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# COMPUTE

AUGUST 1993

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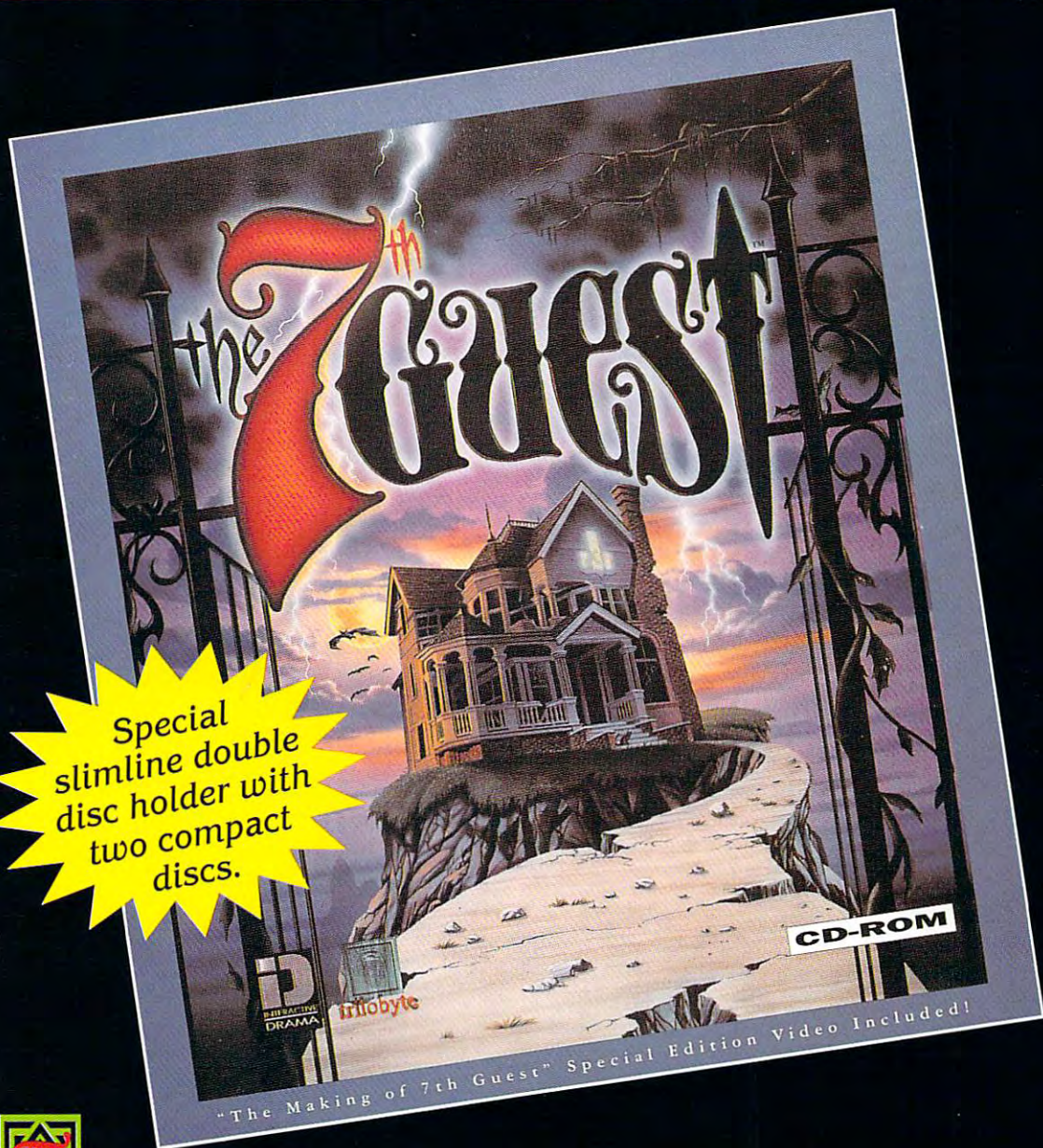
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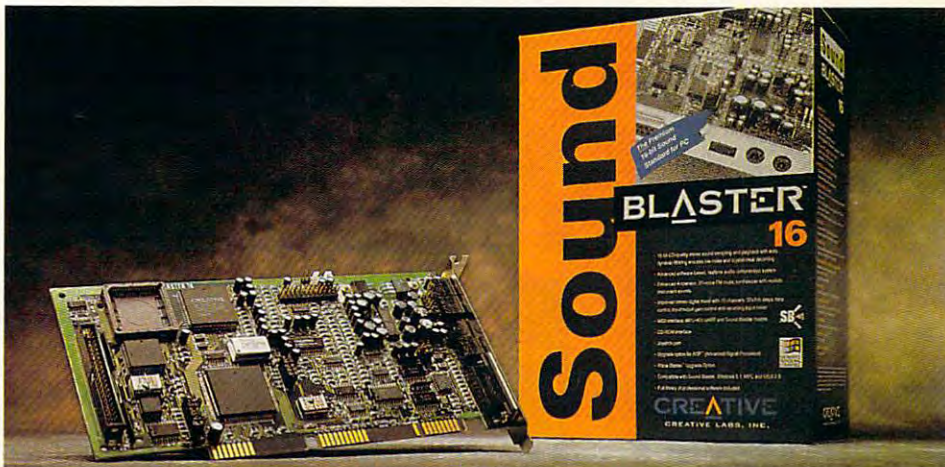
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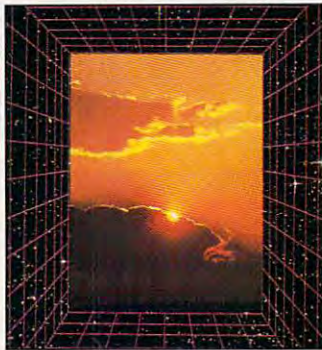
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Clifton Karnes

Spring COMDEX, held this past May in Atlanta, Georgia, will go down in the history books as the best COMDEX to date. Exhibit halls were jam-packed with eager attendees, and a record number of exhibitors filled the show floors and demonstrated an amazing assortment of cool new products. Here are the ten best products I saw at this year's show.

Here's a list of the ten best products I saw at this year's Spring COMDEX.



10. Doublecase makes a series of superlight, hard cases designed to fit almost any notebook. The Doublecase name comes from the case's design, which uses two hard shells for each wall. The inside of the case is dense foam rubber that you can mold to fit almost any notebook or laptop. Your traveling PC is probably as safe in a Doublecase as it is on your desk back at the office. Prices start at \$59.95.

9. Star has really upped the ante in color printers with its sleek, new SJ-144. This superb small printer uses a new medium to print color pages that are amazingly crisp and rich. Cost per page is about the same as with a color DeskJet, and the suggested retail price is \$599.

8. If you find yourself switching screen resolutions in Windows, you'll love Any View from Binar. This clever software add-in lets you click on a button to go from 640 ×

480 to 800 × 600 to 1024 × 768. You also get a virtual desktop, and perhaps most impressive of all, you can adjust your screen's scaling so rulers in programs like Word for Windows and PageMaker measure exactly one real-world inch. Neat.

7. Image-editing and screen capture programs are a large, competitive category in Windows, and a new version of ImagePals (U-Lead) introduced at COMDEX goes to the head of the class. With excellent tools for editing bitmaps, editing color, and capturing screens, all in a scrapbook interface, ImagePals is fast, powerful, and easy to use.

6. Intel's Pentium processor has caused quite a stir in the last few months, and at this COMDEX we saw some of the first machines that are actually designed around the chip. The Pentium's potential is amazing, but hardware systems and software must be specially designed to take full advantage of this potential. When they are, performance increases of nearly ten times over that possible with a 486 are attainable. Putting a Pentium in a 486 system will double your performance.

5. Here's a tie. Corel and Micrografx have long been the two giants in the illustration program category. Both companies had new products at COMDEX, and both looked great. The programs seemed amazingly easy to use, even for nonprofessionals. CorelDRAW! 4.0 includes everything but the kitchen sink in its box, and the company's selling the previous version of CorelDRAW! for \$199, which is a super deal. Designer 4.0 won't have quite as much in its package as CorelDRAW!, but you'll still find lots of goodies including clip art, fonts, and a bitmap editor.

4. Last year, presentation programs became a major category. This year, multimedia presentation software is really hitting its stride, and the best newcomer is Compel from Asymetrix. It's easy to use, and it has all the tools you'll need to combine dazzling graphics, animations, and sounds.

3. If you're in the business of creating Windows help files, RoboHelp 2.0 from Blue Sky Software is the most advanced tool available. New at COMDEX, RoboHelp 2.0 works with Word for Windows and, as the name implies, automates help file creation. Anyone who's created help files by hand will appreciate the point-and-click ease with which you can build topics and jumps and include bitmaps in your help files. You can also compile and test your help files, all from a toolbox that RoboHelp installs in Word.

2. Windows programmers and power users now have a high-powered tool to investigate what's going on behind the scenes in Windows. WinScope from Periscope lets anyone spy on the Windows messages, API calls, and hooks. Ever wonder what's really happening when you drag a file from File Manager and drop it on Notepad? With WinScope you can find out.

1. Page layout has long been the domain of ultraexpensive, powerful programs like QuarkXPress and PageMaker. Now, PagePlus from Serif changes the formula with a program that's ultrainexpensive and very powerful. This amazing program will do the lion's share of what the heavyweights do and at a price of \$59.95. PagePlus even surpasses Quark and PageMaker in a couple of areas, and it's easier to use than either. □

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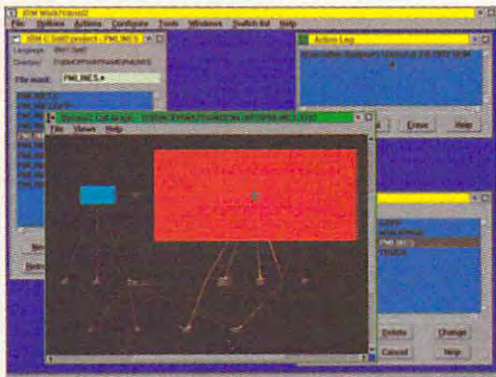


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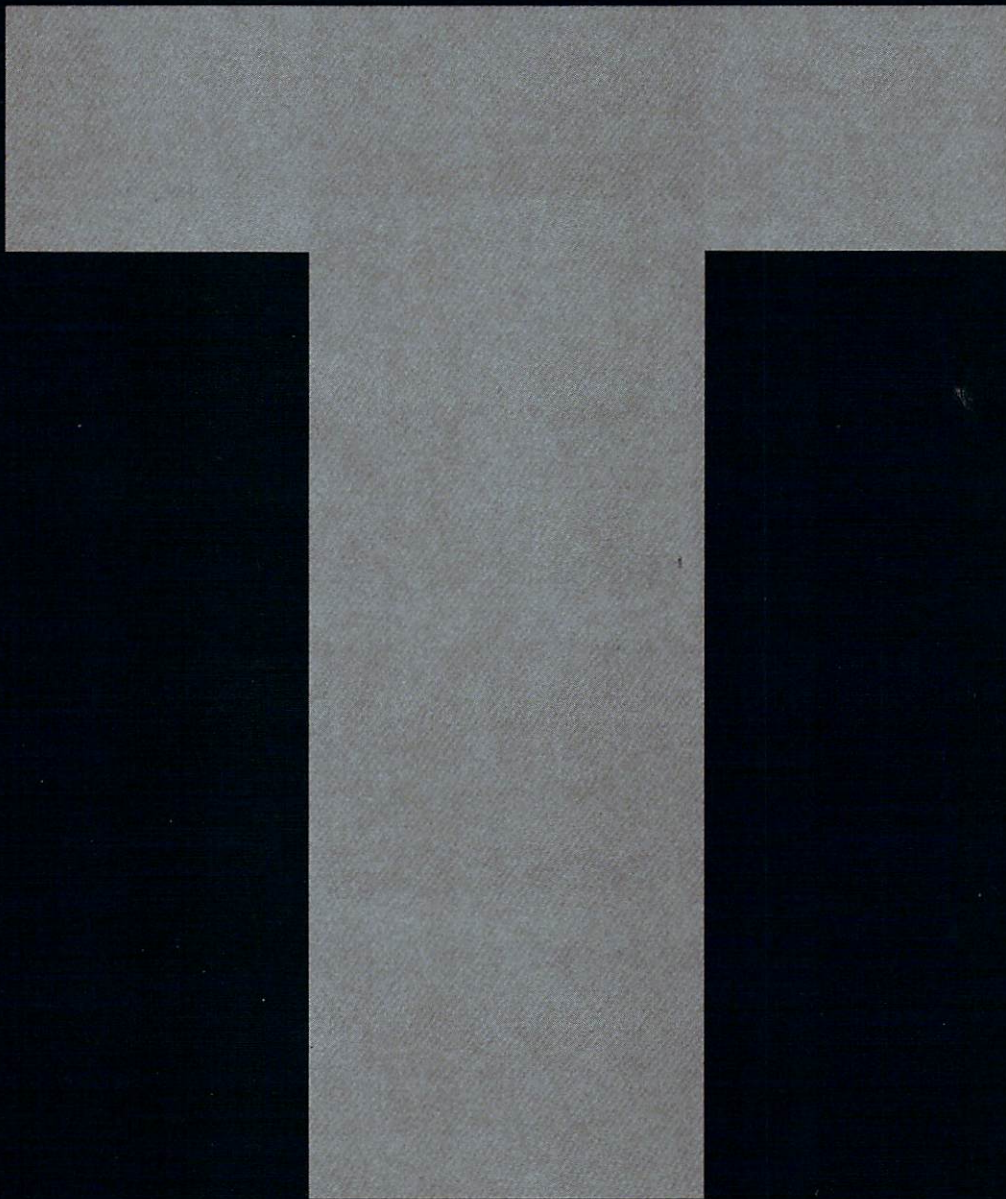
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4-GENERATION OPERATING SYSTEM



**M**icrosoft's recently released Windows NT (New Technology) is a bold attempt to extend Windows' incredible market success far beyond individual desktop PCs into companywide networks and essential mission-critical applications. NT is an industrial-strength operating system capable of competing head to head with OS/2 and UNIX, as well as a fully featured network operating system for both modest peer-to-peer networks (à la Windows for Workgroups) and large client/server networks (like those supported by Novell NetWare). Yet, to the average user, Windows NT looks and feels almost identical to today's Windows 3.1.

To understand what Windows NT is, it's important first to understand what it is not. NT is not the next version of Windows 3.1 or Windows for Workgroups, although it can do virtually everything that those two operating environments can do, and far more. Unlike today's Windows 3.1, which is an operating environment that runs on top of DOS, NT is an entirely new operating system, built from the ground up to demolish the limitations that PC users and software developers have labored under for more than a decade. This means that NT can tackle sophisticated networked applications that are far beyond the reach of Windows 3.1; but as we'll see, it exacts a price in the form of hefty processor, memory, and hard disk requirements.

NT's designers had to balance their desire to develop a state-of-the-art operating system, capable of satisfying the computing needs of large organizations, with the knowledge that NT had to be compatible with the huge installed base of DOS and Windows applications. The result is a 32-bit operating system that pays homage to many of today's most popular computing buzzwords (*multitasking, multiprocessing, objects, and client/server computing*) while supporting 16-bit DOS and Windows applications.

### **Leaving DOS in the Dust**

What are some of the practical improvements of Windows NT over today's DOS and Windows combination? For one, Windows NT says goodbye to the memory management limitations of DOS. No more questions about when and how to use extended versus expanded memory, and no more memory managers such as HIMEM, EMM386, or QEMM-386 to tweak and configure. Unlike DOS with its arcane segmented memory archi-

ture, NT supports a linear memory address space of four gigabytes (two gigabytes for programs and two gigabytes for the operating system), which is more than enough for all but mainframe- and supercomputer-class applications.

If you've tried to run multiple applications at once under Windows 3.1, you know how limited Windows' capabilities are. Trying to print a long document or transfer a file by modem while working in your word processor or spreadsheet can be an agonizing process. Even worse, if any of your programs crash, it can bring the entire system to a screeching halt. Windows NT, however, eliminates these problems with a sophisticated preemptive multitasking system that switches between programs so quickly and smoothly that, from the user's point of view, each program appears to run nearly at top speed. An even more sophisticated capability called multithreading enables many programs, or in NT terminology, processes, to be broken down into two or more threads, each of which can be executed concurrently. Multithreading enables NT to do many more things at once, and it's widely applied within NT itself in order to speed things up. However, programs must be written with multithreading in mind in order to get maximum performance.

In addition, NT's virtual memory manager (which gives each program more room to run by combining available RAM with hard disk space) protects the system by keeping programs and system tasks from interfering with each other. If one program crashes, Windows NT itself and the remaining programs continue to run. The frustrating General Protection Faults and freezes that are common in Windows 3.1 are largely a thing of the past in Windows NT.

For complex applications that require more power than one processor can provide (such as sophisticated engineering-design problems or transaction-processing systems for high-speed processing of sales orders or airline reservations), NT supports multiprocessing. With this capability, two or more processors can work in concert to execute applications. In fact, by combining multiprocessing and multithreading, each processor can run different portions of the same application, or entirely different applications, in order to gain potentially enormous performance improvements. However, most applications must be written from the ground up with multiprocessing in mind; otherwise, performance

improvements are modest at best. Virtually no existing Windows applications can take full advantage of multiprocessing without involving extensive redesign.

### **The Compatibility Suite**

Even though its internal architecture is completely different from that of DOS, Windows NT runs most existing DOS and Windows applications without modification. To do so, NT uses an emulator. Macintosh and NeXT users will be familiar with one such emulator called SoftPC, which completely reproduces the PC hardware architecture in software, so that DOS and Windows applications can run "inside" SoftPC under Macintosh System 7 or NextStep. Insignia Solutions, the company that developed SoftPC, worked with Microsoft to develop a similar emulator for Windows NT called the Virtual DOS Machine, or VDM. The VDM emulates both DOS and the standard PC hardware, and it runs all DOS applications except those that bypass the operating system to talk directly to hardware, such as some games, CAD programs, and older applications that require direct access to hardware for acceptable graphics or hard disk performance.

Windows applications also run on NT by using an emulator; in this case, an emulator called Windows on Win32, or WOW for short, runs on top of the VDM. WOW supports most standard and enhanced mode Windows applications, but not Windows 3.0 real mode applications. (As with DOS, any application that bypasses Windows and directly manipulates memory or hardware is unlikely to work with Windows NT.) Multiple applications can run simultaneously inside WOW, but since the WOW environment so closely duplicates Windows, an application crash within WOW has a good chance of crashing other running applications and possibly even WOW itself. Unlike in DOS/Windows-based systems, however, a crash within WOW will not affect any other non-Windows applications. In other words, while existing DOS and Windows applications are no more "bulletproof" in Windows NT than they are today in Windows 3.1, the overall system is far more reliable.

In addition to DOS, Windows, and Windows NT applications, NT also runs a limited set of OS/2 and UNIX-like applications. For example, NT can run character mode OS/2 1.x applications. In reality, this feature is of very limited usefulness, because most OS/2 1.x applications have long since been upgraded to take advantage of



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Features	MS-DOS 6	Windows 3.1	OS/2 2.1	UNIX	Windows NT
Virtual Memory	no	yes	yes	yes	yes
Multitasking	no	limited	yes	yes	yes
Multithreading	no	no	yes	some (a)	yes
Symmetric Multiprocessing	no	no	no	some (a)	yes
Portable	no	no	no	yes	yes
Access Security	no	no	limited	yes	yes
Graphical User Interface	yes (MS-DOS Shell)	yes	yes	yes, multiple	yes
Requires DOS	yes	yes	no	no	no
Runs 16-Bit Real Mode Windows Applications	no	yes	yes	some (a)	no
Runs 16-Bit Standard Mode Windows Applications	no	yes	yes	some (a)	most
Runs 16-Bit 386 Enhanced Mode Windows Applications	no	yes	yes	no	yes
Runs 32-Bit Windows Applications	no	no	no	no	yes
Runs OS/2 Applications	no	no	yes, all	no	1.x character mode only
POSIX Support	no	no	no	some (a)	yes
Supports DOS FAT File System	yes	yes	yes	some (a)	yes
Supports OS/2 HPFS	no	no	yes	no	yes
Supports NTFS	no	no	no	no	yes
Networking Built In	no	Windows for Workgroups only	no	some (a)	yes
Built-in E-mail	no	Windows for Workgroups only	no	some (a)	yes
386 or Higher CPU Required	no	no	yes	yes	yes

(a) This feature is standard or optional in some flavors of UNIX, while other UNIX variants might not offer the feature at all.

OS/2 2.x's Workplace Shell and Presentation Manager graphical user interface features.

Likewise, NT is also capable of running POSIX 1.0-compatible applications. POSIX is a U.S. government-specified standard flavor of UNIX that allows compatible programs to be run on a wide variety of different computers.

Unfortunately, most existing UNIX applications require more features

and capabilities than those specified in POSIX 1.0.

Further, POSIX doesn't yet support the X Window system or higher-level graphical user interface tools that are quickly becoming an integral part of most UNIX systems. Therefore, as with OS/2, Windows NT's POSIX support is, for now, primarily a token gesture aimed at providing cross-platform compatibility, rather than an immediately useful feature.

### Keeping Secrets

As mentioned earlier, Windows NT includes sophisticated networking capabilities. Existing Windows for Workgroups (WFW) users will recognize NT's networking features as extensions of WFW's capabilities. NT systems can share files, printers, and other resources (such as networkable modems) on a peer-to-peer basis with other NT systems, as well as with WFW systems. These peer-to-peer

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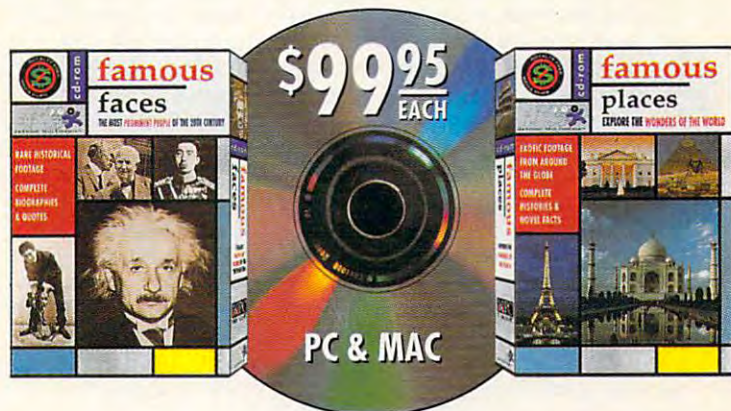
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networks don't require expensive dedicated file and print servers. Or you can choose to create client/server network configurations, with NT systems acting as file, print, and application servers to other NT, WFW, LAN Manager, and DOS-based systems. In fact, Windows NT includes approximately 90 percent of the functions and features found in Microsoft's LAN Manager 3.0. NT supports the network protocols used by LAN Manager and IBM's LAN Server, as well as the protocols used by most UNIX systems and the worldwide Internet. Additionally, Novell NetWare users aren't left out; Windows NT systems can be connected as clients to existing NetWare servers.

A powerful networked operating system like Windows NT will usually be used in applications in which more than one user needs to use the network; otherwise, there's little reason to upgrade from Windows 3.1. As soon as multiple users begin to access a single system or network of systems, security becomes essential. Each user will have applications and data files that must remain private to him or her, while some programs and files will need to be shared by other users.

More importantly, critical functions such as modifying operating system files and adding or deleting users must be strictly limited to authorized system administrators.

Windows NT includes the Security Subsystem, which requires all users to log on with a unique user name and password in order to gain initial access and then strictly controls access to files and subdirectories according to rules set up by the system administrator. NT meets the U.S. government's C2 level of security, meaning that it can be used for moderately sensitive applications (although its safeguards are insufficient for secret or even more sensitive data). By comparison, OS/2 has only rudimentary security features; it relies on LAN Server's network-based security for more extensive protection.

UNIX, on the other hand, has had password protection and access control features for years, but only recently have some desktop UNIX vendors (Univel and SunSoft) brought their products' security up to C2 standards. These vendors require users to purchase add-on software to achieve the same level of security built into Windows NT.

In order to keep track of who has permission to access which files and subdirectories, a file system (which manages the directories and file attributes for each hard disk) must

maintain and update a great deal of security information. The FAT file system used by DOS and Windows makes no allowances for security, nor does it provide the fail-safe features required in mission-critical applications, where a single disk failure could have catastrophic results.

Windows NT's developers devised a new file system, called NTFS (NT File System) that works hand in hand with the Security Subsystem to keep track of security permissions for every file, subdirectory, and user. In addition, for reliability, NTFS supports disk mirroring, in which two disk drives contain identical information, so that the mirror drive can take over instantly in the event of a failure in the primary drive. NTFS can also improve disk performance with a technique called disk striping, in which files are written, or "striped," across two or more physical disk drives.

Because each drive can read or write a different block of data from the same file simultaneously, the time it takes to perform disk functions can be dramatically reduced. In addition, by adding parity, which stores disk data with a small amount of redundant information, small data errors can often be corrected on the fly, and data damaged by more severe hardware or software failures can usually still be reconstructed.

In addition to NTFS, Windows NT is also compatible with the FAT file system and OS/2's High Performance File System (HPFS), although NT's security features can't be used with FAT or HPFS volumes.

### Intel and Beyond

One of the most important and exciting new features of Windows NT is its ability to run on non-Intel processors. UNIX can run on a wide variety of different computers, from desktops to supercomputers, but even today, DOS and Windows can run only on either Intel or Intel-compatible processors, or on top of software that emulates the Intel x86 architecture. In addition to Intel's family of 386, 486, and Pentium processors, NT supports the new generation of high-performance RISC (Reduced Instruction Set Computer) processors that offer big price and performance advantages over CISC (Complex Instruction Set Computer) processors (such as Intel's x86 and Motorola's 680x0 families). Windows NT currently runs on MIPS 4000 RISC processors from Silicon Graphics, as well as on Digital Equipment's Alpha RISC processor family. Future support for Hewlett-Packard's HP-PA and Intergraph's Clipper RISC processors

is planned, and IBM is rumored to be working on moving NT to the PowerPC processor family that will form the backbone of Apple's and IBM's next generation of desktop computers.

Later this year, the first RISC PCs will begin to appear, using Alpha and MIPS 4000 processors. These PCs will be priced slightly higher than, and look and run very much like, existing high-end PCs; they'll have EISA-bus slots and support ISA- and EISA-bus expansion cards.

For superior video display and hard disk performance, most will also support local-bus architectures such as VL-Bus or PCI. They'll use the same keyboards, mice, monitors, modems, printers, and other peripherals as conventional PCs, but instead of DOS and Windows, they'll run either Windows NT or a flavor of UNIX.

These RISC PCs will run existing DOS and Windows applications under NT about as fast as a 33-MHz or clock-doubled 50-MHz 486-based PC does today under DOS, but they'll equal or exceed all but the fastest available Pentium chips when running native Windows NT applications. (Existing DOS and Windows applications won't have to be modified in order to run on these systems, but new NT applications will have to be recompiled in order to run on different processor designs.) Windows NT will help to turn these RISC PCs into real competitors for Intel-based PCs and servers, and in so doing will help to drive down the price of high-end 486- and Pentium-based systems.

### NT Versus OS/2 and UNIX

Windows NT is often compared to OS/2 and UNIX. In fact, when NT was first conceived by Microsoft, it wasn't called Windows NT at all. Instead, it was called OS/2 3.0, and it was intended to be Microsoft's next-generation platform-independent version of OS/2. The split between IBM and Microsoft sealed OS/2 3.0's fate, and the announcement of the ill-fated Advanced Computing Environment in the fall of 1991 by MIPS, Compaq, Microsoft, and others was the first formal acknowledgment that OS/2 3.0 had metamorphosed into Windows NT. Today, Windows NT 3.1 will compete head to head with OS/2 2.1, as well as with a variety of UNIX flavors, including UnixWare (Novell/Univel), SCO UNIX (Santa Cruz Operation), Solaris (SunSoft), and NextStep (NeXT).

The table provided on the preceding page summarizes the similarities and differences between NT, OS/2, and generic UNIX.



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### The Price of Power

Windows NT's power and flexibility has its price. NT demands faster processors, more memory, and bigger hard disks. Unlike Windows 3.1, which runs on virtually any 386, 486, or Pentium processor, Microsoft states that at least a 25-MHz 386 is required for NT. In fact, anything short of a 486 is underpowered so far as NT is concerned. A 25-MHz 486SX is probably the minimum processor needed for adequate performance.

Also, be prepared to buy more RAM. Until March of this year, Microsoft's stated goal was to make NT run in 8MB of RAM with acceptable speed, but software developers who tested the first two beta versions of NT were dubious that Microsoft would ever achieve its goal. With the March beta release, Microsoft threw in the towel and raised the minimum requirement to 12MB of RAM, with the best performance possible only on systems with 16MB or more.

Finally, NT needs lots of disk space; the complete operating system, including networking, OS/2, and POSIX support, requires 80MB of storage. The complete Software Development Kit requires another 40MB. Swap files for virtual memory will require another 10–20MB, so depending on whether you'll be developing applications or simply running them, you'll need 100–140MB of hard disk space just to get started. And don't plan to save money or slots by using Stacker or SpeedStor; at the present time, NT is totally incompatible with these utilities. In fact, NT doesn't even understand Microsoft's own DoubleSpace compression, which is built into DOS 6. (Microsoft is working on a new NT disk driver that will be able to read

and write DoubleSpace volumes, but it won't be available until sometime after NT ships.)

### Should You Switch?

It's clear that Windows NT is a big step beyond DOS and Windows. However, for the average home or small-business user, does it make sense to switch? The answer depends on how successfully you can get your tasks done today with Windows 3.1. If you're constantly battling with DOS's memory limitations, if you need the ability to do both peer-to-peer and client/server computing, or if you want to move a favorite UNIX application to Windows, NT could be right for you. Keep in mind, though, that NT currently doesn't support multi-user capabilities with low-cost character-oriented terminals. Unless you're going to develop your own application from scratch, or move an existing application from UNIX to NT, be sure that your software suppliers are readying NT versions of their programs before you take the plunge. Otherwise, you'll be stuck with expensive NT systems that offer little practical benefit over what you're already using.

