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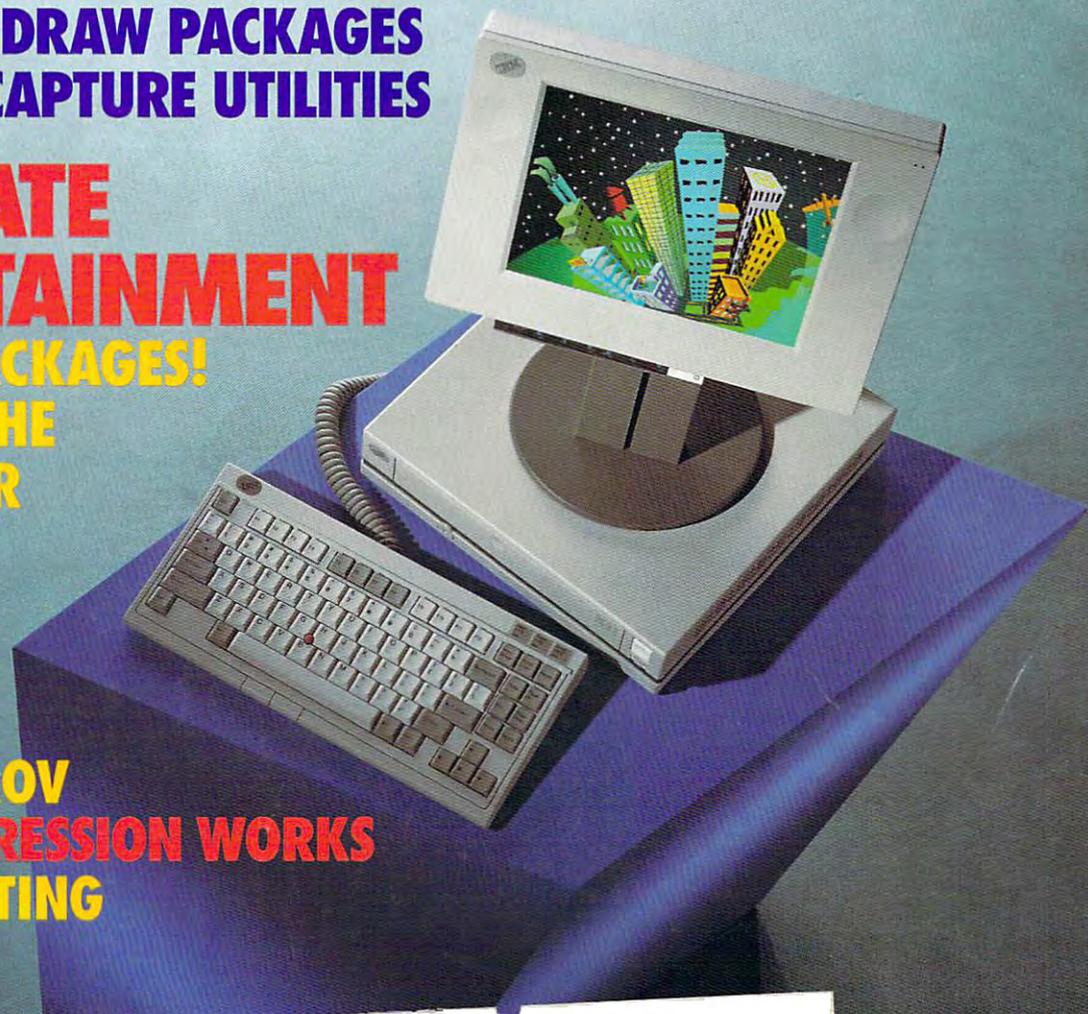
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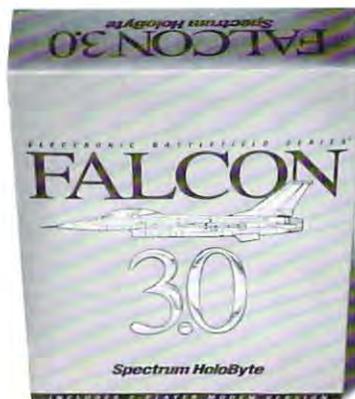
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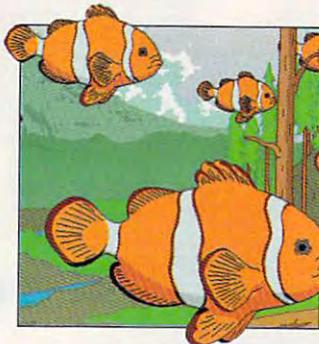
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Clifton Karnes

I have seen the future, and it has an IBM logo on it. This may sound strange given IBM's stormy past, but it's true. As most of you know, IBM didn't create the computer revolution, but in 1981 it intercepted the ball from Apple, Commodore, and Atari and carried it for a touchdown. The original IBM PC was a big win for IBM, which all but walked away with the entire PC game.

But in the late 1980s, IBM started to fumble. It repeatedly introduced hardware that was underpowered and overpriced. OS/2 1.0 was a fiasco, and the company's highly publicized separation from Microsoft left IBM out in the cold without a software partner.

But IBM has been bouncing

**In 1981 IBM
invented
the original PC.
This year it
reinvented it.**



back. With OS/2 2.1, it created an operating system that has intelligent design and delivers high performance. And the ThinkPad notebooks are a similar win for the company, setting new standards in performance, design, and price.

As superior as both of these innovations are, however, they pale beside IBM's latest hardware creation. This new PC from IBM points the way to the future so clearly, it almost takes your breath away. I'm talking about the PS/2 E—IBM's "green" PC, the machine on this issue's cover.

The PS/2 E (known simply as the E) is an innovation in several key areas. It conserves space, saves energy, cuts noise to near zero, and all but eliminates emf emissions.

The E's look is distinctive. The system box is only about one foot square and less than three inches high, bordered by a green band. The box's design is clean and uncluttered. On the front you'll see IBM's logo, an on/off switch, two small status lights, and a small panel. Where's the disk drive? Open the panel, and inside you'll find a 1.44MB floppy drive.

You'll find something else interesting inside: four PCMCIA slots. Instead of a traditional bus for hardware expansion, this PC uses PCMCIA cards. There are four bays which can accept either four Type 1 or Type 2 cards or two Type 3 cards (which are larger).

Open up the system box, and you'll find something else that's amazing. There's no fan. Since this PC runs on a low-power 50-MHz 486SLC2, there's no need for cooling, and as a consequence, there's no noise.

The machine also comes with 8MB of RAM and a 123MB hard disk (which is much too small).

The system unit's small footprint is matched by the keyboard's (there's no built-in numeric keypad, but one is available as an option). And the mouse is built into the keyboard. This is the same pointer used on IBM's notebooks, and although it takes some getting used to, it's quite serviceable. To move the mouse pointer, you press a small red button just below the G and H keys. The left and right mouse buttons are embedded in the keyboard below the space bar. You can use an external mouse if you prefer.

Atop the system unit you'll

find the E's most talked about (and expensive) feature: a beautiful 10.4-inch active-matrix color LCD monitor that features XGA graphics and resolutions up to 1024 x 768. The display can handle 65,000 colors and is crisp and fast. It's also a whopping \$3,000. If the LCD is too pricey, however, there's a low-power, low-emission CRT monitor available too.

When you boot up the E, you'll find yourself in the OS/2 2.1 Workplace Shell. If you're an OS/2 fan, you'll be right at home. And even if you're not, Windows 3.1 and DOS are just a couple of mouse clicks away. If you decide to bypass OS/2 altogether, you can move the WIN-OS/2 emulator or the DOS session to your OS/2 StartUp folder and land in either environment.

OS/2, however, is worth a look. It sports an attractive and full-featured interface that's more object-oriented and consistent than Windows 3.1.

Although the E is innovative in several areas, the heart of the machine is its power savings. Not only does this PC use less power than traditional ones, it has several power-saving features built in—just like most notebooks do. If the power-saving features are enabled, the E uses less power than a 60-watt light bulb. IBM estimates that an office running 100 Es would save \$2,000 a year in electricity, but money isn't really the object; it's saving energy and reducing emf radiation.

The E has the price tag you'd associate with cutting-edge technology (about \$5,330 with the flat-panel LCD display), but as more units are made with similar specifications, the price will surely go down. Meanwhile, think of this lean, sexy machine on your desk. The thought is sure to make you smile and sigh. □

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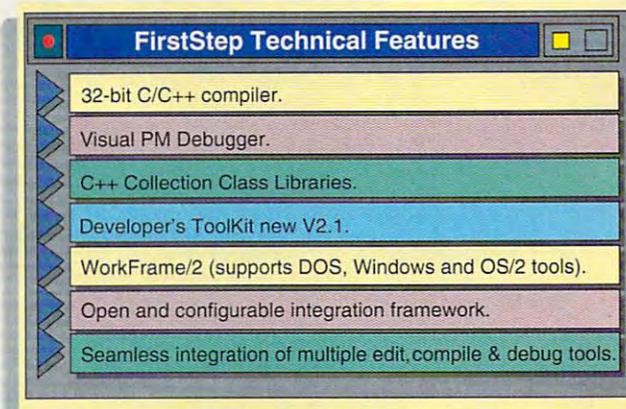
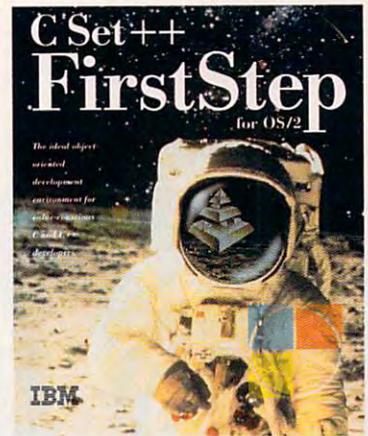


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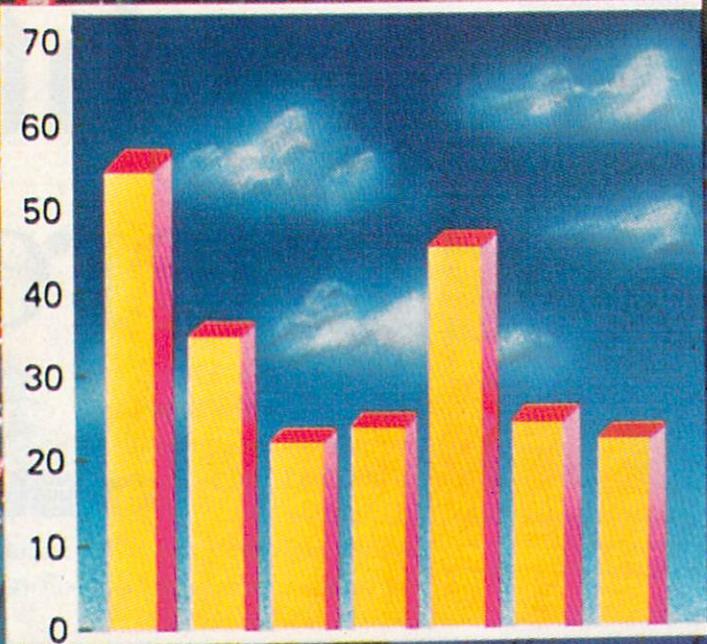
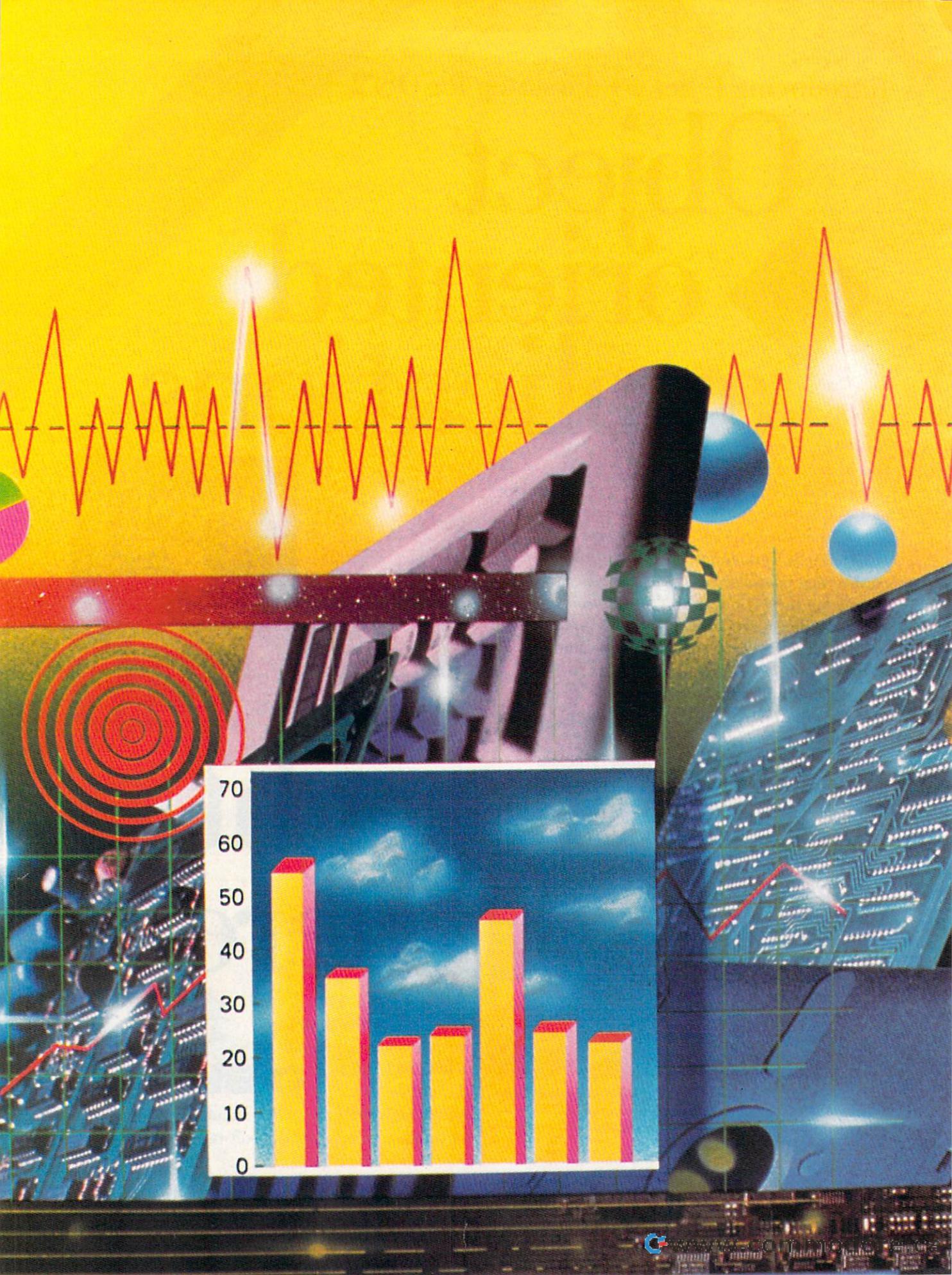
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WINDOWS:

TIPS FROM THREE WINDOWS ACES

BETTER,

THAT PUT THE WIN BACK IN WINDOWS

FASTER, MORE

BY TONY ROBERTS, DAN GOOKIN, AND CLIFTON KARNES

How can you make Windows more responsive and still enjoy the flexibility and power of the interface? Take control of icons, learn to make DOS windows more responsive, make memory do your bidding, optimize your interaction with your hard disk, and more. In this article you'll find tips that make Windows fly, tips that make Windows fun, and tips that make Windows phenomenal.

1 Reduce Font Load

If it seems as if your Windows applications take forever to initialize, your system may be suffering from font overload. Cut back on the number of active fonts in your system, and applications will load faster.

Although Windows 3.1 allows you to have hundreds of fonts active, doing so slows down program loading and slows down your work as you wade through font lists. The solution is to install only the fonts you use often plus those you need for specific purposes.

Perhaps the best way to manage fonts is with FontMinder 1.1 (Ares Software, P.O. Box 4667, Foster City, California 94404-4667; \$79.95). This utility lets you group fonts that you use for specific projects in font packs. When you go to work on the company newsletter, simply drag in the fonts for that project. Once the newsletter is published, just drag those fonts out.

If you work with hundreds of fonts, FontMinder is the one utility that can help keep you sane.

2 Create Icons for Control Panel Selections

Control Panel contains a handy collection of utilities, but most people frequently use only one or two—maybe Printers or Desktop. To get where you're going faster, you can run your favorite Control Panel directly.

While in Program Manager, select File, Run. In the Command Line box, enter the command *control printers*. Control Panel will load and automatically start the Printers utility.

Better yet, create a special Program Manager icon to run any Control Panel utility directly. First, select File, New, Program Item; then click on OK. In the Command Line box, enter *control printers*. Next, select Change Icon, Browse. Then select the WINDOWS\SYSTEM subdirectory and in the File Name box enter *main.cpl*. Select the printer icon and click on OK. Select OK again to close the Program Properties dialog.

3 Start Screen Savers from an Icon

Windows screen savers are great for covering up your work while you turn your attention elsewhere, but there's no apparent way to start a screen saver on demand—you have to wait until the time delay occurs.

Here's how to start a screen saver from an icon.

Using NotePad or SysEdit, open up your WIN.INI file. Locate the Programs= line and type *scr* at the end of it. Restart Windows so this change takes effect.

Now, create an icon for your saver by selecting File, New, Program Item.

To see the filenames for screen savers on your system, select Browse and enter **.scr* in the File Name box. Select one of the savers, and its name will appear in the Command Line box. Add a */s* switch to the end of the command line, and click on OK.

Now you can start a screen saver immediately by double-clicking on its icon. If you want to change the screen saver's configuration, go through Control Panel as usual. If you want to start the saver with a hot key, edit the icon's properties to include a hot key.

4 Shift into High Gear

The Shift key is more powerful than it looks. Here are three Shift-key tricks.

- Hold down the Shift key when starting an application. The program will run, but it will be minimized.
- Hold down the Shift key when starting Windows to prevent the programs in your StartUp group from loading.
- Hold down the Shift key as you double-click on the Control-menu box to save your Program Manager settings without exiting from Windows.

5 Assign a Hot Key to Program Manager

How would you like a hot key that would get you back to Program Manager from wherever you are?

Open your StartUp group and select File, New, Program Item to create a new icon for Program Manager. Enter *progman.exe* in the Command Line box, and specify your preferred hot-key combination in the Shortcut Key box. Ctrl-Alt-Shift-P is a possibility.

At this point, you can further personalize your desktop if you like by adding some custom text in the Description box. For example, try typing in *Bob's Desktop* or *Tony's Analytical Engine*.

Click on OK to close the Program Properties dialog and double-click on the newly created icon to install your changes and activate your hot key. Because the new icon is in the StartUp group, your changes will go into effect every time you start Windows. Don't be concerned that this tip will leave you with multiple copies of Program Manager floating around. Program Manager is a single-instance application. If the program is already running when you try to run it, it merely becomes active rather than starting up a second copy.

6 Eliminate Group Clutter

Almost every Windows application wants to create its own Program Manager group. Before long, you'll be swimming—or perhaps

drowning—in groups.

Create a more efficient workspace by putting the icons for all of your most-used applications in one Master group. Close all other groups, and then select Window, Tile to make your Master group fill the screen. This will allow you to perform most of your work without opening and closing a lot of groups.

Further reduce the group clutter by moving similar programs from their native groups to groups created based on function. For example, put all of your telecommunications icons in a Telecommunications group.

7 Reorder the Group List

You can open a Program Manager group that's not visible by selecting Window and then clicking on the name of the group from the numerical list. However, if you have several groups, your most-used groups may not appear at the top of the list. You can change the settings in the PROGMAN.INI file to make sure the groups you want are at the top.

First, make a backup copy of PROGMAN.INI; then load PROGMAN.INI into a text editor such as Notepad. The file includes a Settings section and a Groups section. Groups lists all of the groups you have created and assigns each a group number.

In the Settings section is a line that begins *Order=* and then lists a series of group numbers. To change the position of a group on the Window menu, place the group's number in the desired position on the *Order=* line. Restart Windows for the change to take effect.

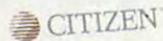
8 Can't See the DOS Error Message?

Sometimes when you're trying to run a DOS application from Windows, all you see is one flash of the DOS screen before the DOS box exits and returns to Windows. There's an error message there, but your eyes aren't quick enough to see it.

To get a good look at the error message so you can figure out what to correct, you need to edit the PIF file that controls the DOS application. Run Pifedit and load the appropriate PIF file. If the application has no specific PIF file, load *_DEFAULT.PIF*.

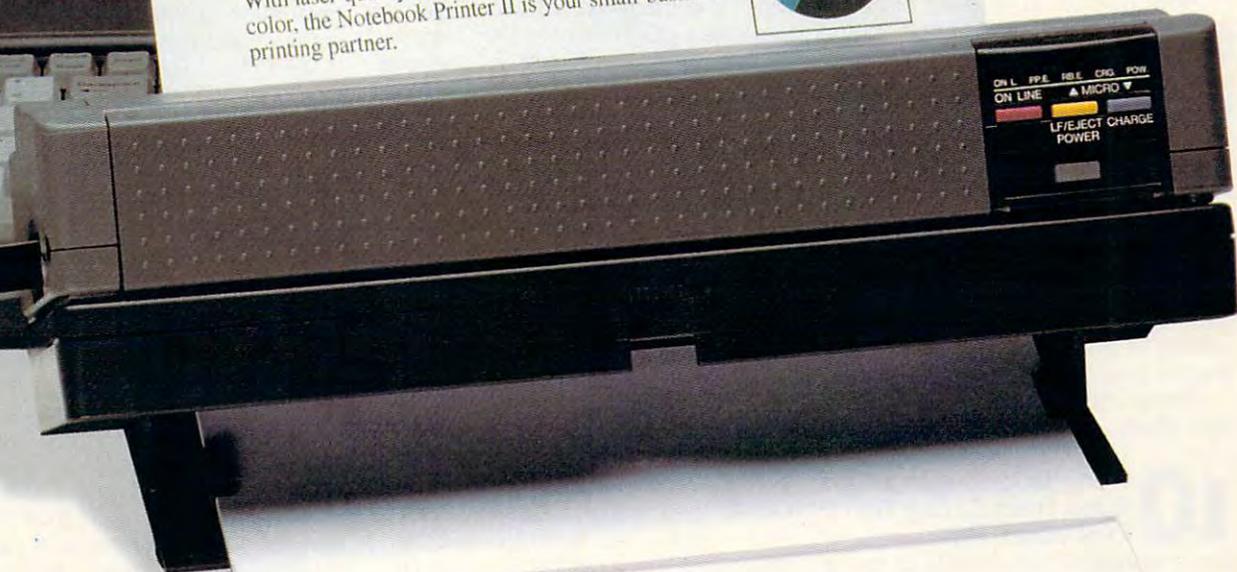
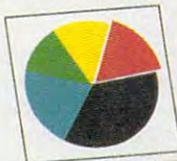
Deselect the Close Window on Exit item, and save the modified PIF. This leaves a DOS window open so you can read any error message that may have been created. Rerun the problem program, and take whatever steps are necessary to correct the problem.

When everything is working smoothly, reopen the PIF file and select Close Window on Exit.



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9 Icon Spacing

You can pack more icons into a smaller space by changing the spacing between them. To do this, open Control Panel and select Desktop. In the Icons section, reduce the spacing setting to bring the icons closer together. A setting of 60 works well. While you're at it, make sure the Wrap Title option is selected so that long descriptions will be wrapped into two or three lines.

Now, go back to Program Manager and select Window, Arrange Icons. Your icons will be nestled a little closer together, but the vertical spacing between rows of icons will be unaffected. Unfortunately, you can't change that setting from Control Panel. You'll have to edit WIN.INI to make that change.

Open WIN.INI with SysEdit or Notepad and search for the [Desktop] section. Look for a line that begins IconVerticalSpacing=. Change the setting in that line to 75. If the line doesn't exist, go ahead and add it.

Restart Windows for the change to take effect.

10 Keep DOS Applications from Eating Up Processor Time

Many Windows users like to run a DOS session and leave it minimized on the desktop so they'll have quick access to the command line to execute DOS commands.

Although you'll rarely attempt to multitask such a DOS session, Windows doesn't know that, so it spends some of its time checking to see if there's any background work that needs to be done in that session.

You can save Windows some effort and speed up your other applications by editing the PIF file that runs your DOS session (usually DOSPRMPT.PIF) to reduce background priority.

Run Pifedit and open the appropriate PIF file. Click on the Advanced button and change the background priority to 1—the lowest possible setting. Save your changes.

Now you can keep your DOS icon minimized on your desktop, but Windows won't worry about checking in with the DOS session as often.

If you ever do need to increase the background priority for a specific reason, you can do it on the fly. If your DOS session is running full-screen, press Alt-space bar to make it a windowed session. Then select the Control-menu box in the upper left corner and choose Settings. Increase the background priority as needed to give the DOS session a greater share of the system's attention.

11 Always Use the Latest Device Drivers and TSRs

Microsoft is constantly improving some of the core device drivers and TSRs used to make Windows a pleasant place. Three of the most important are HIMEM.SYS, EMM386.EXE, and SMARTDRV.EXE. These must always be up-to-date for you to get the most from Windows. The rub is that both DOS and Windows come with these files, so you should use whichever versions of the files have the latest date. If you've just upgraded DOS, then the DOS versions of the files would probably be the most recent.

12 Manage Your Memory

Windows needs oodles of extended memory to run properly. You should configure your PC so that all of its excess memory is of the extended type. To do this and to get the most from Windows, you need to have a good memory manager installed. DOS 5 and 6 come with the programs to do this job, and third-party programs such as QEMM/386 and 386Max are more than up to the task.

With DOS 6, you prepare memory by running the MemMaker program. QEMM/386 uses the Optimize utility, and 386Max has a program called Maximize. These utilities will configure your PC's memory to work best with Windows by controlling extended memory and loading device drivers and TSRs into upper memory, thereby saving precious conventional memory for those programs that need it. This is all complex and heady stuff, but the memory configuration programs make it painless—and a chore you may need to do only once.

13 Use SMARTDrive or a Similar Disk-caching Program

Next to the printer, your disk drives are probably the slowest things Windows has to contend with. Even though your hard drive may be slippery fast, it can be made to work even faster by installing a disk-caching program. DOS comes with such a program, SMARTDRV.EXE, the SMART-Drive disk cache. Third-party disk caches are also available.

The disk cache you use will improve disk operations by storing disk information in memory. Since most information on the disk is read repeatedly, the disk cache speeds up operations by having Windows read the information from memory instead of the relatively slower hard drive. This can improve Windows' performance drastically—especially on systems with ancient hard drives.

14 Avoid RAM Drives

RAM drives are handy tools for speeding up some DOS programs, and they make wonderful temporary storage areas. However, when you use Windows, the memory you sacrifice to a RAM drive is wasted.

Windows craves memory. It eats it all up and then wants more. Whatever memory you devote to a RAM drive is lost to Windows.

The only exception here is if you have a ton of RAM—16MB or more. If so, then you can spare memory for a RAM drive. Even then, Windows would probably rather have all the memory for itself.

15 Avoid DOS Device Drivers and TSRs

Some of the device drivers and memory-resident programs you load in CONFIG.SYS or AUTOEXEC.BAT may be unnecessary for Windows—hogging memory that Windows would rather have for itself.

For example, there is no need to load the ANSI.SYS device driver when you use Windows. The command line-editing program Doskey isn't needed. Windows comes with its own mouse driver, so any MOUSE.SYS or MOUSE.COM commands can be resected as well. And if you're using the SMARTDrive disk cache, you can dispense with the Fastopen command. Just edit these lines from your CONFIG.SYS or AUTOEXEC.BAT file, and Windows will gladly gobble the memory they took.

There is an exception to this rule. If you run a DOS program in Windows and it requires a TSR, such as the mouse driver, then you should load it before Windows starts. However, if DOS programs are a thing of the past for you, then definitely get rid of the excess baggage.

16 Create a Permanent Swap File

Windows runs best in the enhanced mode, its preferred modus operandi for 386 and 486 PCs. And it runs better if you've created a permanent swap file, which Windows can use to boost your overall memory situation.

The permanent swap file is a large file on disk that Windows uses for storing information. You create it from the Control Panel; start the Control Panel and click on the 386 Enhanced icon and then the Virtual Memory button. If you have a permanent swap file already, statistics about it will appear on the screen. Otherwise, click on the Change button to create a permanent swap file for your system.

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should be about 2MB in size. If you have a lot of memory in your PC (8MB or more) or you run complex graphics programs, consider a larger permanent swap file (say, 4MB).

17 Optimize Your Hard Drive

Regularly optimizing or defragmenting the hard drive will improve any PC's performance, especially a Windows system. The idea is to check all the files on your hard drive and patch up any that are fragmented. Files get fragmented as DOS tries to make the best use of disk space; larger files are split into smaller pieces to fit on the disk. It means you can store more stuff, but the fragmented files take longer to save and load since DOS has to keep track of the pieces.

Optimizing your hard drive is done in two steps, both of which should be accomplished before you start Windows. The first is to run DOS's Chkdsk program. This checks for lost clusters on the hard drive. If Chkdsk finds any, run the command again, but specify the optional /f switch. Then delete all the FILE*.CHK files Chkdsk recovers. (You'll probably want to delete them. The odds against their containing useful data are astronomical. When in doubt, load them into a text editor before deleting them.) After that, run a defragmentation program, such as Norton's SpeedDisk, PC Tools' Compress, or DOS 6's Defrag.

It's important to note that optimization isn't voodoo. It doesn't automatically make your PC run faster. Before you optimize, check the percentage of fragmented files. If it's below 10 percent, optimization isn't necessary.

18 Avoid Starting Too Many Applications with Windows

A lot of Windows utilities may automatically start themselves when Windows starts. When this happens, it takes you longer to get to work, since Windows spends a goodly amount of time running all those utilities and other programs. The way to stop this is either to remove some of the programs from the Program Manager's StartUp group or to edit the WIN.INI file and remove some of the files in the [Windows] section by the load= and run= prompts. The second method requires a little more Windows savvy, so you might want to consult with a guru before attempting it.

Note that some of the programs automatically loaded by Windows may be very necessary. For example, a screen saver or font manager is a good thing to have loaded. But start-

ing the Clock or File Manager or other tools just slows down Windows.

19 Run Your Applications Full-Screen

Windows is about, well, windows. Your applications run in their own windows on the screen. And while it's fun to see both Excel and Ami Pro at the same time, it's more work for Windows to keep everything sane. You'll find your applications run better when they're maximized to fill the entire screen. (Another benefit of running your applications full-screen is that you see more of your work.) To do this, click on the Maximize button (the up-pointing triangle) in the upper right of every application window. Or drop down the Control menu (on the upper left of every application window) and select the Maximize item.

20 If You're Running Only One Windows Application, Run It in Standard Mode

Quite a few Windows PCs are set aside to do only one thing. Some may be running just WinWord or another word processor. Others may be order entry workstations running a database. If so, you'll see an improvement in performance if you start Windows in standard mode; type *win /s* at the DOS prompt to select standard mode.

The advantage here is that Windows runs without loading the overhead it needs to work with multiple programs in enhanced mode.

21 Close Applications You're Not Using

You don't have to quit a program to stop using it in Windows. If you tire of WinWord, you can minimize the program and switch over to your Games group for another two hours of Solitaire. Then you can easily switch back to WinWord when the boss lumbers by. While this is what multitasking is all about, having WinWord running drains power from Windows.

Some users will have a whole row of minimized applications lined up at the bottom of the desktop. Each of those applications draws on Windows' resources, impeding system performance. If you're truly going to stop work on a program, then exit it instead of switching away.

22 Use a Plain Desktop Pattern

Falling leaves, interlocking Escher patterns, and comic-book heroes often provide the backdrop for Windows' desktop. But these graphics occupy memory and take time to paint

on the screen. If you're willing to sacrifice beauty for performance, then use the Control Panel's Desktop item to give Windows a plain background. This uses less memory and makes Windows screen redraws faster.

23 Switch to Lower-Resolution Graphics

Just because your Super-DuperVGA card can support a zillion-by-zillion graphics resolution doesn't mean you have to use it. The higher resolutions Windows supports use more system resources and take longer for Windows to manage. To recover some of your performance losses, switch Windows to a lower graphics resolution, which is probably supported by your video hardware. In fact, the boring old VGA resolution is the fastest of the lot. It's also easier to read a 640 x 480 or 800 x 600 screen than screens of higher resolution (particularly if your eyes are over 40).

24 Print to a Networked Printer

The slowest part of any computer setup is the printer. No matter how fast the printer, data slows to a crawl as it's transferred to paper. One solution is to use the Print Manager to handle printing. But better than that is to print to a network printer. You'll see files virtually fly off the screen, seemingly printing in an instant. Don't get too excited, however. Your printout is just waiting elsewhere on another computer that's having to toil with printing. But in the meantime, you've wrested control of Windows and can get on with something else. (Needless to say, this trick doesn't work if you don't have a network or a network-designated printer.)

25 Reinstall Any Windows Program Without Running Setup

There are many times when you need to reinstall just one program, file, or group of files from the Windows distribution disk. You usually can't do this without reinstalling all of Windows again.

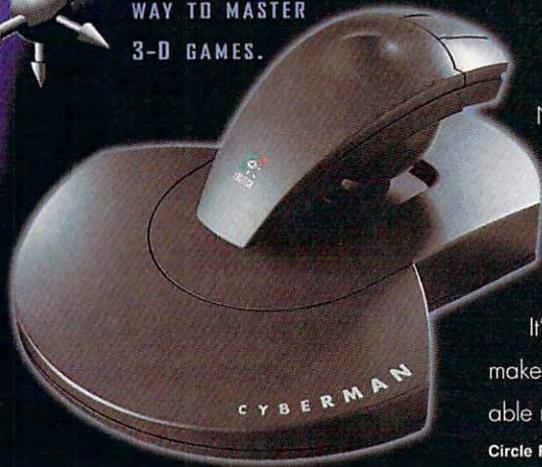
The solution is to decompress the files on the Windows distribution disks.

