National Computer Ethics and Responsibilities Campaign (NCERC). Sponsors for NCERC include the Computer Ethics Institute, CompuServe, Merrill Lynch, the Software Publishers Association, and the National Computer Security Association. Peter Tippet, NCERC's cochair, says the group plans to explore "what is private or in the public domain; what constitutes theft, libel, and plagiarism; and how to deal with electronic versions of potentially controversial content such as pornography." Although NCERC doesn't officially take a stand

on any given issue, some of its sponsors are said to have already developed basic tenets of responsible computer use.

NCERC is available for organizations and individuals to provide the tools and resources necessary for responsible computer use. For more information, contact the National Computer Ethics and Responsibilities Campaign, 18054 Bluesail Drive, Los Angeles, California 90272-2901; 630-0836@mcimail.com (Internet).

Relativity

The approaching end of the twentieth century causes people to look to the future and to look back at the past. Naturally, an interest in genealogy goes along with a fascination with history. For help getting your own family history in line, Individual Software offers Family Ties for Windows. The program uses a note-card interface for ease of entry, with tabs popping up on the right side of the screen as new family members are added. You can print out up to five generations of information, and you can enter up to 2000 names, with a full page available to sum up each person's life. There's even room for divorces and second marriages. Special features include automatic notification when duplicate or conflicting information is entered and the ability to import and export data into GEDCOM (Genealogical Data Communications) format so you can transfer data from other genealogical programs.

A selling point for Family Ties is its extensive reference section with a suggested genealogy reading list and a list of archives, libraries, and genealogical centers nationwide. The list price for Family Ties is \$24.95. For more information, contact Individual Software (continued on page 116)

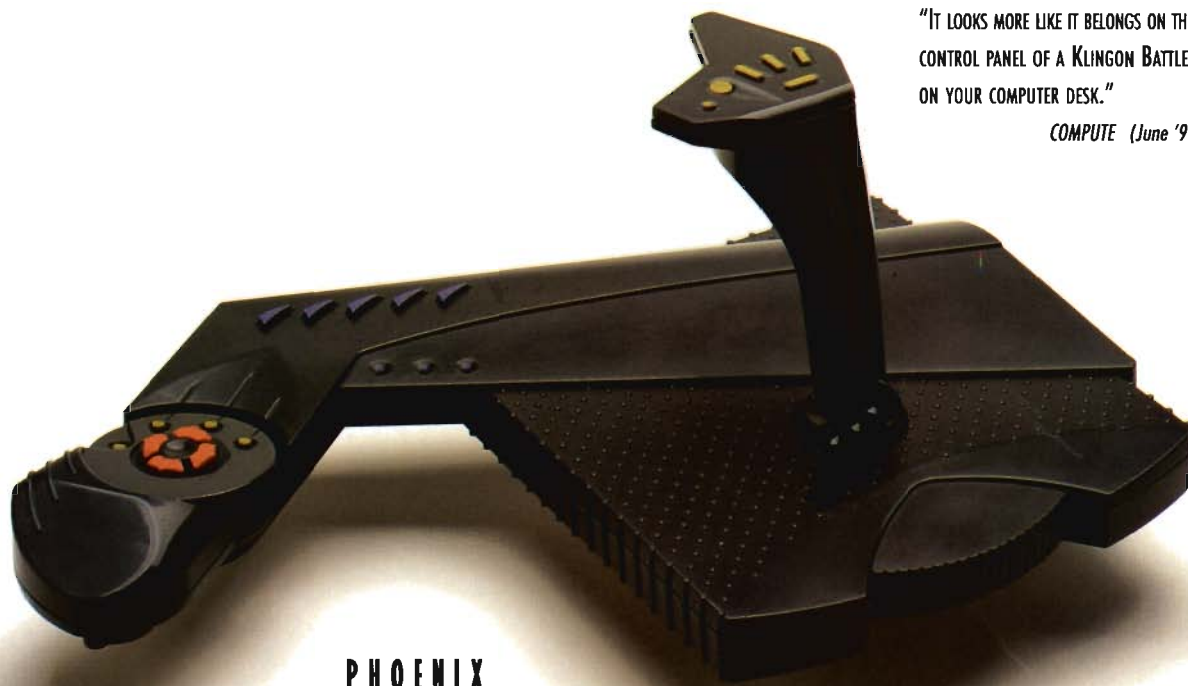
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