On the other hand, if you're currently using Windows applications and you don't really need the additional

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power of Windows NT, or if you have an existing small LANtastic, NetWare, or Windows for Workgroups network and you're not planning to add lots of new users, today's DOS/Windows combination is probably fine for you. In fact, switching to NT might actually be counterproductive for two reasons. First, as I explained earlier, both DOS and Windows applications run in emulators under NT, not in the native NT environment. Like all emulators, NT's Virtual DOS Machine and Windows on Win32 exact a performance penalty.

The second reason for not switching is the extra expense involved in equipping each PC to run Windows NT. Applications that run perfectly well today on a 25-MHz 386SX will probably need at least a 25-MHz 486SX in order to satisfy NT's requirements and still provide adequate performance. In addition, a system with 8MB of RAM that's perfectly adequate for your current DOS/Windows needs will require at least 12MB and probably 16MB of RAM for acceptable performance with NT. For existing applications, you'll get even greater performance gains by upgrading your PC's processor and memory while keeping your current DOS/Windows software configuration. Your existing software will run

significantly faster, and you'll be ready for Windows NT in the future.

If you're willing to wait until sometime in 1994 for a "lite" version of NT, Microsoft is working on Windows 4.0, often referred to by its code name, *Chicago*. According to industry sources, Chicago will have most of the features of Windows NT except its ability to act as a server on client/server networks and its support for OS/2 and POSIX applications. Like NT, Chicago will be a complete operating system and thus will no longer require DOS in order to run. Chicago's memory and disk requirements will probably be significantly more modest than NT's. For example, Microsoft claims that Chicago will be able to run on PCs with 8MB of RAM; however, keep in mind that up until March of this year, Microsoft claimed that NT would also be able to run in 8MB. Also, indications are that like today's DOS and Windows, Chicago will run only on Intel and Intel-compatible processors, although that might change if NT is a big hit on non-Intel platforms.

The bottom line is that Windows NT offers true multitasking, multithreading, and multiprocessing, along with extensive networking capabilities, while remaining compatible with most exist-

ing DOS and Windows applications. In addition to Intel x86- and Pentium-based PCs, you'll also be able to run NT on RISC-based PCs and workstations using MIPS 4000 and Digital Equipment's Alpha processors. However, to use NT with your present PC, be prepared to upgrade your system with a faster processor, more RAM, and a bigger hard disk. If you're a home or small-business PC user, there's little reason to switch to NT unless you really need one or more of its advanced features. Windows 4.0, or Chicago, due out sometime next year, promises to offer most of NT's functionality in a smaller package. In short, Windows NT is a powerhouse that's likely to be overkill for all but the most demanding applications, but it offers a first look at the future of desktop computing, Microsoft style.

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*Len Feldman is the author of Windows NT: The Next Generation, published by Sams Publishing. Mr. Feldman is a computer industry consultant based in San Jose, California; his clients include Borland, Hitachi, Radius, and Toshiba. He was formerly the chief sysop of CompuServe's Multimedia Vendor Forum.* □

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# TEST LAB

Edited by Mike Hudnall  
Reviews by Tom Campbell

**T**his is an exciting time in the Windows database arena. And it's no wonder: Database applications are, depending on whom you believe, the most popular or the second-most-popular use for computers.

The arena wasn't always this interesting. When Windows 1.0 came out in 1984, there was nothing. A few vertical market applications appeared with 2.0, as well as a couple of failed Mac ports. Microsoft was curiously silent all this time, developing, we now know, Access. Microsoft was also well behind the market curve, for by version 3.1, Windows had a downright respectable selection of database managers. Approach Software released Approach 1.0 to great acclaim; it's at version 2.0 now and shows Windows at its best.

SPC's Superbase had a commanding lead of the market before Access sold nearly a million copies at the loss-leading price of \$100; with its intelligent implementation of a database-oriented BASIC, Superbase is still a premier development environment. Fox Software, now subsumed by Microsoft, had done a great job porting its FoxBase dBASE clone to the Macintosh and was reversing the process when Microsoft

bought Fox for a cool \$175 million. The reversal was complete this year when FoxPro appeared on Windows, DOS, Mac, and UNIX—a desktop computer grand slam. Borland was hardly idle. It was developing a dBASE clone for Windows and reengineering Paradox, its flagship database. After more than a year's delay, Paradox emerged from the chrysalis just in time to battle with FileMaker Pro, from that insanely great software company called Apple.

As interesting as the market soap opera is, the products are much more so. These full-featured database managers can all be used to create mousing, windowing, push-button database applications. With some of them it stops there; you can add push buttons, but not list boxes, combo boxes, or radio buttons. All of them import dBASE files—a great relief from times past when compatibility wasn't even mentioned by database publishers. Some of them provide macro languages and ways to replace the standard menus with your own; some don't. All have some form of network support, and many speak SQL; both of these features are left unexplored in these reviews because the typical COMPUTE reader is a hobbyist or small-business person on a single-user system.

Access, FoxPro, Paradox, and Superbase all have programming languages of their own. Every one of them is expensive, and every one of them is a stunning achievement. At list price they're bargains; at the competitive upgrade prices, they're steals. You can't go wrong with any of them.

**AceFile 2.0**  
List price: \$199

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The middle tier is less predictable. Its products range wildly in feature combinations; among them, Approach and FileMaker Pro are out-and-out winners.

If your needs are simpler, you'll want to take a look at the sidebar describing Instant Database from Asymetrix, Data Manager from Timeworks, and FormWorx from PowerUp. They taste great, and they're less filling price-wise. Another sidebar covers CA-dBFast 2.0, a product that shipped too late for coverage in the Test Lab regular reviews.

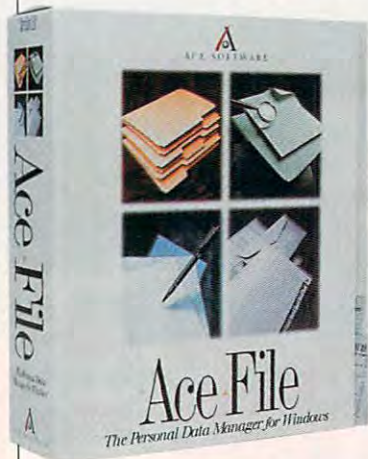
Some of the products covered in this Test Lab support an image data type for fields, but OLE gets extra credit because it can handle any data type, at no cost to the DBMS. Interestingly, few use the common file open dialog Microsoft began promoting with Windows 3.0, and too few support data entry masks to restrict input to, say, a phone number or Social Security number style.

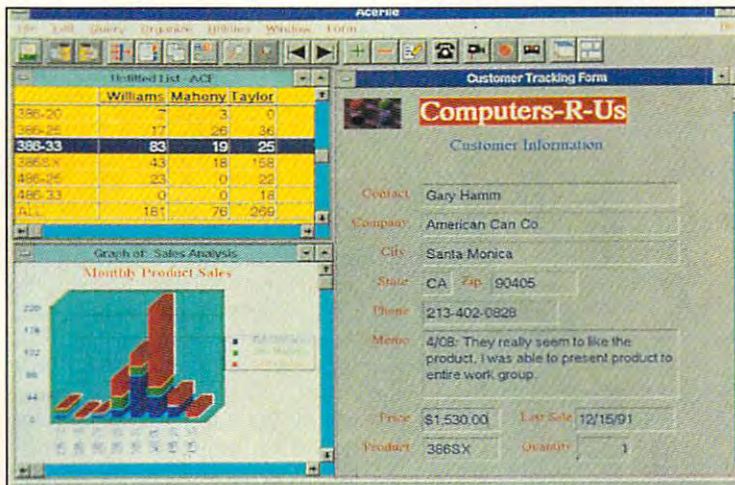
All trends point upward; this is a healthy and impressive bunch. Installation programs are all competent at the very least, although some are called INSTALL.EXE instead of the more standard SETUP.EXE and some don't show available and required disk space. A goodly number offer something besides a full, default installation: sometimes a minimal installation and sometimes a custom installation.

All can print a report to a text file if you install the Windows Generic print driver, but that's a pain. I looked for plain text output without Generic. All of them have calculated fields, and all but one employ the standard Windows help system. Paradox uses the help system most effectively, with a number of well-thought-out visual metaphors that show we are only now beginning to understand the efficacy of hypermedia.

If you've been thinking about graduating from Cardfile, go for it. The game has begun.

TOM CAMPBELL





## ACEFILE 2.0

AceFile is a midrange product with a broad, shallow feature set. In addition to using dBASE III PLUS data files as its native format, AceFile boasts graphing, a dialer, and a rudimentary mail-merge facility with a text editor.

Because of its shallow feature set, AceFile is pretty easy to learn. Some things are a little awkward, such as its handling of index files, but if AceFile is your first database, these considerations are small and shouldn't affect your enjoyment. I find AceFile fairly snappy, and it would be an even better performer were it not for bad handling of screen redraws. There's way too much flicker when AceFile launches, when you quit, and when you enter data or scroll through records in a multiwindow application.

AceFile's idea of a complete database application is a "view set," a file containing the arrangement of windows, databases, and relationships in the application. Nowhere nearly as cohesive as, say, the equivalent application in Access or Superbase, but it gets the job done.

While there's no programming language, AceFile has a wide variety of very useful functions you can embed in forms and reports;

reports are especially flexible. It also has a macro facility, so putting together a view set as a turnkey application is straightforward with only a little study.

The graph module is flexible and has a number of charts. It's not quite as visual as I'd like, taking a fill-in-the-forms approach when direct manipulation would be more desirable. For example, you type in numbers for the angle and tilt of a 3-D pie chart, rather than rotating a model of the chart in realtime.

Somehow I feel that the whole is less than the sum of its parts. I probably wouldn't have noticed this had I not dealt with such seamlessly integrated masterworks as Access and Superbase. For example, you can't have parts of several related files show up in the same window. Each must occupy its own window, leading to rather creative use of tiling in the sample applications.

The manual is pretty good,

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although, despite a longish index, I was stymied when I tried to find out whether the program has memo fields. I couldn't find *memo* or *field types* in the index. AceFile does indeed support memo fields, by the way, because it uses dBASE files as its native format.

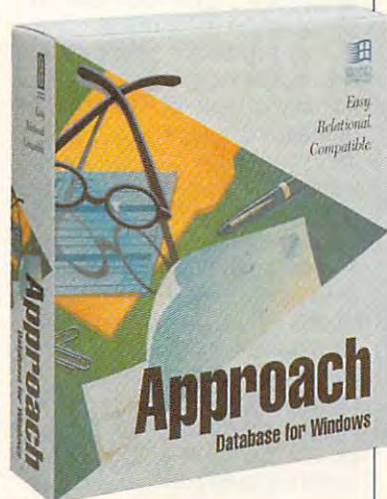
If you need a broad range of features in one box with a moderate price, AceFile is a good choice.

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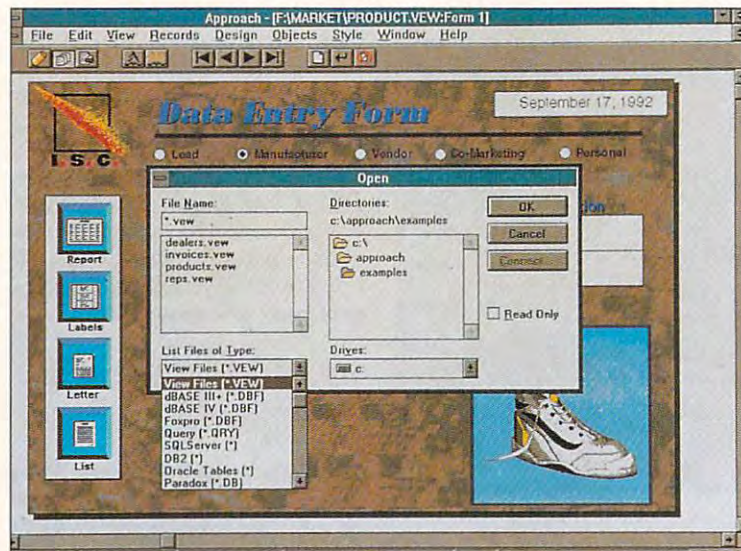
## APPROACH 2.0 FOR WINDOWS

Of all the "easy" Windows database managers in this roundup, Approach and FileMaker Pro seem the best to me. While Approach lacks a programming language, it lets you create impressive turnkey applications very quickly.

Approach impressed me right from the start. Its toolbar contains only the most-used features, so I found it the easiest to learn. Its menus are perhaps the best designed of any in the products I used, leaving the toolbar for what it's supposed to do—provide quick access to the actions that you'll perform most frequently. And let's face it: Icons are helpful if you already know what they mean; however, having to learn 30 or 40 of them can slow you down, even if you're the



# TEST LAB



most determined power user.

I found the manuals elegant and useful, with a well-written tutorial. Unlike, say, FoxPro's big tutorial, which targets experienced Xbase programmers who want to learn FoxPro's special features, the Approach tutorial teaches you both the product and database management at the same time.

The Approach user's guide is equally good, making its few omissions stand out. According to the box, Approach allows you to "become productive instantly by providing turnkey business templates," but I couldn't find *templates* in the index.

This product's online help is fine, but what it calls an index is actually a table of contents. My biggest complaint about help is that you usually can't get it from inside a dialog, such as when you're adding a field to the database structure. The documentation on importing and exporting data is the best I saw with any DBMS. The few complaints I have are minor ones about an otherwise superb product.

Approach was one of the first significant database managers for Windows 3.x, and it shows. I found the drawing tools particular-

ly good, and they have a Group/Ungroup feature, which lets you fuse objects together to form a single selectable unit. Need form

letters? With Approach they're easy, and they're built right into the product. Creating a macro is a snap, although macros are somewhat limited and don't run very fast. The query mechanism is so simple that it doesn't even have a separate name; it's just an extension of the Find dialog you'll see in most Windows applications. While Access makes a big deal about its dynasets, Approach has had a similar feature for a long time. With Approach, when you create a report, you can edit the records output by the report. They aren't called dynasets, but the effect is similar.

An Approach application is held together by a "view" file, and view files do some amazing things. For example, Approach can use both Paradox and dBASE as native file formats without translation. Neither has a

## CA-DBFAST 2.0

A few months ago, I questioned Computer Associates' purchase of both Clipper, a DOS Xbase compiler, and dBFast, a Windows compiler. Since they had different extensions to the dBASE language, I implied that perhaps CA had gotten in over its head.

I'm happy to be proved wrong by release 2.0 of CA-dBFast—gloriously wrong. (Release 2.0 arrived too late for regular coverage. This preliminary look is based on just one day of examination, so bear in mind that it's not an exhaustive look. The dBASE compatibility helped me in this regard, because I was able to run a goodly amount of vanilla III PLUS code through.)

Like Clipper, dBFast is an implementation of the dBASE III PLUS language. Wisely, CA has given dBFast a complete development environment with a multiwindow editor, a debugger, and visual report and form designers. The extensions to dBASE III PLUS are numerous—more than 350 of them, by my count. Many of them echo similar extensions to Clipper (array-handling routines, conditional compilation, binary file I/O), making it clear that

CA is heading in the same direction with both products.

Like FoxPro, CA-dBFast lets you create true Windows applications in dBASE style. Unlike FoxPro, CA-dBFast gives you true EXE file creation at a price that competes favorably with those of Borland and Microsoft language products: \$550, versus about \$1,500 with FoxPro. The EXEs require some frightening overhead—a simple one was 500K—but the productivity gains are worth it.

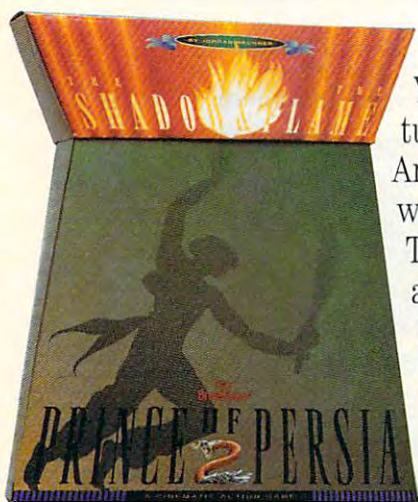
Version 1.0 was beset with problems and was so delicate that it often couldn't run even generic dBASE code. Happily, this seems to be a thing of the past. CA-dBFast 2.0 has some incredible language extensions, a terrific language reference that's chock-full of examples, and a good debugger at a very competitive price. It has a bright future.

CA-dBFast 2.0 lists for \$550. For more information about this product, contact Computer Associates at 1 Computer Associates Plaza, Islandia, New York 11788 (800-225-5224 or 516-342-5224).

—TOM CAMPBELL

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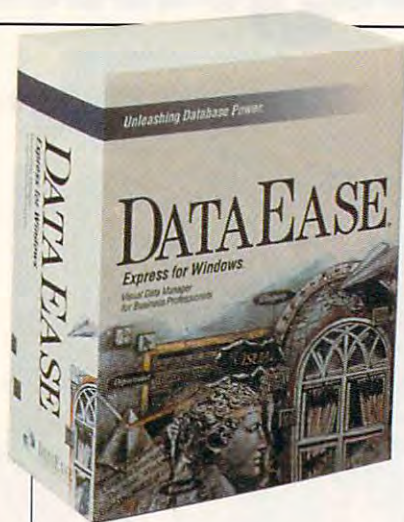
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# TEST LAB



counter data type, yet you can have them in any Approach database, because the view file manages them—an ingenious strategy. The README file is an Approach view file, giving a hypertext twist to the usual last-minute documentation along with a showy but useful illustration of Approach's assets.

One truly non-Windows feature is that Approach is pleasingly fast, allowing you to scroll through records at a satisfying clip. All in all, Approach is probably the best of the nonprogrammable Windows databases in this Test Lab roundup.

Circle Reader Service Number 372

## DATAEASE EXPRESS 1.1 FOR WINDOWS

DataEase is a powerful development environment for nonprogrammers, though it has significant flaws. Designed more for corporations than for individuals, it's built on a rock-solid data engine with numerous connections to minicomputer and mainframe database managers.

While I found it more complicated than the other nonprogrammable database managers, I also found that it can do substantially more in certain areas: queries, viewing the data in different form configurations, and mainframe queries. Another feature geared more toward the corporate user, its use

**DataEase Express 1.1 for Windows**  
List price: \$395

**DATAEASE INTERNATIONAL**  
7 Cambridge Dr.  
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of style sheets on forms, allows you to standardize on one or more visual themes.

Some things just didn't sit well with me. For example, to create a table (database file), you have to choose File/New/Form and choose <New Table> in the Select a Database Table column. It never occurred to me to look there because most DBMSs keep the form and table separate.

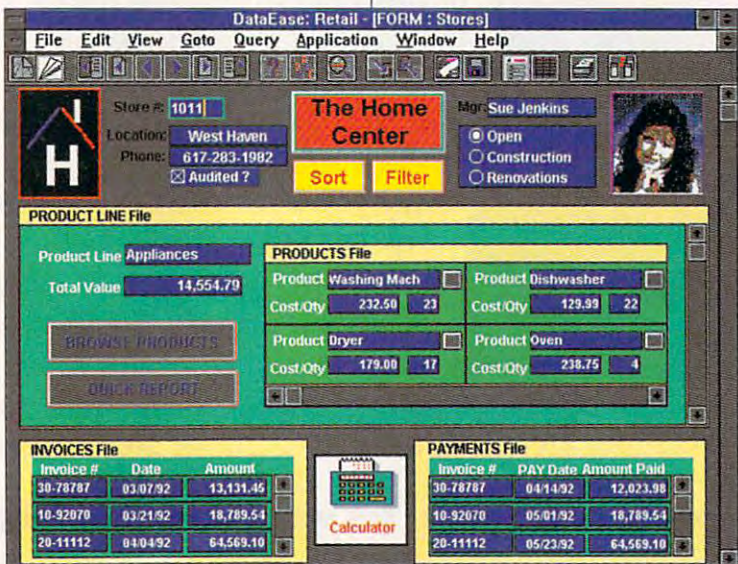
While most of the packages in this Test Lab offer a good number of sample applications, DataEase wins for real-life usability. You can modify the Club ParaDease and project manager sample apps for use in your own business, whereas the sample applications that come with other products would be better thought of as starting points. The DataEase sample apps show a weakness of the overall package, a cluttered design and overenthusiastic use of color that I found somewhat confusing.

Compounding this, the sample apps seem to have been created for a Super VGA system, so the text label *Appointment* became *Ap-poinmen* and *DayMinder Personal Planner* was truncated to *DayMin-der Personal Pla*. Also, the sample application uses teeny fonts in some areas that users with less than perfect vision will find impossible to read.

DataEase employs my favorite catalog approach of the bunch, giving it the edge for team projects. The main window of the catalog is collapsible, like an outliner, and you can double-click on its elements to go directly to them. Its support of graphics is a little iffy, requiring you to enter a filename for each graphic; you can't just paste it in from the Windows Clipboard. On the other hand, it supports all major graphics file types: Windows bitmap, Encapsulated PostScript, CompuServe GIF, Paintbrush PCX, Targa, TIFF, and Windows Metafile.

DataEase wouldn't be my first choice for home or small business use. It's sufficiently eccentric and complex to learn that I'd rather go all the way and learn Access or Paradox.

Circle Reader Service Number 373



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ARTICLE I PAYMENT OF DEBTS AND EXPENSES

I direct that my just debts, funeral expenses and expenses of last illness be first paid from my estate.

ARTICLE II DISPOSITION OF PROPERTY

A. Residuary. I direct that my residuary estate be distributed to my spouse, Martha Parsons. If my spouse does not survive me, my residuary estate shall be distributed to my child(ren) in equal shares. If a child of mine does not survive me, such deceased child's share shall be distributed in equal shares to the children of such deceased child who survive me, by right of representation. If a child of mine does not survive me and has no children who survive me, such deceased child's share shall be distributed in equal shares to the other child(ren), if any, or to their respective children by right of representation. If no child(ren) survive me, Martha Parsons, Hiawatha, Iowa 52233.

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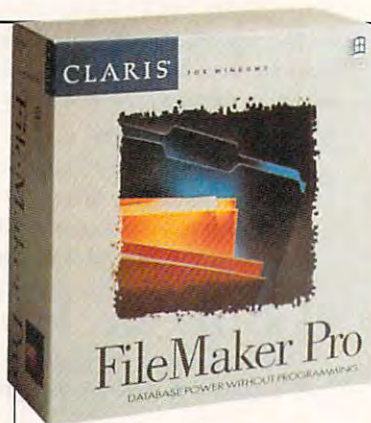
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# TEST LAB



## FILEMAKER PRO 2.0 FOR WINDOWS

From the manual to the sample applications to the software itself, this version of FileMaker Pro oozes quality.

It's one of the first Windows products released by Claris, a wholly owned subsidiary of . . . Apple! Yes, the people who created the Macintosh finally wised up and started cashing in on the Windows market, which they indirectly helped to create. FileMaker Pro has attracted a lot of attention and deserves it. While you can exchange files between the Macintosh and Windows versions of FileMaker Pro, this does not feel like a soulless ripoff. FileMaker Pro is one of the best examples around of how to create a great Windows product.

Miscues are few and far between. One of them is that there are two kinds of scroll bars, the standard Windows variety and a homegrown one. The radio buttons aren't factory issue, either. This is no doubt an artifact of the common code base the program shares with the Macintosh version, but these features jumped out at me. And you can't get help from within dialogs, a feature I missed greatly but was able to do without because of the program's amazing design. The help system is a model for Windows applications—another surprise given its ancestry.

With FileMaker Pro, creating a database is easier than with any

**FileMaker Pro 2.0 for Windows**  
List price: \$129 (during special promotion)

**CLARIS**  
5201 Patrick Henry Dr.  
Santa Clara, CA 95052-8168  
(408) 727-8227

other product in this Test Lab. An Options dialog for each field type allows you to override the sensibly chosen defaults, and it makes such tasks as defining the field as unique or uppercase downright simple. I missed logical field types, but you can get the same effect by making the field a check box—arguably a better solution. Choosing a font brings up a visual representation of all the fonts on your system; I've never seen this in a Windows product, and it's a godsend.

The Find dialog is secretly also a query mechanism, used to select records for reports. This is so subtly integrated into the program that there isn't even a section on reports in the manual.

There is a macro facility that's limited but easy to use. As a programmer, I found it limiting, but as a user in need of slapping together a database application fast, I found it agreeable. File-

## SPEAK UP!

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Maker Pro reads all the major graphics file types and then some, probably more than any other DBMS in this roundup. The sample applications have their own manual, so you don't have to document or create them from start.

Its price puts FileMaker Pro up with the high-end programmable database managers, but I think it's justified by the sheer elegance of its implementation. It adds up to a brief learning curve married to an ample feature set—two qualities that appear often in Windows products but seldom in the same one.

Circle Reader Service Number 374

The screenshot shows the FileMaker Pro 2.0 interface for a database named "CONTACT.FM". The window title is "FileMaker Pro - [CONTACT.FM]". The menu bar includes "File", "Edit", "Select", "Format", "Scripts", "Window", and "Help". On the left, there's a "Data Entry" panel with a scroll bar and "Records: 10" and "Sorted" indicators. The main area is titled "Contact Manager" and features a logo for "EVERYWHERE". Below the logo is a form for entering contact information. The form has several fields: "Name" (with sub-fields for "First" and "Last"), "Marketing Manager" (with a "Contact Info" sub-field), "Phone/Extension", "ACME Accoutories" (with a "Date Entered" field), "Company Name", "Address" (with "Street", "City", "State", and "Zip" sub-fields), "Main Phone Number", "Home Phone", "Fax Number", and "Priority". There are also checkboxes for "Holiday Card", "Perf", "Env", "Trade", "Refered By", and "High", "Med", "Low". At the bottom, there's a "Notes" field and a row of buttons: "Letter", "Envelope", "Fax", "Dial #", "Diary", "Add Name", "Find", "List", and "Labels".



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# TEST LAB



## MICROSOFT ACCESS 1.0

Access typifies the worst and the best of Windows. It's big, slow even on a four-meg 486SX machine, and complicated. It's also a masterpiece, an instant classic of Windows design.

What makes Access special is the depth, richness, and integration of its features. You can save a form as a report. You can edit the results of a query exactly as if you were using the data itself. Windows drag-and-drop features are used extensively. And often, a feature is so obvious that you'll use it without thinking about it because you're simply not accustomed to such an intensely visual environment. The manuals and sample applications look fine and do an amazingly good job for a 1.0 product.

Rough edges in this package are evident but few: The manual slips and calls the program Cirrus, its code name under development; I noticed a page reference of ??? where the writer had neglected to fill in the number; and some simple tasks require a dip into the Access Basic programming language.

I don't see this as an easy database manager, but the program's incredible power yields more per hour of learning than any Windows product I've ever seen. After a few serious months learning Access, you could create very sophisticated Windows

**Microsoft Access 1.0**  
List price: \$495

**MICROSOFT**  
1 Microsoft Way  
Redmond, WA 98052-6399  
(800) 426-9400

applications in very few billable hours. It has the best macro facility of any of the databases reviewed in this Test Lab roundup, and when I checked CompuServe, I noticed that a fair number of nonprogrammers are doing the job of programmers using macros alone.

Access Basic is a strong, capable language, but you won't learn it fast. It looks a lot like Visual Basic, but the two aren't compatible. If you've never used Visual Basic, Access Basic will be a real stretch. There's an extensive, well-written tutorial to help you bridge the gap.

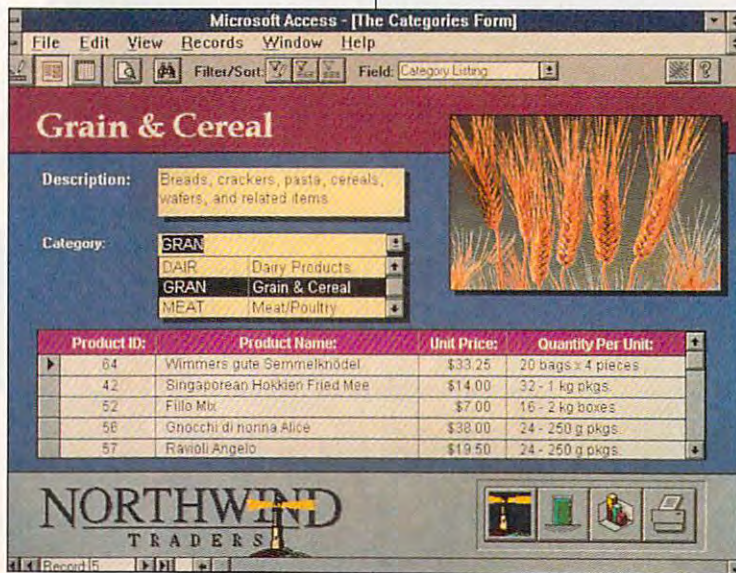
Not only can Access import data from a respectable variety of sources, but it can also "attach" dBASE and Paradox files and indexes. Attached files are left in their original formats, but they act just like they're native to Access. It's faster if you import them, but if you're not willing to entrust your

current data exclusively to Access, you can have it both ways. Keep in mind, however, that importing has a hidden price. Access stores everything—forms, data, program code, reports, macros, queries—in a single file. So if you're developing Access applications for clients off-site, there's no comfortable way to update the code portion of a database without destroying the existing data.

I must admit that my Windows system wasn't comfortable with only four megabytes of memory. Microsoft optimistically lists two megs as the minimum working configuration, but don't even think about it. Be willing to accept the reality that Access is a resource hog.

Access is a thrilling first release. Some features, such as data entry validation, aren't as polished as they could be. Most others, such as its macro facility, drag-and-drop user interface, and Basic language implementation, have already made it to the head of the class. If you're willing to spend some time with the manual, Access will handle any database management task you throw at it.

Circle Reader Service Number 375



## MICROSOFT FOXPRO 2.5 FOR WINDOWS

FoxPro is the one product in this roundup that you must be a database expert to use. Users who don't already know an Xbase language need not apply. If you do know dBASE and want to move to Windows, this is quite simply a product without peer. If you want source compatibility among DOS, Mac, and UNIX versions of a serious database manager, it's the only game in town.

FoxPro is an unabashed power user's tool. While it will laugh in your face if you feed it a machine with less than a 386 and two megs, it gets more performance out of that machine than any other Windows DBMS. (However, all of the products in this Test Lab will do just fine for the typical COMPUTE reader, who usually has fewer than 20,000 records in a database.) Typical FoxPro developers either are porting a DOS Xbase application to Windows or need its screaming performance on data sets with 100,000 or more records.