1. Find the EXPAND.EXE program on the Windows distribution disks. (It will probably be on disk 1 or 2.)
2. Copy EXPAND.EXE to your WINDOWS subdirectory.
3. You'll notice that most of the other files on the disk have extensions that end with an underscore (for example, WINHELP.EX_, MOUSE.DR_, and so on). These are compressed files. (Note that in early versions of Windows, the

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compressed files ended in EXE, but they were not executable.)

4. To decompress one of these files (for example, WINHELP.EX_), type *expand a:winhelp.ex_ c:\windows\winhelp.exe*. C:\WINDOWS\WINHELP.EXE is the executable file you're creating.

26 Run a Specific Recorder Macro

Many times, you want to run Recorder and have a specific macro execute. You won't use it often, but Recorder has a hot-key switch.

1. Make sure your macro specifies a hot key.
2. On the command line, put *recorder -h hot key filename.ext*, where filename.ext is the name of the Recorder macro and hot key is the key combination that normally runs the macro.

For the hot key, use the following symbols, plus the key name.

Key	Symbol
Alt	%
Ctrl	^
Shift	+

For example, if your hot key is Shift-F10 and your macro file is named MYMACROS.REC, you would type *recorder -h +f10 mymacros.rec*.

27 Create New Colors

Most people don't know the RGB values for colors, even the basic ones, and when you need to supply the RGB value for a color, you usually find yourself behind the eightball (RGB value 0, 0, 0). The solution is to use the color selector in Control Panel.

1. Run Control Panel and double-click on the Color icon.
2. Press the Color Palette button and press the Define Custom Colors button.
3. In the Custom Color Selector dialog box, you'll see a matrix of all of the available system colors. You can select one with the mouse and see its RGB values in the three text boxes on the right side of the dialog box. When you find the color you want, simply write down its RGB value.
4. When you're finished using the Custom Color Selector, click on Close and Cancel.

You can use these RGB values to specify colors in Windows Paintbrush, for example. Double-click on a color in the palette and enter the RGB values in the dialog box that appears.

28 Delete Unnecessary Files

Windows requires a large investment in disk space, which you may not be able to afford. You can ease this problem by deleting unnecessary files.

1. Run File Manager and move to your WINDOWS subdirectory.
2. You can safely delete any of the following files, provided you don't need the applications.

- *.BMP (These are bitmap files—probably wallpaper.)
- *.SCR (These are screen saver files.)
- CALC.EXE, CALC.HLP (Calculator and its help file)
- CALENDAR.EXE, CALENDAR.HLP (Calendar and its help file)
- CARDFILE.EXE, CARDFILE.HLP (Cardfile and its help file)
- CLOCK.EXE (Clock)
- MSDOS.EXE (the MS-DOS executive)
- PBRUSH.EXE, PBRUSH.DLL, PBRUSH.HLP (Paintbrush, its DLL, and its help file)
- RECORDER.EXE, RECORDER.DLL, RECORDER.HLP (Recorder, its DLL, and its help file)
- REVERSI.EXE, REVERSI.HLP (Reversi game with its help file in Windows 3.0)
- WINMINE.EXE, WINMINE.HLP (Minesweeper game with its help file in Windows 3.1)
- SOL.EXE, SOL.HLP (Solitaire game with its help file)
- TERMINAL.EXE, TERMINAL.HLP (Terminal and its help file)
- WRITE.EXE, WRITE.HLP (Write and its help file)

29 Edit PROGMAN.INI

Here's the scenario: Windows boots, and one or all of your groups are lost. You can fix problems like this if you know how to edit PROGMAN.INI.

1. Run Notepad and load PROGMAN.INI (you'll find it in your WINDOWS subdirectory).
2. The file has two sections, [Settings] and [Groups], with the following form.

```
[Settings]
Window=-4 0 801 528 1
SaveSettings=1
```

```
[Groups]
Order= 7 1 5 4 3 2 8
Group1=C:\WINDOWS\MAIN.GRP
Group2=C:\WINDOWS\ACCESSOR.GRP
Group3=C:\WINDOWS\GAMES.GRP
```

```
Group4=C:\WINDOWS\STARTUP.GRP
Group7=C:\WINDOWS\UTILITIE.GRP
Group5=C:\WINDOWS\QCWIN.GRP
Group8=C:\WINDOWS\APPS.GRP
Group9=C:\WINDOWS\WPW51US.GRP
```

3. If your groups are still in your WINDOWS subdirectory but they don't appear in PROGMAN.INI, simply add them, following the form *Groupn=C:\WINDOWS\GROUPNAME.GRP*, where n is the number of the group.

30 Re-create Windows Default Program Groups and Icons

It's often necessary to know the default arrangement Windows used when it installed your groups and icons. The solution: Run Setup with the /p parameter.

1. From Program Manager, choose File, Run, and type *setup /p*.
2. Click on OK.

Running Setup/p will re-create your default groups and icons, but if there are just a few items out of place, you may want to do it yourself. Here are the groups and icons Windows 3.1 installs.

Main	MAIN.GRP
File Manager	WINFILE.EXE
Control Panel	CONTROL.EXE
Print Manager	PRINTMAN.EXE
Clipboard	CLIPBRD.EXE
MS-DOS Prompt	DOSPRMPT.PIF
Windows Setup	SETUP.EXE
PIF Editor	PIFEDIT.EXE
Read Me	README.WRI
Accessories	ACCESSOR.GRP
Write	WRITE.EXE
Paintbrush	PBRUSH.EXE
Terminal	TERMINAL.EXE
Notepad	NOTEPAD.EXE
Recorder	RECORDER.EXE
Cardfile	CARDFILE.EXE
Calendar	CALENDAR.EXE
Calculator	CALC.EXE
Clock	CLOCK.EXE
Object Packager	PACKAGER.EXE
Character Map	CHARMAP.EXE
Media Player	MPLAYER.EXE
Sound Recorder	SOUNDREC.EXE
Games	GAMES.GRP
Solitaire	SOL.EXE
Minesweeper	WINMINE.EXE
StartUp	STARTUP.GRP

Initially, there are no files in the StartUp group. □

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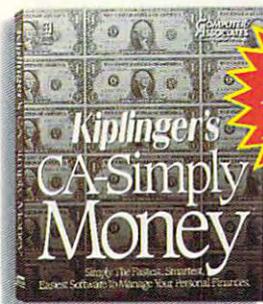
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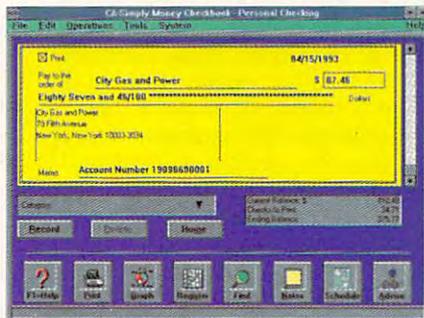
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TEST LAB

Edited by Mike Hudnall
Reviews by William Harrel

Not long ago, graphics artists and desktop publishers believed that using a Macintosh was the only way to create quality logos, brochure covers, and other graphics—especially full-color drawings. And that may have been true, once. But the Windows draw programs covered in this month's Test Lab have closed the gap.

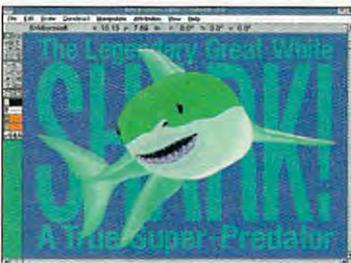
Until Windows 3.0, PC users were hard-pressed to create sophisticated full-color drawings on their PC-based equipment. The areas where designers need the most strength—display, type control, and printing—were all lacking in power. Now there are high-color and true-color video, Adobe Type Manager and TrueType font rendering, better PostScript printer drivers, color printers priced at under \$3,000, and finally, a crop of excellent drawing programs that exploit the potential of Windows.

Of the ten programs reviewed here, some are full-featured applications that can perform almost any graphics function you can think of (and some you couldn't imagine), some are economy packages, and some are specialized illustration packages.

All of these packages claim ease of use—but *ease* is a relative term here. If all you want to do is to create monotone logos and graphics for stationery or a newsletter, or full-color images for your monitor, then learning to use any of these products is easy. However, taking one of them (especially one of the high-end products) to its full potential requires much more than mastering the rudiments of the program. You must, for example, understand several prepress and commercial printing practices, such as color separations, knockouts, trapping, overprinting, and printing to film on a high-resolution imagesetter. These concepts and others,

such as halftoning, fall within the realm of the graphics artist and designer. Learning them is nothing like falling off a log.

All ten programs were tested on a 33-MHz 486 with 20MB RAM, a 24-bit display adapter, and a high-resolution 19-inch monitor. Drawings and separations were printed on both a 300-dpi laser printer and a 1270-dpi Linotronic 330. Not all of the programs require this much muscle, but the high-end programs—CorelDRAW!, Micrografx Designer, Adobe Illustrator, Aldus FreeHand, Professional Draw, and Arts & Letters Graphics Editor—really do perform better on a high-



speed CPU with plenty of RAM and a graphics accelerator. The others—Aldus IntelliDraw, Arts & Letters Apprentice, Graphics Works, and Visio—all run well on a 386.

In one way or another, all of these programs let you achieve the same end—camera-ready art. But they take you to that end with varying degrees of efficiency and using different sets of priorities. This is especially true of the advanced products. A few, for example, offer automated draw options for warping or creating 3-D objects. Others concentrate more on full-color prepress output, with features such as monitor calibration and enhanced PostScript separations. Which one is best for you? It depends on your needs. Monitor calibration and enhanced printing, for example, ensure greater color control and fewer prepress mishaps. Automatic drawing features can save hours—especially if you

don't know how to draw special effects manually.

All of these programs, except Visio and IntelliDraw (which handle drawing much differently), have the following features in common:

- Bézier curve editing. You can add multiple handles (or nodes) to lines and contour line segments independently for precise drawing and editing.
- Gradient and radial fills. These involve the fading of one color gradually into another. All programs do this automatically.
- Fitting type to a path. This is the aligning of text along a curve or other shape. When done manually, this can be an extremely time-consuming process.
- Tracing bitmaps. This involves turning bitmaps into vector drawings for easier editing and high-resolution printing. (The two scaled-down packages do not have this feature.)
- Clip art libraries. These are canned images you can use as is or edit as needed.

There are, of course, many other common features, such as the ability to align objects on grids or in relation to other objects. Most programs let you draw various shapes or blend one object into another.

Another important feature that most of these programs support is the ability to lock and control multiple layers, or "layering." If you've ever tried to create an image made up of several stacked elements, you will appreciate this feature. With it, you can lock layers into place, name them for easy selection, hide them, copy their attributes to other layers, and so on. Without layering, it can be very tedious to create complex drawings with many overlapping elements.

These are all very good programs, but some are more suited to certain applications than others. A few, for example, excel at giving those of us who are not artistically inclined the ability to draw—and draw well. Others

work better for graphics artists who already know how to draw. Visio and IntelliDraw make creating diagrams and floor plans a snap. And so on.

One problem with trying to categorize these products is that there is such an overlap of features. But here goes: If you are a graphics artist with strong drawing skills and prepress knowledge, you will get the most from Designer, Illustrator, or Free-Hand. If you don't draw and need automated drawing features, consider Arts & Letters Graphics Editor, Professional Draw, or CorelDRAW!. For blueprints, floor plans, and diagrams, check out IntelliDraw or Visio.

The two low-end draw programs are great for creating color or computer-screen drawings or monotone graphics for newsletters and reports. However, if you are not artistically inclined, you should probably choose one of the programs that support automatic perspective and three-dimensional effects.

Whatever your needs and abilities, this month's Test Lab has information that should help you understand Windows draw software and choose the product that's best for you.

WILLIAM HARREL

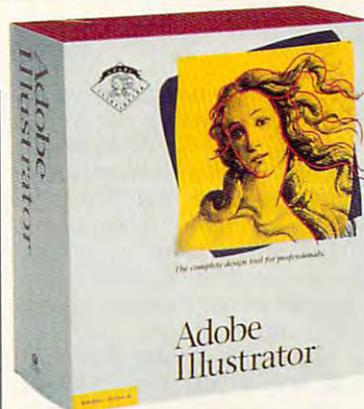
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ADOBE ILLUSTRATOR 4.01 FOR WINDOWS

Adobe Illustrator 4.01 for Windows is a serious design and illustration package for professionals; it's not for the occasional brochure or newsletter publisher. It takes some dedication to learn to use, but once you master it, there's nothing you can't do.

The Windows version of this program, which is also popular on the Mac, installs easily. There are far fewer clip art symbols and borders (325) and Type 1 fonts (40) bundled with this package than with the other packages. What Illustrator delivers is power. It supports both monitor calibration and enhanced separations (via Adobe Separator), and the program has some highly advanced



text-formatting features, such as automatic column flow and sculptured text wraps. Only CorelDRAW!, Professional Draw, and Designer (and desktop publishing software) offer as much formatting control.

Illustrator comes with a full-featured, data-driven overlay for making charts that (though a little slow) eliminates the need to go elsewhere to include professional graphs in your drawings and publications. It supports numerous color models, including CMYK, RGB, PANTONE, FocalTone, Toyo, and TruMatch—all built-in.

Text can be fitted to a curve with Illustrator or with a separate utility, Adobe TypeAlign. TypeAlign allows you to do stupendous special effects with text, such as stretching, warping, adjusting perspective, and creating 3-D effects. However, it works strictly with text (no other objects), and you must import your creations or bring them in on the Clipboard. With either method, you cannot edit the text once it is in Illustrator.

An important strength of Illustrator is that it creates its images in PostScript format. Although all the others allow you to export drawings in PostScript, it is Illustrator's native format. The advantages are many, including compatibility with almost every other draw, desktop publishing, word-processing, and presentation program available, not to mention desktop publishing service bureaus. And even in the best of



TEST LAB

the other draw packages, exporting to EPS format is not always foolproof. With CorelDRAW!, for example, you can sometimes export a file to EPS and then, upon trying to import it back into CorelDRAW!, get an *inappropriate file format* error. I have had or heard of similar experiences with some of the others.

Illustrator's technical support was easy to reach (surprisingly, since Adobe is such a big company), and the technician knew his product well. Again, if you want to create simple graphics to include in newsletters, or on-screen, or in slide presentations, you should probably choose something that's easier to use. In fact, only one other program reviewed here, Aldus FreeHand, has as high a learning curve as this one.

Illustrator is still a little slow in places, such as in screen redraws, and its font and clip art selection are limited. But if you plan to do desktop design at this level, you probably already have a bunch of fonts and are not really concerned with clip art. If you're serious about graphics design, Illustrator is worth spending the time to master.

Circle Reader Service Number 371

Aldus FreeHand 3.1
Minimum requirements: 386 PC, 4MB RAM, high-resolution graphics adapter, mouse
Suggested retail price: \$595

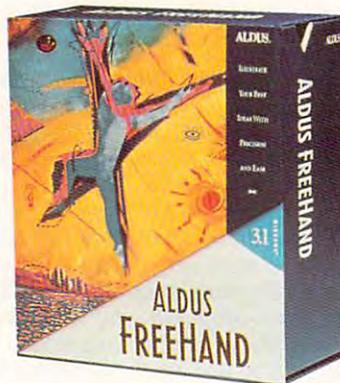
ALDUS
411 First Ave. S
Seattle, WA 98104
(206) 628-2320

ALDUS FREEHAND 3.1

The most popular draw program on the Mac, FreeHand targets professional graphics designers who need four-color prepress precision. This becomes immediately apparent when you open the box.

Along with Aldus's traditionally fine manuals, you'll find color charts and extensive information on separations, trapping, knock-outs, and many other prepress and commercial-printing topics. There's even a 75-page booklet devoted to explaining process-color separations and printing to film.

You install FreeHand with Aldus Setup, which you will surely recognize if you use Aldus PageMaker, Aldus Persuasion, or any other Aldus program. Not only



does Setup give you complete discretion over what files are installed, but it also lets you run diagnostics to ensure that your system is ready to use FreeHand. Aldus products share the same import and export filters; if you use several of these products, you can save a good chunk of disk space.

PageMaker users who purchase FreeHand will discover that the two packages have many features in common, such as the pasteboard metaphor, the grabber hand, and the right-mouse-button view control. Like PageMaker, FreeHand is friendly and easy to use. And it comes with an Asymetrix ToolBook online tutorial that demonstrates (a little slowly) most of the program's features.

FreeHand comes with Adobe Type Manager and the standard typefaces (Times, Helvetica, Symbol, and Courier) but no others. This limitation can be inconvenient if you don't already have a good font library.

FreeHand excels as a serious drawing tool. Layer control is extensive, with the number of layers supported being limited only by system memory. You even have the option of assigning brief notations to each layer—highly convenient for making notes to yourself (or others) about invisible layer attributes, such as line weights, or the reasoning behind halftone screen settings. You can work on up to nine drawings at once. Styles can be created for repetitive tasks. FreeHand provides 99 levels of Undo. Monitor calibration and PANTONE matching are built-



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in. And printing is enhanced with printer-specific add-ons that provide screening and other important controls to the Windows Post-Script printer driver.

Two interesting features are automatic reblending and pressure-sensitive freehand drawing. With automatic reblending, when you change the shape of one or two blended objects, FreeHand automatically redraws the blend. All the other programs (except CorelDRAW!) require you to reblend the objects. Pressure-sensitive freehand drawing lets you simulate traditional pencil and brush strokes with a pressure-sensitive digitizer. And for those of us without graphics tablets, the feature works with a mouse and the right- or left-arrow keys.

I found only two drawbacks to FreeHand—the small sampling of fonts and Aldus's technical support policy. Free support is offered for only 90 days, after which you must purchase additional time or use a 900 number. With a product this sophisticated, your support needs could easily extend well beyond 90 days.

This application's ability to swap files with its Macintosh counterpart can save time at the service bureau, since most service bureaus are still Mac oriented.

No program, except perhaps Adobe Illustrator, provides better, more predictable output. Its Macintosh artist's-station roots render it ideal for professionals (and would-be professionals). If you need precision, you cannot beat FreeHand.

Circle Reader Service Number 372

ALDUS INTELLIDRAW 1.0

Aldus IntelliDraw combines a draw program with rudimentary CAD and presentation features. The program sports a standard draw-program interface with Bézier drawing and editing, sophisticated technical drawing, and simple animation. Whether you need

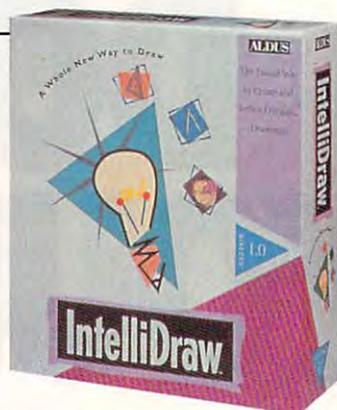
Aldus IntelliDraw 1.0
Minimum requirements: 386 PC,
4MB RAM, VGA, mouse
Suggested retail price: \$299

ALDUS
5120 Shoreham Pl.
San Diego, CA 92122
(619) 558-6000

to create simple drawings to embellish reports or draw up plans to redesign the office, IntelliDraw will make the job easier and more fun.

IntelliDraw is powerful. You'll have to spend some time to master all of its rich, innovative features. But once you get the hang of it, you may prefer IntelliDraw to CorelDRAW! or whatever else you're using now. Aldus takes some of the pain out of learning the program with a well-done 90-minute training video that covers almost all of the program's important features. After watching it, I understood IntelliDraw's sheer power and couldn't wait to get started.

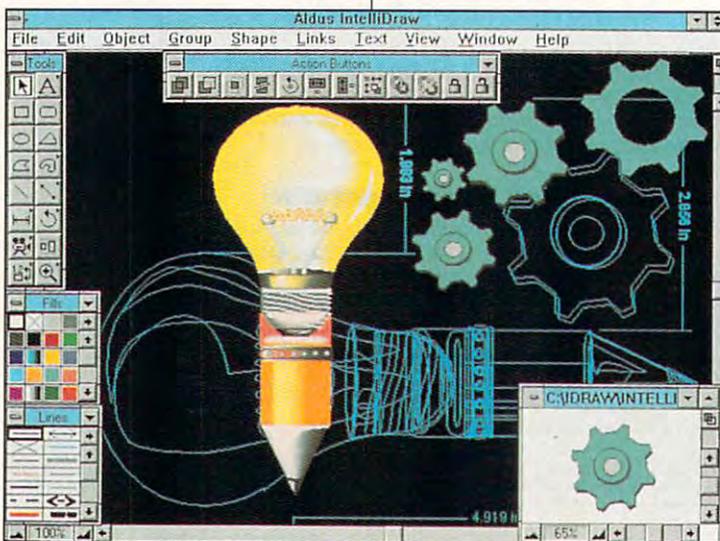
A palette of action buttons lets you lock objects on a page, link them to other objects, group objects and ungroup them, and perform a number of functions that other programs require you to wade through layers of dialog boxes to achieve. IntelliDraw's tool-



box is full of easy-to-use drawing tools, such as the Connector tool that allows you to draw lines that automatically snap to and connect objects. Connections can be locked, stretched, rotated, or drawn at right angles.

Another impressive feature is Auto Align. A pair of cross hairs follows your mouse as you draw, like a pair of automatic intersecting rulers. The cross hairs, or guides, run the length of the document window, allowing you to align the object being drawn with other objects. Auto Align also lets you align existing objects in relation to one another. When, for example, two or more objects are exactly centered, the guides form a cross over them, indicating perfect alignment.

Unlike other draw programs (which use grids and an alignment dialog box to accomplish the



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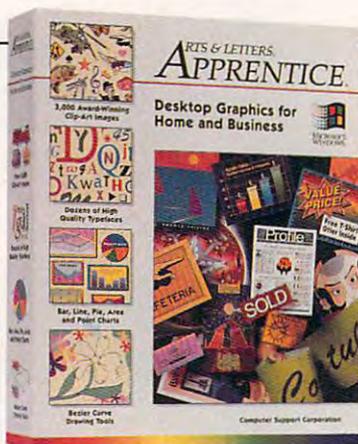


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same feats), IntelliDraw doesn't force you to turn off the alignment feature to place objects freely, nor do you have to open a dialog box to align objects. The cross hairs constantly inform you where an object is in relation to other objects in your drawing.

Yet another slick feature is the user-defined symbol library. You can add objects to your symbol library and delete objects from it. You can also edit symbols once they are defined. Symbols are linked; if you use the same symbol several times throughout your document (remember that documents can have unlimited pages), you can edit it once in the symbol library, and IntelliDraw will update every occurrence in the document.

There's also a collection of "intelligent" clip art, such as office furniture and landscaping elements. You can add drawers to file cabinets or change the shapes of trees simply by double-clicking on them. For example, you can change a pine tree to an oak with a couple of mouse clicks. Change a chair into a sofa by stretching it. No, you don't get a distorted, elongated chair, as you do with other clip art. Intelligent clip art actually converts the chair to a sofa.

There's one important drawback, though: The program does not support process-color separations. Creating camera-ready art for multicolored documents could be a problem. You can, however, print separate layers, which will give you spot-color separations.

The color separation issue

Arts & Letters Apprentice 1.2
Minimum requirements: 386 PC,
2MB RAM
Suggested retail price: \$169.00;
\$29.95 for Jurassic Art

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aside, IntelliDraw is a great, innovative draw program, especially for \$299. While it's not for commercial prepress applications, it fits neatly into a number of other applications. Like most other Aldus software, it is a solid performer. And since there is an identical Macintosh equivalent, it's easy to distribute your drawings across platforms or on a network.

Editor's note: By the time this review appears, there may be a new version of Aldus IntelliDraw.

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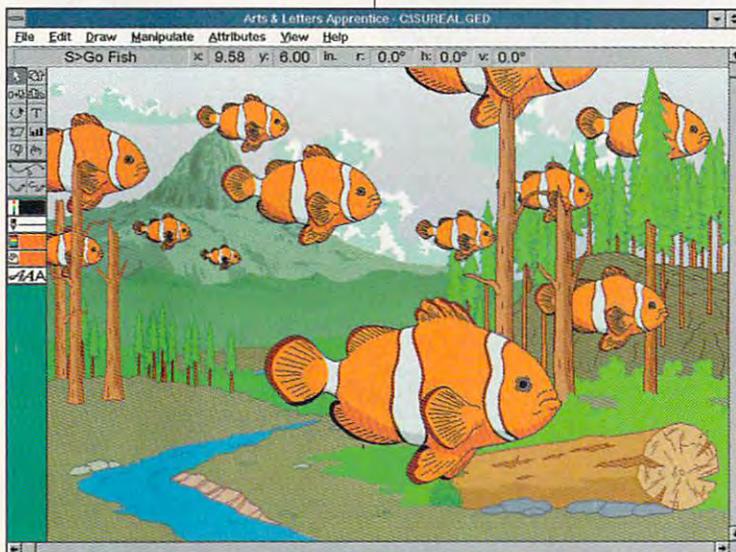
ARTS & LETTERS APPRENTICE 1.2

Until I had an opportunity to open a few menus and see what was missing, it was hard to tell the difference between Apprentice and

its high-end brother, Graphics Editor. The installation is the same, the interface is identical, and so on. With Apprentice, you get the same ease of use, some of the same great clip art images, and the same cataloging system as with the advanced version, for about a quarter of the price. What you do not get with Apprentice is the very sophisticated perspective/warp feature, as many clip art images (3000 rather than 5000), or as many fonts (only 25 instead of 81).

With Apprentice, Computer Support offers styles and a scaled-down graphing option. If your work requires you to do color separations, Apprentice can handle the job; Windows Draw! (the draw program in the other budget-minded package reviewed here, Micrografx's Graphics Works) can't do color separations. As with Graphics Editor, the screen redraw is a little slow. But otherwise, this is a slick graphics program for nonprofessionals. This is also a great program for teaching children about computer graphics. If you're trying to stay within your budget and need a great draw program, check this one out.

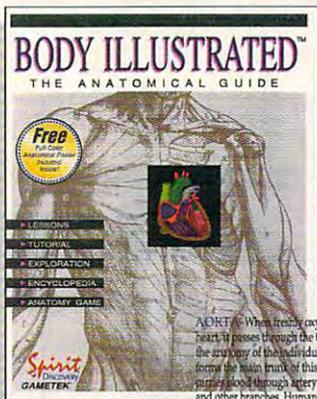
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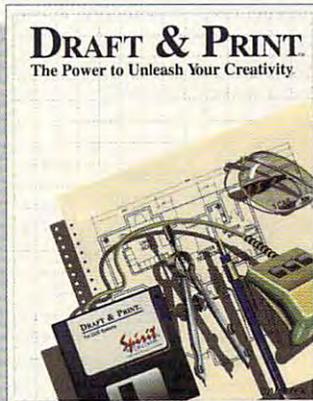
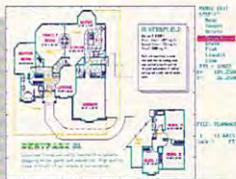
Designed to be fun and easy to use, BODY ILLUSTRATED is a visual and audio guide to exploring the human anatomy. BODY ILLUSTRATED examines hundreds of body parts from different views and is full of detailed illustrations with stunning realism. With just a click of the mouse, each part is explained in clear, non-technical language. A digitized voice provides the correct pronunciation of anatomical part names, "Instant Help" eliminates the need for referring to the manual.

BODY ILLUSTRATED teaches either by lesson method or through the use of the game mode. It is an ideal study guide for students. It's also a valuable reference tool for lawyers, doctors, nurses, clinics, or anyone who needs to know about the human anatomy. Instructors can easily use BODY ILLUSTRATED as an interactive anatomy teaching aid. Included in the box is a full-color anatomical parts poster and a written study guide.

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DRAFT & PRINT is a simple, yet powerful drafting program that's easy enough for the beginner, yet powerful enough for the professional. From floor plans and interiors to landscapes, technical illustrations, engineering diagrams, and architectural plans; the tutorial will have you designing on the day you install the program. With DRAFT & PRINT's extensive collection of drawing tools, full layering, powerful text scaling and rotation, your drawings will be far more accurate and to scale than if done by hand. And changes are a snap, saving you countless hours in editing.

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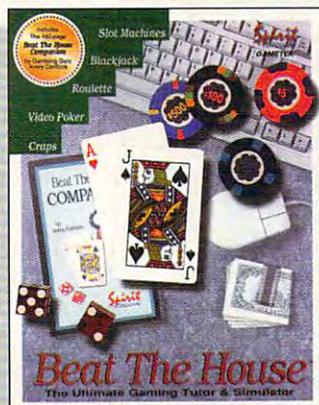
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ARTS & LETTERS GRAPHICS EDITOR 3.12

Of the six full-featured Windows draw programs reviewed in this Test Lab, Graphics Editor is matched only by CorelDRAW! and Professional Draw in ease of use, overall friendliness, and number of features designed to help the nonartist.

The program is built around a collection of 5000 superb clip art images. You can easily edit the images or incorporate them into drawings as is. You should find it simple, for example, to use parts of images, such as the state of California from one of the many maps of the USA. All you have to do is enter a number corresponding to that part of the drawing. The program allows you to store and catalog the images you draw in the same manner.

Easy to install, Graphics Editor includes an online manual with an automated "show me" option that demonstrates many of the program's features. However, you must install everything—all clip art and 81 proprietary fonts—in order for the program to run prop-

Arts & Letters Graphics Editor 3.12
Minimum requirements: 386 PC,
2MB RAM (4MB recommended)
Suggested retail price: \$695.00;
\$29.95 for Jurassic Art

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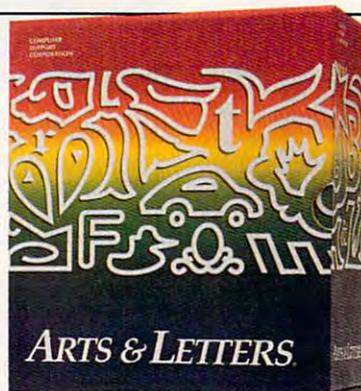
erly. Accordingly, the full installation requires about 12MB.

I found the tutorial to be one of the best I've used. It takes you from the basics to more complicated topics in an easy, friendly style. Even if you don't have much drawing savvy, you will be creating drawings in no time.

Graphics Editor provides an adequate data-driven feature for making charts and graphs. To create a chart, you enter data within the program or import information from spreadsheets.

The program also provides styles for automating repetitive tasks, such as assigning the same attribute to objects in several different drawings. You could, for example, use it to automatically turn a string of text into a logo.

A perspective/warp feature



lets you manipulate text and objects in ways that would require much artistic talent otherwise. You can, for example, make objects appear to move into the distance, give them roller-coaster contours, and even wrap them around themselves.

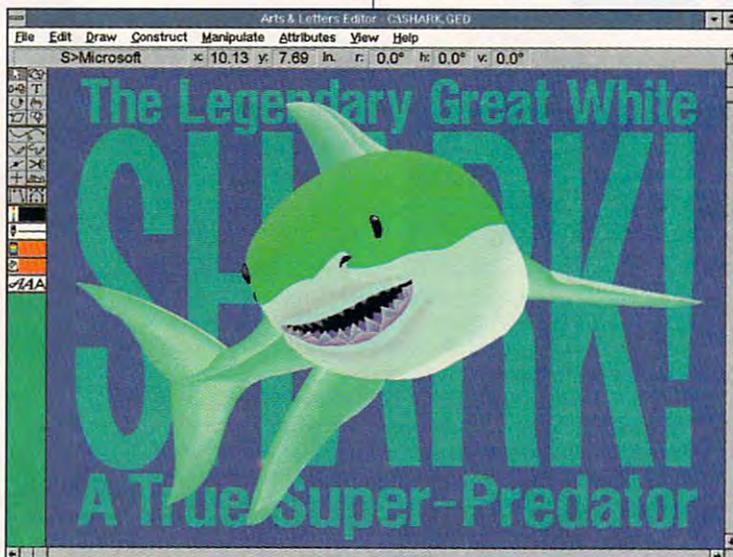
Again, *easy* describes this program—right down to the levers (rather than text boxes) for adjusting the angles of gradients. And if you do have trouble, Computer Support furnishes free technical support. The technician I talked to was a little sketchy on some questions; he had to go off the line to get some answers. But at least he knew what he didn't know.

The absence of monitor calibration and prepress enhancements makes Graphics Editor less appropriate than some of the other draw programs for creating process-color separations. Also, you cannot import and export EPS files or several other kinds of files. Instead, you use a utility called Decipher to convert files to the appropriate format. This arrangement is somewhat inconvenient.

Screen redraws of blends, gradients, and warped elements are too slow. But a math coprocessor version (available free on request) is supposed to speed things up substantially. So if you have a coprocessor or a 486, this may not be a problem.

Graphics Editor is a strong program for nonartists who need to create images in a hurry. Much of the included clip art can be used right out of the box, with little or no modification.

Circle Reader Service Number 375



TEST LAB

CORELDRAW! 3.0 AND 4.0

CorelDRAW! is powerful enough for some professionals, yet it also has a wealth of features designed to help the nonartist.

Although the latest version of Corel's popular drawing product is version 4.0, the company is also selling version 3.0. In both packages you get a lot more than just a strong draw program. You get CorelCHART!, a highly sophisticated charting application; CorelPHOTO-PAINT!, a program for creating and editing bitmapped gray-scale and color images; CorelSHOW!, a slide and onscreen presentation program that supports limited animation; CorelMOSAIC!, a program for cataloging drawings and clip art; and CorelTRACE!, a program which turns bitmaps into vectors. Version 4.0 also contains an animation module, CorelMOVE!, for creating animated graphics for onscreen presentations.