If you already know dBASE or Clipper, you can't go wrong with FoxPro. The dBASE language

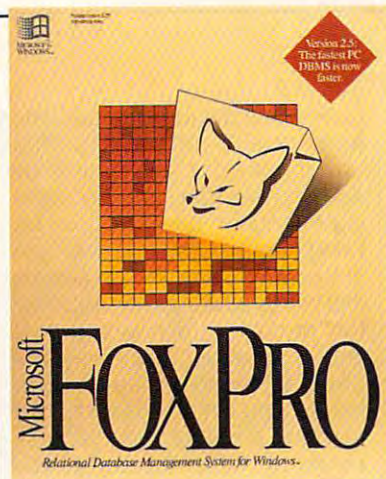
**Microsoft FoxPro 2.5 for Windows**  
List price: \$495

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1 Microsoft Way  
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was already becoming Byzantine with version III PLUS, and the trend has continued to the behemoth FoxPro is today. As a programmer, I'm particularly fond of FoxPro because the entire application can be represented in simple ASCII program listing. This makes team development of programs a realistic goal in a GUI world where maintaining source code for visual application environments is uncharted territory.

While the ads proclaim FoxPro has an applications generator that will let you create programs without coding, don't be misled. The applications generator is weaker than those of Access and Paradox, and you'll have to dip into the source it generates pretty quickly. Also, FoxPro is oriented to the creation of stand-alone EXE programs (with the purchase of the FoxPro Distribution Kit) that can use the Windows API directly, so language shortcomings can always be patched up with C.

If you know a variant of the



dBASE language already or are willing to learn it from third-party materials in order to make use of FoxPro's unique portability to DOS and UNIX, you'll be well served by FoxPro. If you need an easy-to-learn, easy-to-use Windows DBMS that holds your hand, look elsewhere.

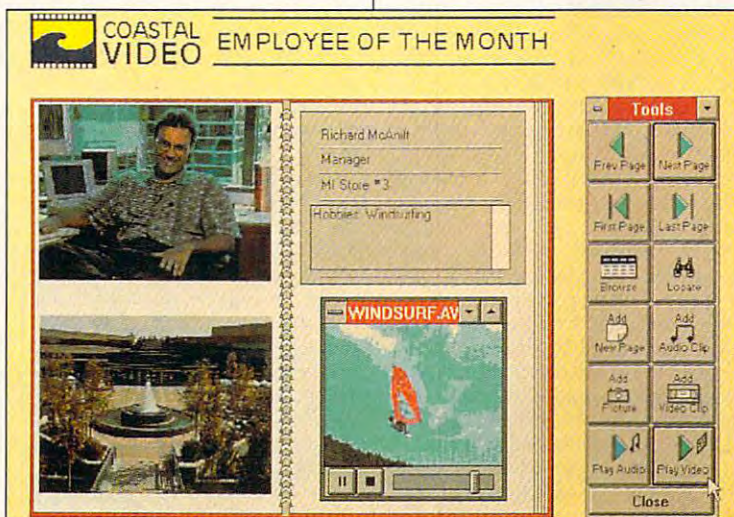
Circle Reader Service Number 376

## PARADOX 1.0 FOR WINDOWS

Paradox gives you the best of both worlds: the assured maturity of a product created by an experienced design and documentation team and the freshness of a 1.0 version. Although Paradox for DOS has been around for years now, the Windows version is a complete rewrite with only data compatibility. Paradox is an awesome development environment.

Paradox, like Access, is billed as being easy enough for an end user but powerful enough for the most experienced developer. I don't believe the former, but the latter is true in spades. If you want to make full use of Paradox, you'll have to learn at least some of its ObjectPAL language, but your efforts will be rewarded handsomely.

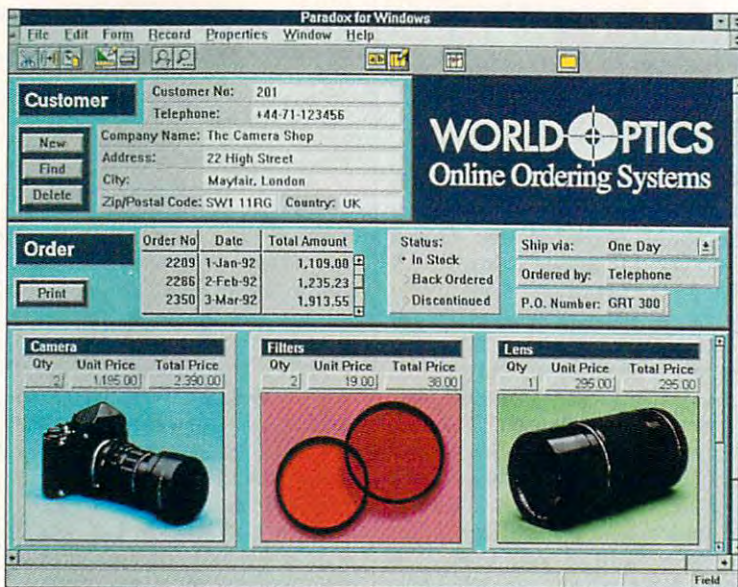
Paradox, long famous for its query mechanism, is even better as a Windows product, allowing you to edit the data set returned by a query. Excellent under DOS, the form designer has no equal in Windows. Paradox thinks of eve-



# TEST LAB

rything in a database application as an object, and you can bring up an object's properties by selecting the object and then clicking the right mouse button. This brings up a submenu, and from that submenu you choose an item that brings up a property dialog for font or color or behavior at print time or whatever. Explaining this takes a lot longer than doing it, and I found it much easier to use than the property sheet Access brings up. While Access lets you see all the properties at once, they appear in a tiny system font that often doesn't fit completely in the box. The Paradox way was much more comfortable to me.

Paradox has an industrial-strength report generator. It does the best job of all the data-



## GLOSSARY

**calculated field.** A field that displays the result of some computation, usually based on other fields. Calculated fields require no space in a file because their values aren't stored, only displayed.

**catalog.** An idea gaining currency in the last few years, the catalog is a way to store information about a single database application—the files it uses, the way data is stored, the program code, and the visual attributes of the application's user interface.

**counter data type.** A number that increments automatically when a record is added; normally, counter fields can't be edited. Useful for generating serial numbers and, more important, for guaranteeing that no record in the database is identical to another record.

**DBMS.** DataBase Management System, such as the programs reviewed here. This is different from a database, which is usually information that can be stored in categories, such as names, addresses, and phone numbers. Lately, databases are being called tables, to emphasize the theoretical view of data as rows and columns.

**field.** A single "unit" or category of information: last name, first name, area code, phone number, and so on. Also called a row in a table.

**filter.** A quick way to select records meeting certain criteria from the database. By convention, a filter can't be

saved and a query can, but they are otherwise similar.

**form.** The user interface into which data is entered. Usually, the form is separated from the structure of the table (a.k.a. database), and there can, in fact, be several forms per table.

**function (in forms and reports).** All of the database managers in this roundup allow the use of built-in numeric and text manipulators such as SUM(), UPPER-CASE(), and AVERAGE(); these are called functions. Sometimes the functions can be used only in forms, sometimes only in reports, but usually in both. Functions work just like spreadsheet functions and can usually be similarly built up into complex expressions.

**index.** Database records are stored on disk and copied into faster RAM only one at a time, while a record is being edited. An index contains a copy of a selected field from all the records in the database in RAM, making it possible to navigate through the database in an ordered fashion without sorting the database.

**macro.** A macro contains one or more memorized actions, such as positioning to the next record or choosing an item from a menu. Less complicated than a programming language but also less useful, macros allow the creation of turnkey applications by nonexperts.

**memo field.** Most fields in a database are of fixed size—a 30-character last

name, an eight-byte numeric field, a two-byte time field, and so on. Memo fields let you store arbitrary amounts of information, usually textual, without wasting space on the disk for records that don't have such information. Useful for recording patient histories, special directions, and sometimes more exotic values like images or sound.

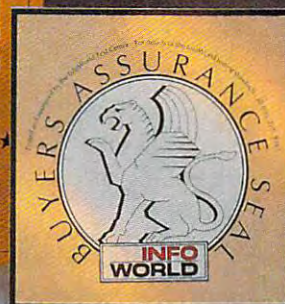
**query.** A way of finding records that meet selected criteria so a report can be printed. Queries are like filters except that they can be saved and quickly retrieved for later use. Sometimes called filters.

**table.** Information stored in row-and-column format, sometimes called a database. Columns are sometimes called fields. The rows are called records. The old term for table is *database*, but that's slowly going out of style.

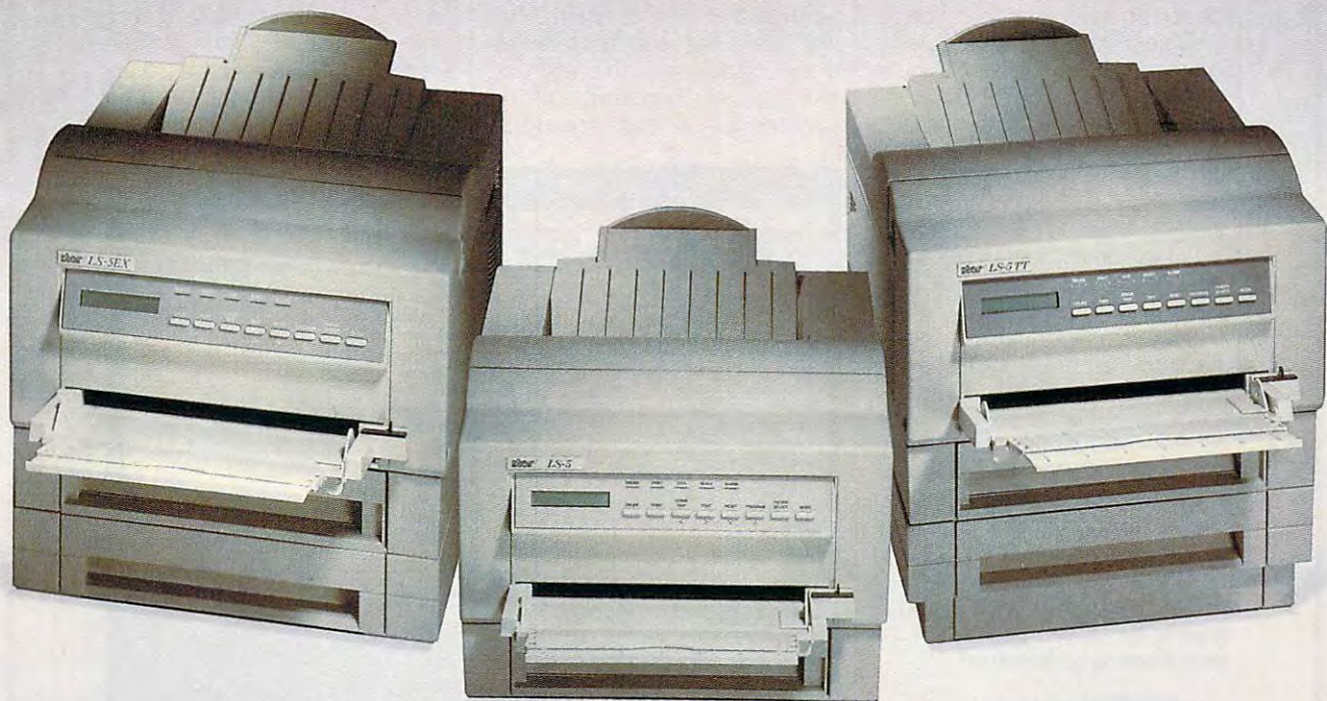
**turnkey application.** A program written using the database manager that anyone, not just the programmer, can use. Normally, it has its own menu, help system, prompts, tables, data entry forms, queries, and reports, typically activated by push buttons or menu picks.

**Xbase.** The most popular database language in the world is dBASE, so influential that it has inspired a horde of similar-but-not-identical counterparts: Clipper, Arago, FoxPro, and so forth. Xbase encompasses all these entities.

—TOM CAMPBELL



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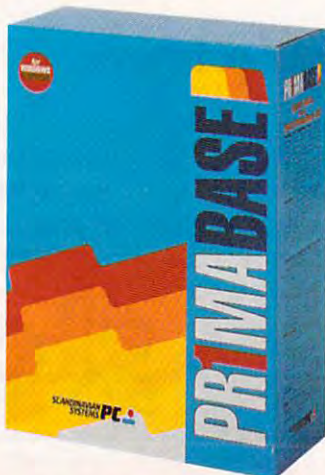


bases surveyed here when creating a default report or form that's based on several tables at once.

ObjectPAL is a killer language. Borland made the right choice in creating a new language that can't use programs created for its DOS predecessor, despite the pain it will cause those with a big investment in DOS Paradox code. ObjectPAL is documented brilliantly; its reference manual is by far the best of the bunch. You can learn ObjectPAL from the ground up through this manual and never have to purchase a third-party book. The ObjectPAL debugger outdistances all other debuggers for database languages.

Paradox is a major achievement and a product of staggering proportions. Among the programmable databases, Access and Superbase are its only competition in this group, and Paradox meets the challenge.

Circle Reader Service Number 377



**Paradox 1.0 for Windows**  
List price: \$795 (\$139 while supplies last; call Borland for information on the Super Pack and Borland Office offers.)

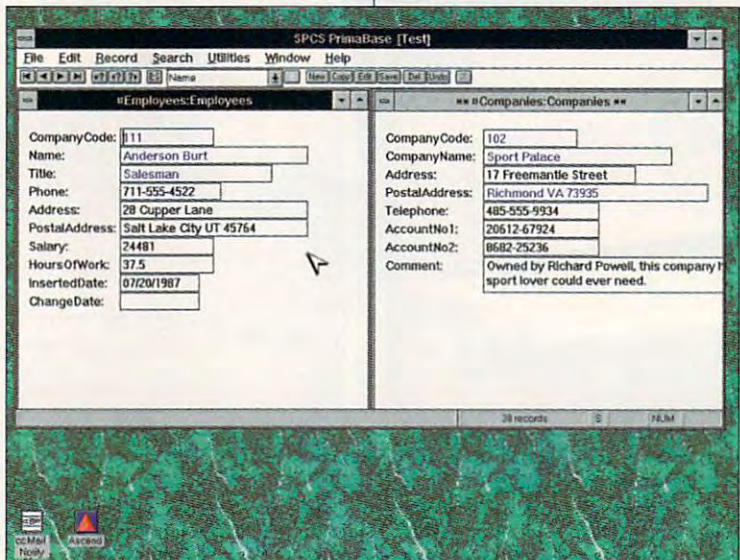
**BORLAND INTERNATIONAL**  
1800 Green Hills Rd.  
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(408) 438-8400

## SPCS PRIMABASE 3.1

Scandinavian PC Systems' PrimaBase is the least full featured of any database in this Test Lab roundup, yet it happens to be the only one guaranteed to pay for it-

Who cares? Anyone whose business or club sends out a lot of bulk mail. Applying bar codes to the labels as the postal service requires is tricky without computerized help, but it can result in massive savings when you convert from first class to third class with machine-readable POSTNET markings.

Without the bar codes, PrimaBase would be better positioned as an inexpensive shareware database manager. Forms are sharply limited. For example, you can add push buttons, but their size, function, and captions are fixed—17 varieties such as New, Edit, Search Next, and so forth. Reports are fairly good, but



self. That's because PrimaBase's main claim to fame is its ability to print all popular bar code types and then some: POSTNET, UPC-A, UPC-E, and others.

**SPCS PrimaBase 3.1**  
List price: \$349.95

**SCANDINAVIAN PC SYSTEMS**  
P.O. Box 3156  
Baton Rouge, LA 70821-3156  
(800) 487-7727  
(504) 338-9580

queries are little more than advanced Find dialogs and can't be saved.

A handy little mail merge that you can use with Windows Write allows you to include text formatting in the form letters that you create. This is certainly a novel and very appropriate use of existing tools.

If you need to print bar codes, PrimaBase is well worth its \$349.95 price. If not, you should probably look elsewhere.

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## LESS FILLING, FEWER FEATURES

### FormWorx 2.0 for Windows

It would be wrong to call these products full-featured database managers, but they're handy tools in the fight against data glut.

FormWorx 2.0 for Windows (there's a nearly identical, compatible DOS version) is an intriguing package designed specifically for the creation of printed forms such as purchase orders, past-due notices, credit card applications, fax cover sheets, sales reports, and so forth. It also comes with a companion product named Fill & File, which effectively turns FormWorx into an indexed database manager, complete with table lookups, default data entry values, calculated fields, search and replace, and customized prompts.

As you might imagine, FormWorx is heavy on border patterns, variable units of measurement, alignment tools, and so on. You can create libraries of form objects or use the supplied ones. Hidden in the back of the book is an invaluable discussion of how to use LaserJet output and manipulate the files from other languages (you can send the form out as an HP macro, a customized set of commands processed directly by the laser printer).

To ease form creation, there's a palette of "data objects," which constrain data entry to the formats for American currency, numbers, dates, times, five- and nine-digit ZIP codes, and seven- and ten-digit phone numbers. You can create custom input masks for those that aren't covered—for example, Social Security numbers, foreign telephone numbers, or European date styles. In all, FormWorx is a bargain and, with a library of 600 forms, may be less expensive than hiring an artist to rustle up even one simple form.

To order FormWorx (\$99.95), call (800) 826-0706 (in London, call 44-81-742-7222) or write Power Up, A Subsidiary of Spinnaker, 201 Broadway, Cambridge, Massachusetts 02021.

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### Instant Database 2.0

Instant Database 2.0 comes from Asymetrix, the company that brought you ToolBook. Written in ToolBook, Instant Database exhibits some of that product's slowness, but not unbearably so. Instant Database has an 80-page manual that manag-

es to cover most issues, but it leaves a few of them, such as the dialer, woefully short of full coverage.

Instant Database is just that; you can create a database structure in a very few minutes just by drawing the fields onto a blank form. You don't bother with giving the fields types, such as number or text, and you don't even type in a maximum length, as is customary with most other database managers. The result is a database that runs plenty fast with up to a few thousand records but



then bogs down quickly. The report mechanism is quite limited, but it has a few useful options such as one to four columns, rudimentary mailing label support, and conditional expressions. This last option appears to be quite powerful.

If you're interested in multimedia computing, take note: With Instant Database, you can add animation, graphics, Asymetrix MediaBlitz scores, Wave audio, MIDI audio, and digital video files to the record fields. The product also supports Microsoft Video for Windows.

If flexibility is less important to you than convenience, Instant Database, with 14 gorgeous but limited sample applications, may be for you.

To order Instant Database (\$95, \$25 upgrade for users of Instant Database 1.0), call (800) 448-6543, or write Asymetrix at 110 110th Ave. NE, Ste. 700, Bellevue, Washington 98004.

Circle Reader Service Number 382

### Timeworks Data Manager 1.0 for Windows

Timeworks Data Manager 1.0 for Windows wins the sweepstakes for best price-to-performance ratio in the non-programmable database category. For \$60, you get a DBMS that competes favorably with AceFile and PrimaBase in most features, at a fraction of the price.

While it's not possible for you to create forms with custom buttons or to replace the standard menus with menus of your own, Data Manager does its job just fine, thank you. It has a toolbar with 12 icons and—miracle of miracles—they're actually labeled! While this may not seem to be a great leap forward in user interface technology, it typifies what Data Manager is so good at: getting the job done.

Timeworks' forms don't support data entry masks such as A\* to force the input to uppercase in a text field. While I'd like that feature because of the flexibility it adds, Data Manager instead lets you bring up a Field Formatting dialog box, and here's where you see some of the program's flexibility. It allows you to force text to uppercase, lowercase, or initial capital (very handy for entering names, unless it's one like deForest); round numbers up or down or truncate them; limit numeric and date values to a certain range; and set the precision for numbers. Sure, it does mean that I can't create a data entry mask for, say, Social Security numbers, but it lets me do the most common tasks easily.

Calculated fields and reports make use of an expression builder that works in an easy, visual Windows fashion. Reports have all the standard features and, while there are no presets for Avery labels, the instructions for creating labels are crystal-clear. Tech support was not hard to reach—amazing for such an inexpensive product.

At \$60, Data Manager is a steal and quite good enough for most applications.

For more information or to order the product, call (708) 559-1300, or write Timeworks at 625 Academy Drive, Northbrook, Illinois 60062.

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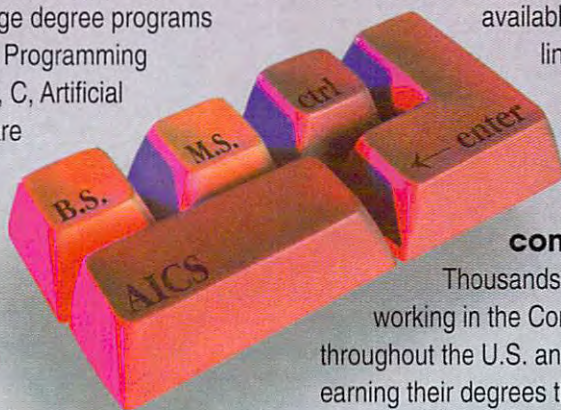
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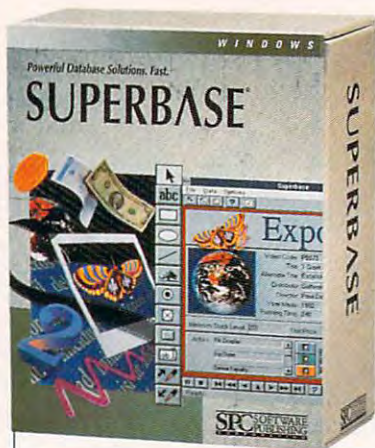
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# TEST LAB



## SUPERBASE 2.0

Let's get one thing clear about Superbase from the start. You must know BASIC to use it properly. If you know BASIC, good, because the Superbase dialect is a good one. Superbase is a mature product that's gotten rave reviews, and it deserves them. It's fast, easy to program, and wonderfully documented, and it comes with some bonus development tools that will make you even more productive.

Superbase has all the bells and whistles you expect from a high-end Windows database manager: easy forms design, a complete and well-integrated query-by-examples mechanism, default creation of several different kinds of reports, a dialog editor, and a macro recorder. The macro recorder is ingenious in that it generates code in SBL, Superbase's version of BASIC.

Creating applications with Superbase is even easier than with Access. For example, you can attach SBL code directly to a button (or list box or whatever), whereas in Access you must attach the code to a macro and then run the macro from the button. I also like SBL better than Access Basic because it's far closer to the spirit of BASIC. Software Publishing intimates in its literature that it will begin to

**Superbase 2.0**  
**List price: \$795 (\$199 for competitive upgrade)**

**SOFTWARE PUBLISHING**  
**3165 Kifer Rd.**  
**P.O. Box 54983**  
**Santa Clara, CA 95056-0983**  
**(408) 988-7518**

make SBL more like Access Basic, but I hope the plans don't pan out. While Access is quite powerful, it's harder to learn than Superbase. If you've been developing applications in, say, PowerBASIC or QuickBASIC as opposed to Visual Basic, Superbase will make more sense to you. There's also a big library of canned SBL routines, so you could well put together a complete app with nothing more than those and some glue code.

Superbase is very fast, too—one of the fastest of the DBMSs in this group. You can scroll through complicated forms even faster than with some DOS data managers.

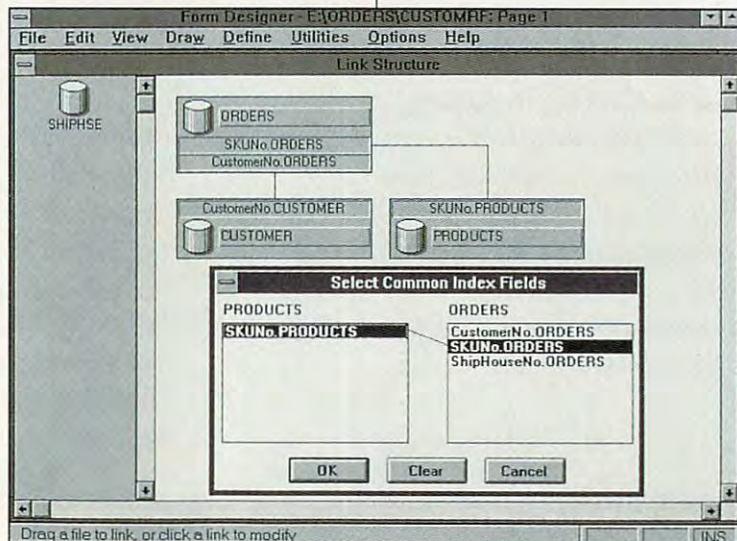
I do have a few complaints, though. I found that dBASE memo fields don't import properly (they become ten-character text fields), and I could find no documentation addressing the

issue. The SBL reference manual, chock-full of useful example code, isn't indexed. And I began to realize that the reason Superbase relies so heavily on what it calls validation formulas (which check to see whether you've entered information into a field properly) is that it doesn't have data entry masks, also known as picture fields.

But you can't go wrong with Superbase, especially if you have experience as a BASIC programmer. Like dBASE in its heyday, Superbase is a full data management system with an easy-to-learn, state-of-the-art script language.

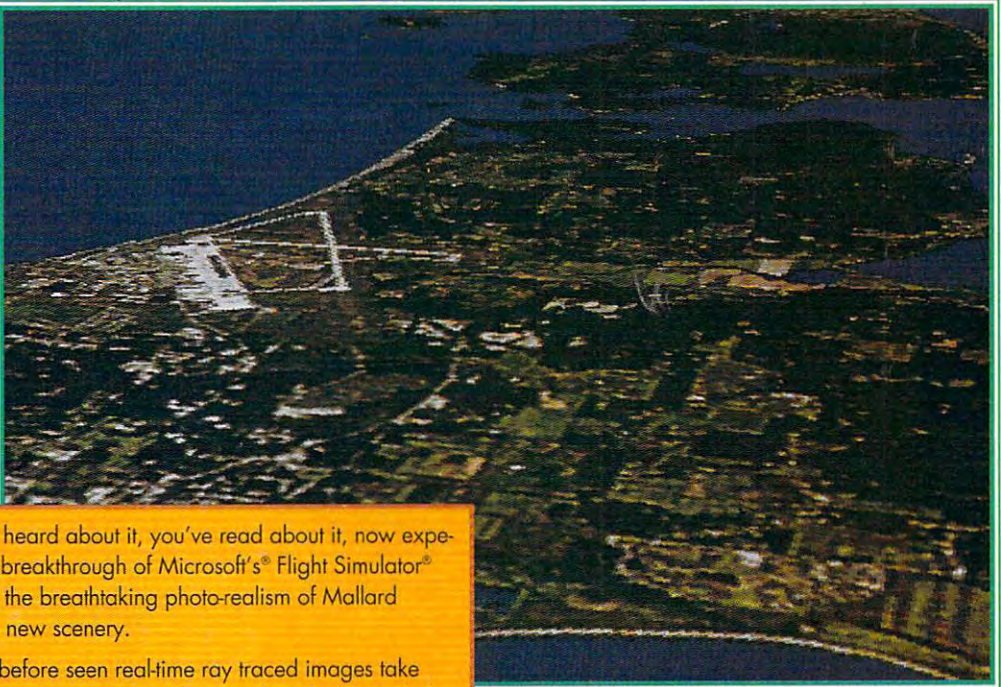
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<b>WINDOWS DATABASE FEATURES</b>	<b>AceFile 2.0</b>	<b>Approach 2.0 for Windows</b>	<b>CA-dBase 2.0</b>	<b>Database Express 1.1 for Windows</b>	<b>FileMaker Pro 2.0 for Windows</b>	<b>Microsoft Access 1.0</b>	<b>Microsoft FoxPro 2.5 for Windows</b>	<b>Paradox 1.0 for Windows</b>	<b>SPCS PrimaBase 3.1</b>	<b>Superbase 2.0</b>
<b>DATA TYPES</b>										
Fixed-length text	■	■	■	■	□	■	■	■	■	■
Memo (variable-length text)	■	■	■	■	■	■	■	■	■	□
OLE objects	□	■	□	■	□	■	■	■	□	■
Floating-point numbers	■	■	■	■	■	■	■	■	■	■
Currency	□	□	□	■	□	■	□	■	□	□
Date	■	■	■	■	■	■	■	■	■	■
Time	□	□	□	■	■	■	□	□	□	■
Images	□	■	■	■	■	□	■	■	□	■
True/false	■	■	■	■	□	■	■	■	□	■
Counter/serial numbers	□	■	□	■	■	■	□	□	□	□
<b>DOCUMENTATION</b>										
Tutorial	■	■	■	■	■	■	■	■	■	■
Quick-start guide	■	■	■	■	■	■	■	■	□	■
Number of example applications on disk	6	18	5	9	7	3	10	6	3	3
Shows how to create an application from scratch	■	□	■	■	□	■	■	■	■	■
Continuous page numbers (for example, 1-300)	□	□	□	□	□	■	□	■	■	□
Sectioned page numbers (for example, A1-A99, B1-B236, and so on)	■	■	■	■	■	□	■	□	□	■
<b>PRINTING</b>										
Templates for Avery labels	■	■	■	□	■	■	□	□	□	□
Postal service bar codes	□	□	□	□	□	□	□	□	■	□
Envelopes	□	■	□	□	■	■	□	□	□	□
Print preview	□	■	■	■	■	■	■	■	■	■
<b>IMPORT</b>										
dBASE III PLUS	■	■	■	■	■	■	■	■	■	■
dBASE IV	□	■	■	■	□	■	■	■	■	■
Lotus 1-2-3 1.0	■	■	■	■	■	■	■	■	□	■
Comma-delimited ASCII	■	■	■	■	■	■	■	■	■	■
<b>EXPORT</b>										
dBASE III PLUS	■	■	■	■	■	■	■	■	■	■
dBASE IV	■	■	■	■	□	■	■	■	■	■
Lotus 1-2-3 1.0	■	■	□	■	■	■	■	■	□	■
Comma-delimited ASCII	■	■	■	■	■	■	■	■	■	■
<b>DATA ENTRY FORMS</b>										
Picture fields	■	■	■	■	□	□	■	■	□	□
Combo boxes	■	■	■	■	■	■	■	■	□	■
List boxes	■	■	■	■	■	■	■	■	□	■
Push buttons	□	■	■	■	■	■	■	■	■	■
Check boxes	■	■	■	■	■	■	■	■	□	■

## TECHNOLOGY UPDATE

# How to get surround sound without buying the theater...

An amazing new surround sound decoder turns your existing stereo into a five channel home theater.

By Chuck Anton

As much as I love renting videos, it's just not the same as seeing a movie in a theater. I remember the first time I saw *Top Gun*. I nearly jumped out of my seat when the planes flew overhead. One of the reasons movies seem so real is because they use surround sound to make it seem like you're actually there. Now, an incredible new device lets you use your stereo receiver to get that same surround sound in your home.

It takes more than just four speakers to get surround sound. You need to have some way of separating the signals. The new QD-1 Series II decoder does just that, and in a revolutionary way that rivals the best Dolby Pro-Logic and THX Systems available.

## Wins over critics.

Noted audio critic, Len Feldman, reviewed the QD-1 for the September issue of *Audio Magazine*. He concluded that "...the QD-1 produced a completely accurate and realistic surround sound experience from a variety of videotapes and laser discs with Dolby surround encoding... the QD-1 delivers home theater sound the way it was meant to be heard."

## Breakthrough 'L minus R.'

Back in the 1960's, Dynaco discovered that in addition to the right and left channels, a "difference" signal existed in a stereo recording, and aptly named it "L minus R." The QD-1 is able to de-

code Dolby Surround signals in a videotape or a laser disc because those spatial and depth cues have been matrixed into the "L minus R" portion of the stereo soundtrack. It does so passively, with no signal processing. What's more amazing, the QD-1 uses your main stereo amp to amplify the rear channels. You do not need any additional amplifiers!

## Concert hall sound.

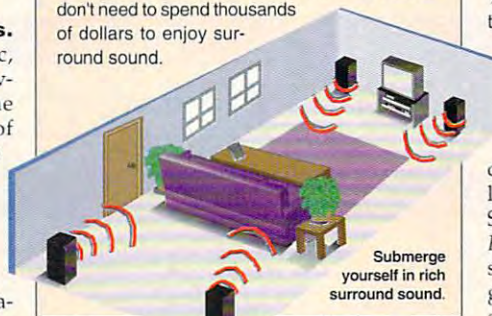
The QD-1 also decodes the ambience found in all musical recordings. This sense of space, or concert hall acoustics is present in all CDs and cassettes, especially live recordings. John Sunier of *Audiophile Edition*, a nationally syndicated radio program, says "If you're a surround sound

## The Secret of Surround Sound

Surround sound has become the rage of the '90's because it adds "depth" to stereo sound, giving you the home theater experience. Simply stated, it makes you feel like you're actually at a concert or a movie theater.

To "fill a room" with sound you need more than the two channels. And that's the beauty of the Dynaco QD-1, it provides five channels from any two channel stereo or TV.

Dynaco offers rear channel speakers specifically designed to integrate with the QD-1 decoder. You may also need our center channel speaker, the A10-V, if your two front speakers are more than eight feet apart. Adding this fifth speaker, or center channel, helps keep dialogue and important localization cues centered. So you don't need to spend thousands of dollars to enjoy surround sound.



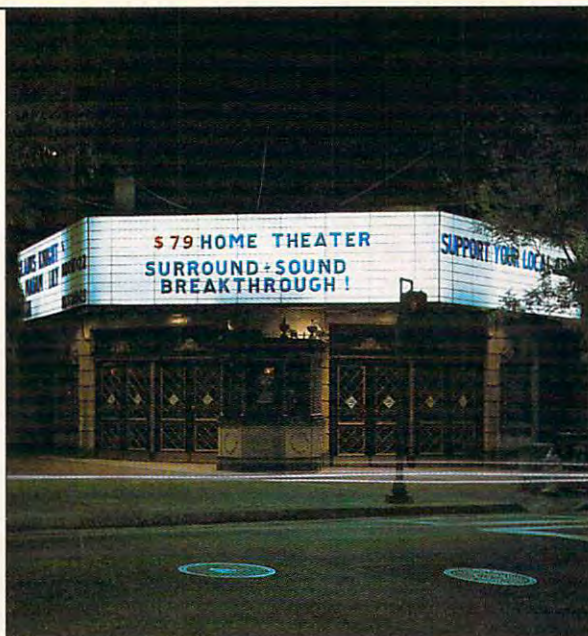
buff who loves to listen to music, you'll find this \$79 passive black box superior to even the \$3000 THX or Dolby Pro-Logic processor."

## THE PASSIVE ADVANTAGE

**Passive.** The QD-1 is *passive*, meaning it requires no AC current. It actually sounds better than active decoders, producing more clarity, more detail, no noise, a greater sense of space, and zero distortion. This superior passive system is a breakthrough unique to Dynaco.

The QD-1 decoder makes your movies come to life. Surround sound brings the theater experience home to you.

**Active.** All Dolby Pro-Logic decoders (stand-alone or built-in units) are active. This means they decode and amplify the signal electronically. The active way induces noise and distortion, hindering the home theater experience. This is an example where "more is less." Spending thousands on an active system will not give you the performance of the QD-1.



**Quick and easy installation.** Hook up is easy. The QD-1 connects to the speaker outputs on your amp. The speaker leads then run to each of your four (or five) speakers. The rear channel speakers may be small; we recommend the AW-1s at \$99 a pair. They come with mounting hardware, a key-hole slot for flush mounting, and have an attractive all-weather gun metal aluminum finish.



The AW-1 rear channel speakers integrate perfectly with the QD-1.

**Factory direct offer.** The QD-1 is so new you won't find it at your local department store. To introduce this product, we are offering it direct to you for a limited time special offer. By ordering now, you can save a substantial amount of money.

**Risk-free home trial.** Let's face it. The best way to evaluate surround sound is in your home, not in a showroom. That's why we're offering this risk-free home trial offer.

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<b>WINDOWS DATABASE FEATURES</b>	<b>AceFile 2.0</b>	<b>Approach 2.0 for Windows</b>	<b>CA-dBFast 2.0</b>	<b>DataEase Express 1.1 for Windows</b>	<b>FileMaker Pro 2.0 for Windows</b>	<b>Microsoft Access 1.0</b>	<b>Microsoft FoxPro 2.5 for Windows</b>	<b>Paradox 1.0 for Windows</b>	<b>SPCS PrimaBase 3.1</b>	<b>Superbase 2.0</b>
Radio buttons	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Multiline edit boxes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
May contain graphics	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Drawing tools (arcs, lines, circles, and so on)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Snap to grid when creating forms	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Default values	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Can change tab order	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Spelling checker	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Functions (simple programming in reports)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>QUERIES</b>										
Automatic creation/assistant	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Query by example	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Expression builder	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Multiple AND/OR expressions	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Wildcard/regular expression searches	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>REPORTS</b>										
Can print date in header and footer	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	NA	<input checked="" type="checkbox"/>
Can print time in header and footer	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Can print page number in header and footer	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Functions (simple programming in forms)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>APPLICATION DEVELOPMENT</b>										
Macros	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Script language	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Can replace main menu	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>HELP</b>										
Search for topics	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Hyperlinked	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Table of contents	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Index	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>MISCELLANEOUS</b>										
Minimum disk space for installation (in MB)	2.5	NA	3	6	2	8	8	12	2	5
Maximum disk space (in MB)	4	4.5	7	12	3	14	16	15	2	7
Recommended RAM (in MB)	2	4	4	4	4	4	4	6	2	4
Spreadsheet-style or "list" view of data	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Dialer	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	*
Network support	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
NA=not applicable or information for this feature not available <input checked="" type="checkbox"/> = yes <input type="checkbox"/> = no *Not automatic, but you can tweak the product to make it happen.										



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# NEWS & NOTES

Jill Champion

## Of Mice and People

Both Microsoft and Logitech have chosen this summer to introduce new ergonomically designed mice. Logitech, maker of the Kidz Mouse and millions of OEM mice, made headlines two years ago with its new line of built-for-comfort mice. Its new three-button cordless mouse fits the palm pleasantly while substituting low-energy radio waves for the usual desk-encompassing tangle of mouse cable. The mouse can be sensed by its receiver over a range of six feet. Users can program the driver to interpret the middle button as a double click and the third button as a keypress (the default is the Esc key). The mouse is scheduled for release in August. Its suggested retail price is \$149.

Microsoft, also vying for the

**Ergonomics helps  
Microsoft's  
mouse ease wrist  
strain.**



“Order of the Palm”, introduced its latest version of one of the most successful rodents since Disney’s. Its first redesign in six years boasts a more comfortable angle (while retaining ambidextrous operation), a thumb grip, and a weight over the ball for enhanced traction. The new mouse driver (version 9) provides many improvements to ease working in Windows, including an automatic snap to the default button in a dialog box, a magnifier for the two square inches of screen nearest the mouse pointer, and a wrap feature that moves the mouse pointer to the opposite side of the screen when you

move past the edge. The serial version lists for \$109.00 and the bus version for \$125.00. The software’s suggested retail price is \$19.95.

## New Deal

Compaq Computer and Microsoft have formed the Frontline Partnership, in which both companies will work together to develop products “that are the easiest to use and the simplest to install, with the best performance and value in the industry”—including desktop PCs, portable PCs, docking stations, and hand-held computers, according to a press release issued by Compaq.

One area that the two companies plan to promote heavily to PC hardware, software, and peripherals industries is the new Plug and Play ISA specification codeveloped by Compaq, Microsoft, Intel, and several other companies. The goal of Plug and Play is to create automatically self-configuring hardware and software.

## Easy Labels

Whether you want one label or a hundred, forget your printer. The LabelWriter II is a hardware/software combo that plugs into your computer’s serial port, ready to produce labels in any quantity instantaneously. Running as a TSR program (DOS version) or a full-featured Windows application (Windows version), the LabelWriter II software gives you a number of options for creative label making, including scalable fonts and the ability to mix font sizes and styles on a line-by-line basis. Other features let you create time-saving label templates, print POSTNET postal bar codes, and view WYSIWYG displays of each label before printing.

LabelWriter II uses a 1-inch printhead and retails for \$249.95. The LabelWriter II Plus uses a 2¼-inch print-

head and retails for \$299.95. For more information, contact CoStar, 100 Field Point Road, Greenwich, Connecticut 06830-6406; (203) 661-9700, (203) 661-1540 (fax).

## Sounds like a Bargain

If your budget can’t handle a Roland MT-32, you might want to consider Modular Circuit Technology’s \$49.95 AdLib-compatible sound card. Called MCT-SOUND, the low-cost card is equipped with a stereo connector that allows external speakers, headphones, or an amplifier to be connected. MCT-SOUND is available through JDR Microdevices. JDR says that the card “makes the most of applications by producing the high-quality sounds they’re designed to create.”

For more information, contact JDR Microdevices, 2233 Samaritan Drive, San Jose, California 95124; (408) 559-1200, (408) 559-0250 (fax).

## Photo CD Catalog

Searching through tiny photographs in a big stock-photo book is the *old* way of doing things, now that Kodak’s new Photo CD technology allows high-resolution 35-mm film images to be stored on a CD for review on a computer or TV screen. And Kodak has formed a joint relationship with L.A.-based Westlight, one of the largest stock-photo agencies in the world, to market its new Kodak Photo CD Catalog, which allows Westlight’s photos to be viewed and manipulated on a Mac or PC.

Ad agencies, publishers, or anyone else who uses stock photos in creative work “can review and discuss each photo in a conference room instead of crowding around a light table,” says Westlight’s founder, Craig Aurness. And once a photo’s se-



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## PORT-ABLE *Sound* PLUS™



Perk up your presentations. Make training more effective. And, put some guts into your gaming pastimes. Anytime. Anywhere. In fact, if you are not a card carrying

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PORT-ABLE Sound Plus is the first portable external sound peripheral to deliver 16 Bit CD quality music with stereo audio capabilities. And, since you just plug into your IBM PC or compatible, desktop or laptop parallel port, you do not need an engineering degree or even a screwdriver.

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compression capability with the highest quality sounds. Here is something else that will be music to your ears. PORT-ABLE Sound Plus comes complete with everything you need including a high fidelity speaker and built-in microphone. There is an "Audio-in" for a CD or tape player and a "Line-out" for external powered stereo speakers. Even a built-in smart parallel port pass through so you can keep printing.

Whether you take your work across the hall or across the country, with PORT-ABLE Sound Plus, you have all the cards you need to play right in your hip pocket. The hinged design lets you flip up the unit if you are short on desk space or lap space. And, the power will always be with you whether you use rechargeable or non-rechargeable AA batteries. PORT-ABLE Sound Plus also comes equipped with an AC/DC power converter.

As a bonus, you will get all the software you need to communicate. Like Lotus Sound™ an OLE server for Windows 3.1. WinReader for Windows 3.1, a handy text-to-speech utility. Digispeech's DOSTalk and DOSReader text-to-speech applications. Show & Tell For Kids™ for

Windows – an easy to use MultiMedia Authoring program. It is also Sound Blaster and AdLib compatible.

Why compromise on quality, portability, compatibility or affordability? When all the cards are on the table, PORT-ABLE Sound Plus from Digispeech, Inc. is your ace in the hole. Suggested retail is only \$198.95.



To order or obtain more information about PORT-ABLE Sound Plus, write or call Digispeech, or, contact your local dealer.

Sales Office: 550 Main Street, Suite J, Placerville, California 95667. Telephone: (916) 621-1787. Fax (916) 621-2093.



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THE SOUND SOLUTION inc.



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lected, it can be quickly imported into a program like PhotoShop to create a comp for the client.

For Kodak, the move is a major rollout of its Photo CD technology into the professional and commercial graphics markets, not to mention bringing ever closer the day when visual information available in a standardized, multiplatform digital format will be business as usual.

For more information about the CD catalog, contact Westlight, 2223 South Carmelina Avenue, Los Angeles, California 90064; (800) 872-7872.

**Logitech continues its design excursion into hand-friendliness with a new cordless mouse.**



## Videogames on TV

Don't look up if you hear a sonic boom this fall. It's probably just Sonic the Hedgehog spinning faster than sound across your TV screen—on the new Sega Channel.

The Sega Channel is a sign of these electronic times—the first TV channel devoted to videogame playing and specifically to owners of Sega Genesis game machines. Subscribers will choose from a wide selection of popular games, previews, and upcoming releases. News, playing tips, contests, and promotions will be featured regularly.

Set for test marketing this fall, the Sega Channel will be priced in the range of most

pay-cable subscription services and, if all goes well, could be available to all U.S. cable operators by early 1994.

## Digitize It

A new service from Orbit Enterprises allows you to "sign" a digitized version of your signature to letters, reports, financial statements, or anything else you regularly print out that requires your John Hancock. Orbit says the result looks hand-signed.

To use the service, you send your signature to Orbit for digitizing. The company returns your digitized LaserJet Signature Macro as either an easily installed DOS application (\$75) or a TrueType font for Windows applications (\$95). To use the signature, Windows users simply select a signature font, type a character, and choose a point size. DOS users enter a short printer command at the place in the document where the signature will appear.

The Signature Macro works with most word processors, including WordPerfect and Word, and it doesn't slow down printing time.

For more information, contact Orbit Enterprises, P.O. Box 2875, Glen Ellyn, Illinois 60138; (800) 767-6724.

## Your Health on a Data Card

The newest thing to hit the healthcare industry is the Optical Card System, developed by Canon, that serves as a portable patient record. The credit card-sized OC20 optical card can store the equivalent of 1600 pages of text. Information is written to the card and read by a read/write drive unit, the RW20, that connects to standard IBM PC/AT and compatible computers.

Healthcare-system administrators, insurers, and providers currently conducting pilot

projects with the card say it should help head off healthcare fraud and eliminate redundant medical procedures—and therefore help contain costs. Also, you can expect improvements in the quality of your care "when a comprehensive, accurate, up-to-date medical summary—including full medical history and drug therapy—is immediately available to a doctor during consultation," according to a press release issued by Canon. But healthcare is only the first application for the card.

Possible uses for optical data cards as storage media are almost unlimited.

## It's Virtually Golf

The plaid high-waters are for real, but you'll only *think* you're playing 18 holes in Hawaii when you swing a club on this virtual-reality golf course, where you'll see exactly where your ball would land—fairway, green, hazard, rough, trees—if you were playing on an actual course. Technigen's Joytec Indoor Golf Center, located in Merv Griffin's Resort Casino and Hotel in Atlantic City, New Jersey, is where you'll find the thrills.

Besides having fun, you might learn something, too, because the computerized "green" you stand on analyzes your stroke, weight distribution, and other factors after every swing—it's sort of like having a built-in personal golf instructor.

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

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### Microsoft Software

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### Dot Matrix Printer

24-pin printer with high graphics resolution.

### DTP Career Opportunities Manual

Gives valuable advice on how to create a winning resume, and lists the many places where you can pursue a career in desktop publishing and design.

**COURSE INCLUDES ALL THIS & MORE!**

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## Music Man

Years ago I ran across a BASIC program that would turn a PC keyboard into a simple organ keyboard. Can you show me how that's done?

WILLIAM TAYLOR  
LOS ANGELES, CA

*Here's a very simple record-and-play-back program that turns your keys A- (the second tier of keys on a standard keyboard) into the white keys on a piano. It keeps track of the notes you play and allows you to play them back at will.*

*You might want to alter the program to request a filename for your recording, because the way the program is written, you'll overwrite your recording each time you play.*

*It works better if you play staccato, because the operating system's debounce routine causes the note to be turned off and then back on as you hold the key down.*

*We attempted an alternative version using the ON KEY command, which worked very well but limited the keyboard to 11 keys. With this version of the program, you can add to your keyboard whenever you like.*

```
INPUT "(P)layback or  
(R)ecord"; a$  
IF a$ = "r" OR a$ = "R" THEN  
  GOTO record  
playback:  
OPEN "notefile.dat" FOR INPUT  
  AS #1  
WHILE NOT EOF(1)  
  LINE INPUT #1, a$: a = VAL(a$)  
  LINE INPUT #1, a$: b = VAL(a$)  
  SOUND a, b  
WEND  
GOTO ender
```

```
record:  
SHELL "mode con rate = 32 delay  
= 1"  
OPEN "notefile.dat" FOR OUTPUT  
  AS #1  
top:  
a$ = INKEY$  
SELECT CASE a$
```

```
CASE "a": a = 451  
CASE "s": a = 506  
CASE "d": a = 536  
CASE "f": a = 602  
CASE "g": a = 675  
CASE "h": a = 716  
CASE "j": a = 803  
CASE "k": a = 902  
CASE "l": a = 1012  
CASE ";": a = 1072  
CASE "'": a = 1204  
CASE " ": a = 0  
CASE "q": GOTO ender  
END SELECT  
SOUND a, 1  
IF a = b THEN  
  counter = counter + 1  
ELSE  
  PRINT #1, STR$(b); PRINT #1,  
  STR$(counter + 1); counter = 0  
END IF  
b = a  
GOTO top  
ender:  
CLOSE
```

## Old Times

I read somewhere that you can change the time and date of a file with some parameter of the Copy command. I can't remember where I read it. Do you know the command syntax?

WALTER GREENWOOD  
SANTA ROSA, CA

*This technique was covered in the March 1993 "Tips & Tools" column. Use the Copy command with concatenation. If you want to change the time and date to something other than the current time and date, use the Time and Date commands first to change these settings in DOS. Then, use this command.*

```
COPY FILENAME + ,,
```

*This will change the file's time and date stamp to whatever the computer's current time and date is.*

*Norton Utilities has the command FD that will allow you to set any date you wish for a file.*

*There are ways to access the directory listing directly with Debug. Each directory listing is exactly 32 bytes long. Bytes 22-23 are the time and 24-25 are the date. It's a little difficult to figure out the coding of these bytes, but if you're adventurous, you can alter them to reflect times and dates that can't exist, such as the time 25:63:62 on the 31st day of the 13th month.*

*We only mention Debug as an option because DOS's command interpreter (the spoiler) prevents you from entering impossible times and dates from the command line.*

## Is There a DR in the DOS?

You see the statement "Must have DOS 3.0 or higher" everywhere. I have DR DOS 6.0. Does that fulfill the requirement? What's the difference between MS-DOS 5.0 and DR DOS 6.0? Also, where can I get a BASIC language (GW-BASIC or QBASIC)?

R. G. DINGWALL  
MEADVIEW, AZ

*DR DOS 6.0 should perform properly with any program that requires MS-DOS 3.0 or higher. The main difference between DR DOS and MS-DOS is the collection of utilities you receive with each one. One of the advantages of MS-DOS is that you get a free BASIC programming language with it. Bill Gates, the cofounder of Microsoft, got his start writing BASICs for microcomputers, and he's never forgotten his roots. Gary Kildall, the founder of Digital Research, got his start creating microcomputer operating systems.*

*The only way you could get GW-BASIC or QBASIC without purchasing a Microsoft version of DOS would be by committing a federal crime—copying one of them from someone else's DOS. We don't advise that you do that. If you*

**Music by the numbers, time bending, back to BASICS, density readings, and more**

*Ever Think You Were*



S O M E T H I N G   E L S E ?



S O M E O N E   E L S E ?



S O M E W H E R E   E L S E ?

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► To confiscate a copy of Syndicate, visit your local software retailer, or call toll free

1-800-245-4525.

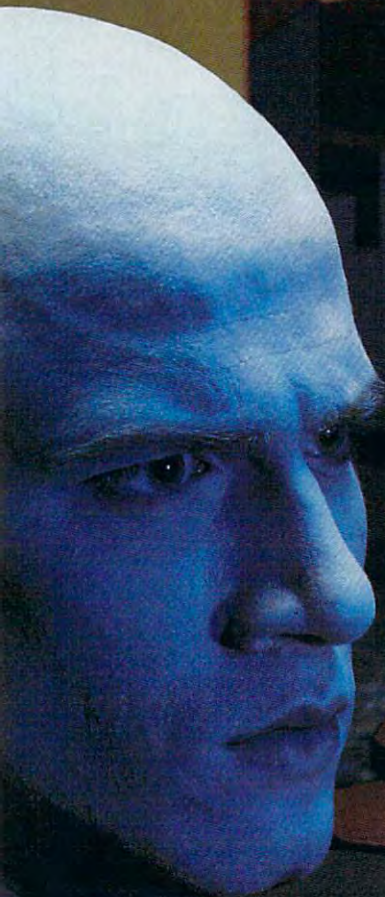
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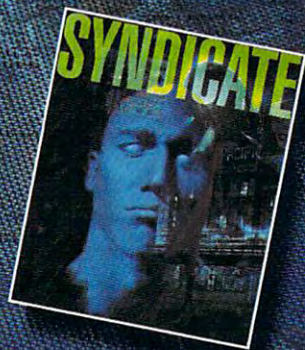
# YOUR HEAD.



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## FEEDBACK

need a BASIC, "Feedback"'s recommendation would be to purchase Quick-BASIC 4.5. PowerBasic is supposed to have a new version out, but as of this writing, we haven't seen it. True BASIC is another contender. The cheapest way to get a BASIC would be to purchase and install Microsoft DOS 6.0.

### More Density Problems

My home computer has a double-density disk drive. When I purchased some programs on high-density disks, I was told that I could install them on a computer with a high-density drive and then recopy them to double-density disks so my computer could read them. I have tried this with several programs, but it doesn't seem to work. I get an error message from DOS, such as *Data error reading drive A: or Sector not found: error reading drive A:* Is there a way to run high-density disks on my double-density drive? Is there something wrong with my drive?

MICHAEL STAUFFER  
ALLEN, WY

*The answer to your last question is that there's probably nothing wrong with your disk drive. We suspect that you're using disks formatted as double-density in high-density disk drives. These drives leave narrow tracks that the relatively coarser heads in double-density drives have trouble locating and reading. Format some double-density floppies in your computer, and then copy the files to them on a computer with a high-density drive. If this doesn't work, there's a possibility that your drive is out of alignment and will require the attention of a trained technician.*

*In answer to your penultimate question, you can't read high-density disks with your double-density drive.*

*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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# WINDOWS WORKSHOP

Clifton Karnes

## DO WINDOWS USERS NEED DOS 6?

If you live on a desert island, you may not have heard about DOS 6. The rest of us, though, have been hearing about it a lot. And everyone's trying to figure out the same thing: Is it worth the \$50 upgrade? The ones wondering the loudest are probably Windows users. Many of us, after all, don't have all that much to do with DOS. So is DOS 6 worth the upgrade if you run Windows? In a word, yes, and in this column, I'll tell you why.

First, there are several Windows programs included with DOS 6: Microsoft Undelete, Microsoft Backup, Microsoft Antivirus, and a Windows-hosted compression information program that works with DoubleSpace.

The Undelete and Antivirus programs are from Central Point Software, and they strongly resemble the programs of the same name in PC Tools Deluxe. The Backup program is a special version of Symantec's Norton Backup. These are all first-class tools that any Windows owner will be happy with. And to its credit, the DOS 6 installation program automatically installs a Microsoft Tools group in Program Manager, a Tools menu on File Manager, and, if you're using Windows for Workgroups, four new buttons on the File Manager's toolbar.

Of these utilities, the Undelete program is especially useful. It offers an easy way to recover deleted files, and it can be configured for three levels of delete protection. With Standard, a file can be recovered if it hasn't been overwritten. With Delete Tracker, Undelete stores some information about the state of each file

to make successful undeleting more likely. And with Delete Sentry, deleted files are actually spirited to a hidden subdirectory and held there as long as disk space permits. With Delete Sentry, files can always be undeleted in perfect condition as long as you don't wait too awfully long.

The Undelete command installed in File Manager is very helpful, too. The installation program puts this command on the File menu, and, if you're using the Windows for Workgroups File Manager, it installs an Undelete button on the toolbar. When you access Undelete from File Manager, Undelete opens in the directory selected in File Manager. It's much faster and easier to select a directory in File Manager than to use Undelete's Change Drive and Directory dialog box.

These Windows programs are obviously useful to a Windows user, but beyond them there are several other significant enhancements in this DOS.

First, there's MemMaker. If you run DOS programs from Windows, this can be a godsend. MemMaker optimizes the way your computer uses UMBs (Upper Memory Blocks). On my PC, I'm running Stacker, DOS network drivers, multimedia drivers, plus the usual stuff like SMARTDrive, Share, Mouse, and Doskey. Before running MemMaker, I had less than 500K of conventional memory free in a DOS session, and some DOS programs just wouldn't run. After running MemMaker, I have about 570K of memory for DOS programs, and everything runs fine. If you need more DOS memory, MemMaker alone may be worth the upgrade.

The next DOS 6 enhancement that may be useful to Windows users is Interlnk. If you

share information between computers, Interlnk is an easy way to move files. With Interlnk, you have a client machine and a server machine. On the client, you run an Interlnk device driver. On the server, you run an Interlnk executable. When both programs have been run and your computers are connected with either a serial or parallel cable, the server's drives appear as virtual drives in both DOS and Windows.

If you run Windows File Manager on the client, you'll see the server's drive icons on File Manager's drive bar. You can treat these drives just like your machine's native drives. You can display a directory tree and file window for them, you can copy files to and from these drives, you can tile and arrange the drive windows mixed and matched with your native drive's windows, and you can run programs from them.

The first time I ran Interlnk between my desktop and laptop, I copied a directory and all its subdirectories from the client to the server by dragging and dropping. This is the easiest way I've seen to transfer files between machines.

The last reason for Windows users to upgrade to DOS 6 is DoubleSpace, which can nearly double the size of your hard disk. We all know how Windows programs gobble up disk real estate, and we can all use the extra space. DoubleSpace seems like a blessing for Windows users, but no other part of DOS 6 has caused as much controversy. Next issue, I'll talk about how to install DoubleSpace, how to use it, how it fares against Stacker, and some DoubleSpace add-ons. If you want to go ahead and try DoubleSpace, please see my "DOS 6 First-Aid Kit" in this issue for some safety tips. □

**For Windows users, DOS 6 is an upgrade that's definitely worth considering.**

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# TIPS & TOOLS

Edited by Richard C. Leinecker

## Screen Saver Heaven

Two readers sent in graphical screen savers that were written in QBASIC. Although monitor manufacturers insist that their monitors won't be damaged if left on for extended periods of time, most people don't like to take chances. Besides, screen savers add an appealing, interesting look to what might be a boring screen with a command line prompt. If you have DOS 5.0 or higher, you should have QBASIC in your DOS directory. If it's missing, try reinstalling DOS 5.0.

You can run any one of these as an independent program. I'd suggest putting them all in a subdirectory where you can keep track of them. I put mine in a directory within my DOS directory called SAVERS. All of my references will assume a path to the BASIC source code of \DOS\SAVERS.