And if all this isn't enough, with version 3.0 you get a CD-ROM containing 12,000 clip art images and over 250 Type 1 and TrueType fonts (the floppy version contains 4000 images and just over

CorelDRAW! 3.0 and 4.0
Minimum requirements: 386 PC, 4MB RAM (8MB recommended), VGA, mouse or graphics tablet, CD-ROM drive for CD-ROM elements
Suggested retail price: \$199 for 3.0 (includes CD-ROM disc and floppy disks), \$595 (includes CD-ROM discs and floppy disks)

COREL
1600 Carling Ave.
Ottawa, ON
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150 fonts), and you get a great draw program to boot. Version 4.0 has two CD-ROMs containing over 18,000 pieces of clip art and clip media and 755 fonts.

A complete installation requires over 30MB of disk space; however, the installation program lets you load all or any part of the package. The draw program itself includes a spelling checker and thesaurus. Many options have "roll-up" menus that float in the editing area, allowing you to make changes to objects quickly. And when you aren't using these menus, you can roll them up into a title bar and use an arrange command to stack them neatly in cor-

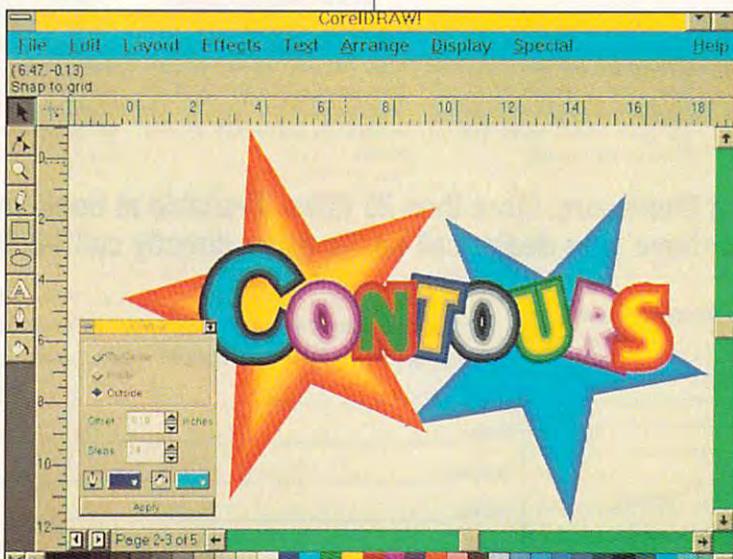


ners of the drawing area.

Extrusions, perspectives, blends, and many other features can be created and modified interactively with a mouse, rather than by entering values in dialog boxes, checking the results, and then going back to do it all over again. An interesting feature is the Rainbow option for blends. With it, instead of blending directly from one color to the other, you can reverse the blend on a color wheel and get a rainbow effect. In other words, if you choose two like colors, say light and dark blue, and blend them backwards, you'll get yellows, reds, purples, blues—hundreds of shades, depending on the number of blend steps you choose.

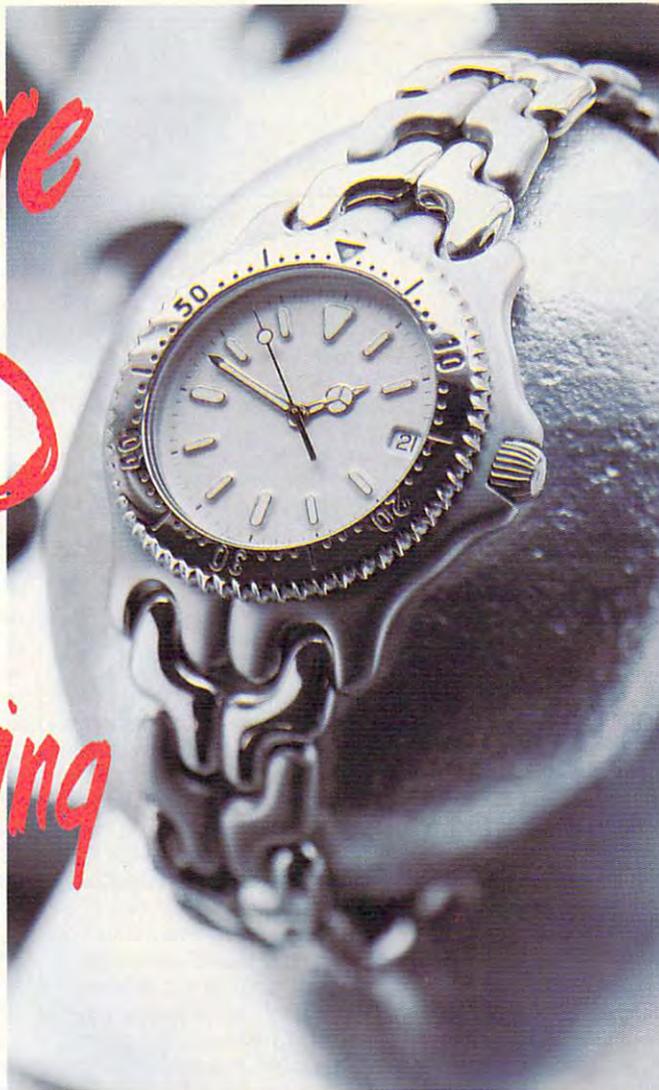
The differences between versions 3.0 and 4.0 are many, but not so extensive that you could not use version 3.0 for all your graphics needs. Version 4.0 supports multiple pages and has some page layout features not found in previous versions. You should look to version 4.0 if you want animation, OCR, and advanced prepress options, and if you want to save color separation configurations for future use. However, each package is a terrific value. While CorelDRAW!'s draw program itself is not necessarily stronger than some of the others reviewed here, the extras make it the best buy.

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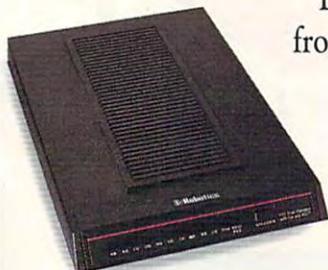


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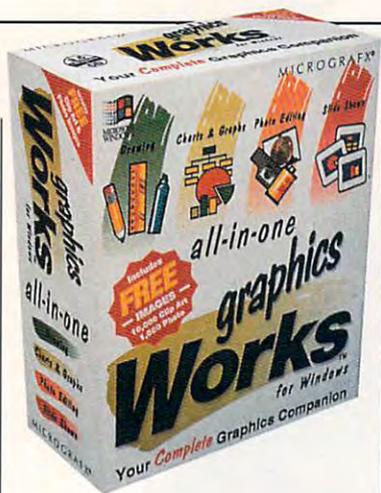
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GRAPHICS WORKS 1.0

Looking for ease of use? Then take a look at Graphics Works, built around Micrografx's popular, economical Windows Draw!, a relatively sophisticated vector draw program. Windows Draw! is a scaled-down version of Designer. You get about 80 percent of Designer's functionality for about 10 percent of the price.

Since Windows Draw! doesn't support color separations, trapping, and other commercial prepress options, it won't meet the needs of professional graphics artists, but it's great for most small business and home office settings—everything else you need to create sophisticated vector drawings is included. With Windows Draw! you can rotate, skew, fill, and manipulate Type 1 or TrueType fonts in every way imaginable, which makes this program great for creating logos and special effects.

The other applications in Graphics Works include PhotoMagic, a bitmap photograph editor; Windows OrgChart, for creating organization charts; WinChart, a charting and graphing program; and SlideShow, the standard slide-show module included with Micrografx's high-end draw and presentation packages, Designer and Charisma. There's also a clip art indexing and viewing utility for

Graphics Works 1.0
Minimum requirements: 386 PC, 4MB RAM, VGA (SVGA recommended), mouse; CD-ROM drive optional for some programs and images
Suggested retail price: \$199

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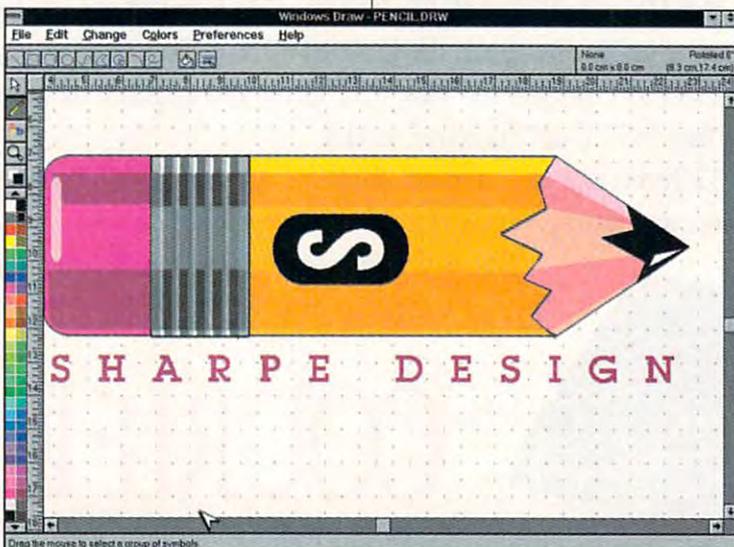
managing the 10,000 clip art images that come in the package, as well as a photo index and view utility for the 1000 photographs also included. However, to access the bulk of the clip art and photographs, you'll need a CD-ROM drive. (Both a CD-ROM and floppies are included in the box.)

The most impressive aspect of the Graphics Works package is its ease of use, which arises in part from the use of similar interfaces for its various programs. After you learn the basics in one, mastering the others is simple. And there's a Run command on the File menu in each application that lets you access the other Graphics Works applications with a mouse click.

I consider the 10,000 clip art images included on the CD-ROM some of the best available. (Actually, the clip art and the photographs are worth the product's purchase price. Just consider the graphics applications a bonus.) Micrografx has a strong reputation in the graphics industry for superb clip art. You will probably never have to look any further for a suitable image. The options are nearly limitless. There are well-drawn maps, complete with cities and other geographic information; terrific anatomy art; and a collection of business scenes and symbols to suit almost every imaginable situation. And when your documents or presentations call for photographs, surely one of the 1000 24-bit images of nature scenes, people, animals, and business situations will fill the need.

When you buy Graphics Works, you get Micrografx's great support program, which includes 24-hour service during the week and limited hours on weekends. The technicians are very well trained and courteous. This is a strong, easy-to-use draw program. The average small or home-based business can't miss with Graphics Works.

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Car & Driver

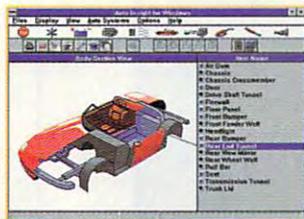
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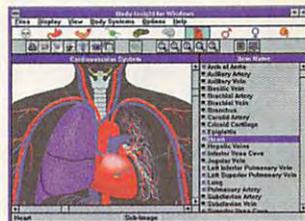


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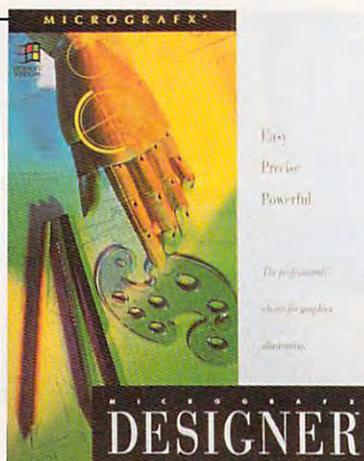


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TEST LAB



MICROGRAFX DESIGNER 4.0

Designer targets technical illustrators, graphics artists, and designers, who care more about precision and performance than about a pretty interface. However, Designer's recently reworked interface provides ease of use along with very powerful features.

New features abound. There are so many, in fact, that choosing a few to talk about is difficult. In terms of technical enhancements, the most significant addition is a color separation utility that lets you separate not only Designer files but also any EPS graphic. With this feature, you can trap objects and perform undercolor removal (UCR), dot-gain correction, ink correction, and a myriad of other functions—all of which are prepress options necessary for top-quality reproduction at the print shop. And as with the new version of CorelDRAW!, you can save color separation configurations for future use. If you currently have to repeat the steps required to set up separations each time you print to your service bureau's imagesetter, you'll appreciate this feature.

Speaking of color, no longer must you order optional color palettes from Micrografx. Palettes for PANTONE, FocalTone, and TruMatch systems are provided, and you can create your own. You can also print spot-color separations.

Micrografx Designer 4.0
Minimum requirements: 386 PC, 4MB RAM (8MB recommended), VGA, mouse
Suggested retail price: \$695

MICROGRAFX
1303 E. Arapaho Rd.
Richardson, TX 75081
(800) 676-3110
(214) 234-1769

Designer has never had good automatic special-effects features—until this new version, that is. Before, to produce 3-D effects, such as extruded text or objects that look as though they fade off into the distance, you had to have the artistic knowledge and talent to create them. Even graphics artists find this a trial-and-error proposition. Now, creating 3-D objects is a snap with the features Extrude, Rotate, Scale, and Perspective. There's even a new control option that lets you adjust shading according to an imaginary light source. These options make Designer more accessible to the nonartist.

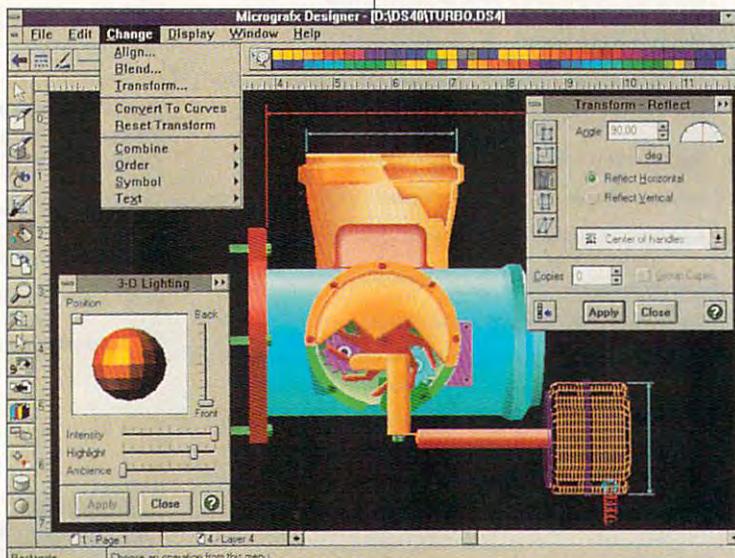
This year's draw programs have become amazingly adept at text handling, and Designer is no exception. You can pour text into

frames of any shape, for some interesting effects, such as text that is contoured to fill a star shape and other forms. You can link text containers (or frames), a feature that's similar to jumping text from one page to another in a desktop publishing newsletter layout. (By the way, Designer now supports multiple pages.) The text-on-a-curve and wrap features are enhanced. There's a spelling checker, as well as automatic hyphenation, and no longer must you convert text to curves (an irreversible procedure that leaves text blocks uneditable) before applying gradients and other artistic effects (which means that the text remains editable).

You can perform these wonderful new options with one or all the 250 Type 1 or TrueType fonts shipped with the program.

Another useful addition to the Designer package is PhotoMagic, Micrografx's low-end bitmap editor. PhotoMagic is not a full-featured photograph editor, as is the CorelPHOTO-PAINT! module bundled with CorelDRAW! 3.0 and 4.0, but it does allow you to scan directly into the program and perform most bitmap-editing functions.

Designer now supports multiple





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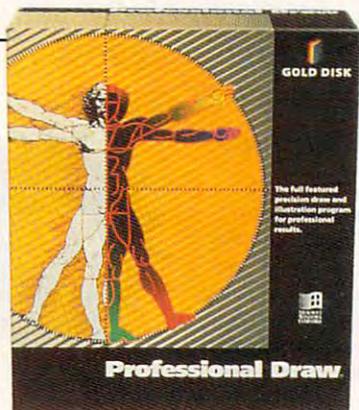
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TEST LAB



levels of Undo and Redo. It's also an OLE (Object Linking and Embedding) client and server. You can create onscreen presentations and slides from drawings and use Designer to show your presentations, or you can use Designer as a stand-alone viewing utility that you can take on the road.

Designer is known for its precision, and version 4.0 lives up to that reputation. According to Micrografx, object placement is accurate to within one micron, and the program supports printer resolutions up to 24,600 dpi.

Not for the faint of heart, full-featured Designer is aimed squarely at the professional.

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PROFESSIONAL DRAW 1.0

At \$495, Professional Draw costs less than many of the other programs reviewed here, and although it does not have all of the combined features of the applications in CorelDRAW!, overall it is at least as good as that program. Gold Disk is a strong company and makes great software. Professional Draw is no exception.

The program installs easily and lets you decide which files to load, including files for CorelDRAW! 2.xx WFN fonts, TrueType fonts, Professional Draw proprietary fonts, or the 150 Type 1 fonts that come with Professional Draw. In fact, Professional Draw is the only draw program here that can import CorelDRAW! 3.0's CDR format. It also sports many of

Professional Draw 1.0
Minimum requirements: 386 PC,
2MB RAM, VGA
Suggested retail price: \$495

GOLD DISK
5155 Spectrum Way, Unit 5
Mississauga, ON
Canada L4W5A1
(800) 465-3375

CorelDRAW!'s automatic drawing features, such as Perspective, Extrude, and Envelope. It supports interactive mouse-manipulation and light-source adjustments, such as those found in CorelDRAW! and Designer. Radial graduated fills and light source can be adjusted with levers, rather than with obscure values in dialog boxes that make sense only to mathematicians.

A feature unique to Professional Draw is its extensive snap-to controls. You can place lines precisely—snapping to a corner, on a circle tangent, parallel to each other, perpendicular to each other, at center, and at midpoint.

But what really sets this program apart from CorelDRAW! 3.0 is its advanced printing options. From within the Print dialog box, you can set knockouts, traps, over-

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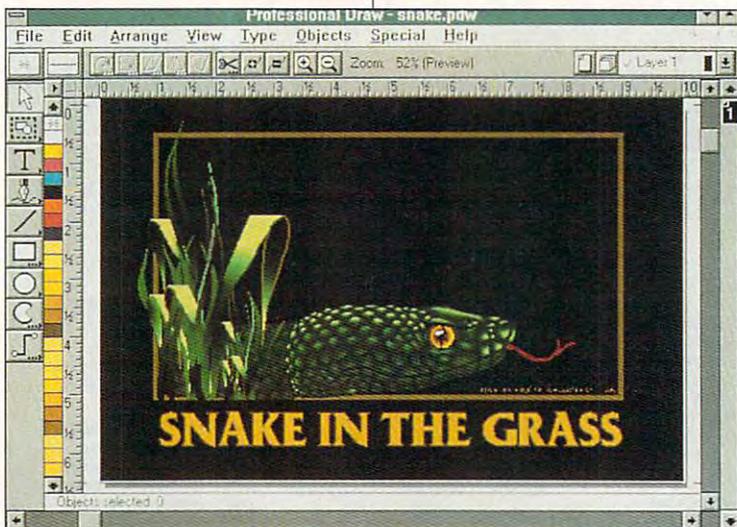
The call will cost 95 cents per minute, you must be 18

or older, and you must use a touch-tone phone.

prints, and many other options. Trap settings include choke and spread amounts for each color, whether spot or process. Halftone settings include control of dot shapes, ten of which are predefined or user-defined. You can set color brightness and contrast, color balance, gray-scale conversion, and posterization. Drawings can be converted to gray scale, spot colors, or process colors automatically, and you can invert them.

If all you need is a strong, easy-to-use, and moderately priced draw program, there is really no reason not to buy Professional Draw.

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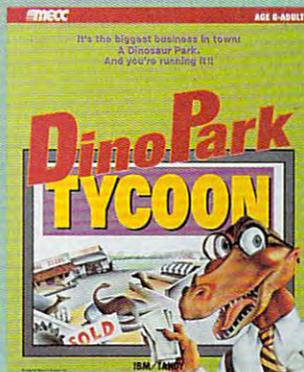


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TEST LAB

VISIO 2.0

Visio's approach to drawing is entirely different from the approaches taken by other programs reviewed here. (IntelliDraw does, however, have many of Visio's drag-and-drop and smart-graphics features.) Instead of calling it a drawing program, the publisher (Shapeware Corporation) calls it shapeware. This product is designed for business users who don't know how to draw. The concept is that you create business drawings—floor plans, diagrams, flow charts, and so on—by combining predefined shapes. This approach, though somewhat limited, is very effective.

Shapeware calls Visio's approach drag-and-drop drawing. To create drawings, users drag predefined shapes from job-related stencils, or palettes of shapes, and drop them onto the drawing page. Simply by moving objects onto a page, you make your drawing come to life. I created a complicated organization chart in no time, without spending much time in the documentation.

Visio is OLE (Object Linking and Embedding) aware, which means that you can embed drawings in, and link them to, other ap-

Visio 2.0

Minimum requirements: 386 PC (20 MHz or faster), 4MB RAM, VGA
Suggested retail price: \$129 through December 1993, then \$299; \$79 for upgrade from version 1.0

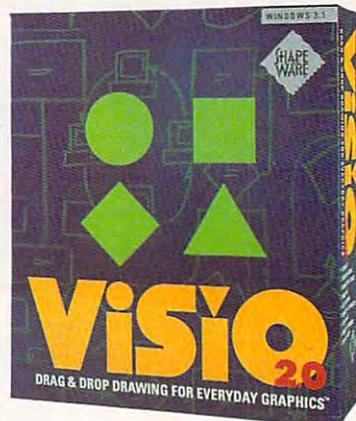
SHAPEWARE

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plications, such as your PowerPoint presentations or PagePlus layouts. Text is integrated. All you do is select an object and start typing. The text is automatically centered in the object. You can create master shapes and copy them throughout your drawing; when you change the master, all copies are automatically updated (a feature known as cloning in some other programs).

Styles let you predefine frequently used formats, such as text attributes, line weights, fill patterns, and so on. Once a style is defined, all you do is change it to automatically update all other objects formatted with the same style. You can set your measurements system to inches and feet, metric units, or one of several other units.

The options Glue and AutoCon-



nect allow you to draw a line between two shapes, then reposition them without breaking the connection. Connecting lines stretch, contract, and change angle perfectly when shapes are repositioned. The AutoConnect feature lets you connect objects automatically.

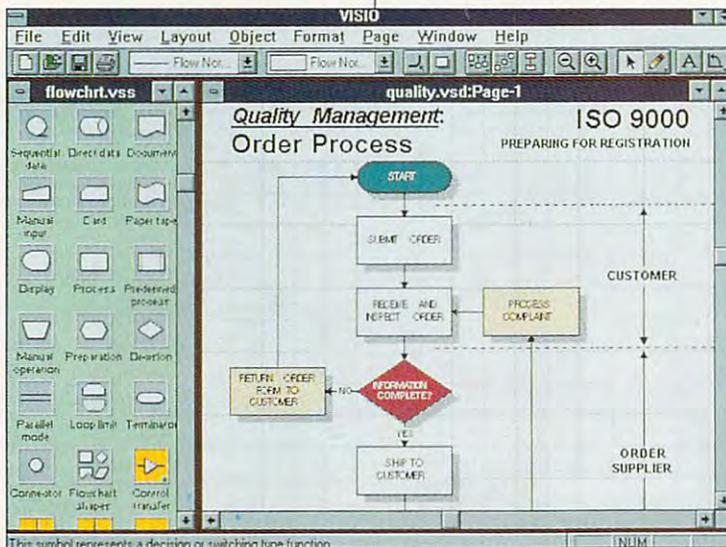
Visio performs its magic with shapes, or clip art, called SmartShapes. SmartShapes can assume different forms, colors, proportions, and other properties, depending on the context in which you use them. You can use them as Shapeware has defined them, or you can modify them to suit your needs. Each shape has its own spreadsheetlike form you can edit to modify its behavior.

Visio comes with several predefined shapes, and you can buy several themed collections from Shapeware. The collections include Marketing, Space Planning, Home Planning, and Landscape Planning, as well as several others. Or you can purchase a book that shows you how to develop your own Visio shapes.

Visio must be a popular product. I called technical support several times and had to wait for a long time on the line each time. However, when I did get through, my questions were answered clearly and courteously. I couldn't find a problem the technician couldn't solve.

If you need a program designed to help you create diagrams and flow charts, this is a good one.

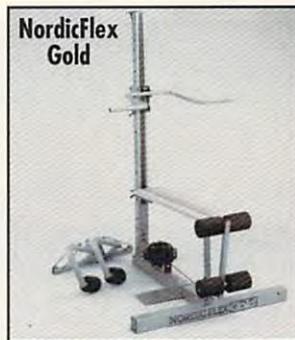
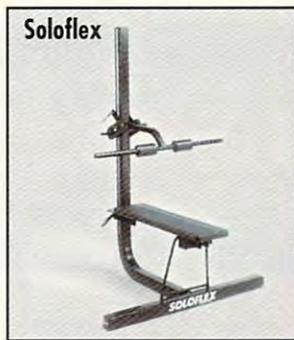
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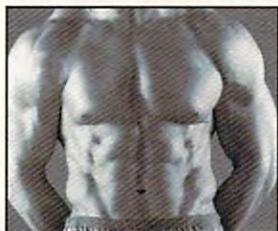
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3 Leg Extension Unit included	<input checked="" type="checkbox"/> YES Permits both leg extensions and lying leg curls.	<input checked="" type="checkbox"/> NO Costs \$200 extra.	<input checked="" type="checkbox"/> YES, BUT... Leg unit included doesn't permit lying leg curls.
4 Butterfly Unit included	<input checked="" type="checkbox"/> YES No extra cost.	<input checked="" type="checkbox"/> NO Costs \$200 extra.	<input checked="" type="checkbox"/> YES, BUT... You must assemble before each use, and disassemble to use bench press.
5 Strength conditioning for all five major muscle groups	<input checked="" type="checkbox"/> YES HEALTHMAX strengthens all five: arms, legs, abdominals, back and pectorals.	<input checked="" type="checkbox"/> YES, BUT... You must purchase \$400 in extra accessories to do comparable exercises for legs and pecs.	<input checked="" type="checkbox"/> YES, BUT... Why would you pay \$700 more than HEALTHMAX ?
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7 Hydraulic cylinder resistance system	<input checked="" type="checkbox"/> YES Adjusts to your personal resistance level with a simple twist of a dial.	<input checked="" type="checkbox"/> NO Uses rubber bands which must be changed to vary resistance level.	<input checked="" type="checkbox"/> NO Uses complicated cord/pulley/mechanical resistance system.
8 Full refund of return freight if unit returned	<input checked="" type="checkbox"/> YES If not satisfied, we will refund your cost, shipping/handling charges, and all return freight!	<input checked="" type="checkbox"/> NO You pay over \$85 to return. It must go by truck to Oregon!	<input checked="" type="checkbox"/> NO You pay about \$65 to return by UPS.
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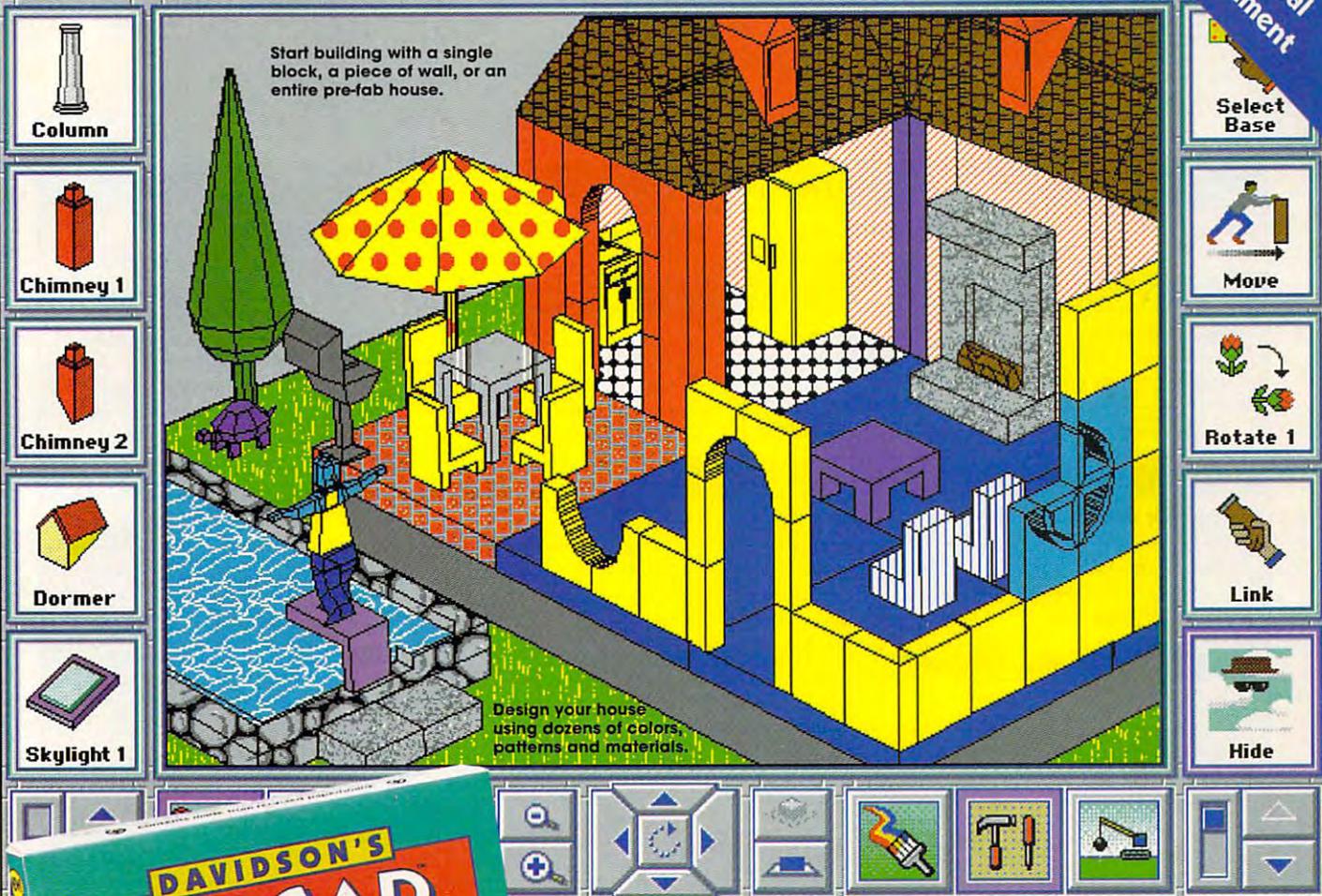
TEST LAB

Windows Draw Program Features

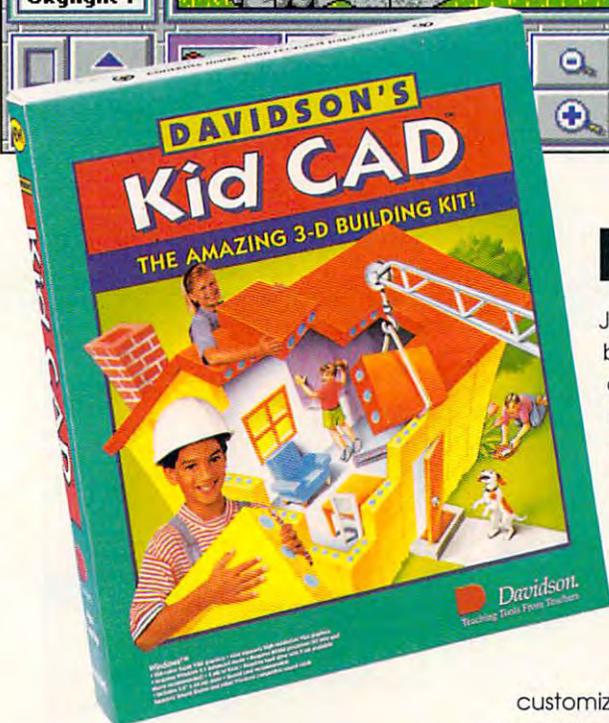
	Adobe Illustrator 4.01	Aldus FreeHand 3.1	Aldus IntelliDraw	Arts & Letters Apprentice 1.2	Arts & Letters Graphics Editor 3.12
LAYERING					
Number of layers supported	unlimited	unlimited	unlimited	unlimited	unlimited
Layer control and locking	no	yes	yes	no	yes
Layer notations	no	yes	yes	no	no
TYPESETTING OPTIONS					
Number of fonts included	40	13	0	25	81
Paragraph text	yes	yes	yes	no	yes
Creates fonts	no	no	no	no	no
AUTOMATIC DRAWING FEATURES					
Charts and graphs	yes	no	yes	yes	yes
Imported fills	no	no	no	no	no
Extrude (3-D)	no	no	no	no	no
Perspective	no	no	no	no	yes
Macros	no	no	no	no	no
Styles	yes	yes	no	yes	yes
Number of undos	1	99	99	1	9
PRINTING OPTIONS					
Batch printing	no	no	no	no	no
Enhanced PostScript printing	yes	yes	no	no	no
Enhanced process-color separations	yes	yes	no	no	no
Monitor calibration	yes	yes	no	no	no
MISCELLANEOUS OPTIONS					
Number of multiple drawings	20	limited by memory	unlimited	1	1
PANTONE Matching System (PMS)	yes	yes	no	no	no
Focoltone color matching	yes	no	no	no	no
Cataloging of clip art and drawings	yes	no	no	yes	yes
Number of clip art images included	375	500+	650*	3000	5000

*Clip art is dynamic; changes shape as needed.