With QBASIC in your path and the code in a central location, you can type *qbasic /run \dos\savers\saver1.bas* from anywhere on your drive, and the first screen saver will run. You could also put this command in a batch file to save typing.

```
REM BASIC Source Code for
REM Screen Saver 1 Display
REM by Zach Dinkmeyer
REM of Huntington Beach,
REM California
CLS: SCREEN 9
RANDOMIZE TIMER
DrawLoop1:
x1% = RND * 639
y1% = RND * 349
x2% = RND * 639
y2% = RND * 349
c% = RND * 15
LINE (x1%, y1%)-(x2%, y2%), c%
Counter = Counter + 1
IF Counter = 1000 THEN CLS (0):
Counter = 0
a$ = INKEY$
IF a$ = "" GOTO DrawLoop1
SYSTEM
```

```
REM BASIC Source Code for
REM Screen Saver 2 Display
REM by Jason Haimerl
REM of Oconomowoc, Wisconsin
CLS: SCREEN 1
RANDOMIZE TIMER
DrawLoop2:
x% = (RND * 300) + 1
y% = (RND * 260) + 1
RESTORE
FOR j% = 1 TO 13
READ k%
CIRCLE (x%, y%), k%
FOR i% = 1 TO 5000: NEXT: CLS
NEXT
a$ = INKEY$
IF a$ = "" GOTO DrawLoop2
SYSTEM
DATA 1, 25, 50, 75, 100, 125
DATA 150, 175, 200, 225, 250
DATA 275, 300
```

```
REM BASIC Source Code for
REM Screen Saver 3 Display
REM by Jason Haimerl
CLS: SCREEN 2:
RANDOMIZE TIMER
DrawLoop3:
x% = (RND * 155) + 1
y% = (RND * 1000) + 1
LINE (y%, x%)-(y%, x%)
x% = (RND * 2000) + 1
y% = (RND * 155) + 1
LINE (x%, y%)-(x%, y%), 300
CIRCLE (x%, y%), 1
PRINT
FOR i% = 1 TO 1000: NEXT
a$ = INKEY$
IF a$ = "" GOTO DrawLoop3
SYSTEM
```

```
REM BASIC Source Code for
REM Screen Saver 4 Display
REM by Jason Haimerl
CLS: SCREEN 1
RANDOMIZE TIMER
DrawLoop4:
x% = (RND * 800) + 1
y% = (RND * 145) + 1
j% = (RND * 50) + 1
CIRCLE (x%, y%), j%
PRINT
FOR i% = 1 TO 1000: NEXT
a$ = INKEY$
IF a$ = "" GOTO DrawLoop4
SYSTEM
```

```
REM BASIC Source Code for
REM Screen Saver 5 Display
```

```
REM by Jason Haimerl
CLS: SCREEN 1
RANDOMIZE TIMER
DrawLoop5:
x% = (RND * 800) + 1
y% = (RND * 100) + 1
LINE (x%, y%)-(x%, 191)
PRINT
FOR i% = 1 TO 1000: NEXT
a$ = INKEY$
IF a$ = "" GOTO DrawLoop5
SYSTEM
```

With a little bit of effort and some programming savvy, you could turn these stand-alone programs into something more. I wrote two small utilities and a batch file that use these screen savers.

The first utility waits a specified number of minutes. If there's a keypress, it returns with an errorlevel of 1. If the time has elapsed, it returns an errorlevel of 0, and you can execute one of the screen savers. It's called Waittime, and to use it, you just type *waittime* followed by the number of minutes you want to wait.

The second utility returns a random number as an error code. You must specify a maximum value. If you want it to return values from 0-14, you'd type *getrand 14*.

debug waittime.com  
File not found

```
-e 100 be 81 00 ac 3c 0d 74 20
-e 108 3c 20 74 f7 4e ac 3c 30
-e 110 7c 16 3c 39 7f 12 8a c8
-e 118 b8 0a 00 f7 e3 8b d8 80
-e 120 e9 30 2a ed 03 d9 eb e5
-e 128 0b db 75 03 bb 05 00 b8
-e 130 47 04 f7 e3 8b d8 2b c0
-e 138 8e d8 be 6c 04 8b 0c b4
-e 140 01 cd 16 75 10 3b 0c 74
-e 148 f6 8b 0c 4b 0b db 75 ef
-e 150 b8 00 4c cd 21 b8 01 4c
-e 158 cd 21
-RXC
CX 0000
:5a
-W
Writing 005a bytes
-Q
```

Dazzle yourself with screen savers and get random numbers for your batch file.

If you run Checksum (July 1993 "Tips & Tools") on Waittime, you should see the number 10125 on your screen.

Bradley M. Small (of Greensboro, North Carolina) points out that if you change the last two lines of Waittime, the program will return the ASCII value of the key pressed as an errorlevel.

If you are interested in creating this utility, give it another name because it isn't intended to work with this series of programs. The following lines are the ones you should modify in Waittime.

```
-e 150 b8 00 4c cd 21 90 b4 4c
-e 158 cd 21
```

If you make this modification and run Checksum, the number 10264 should appear on your screen.

```
debug getrand.com
```

```
File not found
```

```
-e 100 be 81 00 ac 3c 0d 74 20
-e 108 3c 20 74 f7 4e ac 3c 30
-e 110 7c 16 3c 39 7f 12 8a c8
-e 118 b8 0a 00 f7 e3 8b d8 80
-e 120 e9 30 2a ed 03 d9 eb e5
-e 128 2b c0 8e d8 be f0 04 8a
-e 130 0c 80 e1 0f 8a e9 fe c5
-e 138 88 2c be 6c 04 2b d2 3b
-e 140 d3 73 07 d1 e2 80 ca 01
-e 148 eb f5 8b 04 d3 c8 23 c2
-e 150 3b c3 77 d4 b4 4c cd 21
-RCX
CX 0000
:58
-W
Writing 0058 bytes
-Q
```

If you run Checksum on Getrand, the number 11268 should appear.

Here's my batch file. If a key is pressed, the keypress is sensed, and the batch file simply quits. Otherwise, the batch file executes one of the screen savers at random after five minutes.

Make sure that the batch file, QBASIC, and the two util-

ities are in your path.

```
ECHO OFF
CLS
REM First, we'll wait for a five-
REM minute period or a
REM keypress.
WAITTIME 5
IF ERRORLEVEL 1 GOTO END
IF ERRORLEVEL 0 GOTO DOSAVER
GOTO END
```

```
:DOSAVER
REM Next, we'll call the program
REM that gives us a random
REM number. The maximum value
REM is 4 because we have five
REM screen savers and our
REM numbering starts at 0.
GETRAND 4
IF ERRORLEVEL 4 GOTO SAVER5
IF ERRORLEVEL 3 GOTO SAVER4
IF ERRORLEVEL 2 GOTO SAVER3
IF ERRORLEVEL 1 GOTO SAVER2
IF ERRORLEVEL 0 GOTO SAVER1
```

```
:SAVER5
QBASIC /RUN
\DOS\SAVERS\SAVER5.BAS
GOTO END
```

```
:SAVER4
QBASIC /RUN
\DOS\SAVERS\SAVER4.BAS
GOTO END
```

```
:SAVER3
QBASIC /RUN
\DOS\SAVERS\SAVER3.BAS
GOTO END
```

```
:SAVER2
QBASIC /RUN
\DOS\SAVERS\SAVER2.BAS
GOTO END
```

```
:SAVER1
QBASIC /RUN
\DOS\SAVERS\SAVER1.BAS
GOTO END
```

```
:END
```

```
RICHARD C. LEINECKER
REIDSVILLE, NC
```

## Deep Directories

I often need to make directories that have more than one

new subdirectory when I'm organizing my hard drive. For instance, I might need to store THIS.TXT in the C:\EDIT\FILES\TXT subdirectory. Normally, if all three of these don't exist, you have to make each one. I have a batch file, called MMD.BAT, which creates them in one step and removes one more headache from the DOS prompt.

```
@ECHO OFF
IF "%1"==" " GOTO USAGE
CTTY NUL
ECHO D |XCOPY %COMSPEC%
%1\NUL
CTTY CON
GOTO END
```

```
:USAGE
ECHO Usage: MMD
PATH_TO_CREATE
:END
```

```
THOMAS E. HINES III
KANSAS CITY, MO
```

## Maintain Your Cover

If you're constantly putting new cards in your computer, you might be tempted to leave the cover off. Don't do it. The cover is important. It guards your safety, it channels cooling air through the machine, and it protects the boards inside (one dropped paper clip or screw could wreak havoc on an open, running machine).

```
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.* □

**Make batch files pause for a specified time and create whole directory trees with a single command.**

# INTRODOS

Tony Roberts

## UPGRADE UPDATE

Have you upgraded to DOS 6 yet? Do you have the latest and greatest version of your word-processing program? How about the newest installment of your checkbook manager, the one with charts and graphs?

My mailbox—and I'll bet yours, too—is often chock-full of upgrade notices for the software I own, and for some programs I don't own. All this mail has me wondering how important it is to keep up with the versions, software's version of suburbia's keeping up with the Joneses.

The answer is not a simple one: It depends on how you use your computer and how you work.

For starters, let's take a look at DOS 6. This is an interesting, but not a revolutionary, upgrade. In my case, it adds nothing to my system that is not being accomplished by some other commercial or shareware program.

Do I need DOS 6? No.

Do I have DOS 6? You bet. After all, this is a DOS column. Its author ought to be in touch with the latest DOS product whether he needs it or not.

**Upgrade Rule #1: If your livelihood depends on the software, upgrade.**

Another issue to consider is support. Do you, or those who work for you, need help using your software? Do you rely on the software manufacturer's support staff to help solve technical problems as well as to give you guidance when you don't feel like reading the manual? If so, it's probably a good idea to stay current for that product; as each day passes, the support staff will become less and less familiar with the foibles of past versions.

**Upgrade Rule #2: Stay current if you want handholding.**

When deciding whether to

upgrade, you also must consider whether you're a loner or you share your work with others. In the desktop publishing business, for example, publication files often are worked on by two or three people. Then the files are handed over to a service bureau for output. In a case like this, it makes sense to make sure everyone is upgraded to the same software level.

**Upgrade Rule #3: Stay compatible with associates, vendors, and suppliers.**

Many software companies seem to have embraced the idea of annual upgrades. I'm willing to bet that I'll see an upgrade notice for my checkbook/financial manager software this October. The program's been upgraded each of the last three autumns; why should 1993 be any different?

Looking back at my records, I see I've paid more for upgrades than for the original version of that program. But that's OK; the upgrades I've purchased have added important functions, made the program easier to use, and saved me time. I'm happy with what I've paid for.

I did bypass last year's invitation to upgrade, however. The improvements in that upgrade centered on the program's new abilities to create charts and graphs pertaining to my financial situation. I didn't see how those multicolor graphics would make me richer or better organized financially, so I skipped the upgrade and saved a few bucks—a clear plus for my financial status.

**Upgrade Rule #4: Don't be swayed by the fancy brochures; it's up to you to decide whether new features are valuable to you.**

Finally, be aware that computer and software technology is a rapidly advancing field. No program invented today

will be worth much in five years. If you're buying software that's central to your business, plan to make regular upgrades to stay on the cutting edge. If you're a hobbyist, it probably won't hurt you to be a generation or two behind.

**Upgrade Rule #5: Software upgrades are a cost of doing business—budget for them.**

Now that we've looked at whether to upgrade the software you have, what about upgrading the software you don't have? This phenomenon has become known as the competitive upgrade, and for software addicts, it's one of the best deals around.

Let's say you own Brand X word-processing program, which normally lists for \$495. The maker of Brand Y word processor wants you to convert to his program, so he offers you a competitive upgrade for the price of \$99. What a deal! You get a brand-new \$495 program for \$99!

If you like to acquire new software, keep your eyes open for the competitive upgrade deals, and when the program you're yearning for goes on sale, snap it up.

But competitive upgrades are a little unfair, and that may contribute to their undoing. Let's say you don't own a word-processing program. How does it make you feel to pay full price, when everyone around you buys a copy for 80 percent off?

I find it hard to buy under those conditions. I'll stay on the sideline until the price comes down for everybody. Software companies are discovering that lower software prices translate into increased sales. Perhaps before long, the competitive upgrade prices will become the suggested retail prices.

Then the manufacturers will have thousands of new potential upgrade customers. □

**How important is it to keep up with the versions?**

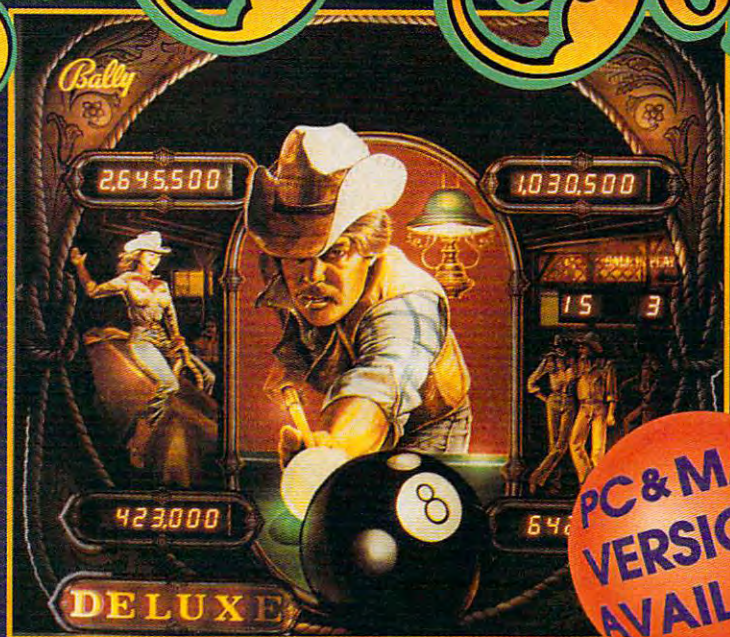


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Circle Reader Service Number 157

# PROGRAMMING POWER

Tom Campbell

## BASICALLY, A TRUE BARGAIN

Continuing a BASIC hot streak (last month, we covered the estimable PowerBASIC), we turn to an amazing bargain: The True BASIC Sampler Edition, a \$15 version of the only ANSI-standard BASIC implementation from the guys who invented BASIC.

John Kemeny and Tom Kurtz, two professors at Dartmouth, literally created BASIC from scratch in 1964. They wanted a friendlier introduction to computers than FORTRAN, then the state of the art. What is not so well known is that they upgraded their BASIC with astonishing speed, creating interactive versions that acted very much like QuickBASIC did 20 years later. They gave the language a host of features yet to be matched in most other BASICs, such as matrix manipulation, advanced graphics, local variables, and required variable declarations. Kemeny and Kurtz were understandably embarrassed when simplified imitations of the very earliest version of their language were cloned on every machine from toy microcomputers to mainframes and their beloved creation was then nearly throttled to death by programming cognoscenti who judged it thirdhand and pronounced the impostor versions dead on arrival.

It is also relatively uncommon knowledge that there is an ANSI standard for BASIC, ratified several years ago, and True BASIC conforms to that standard (QuickBASIC, GW-BASIC, and the like don't even come close). The obvious question is, of course, so what? QuickBASIC and QBASIC are the de facto standards, running on millions of desktops, as opposed to perhaps tens or hundreds of thousands us-

ing True BASIC. It would not be difficult to stop the argument there.

But an ANSI-standard BASIC has the tantalizing potential of allowing, say, PCs, Macintoshes, Amigas, and Sun workstations to run the exact same source code. Kemeny and Kurtz finally wised up and formed their own company, one that now carries—sit down; you'll be shocked when you hear this—versions of True BASIC that run identically on PCs, Macs, Amigas, and Sun workstations. True BASIC (it's the name of the company, too, and it's located at 12 Commerce Avenue, West Lebanon, New Hampshire 03784; 800-872-2742, 603-298-7015 [fax]) also carries a host of True BASIC source libraries for math, scientific, engineering, and some general-purpose use.

What's most exciting to me is that you can experience True BASIC yourself if you own a PC compatible (or if you slipped and accidentally bought a Mac) for only \$14.95. This is easily the best demo package I've ever seen; it gives you a full version of the language, the ability to create files up to 150 lines long, and a 208-page paperback book by the masters themselves showing you BASIC from the ground up. I got both the Mac and the PC versions, and sure enough, the same source runs identically on the two machines.

True BASIC is a very different animal from the other BASICs. Like QuickBASIC and QBASIC, it compiles programs in the background as you type, so you get the speed of a compiler with the convenience of an interpreter. The environment isn't nearly as comfortable as QBASIC, although it's similar in concept: menus, an immediate window, and so forth. The problem is

that it's clunky. You bring up a menu by pressing Alt-1 for the leftmost menu, Alt-2 for the one next to it, and so on. The help system, while user-extensible, is primitive and requires that you press Ctrl-Break to leave a help screen. F1 isn't the help key, F10 isn't the menu key, and it can't find help files when run outside the directory it was installed in.

True BASIC is very strong in the math and string-handling departments. TRUNCATE truncates a number to the specified decimal places; MIN and MAX return the minimum and maximum of two numbers; pi is built in; there's support for natural, common (base 10), and base 2 logarithms; and more. There are whole groups of string functions not found in other BASICs. LTRIM, RTRIM, and TRIM removing leading and trailing blanks; CPOS finds the first occurrence of a character in a string; CPOSR does the same but from the end; NCPOS finds the first occurrence of a character not found in a string; and NCPOSR does the same but from the end. There's a whole array (sorry) of matrix-handling statements and functions, and the graphics subsystem is far better thought out than those built into other BASICs.

The sample edition is a roaring success, and my main criticism is a political one. The manual never mentions the Microsoft BASIC variants, probably on the theory that there's no reason to aid the competition. That doesn't make sense to me. I'd much rather the book contain a 10- or 12-page comparative analysis and conversion guide so that interested parties could convert their Microsoft BASIC code over to True BASIC. This would only increase its market, a move both True BASIC and we users deserve. □

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# HARDWARE CLINIC

Mark Minasi

## DOS 6's MULTI-CONFIG, PART 2

In the June issue, I started looking into MultiConfig, the new DOS 6 feature that allows you to unify your scattered CONFIG.SYS/AUTOEXEC.BAT files. This month, we'll look further into MultiConfig's many capabilities.

If you have a color monitor, you can customize the colors of your MultiConfig menu with the Menucolor command. It looks like this: menucolor foreground,[background].

Foreground and background are numbers representing the colors that the PC text screen can display—there are 16 of them. Foreground is a mandatory value, but background is optional. If you don't specify a number, then you just get the normal black background.

I guess what troubles me about this command is the wasted time it causes. If you remove all the combinations where the foreground equals the background, there are still 240 different foreground/background combinations. Experience has shown me that there are a fair number of people who won't rest until they've seen them all.

So far, we've merged only one of DOS's startup files. Now that you've merged two different CONFIG.SYS files into one using MultiConfig, complete with a startup menu, defaults, timeouts, and even colors, it's time to see what MultiConfig does for your AUTOEXEC.BAT. And the answer is, "not much."

There is, however, enough in the way of tools to allow you to link CONFIG.SYS configurations to AUTOEXEC.BAT configurations. Here's how.

Let's return to the two-configuration approach we established in June. Suppose there

are two AUTOEXEC.BATs, one for the normal configuration and another for the interlink configuration. The normal AUTOEXEC.BAT might look like this.

```
@ECHO OFF
PROMPT $P$G
PATH C:\DOS
DOSKEY
```

The interlink AUTOEXEC.BAT might look like this.

```
@ECHO OFF
PATH C:\DOS
INTERSVR
```

I want to explain this so both batch veterans and beginners can use this information, so let me first show the people who are comfortable with batch language programming how to put these AUTOEXEC.BATs together into one AUTOEXEC.BAT. Then I'll present a step-by-step formula for combining batch files that anyone who can use an editor can follow.

The key to being able to combine two (or more) AUTOEXEC.BATs into a single batch file and then extract them as they were originally is an environment variable called CONFIG. It contains the name of the configuration that you selected—in our example, that means either normal or interlink. You then use "IF . . . ==" commands and GOTOs to control which part of the AUTOEXEC.BAT file is executed. Here's what it would look like for our example AUTOEXEC.BAT situation.

```
@ECHO OFF
IF %config%==normal GOTO
normal
IF %config%==interlink GOTO
interlink
:normal
PROMPT $P$G
PATH C:\DOS
```

```
DOSKEY
GOTO end
:interlink
PATH C:\DOS
INTERSVR
GOTO end
:end
```

Batch experts may look upon my approach in the previous example as being a trifle inefficient, but it follows a nice, simple formula that anyone can use to quickly combine a number of configurations into a single AUTOEXEC.BAT. Let's see how to use that formula to assemble different AUTOEXEC.BATs into a single file. If we have three AUTOEXEC.BAT configurations that are named c1, c2, and c3, we could build our AUTOEXEC.BAT like this.

```
@ECHO OFF
IF %config%==c1 GOTO c1
IF %config%==c2 GOTO c2
IF %config%==c3 GOTO c3
:c1
[put the c1 commands here]
GOTO end
:c2
[put the c2 commands here]
GOTO end
:c3
[put the c3 commands here]
GOTO end
:end
```

This skeleton of a batch file is intended to underscore how to build an AUTOEXEC.BAT that supports three configurations. You can easily see how to extend it to four, five, or any number of configurations.

It may be obvious, but I'll mention anyway that the lines in brackets shouldn't be typed literally; they're intended to be instructions to you, not to be typed to the PC.

Perhaps even more generally, you can assemble a combined AUTOEXEC.BAT using this step-by-step method.

**DOS 6's  
MultiConfig lets you  
combine several  
AUTOEXEC.BAT and  
CONFIG.SYS files.**

**Step 1:** The first line of your combined AUTOEXEC.BAT should be an @ECHO OFF.

**Step 2:** Examine your CONFIG.SYS's [menu] section that you assembled previously and write down the names of all the configurations. Take the name of the first configuration and incorporate it into an if statement that looks like this: IF %config%==[name of configuration] GOTO [name of configuration].

You should replace [name of configuration] with the actual name of the first configuration. Do that for each configuration name. For example, suppose you find that your CONFIG.SYS has a menu section that looks like this.

```
[menu]
menuitem standard,Normal
stuff I use
menuitem maxmemory,Set up
to give maximum free
memory
menuitem wingcomm,Configura-
tion to run Wing Commander II
menudefault . . .
```

That means that you have three configurations named standard, maxmemory, and wingcomm. (Notice that I didn't include the normal and interlink configurations. I didn't want you to start thinking that they were mandatory.) You'd prepare the first configuration IF to look like this: IF %config%==standard GOTO standard.

Notice that the ==standard is in lowercase. The case in the IF statement must match the case of the named configuration, or this just plain won't work.

You'd then assemble the other IF statements, one for each of the two other configurations, and you'd have an AUTOEXEC.BAT that looks like this.

```
@ECHO OFF
IF %config%==standard GOTO
standard
IF %config%==maxmemory GOTO
maxmemory
IF %config%==wingcomm GOTO
wingcomm
```

**Step 3:** Create a section of the AUTOEXEC.BAT for each of the configurations. Each section should have two lines. The first line is the name of the configuration preceded by a colon, and the second line should say GOTO end. The last line in the batch file should say :end. If you do that, your AUTOEXEC.BAT will look like this.

```
@ECHO OFF
IF %config%==standard GOTO
standard
IF %config%==maxmemory GOTO
maxmemory
IF %config%==wingcomm GOTO
wingcomm
:wingcomm
GOTO end
:maxmemory
GOTO end
:standard
GOTO end
:end
```

**Step 4:** For each section, insert the AUTOEXEC.BAT for that section between the label with the colon at the beginning of it and the GOTO end. Save this file, and you're done.

To put it all together, let's suppose the AUTOEXEC.BAT for the standard configuration looks like this.

```
PROMPT $P$G
PATH C:\DOS
DOSKEY
PRINT ^Q
SMARTDRV
```

The configuration for maxmemory looks like this.

```
PROMPT $P$G
```

```
PATH C:\DOS
LH DOSKEY
```

And the configuration for wingcomm looks like this.

```
CD\GAMES\WC2
WC2
```

You'd insert these files into the AUTOEXEC.BAT that you're building, and your final AUTOEXEC.BAT would look like this.

```
@ECHO OFF
IF %config%==standard GOTO
standard
IF %config%==maxmemory GOTO
maxmemory
IF %config%==wingcomm GOTO
wingcomm
:standard
PROMPT $P$G
PATH C:\DOS
DOSKEY
PRINT ^Q
SMARTDRV
GOTO end
:maxmemory
PROMPT $P$G
PATH C:\DOS
LH DOSKEY
GOTO end
:wingcomm
CD\GAMES\WC2
WC2
GOTO end
:end
```

There you have it—a quick and painless way to integrate your configurations under DOS 6.

### Speak Up!

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**DON'T TRY THIS AT  
HOME**

By Lamont Wood

**The desktop publishing revolution  
has made the personal computer the playground of the  
forger and the counterfeiter—or has it?**

**S**ure, you're an honest person. Basically. But you've applied for a nice job, and they want a letter of recommendation from, say, your college department head. But all they're likely to get from that professor is a damning letter describing what you were caught doing while the lab burned. In fact, you have a letter like that sitting in front of you now, written on university letterhead and signed by your professor.

Desperately, you cast about for a solution to your dilemma—and note that your computer has a color scanner and a laser printer attached to it. So you could just scan in the letterhead and the signature, and write your own letter.

Why not? Who would know?

### Forging Ahead

Welcome to desktop forgery. It's a new scam many observers expect to snowball as technology makes documents easier and easier to reproduce, perhaps ending the concept of face value. And perhaps also changing the way some of our paperbound institutions function.

Or perhaps not—because we still have those first two questions:

Why not? Because it would be wrong (to paraphrase Richard Nixon).

*Who would know?* The people who catch you. Because you're very likely to get caught.

For instance, the printout from your laser printer could be traced back to you—although it's difficult to make such a trace, acknowledges Mike Noblett, chief of the Document Analysis Research and Training Unit at FBI headquarters in Washington, DC. Fans of detective novels know all about how the FBI collects print samples from typewriter brands and how every manual typewriter has distinctive wear patterns that can identify its output. Of course, hardly anybody uses such machines anymore, but the rollers and paper grabbers of laser printers do leave distinctive marks that can at least give away what brand of printer was used, Noblett notes. And scratches on the toner drum (if there are any) can be distinctive enough to identify an individual machine.

So you resolve to get a new toner cartridge just for this scam. But after that, you run into a problem—the letterhead you want to copy includes an embossed silver logo. Your laser printer can't emboss anything, and no metallic (silver, gold, or bronze) toner is available for laser printers, even if your scanner could pick up those reflective colors. That's why you see more and

more letterheads printed with embossed metallic backgrounds, explains William Flynn, a document examiner and president of Affiliated Forensic Laboratories in Phoenix, Arizona.

Anyway, you ponder, you also have to fake a letterhead envelope, and that's even harder. Indeed, sources say that beginners often give themselves away by overlooking the need for a convincing envelope. Or by leaving their fingerprints all over it, even when the document inside is surgically clean.

Ah, you think, but what if I fax the letter? Everyone faxes everything these days. All faxes are black-and-white, so the original color won't matter. And no envelope is needed.

So you whip out something convincing and head down to the copy shop to use the fax machine. There are other people there, too, nervously making photocopies of medical records, buying snapshot film, fingering check paper, and making furtive glances at the color copier.

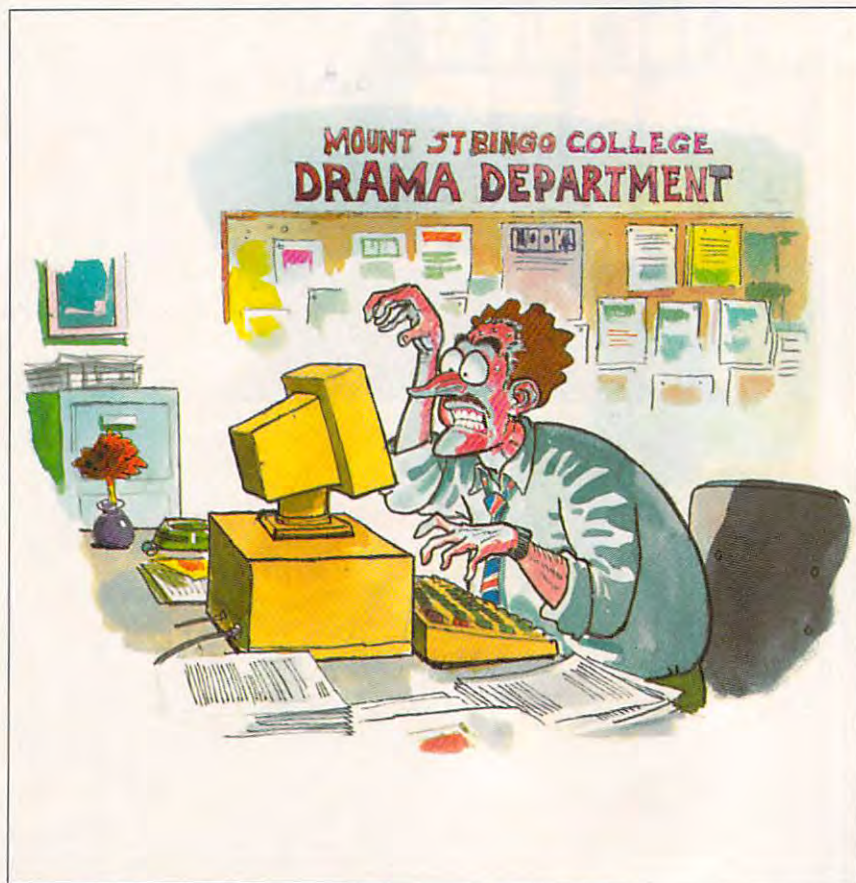
Are they up to something, too? you wonder. No, they probably aren't. But maybe it's just as well that you wonder.

### Paper Hanging

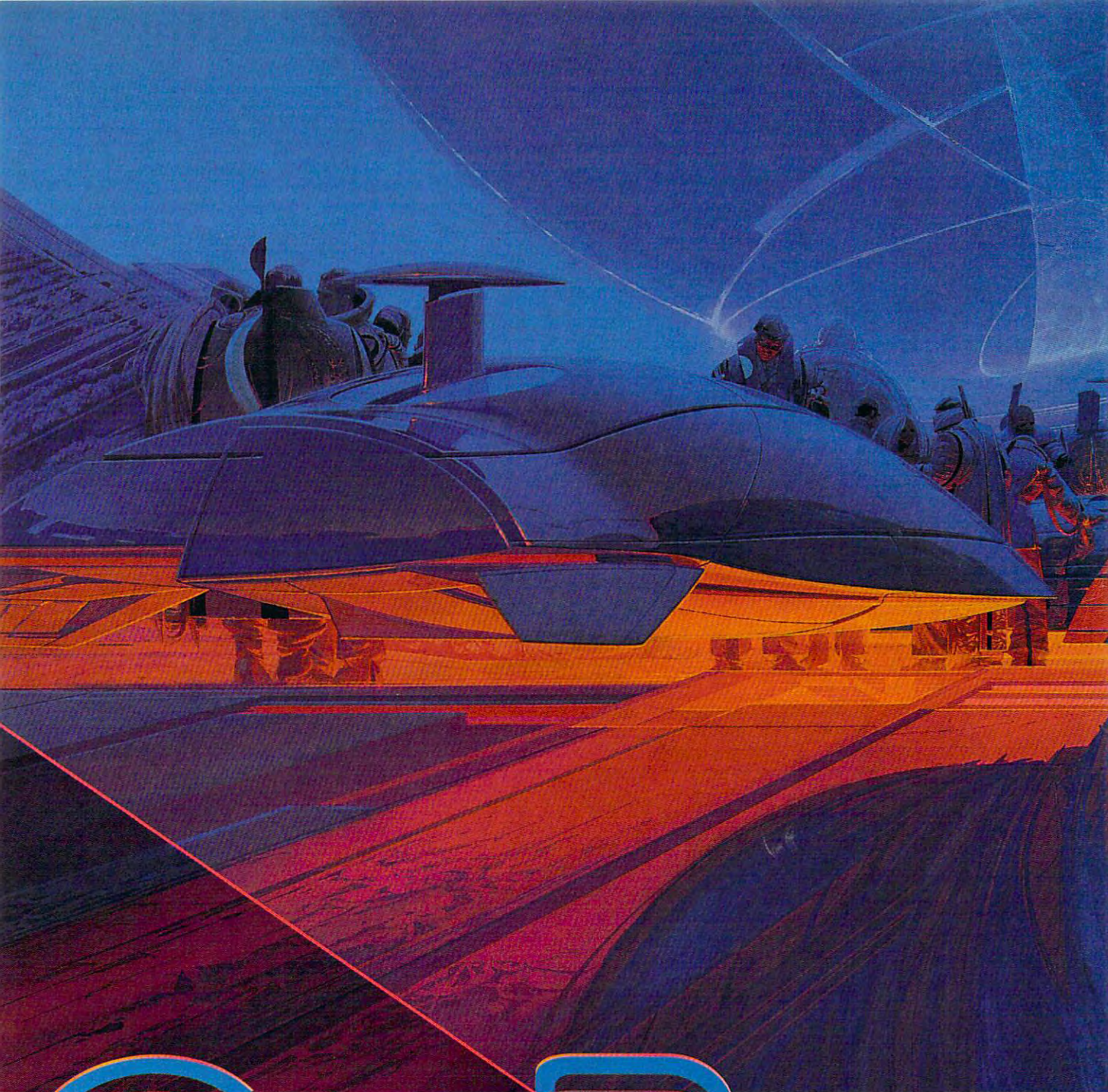
Those people fingering the check paper in the copy shop can give the hives to someone like Susan Morton, senior forensic document examiner with the U.S. Postal Service in San Francisco. While laser printers were once considered unsuitable for printing checks, today even large payroll firms use them, leaving bank tellers accustomed to the sight of laser-produced checks, she mourns.

The result is that she has seen gangs traveling the country packing computers, scanners, and laser printers. Arriving in a town, their first move is to rob a mailbox to acquire some checks that were mailed to, say, the local utility company. They will copy the account and routing code off some citizen's check and decide what branch bank that person probably uses. Then they forge a large corporate or government check to that person, using information from other checks they found in the mail. Packing a forged ID, a gang member will then go to a branch across town where presumably nobody knows the citizen and deposit part of that forged check. The check may be for \$5,000, of which the forger takes \$2,000 as cash, smiles, and leaves.

The bank may admit it's been scammed, or it may seek to blame the innocent citizen. "Some banks are nice and cooperative, and some can hassle you for years," Morton notes.







# CYBER RACE™

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One check-forging gang was chased across Texas for about six months in the late 1980s, recalls Robert Ansley, corporate security manager for Dell Computer in Austin, Texas, then with the Austin police department. Armed with a stolen Macintosh and an ID maker stolen from a highway patrol substation, they passed more than \$100,000 in bogus checks in Austin alone. But instead of hiring street people to go into the bank, as other gangs have done, they used the same woman over and over, and her description was sent to every check-cashing outlet in the city. A teller spotted her, she fled—and it turns out the gang had overlooked the detail of forging a license plate for their getaway pickup truck.

Sources say other gangs have used laser printers to forge security ID badges to get into office buildings and steal the computers, nodding to the friendly security guard at the front desk while trudging out with their arms full. But they usually find that fencing computers is harder than stealing them and get caught.

Knowing this, perhaps you've decided that forging is not the career for you. And anyway, you're just one faxed letter away from a good job. So

you fax your forged letter from the copy shop. Your prospective employer gets it. And sees from the ID line that fax machines insert at the top of each page that the letter came from the copy shop down the street, instead of that university three states away.

The fax, and your job, go straight into the trash can.

### Copycats

You're not alone in getting caught. Think back to the crowd at the copy shop. That medical professional was creating a new page for a patient file with some dates changed to make himself look like a genius instead of a quack. But at the malpractice trial it comes out that the page in question has one set of staple holes and all the surrounding pages have seven. The person buying the snapshot film was trying to back up a burglary insurance claim, but the insurance investigator checks the production code on the back of the film and finds it was made some weeks after the photographed jewelry was supposedly stolen. The ones fingering the check paper get caught as described. As for that furtive guy at the color copier—he's doomed.

So, to return to our earlier question, does all this new technology mean

our paperbound civilization is in danger of coming apart at the seams?

Apparently not. "We have not seen an increase in the amount of document fraud per se," says Noblett. "We have seen more and more computer-generated documents, but the total amount [of document fraud] is about the same. Computers have also made things easier for counterfeiters, but we don't see any more counterfeiters than before."

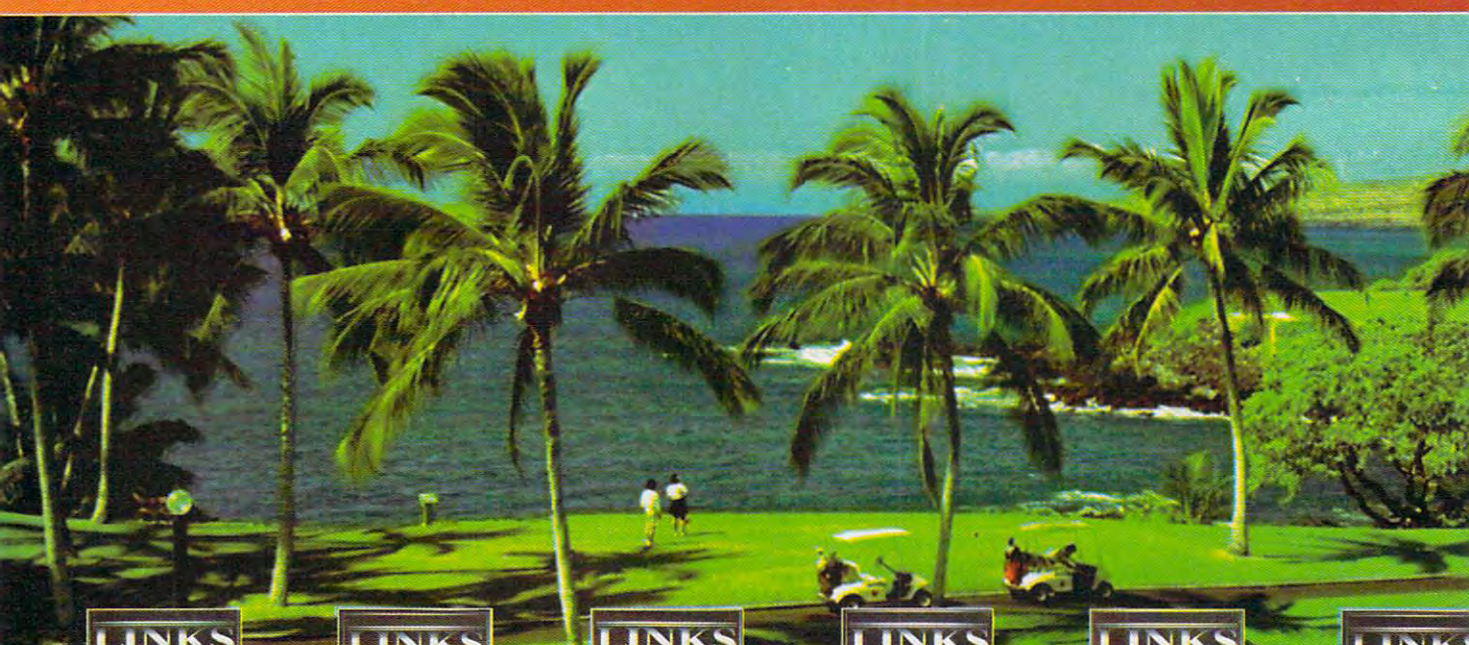
So perhaps people have remained basically honest—although a few safeguards may be in order. "We have been urging corporations to move forward with EDI [paperless invoicing, ordering, and so forth, using Electronic Data Interchange] for more and more of their business transactions and avoid paper, since it will become so vulnerable," says Donn Parker, computer crime expert with SRI International in Menlo Park, California.

### Read This or Go to Jail

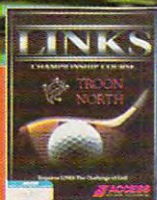
Yes, modern color copiers make reproductions of paper money so convincing that they can often readily be passed, notes Gayle Moore, special agent with the public affairs office of the U.S. Secret Service in Washington, DC.

And making such copies can get

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you sent to prison for 15 years, fined \$5,000, or both, she adds. And you're likely to get caught because, while the reproductions may *look* good, they don't *feel* anything like paper money—they are far slicker.

Meanwhile, new anticopying measures are being added to U.S. currency. Microprinting is being added around the outside of the portraits, which copiers will pick up only as fuzzy lines—which is all it looks like except under high magnification. And plastic strips are being added inside the paper itself—a copier won't reproduce them, but they will appear when you hold a genuine bill up to the light.

Meanwhile, Canon USA is said to be adding anticounterfeiting technology to its color copiers. A Canon spokesman declined to discuss the matter, but other sources say the technology can sense the graphical patterns of U.S. currency in whatever it scans. If currency is detected, the unit will spit out a black page.

But serious counterfeiters are likely to eschew color copiers anyway, preferring traditional methods, Moore notes. While a \$47,000 color copier might give you seven copies a minute, you can churn out millions of bogus dollars a day with an offset press. So

color copiers are mostly used for low-volume opportunistic counterfeiting, she explains. In 1991, the Secret Service busted 66 traditional counterfeiting operations, while seizing 52 office machines that had been used for counterfeiting. But whichever method is used, there is usually some paper trail connecting the perpetrator to the machinery, she notes.

Meanwhile, truly sophisticated counterfeiters are often too smart to waste their time producing money, preferring negotiable instruments like stocks and bonds. Desktop forgery hasn't been much of a factor in this field, says Jack R. Calvert, director of the National Forensic Laboratory of the Criminal Investigation Division of the Internal Revenue Service in Chicago, since copiers still don't have the resolution to defeat the safeguards of the safety paper such bonds are printed on. Safety paper can have pantagrams (continuous background patterns) that appear only when a photocopy is made, ink that appears only under special lights, or watermarks no copier can duplicate.

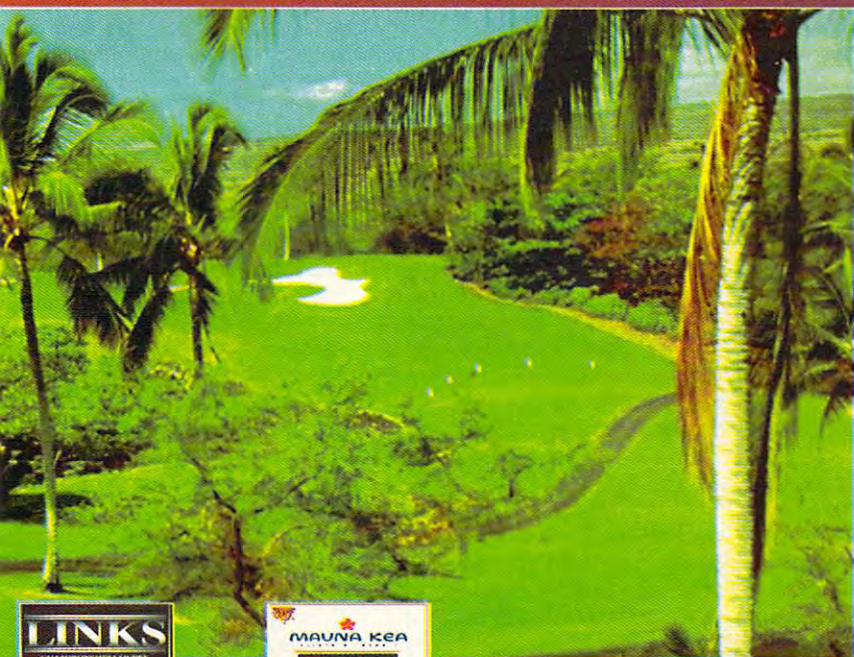
"Things are not falling apart yet, but we are running at full tilt to counteract anything that might come out in the near future," he says.

Meanwhile, perhaps you should consider joining the other side. There are estimated to be fewer than 600 qualified document examiners in the U.S. and Canada, and the industry is looking for new blood. If you're interested, George Pearl of Atlanta, president of the Association of Forensic Document Examiners, urges you to contact AFDE's membership director, Vickie Willard, at 526 Superior Avenue, Suite 740, Cleveland, Ohio 44114, or (216) 574-2204. It takes about two years to learn the trade.

### Don't Do the Crime

Don't do the crime, if you can't do the time, as the theme song from "Baretta" used to say. It's so easy to break certain laws with a computer that people sometimes forget they're engaging in criminal acts. You could make enough copies of WordPerfect in an afternoon to supply everyone on the block, but you would be breaking federal laws by doing so—and more and more pirates are being caught and prosecuted. Scanning in a dollar bill takes seconds, and printing out hundreds of them takes only a few minutes. But when you figure years behind bars into the equation, you just might not have time to take the risk. □

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# PRODUCTIVITY CHOICE

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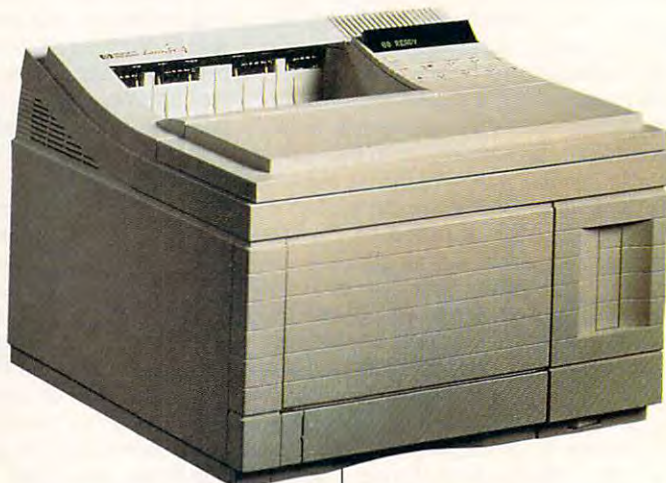
## LASERJET 4

It's no wonder that Hewlett-Packard's LaserJet printers are so popular. Hewlett-Packard consistently offers great printers at incredible prices. The LaserJet 4 is no exception. In fact, it's the best LaserJet ever, and it's the best value Hewlett-Packard has offered so far. With a suggested retail price of \$1,759 (if you look around, you can find one for around \$1,400), the LaserJet 4 weighs in at \$200 dollars cheaper than the LaserJet III. For the price, the LaserJet 4 gives you four times the resolution, 37 more fonts, much improved print quality, and over twice the speed.

Many computer pundits have hailed 1993 as the year of the 600-dpi (dots per inch) printer. Why 600 dpi? While this seems like only twice the resolution of standard 300-dpi printers, it's actually four times higher. Smaller, tighter dots mean crisper, cleaner text. That means type in small point sizes (such as, say, 12 points or lower) maintains its fine lines and stroke weights, and large text remains black and has smooth, sharp edges.

But where you'll really notice the difference with a 600 dpi printer is in printing grayscale and graphical images. Since laser printers simulate shades of gray by alternating black dots with noncovered white areas, 600 dpi offers a significant improvement over 300 dpi. When you use a 600-dpi machine, what you wind up with is about four times the number of simulated shades of gray that you can get with a 300-dpi machine.

Need more fonts? The LaserJet 4 is more than obliging.



It comes with 35 scalable Intellifont outlines, including Garamond, CG Omega, and Albertus; plus it has a TrueType font rasterizer and the ten TrueType fonts in Windows—families of Arial and Times New Roman, as well as Symbol and WingDings.

And, if you have a LaserJet 4, you can also download any Intellifont or TrueType outline to the printer. PostScript Type 1 fonts are supported as well, with a \$499 PostScript Level II upgrade. (PostScript is the standard language used by graphic artists and desktop publishers. They use PostScript printers to proof their documents before taking them to service bureaus for a final, high-resolution imagesetter output.)

You can, of course, use Adobe Type Manager (ATM) to utilize Type 1 font technology on the LaserJet 4. ATM costs only \$99, but before you buy it, make sure you don't already have a copy. It comes bundled with many popular word-processing, desktop publishing, and graphics applications.

Just when you thought printers couldn't get any faster, Hewlett-Packard comes

through again. The company's Printer Command Language 5 (PCL 5), the language used in LaserJet IIIs and 4s, is already faster than most other languages—especially the popular PostScript. But the addition of the TrueType font rasterizer and Windows TrueType fonts means that you don't have to wait for your computer to download fonts. The LaserJet 4 comes with one of the fastest processors in the business: Intel's 20-MHz 80960 RISC processor. It also has increased data compression.

What all these new enhancements mean to you is that the LaserJet 4 is one fast printer—perhaps the fastest eight-ppm (pages per minute) printer available on the market today. Another terrific speed enhancement you'll really appreciate is Hewlett-Packard's new Bi-Tronic bidirectional port. The Bi-Tronic can handle data transfers at up to 156 kilobytes per second, which is a much faster rate than that offered by standard parallel ports. Depending on the speed of the computer it's connected to, the Bi-Tronic traditionally sends data to the printer at between 50 and

150 kilobytes per second. So the only thing that will hold back the LaserJet 4 is the speed of your computer.

The bidirectional parallel port also talks back to your computer, in a similar manner that a serial port talks with a Mac. Wouldn't it be great if you could get a message on your computer screen that tells you when your printer is out of paper or that notifies you of a paper jam, instead of your having to walk down the hall to see what's holding things up? The LaserJet 4 is capable of this kind of two-way communication with your computer. However, as of yet there is no software interface support for either DOS or Windows. In order for your computer to receive the printer's messages, support must be written into DOS applications.

Windows users, take heart. Microsoft is working on software to activate the Bi-Tronic interface under Windows. It may be available by the time you read this; check the Microsoft forum on CompuServe, or look on the Microsoft BBS.

All these wonderful frills aside, the question remains: How does the LaserJet 4 actually print? I tested speed and output against a Lexmark 4029 600-dpi printer. The Lexmark 4029 has a software option—the 4029 Windows Print Accelerator—that uses TrueType fonts to turn in

record print times at 300 dpi.

In some of my field tests, especially when I was printing pages containing just TrueType text, the LaserJet 4 was a hair faster than the Lexmark 4029; however, the LaserJet ran at about the same speed as the 4029 when I was printing pages containing graphics.

The print-quality tests—in which I was comparing the smoothness of type, monotone graphics, and gray-scale photographs of the printouts—revealed that Hewlett-Packard's Resolution Enhancement Technology (RET) is slightly superior to the Lexmark's Print Quality Enhancement Technology (PQET).

On the LaserJet 4, small text (12 points and under) prints just a little crisper, and large text (14 points and higher) looks a little smoother. There is, however, a quite noticeable difference in quality when you use a magnifying glass to compare the print samples. The LaserJet 4 prints text much better.

Graphics and photographs also come out cleaner and with seemingly more shades of gray when printed on the LaserJet 4. I always thought that the Lexmark's halftone quality couldn't be beat—until I saw what came rolling out of the LaserJet 4. It's quite impressive!

Once again, Hewlett-Packard has done what it usually does better than anybody else in the printer market: It has created a fine printer at a fine price. As with the earlier LaserJets, this one sets several new standards.

First, although 600-dpi printing has been available for a while now, it has never been

offered at such a reasonable price. Usually, if Hewlett-Packard has it, everybody else soon will. Second, last fall Hewlett-Packard entered into an agreement with Microsoft to develop Windows-based printing standards. The first results of this team effort are the resident TrueType fonts in



the LaserJet 4 and the bidirectional parallel port. Count on the bidirectional port being the next-generation computer-printer interface, with several other printers sporting it by year's end.

With all this, there are fewer and fewer reasons for business users to shell out the cost of PostScript. PCL 5 now offers scalable-font technology, higher resolution, better handling of vector (draw-type) graphics, on-board TrueType fonts, and a low price—all of which give the LaserJet 4 a true advantage over other 600-dpi printers.

Do you need 600 dpi? Well, look at it this way: Considering all the other features and the improved print speed and quality of this printer, the higher resolution is just a bonus. If you're in the market for a new printer, unless you are a desktop publisher or graphics designer, you can't beat this one. □

**LaserJet 4—  
\$1,759**

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Circle Reader Service Number 391

# PERSONAL PRODUCTIVITY

Rosalind B. Resnick

## TO ERR IS HUMAN

With all the great deals on computers these days, it seems as if you can't go wrong in selecting a new computer. Surprisingly, though, many people do go wrong.

Here are ten common mistakes that computer buyers make and some tips to help you avoid them:

**Not asking yourself why you need the computer in the first place.** Before you can shop intelligently for a computer, you have to decide what tasks you want to use it for and what soft-

**If you look before you leap and buy exactly the computer you need, you'll find the bargain that's waiting for you.**



ware you'll be using. If you plan to do mostly word processing, for example, you can get by with a less powerful—and less expensive—computer than if you intend to do desktop publishing or run lots of Windows applications.

**Not doing your homework beforehand.** While benchmarks and test procedures vary from reviewer to reviewer, product reviews can be a valuable guide to a computer's performance. Don't forget that friends, colleagues, user-group members, and even bulletin boards can offer useful suggestions as to which computer to buy—and which computer to steer clear of.

**Buying too little random access memory.** As the adage goes, You can never be too rich or too thin—or have too much RAM. Especially if you're planning to use software that runs under Windows. You're going to need at least 4MB of RAM; some experts suggest 8MB. "Sixteen would be even better," says Jerry Siegel, a computer consultant in Hollywood, Florida. Even with RAM prices higher than usual right now, it's one of the least expensive upgrades you can make.

**Buying too small a hard drive.** Just a few years ago, a 40MB hard drive was considered quite roomy. But now that Windows has burst onto the scene, PCs with hard drives as large as 250MB are not uncommon. That's because some Windows programs, such as Word for Windows 2.0, grab upwards of 10MB of hard disk space and require lots of room to run.

**Buying a microprocessor (CPU) that can't be upgraded.** While the 386 computer you buy today may be adequate for now, chances are that before long you'll need a PC with a 486 processor to run the newest software. By spending a little more to buy a PC that's upgradable, you won't have to junk the thing a year from now.

**Spending big money to upgrade your old PC.** Now that computer prices are down, it's hard to justify the cost of outfitting your old computer with a bigger hard drive or a color monitor. "Throw away and buy new," suggests Robbie Robertson, a consultant in Waterloo, Iowa, "or better yet, sell the old while there is still a market for it, and buy new."

**Buying the latest and greatest system on the market.** While you shouldn't buy less computing power than you need, there's no reason to buy more. State-of-the-art systems

often carry a premium price. For example, a top-of-the-line PC equipped with Intel's 66-MHz 486DX2 chip sells for about \$3,000 these days, while you can get a slightly slower PC with a 50-MHz chip for \$1,000 less. If you're like most users, the difference in speed will be far less noticeable than the dent in your bank account.

**Failing to arrange for good technical support.** Unless you're handy with a screwdriver and unafraid of tinkering with your AUTOEXEC.BAT file, you'll want to pick a PC vendor that offers prompt, reliable technical support. Some companies offer on-site service, others offer a toll-free hot line, while still others let you sink or swim on your own. It may also make sense to invest in an extended warranty.

**Paying cash.** If your credit card offers a buyer protection plan, it's a good idea to use your card, rather than cash or a check, to buy your PC. This way, you're protected if the computer you get turns out to be a lemon or the company you bought it from goes belly up.

**Grabbing a deal that seems too good to be true.** These days, some PC vendors are hawking 486-chip systems for rock-bottom prices of under \$1,000. But not all 486s are alike, warns Yisroel Goodman, a consultant in Far Rockaway, New York. "[A low price] does not mean that [the company] put together a balanced system and then discovered to their delight that they could sell it for \$995," Goodman says. "It means that they purchased the cheapest components they could in order to assemble a \$995 system."

If you look before you leap, use your money wisely, and match your purchase to your purpose, you'll find the bargain that's waiting for you. □

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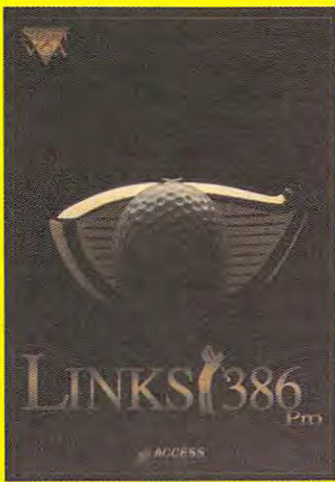
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# MULTIMEDIA PC

David English

## MULTIMEDIA MEGASHOW

It's billed as the world's largest multimedia event, with over 10,000 attendees and 150 exhibiting companies. Last year it acquired the weighty title of The Seventh Annual Conference & Exposition on Multimedia and CD-ROM. This year, it was simply called *intermedia*.

On the conference side of *intermedia*, attendees heard a lot of talk about converging technologies (though one speaker noted that "colliding cultures" would be a more appropriate way of putting it). Everyone, it seems, is either anticipating or dreading the coming merger of computers, cable television, broadcast television, publishing, consumer electronics, telephones, movies, and the recording industry. Not surprisingly, computer and software companies are rushing to form alliances with companies in other fields, so as not to be left behind. Microsoft, for example, showed a computer-enhanced television that lets you view real-time statistics and order stadium tickets while watching a baseball game.

Meanwhile, back on the show floor, you could almost smell the optimism in the air as companies displayed their latest crop of multimedia products. Warner New Media dazzled showgoers with *Hell Cab*, a nightmarish ride with a New York cab driver who is out to capture your soul. Stunning 3-D graphics and sound make this Macintosh CD-ROM a ride to remember. A PC version should be cruising the streets soon.

Microsoft announced three new CD-ROM titles, including Microsoft *Dinosaurs*, a sumptuous look at everyone's favorite former earth rulers. *Dinosaurs* includes over 1000 high-quality illustrations and photo-

graphs, 200 background articles, plenty of ambient sounds and growls, and even dinosaur screen savers. Microsoft worked with The Dinosaur Society to verify the information and included a section for us old fogies which explains that many of the dinosaur facts we learned as kids are no longer true. The other new Microsoft titles are *Multimedia Mozart: The Dissonant Quartet* and *Multimedia Stravinsky: The Rite of Spring*. Like *Multimedia Beethoven: The Ninth Symphony*, each contains a famous work of classical music and a wealth of background information.

DeLorme showed the follow-up to its popular CD-ROM applications, *Street Atlas USA* and *MapExpert*. It's called *Global Explorer*, and it contains street maps for more than 120,000 places worldwide, as well as detailed topographic maps for the entire world. Asymetrix introduced a powerful multimedia presentation program called *Compel*, with extensive video, animation, and sound support. In a break from its usual hardware products, ATI demonstrated its new video editor, *MediaMerge*. It lets you edit video files, record and edit audio, and add a variety of transition effects.

Other new CD-ROM titles include *Jazz: A Multimedia History* from Compton's NewMedia, which lets you hear as well as read about the legends of jazz, from Duke Ellington and Louis Armstrong to Miles Davis and Weather Report; *Interactive Venture's Mayo Clinic Family Health Book*, which includes 45 animations and 500 color illustrations, in addition to 1300 pages of interactive text; *The Compleat Beatles* from Compton's NewMedia, which includes the entire documentary film, *The Compleat Beatles*, as well as text from the book of the same name; *Voyager's A Hard Day's Night* (initially available on-

ly for the Mac), which includes the entire Beatles movie, the movie's script (which can automatically scroll with the movie), and a preview trailer; *TestDrive Software System*, a new quarterly CD-ROM from TestDrive, which lets you try out and optionally purchase major PC applications; and the 1993 edition of the *New Grolier Multimedia Encyclopedia*, which includes dynamic maps and audio-visual essays.

Adult CD-ROMs drew a lot of attention at *intermedia*. Popular adult movies are now available on CD-ROM. Titles include *House of Sleeping Beauties*, from Pixar; *Hidden Obsessions*, from Romulus Entertainment; and *Things Change: My First Time*, from PC CompoNet. At a special session devoted to the future of erotic multimedia, *Penthouse* wowed the crowd with its first CD-ROM title, *Penthouse Interactive*. It lets you become the photographer in a *Penthouse* photo shoot.

On the hardware front, you can now equip your PCMCIA-equipped laptop or notebook computer with a variety of multimedia options, including a sound card (MediaShare's *Tempo*), a video capture card (MediaShare's *Focus*), and a SCSI adapter (Trantor's *SlimSCSI*). NEC showed the first double-speed portable CD-ROM drive, the *NEC MultiSpin 38* Portable CD-ROM Reader. Media Vision displayed its new *Pro Audio Studio 16* package, which includes an improved 16-bit sound card, voice recognition software, and a small microphone. Creative Labs privately showed me its own voice recognition software, which will be available soon for its sound cards. Finally, *Gold Disk* demonstrated *VideoDirector*, which lets you use your computer to control both your home VCR and camcorder, allowing you to quickly and easily edit your videotapes. □

There were a lot of new multimedia products at this year's *intermedia* show.



# 128 feet and two floors away you'll still get great sound from your stereo... without wires!

Amazing new technology gives you the power to broadcast your favorite music through walls, ceilings and floors to wireless speakers anywhere in or around your home.

by Charles Anton

**E**ver drag your stereo system into another room of your house just so you could listen to it? Probably not. Most people can't afford to risk ruining their equipment.

With these new wireless speakers, you won't have to. Now you can listen to music anywhere in or around your home without lugging around heavy equipment or stringing wires.

Imagine listening to your favorite CDs, records, tapes, radio station, or TV show anywhere in your home. Imagine stepping into the pool or hot tub and having a self-contained wireless speaker right there with you—no risk.

#### State of the art sound.

These wireless speakers will work with any stereo, TV or VCR. And wait till you hear how they sound. The four-inch full range speakers deliver deep, rich bass and crystal clear highs. You'll get the perfect volume for any room because each one has its own volume control on/off switch. Plus, they have separate treble and bass controls.

Each speaker delivers a peak of seven watts per channel, for a total of fourteen watts when two speakers are used together for stereo sound. They have a built-in crystal-control frequency mechanism to lock on the signal. *These wireless speakers are also self-amplified, so they can't be blown out no matter what your stereo's wattage.*



Chase transmitter