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TEST LAB

Windows Draw Program Features					
	CoreIDRAW! 3.0 and 4.0	Graphics Works	Micrografx Designer 4.0	Professional Draw	Visio 2.0
LAYERING					
Number of layers supported	unlimited	unlimited	32,767	unlimited	unlimited
Layer control and locking	yes	no	yes	yes	yes
Layer notations	version 4.0	no	yes	no	yes
TYPESETTING OPTIONS					
Number of fonts included	200 and 755	32	289	150	0
Paragraph text	yes	no	yes	yes	yes
Creates fonts	yes	no	no	yes	no
AUTOMATIC DRAWING FEATURES					
Charts and graphs	yes	yes	no	no	yes
Imported fills	yes	no	yes	yes	no
Extrude (3-D)	yes	no	yes	yes	no
Perspective	yes	no	yes	yes	no
Macros	no	no	no	no	no
Styles	yes	no	yes	yes	yes
Number of undos	1 and 99	1	99	1	0
PRINTING OPTIONS					
Batch printing	with CoreISHOW!	no	yes	yes	no
Enhanced PostScript printing	yes	yes	yes	yes	no
Enhanced process-color separations	yes	no	yes	yes	no
Monitor calibration	yes	no	yes	no	no
MISCELLANEOUS OPTIONS					
Number of multiple drawings	1	1	limited by memory	unlimited	unlimited
PANTONE Matching System (PMS)	yes	no	yes	yes	no
Focoltone color matching	yes	no	yes	yes	no
Cataloging of clip art and drawings	yes	yes	yes	yes	yes
Number of clip art images included	18,000	11,000	13,740	1000+	2300

Give Your Joystick a Thrill.

In the early 21st century, staged fighting has become a lucrative profession for female hardbodies, with dozens of legal arenas in the city. But for the leanest, meanest warriors, the real money comes from the illegal bouts held outside the city. It's the hottest day of the summer and you're baking inside a dilapidated warehouse. You — and your opponent — wear the latest in MECHA armor. The best fighting armor in the world.

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It's dream babes in heavy armor battling for prize money — action packed, arcade style fun for your PC. But be warned — with its intense violence and voluptuous women, Metal & Lace: Battle Of The Robo Babes is for mature audiences only. And not for the faint hearted. Available now at your nearest dealer or call 1-800-258-MEGA. Or write Megatech, P.O. Box 11333, Torrance, CA 90510. Visa, Mastercard, checks accepted.

System requirements: 286-20 or faster machine (386 recommended) with 640K RAM, hard disk, joystick recommended. Operating Sys.: MS DOS 3.3 or above, Windows 3.1. Graphics compatible with VGA. Sound support: Sound Blaster, Sound Blaster Pro, Thunder Board, Pro Audio Spectrum, Adlib Gold and Speed Master.

R

This game is not for the faint-hearted. Contains violence and some material inappropriate for minors under 18.

For a free demo, call our 24hr. BBS at 310-539-7739. (8N1)

Circle Reader Service Number 249

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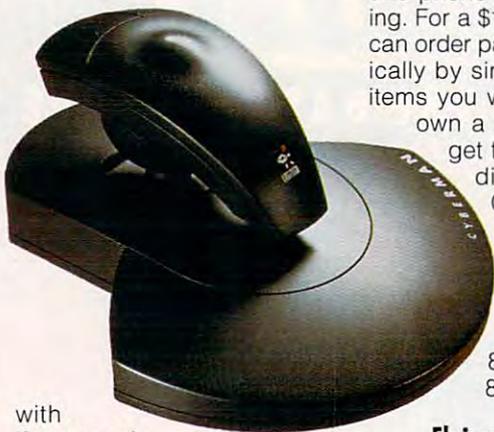
NEWS & NOTES

Jill Champion Booth

Feel It Happen!

From Logitech comes the ultimate in 3-D realism and sensory immersion: CyberMan, an interactive, hand-held controller that dramatically improves your computer game-playing experience. CyberMan's design gives you tactile game feedback with full-motion, multidirectional game-playing control not possible with either a joystick or a mouse. A motor built into the controller allows you to actually feel various gaming events, such as being struck or bumping into a wall, synchronized

Removable mass storage, mouse control, the future of taxes, and tactile feedback devices



with the game's sound and action. CyberMan is 100-percent compatible with existing Logitech mice, but to take advantage of the 3-D control and tactile feedback, you must use a special driver. Look for Access, Electronic Arts, Interplay Productions, Knowledge Adventure, Origin, Sierra On-Line, and a slew of other software companies to incorporate CyberMan's 3-D compatibility into their products this year. The suggested retail price is \$129. Contact Logitech, 6505 Kaiser Drive, Fremont, California 94555; (510) 795-8500, (510) 792-8901 (fax).

Fast Travel Info

Whatever your vacation interests, from the Colorado moun-

tains to the French Riviera, some country, state, or city tour operator or private group has probably put out a free brochure about your dream destination.

To help you get your hands on all those useful pamphlets, a company called Travel Companions has set up an electronic bulletin board listing more than 9500 travel brochures, maps, and information kits. Except for your own telephone charges, you can search the database free. The computer listings describe each pamphlet and give an address and phone number for ordering. For a \$12 annual fee, you can order pamphlets electronically by simply marking the items you want. If you don't own a modem, you can get the information on disk for only \$19. Contact Worldwide Brochures, 1227 Kenneth Street, Detroit Lakes, Minnesota 56501; (800) 852-6752, (218) 847-7090 (fax).

Flying Toasters for DOS

"For too long," says Wes Boyd, Berkeley Systems' CEO, "Mac and Windows users have had After Dark all to themselves. One hundred million DOS users worldwide were being deprived. Something had to be done about it, and we were just the company to do it." And what his company did was to create a DOS version of its top-selling After Dark screen saver. Now airborne appliances, aquatic fauna, whirlpools, shooting stars, playful kittens, and more than 30 other surrealist displays are available for DOS screens everywhere. The suggested retail price for After Dark for DOS is \$49.95. Contact Berkeley Systems, 2095 Rose Street, Berkeley,

California 94709; (510) 540-5535, (510) 540-5630 (fax).

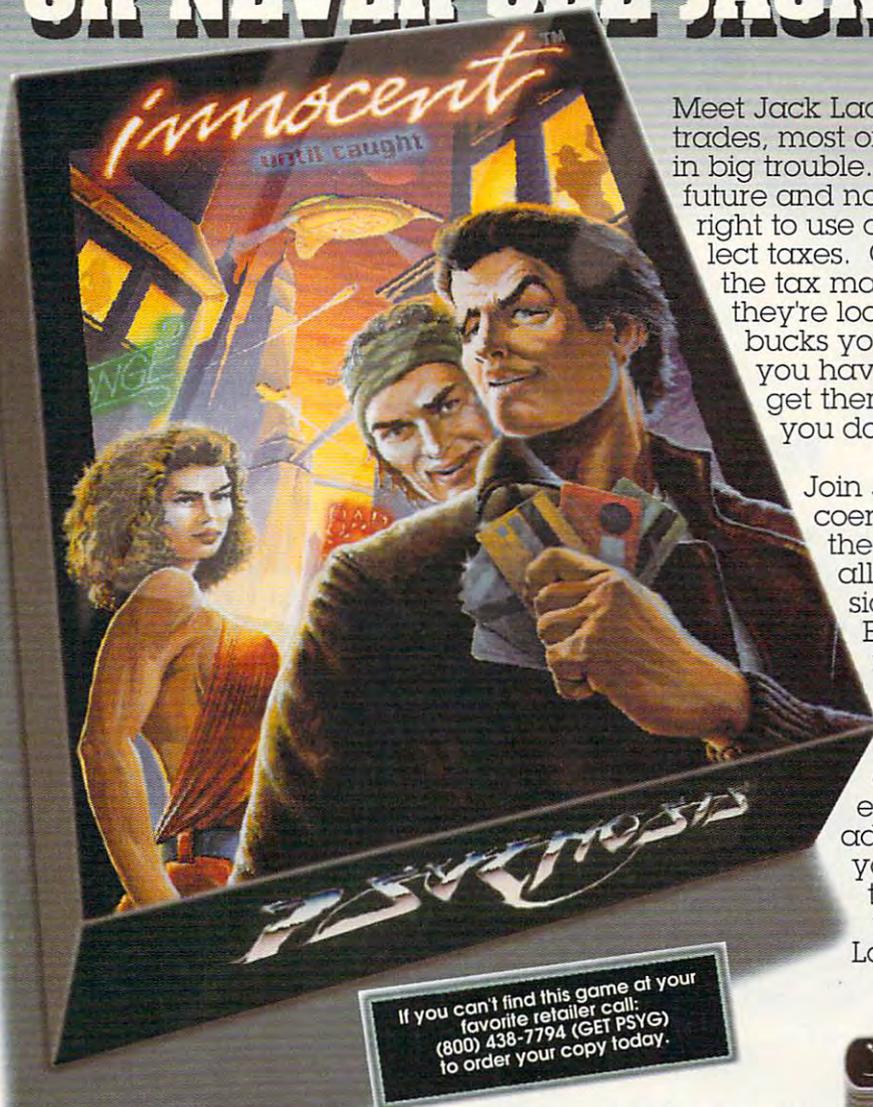
For Your Eyes Only

That Windows Solitaire screen is a dead giveaway that you're . . . uh . . . working "light" today. Or maybe you're the chief of personnel and you prefer not to broadcast confidential information while working in employees' personal files. So how do you protect your screen from all those prying eyes? ACCO's new SS Security Screen Filters are equipped with a film laminate that allows only a 15-degree viewing window. Onlookers see only a clouded view and are unable to read what's visible to you. In addition, the optical-quality glass used in the filters actually increases contrast more than 20 times and sharpens on-screen images—but for your eyes only. Suggested retail prices for the different models range from \$149.95 to \$189.95. Contact ACCO USA, 770 South ACCO Plaza, Wheeling, Illinois 60090-6070; (708) 541-9500, (708) 541-5821 (fax), (800) 247-1317 (toll-free fax, U.S. only).

Torture Yourself Early

Want to get a head start on knowing how much the new Clinton tax laws are going to sock it to you? TurboTax Tax Planner from ChipSoft will help you plan strategies to cope. The comprehensive forecasting and analysis program is designed to evaluate your tax liability across a broad variety of events like real-estate transactions, investments, and retirement. TurboTax Tax Planner analyzes different scenarios and presents results so you can easily understand their relative tax impact. In addition to incorporating any newly passed tax legislation, TurboTax Tax Planner features tax rates and brackets that ad-

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SEE JACK DEAL.
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OR NEVER SEE JACK AGAIN.**



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Join Jack as he cons and coerces his way through the backstreets and alleys on the seedy side of the galaxy. Eight-way scrolling, full perspective scaling and Hypertext-style interaction give this game a colorful and realistic edge. This unusual adventure captures your imagination and thrusts you right into the heart of Jack Ladd's bizarre world.



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NEWS & NOTES

just up to (and even beyond) the new 39.6-percent marginal federal rate for the wealthiest taxpayers—providing accurate tax planning for 1993 taxes and planning flexibility through 1997. The suggested retail price is \$29.95. Contact ChipSoft, 6330 Nancy Ridge Drive, Suite 103, San Diego, California 92121; (619) 453-4446, (619) 453-1367 (fax).

Curtis Surges Market

Curtis Manufacturing has a sleek new line of surge protectors that, according to

\$8.95 to \$149.95. Contact Curtis Manufacturing, 30 Fitzgerald Drive, Jaffrey, New Hampshire 03452; (800) 955-5544 (U.S. only), (603) 532-4123.

A True Font Library

Bitstream is offering its entire typeface library of nearly 1100 faces in TrueType format for Windows 3.1 operating environments. Larry Oppenberg, vice president of Type Operations, says he expects the Bitstream Typeface Library (BTL) in TrueType format for Windows 3.1 to appeal equally to a range of users, from individuals to businesses, such as



Curtis supplies multioutlet power protection to 980 joules.

the company, are technically superior to any others on the market. Each unit has been designed to deliver maximum performance with high joule ratings. The line starts with single-outlet protection at 140 joules and works up to eight-outlet maximum protection at 980 joules. In the company's independent tests, the model SP5000 at 196-V maximum suppression outperformed UL's best standard rating by 60 percent. The entire line is backed by a comprehensive warranty program: Curtis guarantees each surge protector and its performance by insuring the equipment that's plugged into it, and top-of-the-line models even cover damage to connected equipment caused by lightning strikes. Suggested retail prices range from

desktop publishers, designers, graphic artists, and marketing communications departments. General target markets are small-office and home-office desktop publishing, business publishing, graphics companies, and graphic artists. Pricing per BTL format begins at \$32.25. Contact Bitstream, 215 First Street, Cambridge, Massachusetts 02142-1270; (800) 522-3668, (617) 868-4732 (fax).

Mousetamer

Tired of mouse cable drag and snag? Now you can make that pesky rodent behave with a new device called the Mousetamer. Based on the same principle as the old ironing-board "whips," the Mousetamer prevents your cable from snagging and pulling, gives you

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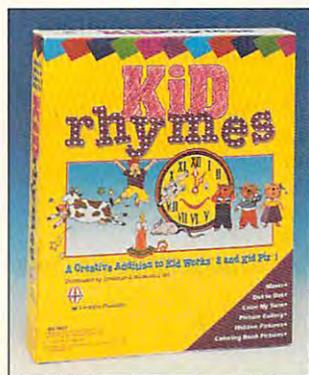
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greater control of the mouse, and makes it feel like a wireless mouse—without the drawbacks of radio-frequency interference, loss of signal, slow cursor response, and loss of resolution.

At a suggested retail price of \$4.95, the Mousetamer is a bargain. For more information, contact American Business Concepts, 4400 Sunbelt Drive, Dallas, Texas 75248; (214) 380-4422, (214) 407-9096 (fax).

Kid Rhymes

Creative Pursuits, a Los Angeles-based company that focuses on educational soft-



Kid Rhymes makes for good times.

ware, recently released Kid Rhymes, a companion product to Davidson & Associates' Kid Works 2 and Brøderbund's Kid Pix. Kid Rhymes has six activities that can be accessed through the Kid Works 2 or Kid Pix File menu. In Dot-to-Dot, kids create images from popular nursery rhymes; Coloring Book lets them color pictures on the computer screen or print them on paper; in Mazes, kids use problem-solving skills to help characters find their way; Picture Gallery lets them personalize predrawn pictures with their own colors; Hidden Pictures lets kids search for hidden objects in familiar nursery-rhyme scenes; and in Color My Twin, kids copy and color the patterns of a favorite nursery-rhyme character to create a symmetrical twin. Available in both DOS and Mac formats, Kid Rhymes' suggested retail price is \$29.95. Contact Da-

vidson & Associates, 19840 Pioneer Avenue, Torrance, California 90503; (310) 793-0600, (310) 793-0601 (fax).

Removable Hard Drives

If you can't remember to make floppy backups or you don't want anyone to access your work, get a pocket-sized removable hard drive. A new line of drives from Logisys, called Intelligent Drives, allows you to remove or insert a hard drive cartridge without turning off your computer. Each Intelligent Drive system consists of an IDE controller card, a pocket-sized cartridge, and a bracket for 5¼- and 3½-inch drive bays. Logisys says the system uses the latest drive technology to ensure that the cartridge delivers the same performance as fixed IDE drives. Cartridges are available in capacities of 80MB, 135MB, 180MB, 260MB, and larger. The installation kit is \$150; cartridges range from \$399 to \$599. Contact Logisys at 4749 East Wesley Drive, Anaheim, California 92806; (800) 333-5679, (714) 693-1188 (fax).

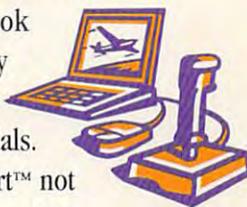
Freebies for Parents

Microsoft and the Computer Learning Foundation have developed a free booklet to help parents become familiar with multimedia personal computing. *The Power of Learning with Multimedia Personal Computing* introduces multimedia and explains how using a computer at home can sharpen key learning skills. Call (800) 426-9400 or write to Computer Learning Foundation, Attention: Multimedia Booklet, P.O. Box 60967, Palo Alto, California 94306.

Companies or public relations firms with items of interest for "News & Notes" should send information along with a color slide or color transparency to News & Notes, Attn: Jill Champion Booth, COMPUTE, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408. □

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Mouse remains fully operational while gameport is in use.

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Supports joystick & rudder pedals simultaneously. No calibration, jumpers or manual speed adjustments necessary.



Abort, Delete, Retry

Because of a printing error, November's multimedia feature, titled "Open Windows to Sound," includes two incomplete paragraphs on page 80. The complete paragraphs are listed below.

"As if that weren't confusing enough, Windows throws another wrench into the works by combining MIDI with the FM synthesis associated in the DOS world with Ad Lib compatibility. If you don't actually have a MIDI device, Windows will let you map the General MIDI instruments to your sound card's FM chip. You can see this for yourself by calling up the MIDI Mapper utility through Windows' Control Device program. MIDI Mapper lets you specify which MIDI device will be associated with each of MIDI's 16 channels, which sound will be associated with each of Windows' 128 MIDI instruments, and which MIDI note will be associated with each MIDI drum sound.

"So what can you actually do with Windows audio? First, you can play back audio from the growing numbers of Windows programs that support sound. In addition to Windows games, such as Super Tetris, SimCity, Tesserae, and Cogito, you'll be able to use the many MPC programs on CD-ROM, including Brøderbund's Just Grandma and Me, Microsoft Encarta, Microsoft Cinemania, Compton's NewMedia's Jazz: A Multimedia History, The New Grolier Multimedia Encyclopedia, and hundreds of other Windows-based multimedia applications. You'll be able to capture and play back software-based video files using Video for Windows and QuickTime for Windows. And you'll be able to add audio to your presentations, with programs such as Action! and Compel."

Saving Time

Why don't computer makers build into the ROM a program that sets the system clock when daylight saving time goes into effect and again when we return to regular time?

RAY METZGER
LEHIGH ACRES, FL

One of the dangers of the computer age is that we'll become dependent on our computers for everything. In order to forestall this, computer companies got together in secret to form a cabal that will ensure that we continue to maintain that frontier spirit—the spirit that helps us to survive in the face of adversity. This Star Chamber decided to make every computer user reset the system clock at least twice a year.

We've written a little program that you can run from your AUTOEXEC.BAT to set your system clock ahead in the spring and back in the fall. Is it simpler than changing the clock? No. You see, we're also members of the cabal.

Seriously, not everyone uses daylight saving time, so for millions of users such a utility would be more of a problem than a solution.

Here's the DST.BAS program.

```
currentdate$ = RIGHT$(DATE$, 4)
+ LEFT$(DATE$, 2) +
MID$(DATE$, 4, 2)
ON ERROR GOTO errorchecker
OPEN "\timetemp.hhh" FOR
INPUT AS #1
CLOSE
IF LEFT$(DATE$, 2) >= "04" AND
LEFT$(DATE$, 2) < "10" THEN
i = VAL(RIGHT$(DATE$, 4)) - 1993
s = 4: j = i
DO WHILE j > 0
GOSUB back1
j = j - 1
LOOP
IF (i + 1) / 4 = INT((i + 1) / 4) THEN
GOSUB back1
```

```
s$ = "0" + RIGHT$(STR$(s), 1)
springforward$ = RIGHT$(DATE$,
4) + "04" + s$
IF (currentdate$ > springforward$)
OR ((currentdate$ =
springforward$) AND
(LEFT$(TIMES$, 2)
>= "02")) THEN
OPEN "\timetemp.hhh" FOR
INPUT AS #1
LINE INPUT #1, a$
CLOSE #1
IF a$ >= springforward$ THEN
GOTO ender
ELSE
GOTO changetime
END IF
END IF
ELSE
IF LEFT$(DATE$, 2) >= "10"
THEN
i = VAL(RIGHT$(DATE$, 4)) - 1993
s = 31: j = i
DO WHILE j > 0
GOSUB back2
j = j - 1
LOOP
IF (i + 1) / 4 = INT((i + 1) / 4) THEN
GOSUB back2
s$ = RIGHT$(STR$(s), 2)
fallback$ = RIGHT$(DATE$, 4) +
"10" + s$
IF (currentdate$ > fallback$) OR
((currentdate$ = fallback$) AND
(LEFT$(TIMES$, 2) >= "02"))
THEN
OPEN "\timetemp.hhh" FOR
INPUT AS #1
LINE INPUT #1, a$
CLOSE #1
IF a$ >= fallback$ THEN
GOTO ender
ELSE
GOTO changetime
END IF
END IF
END IF
GOTO ender
changetime:
a$ = TIMES
a = VAL(LEFT$(a$, 2)): b$ =
RIGHT$(a$,
6)
a = a + (MID$(currentdate$, 5, 2)
>= "10") - ((MID$(currentdate$,
5, 2) >= "04") AND
(MID$(currentdate$, 5, 2) <
"10"))
```

Filling in the
blanks, automating
your PC's clock,
and batching QBASIC
from your
AUTOEXEC.BAT

The World's First Photorealistic Interactive CD Sci-Fi Adventure



THE JOURNEYMAN PROJECT



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Mark Rhodes, Multimedia Editor,
Micropublishing News

6 June 2318, 0651Z.

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Come on down to Jack Daniel's someday and watch us make our smooth sippin' whiskey.

A JACK DANIEL'S RICKER KNOWS the difference between whiskeywood and firewood.

For the charcoal that mellows our Tennessee Whiskey, we'll only burn hard maple taken from high ground. Anything else is too soft and would just go to ash. (Jack Bateman here is weeding out a stack of creek maple.)

A new man in our rickyard must learn many skills before we bring him on. But first is knowing what wood makes the whiskey. And what wood makes the fire you sip the whiskey by.

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FEEDBACK

```
a = -(a + (-24 * (a = -1))) * (a
<>24)
TIMES = RIGHTS$(STR$(a),
LEN(STR$(a)) - 1) + b$
GOSUB maketimetemp
PRINT "System clock changed."
ender:
PRINT DATE$, TIMES$
SYSTEM
errorchecker:
GOSUB maketimetemp
RESUME NEXT
back1:
s = s - 1
IF s < 1 THEN s = 7
RETURN
back2:
s = s - 1
IF s < 25 THEN s = 31
RETURN
maketimetemp:
OPEN "\timetemp.hhh" FOR
OUTPUT AS #1
PRINT #1, currentdate$
CLOSE 1
RETURN
```

Auto Execute

Is there a way to get a QBASIC program to run from my AUTOEXEC.BAT?

ROBERT TOMLINSON
MESQUITE, TX

Yes. First, place the command SYSTEM at the end of the QBASIC program so that you'll exit from it when it's completed. Otherwise, when the program is finished, you'll be left sitting in QBASIC. Make sure the directory containing QBASIC is in your path. Then place the command to run the program within your AUTOEXEC.BAT. Say your program was called DST.BAT. To run it, place this line in your AUTOEXEC.BAT.

QBASIC /RUN DST

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. Call our special "Feedback" line: (900) 884-8681, extension 7010201 (sponsored by Pure Entertainment, P.O. Box 186, Hollywood, California 90078). The call will cost 95 cents per minute, you must be 18 or older, and you must use a touch-tone phone. Or you can write to "Feedback" in care of this magazine. Readers whose calls or letters appear in "Feedback" will receive a free COMPUTE baseball cap while supplies last. We regret that we cannot provide personal replies to technical questions. □

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ENTERTAINMENT SOFTWARE

THE BEST IN ARCADE GAME SOFTWARE

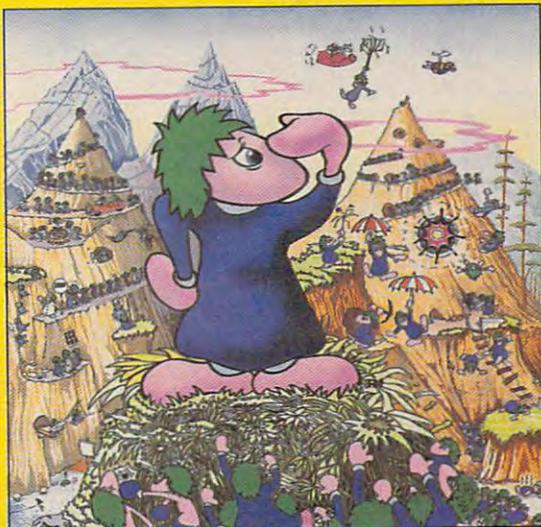
Historically, arcade games have never been the PC's long suit. Lacking the custom graphic coprocessors of its competitors—from the humble C64 to the more advanced Amiga and Atari ST—the PC simply couldn't cut it. So while others enjoyed a deluge of cutting-edge action games, the stodgy old PC held firm to its standing as an artless business computer.

Things certainly have changed. The once-dull PC now bursts with power—dynamic sound, graphics, and precision input devices. Consequently, for the first time, arcade games are hot on the PC. As if making up for lost time, designers and players are attacking the genre with a passion. Although the overall selection remains small compared to other systems, the floodgates are now open.

Hint: Traditional analog joysticks may be great for flight simulations, but they make lousy arcade controllers. Serious action players should invest in the four-button Gravis PC GamePad (Advanced Gravis, 604-431-5020, \$29.95), a marvelous short-throw, console-style controller made especially for arcade games.

Arcade games generally fall into the following categories: Platform (run and jump), Shoot-em-Ups, Maze, Puzzle, and Classic (traditional games, such as pinball, adapted for the computer). Many designers, however, find ingenious ways to meld one or more categories—combining, for example, platforms with puzzles.

A perfect example of this



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melding of one category with another is Wolfenstein 3-D (Apogee, 800-426-3123, \$50), which combines first-person maze running with nonstop shoot-em-up action. Players assume the role of a Schwarzenegger-style World War II prisoner attempting to escape a heavily guarded Nazi castle. Self-rated PC, for Profound Carnage, the game skyrocketed to cult status on the strength of its lightning speed, outrageous sound effects, and heart-pounding action. The full game features six individual episodes, each containing nine or more convoluted castle levels. The designers, Id Software, have followed this success with Doom, a game that features more involved play mechanics and dazzling graphic effects.

In the mood for some intense arcade aerobics? Prepare for a fast-paced workout with The Lost Vikings (Interplay, 800-969-4263, \$39.95). Take control of three well-meaning, but slightly dense, Viking warriors on a mad romp through time and space. The game's unique challenge involves alternating control between the three lead characters, each of whom possesses a special ability. You'll need a thoughtful, well-timed group effort to survive the game's 37 large, puzzle-filled levels. The graphics are bright, colorful, and detailed.

Few titles have put a more lively spring in the step of platform games than Jordan Mechner's Prince of Persia (Brøderbund, 800-521-6263, \$29.95). Loosely based on the Arabian Nights adventure, your goal is to rescue the Princess, held captive 12 levels above you in the Sultan's castle. Widely considered a milestone in

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the genre, this game provides a stunning showcase of rotoscoped animation, featuring incredibly fluid and lifelike character animation. Acrophobics beware: Much of the platform action in this remarkably physical game takes place at perilous heights, guaranteed to induce sweaty palms and queasy stomachs.

Brøderbund recently released Mechner's long-awaited sequel, *Prince of Persia 2: The Shadow and the Flame* (\$49.95). The new title features 15 extra-large levels with a wider variety of settings and obstacles, vastly improved graphics, and an almost merciless array of opponents. Both games should be considered standard equipment for serious arcade players.

No doubt inspired by Mechner's work, French developer Delphine Software uses rotoscoped animation with even greater success in its phenomenal arcade adventure, *Flashback* (Strategic Simulations, 800-245-4525, \$49.95). This futuristic thriller combines intense arcade athleticism with explosive firepower and mind-bending puzzles, spread out among six huge, diversely entertaining levels. Both background and foreground graphics are excellent—highlighted by film-quality animation—and expertly blended with atmospheric sound effects and cinematic transitions. Fans of this game also should check out Delphine's previous ground breaker, *Out of This World* (Interplay, \$29.95).

Other exceptional platform games with a strong puzzle flair include the wildly popular *Lemmings* and *Lemmings 2: The Tribe*

(Psygnosis, 800-438-7794, \$29.99 and \$59.99, respectively). The object of both games is to guide tiny green-haired, half-witted creatures across dangerous terrain to the exit door. What sounds simple in theory, however, proves absolutely maddening in practice, requiring steady nerves, quick reactions, and surprisingly sophisticated real-time strategy. The original game boasts 80 one-player and 40 two-player levels, arranged in difficulty from Easy to Mayhem. *Lemmings 2* expands this premise dramatically, dividing its 120 levels among 12 unique Lemming tribes. The little guys also are given much more to do—with 55 different skills ranging from archers to surfers—as well as a wild assortment of precarious, often surreal obstacles. The sequel offers improved sound and graphics, although the original remains eminently playable.

Those looking for more edge-of-your-seat, gut-level gratification should try their trigger fingers on the growing number of high-octane shoot-em-ups. Firmly entrenched at the top of the list is *Wing Commander Deluxe Edition* (Origin, 800-245-4525, \$79.95), Chris Robert's legendary space combat game. Structured around a branching, cinematic storyline, your pilot skills are put to the test in a series of increasingly dangerous deep space missions. The key to the game's success is the ferocious action scenes, featuring in-your-face 3-D dogfights, exploding with fiery bit-mapped graphics and script digitized sound.

The game's outstanding sales have prompted several add-on mission disks, as well as the newly released *Wing Commander Academy* (\$49.95). This latest stand-alone game forgoes the original's fancy

theatrics to offer nothing but pure adrenaline-pumping action.

Another popular blending of styles combines shooting action and puzzle solving in an overhead maze setting. One of the most entertaining in this category is *D/Generation* (The Software Toolworks, 415-883-3000, \$24.95), a riveting race through 10 levels of a mutant-infested office building. Nothing is as it seems—don't even trust the furniture—in this brilliant 1991 release. On a more abstract, pure arcade level, *S.C. OUT* (Inline Design, 203-435-4995, \$59.95) captures the imagination with its finger-numbing action and intricate puzzles. The game boasts 101 huge 4-way scrolling levels, with a built-in—yet curiously undocumented—game editor, which allows players to create up to 999 diabolical levels. Graphics, sound effects, and player controls are all superb.

When you feel the need for speed, strap yourself into *Stunts* (Brøderbund, \$19.95), perhaps the best arcade-style racing simulation ever made. From gut-wrenching loops to elevated jumps, this one's a full-tilt screamer on even marginally equipped systems, with amazingly responsive joystick control. The game's easy-to-use track construction kit—with user-created tracks available on most major online services—assures almost limitless high-octane fun.

If you enjoy vibrant, challenging entertainment, but lack the twitchy wrist required by most action-oriented fare, check out Russia's gift to the gaming world, *Tetris* (Spectrum Holobyte, 800-695-4263, \$19.95). Sure it's simple,

TOP 10 ARCADE GAMES

Lemmings 2. A wild and wacky 120-level puzzler, featuring sound and graphics enhanced from the best-selling original.

The Lost Vikings. True arcade-quality graphics highlight this fast and funny multilevel contest.

Flashback. A mind-bending adventure sparked by brilliant rotoscoped animation, this one points the PC in a bold new direction.

Prince of Persia 2: The Shadow and the Flame. Improved graphics and tougher opponents mark this long-awaited sequel.

Wolfenstein 3-D. A

runaway hit noted for its blazing speed and ultraviolent action, often imitated, but rarely equaled.

D/Generation. Unassuming and often overlooked, this one's a nail-biter.

Wing Commander. Dynamic space combat wrapped around a cinematic storyline, this one started the current 3-D action craze.

S.C. OUT. Another low-profile action puzzler with an incredible built-in construction kit.

Stunts. Auto racing with a wild and wicked twist, featuring a terrific built-in track editor.

Super Tetris. The best rendition yet of the world-famous computer classic.

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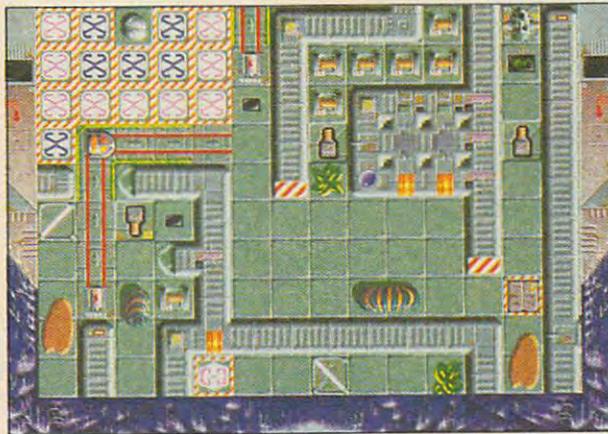
but try saying *no* to just one more game. Creating its own cottage industry, there are even several varieties to choose from: the VGA-enhanced Tetris Classic (\$44.95); Tetris Trio (\$49.95), combining Tetris, Welltris, and Faces; and the best of the lot, Super Tetris (\$49.95), featuring greatly improved sound, graphics, and gameplay options. Other excellent visual puzzle games include Tinies (Inline Design, \$59.95), Pipe Dream (LucasArts, 800-STARWARS, \$19.95), and Ishido (Accolade, 800-245-7744, \$24.95).

—Scott A. May

THE BEST IN SIMULATION GAME SOFTWARE

At their best, computer simulations should not only entertain, they should enlighten as well. As an interactive reflection of real-world activities, they allow ordinary people to experience extraordinary things. Let's face it, few of us will have the opportunity to pilot a real jet fighter, race the Indianapolis 500, or fly in a space shuttle. With a little imagination and a powerful PC, simulations allow anyone to do almost anything.

The overwhelming majority of titles in this genre are combat flight simulators—most directly based on real-life military aircraft, both modern and historical. It's not only one of the most prolific categories of entertainment software, but a proving ground for some of the industry's hottest design innovations. Just as early test pilots pushed the envelope of man and machine, flight sims continually test the boundaries of today's powerful PCs.



Inline Design's S.C.O.U.T.

The field is so crowded with high-quality products, it's nearly impossible to narrow the selection. We'll begin with some of the established classics, particularly those best suited for rookie pilots. Almost four years old, but still flying high, Damon Slye's Red Baron (Dynamix, 800-326-6654, \$49.90) remains one of the genre's top picks. Test your skills in the skies of World War I Europe—on both the British and German sides—flying such vintage fighters as the Sopwith Camel, Fokker Eindecker, and Nieuport 17. If you're looking for realistic dogfight action, you can't get much better than this, squaring off against some of history's best, including Max Immelmann, Eddie Rickenbacker, Oswald Boelcke, and the Red Baron himself, Manfred von Richthofen. Also featured are dozens of single missions, historical scenarios, and full campaigns, augmented with one of the genre's most versatile flight recorders. The game now comes packaged with the Red Baron Mission Builder, which adds untold enjoyment to this award-winning classic.

For dogfights of the modern era, you can't get much

better than Chuck Yeager's Air Combat (Electronic Arts, 800-245-4525, \$59.95). Like Red Baron, this one's a comparative old-timer, but one that still holds its own against the more flashy newcomers. A fighter pilot's dream, the game simulates a wide variety of aircraft from three combat eras: World War II, Korea, and Vietnam. Players assemble scenarios as you might order a meal from a Chinese menu—choosing an aircraft, starting altitude, and tactical position, as well as the opponent type, number, and skill. Select from more than 15 available aircraft, ranging from the P-47 Thunderbolt and B-29 Superfortress to the F-4 Phantom and MiG-21 Fishbed. The action explodes in a white-knuckle test of piloting prowess, weapons superiority, and split-second tactical skills. The program also features dozens of historic missions, a flight recorder, and wonderfully stable joystick controls.

An excellent choice for both beginning and intermediate dogfighters is Secret Weapons of the Luftwaffe (LucasArts, 415-721-3300, \$49.95), the premiere World War II-era air combat

sim. Take off as either an Allied or Axis pilot, commanding such classics as the P-47 Thunderbolt, P-51 Mustang, B-17 Flying Fortress, Messerschmitt Komet, Focke-Wulf 190, and experimental Gotha 229 fighter-bomber. A series of official supplement disks, as well as dozens of user-created hexed planes—available through various online services—adds even greater firepower. The game offers a wide scope of training flights, single missions, and full campaigns. One of its distinguishing marks is the use of bitmapped aircraft, instead of the usual polygon renderings, resulting in even greater detail, particularly images of planes trailing smoke and fire during close-range combat. Other highlights include terrific sound effects, from the vibrato engine hum and teeth-chattering explosions to the realistic Doppler drone of passing aircraft.

Yet another bona fide classic of the World War II era is Aces of the Pacific (Dynamix, \$59.95), an award-winning combat sim from the creators of Red Baron. The sunny skies and blue water of the South Pacific provide stark contrast for this sensational aerial ballet of black smoke, bullets, and bombs. Hit the air in dozens of vintage U.S. and Japanese aircraft, including the Yokosuka D4YA Judy, Mitsubishi Zero, P-38 Lightning, P-39 Airacobra, and F4U Corsair. Structured similarly to Red Baron, the game features extensive training, single and historic missions, and numerous campaign options. Graphics and sound effects are state-of-the-art, with intensity levels heightened by the splendid flight recorder.

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Dynamix has followed this successful product with the equally impressive *Aces Over Europe* (\$59.95).

Other air combat simulations, most suitable for intermediate pilots, include *F-117A Nighthawk* (MicroProse, 800-879-PLAY, \$49.95), *Knights of the Sky* (MicroProse, \$19.95), *Comanche: Maximum Overkill* (NovaLogic, 800-245-4525, \$69.95), and *Strike Commander* (Origin, 800-245-4525, \$79.95).

Those who feel they've earned their wings can try their luck in the upper echelon with *Falcon 3.0* (Spectrum Holobyte, 800-695-GAME, \$79.95), widely considered to be the best in the business. Packing the most realistic avionics of any PC combat sim, this is the closest most will come to piloting an F-16 without joining the Air Force. Some of the game's most outstanding features include full squadron-level command of up to

eight fighter jets through a variety of single and campaign missions. Action erupts hot and heavy in such theaters of conflict as the Middle East and Central America, with more than 90,000 square miles of ground detail rendered in stunning 3-D contoured polygons. In addition to the computer opponent's remarkable artificial intelligence, you also can go head-to-head against a friend—flying the MiG-29—via null or remote modem link. Add-on mission disks include *Operation Fighting Tiger* (39.95) and *MiG-29* (\$59.95).

Even the most jaded fighter jocks will experience future shock in *X-Wing* (LucasArts, \$69.95), the first full-fledged space combat simulator. Why putter with biplanes or jet fighters when you can warp out in X-, Y-, and A-Wing starfighters, armed to the teeth with laser canons and proton tor-

pedoes? Engage in an increasingly difficult series of missions against the evil Empire, ranging from simple deep space recon to multiphase attacks on battle cruisers and star destroyers. It's a rip-roaring good time, but not for the easily frustrated. Both graphics and sound effects set new standards for the genre. A supplement disk, *Imperial Pursuit* (\$29.95), is available.

Other advanced combat flight sims worth considering are *Megafortress* (Three-Sixty Pacific, 800-245-4525, \$59.95), *Gunship 2000* (MicroProse, \$39.95), *Tornado* (Spectrum Holobyte, \$79.95), and *F-15 Strike Eagle III* (MicroProse, \$69.95).

Of course, there's more to flight simulation than blasting things to smithereens. The top straight flight simulator is without doubt *Flight Simulator 5* (Microsoft, 800-426-9400, \$64.95), the latest incarnation of an industry pioneer. Cosmetically, the game features a complete Super-VGA makeover, including digitized cockpit displays, texture-mapped terrain, dithering horizons, and eye-popping 3-D landmarks. The simulation also features new satellite navigation tools, more realistic weather, improved flight models, sampled sound effects, and a more useful flight recorder.

Stunt Island (Walt Disney Computer Software, 800-688-1520, \$59.95) skillfully blends flight simulation and cinematography into one of the genre's most fascinating, utterly original creations. Designed for advanced, ambitious players, you'll don many hats in this one—stunt pilot, director, prop master, set designer,

and film editor—as you assemble daredevil stunts on the world's largest fantasy backlot. Scout locations on the island's disparate terrain, from mountains and skyscrapers to farmland and urban sprawl. Choose from an amazing assortment of 45 aircraft, from World War I to modern-day, including such oddities as hang gliders and shuttles, all rendered in fast, beautifully shaded VGA polygons. Despite its diversity, each aspect of the game is integrated to offer a long-lasting, educational experience.

Coming back down to earth, the genre's few non-flight simulations deal with business-oriented resource management, although most are better classified as strategy games. Likewise, most driving games—such as the top pick here, MicroProse's *World Circuit*—are true simulations, but usually are categorized as sports.

—Scott A. May

TOP 10 SIMULATION GAMES

Stunt Island. A stunning combination of flight simulation and full-featured cinematography.

Red Baron. Though set in World War I, Damon Slye's masterpiece is the model for most modern air combat sims.

Chuck Yeager's Air Combat. Dogfight through three combat eras.

Falcon 3.0. The current champ among high-end combat flight simulations, with few challengers on the horizon.

Aces Over the Pacific. Easy to learn, but tough to put down, this one offers the widest appeal of any

combat sim.

Secret Weapons of the Luftwaffe. Another historical powerhouse, filled with fast action and an explosive presentation.

X-Wing. Rooted in the Star Wars saga, this is the only space game good enough to qualify as a top-rated flight simulation.

Flight Simulator 5. The pioneer of civilian flight simulation gets a long-awaited facelift in this feature-packed update.

Megafortress. This high-tech, high-stress bomber simulation captures the multitasking intensity of modern warfare.

World Circuit. Is it a sports game or a true simulation? It earns a spot on both lists

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sults are often the most enduring entertainment of any software genre.

Few sports are as fiercely contested among designers and players as professional baseball. Debates over which title best simulates the action, statistics, or managerial options probably will rage as long as fans argue over their favorite teams. *Hardball III* (Accolade, 800-245-7744, \$59.95) currently reigns as league leader in the action-oriented category. This one has a lot going for it: beautiful 256-color graphics, VCR-style instant replay (with option to save), accurately rendered stadiums, TV-style close-ups, multiple view angles, and best of all, digitized play-by-play from veteran sportscaster Al Michaels. Play options include exhibition games or user-defined full season play, with mid-season all-star games and limited statistical printouts. Add-ons, such as the *MLBPA Players Disk* (\$24.95) and *Big League Ballpark Disk* (\$24.95), extend the game's instant appeal.

Heating up the bullpen is *Accolade's* closest rival, *Tony LaRussa Baseball II* (Strategic Simulations, 408-737-800, \$59.95). This power hitter actually boasts the league's best graphics and most realistic animation, but it falls short of the fence in terms of accurate and responsive player controls. Announcer Ron Barr is on board for digitized play-by-play—smoother, but not as expressive, as Michaels in *Hardball III*. As you'd expect from the title, the game shines on the managerial side, featuring a roster of 2,000 veteran players and 54 historical teams, with stats updated and printed in



Links 386 Pro from Access

134 categories. Optional add-on disks include the *MLBPA Players* (\$19.95), *AL/NL Stadiums* (\$29.95), and *Fantasy Draft* (\$19.95).

For those who see baseball as merely a numbers game, the field abounds with several excellent all-stat games. Many of the league's oldest and most respected titles recently have resurfaced with much-needed graphical facelifts. Beneath their hi-res, mouse-driven facade, however, still beats the heart of a spreadsheet. Among the best new titles are *MicroLeague Baseball 4* (MicroLeague Sports Association, 302-368-9990, \$49.95), *APBA Baseball for Windows* (Miller Associates, 800-654-5472, \$69.95), and *Strat-O-Matic Computer Baseball 4.0* (Strat-O-Matic, 800-645-3455, \$60).

Although baseball probably will always be known as the national pastime, football has long been America's favorite sport. The computer gridiron is also currently the scene of the game industry's hottest innovations. Leading the charge, with few competitors even close, is *Front Page Sports: Football Pro*

(Dynamix, 800-326-6654, \$69.95). The game's most obvious virtues are the dazzling on-field graphics, which use much of the same 3-Space technology pioneered in the company's best-selling flight simulators, *Red Baron* and *Aces of the Pacific*. More than 8,000 frames of rotoscoped animation make up the incredibly fluid, lifelike player movements, with nine fixed camera positions capturing the bone-crunching action. Gameplay itself is fast, smooth, and responsive, with support for dual joystick controls and truly remarkable computer artificial intelligence. But wait, we've only skimmed the surface! Beneath this slick veneer are the real goodies: 2,500 plays, real NFL teams and players, more than 300 printable stat categories, team owner and general manager duties, and the best coach's playbook designer on the market. No doubt about it, *FPS: Football Pro* is a work of art.

Of course, true football fans can never get enough pigskin action. The best of the second string titles offer credible performances in their own right. *Tom Landry*

Strategy Football Deluxe Edition (Merit Software, 800-238-4277, \$49.95) tops the list as the most entertaining coaching simulation. Highlights include a team and league editor, full season play, expanded stat tracking, null or remote modem play, and the most user-friendly interface in the genre. Other top draft choices for both action and strategy football include *Unnecessary Roughness* (Accolade, \$69.95), *NFL Football* (Gametek, 800-928-GAME, \$49.95), and *NFL Coaches Club Football* (MicroProse, 800-879-PLAY, \$49.95). Pure strategy fans should check out *MicroLeague Football 2* (MicroLeague Sports, \$54.95) and *3-in-1 Football* (Lance Haffner Games, \$39.95).

Few sports are as well adapted to computer simulation as golf, with its understated strategies and graceful motion. The undisputed king of the fairways is *Links 386 Pro* (Access, 800-800-4880, \$39.95), best known for its digitized full-motion video and scanned Super-VGA graphics. Most people don't believe their eyes upon first seeing the silky swings of the onscreen golfers. One of the game's most fascinating features is the ability to play a round and give the results (on disk) to a friend, who can then compete against your saved game. Other highlights include a user-defined windowed interface, multiple camera views, printable stats, and crisp digitized sounds. Like most other established golf games, this one boasts a batch of scenic course disks (\$29.95 each). A Windows version is sold under the title *Microsoft Golf* (Microsoft, 800-426-9400,

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\$64.95).

The runners up for best golf game are equally good, in their own way. *Accolade* has enjoyed tremendous success with Jack Nicklaus' *Golf and Course Design: Signature Edition* (\$69.95), noted for its outstanding 256-color VGA course designer. Beyond the wide assortment of supplement course disks offered through the company, dozens of user-created courses can be downloaded off services such as CompuServe, GEnie, and America Online. Other worthy golf titles include *PGA Tour Golf for Windows* (Electronic Arts, 800-245-4525, \$59.95) and David Leadbetter's *Greens* (MicroProse, 800-879-PLAY, \$59.95), the latter noted for its unusual multi-player modem option.

The mechanics of computer auto racing force most games in this category to straddle the line between sport and simulation. The best in a new breed of high performance models is *World Circuit* (MicroProse, \$59.95). The game features exquisite reproductions of 16 world class Grand Prix circuits, from Monaco's twisting urban sprawl to the gut-wrenching figure eight of Japan's Suzuka raceway. Fabulous first-person perspective, rendered with a speedy combination of bit-mapped and textured polygon graphics, puts you right on the tarmac. The game also feels right, whether you're tearing down the straight-aways or slipping into a tight curve. A unique alternating play mode allows two drivers to compete on a single computer. Or you can play two simultaneously via null or remote modem link. Other worthy contenders for the checkered flag are

TOP 10 SPORTS GAMES

Front Page Sports: Football Pro. Unbeatable combination of 3-D graphics, managerial decisions, and playbook design.

World Circuit. Great looks and smooth play combine for full-throttle action.

Hardball III. Well-balanced design of action, graphics, and strategy, with play-by-play by sensational Al Michaels.

Links 386 Pro. Soars to top of golfing leader board with digitized Super-VGA graphics.

4-D Boxing. Polygon graphics deliver ultra-smooth, lifelike animation.

APBA Baseball for Windows. Polished Windows interface brings new life to this venerable stat classic.

Jack Nicklaus Golf, Signature Edition. Lush graphics and built-in course designer highlight this all-time favorite.

Summer Challenge. Up to 10 players compete in 8 expertly designed Olympic-style events.

Tom Landry Strategy Football Deluxe Edition. Solid coaching sim with excellent stats, play calling, modem option, and the best mouse interface in its league.

NHL Hockey. Excellent conversion of the best-selling console classic.

IndyCar Racing (Papyrus Software, 617-868-5440, \$74.99), *Car and Driver* (Electronic Arts, \$59.95), and Mario Andretti's *Racing Challenge* (Electronic Arts, \$24.95).

The best of the so-called minor sports include *4-D Boxing* (Electronic Arts, \$24.95), an amazing new approach that borders on virtual reality. Boxers are rendered with large polygon shapes, affecting an odd, abstract look, but facilitating remarkably fluid, lifelike motion. Multiple camera angles, including a wild first-person view, puts you right in the ring. Hockey fans will be delighted with Electronic Arts' excellent *NHL Hockey* (\$69.95), a potent combination of fast action and in-depth coaching skills. Converted to the PC from the best-selling Sega Genesis original, the game features full rosters of real NHLPA teams and players, with your choice of exhibition or full 84-game season

play, including the Stanley Cup finals. Other highlights include Ron Barr's digitized voice, skate or coach play options, detail stat reports, and two-play competitive mode.

Other outstanding sports titles, in a variety of categories, include *Summer Challenge* (Accolade, \$54.95), *Test Drive III: The Passion* (Accolade, \$59.95), *Wayne Gretzky Hockey 3* (Bethesda Softworks, 301-926-8300, \$59.95), and *Cactus League College and Professional Basketball* (Cactus Development, 800-336-9444, \$49.95).

—Scott A. May

THE BEST IN STRATEGY GAME SOFTWARE

In many ways, the strategy category serves as a catch-all for games that don't fit neatly within other, more specific, genres. When you think about it, every computer game requires the

player to exert some degree of strategic skill. Arcade contests, for example, may seem like mindless action fare, but they actually demand a great deal of real-time plotting and scheming. Many of the titles you'll find here contain elements of arcade, simulation, adventure, or war games, yet offer enough strategic prowess to earn separate distinction.

The most clearly defined examples of the genre are titles based on traditional board, tabletop, and parlor games. Chess wizards looking for the ultimate opponent will find nirvana in *The Chessmaster 3000* (The Software Toolworks, 415-883-3000, \$49.95), available for both DOS and Windows. Advanced features include a library of 150 classic matches, blindfold chess, tournament and championship play, and finely tuned computer play and response settings. For the beginner, there's an online mentor and built-in tutorial. All players will enjoy the intuitive mouse-driven interface and wide selection of high-resolution chess pieces and board designs. For those in the mood for a strong game, with a slightly irreverent feel, check out the animated *Battle Chess* series from Interplay (714-553-6678), available in versions for DOS (\$29.95), Windows (\$49.95), and Super-VGA (this one is called *Battle Chess 4000* and costs \$59.95). All are strong opponents with exceptional graphic flair and the added attraction of remote modem play. Finally, there's National Lampoon's *Chess Maniac 5 Billion and 1* (Spectrum Holobyte, 800-695-GAME, \$69.95), a game

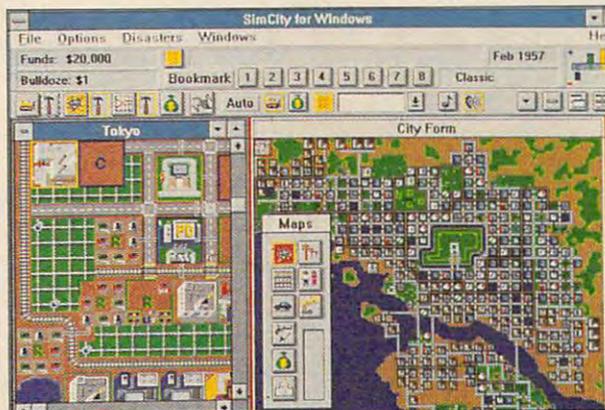
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whose self-described "rude" sounds and animated graphics almost make up for its rather weak chess engine.

Solitaire addicts will be easily hooked on Solitaire's Journey (QQP, 908-788-2799, \$59.95), a whirlwind tour of 105 different solitaire card games. Other titles in a similar vein include the Hoyle Book of Games series from Sierra (800-326-6654): Classic (\$42.45), Vol. 2 (\$29.70), and Vol. 3 (\$42.95). For the more socially minded, there's Grand Slam Bridge II (Electronic Arts, 800-245-4525, \$49.95), a 256-color VGA update of the best-selling original with new mouse and sound card support, customized bidding, and dealing options for up to four human players.

Perhaps the most famous—certainly the most copied—solitaire game designed especially for the computer is Shanghai II: Dragon's Eye (Activision, 800-477-3650, \$29.95). A brilliant enhancement of Brodie Lockard's original work, the program is loosely based on the Chinese tile game, Mah-jongg. The latest version features 8 tile sets, 13 board designs, a two-player tournament mode, and a built-in board designer.

If gambling's your game, ante up to Amarillo Slim Dealer's Choice (Villa Crespo Software, 708-433-0500, \$29.95), which features 28 poker varieties, online tutor, and user-defined house rules. What it lacks in presentation—marginal 16-color EGA—it makes up with fast, fun game play. Those on a budget will also enjoy Villa Crespo's CoffeeBreak gambling series, including Ca-



SimCity from Maxis

sino Craps, Dr. Wong's Jacks & Video Poker, and Dr. Thorp's Mini-Blackjack (\$12.95 each). High rollers can wrestle the one-armed bandit without going to the cleaners in Strategic Video Poker (LWS Software, 800-828-2259, \$49.95) and Masque Video Poker (Masque Publishing, 800-765-4223, \$49.95). With detailed statistical analysis, numerous payoff configurations, and optional online strategy, both products offer fast-paced simulations of the most popular Las Vegas and Atlantic City machines. For an all-in-one guided tour of casino games, check out Beat the House (Gametek, 800-927-GAME, \$59.95), which features detailed tutorials for slots, blackjack, roulette, video poker, and craps.

Computer incarnations of famous multiplayer board games include an entire series by Virgin Games (800-874-4607): Risk (\$29.99), Monopoly Deluxe (\$49.95), and Scrabble Deluxe (\$49.95), available in high-res DOS and Windows versions. For classics that exist only on the computer screen, you can't get much more famous than Tetris (Spectrum Holobyte, \$19.95), a simplistic, yet

undeniably addictive, strategy game of falling blocks. The game's huge success sparked a wildfire of inferior knockoffs, culminating with the final—and best—version, Super Tetris (\$49.95), available for both DOS and Windows. Another computer original bound for classic status is The Incredible Machine (Sierra, \$34.95), an arcade-style puzzle feast inspired by Rube Goldberg's wacky homemade contraptions. The original contains 85 increasingly difficult levels, to which 80 more are added in the enhanced sequel, The Even More Incredible Machine (\$42.45).

Game designers often look to real life for inspiration. Currently the hottest trend in strategy gaming is resource management, applied to everything from big business to complex social and political systems. One of the first to open this strategic can of worms was Will Wright's phenomenally popular SimCity (Maxis; 800-336-2947; \$49.95 for DOS, \$59.95 for Windows), a model of urban planning highly regarded for its realism. From this tiny seed, Maxis sprouted an entire line of fun, microcosm software, including SimEarth (\$49.95), SimLife (\$69.95),

SimAnt (\$49.95), and finally, SimFarm (\$49.95). Bringing real-world resource management down to a more earthy level, this last title looks to be most tangible in the series.

Players with a nose for economic planning and elaborate corporate infrastructures can find rewarding careers in such games as Railroad Tycoon Deluxe (MicroProse, 800-879-PLAY, \$69.95), Rags to Riches (Interplay, \$59.95), A-Train Construction Set (Maxis, \$69.95), Buzz Aldrin's Race Into Space (Interplay, \$69.95), and Air Bucks (Impressions, 203-676-9002, \$59.95).

Why manage a business when you can control the universe—or at least a small corner of it—in Populous (Electronic Arts, \$24.95) and Civilization (MicroProse, \$59.95). Populous is set in an abstract fantasy world, where two gods vie for supreme deity, via modem if so equipped. Civilization is Sid Meier's masterpiece of human survival, splendidly drawn from the pages of world history. Both games gave rise to a flood of excellent so-called *god sims*, including Populous II (Electronic Arts, \$59.95), PowerMonger (Electronic Arts, \$49.95), Utopia (Gametek, 800-927-GAME, \$19.99), Global Effect (Millennium, 800-245-4525, \$14.95), Caesar (Impressions, \$59.95), and Mega lo Mania (UBI Soft, 415-332-8749, \$49.95).

Looking for heavy strategy, but with a lively arcade bite? Take a walk on the dark side in Syndicate (Electronic Arts, \$59.95), a grim look at the future of law and disorder. Command an elite squad of heavily armed cyborg hitmen in this one-

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player power struggle, noted for its stunning sound and graphic violence. Slightly less cynical, and more abstractly violent in nature, is RoboSport (Maxis, \$39.95), a 1-2 player Windows game loosely based on the old Capture the Flag premise.

Strategy games and TV quiz shows have a lot in common—a connection best exploited by LexiCross (Interplay, \$39.95), a flashy, futuristic word puzzle game played with quick wits and tongue firmly in cheek. With several levels of difficulty, modem option, and superb multiplayer tournament mode, this classic offers true long-lasting challenge. Another excellent offering in the TV game show format is CrossWire (SilverSun, 800-874-5837, \$39.95). Test your knowledge in more than 16 categories, including pop culture, history, science, art, sports, music, and geography in this fast-paced Windows game.

—Scott A. May

THE BEST IN ADVENTURE GAME SOFTWARE

Adventure games are currently the most popular form of computer entertainment. If you can look at pictures, read a few words, and click with the mouse, that's all the skill needed to play one. A distant relative of the industry's early all-text adventures, today's adventures are more akin to huge, interactive versions of what the comic-book industry now calls graphic novels. It's a blistering hot field, thanks to continuing advances in cinematic techniques, digitized sound, effortless interfaces, and quality scripts.

Like its close cousins in

TOP 10 STRATEGY GAMES

Civilization. Grow your own society, loosely based on human history, both good and bad. Like an interactive civics lesson, but more fun.

The Even More Incredible Machine. Beneath the silly arcade front lurks a seriously fun, mind-bending strategy game.

Populous. First of the so-called *god sims* remains the genre's most polished.

SimCity. The microcosm that started a revolution. If only real cities were this much fun to build.

Railroad Tycoon Deluxe. If you build it, they will run—railroads, that is. A classic of hands-on entrepreneurial strategy.

LexiCross. Take a TV game show, zap it into an offbeat future, and you've got a classic multiplayer word puzzle game.

Buzz Aldrin's Race Into Space. Find out if you've got the right stuff to beat the Russians to the new frontier. Complex, historical, and thoroughly rewarding.

Chessmaster 3000 (Windows version). This one has beauty and brains, an unbeatable move for serious chess fans.

RoboSport. Employ unusual think-ahead strategies to program robots for real-time combat. A two-player classic, with modem option.

Syndicate. Populous meets Blade Runner in this dark, violent, and marvelously original action-strategy game.

the role-playing genre, adventure games are heavily influenced by mystic lands of magic, lost treasure, poor souls held captive, and brave heroes to the rescue. There are also extremely strong puzzle elements, in the form of clever word play or visual riddles, which often must be solved before turning the page.

The grand old master of the genre is, without a doubt, Sierra's King Quest series, created by Roberta Williams. Now in its sixth installment, each stand-alone adventure delves deeper into the lives of its cast of recurring characters, the royal family of Daventry. To ardent followers of the series, Williams' elegant prose evokes imagery as rich and rewarding as any in traditional literature. Combining beautiful scanned artwork, ambient sound effects, an

open-ended storyline, and a comfortable mouse interface, King's Quest VI: Heir Today, Gone Tomorrow (800-326-6654, \$67.95) is by far the best. Although technically less dazzling, King's Quest V (\$59.45) remains a solid choice, and in many respects, offers a more intriguing plot.

Another top fantasy adventure is The Legend of Kyrandia (Virgin Games, 800-874-4607, \$39.99), designed by Westwood Studios, creators of the original Eye of the Beholder role-playing games. In this quest, you must defeat the evil court jester Malcolm, who has slain the king (your father), stolen the magic gemstone, and cast the entire land of Kyrandia into turmoil. Beneath this simple story lies an adventure filled with uncommonly rich characters—and surprising hu-

mor—enhanced by excellent graphics, sound, and animation.

Graphic adventures with a more modern twist include Indiana Jones and the Fate of Atlantis (LucasArts, 415-721-3300, \$34.95), loosely based on Steven Spielberg's popular movie series. Join the offbeat archaeologist, master of the bullwhip and double-entendre, as he battles Nazi spies on—and below—several continents. It's the best Indy movie that was never made.

Those who prefer to leave graphics to the imagination will enjoy a game from Activision (800-477-3650) called Lost Treasures of Infocom, a fantastic collection of all-text adventures from a true pioneer in the genre. Volume One (\$69.95) features 20 individual titles, including the entire Zork series, as well as such classics as Deadline, Witness, Lurking Horror, Infidel, Planetfall, and Hitchhiker's Guide to the Galaxy. Volume Two (\$49.95) offers an additional 11 titles, including Border Zone, Bureaucracy, Cuthroat, and Wishbringer. Beyond sheer entertainment value, both libraries contain bona fide collector's items, chronicling the history of early computer games. Despite their age, few of the adventures have lost their appeal. Fittingly, the groundbreaking Zork series has reemerged with state-of-the-art, digitized graphics in Activision's recently released Return to Zork (\$79.95).

Science fiction adventures are staging a strong comeback, boldly led by such titles as Martian Memorandum (Access, 800-800-4880, \$39.95), Star Trek: 25th Anniversary

ENTERTAINMENT SOFTWARE

(Interplay, 714-553-6678, \$49.95), and Space Quest V (Sierra, \$59.45). One of the most original works in recent years is Inca (Sierra, \$50.95), designed by Paris-based Cotel Vision. Sparked by myriad puzzles and arcade sequences, it's a surreal blend of fact and fiction, topped with gorgeous graphics and full-motion video. Another French developer on the cutting edge is Delphine Software, best known for Out of This World (Interplay, \$59.95), a fascinating blend of rotoscoped action and cinematic-styled adventure. Those who desire more traditional excursions into science fiction will thoroughly enjoy Frederik Pohl's Gateway (Legend, 800-245-7744, \$59.95) and Gateway II: Homeworld (Legend, \$59.95). Both titles feature Bob Bates' intuitive

and efficient windowed text interface.

Hardboiled detective fans have a lot of graphic adventures to choose from. Police Quest 3 (Sierra, \$59.45) and Blue Force (Tsunami, 209-683-9283, \$69.95) take players into the heart of darkness. These tough urban crime dramas unfold at a brisk clip, packed with intense action and mystery. For more old-fashioned detective fare, crack open The Lost Files of Sherlock Holmes (Electronic Arts, 800-245-4525, \$69.95), a large-scale murder mystery that's anything but elementary. This one's notable for its intuitive icon interface, context-sensitive musical score, and handsomely drawn artwork.

Of course, many of the best adventures aren't confined by traditional story-



Inca from Sierra OnLine

lines; they incorporate elements of arcade, role-playing, and real-time strategy. You'll find both action and suspense on the high seas with Pirates! Gold (MicroProse, 800-879-PLAY, \$54.95), a full-blooded enhancement of Sid Meier's best-selling original. Sets sail under an English, French, Dutch, or Spanish flag in one of six rich historical eras, ranging from 1560 to 1680. As a dashing buccaneer, you'll live a fascinating life, full of exploration and confrontations, from political posturing and trade negotiations, to exciting ship-to-ship combat and deadly fencing duels.

Horror buffs have plenty to howl about, beginning with Alone in the Dark (Interplay, \$59.95), a blood-curdling adventure inspired by H. P. Lovecraft. Explore every creaking inch of a creepy old mansion, fending off ghosts, ghouls, and insidious traps. Rendered with fluid, 3-D texture polygons, the designers succeed in creating a kind of virtual reality nightmare. Unsettling mood music and crisp digitized sound effects will keep you up all night, chilled to the bone. Other harrowing horror titles include The Legacy: Realm of Terror (MicroProse, \$59.95), Dark Seed (Cyber-

dreams, 800-238-4277, \$69.95), Return of the Phantom (MicroProse, \$59.95), Uninvited for Windows (Viacom New Media, 708-520-4440, \$59.95), and Elvira II: Jaws of Cerberus (Accolade, \$69.95). Players with itchy trigger fingers can even lead a space-age bug hunt in Space Hulk (Electronic Arts, \$59.95), an utterly visceral adventure with strong arcade and strategy elements.

On the lighter side, nothing is sacred on Monkey Island 2: LeChuck's Revenge (LucasArts, \$34.95), Ron Gilbert's agonizingly funny sendup of the pirate adventure genre. Role-playing games get an equally painful kick in the pants with Eric the Unready (Legend, \$59.95), a text and graphic adventure with more inside jokes than you could shake a talisman at. You'll never look at a detective story with a straight face after playing Sam and Max Hit the Road (LucasArts, \$69.95), a slapstick misadventure starring everyone's favorite free-lance police. Yet another hot LucasArts comedy is Day of the Tentacle (\$69.95), a marvelously drawn B-movie parody. Finally, there's Freddie Pharkas, Frontier Pharmacist (Sierra, \$59.45), a terrific wild west spoof from Al

TOP 10 ADVENTURE GAMES

King's Quest VI. Latest edition of Roberta Williams' trend-setting adventure series is bigger and better than ever.

Monkey Island 2: LeChuck's Revenge. Side-splitting pirate parody doubles as challenging adventure yarn.

Inca. Uncommonly original and perfectly executed blend of disparate gaming styles, held together with stunning graphics and sound.

Indiana Jones and the Fate of Atlantis. Filled with action and humor, this rousing adventure features a plot even Hollywood can't match.

Alone in the Dark. Turn out the lights, turn up the sound, and enter a

spine-tingling world of horrifying entertainment.

Day of the Tentacle. Vintage B-movie spoof for kids and parents alike, accented with colorful, stylized cartoon graphics.

Eric the Unready. Fantasy role-playing may never be the same after running this gauntlet of in-jokes and pratfalls.

Out of This World. Strikingly original combination of rotoscoped animation, cinematic action, and problem-solving adventure.

Pirates! Gold. The perennial swashbuckling favorite returns with enhanced gameplay and knockout Super-VGA graphics.

The Lost Treasures of Infocom. Two-volume set offers glimpse of gaming history through 31 classic all-text adventures.

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Lowe, king of sophomoric satire and creative father to Leisure Suit Larry, world famous lounge lizard. For those who can't resist sexist gags and toilet humor, check out Leisure Suit Larry 5 (Sierra, \$33.95), but don't say we didn't warn you.

—Scott A. May

THE BEST IN ROLE-PLAYING GAMES

Role-playing games, by nature, are unquestionably the most personal of all entertainment genres. After all, the basic premise of any role-playing game is to delve as deeply as possible into the psyche of its main characters. Most games let you carefully craft a party of characters, then pamper, polish, and protect them through outrageous adventures. Some fictional characters are programmed to develop such distinctive personalities that if they fall to harm's way, their human caretakers often react with intense emotions.