#### Are wireless speakers right for you?

Are you concerned about:

- **Convenience.** You have a great stereo system in one room, but you want your music closer to you.
- **Value.** You want to get your money's worth out of your stereo equipment, tapes and CDs by listening to them more often and in more places.
- **Quality.** These wireless speakers use FM technology to transmit static-free music throughout your home.
- **Safety.** You have a pool or hot tub and you don't want dangerous speaker wires lying around.

**Patented technology.** These incredible Chase speakers use a patented FM technology to broadcast wirelessly through your home's walls, floors and ceilings. In fact, at the Annual Consumer Electronics Show, they were dubbed "one of the most exciting new products of the '90's."

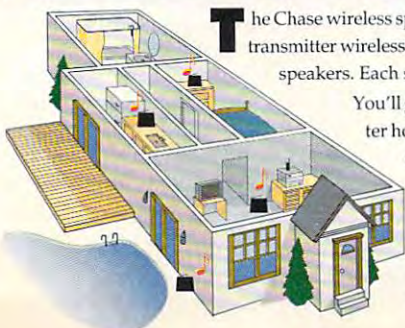
**Easy installation.** The powerful Chase transmitter plugs into a headphone, audio-out or tape-out jack on your stereo, CD player, VCR or TV. Use one transmitter to send both left and right channels to an unlimited number of speakers. Or use two transmitters to send the left and right channels separately to get full stereo separation on as many pairs of speakers as you want.

**'No Questions Asked' guarantee.** With every product from Comrad, you get a complete "No Questions Asked" 30 day money-back guarantee.

Plus the wireless Chase speakers come with a 90 day manufacturer's warranty. If you're not completely satisfied for any reason, return them for a full refund.

**Factory direct offer.** For a limited time, we can send these amazing wireless speakers direct-to-you far below the \$149 retail price. Now through a special promotional campaign, the Chase wireless speaker is only \$79. Order more than one, and your additional speakers are only \$69 each. The wireless transmitter is only \$29.

#### HOW DO THEY WORK?



**T**he Chase wireless speaker uses a breakthrough patented FM technology. A small transmitter wirelessly broadcasts music through walls, floors, and ceilings to your speakers. Each speaker has a built in receiver so no wires are needed!

You'll get a complete 150-foot range, giving you great sound no matter how large your home. And because this system uses radio signals unlike "line of sight" infrared systems, you'll get static-free transmission...even through walls!

A single transmitter can broadcast to an unlimited number of wireless speakers. The speakers with their built-in receivers and amplifiers can then provide music from your sound source anywhere around your home—even outside!

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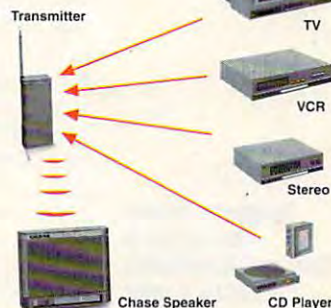
#### Chase's wireless speaker breakthrough.

This amazing wireless speaker has its own built in receiver and amplifier. Utilizing FM technology for a 150 foot range through walls, they can blanket even the largest home with clear, crisp music. Designed in an "acoustically balanced" bookshelf size (9H x 9.5W x 3.75D") it operates on four 'D' batteries or with an optional AC adaptor.

#### Broadcast wirelessly from virtually any sound source.

Broadcast to wireless speakers through walls, ceilings and floors up to 150 feet.

Easy hook-up of the transmitter to virtually any sound source with RCA plugs to your audio out/line out, tape out jacks or connection through headphone jacks. All connectors are included with the system.



So, take advantage of this direct offer and purchase your wireless transmitter and as many speakers as you need to fill your home with music.

Chase Transmitter ..... \$29 \$2 S&H  
Chase Wireless Speaker\* ..... \$79 \$6 S&H

\*Discount of \$10 on each additional speaker you order.  
You need at least one transmitter to operate speakers.

To receive this special pricing, you must mention promotional code CU1106. Your order will be processed and on its way to you in 72 hours.

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# ART WORKS

Robert Bixby

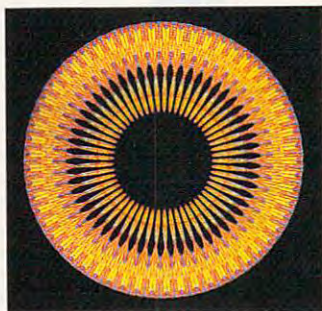
## BY THE BOOKS

Each month, we receive dozens of books for review. For some reason, most of them come addressed to me. Since this is a column about publishing, I thought I might take a moment to talk about the books received as a group and to single some out for attention.

Generally, computer books are here-today-gone-tomorrow books, temporarily a step above periodicals: a slightly longer pause for paper between the forest and the recycling bin. Not even used-book dealers are interested in old computer books. On the other hand, during their brief lifetimes, computer books are invaluable. They need to be ruggedly made, easy to read, full of reference material, and well indexed. The rigor of rapidly creating good books from scratch that have a 6- to 18-month shelf life has been the ruin of more than one publisher (and has caused more than one author to tear his or her hair out).

Random House, like a lot of major publishers, is a relative newcomer to computer-book publishing. Its books are mark-

edly more attractive than the general run of the mill. If you think you know what a computer book looks like, you should take a look at Random House Electronic Publishing's books. They use ample, but not excessive, color, and the covers are as attractive as those of any trade paperback. Look for Robin Raskin and Carol Ellison's *Parents, Kids, & Computers* (ISBN 0-679-73910-6, Random House Electronic Publish-



ing, \$20) if you want to see what can be done with computer books.

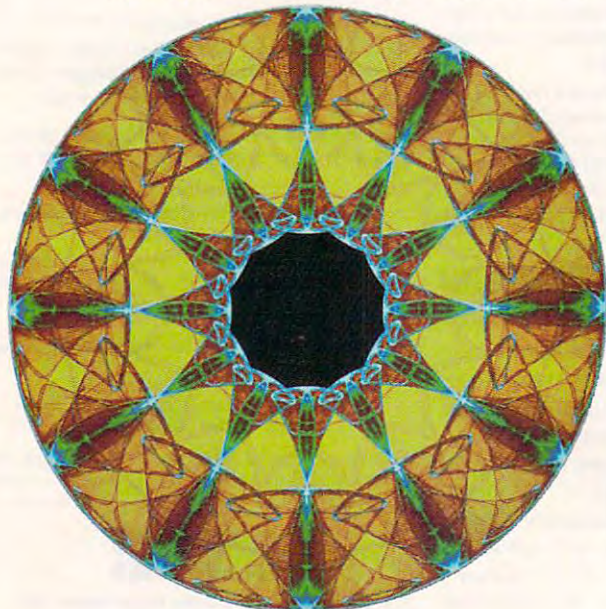
We receive many books on fractals. I've probably seen no fewer than a dozen in recent months. These books generally have the look of a good art book, full of beautiful full-color illustrations. *Symmetry in Chaos: A Search for Pattern in Mathematics, Art, and Nature* by Michael Field and Martin Golubitsky (ISBN 0-19-853689-5, Oxford University Press, \$35) is a little more than the standard fractal book, in that it explains in layman's terms what is meant by *symmetry* and *chaos*. It goes into the mathematics behind the fractal designs and even provides a collection of BASIC fractal programs. Having published books containing programs (and macros) myself, I can forgive the fact that there are some typos in the programs. Be forewarned: Use a little common sense when typing in the programs. You'll find some errors. I don't think there is a prac-

tical way to eliminate them from program listings published in books.

Computer art books come and go, but some have lasting and universal interest. *The Computer Artist's Handbook* by Lillian F. Schwartz (with Laurens R. Schwartz; ISBN 0-393-02795-3, W. W. Norton, \$55) tells you much more than how to draw a circle in a paint program. Lillian Schwartz is one of the true pioneers of computer art. She started creating art with computers before computers were seen widely as a medium for art, back when the initial stabs at computer graphics were being made in the inner sanctums of IBM and AT & T. She talks about how she created many computer masterpieces. Along the way, she drops hints for creating images and illusions with the computer, as well as describing the circumstances of some of her great discoveries. You may recall that a few years ago an artist serendipitously discovered that the Mona Lisa was actually a self-portrait of Leonardo da Vinci. Schwartz was the discoverer of that secret, and the story of her discovery, complete with sketches and computer enhancements of the painting, an x-ray of the Mona Lisa, and the original cartoon for the Mona Lisa are provided. In addition to teaching a great deal about the computer as an artist's tool, Schwartz goes a long way toward showing the kind of innovative thinking an artist must go through in order to create original art. Virtually every page contains full-color computer graphics.

Don't forget to write to me to let me know what you're up to in the publishing world. Remember that I want to hear about your projects and your interests—and that I'm soliciting publishing and graphics tips for publication. □

**Symmetry blooms from chaos in Field and Golubitsky's fractal primer.**



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own pace — no classroom pressures, no night school, no need to quit your present job until you're ready to make your move! Step by step you're guided through the assembly of a powerful 486sx-based computer system — the centerpiece of your coursework — complete with monitor, floppy drive, 80 meg hard drive, operating and applications software.

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# DISCOVERY CHOICE

*Land a 747 or a pterodactyl next to Big Ben—anything's possible when you're the director of this film production and flight simulator package.*

David Sears

## STUNT ISLAND

Back in the early days of filmmaking, daring young aviators often ended a day of breathtaking aerobatics with grievous injuries. Disney Software's Stunt Island—equal parts flight simulator, production studio, and Hollywood magic—manages to extract the danger and intensify the fun. Suddenly, those of us with the urge to barnstorm can prove our mettle for some virtual dollars and even make some movies. More important, however, we can now go behind the scenes and play the roles of director, set designer, property manager, and stunt man. Wearing all those hats proves an educational experience, and as an introduction to Hollywood-style filmmaking, it's a bargain that film school tuition can't hope to beat.

Somewhere at sea, protected from the pesky mainland safety regulations, Stunt Island waits, the site of countless chase sequences, airborne rescues, dogfights, and fiery crashes. The studio anticipates certain dire circumstances and even provides hospital facilities to patch up stunt fliers, but fly straight. If you foul up too often, you'll flunk out of the competition.

Besides just flying around the island scouting locations for stunts, flying in the Stunt Pilot of the Year competition is probably the best way to acquaint yourself with the environs. Each stunt in the competition is controlled by a script similar to the ones used to film entire movies. You'll have a limited number of takes to accomplish the stunt, but each failed attempt costs you

and the studio money. Besides, you should perform dangerous stunts as few times as possible.

In the competition, you'll shoot down a World War II Zero, snag a balloon gondola using a wingtip, pilot a hang glider into a medieval castle, land in a burger stand parking lot, egg-bomb the police from the cockpit of an angry duck, and much more. Through the competition, you'll encounter a few of the many planes that stock the prop department's hangars—everything from the Boeing 747 to the SR-71A Blackbird, the Sopwith Camel to the pterodactyl. Each of these aircraft handles much as you would expect it to, though to allow for seat-of-the-pants flying, the controls seem distilled down to a bare minimum.

The simulator itself is top-notch, especially considering the number of planes available. Except for the organic craft, each vehicle offers a detailed cockpit view along with

the traditional left, right, rear, and spotter plane perspectives—and what a view! On a speedy 80486, you won't notice any stick sluggishness even with 100-percent detail and dithering options active. These and other simulation characteristics are controlled from a pop-up panel accessible throughout the game.

The island itself is small enough to cross in a Curtiss June Bug without too much monotony, but it's probably the largest back lot Hollywood has ever seen. Practically any action sequence imaginable can be made here.

Stunt Island's educational value doesn't lie in its nifty flight simulator, though the chance to fly the 45 available planes is worth the purchase price. Actually, Stunt Island gives you the chance not only to fly stunts but to engineer and script them yourself.

From the Set Design screen, you can select any island location as your site.



Once you have a site in mind, stock your set! You may place up to 40 props on the set at one time, but only the first 8 will act as cameras. Of these, slot 1 belongs to the stunt plane, and slot 2 to the spotter plane. The rest of the slots can hold any object and be placed anywhere.

The cameras can take the form of objects, visible or invisible. Even the stunt craft and the spotter plane can become any object. From the hundreds of props, you might find the letter W makes an excellent and unique spacecraft—and why not? It's your movie. Why not film an invasion sequence as angry consonants storm the earth? Props range from historic landmarks, such as Big Ben and the Eiffel Tower, to the more mundane, such as road signs and boulders.

Positioning objects on the set and imparting them with motion characteristics such as pitch, yaw, and roll takes seconds using the pop-up control panels. If you can imagine in 3-D, planning an interesting set takes very little time; if not, the superb 3-D modeler puts everything onscreen for you as you place it, from the perspective you choose.

As mentioned, pilots complete stunts according to parameters set up by scripts. A script consists of events that you define using a set of intuitive pull-down menus within the Set Design screen. For example, you might want the pilot to guide his Bristol Bulldog between two trees to the left of a road. From the menus you can define the area between the two trees as a collision window. Then, whenever the aircraft passes through the window, an event has oc-

curred, and the program will follow further instructions you give for that event. These instructions can check time limits and aircraft speed, change the shape of objects, and trigger animation or sound. This abbreviated list only hints at the potential hidden under the Event option. Any stunt you can imagine, you can script here, and the process is much less taxing than writing even a simple program in BASIC.

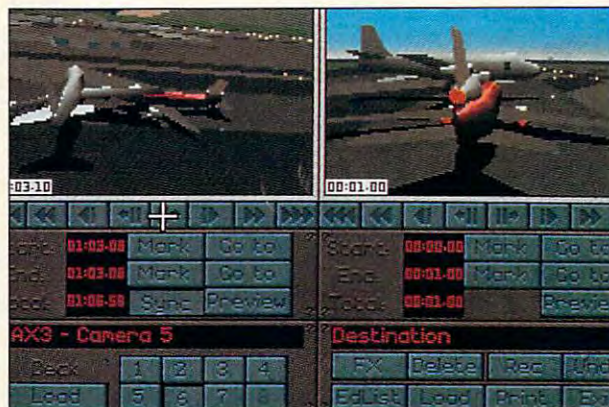
At the screening room, you can view the dailies—so called for their timeliness. If you choose to record a free flight instead of a stunt, you'll see a pilot's perspective of the flight. If, however, you fly a stunt with scheduled cuts from camera to camera and choose Auto Editing, you'll see the sequence unfold much the way it was intended, complete with point-of-view changes to props besides the aircraft and, of course, multiple shots of the same stunt. You can position the seven cameras with impunity. After all, in the virtual world of Stunt Island, both the cameras and the film are free, so you can use more than the average film budget could afford.

No studio can complete a motion picture without this postproduction essential: editing. Stunt Island gives you the opportunity to try your hand at a variety of techniques, such as cutting on action or using parallel action to heighten tension—and it also allows you to make some terrible decisions and put together a grade D film out of grade A takes. Essentially, the editing studio consists of eight video recorders that, if you use eight cameras when flying the

stunt, will hold up to eight separate rolls of processed film. These recorders can also load stock footage from other stunts, should you care to open the vaults.

To edit footage, you just mark the beginning and end of the footage you'd like to use in your film, using the logically labeled onscreen buttons. Next, copy the footage to the destination VCR. As you switch from source deck to source deck, fast-forwarding and rewinding, you soon develop a feel for construct-

**IBM PC or compatible (16-MHz 386SX or faster), 2MB RAM, VGA, hard drive with 13MB free; supports most sound cards,**



ing believable action sequences. The most valuable lesson that Stunt Island's editing room can teach neophyte filmmakers is that inspired editing can sometimes salvage the worst footage. For this to happen, editors must practice, and a few good books on editing could prove invaluable.

Aimed at film buffs and flight-simulator fans, Stunt Island seems too rare and too powerful to simply be called a game. With its straightforward approach to moviemaking, it could find a home in film school editing classes, and it just might inspire the next Spielberg—possibly you. □

**Joystick or mouse recommended—\$59.95**

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# GAME INSIDER

Shay Addams

## BIGGER GAMES, SMALLER GAME MAKERS

Since Links 386 Pro started the trend, everything from flight sims to chess, from war games to adventures is sporting SVGA graphics. A few of these include Buzz Aldrin's Race into Space (simulation), Empire Deluxe (strategy), Rags to Riches (business simulation), Battletchess 4000 (chess), Car and Driver (racing simulation), Trump Castle III (gambling), AV-8B: Harrier Assault (flight sim/war game), SVGA Air Warrior (flight simulation), the V for Victory series (war games), and Gateway II: Homeworld (adventure).

Among the most recent releases to show off SVGA graphics is Gateway II: Homeworld, Legend Entertainment's second graphic adventure based on Frederick Pohl's series of science-fiction novels. Instead of following the novels' plot line, designers Mike Verdue and Glen Dahlgren relied on the environment of the stories to create a fresh episode in the Gateway saga.

In this one you will travel the stars in your quest for the home planet of the Heechee,

**From the classic Xanth series, Legend is developing Companions of Xanth, a fantasy adventure, for summer release.**

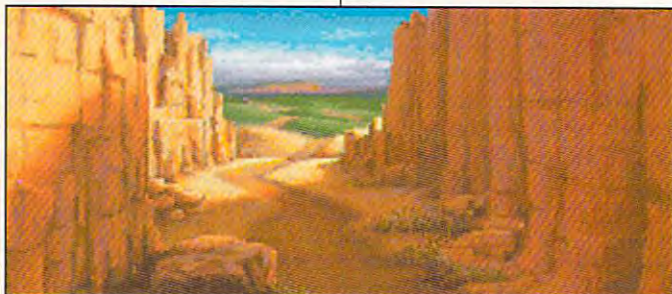


a mysterious race of beings on the far side of the universe. If you enjoy puzzles based on operating high-tech gadgetry and devices, Gateway II is the way to go. Many of the puzzles revolve around such objects, and some have their own custom interfaces that eliminate the need for typing or even picking words from a menu.

Gateway II features more of everything that distinguished the first Gateway—digitized sounds, animation, and other

tered Lands. SSI may even opt to do only a CD-ROM version of M. That's because many of the space-consuming graphics would have to be trimmed or cut completely from a floppy-based version. SSI was one of three major developers that downsized in late spring. It lost 10 percent of the staff but, according to a spokesperson, it will still release 15 new titles this year as scheduled.

Sierra and MicroProse also reduced their staffs by 10 per-



special effects. The puzzles will be just as difficult, so Legend includes a free hint book in the package.

Legend is currently adapting another classic series—fantasy instead of science fiction this time—as an adventure. The Xanth novels of Piers Anthony are the basis for Companions of Xanth, due out about this time. Legend also publishes Steve Meretzky's Spellcasting quests, but the original Madman of Adventure is up to something completely different in his next game. It will still be a comedy, though: Meretzky's last shot at a "serious" adventure was A Mind Forever Voyaging, which some players dubbed A Game Forever Voyaging. Look for it any day now.

But don't keep looking for the PC version of M, SSI's science-fiction adventure. It's been postponed until next year, along with the Super NES version of Dark Sun: Shat-

cent. Sierra had some hits last year, but reportedly took a beating due to the high startup costs of The Sierra Network. Though MicroProse reported record revenues for the year, unfortunately it also posted record expenses.

Science-fiction scenarios continue to dominate the games scheduled for release as summer winds down and autumn kicks in. Two more science-fiction scenarios should be docking at a spaceport near you this month, each offering a different slant on spaceships and aliens.

Tsunami Media's Protostar, which is in the same vein as Starflight, will be ten times bigger. Tsunami calls Protostar "... our most graphically stunning game so far." That's saying a lot, considering the lush graphics of Ringworld.

Origin's Privateer, set in the Wing Commander universe, is also scheduled to show up about this time. □

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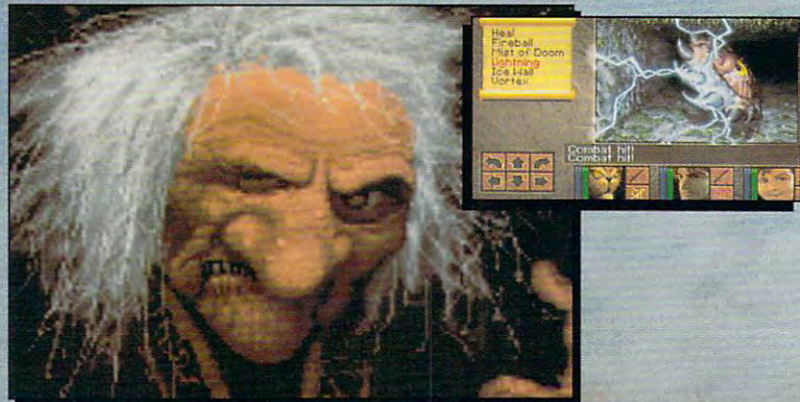
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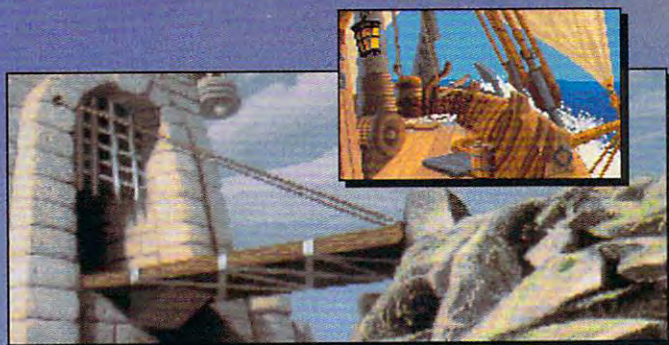
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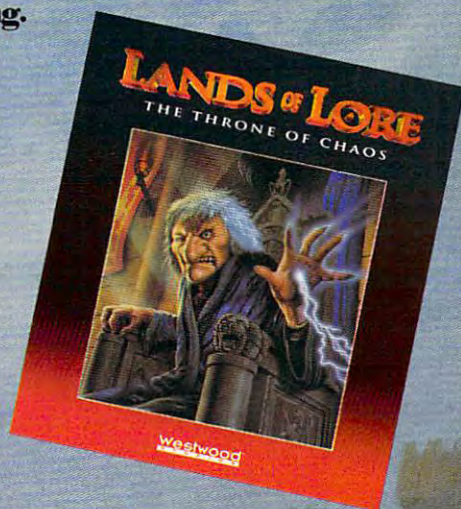
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# ENTERTAINMENT CHOICE

*Holographic images and fluid gameplay help give this intense space-combat simulator its high replay value.*

Scott A. May

## X-WING

It took some time and a lot of effort, but the Force is finally with us! X-Wing roars onto computer screens as the further realization of a dream that began in 1977, with the introduction of George Lucas's *Star Wars*. Though initially intended as a campy homage to Hollywood's pulp adventure serials, the film instead carved a permanent niche in popular culture. Ironically, while the cinematic effects pioneered by Industrial Light and Magic have moved light-years beyond Lucas's original vision, today's powerful personal computers are only recently catching up. You could say, then, that X-Wing has actually been 16 years in the making. Spend some time with this landmark simulation and you'll agree—it was well worth the wait.

LucasArts' creation invites obvious comparisons to Origin's best-selling *Wing Commander* series. Both are similarly structured sci-fi epics, enhanced by cinematic segues, explosive sound effects, and in-your-face 3-D action. The two products differ, however, in direction and substance. *Wing Commander* could best be described as an arcade-style space shoot-'em-up. X-Wing, on the other hand, strives to be the first authentic space-combat simulator. It succeeds brilliantly.

The game draws its greatest inspiration from the original *Star Wars* saga, charting the formation of the Rebel Alliance against the evil Empire and the construction of the genocidal *Death Star*. A lengthy animated introduction sets the stage, with additional background information pro-



vided in the richly illustrated manual. Movie fans may be disappointed that such mainstays as Luke Skywalker and Han Solo are nowhere to be found. Instead, you become the lead character, fulfilling a destiny written in the stars.

All action is initiated from the space port on the Rebel flagship *Independence*. After pilot registration—incorporating the game's unobtrusive, manual-based copy protection—you're presented with several paths to follow. Pilot Proving Ground is the logical first stop for rookie space pilots, as this is where you'll learn the fine art of flying the X-Wing, Y-Wing, and A-Wing Rebel ships.

You're run through a series of holographic images that appear as a maze of floating gate platforms, twisting and turning into 3-D space. Each round must be completed within a set time limit, which becomes shorter the further you progress. This section offers your first taste of the game's realistic 3-D flight model and the remarkable control afforded by zero gravity. Complete

all eight courses in a given ship, and receive an honorary flight badge.

The next step in your training leads to the Historical Combat simulator, where you participate in re-creations of actual Rebel missions. Six missions of increasing difficulty are available for each ship type, allowing you to practice various skills in a series of combat, rescue, and reconnaissance scenarios. This is also the best opportunity to familiarize yourself with each ship's tactical strengths and weaknesses. Purely a simulation, with no impact on your pilot status, Historical Combat provides invaluable hands-on experience in almost every imaginable confrontation.

As they say, however, there's nothing quite like the real thing. At the heart of the program are the grueling tours of duty, three in all, for a total of 38 missions. You begin the game with the title of Flight Cadet, with the opportunity to advance five levels to the rank of General of the Alliance Fleet, earning various medals and awards along the

way. Mission types range from simple patrols and brief interdictions to full-scale attacks and defensive stand-offs. Make it to the final mission, and you'll re-create Luke Skywalker's bone-chilling trench run on the massive *Death Star*. Completed missions are automatically added to the historical simulator.

Preflight instructions are appropriately futuristic, featuring holographic map displays outlining mission objectives, obstacles, and way points. Missions are timed and must be completed within extraordinarily strict guidelines. Unlike *Wing Commander*, where the story continues as long as your pilot survives, failure to follow exact rules here results in a failed mission. Unfortunately, these rules are murky at best and are downright enigmatic at higher levels.

This brings up X-Wing's most controversial point: Instead of being a free-form combat simulation, it is rigidly structured, with only predetermined outcomes. Such restrictions leave no margin for error, thus discouraging spontaneity and creative solutions. On the other hand, the game forces you to stretch the boundaries of skill and imagination beyond what simple arcade shoot-'em-ups can offer. Though this causes X-Wing to be often outrageously difficult, the result is replay value far higher than that of previous efforts in the genre.

Gameplay is tight, yet fluid, aided by spectacular graphics and sound effects. Cockpit designs are handsomely rendered in 256-color bitmap overlays, with 17 different view angles. Main features include forward and rear sensors with color-coded identifi-

cation and quick placement of surrounding craft. The central combat multiview monitor helps you identify enemy ships, as well as scan for shield status, damage, and sections vulnerable to attack.

One of the most useful skills you must learn is how to shift your ship's energy among engines, shields, and weapon regeneration. An R2 Astromech droid serves as your copilot, reporting damage, performing repairs, and providing a communications link with other ships. It also allows in-flight access to sector maps and a review of mission directives.

Weapon systems increase proportionally in power and number with each upgrade in ship design. X-Wings are armed with laser cannons and proton torpedoes, while the medium-range Y-Wings come equipped with additional icon cannons. The heavy-duty A-Wings pack the biggest wallop, boasting an array of devastating concussion missiles. Weapons fire with a satisfying burst of light and sound. Destroyed alien ships ignite in breathtaking bitmap explosions. The fiery destruction of larger ships is particularly well done, starting with a chain reaction of small eruptions and climaxing in a thunderous fireball.

Outside views of all ships are rendered in solid-fill polygons, a design decision that pays off with superb 3-D modeling and a smooth, rapid frame rate, even on slower machines. Although the publisher recommends an 80386-based system, user-defined graphics detail allows the game to run surprisingly well on a fast 80286 machine. In addition to LucasArts' iMUSE

interactive soundtrack, users with Sound Blaster-compatible sound cards will also enjoy crisp digitized speech. Few sounds are as chilling, however, as the unholy roar of TIE fighters screaming across your path.

Perhaps the game's most dynamic and helpful accessory is the in-flight recorder, identical to one used in *Secret Weapons of the Luftwaffe*. Combat footage can be played from almost any point of view, during missions or afterward in the space port film

**IBM PC or compatible (80386 compatible recommended); 1MB RAM (additional features supported with expanded memory); 256-color VGA; hard drive; high-density floppy drive; joystick or mouse (joystick recommended); supports Sound**



room. Use it to study unsuccessful missions to learn from your mistakes. Use the highly maneuverable free-floating camera as a sophisticated reconnaissance tool, exploring areas of this virtual reality otherwise unseen from your cockpit view.

Intense combat action and levels that rapidly increase in difficulty may keep X-Wing beyond the reach of casual fighter jocks. But for those with the skill and tenacity worthy of a Rebel space pilot, X-Wing brings the excitement born in a galaxy far, far away a little closer to home. □

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Circle Reader Service Number 393

# GAMEPLAY

Paul C. Schuytema

## CREATE AND CONTROL

Do we have an innate desire to better humanity? Perhaps an entrepreneurial drive? Or is it simply an egotistical desire to play God? Whatever drives us, controlling a world with broad, sweeping gestures that affect untold numbers of people is deeply satisfying. Fortunately, with the aid of several excellent games, we can satisfy the lust for total power without any of the potentially dangerous repercussions.

Experience the power of being a god—admired and hated—in one of these fascinating simulations.



Populous II

Populous II: Trials of the Olympian Gods (Electronic Arts) is a true player-as-God game set against the pantheon of ancient Greece. You assume the prowess of a son of Zeus and control the fate of a civilization of loyal worshipers. The game endows you with true Olympian abilities, allowing you to raze the land with the click of a mouse button. An unfaithful enclave resides along the coast? No problem, simply lower the ground into the sea and be rid of it.

In Populous II you possess the ability to endow a leader, from Adonis to Odysseus, with heroic stature, enabling him to fight with valor and inspire the moral fortitude and wonderment of his people.

You can mold the world to suit your tastes as well as command the devotion and actions of the petty humans occupying it.

Moving a notch down from the godlike powers of Popu-

lous II, Civilization (MicroProse) is a tried-and-true game of civilization building. The game gives you complete logistical control over a budding tribe of Homo sapiens which has just made the move from hunter-gatherers to village settlers. It's up to you to guide and develop this fledgling civilization first to world prominence and, eventually, to space migration to Alpha Centauri.

In a wonderfully intuitive interface, you move from detailed control screens representing single cities to a cartogra-



Civilization

pher's-eye view of the whole explored world. Every detail is at your control, from what advancements to pursue to what fields to irrigate to where to lay down the railways.

You get a hands-on, what-if experience of developing an entire culture from the ground up. You literally create the world and administer laborious tasks, such as building infrastructure or protecting the realm, to the citizens. You can even cause a revolution that causes the civilization to shift from one form of government to another.

SimCity for Windows (Maxis) is the latest edition of the best-selling city simulator. Even more specific in focus than Civilization, SimCity concentrates your attention on developing and managing a growing city. By fully utilizing Windows' power to display simultaneous windows of information, SimCity allows you to monitor the lay of the land and the

block-by-block details of the city, as well as a host of graphs charting development—or decline.

You still have a sense of playing God—or perhaps *boss* would be a better term—as you face block-by-block development of the city. Ground must be bulldozed, power plants must be built, and suspension wires need to be constructed. Roads must be laid to provide optimum traffic flow, and police and fire districts must enforce the peace and safety of the citizens. All of this costs money, of