Computer role-playing games (CRPG) are natural extensions of their traditional pen-and-paper games or table-top miniatures. Instead of simply imagining monsters and moss-covered labyrinths, computer games burst with ethereal life, thanks to ever-evolving graphics and sound effects. Hard-liners may complain that the real magic has been lost; for the rest of us, however, CRPGs are the realization of our dreams—or more often, our nightmares. Almost without exception, role-playing games are dark, otherworldly affairs. Most CRPGs take place in the distant past or in strange fantasy realms populated by wizards, dragons, and elves

and topped with an overabundance of evil.

The fantasy realm is stocked with so many quality efforts, it would be impossible—and downright confusing—to mention them all. An excellent place to hone your skills is the third installment of Jon Van Caneghem's popular series, *Might and Magic III: Isles of Terra* (New World Computing, 800-325-8898, \$39.95). Unlike many single-minded adventures, this game consists of a series of mini-quests, each taking you a step closer to your final confrontation. Foremost among the game's many innovations is its icon-driven player interface and its use of large scale, brightly colored graphics. The game also introduces new techniques for unrestricted wilderness travel; this allows players to explore virtually every nook and cranny of this massive gaming universe. Van Caneghem has followed this landmark game with two equally impressive *Might and Magic* titles: *Clouds of Xeen* (\$39.95) and *Darkside of Xeen* (\$49.95).

One of the genre's most successful pairings has been Strategic Simulations' computer recreations of TSR's legendary *Advanced Dungeons & Dragons* series. The result has been a steady stream of high-quality products, known to fans as the Gold and Black Box games. The cream of this prolific crop is without doubt the *Eye of the Beholder* series, volumes 1-3 (408-737-6800; \$19.95, \$59.95, and \$69.95, respectively). Trademark features of the games include superb character generation and combat controls, intelligent nonplayer characters, cinematic-style story transi-

tions, and chilling real-time action in the 3-D graphics window.

The final installment, *Assault on Myth Drannor*, is particularly challenging and recommended for experienced players only. Those who have mastered every castle and dungeon in the series can now create their own with Strategic Simulation's *Unlimited Adventures* (\$59.95), a full-featured AD&D fantasy construction set.

Another long-running favorite in the genre is the *Ultima* series by Origin's Richard Garriott, a.k.a. Lord British. Like many of its contemporaries, the series recently replaced its flat graphics and stilted interface with exquisite 256-color VGA, mouse-driven controls, and digitized speech. The latest editions of the award-winning saga are *Ultima VII: The Black Gate* (800-245-4525, \$79.95) and its add-on disk, *Forge of Virtue* (\$24.95). This game continues the series' familiar three-quarter, top-down view of the action but fills the full screen with improved graphic detail and peripheral animation. The storyline is huge and delightfully complex—not surprisingly, it takes nearly 20 megabytes of hard drive space. Garriott also jumps on the first-person bandwagon with *Ultima Underworld: The Stygian Abyss* (\$79.95). Unlike similar efforts, where characters must walk a path with limited view angles, this game allows unrestricted 360-degree movement. Combined with beautifully drawn 3-D modeled terrain and a remarkable illusion of depth, the experience is extraordinary. Origin recently followed with *Ultima Underworld II: Labyrinth of*

Worlds (\$79.95), which features a slightly revamped interface and the return of some old enemies.

The oldest of the genre's esteemed originals, by many accounts, is perhaps the best of the bunch: *Wizardry VII: Crusaders of the Dark Savant* (Sir-Tech, 800-447-1230, \$69.95). D.W. Bradley's epic series was the first CRPG to feature phased combat and 3-D perspective—in 1981's *Proving Ground of the Mad Overlord*. Although Sir-Tech subsequently fell behind in the audio/visual department, the company makes a bold comeback with this dazzling work. Atop the game's traditionally styled role-playing engine—widely considered the strongest in the genre—Bradley integrates a marvelous mouse-driven graphic interface. Of special note is the spine-tingling sensation of creatures rustling just beyond your field of vision, accompanied by distant growls, growing louder as you approach. Other new features include wilderness travel, automapping, day/night cycles, and vastly improved magic and combat. For players continuing on from the previous bestseller, *Bane of the Cosmic Forge* (\$59.95), the game boasts multiple starting points.

Among the best in a new breed of role-playing games is *Betrayal at Krondor* (Dynamix, 800-326-6654, \$59.45), based on the best-selling *Riftwar Saga* by Raymond E. Feist. In this totally unique blend of CRPG and graphic adventure, the story's characters aren't created by the player; instead, you function as a kind of interactive narrator, guiding the otherwise fiercely independent char-

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TOP 10 ROLE-PLAYING GAMES

Might and Magic: Clouds of Xeen. Big and colorful, this one's an excellent choice for rookie role-players.

Betrayal at Krondor. With a unique open-ended style, this is the vanguard of a new breed in role-playing adventure.

Wizardry 7: Crusaders of the Dark Savant. The grand elder of the genre, graphically updated and wicked as ever.

Ultima Underworld. Lord British goes underground with this stylish, 3-D virtual fantasy environment.

Eye of the Beholder III. The final installment of this trend-setting series offers tough challenges for advanced players.

Unlimited Adventures. Design your own diabolical quests with this full-featured role-playing construction kit.

Starflight 2. The first true science fiction role-playing classic makes up in gameplay what it lacks in graphics.

Star Control II. Interstellar epic combines exceptional graphics with role-playing, adventure, and arcade-style space combat.

Ultima VII. Latest in long-running Lord British series features vastly improved control scheme, sound effects, and character intelligence.

Lands of Lore: Throne of Chaos. A graphic knockout, with a storyline to match, enriched by an intuitive, streamlined interface.

acters through a series of adventures. Likewise, the game's structure can be tight or loose, closely following the main plot line, or branching off to explore a 3-D virtual fantasy world—224 million square feet of trails, rivers, mountains, lakes, islands, towns, twisting sewers, and abandoned mines. Because characters learn behavior based on decisions made at a particular time or place, no two games are exactly alike. Also worth noting is the extensive use of scanned artwork and digitized actors, as well as the 3-D tactical combat system.

Other worthy titles in the fantasy realm include *Lands of Lore: Throne of Chaos* (Virgin Games, 800-874-4607, \$49.95) from Westwood Studios, creators of the original *Eye of the Beholder*; *Magic Candle III* (Mindcraft, 800-525-4933,

\$59.95); *Challenge of the Five Realms* (MicroProse, 800-879-PLAY, \$49.95); *Realms of Arkania* (Sir-Tech, \$59.95); *Elvira* (Accolade, 800-245-7744, \$24.95); and *Darklands* (MicroProse, \$59.95).

Tired of trolls and arcane magic? Blast off to the future with science fiction role-playing games. Although the selection isn't nearly as large, this category recently has sparked renewed interest among game designers. Two of the oldest, yet still highly regarded, are *Starflight* and *Starflight 2* (Electronic Arts, 800-245-4525, \$24.95 each). Although the graphics and sound are primitive by today's standards, these intergalactic quests are unparalleled for their deep space atmosphere and player involvement. Much of this spirit also can be

found in *Star Control II* (Accolade, \$59.95), an epic-flavored star quest boasting excellent sound and graphics, involved alien interaction, and the best arcade-style space combat in the genre. Other titles of this caliber include *Planet's Edge* (New World Computing, \$29.95), *Hard Nova* (Electronic Arts, \$24.95), and *Tegel's Mercenaries* (Mindcraft, \$59.95).

Another title of exceptional quality is *Rules of Engagement 2* (Impressions, 203-676-9002, \$69.95), Omnitrend's mammoth space saga that combines starship role-playing with strategy and real-time tactical combat. The game's most remarkable feature, however, is called the Interlocking Game System, which offers internal links to Impressions' classic *Breach 2* (\$14.95) and upcoming *Breach 3*.

—Scott A. May

THE BEST IN WAR GAME SOFTWARE

Historical conflict games or war games, as they usually are known, have been around for many years. Originally available as board games from such giants as Avalon Hill, SPI, and GDW, the war game was the standard start up fare of a number of companies, most notably *Strategic Simulations* (SSI). Although much maligned as an adjunct of "war toys" by the politically correct, historical conflict games are, in fact, the preference of those who combine a love of history and/or find chess too abstract as a strategic challenge. For the purposes of this article, games that include warfare as an intrinsic part of the game also have been in-

cluded. Many of the newcomers to computer war games have come from the board game market. A half way point in that journey is HPS's *Aide De Camp* (\$79.95). *Aide De Camp* is a gamer aid, which allows the conversion of board games into computer representations that can be used for e-mail gaming.

Three companies dominate the war game field today. SSI has been joined by Three Sixty and the Australian firm SSG. While it's impossible to issue a blanket recommendation for each company, it's fair to say that most of their products are impressive.

In 1992, Three Sixty Pacific (800-653-1360) changed the face of computer war gaming with the introduction of *V for Victory: Utah Beach* (\$69.95). Here was a game designed for the computer but set up in board game style. Immediately, a large segment of the potential audience was completely at ease. Moreover, the June 44 Normandy Invasion was a perfect backdrop for an entertaining challenge. Subsequent releases in the *V for Victory* series have included, *Velikiye Luki* (\$69.95), one of the more obscure *Eastern Front Battles*; *Market Garden* (\$69.95); and the recent release of *Gold : Juno : Sword* (\$59.95). Three Sixty will be packaging the first three *V for Victory* games into a special *Victory Pack* (\$69.95), which may qualify as one of the better Christmas bargains. The developers of the *V for Victory* series, Atomic Games, have now moved over to Avalon Hill and will be working on a conversion of the venerable *Squad Leader* board game.

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Strange how cyclic this business can be. Three Sixty's other World War II European Theater depiction, High Command (\$69.95), is in many ways more of a game than a simulation. Until Avalon Hill redoes Third Reich properly, High Command remains locked in battle with Clash of Steel (SSI, 408-737-6800, \$69.95) for the attention of strategic gamers.

Clash of Steel is the latest in a long line of great war games from SSI. Simpler than High Command, Clash of Steel still allows the opportunity to explore different historical what ifs and various areas of research. For most war gamers, both strategic simulations will be of interest. SSI's war games are too many to list, but one that should be noted is Battles of Napoleon (\$49.95), one of the more

accurate games on the market. It includes four battles and a scenario construction set. Of the many Civil War titles produced by SSI, Gettysburg: The Turning Point (\$59.95) remains the best of the lot even after seven years. Pacific War (\$79.95), Western Front (\$59.95), the somewhat strangely named East Front Game, Second Front (\$59.95), the out-of-print USAAF, and Carrier Strike (\$59.95)—all have one thing in common: Gary Grigsby. A prolific designer of good and occasionally great games during the 1980s, Grigsby has been putting out hit after hit recently. If you come across a game produced in the 1990s and designed by Grigsby, get it. Grigsby also supports his own games on the GENIE online service.

The only design team to

challenge Grigsby in quality and quantity is the Australian team of Roger Keating and Ian Trout. Their company, SSG (904-494-9373) has been putting out consistent product since the release of Battlefront (\$39.95) in 1987. While a good corp-level World War II game in its own right, Battlefront has become the framework for a string of quality historical recreations. Most notable is the civil war trilogy, Decisive Battles of the Civil War I, II, and III (\$40 each). Each game contains 5-6 significant (though not necessarily decisive) battles of the Civil War. SSG's Carriers at War (\$50), the company's first release nearly 10 years ago, continues to age well. The update, Carriers at War 2 (\$70) is even better, and the recent Carriers at War Construction kit (\$60) contains

nine new scenarios and the ability to design your own.

Australia also has provided the biggest diamond in the rough. Panther Games, ably led by Dave O'Conner, produced Fire Brigade. While hard to find, this game of late 1943 Eastern Front battles was a forerunner of the V for Victory series. Strong artificial intelligence also was featured in this product.

Few games in our time have had the reputation of Empire. Mark Baldwin's game, published by Interstel, is no longer available, but New World Computing (800-325-8898) introduced Empire Deluxe (\$59.95) in 1993. Deluxe adds most of the requests made by Empire fans. Castles II (Interplay, 714-553-6678, \$59.95) was a pleasant surprise. A sequel that was better than its original, as Vince De Nardo and crew added more gameplay elements.

Bruce Zaccagnino and QQP (908-788-2799) released Mark Baldwin's Perfect General (\$59.95), a game designed more for playability than accuracy. Zaccagnino's own Lost Admiral (\$59.95) owes more than a passing compliment to Baldwin's Empire and, therefore, was well received. Lawrence Schick at MicroProse (800-879-PLAY) was behind Task Force 1942 (\$69.95), a game that might qualify for the simulation list.

Probably the biggest surprise this past year, and a pleasant one at that, was Dune II (Virgin Games, 800-874-4607, \$59.95). Developed by Westwood, which is better known for its adventure games, Dune II provided some of the best tactical challenges in years. Impressions (203-676-

TOP 10 WAR GAMES

Civilization. Quite simply the best game on the market. Not specifically a war game but more a combination of the best elements of Sid Meier's previous Railroad Tycoon, Maxis' Sim City, and a multitude of strategy and war games.

Master Of Orion. While not quite Civilization in Space, Master of Orion comes close. Featuring multiple races with different strengths, plus an artificial intelligence that doesn't cheat while playing the *impossible* level.

V for Victory series. For board game players making the transition to computer games, nothing could be better than the V for Victory series.

Empire Deluxe. While no longer a top seller, Empire remains one of the better games. Empire Deluxe adds the best wish list requests to make the ultimate game for many.

High Command. Returning once more to World War II, High Command follows the Three-Sixty Pacific tradition of producing computer war games that resemble board games.

Battlefront Series. Rather than pick one of this series, it's better to recognize the entire group of Battlefront games from SSG.

Caesar. An impressive move into the U.S. market from the British firm, Impressions. Sim City does Rome best describes this sleeper hit.

Clash of Steel. A strategic treatment of the War in

Europe 1939-1945. In many ways, Clash of Steel is a poor man's High Command. The program's artificial intelligence is its best selling point—it performs well on both offense and defense.

Dune II. A game overlooked by many war game players. Set within the classic Dune world, Dune II is a game of economic and military struggle. It contains classic board game strategies with Sim City-like construction.

Fire Brigade. Truly ahead of its time, this game of Kiev eastern-front battles by Dave O'Conner and Panther Games contained many of the elements that made V for Victory so successful. Hard to find—perhaps someone will acquire the rights and update this classic.

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9002) is a new kid on the block. Its *When Two Worlds War* (\$59.95) is simplistic as a one-player game, but as a two-player modem game, it really shines. Caesar (*Impressions*, \$59.95), the company's *Sim City* meets *Rome* game, remains a favorite. *Impressions* is also the home for *Rules of Engagement 2* (\$69.95). A space conflict game stunning in its scope, *Rules of Engagement 2* has one of the most detailed built-in scenario editors ever published.

Space conflict games as a whole are an interesting breed. Our Australian friends at SSG have put out a classic in *Reach for the Stars*, one of the few games worth buying an obsolete machine just to play. The release of *Master of Orion* (\$49.95) from MicroProse ups the ante in the space warfare genre. Which leaves us with the best game on the market today, *Civilization* (MicroProse, \$69.95). Because it's a game that doesn't fit neatly into any particular classic pigeon hole, we can only proclaim it the best in whatever category you might choose to place it.

The future holds much promise, as Jim Dunnigan's *Victory at Sea* (360), Sid Meier's *Civil War Game* (MicroProse) and Atomic's *Squad Leader* (Avalon Hill) are all potential inductees into next year's war game top ten.

—Wallace Poulter

THE BEST IN CD-ROM GAMES

CD-ROM games have come a long way in the last few years. We've gone from CD-ROMs that contain only disk-based versions of games to



Civilization from MicroProse

CD-ROMs with games created especially for the new medium—and everything in between.

For the sake of simplicity, let's break these CD-ROM games into three categories: ports, hybrids, and pure breeds.

Ports

When CD-ROM drives started to sell well in 1989, game developers began to port the disk-based versions of their most popular games to the new medium. It was the easiest and quickest way to test the waters. Access released a CD-ROM with many of its previous hits, Origin combined its popular *Wing Commander* with two mission disks onto one CD-ROM and *Ultima Underworld I & II* onto another, and LucasArts produced a CD-ROM with *Secret Weapons of the Luftwaffe* and threw in some add-on disks. The extra value came from buying several games for the price of one and not having to install the games on your hard drive.

Even today, you can find vendors offering CD-ROMs in value-pack ports. By the time you read this, Psygnosis will be selling a

CD-ROM that contains both *Lemmings* and *Oh No! More Lemmings* for the price of a single game (Psygnosis, 617-497-7794, \$59.99).

Hybrids

Most of today's CD-ROM games are actually hybrids—disk-based games that are given extra features when converted to CD-ROM. The immense space provided by the CD-ROM (as much as 680MB) lets a company take a popular DOS-based game and add voices to the characters, a digitized music track, and even additional graphics and puzzles.

The most dramatic example of these added features is the adventure game, *King's Quest VI CD* (Sierra On-Line, 800-326-6654, \$79.95), which is an enhanced version of the disk-based *King's Quest VI: Heir Today, Gone Tomorrow*. The CD-ROM version replaces the characters' on-screen words with actors' voices (for a total of four hours of dialog and narration) and adds higher-resolution graphics throughout the game (under Windows, the icon interface, inventory items, and talking charac-

ters are shown in 640 x 480 with 256 colors). The CD-ROM also includes a 50-megabyte animated sequence that runs for 7 minutes, as well as a 4-minute Video for Windows movie that shows how the game was made.

Most hybrid CD-ROM adventure games add spoken dialog and narration. These include Sierra's other CD-ROM games, *King's Quest V* (\$69.95), the previous adventure in this popular series; *Space Quest IV* (\$69.95), a rollicking spoof of space adventures, featuring the voice of Garry Owens ("Laugh-In"); *Laura Bow: The Dagger of Amon Ra* (\$69.95), a mystery adventure in the tradition of Nancy Drew; and *The Adventures of Willy Beamish* (on the Dynamix label, \$69.95), a light-hearted look at the action-packed life of a pre-teen.

LucasArts offers similarly enhanced CD-ROM versions of its popular adventure games, including *Loom* (415-721-3300, \$59.95), a magical tale that successfully integrates a musical theme into the story; *Monkey Island* (415-721-3300, \$59.95), a satisfying spoof of pirate adventures; *Indiana Jones and the Fate of Atlantis* (800-STARWARS, \$69.95), an original story based on the popular movie character; and *Day of the Tentacle* (800-STARWARS, \$69.95), a droll parody of 1950s science-fiction movies.

Other hybrid titles include *Dune* (Virgin Games, 800-874-4607, \$99.99), which integrates actual footage from David Lynch's classic movie, *Dune*; *Battle Chess CD-ROM Enhanced* (Interplay, 714-553-6678, \$79.95), which sports a new

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music track, additional sound effects, and higher-resolution graphics; The Chessmaster 3000 (The Software Toolworks, 415-883-3000, \$79.95), a first-rate chess game that adds full voice instruction; Microsoft Multimedia Golf (Microsoft, 800-426-9400, \$64.95), which adds spectacular flybys of each hole and video golf pro tips to the disk-based Microsoft Golf for Windows; and Inca (Sierra On-Line, 800-326-6654, \$69.95), a marvelous mix of ancient cultures and high-technology with animation and sound added to the CD-ROM version.

Pure Breeds

The future belongs to games that are designed especially for CD-ROM. You only have to compare the quality of most of the new made-for-CD-ROM titles to the typical port and hybrid games to see the incredible potential of the new medium.

Many of the companies that have dominated the hybrid market, such as Sierra and LucasArts, are designing games that will be available only on CD-ROM. In 1994, many of the top games from the well-known game companies will be designed especially for CD-ROM and then scaled-down for the disk version. By 1995, many of these same companies will either be producing games only for CD-ROM or releasing each game in separate versions for both CD-ROM and disk. With as much as 680MB available for a CD-ROM game versus 20-30MB for a disk-based game, it shouldn't be surprising that the leading edge games are moving to CD-ROM.

The year 1993 has



Rebel Assault from LucasArts

brought us the first group of games created especially for CD-ROM. While not all of them are as playable as the best disk-based or hybrid-CD-ROM games, their advanced graphics and sound have dramatically raised our expectations for computer-based games. The most famous of these would have to be The 7th Guest (Virgin Games, 800-874-4607, \$99.99). Too large to fit on a single CD-ROM, this double CD-ROM game features a terrific musical score (especially when used with a General MIDI music device), full-motion video characters, and eye-popping 3-D rendered backgrounds.

Sherlock Holmes: Consulting Detective Volumes II & III (Viacom New Media, 708-520-4440, \$69.95 each) are the follow ups to Sherlock Holmes: Consulting Detective Volume I (\$69.95), which was one of the first games to integrate video clips into the game's action. Viacom's latest title, Dracula Unleashed (\$69.95), includes over 150 video scenes (for a total of 90 minutes of video) that you navigate using a VCR-like interface. Who Killed Sam Rupert? (Creative Multimedia, 503-241-4351; \$39.99) also successfully integrates video clips into a

mystery setting. A sequel to Sam Rupert should be available by the time you read this.

Model car fans will enjoy two innovative CD-ROMs from Revell-Monogram (708-966-3500): European Racers (\$69.95) and Backroad Racers (\$69.95). Both feature an actual model car kit, step-by-step instructions on how to construct the model (rendered onscreen in high-resolution 3-D polygon animation), and a racing game where you can square off against similar vehicles (here you'll interact with video footage of various characters, such as a policeman and a pit crew member). Each CD-ROM includes the simulation software for three additional models, which you can buy separately at toy stores or hobby shops.

Quite a few pure breed CD-ROM games will be shipping just before Christmas. They all feature graphics, sound effects, and music that are state-of-the-art.

Hell Cab (Time Warner Interactive, 800-593-6334, \$99.99) includes photo-realistic characters and a plot that involves a New York City cab driver (he's really a trainee devil), prehistoric jungles, Nero's Rome, and the trenches of World War I. Your goal is to make it back

to the airport with your soul intact.

If you liked X-Wing, you'll love Rebel Assault (LucasArts, 800-STARWARS, \$69.95). This thing looks and sounds so much like a Star Wars movie, you'll do a double-take. The ships and planets are rendered with high-resolution graphics to match the ones in the Star Wars films; John Williams' score is there, often note for note; and even the dialogue and position of the characters recall specific scenes from the movies.

The Journeyman Project (Quadra Interactive, 619-931-4755, \$79.95) has some of the most innovative graphics I've ever seen in a game. The year is 2318. Your mission is to repair a rip in time caused by careless time traveling. The game features both arcade action and mental puzzles. The pre-release version I played ran slow, but Quadra Interactive was working on speeding it up.

Iron Helix (Spectrum Holobyte, 510-522-3584, \$99.95) is an action adventure game set in the future. A biological weapon threatens to start a galactic holocaust—unless you can pilot a small robotic probe through an enormous starship.

Other titles scheduled for imminent release include The Labyrinth of Time (Electronic Arts, 800-245-4525, price not available), a Super-VGA maze with logical puzzles and historical themes (you travel from a subway car to various historical eras); Myst (Brøderbund, 800-521-6263; \$59.95), a stunningly photo-realistic adventure from Rand and Robyn Miller (developers of the Manhole and Cosmic Osmo), ship-

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ping in early 1994; The Xlth Hour: 7th Guest Part II (Virgin Games), the eagerly awaited sequel to The 7th Guest (planned for late 1993 or early 1994); Microcosm (Psygnosis, 617-497-7794, \$59.95), yet another great-looking sci-fi game; and Conspiracy (Virgin Games), a Soviet thriller starring Donald Sutherland.

If you think Conspiracy sounds more like a movie than a CD-ROM game, prepare to be amazed by the CD-ROM games that will be released in 1994. Access (800-800-4880) is set to release its double CD-ROM game, Under a Killing Moon, by early spring, starring Margot Kidder, Brian Keith, and Russell Means. If you have the new \$449 Reel-Magic board from Sigma Designs (510-770-0100), you'll be able to view its virtual reality sequences as full-screen, full-motion video with CD-quality sound. Other CD-ROM games that will be available in Reel-Magic's MPEG-compression format include Activision's Return to Zork, Interplay's Lord of the Rings, Readysoft's Dragon's Lair, Sierra's Outpost and Police Quest 4: Open Season, and Virgin's The Xlth Hour: 7th Guest Part II.

Expect 1994 to be the year that interactive movies truly come of age.

—David English

HOW PC GAMES PLAY IN EUROPE

The PC game scene is quite different in England and Europe from that in the U.S. For a start, the PC isn't the only machine in the picture. Another factor is that England and Europe tend to lag behind the U.S. in many technical respects.

TOP 10 CD-ROM GAMES

The Journeyman Project. The pre-release runs slow, but the graphics are the best I've seen. Looks to be the best conceived of the bumper crop of science-fiction CD-ROM games.

King's Quest VI. One of Sierra's best games, enhanced for CD-ROM with dialog, a high-resolution interface, and a 50MB opening animation.

The 7th Guest. Most celebrated and innovative CD-ROM game of the first half of 1993. Great musical score and eye-popping interiors paved the way for the current wave of stunning titles.

Day of the Tentacle. Wacky graphics and humorous storyline makes this spoof of 1950s sci-fi movies a joy from start to finish. Cast includes Richard Sanders of "WKRP in Cincinnati."

Rebel Assault. Combine the excitement of X-Wing with high resolution graphics and a movie-like score, and you have the first high-powered arcade game for CD-ROM.

The Chessmaster 3000. Simply the best way to learn chess on your own. The spoken instructions make the CD-ROM version extremely easy to use.

Space Quest IV. Roger Wilco is back, and this time in full voice. Garry Owen, of "Laugh-In" fame, provides the commentary. Even more

fun than the disk version.

Hell Cab. Great graphics and a cunning sense of humor make this the game to show your neighbors.

Microsoft Multimedia Golf. Though it doesn't have the high-resolution backgrounds of Links 386 Pro, this CD-ROM version of Microsoft Golf for Windows includes spectacular flybys of each hole and video golf pro tips. Compatible with Access' Links golf courses.

Under a Killing Moon. Given the strength of early previews, this looks to be one of the top CD-ROM games of 1994. It's the first CD-ROM game to use several well-known actors and include virtual reality technology.

The Competition

The European hardware purchasing public is less affluent than that in the United States and yet is faced with relatively more expensive equipment.

The low end of the market is made up of kids who would buy Sega or Nintendos in the U.S. Many European youngsters shell out around £100-200 for a console, though there's a significant overlap with a second group of youngsters who persist with the classical home computer. Commodore sells hundreds of thousands of A1200s and A600s, as well as, until fairly recently, millions of C64s.

PCs and Games in the UK

Rarely are PCs purchased simply for game playing. The main reason is cost. A basic 386 PC system in the UK will set you back around £800-1000, depending on

the amount of hard drive and RAM resources you get. This is without the obligatory sound card, speakers, and joystick gizmos, which will add an additional £100 to the total, giving you a layout of around \$1600, before you've even fired a shot in anger at any alien scumbags. Is it any wonder why the English, hassled into poverty by the recession, would prefer to spend their hard earned cash on a \$500 Amiga?

I think it's fair to say that there's a cultural difference between the two sides of the Atlantic in terms of PC usage and general computer literacy; U.K. users lag behind a couple of years. This is reflected in the number of personal computers required at home to keep us up to date with the office work, and since this group makes up the bulk of game purchasers, it's been a slow start for PC gamers over

the years, a situation which is finally changing. Software sales are roughly 50-50 with those for Amiga computers for any given product.

It's only recently that the U.K. has seen widespread availability of 386 clones (about a third of PCs sold by games retailers are Amstrads, a third are badged Eastern imports, and the rest are IBMs). These PCs now are able to keep up with the fast graphics and wild sound that U.K. gamers demand.

Prior to 1993, few of the popular action games would even run on the older 286 EGA computers. Games on the PC were seen as mind-numbingly boring strategy affairs, with long drawn out scenarios that required a Ph.D. in warfare and twelve years to play. They took ages to get into and ages to lose, and the graphics were depressingly uninteresting to say the least. Flight simu-

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lators, which took advantage of the PC's superior number crunching, were easily matched by the other computers' graphics chips, and programmers often used tricks to noticeably speed things up. The dolphinesque clicks that emanated from the minuscule internal speaker were laughable to those used to 8-bit stereo sampled sound, thundering out of your stereo system as the last alien exploded into a flaming fireball of cycling color. So what if your game ran off three floppies, required 26 disk swaps to get past the title animation, and the copy protection meant one in three loads aborted—you could live with that, couldn't you?

What's changed? The PC still has mind-numbing strategy games with the graphic prowess of a house brick, but nowadays companies such as Gremlin Graphics, Team 17, and Psygnosis have woken up to the fact that you can do animation on a PC—it does have more than 16 colors to play with; and 16-bit sound cards aren't as rare as rocking horse manure. There's a new wave of computer games about to hit the PC, and they owe their origins to the fast action multicolored worlds of the other systems mentioned. Spectacular still graphics is easy enough with 640 x 480 x 256 colors, but moving it around at 30-50 frames per second isn't as straightforward.

Conversion Problems

A game developer who has to code for widely different platforms such as the PC and Amiga faces a number of tricky problems. Since a given game usually will appear simultaneously on all platforms, it tends to be

TOP 5 EUROPEAN GAMES

Lemmings: This Psygnosis original releases as many as 100 of these stupid creatures, which duly walk over the nearest cliff, through the closest drowning pool, and into the most convenient trap. Only you can save them. The graphics are wonderful (imagine 100 sprites all doing their own thing at once). Just perfect.

Populous: Marketed by Electronic Arts and recently released at a budget price. For anyone who wants to be God—for just a while.

Zool: In this platform game from Gremlin

Graphics, a cute Ninja-type character bounces around avoiding the bad guys, collecting the goodies, and killing the end-of-level guardian.

Alice in Wonderland: A great adventure in the type-in-and-go traditional sense. Graphics are extremely detailed, but the charm of the game is in its superb parser.

Lotus, The Ultimate Challenge: Flying around various circuits in an Esprit is OK, but the game really accelerates away from the rest if you play with another person. It's great fun, and the graphics whizz by so quickly the slightly rough scrolling is forgivable.

developed concurrently, rather than converted. Consoles are easier to code for because they have lower resolutions than the PC. European game developers, who are accustomed to writing games for minimal systems where there's precious little RAM to play with and disk access must be kept to a minimum as the luxury of a hard drive can't be counted on, are among the best. Their talents for squeezing the most out of very little are

being applied to the PC and its unique problems. Brute force and processor power seemingly can overcome the lack of dedicated video graphics chips with scrolling hardware, sprites, and fast rendering engines.

These days, most games require at least VGA, and while many will run on a 640K machine, most of the decent ones will tax 2MB of RAM and take a 3-5MB chunk of hard drive out of your way.

Price and Piracy

Games in the U.K. are, on average, more costly than in the U.S. Usually you find a direct swap of the pound sign for the dollar sign, and it doesn't take Lotus 1-2-3 to see the exchange isn't favorable. However, things are changing with many of the best older titles being re-released at *budget* prices, usually £10-20, and these really represent good value for money.

It has to be said, and I'm ashamed to say it, but we have the best pirates in the business manning all kinds of bulletin boards. It's not unusual for a fully cracked game (that is, all copy protection vanquished and, somewhat cheekily, a whole host of cheats built into the code) to be up on a BBS before the game is launched officially. Clearly this is detrimental and is one reason why many companies are moving to the PC, where the problem is less acute. (Amiga versions of a top quality game may only ship 30,000 units in a potential market of 1.5 million machines.)

The PC world definitely is changing its face in the U.K. More of the top companies are porting their stuff to the platform, and several are developing exclusive titles for it.

U.K. programmers are quit adept at squeezing the last ounce of animation power out of their computers, and to this end, you'll be seeing many more excellent action games. Platform games, football (or rather, soccer) games, blast-'em-to-bits-and-beat-the-living-daylights-out-of-the-Ninja-Nasty type of programs also will become commonplace.

—Mike Nelson

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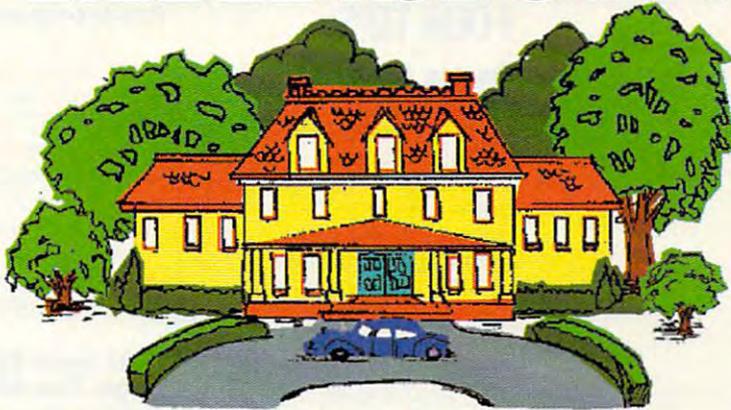
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WINDOWS WORKSHOP

Clifton Karnes

FOUR TIPS

Program Order

Problem: When you run a program by specifying its filename without an extension and there is more than one program with that name, Windows uses the extensions to decide which program to run. In other words, with the two programs MYPROG.EXE and MYPROG.COM, Windows, by default, will search for and run the COM program first. This is inefficient, however, if you use mostly Windows programs, which are EXE files.

Solution: Change the order Windows uses to search for programs.

Background: Both MS-DOS and Windows look for programs in a certain order. DOS first checks to see if the command issued is an internal DOS command; next it looks in the current directory and on the path for files in this order: COM, EXE, and BAT. Windows doesn't check to see if the command is internal, but it runs programs in the same order: COM, EXE, and BAT, followed by PIF.

The big difference between Windows and DOS is that Windows lets you change the order in which it runs programs. If most of the programs you run are Windows programs, which always end in EXE, then having the system search for COM files before EXE files is unnecessary overhead.

Step by step:

1. Run SysEdit and make WIN.INI active.
2. Find the Programs= entry in the [Windows] section. It will probably look like this.

Programs=com exe bat pif

3. Edit the line so it reads as follows.

Programs=exe com bat pif

Note: When you run a program, you can eliminate the search in DOS or Windows by including the extension along with the filename. For example, if you specify NOTEPAD.EXE instead of NOTEPAD, neither DOS nor Windows will search for other files named NOTEPAD.

Make Sound Recordings Longer Than 60 Seconds

Problem: Sound Recorder has a maximum default recording length of 60 seconds.

Solution: Create a blank sound file to insert in another file.

Step by step:

1. Run Sound Recorder and record for 60 seconds with your microphone turned off.
2. Save this file as BLANK60.WAV (don't forget the WAV extension).
3. Whenever you want to extend the recording time of a file, open BLANK60.WAV; choose Edit, Insert File; and insert another copy of BLANK60.WAV in the file.

Note: BLANK60.WAV is 2.5MB in size. You'll have to have a substantial amount of RAM and disk space to make sound files longer than the default 60 seconds. One solution is to make a second, shorter blank sound file to insert. I've created a file called BLANK15.WAV, which is a blank 15-second sound file. I simply insert this as many times as necessary to increase the length of BLANK60.WAV.

A Solid, Nonblinking Cursor

Problem: Windows' blinking cursor can be irritating.

Solution: Change the blinking cursor to a solid one.

Step by step:

1. Run SysEdit and activate WIN.INI.
2. In the [Windows] section, find the CursorBlinkRate= entry.
3. Change the value to CursorBlinkRate=-1.
4. You can test your cursor by running Control Panel, Desktop and clicking on OK.

Note: The default blink rate is 530, with a range of 0-1200. These numbers determine how long, in milliseconds, the cursor will be displayed, so larger numbers mean a slower cursor. The value -1 turns the cursor on. You can change the cursor blink rate in Control Panel, but you can't turn blinking off, as we have done by editing the WIN.INI file and adding a -1 to CursorBlinkRate.

Save File Manager Settings

Problem: When you set up File Manager just the way you want it, the normal way to save your settings is to select Save Settings on Exit, close File Manager, run it again, and turn off Save Settings on Exit.

Solution: Shift-double-click on File Manager's Control-menu box.

Step by step:

To save your settings at any time, simply hold down the Shift key and double-click on File Manager's Control-menu box.

Note: There is a similar (and better-known) way to save settings in Program Manager by clicking on its Control-menu box, but most people don't know you can do the same with File Manager.

These four tips are taken from my new book, Essential Windows Tools (published by COMPUTE books). All are drawn from the chapter "52 Essential Power Tips." □

By creating a blank sound file, you can break Sound Recorder's 60-second barrier.

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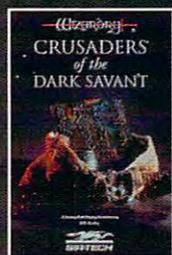
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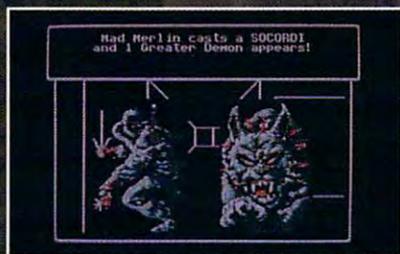
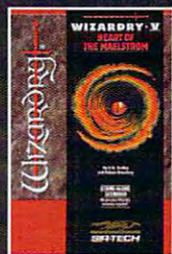
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INTRODOS

Tony Roberts

DATA COMPRESSION: PACKING IT IN

It's axiomatic: Data expands to fill all available storage space on your disk.

When you run out of room, you can either delete files, purchase additional storage, or find some way of making more data fit into less space. For more and more computer users, the last option, data compression, is the best way to go. Let's see how compression works and look at the ways it can be achieved.

Compression software uses a variety of algorithms to compact files. These programs usually start by looking for repeated characters in a file. For example, many people routinely press the space bar five times every time they indent a paragraph. The compression software identifies these repeated strings, and instead of storing five spaces in the disk file, it stores a code that means five spaces.

The compressed file, therefore, is a series of special codes that describe the original file. When file decompression is requested, the codes are expanded, and the file is returned to its original form and size.

Graphics, word-processing, database, and spreadsheet files usually compress well because of the high incidence of repetitive data that occurs in them. Program files, however, normally do not compress as much.

For years, telecommunicators have been big fans of file compression. Smaller, compressed files transfer much faster than uncompressed files, and that means lower connect-time charges, which in turn means lower long-distance bills. But even if you're not a

telecommunicator, you may want to begin compressing some of your files to free up some disk space and to simplify file management.

Single files or groups of files can be compressed with utilities such as PKZIP and LHArc. PKZIP has become a widely recognized standard. LHArc, another well-known compression program, is freely distributed. Be aware that the compression algorithms used by these programs differ, however, so a file compressed with PKZIP can't be decompressed with LHArc.

In addition to saving space, compression utilities can take several files and combine them into one file called an archive. For example, you can gather up all the files you used to prepare last year's tax returns—spreadsheet files, word-processing files, tax-preparation software files, and so on—and bundle them into an archive called TAXES92. Copy this archive file to a floppy disk and store it with your income tax materials. When you're ready to work on your 1993 tax return, you'll have all of your 1992 documents to use as a handy reference right at your fingertips.

Or, for another example, look at your correspondence subdirectory. Does it include dozens or hundreds of memos that you keep on hand because you may want to refer to them sometime? Why not take all of your letters from 1993 and compress them into one archive called LTRS93? In addition to freeing up hard disk space, archiving your letters reduces the clutter in your correspondence subdirectory. If you ever need one of the letters in the archive, you can give a command to decompress only the one you need.

In the past few months, another type of compression—whole disk compression—has

received considerable attention, thanks to the inclusion of DoubleSpace as an integral part of DOS 6. Under this system, everything that's stored on disk is compressed as it's being saved and decompressed as it's being read. And it all happens without any intervention from the user.

Disk compression may slow system performance a tad, but the payoff is that you can store nearly twice as much data on any given disk. On a fast computer, the slowdown is barely perceptible. DoubleSpace and similar utilities, such as Stacker from Stac Electronics, can provide a low-cost way to expand your system without your having to open the box and install new hardware.

However, the inclusion of DoubleSpace with DOS 6 has fueled a continuing debate about the safety of disk compression. While the majority of users have installed DoubleSpace successfully, a few have reported problems and have experienced data loss. Most of these problems appear to be installation issues, and Microsoft's answer—a DOS 6.2 maintenance release—may be available by the time you read this.

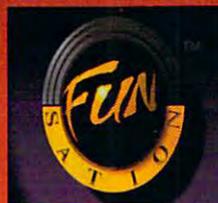
It's clear, though, from Stacker's track record and from the experience of those who've achieved successful installation of DoubleSpace, that whole disk compression is a viable alternative to installing a new hard drive. Still, the standard computing caveat—always keep backup copies of your data—bears repeating.

If you use whole disk compression, note that you won't double the benefit by trying to combine the effects of Stacker or DoubleSpace with PKZIP or LHArc. Once a file is compressed, the whole disk compression program won't be able to do much more. □

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McCree

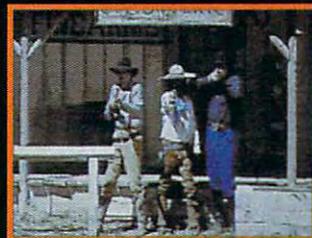
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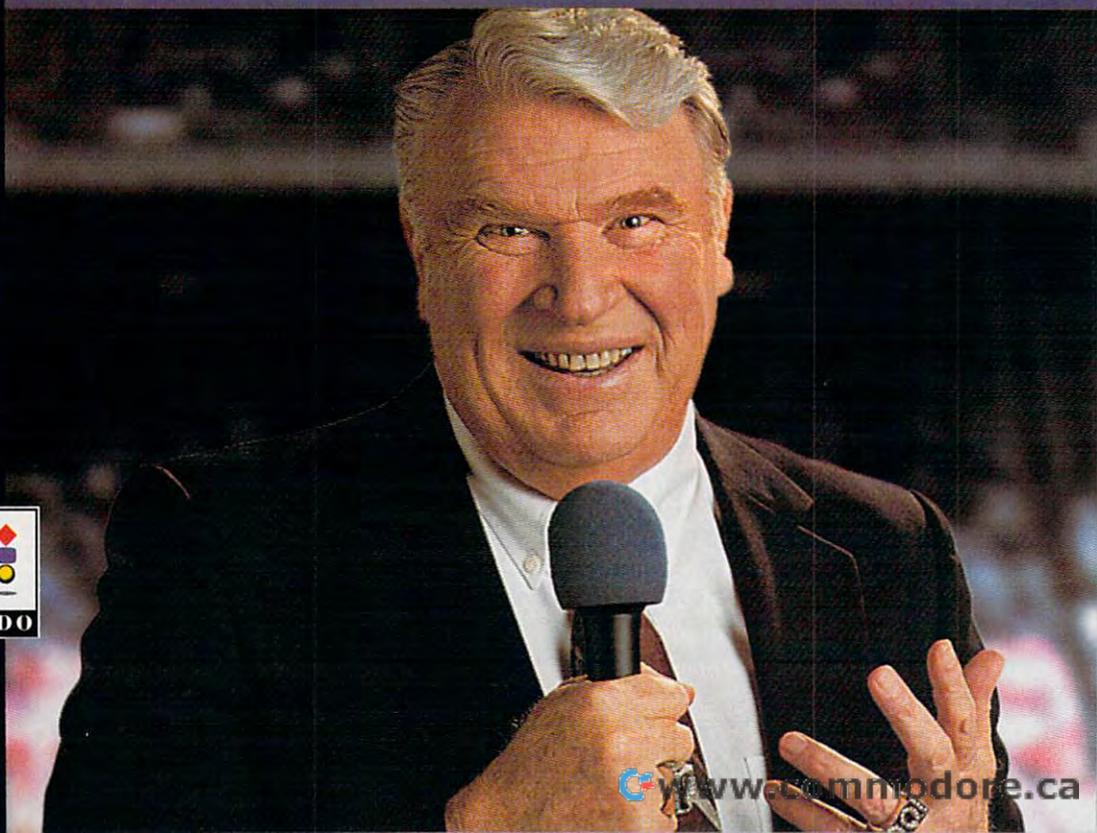
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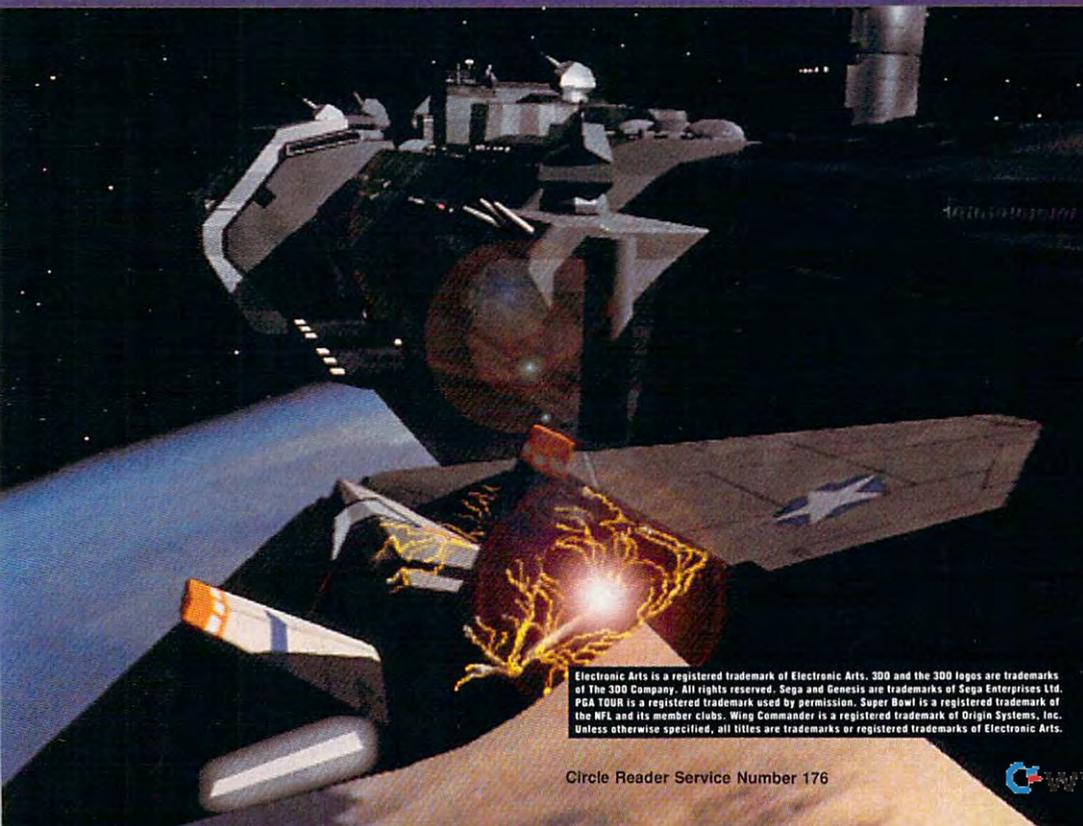


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ELECTRONIC ARTS

PROGRAMMING POWER

Tom Campbell

PROGRAMMING WINDOWS HELP FILES

To create a WinHelp HLP file, you need at least two source files. The first is a project file, with the default extension HPJ. The project file contains, at a minimum, a list of all the help source files (called topic files) in the project. The other file or files are the actual help source files, which use a default extension of RTF.

Project files are in sections and look somewhat like the INI files so common to Windows applications and the Windows system itself. At a minimum, you need a [Files] section and a list of the topic files. For example, the minimum HPJ file for a product called Super-Note might be named SUPRNOTE.HPJ and contain just one topic file in its [Files] section. It would look like this.

```
[Files]
SUPRNOTE.RTF
```

Most help files also have an [Options] section with such items as compression level, copyright, title, and so on; but you can get by just fine without it to start.

Topic files are much more complicated, even at a minimum, and that's what brought this column about. I have to create large help files frequently. They need good indexes, generous keyword lists, and lots of hyperlinks. They don't need the many impressive bells and whistles that come with the help engine, such as user-defined buttons, custom DLLs, or CD-ROM file systems. All that stuff is great, and I strongly encourage you to read the help compiler documentation. It won't take you long to realize that the Windows help system is an unsung hero in the

development world. But that doesn't solve the simple problem of creating a minimal help system. The help docs just don't tell you what to leave out. So, here goes.

RTF is a minilanguage in which the keywords start with a backslash, and compound statements employ the curly braces and semicolons so familiar to C programmers. All the rest is ASCII text.

1. The file must begin with a left brace and end with a right brace.

```
{ }
```

2. The first keyword is \rtf.

```
\rtf
```

3. The second is the \ansi statement.

```
\rtf\ansi
```

4. Next, you should include a \fonttbl statement enclosed in braces. The syntax is

```
\fonttbl{\f<number><tag><multiword font name>;} . . . }
```

where <number> is replaced by a number such as 0, 1, or 15, <tag> is the one-word font name, <multiword font name> is the typeface family name, and the three dots mean 0 or more occurrences of the \f statement. It's much easier to see the following example.

```
\rtf\ansi
\fonttbl
{\f0\froman Times New Roman;}
{\f1\fddecor Courier New;}
{\f2\fswiss Arial;}
}
```

5. Specify the default font using the \def statement. The syntax is

```
\deff<font number>
```

where is a number, such as 0.

Here's an example.

```
\rtf\ansi
\fonttbl
{\f0\froman Times New Roman;}
{\f1\fddecor Courier New;}
{\f2\fswiss Arial;}
\deff0
}
```

In this case, the default is f0, for Times New Roman.

RTF is interesting in that, like most "real" programming languages, white space is irrelevant. That is, between the backslash keywords and the curly brace statements, you can use any number of spaces, tabs, or newlines—or none. The dreary part is that a simple blank line needs its own \par keyword and a tab uses the \tab keyword, instead of an ASCII 9. (This is actually good. DOS uses a different ASCII convention for blank lines than UNIX and the Mac, and IBM mainframes use something different from all of them. Consequently, RTF files offer an accurate, though bulky, means of assuring correct formatting on all computer systems.)

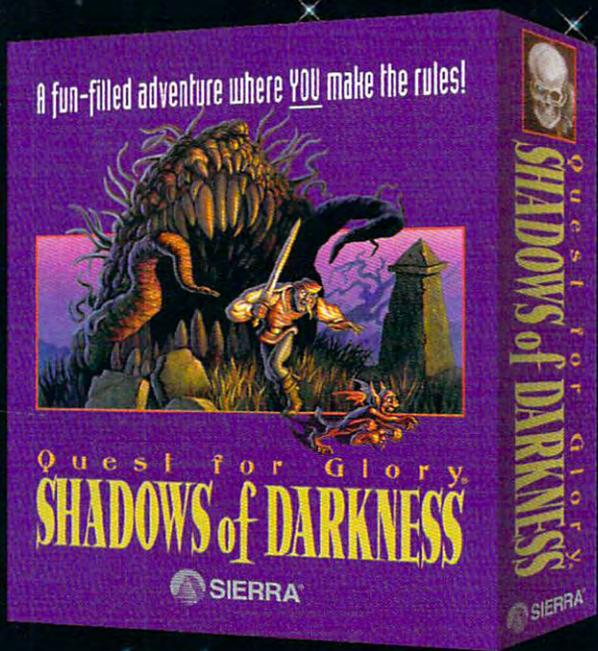
6. Create the topics with

```
#{\footnote <UniqueContext>}
${\footnote <Optional Topic Title>}<Topic text>
\page
```

where <UniqueContext> is replaced by a unique context name. The name may consist of letters, digits, and the underscore character.

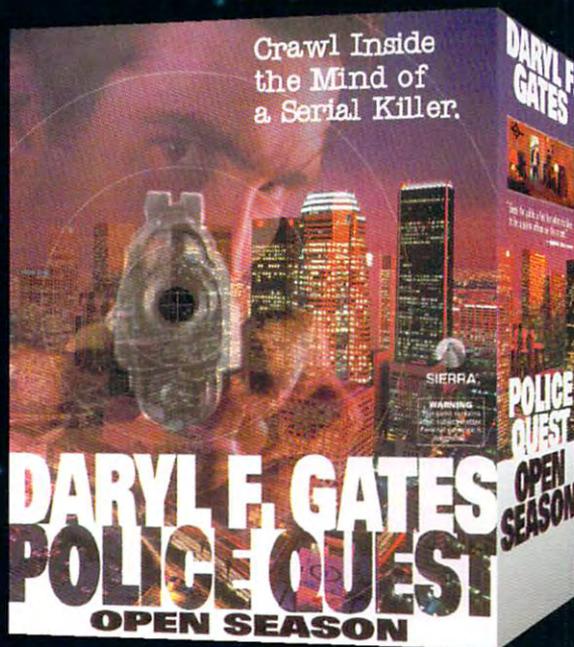
<Topic text> is just that—what you want to talk about in the help file. Note that newlines are ignored. To start a new paragraph, use the \par statement.

RTF is a minilanguage in which the keywords start with a backslash.



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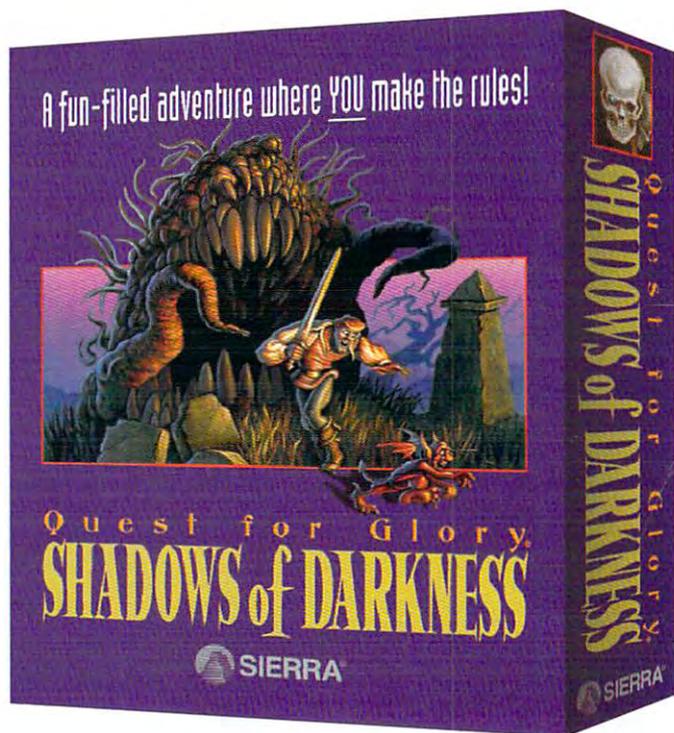


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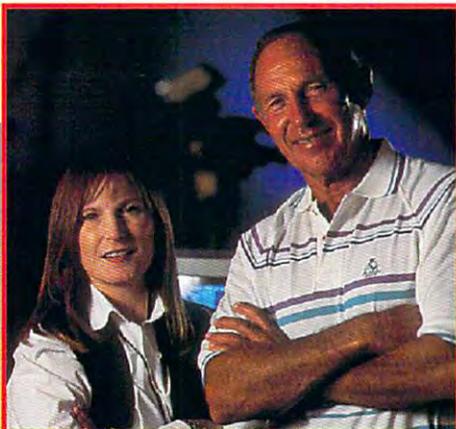
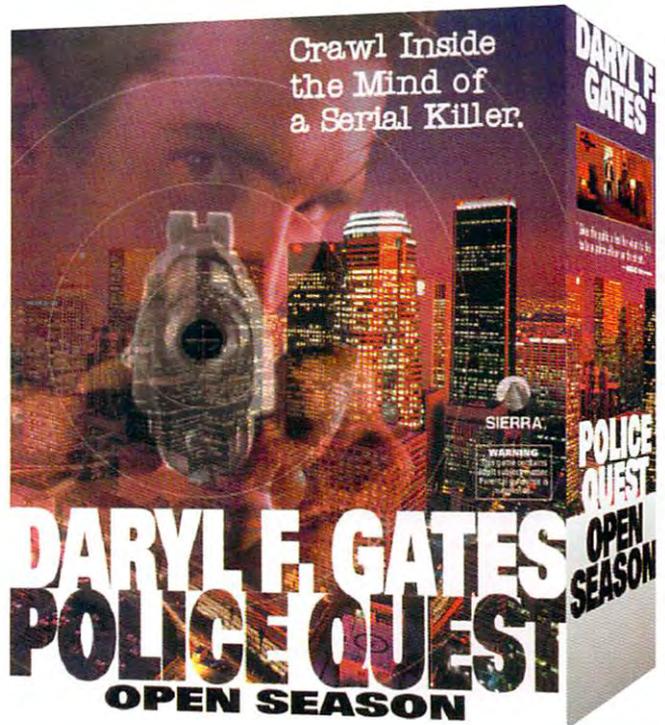
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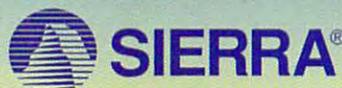


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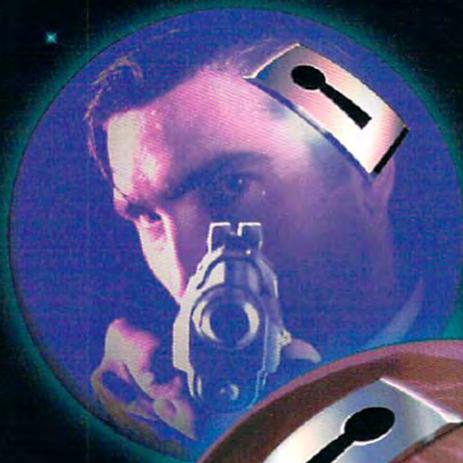
In his 43 years on the force, Chief Daryl F. Gates investigated some of the toughest serial murders of our time. *Open Season* director Tammy Dargan is a former producer of the television series *America's Most Wanted*^{*}.

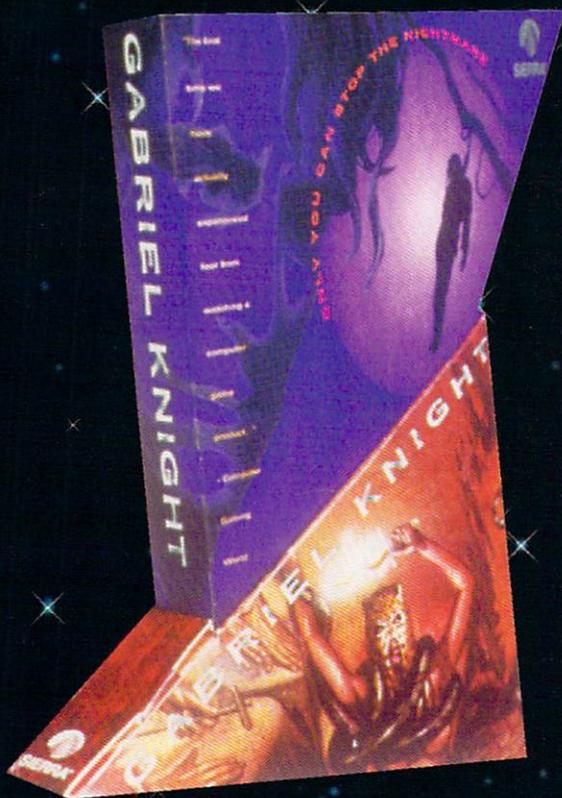


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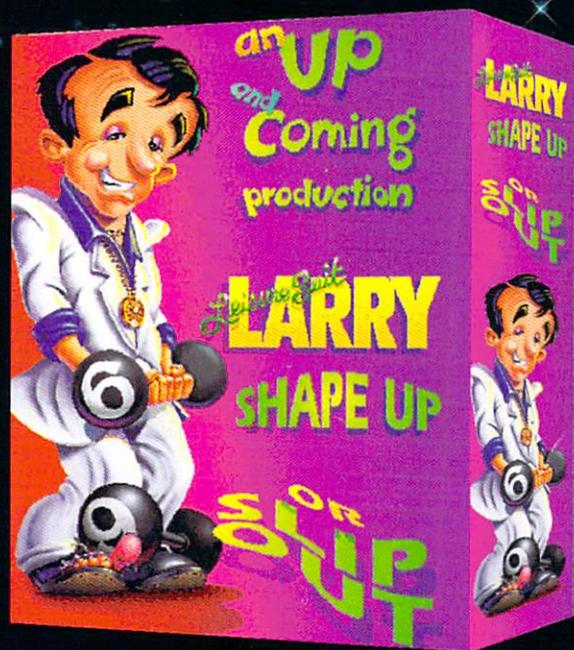
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INTENSITY

ABSURDITY



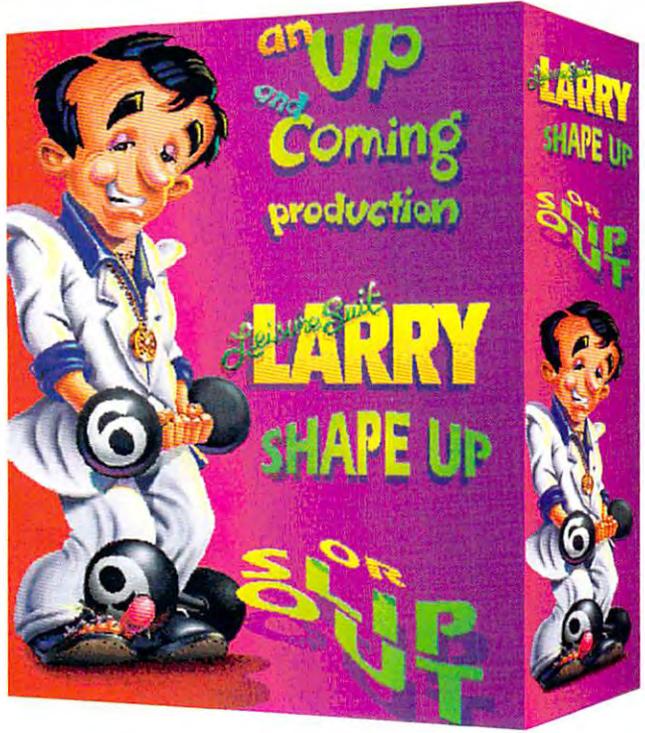
LOOK ON THE BACK

To find out how your *Key to Adventure* could be your key to big prizes!

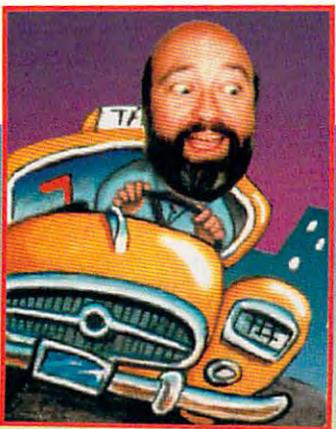
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AL LOWE

Game designer Al Lowe is the culprit behind the Leisure Suit Larry phenomenon. Al is a former music teacher and jazz musician, which accounts for all the sax and violins in his games.



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1. Remove the *Key to Adventure* card. You can also write to Sierra to receive a *Key to Adventure**. Write to:
Key to Adventure Contest, P.O. Box 485, Coarsegold, CA, 93614
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Contest ends January 31, 1994. Write-in requests must be postmarked by December 31, 1993. Prizes must be claimed, in writing, by February 28, 1994.

Please allow 4-6 weeks for delivery of prizes after receipt of winning contest cards at Sierra.

Unclaimed prizes will remain the property of Sierra On-Line, Inc.

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JANE JENSEN

Designer Jane Jensen has written horror and suspense stories for many years. She co-designed *EcoQuest: The Search for Cetus*, and is co-author and co-director of the bestselling *King's Quest VI*.



PROGRAMMING POWER

The <Optional Topic Title> really isn't optional. If you want the topic to show up in the search dialog, you need it. The <UniqueContext> string is what gives it a position in the file—titles don't have to be unique, but contexts, like sub-routine names, do.

Here's an example.

```
{\rtf1\ansi
\deff2
\fonttbl
{\f0\froman Times New Roman;}
{\f1\fddecor Courier New;}
{\f2\fswiss Arial;}}
#{\footnote SuperNoteOverview}
${\footnote Overview of SuperNote}
SuperNote makes note taking easier
than ever.
\par
\page
}
```

Why are the critical help context and topic title functions given \footnote commands? It's a kludge, that's why. Remember, RTF wasn't designed for the creation of help systems. Microsoft just chose RTF as the vehicle for help sources, perhaps because it's easy to create RTF filters for word processors.

SPEAK UP!

Is there a feature topic
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you must be 18 or older,
and you must use
a touch-tone phone.

7. End each topic with a \page statement, as shown above. You can have as many topics per file as you wish; one common convention is to have one file per menu and dialog in the application.

8. While you've just been given the absolute minimum, a help system is nothing without keywords. Keywords appear in the search dialog, using WinHelp's cool word-completion algorithm, which jumps to the first word matching the letters as you type them. You can have as



Creating simple help files can be easier than you think.

many keywords as you wish per topic, and they too use a footnote (this time, the K footnote:

K{\footnote Overview;Starting out}).

Footnotes can consist of more than one word, and you use semicolons to separate them. You can put them anywhere, but I put them right after the title.

9. Your last task is to include hypertext links within the help text. The link consists at a minimum of the {\w} command with the name of the context following the \w. Normally, you will precede it with the text you want to show in green as the highlight using the {\uldb} command with the text following the \uldb. As an example, here's a link to the SuperNoteOverview context shown in the example above.

{\uldb The Overview}{\v SuperNoteOverview}will give you the basics if you're new to Windows text editors.

Technically, the \uldb isn't required. If you omit it, the context name will appear, which often works out fine in the case of SuperNoteOverView.

That's it. Fewer than ten steps as a basis for creating commercial-quality help systems with tools you already have. Your applications will have a bur-nished, well-rounded appearance that matches that of professional software.

Tune in again next month for an easier way! □

MEET THE EDITORS ONLINE

If you like reading COMPUTE magazine, you should see what we've done with the electronic version. That's right—COMPUTE now has its own area on America Online. Log on to AOL and then go to the keyword *compute*. Once in COMPUTE Online, you can read the current issue and back issues, conduct an electronic search for articles or topics of interest, read reviews, download software, and much more. You can even download entire copies of COMPUTE books.

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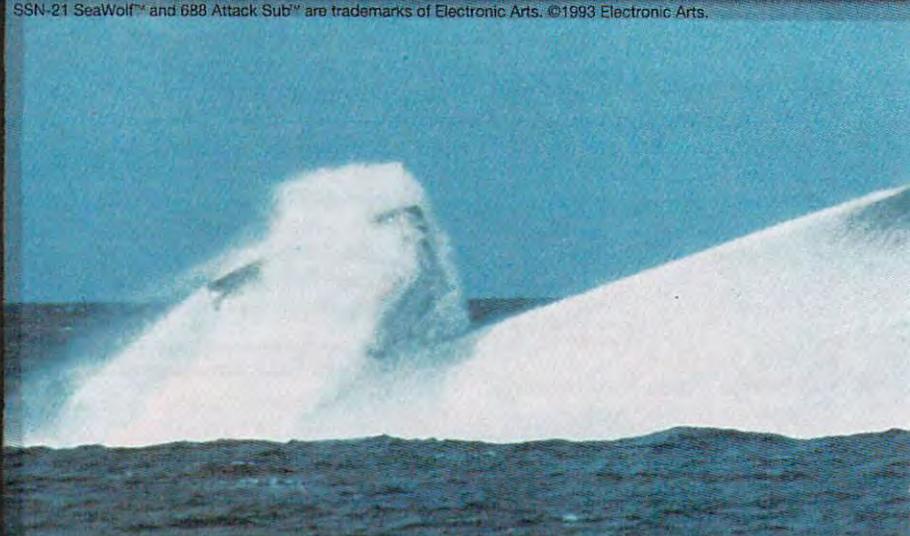
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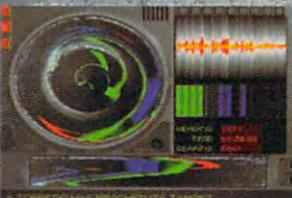
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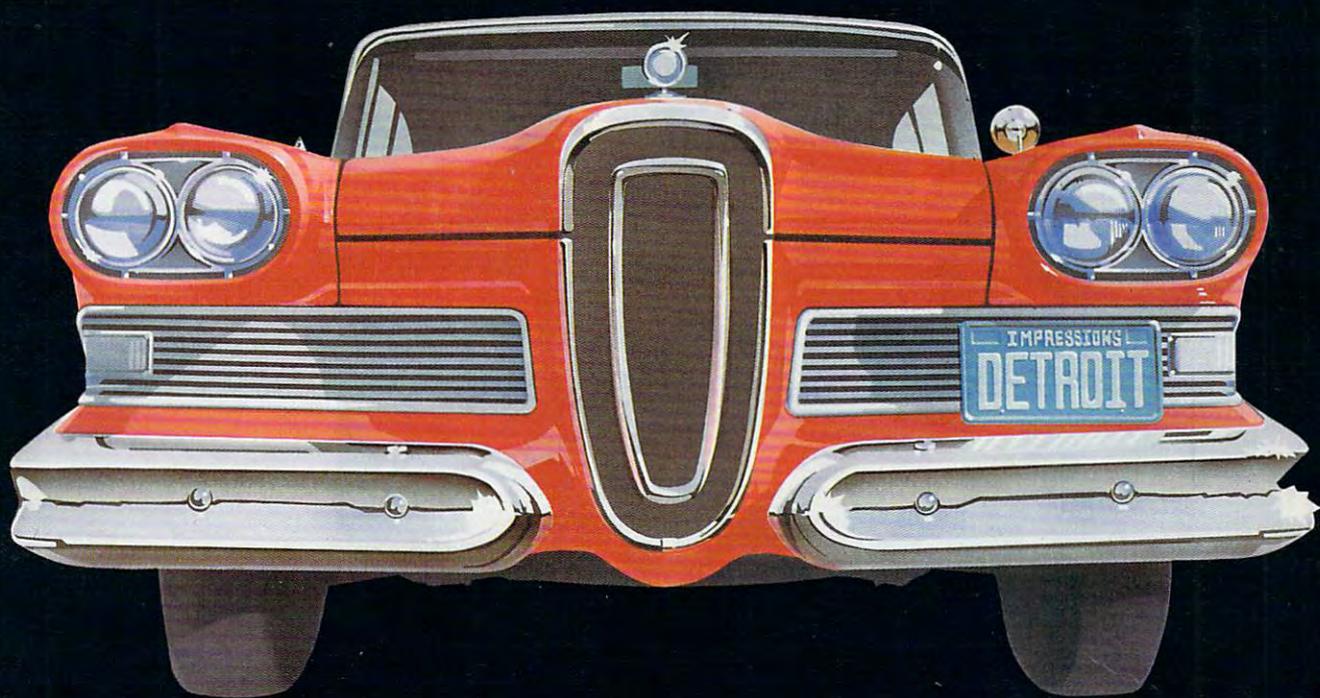


Sure, it'll test your nerves. But what were you expecting, the Love Boat?



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IBM PC VGA Screenshots

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Now you see it. Now you don't. The land of Kyrandia is disappearing piece by piece and all the evidence points toward one perilous conclusion: a curse. Thus

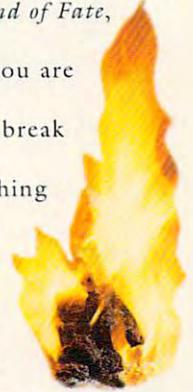


begins *The Hand of Fate*, series, where you are

the offbeat, young mystic who must voyage to the center of the world to break the spell. Out of sync and out on foot, your aberrant journey reveals nothing is what it isn't. And one hand,



seems. Everything is what it you can count your friends on Literally. Conspiring to push



the twisted edge of cinemagraphic entertainment, Westwood Studios has designed more puzzles and gameplay in the first few chapters of



The Hand of Fate
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HARDWARE CLINIC

Mark Minasi

THE TWILIGHT OF THE PC

If you've been following the industry recently with an eye to buying a new computer, you've probably noticed an important trend. PCs are less expensive than they've ever been.

There's nothing new in that. PC prices have been on a constant downward spiral. But, if you've been in the market for very long, you've probably noticed another important trend: The computer you want to buy—the one with the latest technology, the most RAM, and the biggest mass storage capacity—has always been just out of reach. Until lately.

The low prices for the best of the best should make PC lovers jump for joy, but there is a dark side to this phenomenon because just as the rapid drop in prices has spurred sales, it may also signal the end of the line for PCs.

Since shortly after the arrival of the PC in 1981, the market could be separated into three distinct levels. A basic computer system that could run the low- to midrange programs of the day cost around \$1,000.

Even five years ago, \$1,000 would buy you enough XT power to run WordPerfect 5.0 and Lotus 1-2-3 2.0.

If you had a little more cash, or higher expectations for your machine in terms of speed and processing power, the next price point, around \$3,000, got you either a power user's clone or a low-end machine from a major computer company.

If you had a lot of cash and were running major applications that required lots of horsepower like a huge database or CAD software, you could get a top-of-the-line machine with the best display, largest and

fastest hard drive, and so on, for \$6,000–\$11,000.

PC prices have always dropped at a steady rate; in general, today's \$3,000 power workstation is tomorrow's basic PC. It goes through this metamorphosis to a basic PC because the basic requirements of software grow over time. For example, an 8088-based XT will run WordPerfect 5.1 with no problems, but 6.0 doesn't run very well on an XT. Even on a 16-MHz 286 AT clone it seems slow.

While these price points have remained steady for close to a decade, the drop in PC prices in the past two years is unprecedented. The reason for the price drop is that the PC world is different today. The difference can be seen on the high end.

Since today's high-end machine is tomorrow's midlevel machine, we should be able to predict what tomorrow's midrange machine will be. We look up from our fire-breathing desktops to see what's on the horizon. And we see nothing.

What did a top-of-the-line computer look like two years ago? A 486DX2/66 with 16MB, SCSI controller, 380MB hard disk, CD-ROM drive, local-bus video, and 17-inch monitor would have been a high-end computer. That would have cost about \$7,000–\$9,000.

How about a top-of-the-line computer today? It looks pretty much the same, except that it would probably have a 520MB hard disk and would cost around \$4,500.

The high-end machine is rapidly becoming the midrange machine, and there is nothing taking its place. As I see it, the big issues are the following:

- Processors are maxing out.
- PC buses have unacceptable speed limitations.
- PC BIOS cannot exceed 1GB hard disk size.

- Networking isn't built into DOS or Windows.
- PC operating systems lack good memory management, multitasking, and security.

We haven't seen a new PC processor in two years—not even a faster version of an existing chip.

You may be thinking, What about the Pentium? Well, what about it? The Pentium may turn out to be a practical chip one day, but that won't be today, or even by the time you read this.

The Pentium is plagued by heat problems and production difficulties. Intel designed the Pentium with a 0.8-micron resolution on the chip mask, requiring the Pentium chip to be quite large as chips go and making it harder to build in quantity.

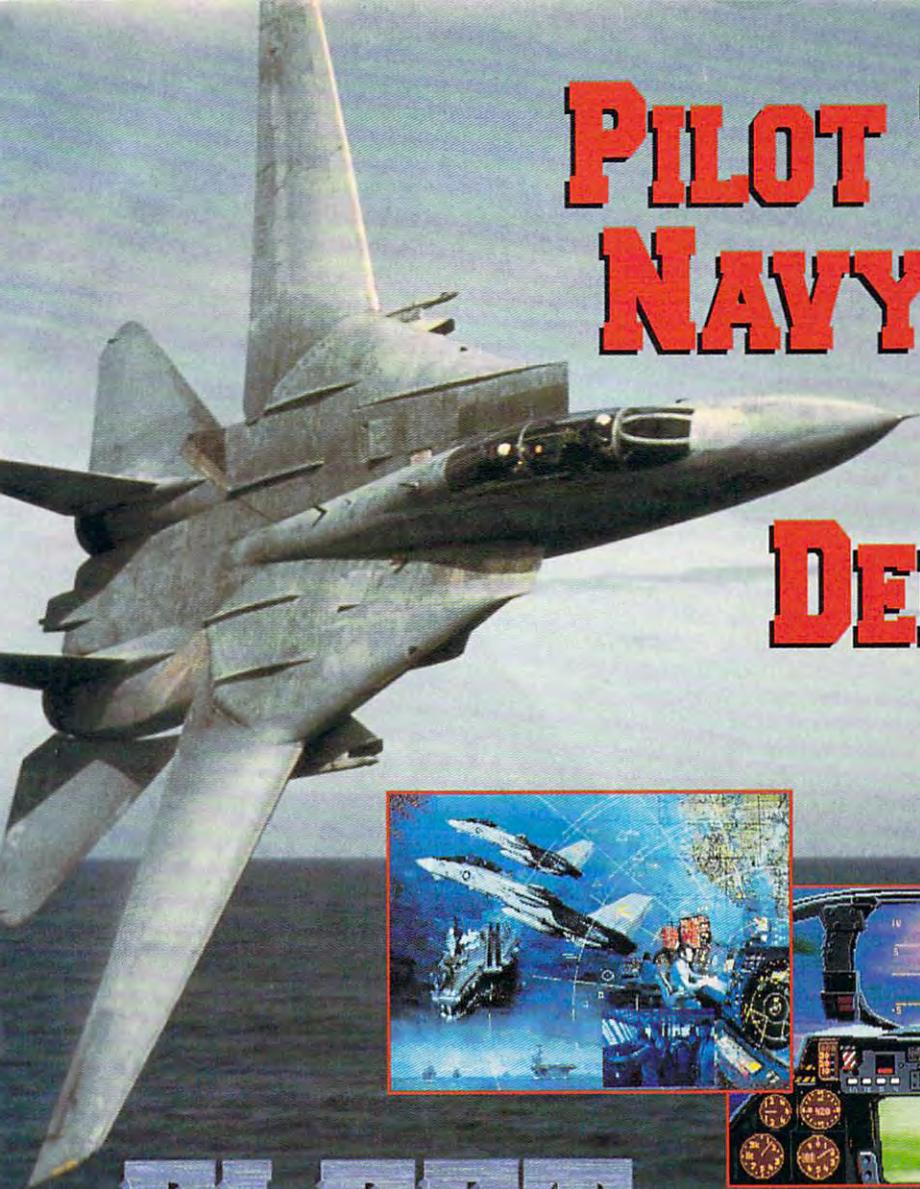
And at 66 MHz, the Pentium doesn't really produce real-world speed that's much in excess of that of a 486DX2/66; the real improvement will be seen if a 100-MHz version ever appears. As you may have read a few months ago in "Hardware Clinic," Intel won't be ramped up to produce Pentiums in any quantity until late in 1994.

So the basic CPU has been in a developmental stall for a couple of years. Maybe we've gone as far as we can without a major CPU change. It happened to the 6502 series that powered the first generation of 8-bit computers like the Apple II and the Commodore 64 and the Z80 that powered the CP/M machines that paved the way for the PC. We have to learn to accept the fact that you can only improve an existing technology a certain amount before you need to scrap it and start from scratch.

The notion that PC-compatible processors are maxing

As the PC reaches the end of the trail, what alternatives await us just over the horizon?

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HARDWARE CLINIC

out in power is more serious than it appears on first glance.

Microcomputers got their start in the mid 1970s as hobbyist machines and as machines that a computer junkie could control completely. But one of the things that made the PC popular was the relatively high amount of computing power that you could buy for a relatively small amount of money. The idea that Intel-compatible microprocessors have increased in power by a factor of about 100 in ten years while mainframe processors have only jumped by single-digit factors in that time is one of the things that has fueled the move to client/server architecture.

But would corporate America invest all that time and money if it knew it was moving from one dead-end architecture to another?

What's faster than the Pentium? These days, lots of things are. But first and foremost is the DEC Alpha chip. Not only will it run NT programs very quickly, but it can also run regular old DOS and Windows programs (under NT, of course).

But a chip maker recently told me, "The Alpha's obsolete already. A whole bunch of new 128-bit superscalar chips will be out before you know it, and they'll cost about what the Alpha does . . . or they may be cheaper."

IBM's Power PC chip is a real alternative. It will offer desktop systems in the \$10,000 range that will outpace a 486 by a factor of about 4. Count on the \$10,000 price to come down quickly.

Originally, IBM and Apple were set to work with each other on the Power PC and its accompanying operating system, Taligent. Taligent was supposed to be essentially Macintosh System 8 and to run on Macs, PCs, and Power PCs. But now IBM has backed out of the Mac-compatibility promise, giving Apple good reason to want to sell Power PCs for less money than IBM. And if neither IBM nor Apple sells

cheap Power PCs, any company can buy the Power PC chip set from Motorola and undersell IBM and Apple.

The next problem in the PC architecture is the speed of buses. The ISA and EISA buses operate at only 8 MHz, and the MCA bus operates at 10 MHz—and this in an age of 66-MHz computers.

Yes, there is a local-bus standard, in the VESA (Video Electronics Standards Association) local bus, but it's not much of a standard. I've seen a fair number of compatibility problems with boards using the VESA standard.

State-of-the-art buses should transport 64 bits, not 32, and should allow bus mastering (intelligent boards transporting data between themselves without CPU intervention). You probably know that bus mastering is already available with the MCA and EISA buses, but it's not part of either VESA or PCI, the new Intel local-bus standard.

Some help may come from the PC-MCIA (Personal Computer Memory Card Industry Association) bus slot type. PCMCIA boards are smart enough to be able to configure themselves when inserted, and they can be changed while the computer is running. These are both powerful features. But PC-MCIA does

not support bus mastering yet, and it ticks along at a mere 8 MHz.

Ever notice that the *Enterprise's* chief engineer, Geordi LaForge, never has to screw around with cables?

Every time I'm fumbling around with a LAN cable or installing a new SCSI device, I find that Geordi comes to mind. Apple's Newton can

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—William Trotter, *PC Entertainment*

"*Under a Killing Moon*...the most elaborate graphic adventure to date. A ground breaking CD adventure!"

—Joyce Worley, *Electronic Games*

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—Denny Atkin, *Entertainment Editor, Compute Magazine*



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

beam its information from one Newton to another. Why can't my laptop beam data to and from my main desktop PC?

Another communications problem that plagues PC users is setting up and maintaining a network. LANs are a major pain for several reasons.

Some of the most important reasons

stem from the general problem of keeping wires in the walls attached to PCs without any breaks, cracks, nicks, cuts, or bruises. That problem applies to all computer communications. But the PC adds an extra element of trouble with its antediluvian operating system, DOS and Windows. DOS was not designed with networks in mind. File sharing was a notion tacked onto the side of DOS, and networks become part of DOS workstations with the inclusion of temperamental device drivers.

By contrast, the Mac's operating system was built with networking in mind from the very beginning. It was fairly lame networking—a serial port connection no faster than 0.24MB per second—but the underlying architecture makes adding a high-speed network like Ethernet a simple matter.

NT and UNIX are examples of micro-computer operating systems that are designed to network, but DOS will never be NT.

Which brings me to PC operating systems. DOS was an obsolete piece of garbage back in 1987, but we still use it. We use it for varied reasons, but the main one is inertia.

What we have in the DOS and Windows environment is adequate.

But our use of

the PC is limited terribly by DOS and Windows. There's the annoying 640K limitation. Getting around it with DPML (DOS Protected Mode Interface) or XMS (eXtended Memory Specification) code is cumbersome and apparently poorly understood by programmers. It can be quite a trick to get a number of DOS and Windows programs to work together.

DOS is inflexible. It's necessary to reboot your system every time you make any change to CONFIG.SYS or AUTOEXEC.BAT. We take it as a given, but why must it be that way? Other operating systems don't require this of you. The product manager of Windows NT told me, "If you ever have to reboot your computer after you've got NT up and running, then we've failed in our job."

DOS doesn't support true multitasking; it's still quite possible (in fact it's simple) to crash a Windows communication program by accessing some large file in one program while Windows communication goes on in another program.

In every computer generation, progress and innovation go on for years. It seems for a while that the sky's the limit. But the constant need to support the old while inventing the new eventually dictates that nearly all of the industry's time is taken up with the old, leaving nothing for the new. That generation of hardware and software eventually becomes entrapped by the fact that it's good enough.

Soon, we PC users may have to make a choice. We can either join the vanguard or be left behind. And just when I thought I was done buying hardware for a while.

Speak Up!

Do you have a hardware problem you'd like Mark to tackle in this column? Let him know about it by calling (900) 285-5239 (sponsored by Pure Entertainment, P.O. Box 186, Hollywood, California 90078). The call will cost 95 cents per minute, you must be 18 years of age or older, and you must use a touch-tone phone. ☐

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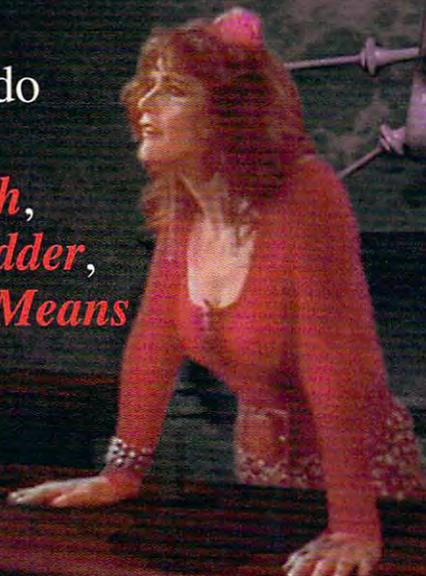
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TIPS & TOOLS

Edited by Richard C. Leinecker

Tips Ahoy

This column is dedicated to making your life easier. These tips represent the best of our readers' sage advice on subjects ranging from DOS prompt hints to application shortcuts to Windows tips. And the tips I receive are getting better. This morning I decided to use the first four tips I opened and after that rejected less than 50 percent.

But that's not the end of it. If for one single month I didn't get submissions, you'd read a column entirely written by yours truly. I'd also like to see some areas given more attention. That way, "Tips & Tools" would be even more useful for more people. Lastly, I'd like you to have the experience of seeing your byline in this magazine. Here are some tips for sending in tips.

The most important rule: Don't submit a tip similar or identical to one that's been recently published.

The second rule: Neatness counts. I read hundreds of tips each month, and the ones that are hard to read are also hard to accept. Handwritten tips are OK; just make sure they're legible.

Try to think of tips that'll appeal to a wide audience. We like to please as many folks as possible with each tip. Some excellent tips don't make it because they're too specialized.

Short tips are fine (and sometimes they're priceless). For debug scripts you need to include source code.

I'd like to add more application tips. Stick to the major applications, though. Access, dBASE, Excel, Lotus, Paradox, Word, WordPerfect, WordStar, and Works are all good examples of applications that are widely used. Batch file, QBASIC, and debug tips that perform useful functions are

welcome. Several specific things I'd like to see are using PKZIP to compress a large directory to multiple disks, doing high-density disk copies with a single pass, and playing notes through sound cards. Windows tips are especially welcome.

RICHARD C. LEINECKER
REIDSVILLE, NC

What's Your Type?

Here's one I learned the hard way. Always have your hard drive type written down in a safe place. That way, if your CMOS loses its information or the battery runs down, you can restore the hard drive settings with no difficulty. All of the other CMOS settings are easy enough to get right, but your hard drive probably has several cryptic setup numbers that are essential.

When your system boots, press the key that brings up the CMOS setup screen (it's usually the Delete key). Then write down all of the hard drive descriptor numbers. You may be able to send your CMOS setup screen directly to your printer by pressing the Print Screen key.

KELLEY MARTIN
ABINGDON, MD

Multiple Cleans

In your September 1992 issue, you published a debug script that creates a file called CLEANDEL.COM. It deletes a file and, for security, zeroes all of the information that was in the file. I found this very useful, but it's limited because it only accepts one filename. I wrote a batch file which calls Cleandel from a DO loop, thus allowing wildcards and up to three possible file specifications.

As a safeguard, I also test for *.* and display a warning message with an opportunity to abort. Here is the program

listing for ZERODEL.BAT.

```
@ECHO OFF
CLS
IF "%1"==" " GOTO USAGE
IF "%1"=="*" GOTO WARNING
IF "%2"=="*" GOTO WARNING
IF "%3"=="*" GOTO WARNING
:DOIT
FOR %%r IN (%1 %2 %3) DO
CLEANDEL %%r
GOTO END
:WARNING
ECHO.
ECHO ALL files will be
permanently deleted.
ECHO Is this what you want to do?
ECHO LAST CHANCE
ECHO.
ECHO Press Ctrl-C to abort.
PAUSE
GOTO DOIT
:USAGE
ECHO.
ECHO USAGE ZERODEL %%1
%%2 %%3
ECHO.
ECHO Example: ZERODEL *.BAK
*.OLD *.TXT
ECHO will delete all BAK, OLD,
and TXT files.
ECHO.
:END
BOB INDOVINA
PITTSFORD, NY
```

Summary to the Rescue

In my office we use WordPerfect and frequently have more than one person working on a document. It can be terribly frustrating trying to find a piece of correspondence someone else created.

I found the document summary function to be an invaluable tool in solving this dilemma. The document summary shows when the file was created, the last revision date, the name and type, the author, the typist, the keywords, the subject, the account, and an abstract of the first 400 characters of the document. The dates are automatically generated, but the other entries must be filled in by the user. If you don't need a summa-

Creating a tip for
COMPUTE,
saving your setup,
and zeroing
out deleted files

TIPS & TOOLS

ry, press F7 when the screen appears.

To set up the document summary function for all files, follow these steps.

1. Press Shift-F1 (Setup).
2. Press 3 or E to select Environment.
3. Press 4 or D to select Document Management/Summary.
4. Press 1 or C to select Create Summary or Save/Exit and select (Y)es.
5. Press F7 (Exit) to return to the editing screen.

NANCY L. NEWTON
DAVENPORT, IA

No-Skid Keyboards

I love to get ahead of the computer by typing in the next file to run along with its command line arguments. It makes me feel like I'm not wasting my time while I wait for the system to complete an operation. There's only one problem: What if I change my mind? How do I cancel a series of commands already entered? The answer is, I can't.

It happens to me mostly when I'm compiling a program and in a rush. I'm just about done with the task at hand, and someone's anxiously awaiting a call from my modem to get the revised version. Just as the compiling is about to finish, a zillion errors appear, and the program goes on to link nonexistent files.

Of course, compilers aren't the only things prone to this sort of problem. I'm sure in your computing career there have been many times you've wished you could put on the brakes and cancel what you'd typed. Well, relax; I have a solution—it's a program called CTRL.C.COM.

To use it, just type *ctrlc* from the DOS prompt. The program is a TSR, so once it's loaded, it's there until you reboot. The program looks for a Ctrl-C key, and anytime it gets one, it clears the keyboard buffer. Now, when I've typed in the next set of commands and I get errors, I just press Ctrl-C, and the keyboard buffer is cleared. A word of warning is in order. This utility may not work if you have other TSRs that trap the keyboard. But as a DOS process under Windows, it's fine.

You can type in Ctrlc using the DOS Debug command or Tip_tool, which can be downloaded from the COMPUTE area on America Online or from CompuServe or GEnie. If you are using Debug, make sure the DOS program called Debug is in your path or the current directory. In these examples, the italic text is what the computer prints; the roman text is what you should

type. One way to be sure you get these programs exactly right is to have someone read the numbers to you as you type them in. Another way suggested by one of our readers is to read the numbers into a tape recorder and then play them back as you enter the program code.

debug ctrlc.com

File not found

```
-e B8 09 35 CD 21 89 1E 3F
-e 01 8C 06 41 01 B8 09 25
-e BA 1C 01 CD 21 B4 31 BA
-e 20 00 CD 21 06 50 2B C0
-e 8E C0 26 80 3E 17 04 04
-e 75 0E E4 60 3C 2E 75 08
-e 26 A1 1C 04 26 A3 1A 04
-e 58 07 2E FF 2E 3F 01 00
-e 00 00 00
```

-RCX

CX 0000

:0043

-W

Writing 0043 bytes

-Q

The checksum value (see the July 1993 "Tips & Tools" for the new Checksum program) is 04863.

RICHARD C. LEINECKER
REIDSVILLE, NC

Correction

TDOS.BAT and DDOS.BAT, published in the November "Tips & Tools" each have a minor error that prevents them from working. Here is the corrected listing for TDOS.BAT.

```
@SET OP=%PROMPT%
```

```
@SET PROMPT=$T$_
```

```
@SET PROMPT=%OP%
```

Here is DDOS.BAT.

```
@SET OP=%PROMPT%
```

```
@SET PROMPT=$D$_
```

```
@SET PROMPT=%OP%
```

The blank line between the second and third lines is necessary.

ROBERT BIXBY
GREENSBORO, NC

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

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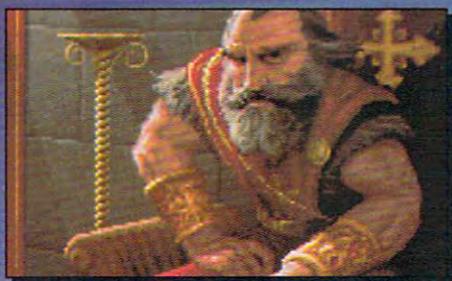
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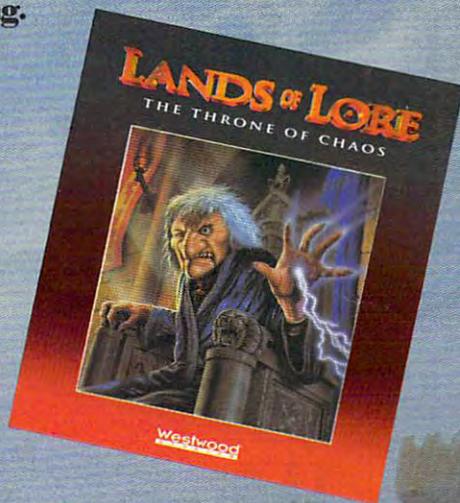
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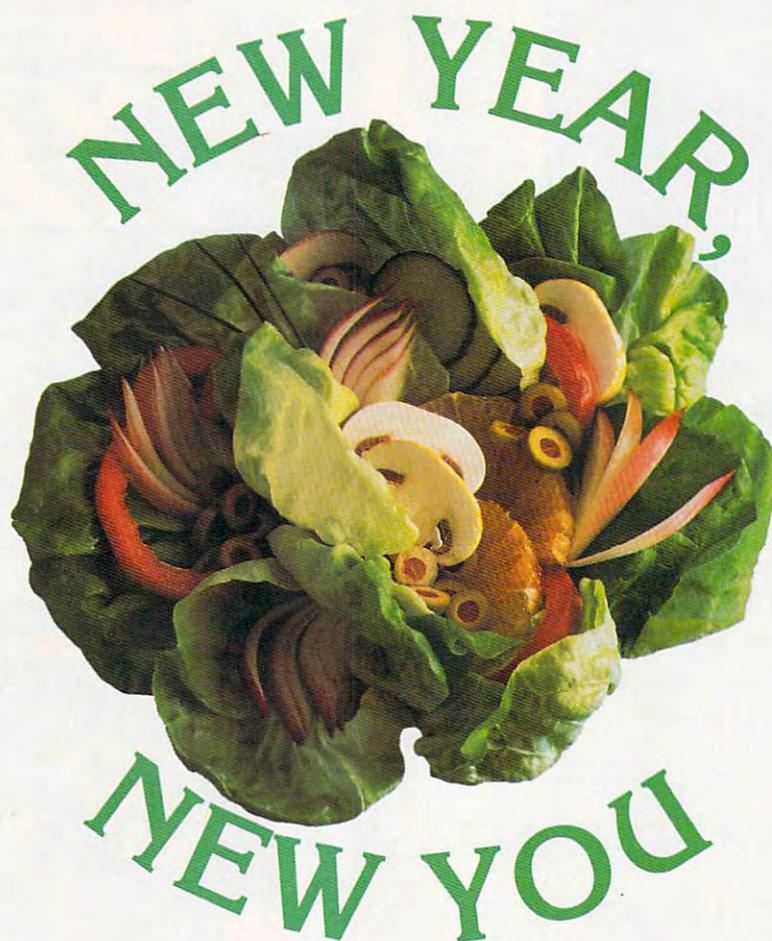
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**This year, your computer can help you keep
your resolution
to lose weight, eat better, and
exercise more regularly.**



Whether you're ready or not, the new year is upon us, bringing with it the timeworn tradition of New Year's resolutions, those promises that you make each year to live life to the fullest, to be a better person, and, most urgently, to improve your physical condition. Although these may seem like simple goals on January 1, at least one tends to fall by the wayside the next day when you walk into a kitchen full of leftover turkey and holiday candy.

But 1994 can be different. You can keep your resolution to shed those extra pounds and develop a sensible diet. Your computer can help with diet programs that make it easier to manage your diet and watch your weight loss. Many of them also help you design and monitor a fitness regimen.

The software you choose will ultimately depend on your lifestyle and goals, but there are certain features that you should look for in any program. The first is good nutrition, says Dr. William R. Fackler, a Richardson, Texas, pediatrician who has used Diet Analyst from Parsons Technology. A program should stress healthy eating habits and should contain reliable nutritional information. But

By Lisa Young

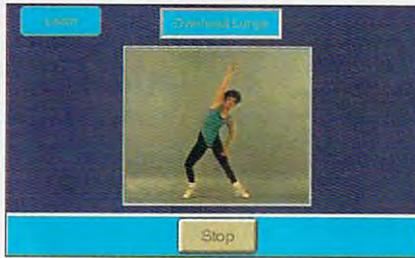


before you select any diet program, you should talk with your physician, says Dr. Fackler. It's important to take into account any medical problems that would require a special diet or any fitness limitations that would restrict activity.

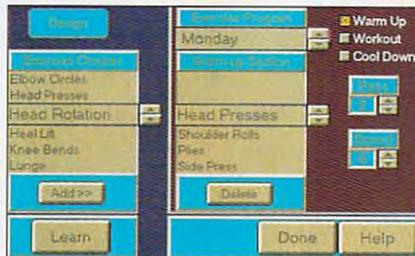
Harry Barney, associate professor in the School of Applied Health Professions at the University of Connecticut and a user of another program, Fitness Software Systems' Nutrition Expert, for nearly two years, recommends that you select a program that provides detailed feedback. It's essential that you understand why a particular food is good for you and why others are not. The educational value of a program is important in helping you maintain a healthy diet after you've lost weight. Barney also recommends that you choose a program that you can personalize. Because everyone has specific needs, it's important to find a program that will treat you as an individual.

Organize Your Appetite

One of the biggest challenges when you begin a diet program is knowing where to start and how to get organized. No diet program is going to be successful if you don't monitor your



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eating and fitness habits. Knowing the quantity and nutrient content of what you have eaten can be a determining factor in losing weight.

"Most times, poor nutrition can be directly attributed to a lack of understanding of how foods and their nutritional components affect our bodies," says Michael J. Harnad, president of

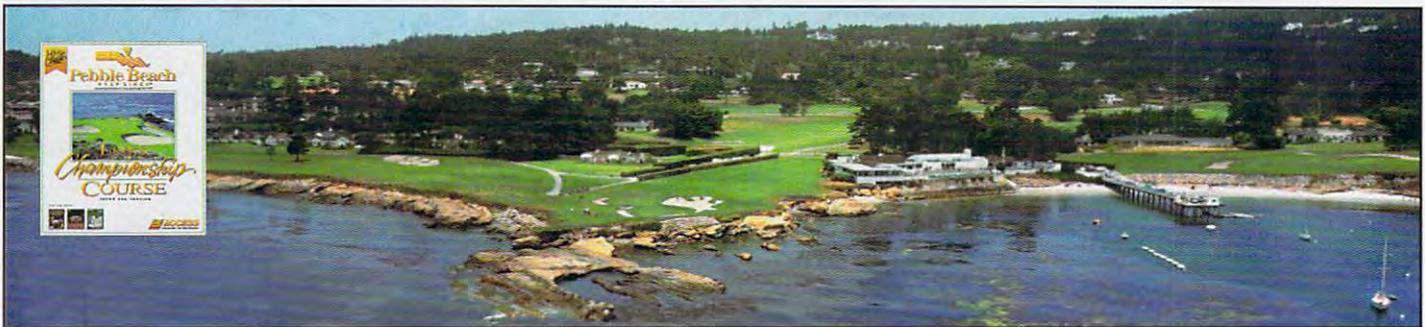
Fitness Software Systems. "Knowing what your present requirements are allows you to make the dietary adjustments to lose or gain weight."

Harnad had been an amateur bodybuilder for nearly 13 years but felt that he was not competing at his full potential. The problem, he discovered, was a lack of organization. Without a detailed nutritional plan, it was easy for him to overeat slightly, producing a bit of flabbiness that cost him points during competitions. Using his master's degree in computer science, Harnad developed software programs to help regulate his nutritional and training regimens.

"It started as a personal project, and then I discovered that other people were interested in it, too," he says. "To achieve fitness, one must commit to a lifestyle that includes regular exercise and sound nutrition. This means knowing what exercises to perform and what foods to eat."

Nutrition Expert uses your age, sex, height, weight, and activity level to develop a personal profile. Then it uses that profile to help with meal planning and diet analysis.

This user-specific response is one of the program's most valuable features, according to Harry Barney.



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