SimCity

course, so taxes must be raised and spent.

Managing the design and development of a city or attempting to control one of the real-world cities included in the game, you get a feel for the interlocking nature of human society and how one move affects many variables. In addition to the man-made variables, you must plan for and contend with natural disasters such as flooding and earthquakes—all the while keeping an eye on the mood of the populace.

Power mongering: It's an enticing and disturbing human trait. Thanks to these great games, we can work through our delusions of megagrandeur on the privacy of our own PCs. Then all we must deal with is the very real potential of addiction. In the words of Edmund Burke, "Those who have once been intoxicated with power . . . can never willingly abandon it." □

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SOFTWARE





# Wars of the Distant Past

**W**in aqueduct, a castle, and a samurai sword—these three are icons of the bygone days that we can now experience on our PCs. The distant past was a time of radically different cultures, primitive technologies, and, of course, war. In the Roman Empire, cohorts (divisions of a Roman Legion) patrolled the provinces, repelling the barbarians and maintaining the emperor's sovereignty. In feudal Europe, barons battled barons for papal favors, the wealth of the land, and a chance to be crowned king. In feudal Japan, the code of honor known as Bushido governed the samurai, who fought across rice fields to strengthen the power of their lords.

We can read about distant history because the actions of the movers and shakers of the time are recorded. But what was it really like? What was it like to make decisions in a time in which values and goals were radically different from those of today? Now we can find out. Several excellent computer games take us back through the centuries and allow us to learn history through action and strategy and to struggle for success much as the royalty of the time had to struggle to obtain and maintain power. Beyond being lessons in history, the games we'll look at offer serious challenges, forcing players to adopt strategies that fit within the context of the times they simulate.

## Caesar

This game from Impressions takes us back to the first century B.C., when the first Roman emperor, Augustus Caesar, came into power. You begin the game with the title of citizen. You are the governor of a remote province of the empire. You must develop and nurture the province to prosperity in order to receive a promotion and relocation to another, more valuable province. With careful planning, proper tributes, and a warlike strategy, you can achieve the ultimate goal: being crowned emperor.

You're forced to focus mostly on the capital city of the province and to guide its development. When the game begins, the province is barren; you find only a few small villages dotting the countryside. A fort rests where the capital will be built, and a cohort is ready for patrol duty. The capital is built from the ground up, with the social and

By Paul G. Schuytema

political heart of all major Roman cities, the forum, at its center. Using an interface somewhat reminiscent of SimCity but far more detailed, you lay down roads and place residences, which begin as small tents. Water, certainly one of the prime requirements for any civilization, must be made accessible, and reservoirs can be built to trap the water. Aqueducts can be laid to bring water into the fledgling city, and a fountain will make the water accessible.

You continue to develop the city, enlisting the aid of your advisers at the forum. They give you advice such as which industries will likely flourish in the province and the proper allocation of the plebs in the work force. Bath houses, plazas, hippodromes, coliseums, and schools can all be built.

The city-building aspect of Caesar is a fascinating voyage into the world of the Roman Empire. Impressions has gone to great lengths to make sure that the type of structures and the development of the city are in line with the historical and archaeological facts. As the city grows, you must build larger forums to effectively govern the growing acreage. You get a real sense of being there.

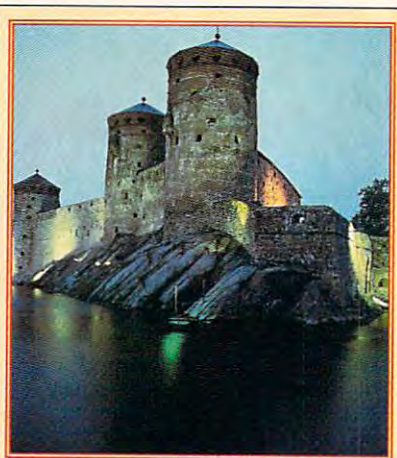
However, Caesar goes far beyond the construction of a city. By utilizing the forum's advisers, you gain insight into the multitude of variables affecting life in a Roman province, from conscription service to developing stronger cohorts.

You must also develop the entire province, linking the small villages to your capital via provincial roads and linking your capital to the imperial highway system. The game allows you to construct grand, sweeping walls and battlements, and you can build additional forts that in turn create new cohorts.

Eventually, barbarians will rush in and attempt to capture your capital, and the cohorts must then be sent to attack. You control the formations of the units, and as a conflict progresses, losses in numbers as well as morale are documented.

Soon, Impressions will release Cohort II, which you will be able to link to Caesar. This will provide you with man-by-man control of the battle using Impressions' microminiatures gaming system.

As a city management program, Caesar certainly succeeds, but as an entire game of provincial management in the Roman Empire, it is exciting and addicting—not to mention exhausting.



## Medieval Castles

The medieval castle was not a structure meant primarily for defense; its purpose was to dominate. A castle could easily influence lands within a 25-mile radius, since 30 miles was within a day's march for the average foot soldier.

During times of attack, peasants, livestock, and property could be brought into the castle for protection. The castle walls, as well as the height advantage for archers and for dumping all nature of things upon attacking forces, meant that an attacker would need at least a four-to-one advantage to have any hope of taking a castle.

A castle was not merely the site of courtly love and stately banquets. The average castle generated the clamor that our large factories produce, and people would have to shout if they hoped to be heard over the chopping and hammering. A castle, as opposed to earlier, fortified towns, was not community property; it was a personal possession of the king, the queen, or a baron.

Contrary to what many might think, the castle was economical to build. Labor was cheap and often free, and raw materials needed only to be amassed. In building a castle, the greatest cost was time. After the plague, though, the situation changed, and labor prices rose because of the shortage of skilled craftsmen.

### Castles II: Siege & Conquest

A medieval simulation based on fourteenth-century France, this Interplay game begins on January 1, 1312, just after the king of Bretagne (the mythical France in the game) dies without

an heir. The kingdom is divided into territories controlled by rival lords who are all vying for the throne. To become king, you must unite enough territories to secure your strength and then petition the Pope for the right to wear the crown.

Castles II is a surprisingly addicting game of logistics and aggressive acumen, making it a task-based game. This means that you initiate an action (which takes time to complete) and then wait for the results. There are three different general sets of tasks: administrative, military, and political. An example of an administrative task is gathering timber resources, while a military task might be recruiting forces, and a political task might entail sending a diplomat to demand a tithe from a rival lord.

Managing tasks may seem dry at first, but there is a real challenge inherent in the logistical distribution of task points to maintain an optimal efficiency. While tasks are the main means of controlling the game, you also have the opportunity to design, from the ground up, any of the castles you wish to build. The castle design portion of the game is intriguing, and you can place low or high walls, square or round towers, gates, moats, and keeps. You can choose to build the castle walls first or construct the keep first. If you design a truly magnificent castle, you can save the design for future use.

In Castles II, not only is a castle a defensive tool, but it also assists in nearly every aspect of the game. A large enough castle will keep neighboring territories from revolting and can double the production rate of the territory's commodity.

Combat can be handled as a computer simulation, or you can choose to make all tactical decisions on your own, controlling each knight, archer, or infantry unit individually.

Diplomacy and careful planning are the keys to victory, but your fortune may change unexpectedly due to some developing plot or rival alliance. Also, good relations with the papacy are imperative, since only the Pope can legitimize the crown.

Castles II is a good-looking game in which most of the action occurs on a single screen. The only time the screen shifts views is during a tactical battle or when you choose to visit a territory to build a castle or check on its progress. The game also features a series of video clips which accompany important actions, most taken from the sweeping black-and-white epics of the 1930s and 1940s.



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## Conquered Kingdoms

QQP's ancient history entry is a medieval war game in the same vein as the popular Perfect General series. You battle either the computer or another player (live or via a modem connection) in a game of geographical conquest.

In Conquered Kingdoms, you control units which represent a group of individuals such as archers or knights. Each scenario begins with the selection of troops, using points to buy units and place them on the multiscreen map.

The game progresses in turns, enabling each side to move. Then, the battles are resolved. At first, Conquered Kingdoms seems a cryptic and abstract war game, but after several turns, the depth truly comes through. Resources need to be captured and managed, as do castles and towns. By carefully managing resources, you can create reinforcements that can be placed in any castle you hold.

Conquered Kingdoms is a game of details and careful planning, and a single scenario can easily last many hours. The excitement of controlling an entire army, piece by piece, in a giant medieval chess match, grows with every turn, and the ability to control units in a semitactical sense allows for strategies regarding formations and the development of lines of strength. By making the scale much larger than an actual one-to-one correspondence, you have the opportunity to react to and use a myriad of terrain types and to cover a lot of land in little time.

QQP is noted for games that possess simple yet sophisticated interfaces, and Conquered Kingdoms is no exception. Virtually every action can be handled by intuitive mouse clicks, and the program takes care of all of the dirty work (like movement restrictions) by means of various terrain types and enemy lines of sight. The game truly allows you to concentrate on organic strategy rather than on rules or icon manipulation.

Because of the depth and challenge of Conquered Kingdoms, it will be a long, long time before you'll be able to master all the scenarios and the incredible complexity of the artificial intelligence of the computer opponents. Playing against a human opponent is even more rewarding, and it's especially exciting when you are playing by modem and seeing only the results of your opponent's actions (but you might want to find a local opponent or play through

CompuServe's MTM service to save on phone charges for the lengthy calls). You can even play opponents by E-mail, utilizing a special save feature of the game.

Conquered Kingdoms also has an option that, while not exactly true to historical fact, allows you to control fantasy units such as trolls, dragons, and wizards.

---

**R**elive ancient  
history as you  
struggle for power  
in one of these  
addicting games of  
strategy.

---

## Conquest of Japan

A tactical simulation of samurai conquest from Impressions, Conquest of Japan brings sixteenth-century Japan to life. The game consists of a battle between two daimyos (lords) on the main Japanese island of Honshu, each controlling five cities—and each wanting total control of all ten cities. One player can compete against the computer, or two players can go head to head.

The game is somewhat reminis-

cent of the excellent Milton Bradley board game Shogun, but it features an extremely detailed combat system. The overall strategies of the game are straightforward: The game begins with the recruiting of five armies and the decision as to what portion of the forces to leave behind to defend the cities.

Movement of the armies is a simple one-step-at-a-time sequence until two armies run into each other. During the course of the campaign, the towns collect revenues that can be used to recruit more troops.

Conquest of Japan comes alive, though, when two armies meet for battle. Utilizing Impressions' own microminiatures system, the battle is played out at a truly tactical level. The first step for a battle is to select one of the traditional troop formations, from the all-around *Ganko* (birds in flight) to the defensive *Gyorin* (fish scales). The view shifts to an overview of the battlefield, and orders can be given in nearly any combination or detail imaginable.

The interface allows commands to be given to individuals, to a group (such as a line of spearmen), or to the army as a whole. Communication is important on the battlefield, and groups of troops must have a signalman to follow your orders. If a signalman is killed, another must be assigned, or you risk losing the units due to noncommunication.

During the battle, all manner of information is available to you, such as morale and current attack strength. Perhaps the most powerful feature of the battlefield controls is the ability to alter, split, and regroup your forces into any of 24 formations.

The incredible depth of tactical control takes a while to get used to, but complex and effective battle strategies are the result of a little patience. You can achieve the genuine feeling of commanding a sixteenth-century samurai army.

## In the Present Tense

By combining many levels of gameplay with historical accuracy, these games can truly be windows into several very exciting eras of our ancient past. Each of these games plays within the rules of its respective time period, allowing you to step back and enjoy the decisions and challenges of those times while learning about the limitations and advantages of a multitude of tactics and technologies. A weekend spent in ancient Rome, medieval Europe, or feudal Japan can become an educational addiction. □

## Buyer's Guide

**Caesar—\$59.95**

**Cohort II—\$29.95**

**Conquest of Japan—\$59.95**

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**Castles II: Siege &  
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**Conquered Kingdoms—  
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# 64/128 VIEW

A veteran 128 publication turns its editorial eye on the 64 with the launching of *Twin Cities 128/64*.

Tom Netsel

**G**azette celebrated its tenth anniversary when the July issue rolled off the presses. That's almost 120 issues. (We missed a couple during the summer of 1990.) *RUN* made it to issue 99 before it closed its final page.

Computer magazines come and go, and those that hitch their editorial wagons to one machine often experience a meteoric ride. Some flash onto the scene, burn brightly, and then fizzle away; while others maintain a steady glow.

Gazette started its association with the 8-bit Commodores by focusing on the VIC-20 and the 64, adding coverage of the Plus/4, 16, and 128 when those machines came along. When the 64 and 128 emerged as the leaders, we followed the numbers and concentrated our coverage on those machines. Surveys tell us that 70 percent of you own 64s.

Few publications have devoted coverage exclusively to the 128. *Twin Cities 128* was the exception. Founded by Loren Lovhaug in 1985, *TC 128* was primarily a technical publication that appealed to 128 programmers. It had its fans, but they were not enough to keep it in operation. It folded in 1991.

And then along came John W. Brown, president of Parsec. He bought the rights to the magazine a few months later and resumed publication. Coverage at that time was still limited to the 128.

When *RUN* died last year, Brown figured that his publication should offer some support to 64 owners

in addition to the 128 crowd. So with issue number 33, Brown launched the new *Twin Cities 128/64*. Produced on a 128-D with a laser printer, *TC 128/64* devotes about half of its 56 pages to each machine. Look for reviews, articles, GEOS info, and technical pieces, but don't expect a large number of type-in programs.

The cost for U.S. subscribers is \$24 for six issues. The magazine and companion disk cost \$40. To subscribe or for more information, write to Parsec, P.O. Box 111, Salem, Massachusetts 01970-0111. You can also write for a free copy of the magazine.

In addition to *Twin Cities 128/64*, Parsec offers a variety of disks, fonts, GEOS graphics, and other products for 64 and 128 users. SIDplayer fans should note that COMPUTE has sold the exclusive distribution rights to the book and disk to Parsec. That book/disk combination should be repackaged and for sale by now.

In "Upgrading Without Changing Platforms" (June 1993), it was reported that Parsec had dropped plans to produce a board that would let a 128 operate at 6-12 MHz. Well, that wasn't entirely accurate. Brown told me that the company working on the prototype had dropped it, but he still intends to produce it—and one for the 64 as well.

Brown says the product is now an external cartridge, CMD compatible, that will plug into the expansion port. It will probably use a 65C816 chip and operate at 12 MHz. The cost is expected to be about \$200. □

## GAZETTE

### 64/128 VIEW

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A veteran 128 publication now covers the 64, too.  
By Tom Netsel.

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By Karl R. Witsman.

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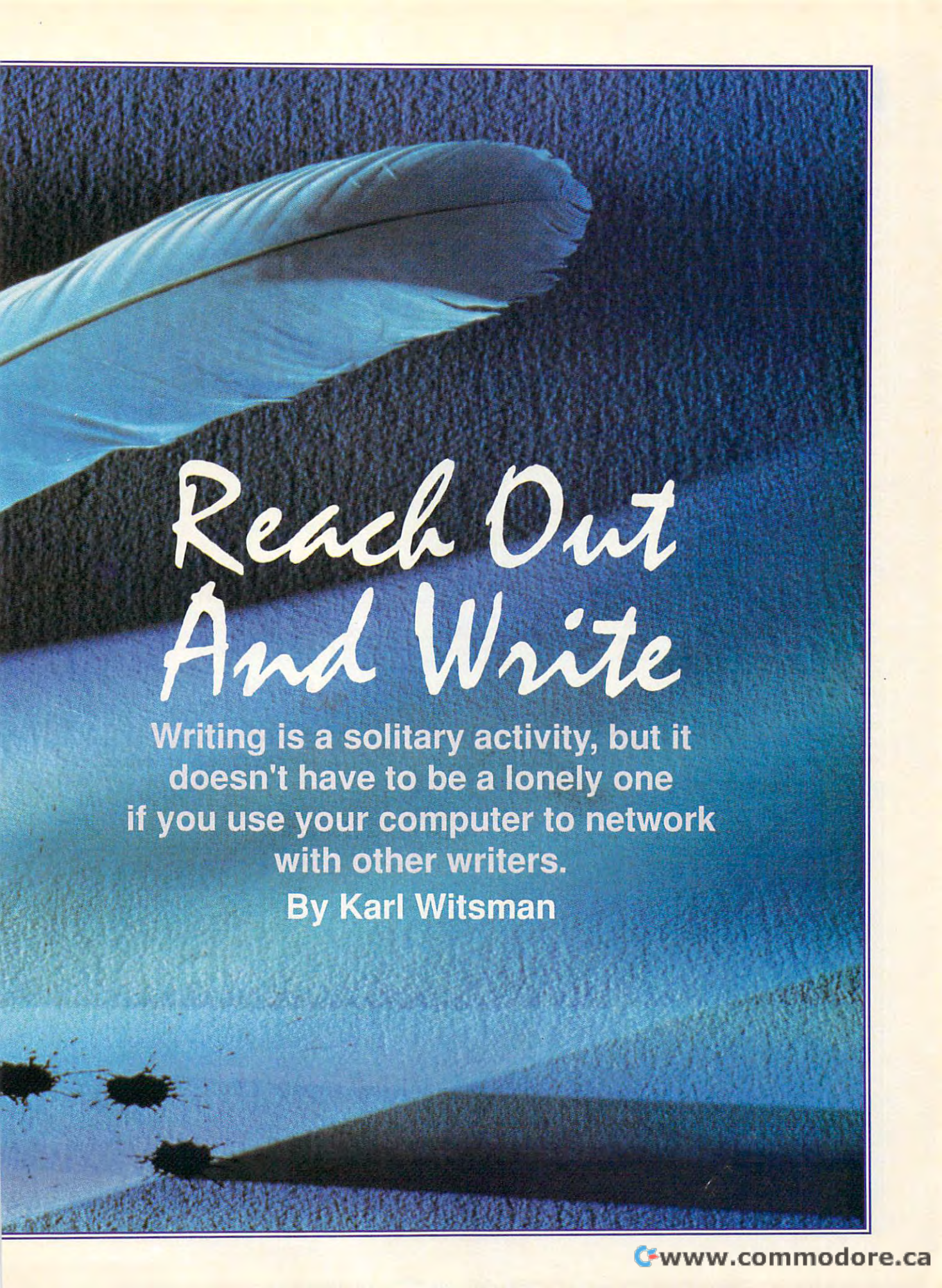
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The Automatic Proofreader (64/128)

G-40



A blue feather is shown in a blue, textured environment, possibly representing a digital or virtual space. The feather is positioned in the upper left quadrant, pointing towards the right. The background is a deep blue with a fine, grainy texture. In the lower left corner, there are several dark, splattered ink-like marks.

# Reach Out And Write

Writing is a solitary activity, but it  
doesn't have to be a lonely one  
if you use your computer to network  
with other writers.

By Karl Witsman

If you're a writer, you know what kind of power a computer gives you—power that you never had with a typewriter. But if you use your 64 only for word processing or the occasional game of Space Invaders, you haven't explored its most powerful use. There's a great force out there just waiting for you to tap into it with your computer and modem. It's called networking, and it can multiply your computing power and help your writing!

Most folks using computers have heard of BBSs or bulletin board systems. The popular notion of a BBS run by a teenaged hacker may have some validity, but many systems are run by serious computer enthusiasts, computer clubs, schools, and businesses. Some are created for fun; others have a more serious intent. All require a modem to connect your computer to a telephone line.

Running any BBS can be troublesome and is definitely time-consuming for the owner or system operator (sysop). These are labors of love, since most BBSs bring in no money. Sysops usually appreciate any help they can get, even if it's only through the messages posted by callers, but volunteers can help in other ways as well. Many boards have areas devoted to special topics, and often these areas are directed by outside sysops. I have volunteered on more than one of my local boards to form a writers' area. This is a place where local writers can converse about literary topics, and this is the place where networking comes into play.

## A Writer's BBS

To share the fun and information, try to find a BBS in your local area. If you can't locate one with a writer's SIG, here are some you might want to try. Several of these BBSs have specific writing areas. All allow access up to at least 2400 bps and run 24 hours.

- Almost Paradise, Oakwood, Illinois; (217) 354-4711. The sysop is Christy Blew. Leave a message for Karl Witsman, user number 56. If I can find more BBS/writing information, I'll reply with it here.
- Electronic Pen BBS, Harrington Park, New Jersey; (201) 767-6337.
- Data Central, Indianapolis, Indiana; (317) 543-2007.
- Heartland Free-Net, Peoria, Illinois; (309) 674-1100.
- Unique and Nifty BBS, Crawfordsville, Indiana; (317) 364-9600.
- Voyager BBS, East Lansing, Michigan; (517) 641-4367.

For additional BBS sources, try these publications or bulletin boards.

- *BBS Callers Digest*, 701 Stokes Road, Medford, New Jersey 08055. Its BBS is The Livewire at (609) 235-5297.
- *Boardwatch Magazine*, 5970 South Vivian Street, Littleton, Colorado 80127. Its BBS number is (303) 973-4222.
- *Infomat Online Weekly PC News Magazine*. For information about BBSs everywhere, call (913) 478-9239.

## Write Here

On a BBS, writers can discuss anything, such as the mechanics of manuscript preparation, agents, who uses/hates outlines, how to query about possible articles, or how to deal with deadlines. Some topics are even more involved, such as "Where does this sex scene fit into the story?" or "How do I show my character's thinking processes?" For questions that have no simple answers, the opinions of other writers can often prove helpful. If you're not a member of a writing group that meets in person, this electronic connection may be the only way to pick the brains of others in your field.

## Three Approaches

There are three main ways to converse on a BBS. The first is simply to leave a message in a general message area and let other callers read and respond to it. In most cases, other callers can respond on the same message area or send you a private reply through electronic mail.

The second method of exchanging information with other computing writers is through SIGs (Special Interest Groups). As their name implies, these areas concentrate their focus on a specific topic of interest and one could be devoted to writers.

## Echo, Echo

The third, and most sophisticated, method of communicating on local BBSs is Echo messaging. Echoes are a number of BBSs that form a net-

## Writers' Forums

The commercial online services offer a variety of opportunities for writers to meet and exchange ideas. Here's a sampling of what's available.

### GEnie

401 N. Washington St.  
Rockville, MD 20850  
(800) 638-9636

Jack Smith, screen name *Writers.Ink*, runs the Writer's Roundtable. The nonfiction group meets Wednesdays at 9:30 p.m. General Writing meets Sundays at 9:30 p.m., and the Poetry Meeting is held on Tuesdays at 10:00 p.m. Romance Writing meets Thursdays at 9:00 p.m. All times are Eastern Time.

### QuantumLink

8619 Westwood Center Dr.  
Vienna, VA 22182-9897  
(800) 782-2278

The Writers' Forum meets every Tuesday at 10:00 p.m. ET. Contact Karl Witsman, whose screen name is *KarlW3*.

The Writers' Forum consists of a very imaginative bunch. After the main topic has been thoroughly discussed, the group talks about current writing projects and other topics.

### DELPHI

3 Blackstone St.  
Cambridge, MA 02139  
(800) 544-4005

The DELPHI Writer's Group is for all writers of fiction or nonfiction. "We do admit to being a bit mercenary about writing at times, but of course that's all a part and parcel of getting into print—our primary interest here!" says the introductory text. Features include a Critique Network and a special database for writers' résumés, plus public domain and shareware software for writers.

Members are also eligible for special discounts on books, products, and supplies for writers. There are special databases for poets, screenwriters, and fiction and nonfiction magazine and book authors.

Poetry Conference meets Tuesdays at 9:00 p.m. ET, and the Creative Writing Workshop is held Monday nights at the same time. Contact persons are Ralph Roberts, whose screen name is *Author*, and Michael A. Banks, whose screen name is *Kzin*.

### CompuServe

5000 Arlington Centre Blvd.  
Columbus, OH 43220  
(800) 848-8199

CompuServe has a Desktop Publishing Forum, a Desktop Vendor Forum, and Journalism Forums. Contact Don (76711,437) or Thom (76702,765) for more information about items of interest to writers.

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work. Most of these networks are set up by sysops who know sysops in other towns. Using this system, a writer in Connecticut might leave a message on his or her local BBS. Around 3:00 a.m., the Connecticut BBS might call a BBS in New York and exchange messages, being careful to keep the writing messages separate from those dealing with computers, sports, and other topics. The New York BBS might then call a BBS in Ohio and repeat the process. In this way, the messages echo around the country.

When I call my local board, I can read the message posted by the Connecticut writer and respond to it. Writers all around the country have an opportunity to respond, and these responses are entered into the network. In a day or so, after the BBSs exchange messages again, the Connecticut writer can read the responses, as can all of the other writers on the network.

One such echo is the National Writers Echo. I was a local monitor here in Danville, Illinois, on the Friendship BBS, which was run, before his death, by Terry Claybaugh. Through this network, I exchanged messages with many writers of varying degrees of fame, including Billie Sue Mosiman (author of *Wire*) and John DeChancie

(author of the Starrigger series and the Castle Perilous series).

Such free exchanges of information and opinions with other working writers can expand your knowledge and help you keep track of up-to-the-minute publishing trends. All messages and mail are automatically date-stamped, so you can ignore old information and be aware of the most recent updates and changes.

REF# 432

POSTED: 04-20-91

FROM: Karl R. Witsman

TO: All

*Writers, I'm steaming mad! The U.S. Copyright Office has raised the copyright fee from \$10 to \$20 to register our works! This may be fine for those who write nothing but books, but for those of us wishing to register short stories or articles, it's an outrage. Next time we must not let this happen; next time we must unite and apply our skills in written communication in letters to the Copyright Office, Congress, and the president. At five cents a word in a pulp publication, it takes a lot of words to earn \$20. Let them charge bigger fees for books, and even bigger fees for screenplays that are being produced into movies, but leave writers of features some slack. If you would like to vent your spleen, as*

*I just did, be sure to talk to the right people—those at the following address: Copyright Office, Library of Congress, Washington, DC 20559.*

As you can see, a BBS can also be a good way to blow off steam and let others know how you feel about trends in the field. Let's face it, writing is a solitary profession, but it doesn't have to be lonely if you can reach out and telecommunicate with someone.

## Bigger and Better

Commercial online services are the big alternatives to local boards. These are not custom networks, but gigantic groups serving thousands of subscribers with varying interests. As the word *subscriber* suggests, these services cost for membership.

Some examples of such services are DELPHI, CompuServe, Quantum-Link, America Online, GENIE, and BIX (Byte Information eXchange). Each service has its own pricing structure and fees, so a call to each would be a good idea for potential subscribers.

Practically all of the major services have at least one area designated for writers. In some, you post a message as you do on a local BBS and then return in a few days to read the replies. Many services also offer areas for immediate writing discussions. This

## Publishers Go Online

Have you ever written an article and then spent months mailing it from publisher to publisher? Now you can submit your manuscripts electronically through a groundbreaking step in publishing by Manuscript Marketing Technologies Incorporated.

MMTI is not like other BBSs and online services. It offers writers a unique opportunity to submit articles or stories which are then offered to publishers electronically. More than 500 authors from all over the world have availed themselves of this service so far, as have 140 publishers from the U.S. and Canada.

Submissions can be made through special software for IBM compatibles which automates the process and records the article or story on disk. Macintosh users can use Microsoft Word format, which is then transferred to ASCII and then into the IBM-compatible program. Manuscripts submitted on paper are scanned through optical character recognition (OCR) software.

Publishers can call MMTI's computer and set the parameters for

what they're looking for in a manuscript. Let's say a publisher needs an article on homeless persons that's about 2000 words long. The publisher specifies the subject, length, and format (article, screenplay, book), and the software displays only those works meeting the criteria. Within the fiction category, there are 26 different parameters, and there are 323 categories in nonfiction.

When a publisher finds an article that meets the criteria, the manuscript can be locked so that no other publisher can get it. The service then gives the publisher information about how to contact the writer. The publisher and writer then work out a deal. Once the two parties come to an agreement, the publisher can download the work into the publisher's computer. Little or no paper changes hands. Only the original disk and contract have to be mailed.

If you're a writer who's spending a fortune on postage in mailing heavy manuscripts from publisher to publisher, this service might be the answer. It's also a good way to make simultaneous submissions for time-sensitive material. Each month, the

writer gets a report of how many times the article was read and why it might have been rejected. This gives the author a chance to judge if the work needs further revision.

The cost is an initial \$25.00 fee and \$10.00 per month. There is a storage charge of \$.0001 per word per day. (A 6000-word piece would run \$1.80 a month.) There is also a \$2.00 fee per disk. When compared to postage to mail the manuscript to 140 publishers, this is a very good deal. (Just sending a query letter to all these publishers would run \$40.60!)

For a full brochure and more information about its services, write to Manuscript Marketing Technologies, P.O. Box 234, Camden, South Carolina 29020. The telephone number is (803) 425-1675.

Remember, MMTI does not act as an agent, and it cannot offer you advice. The company merely offers storage and a distribution service. The software does not handle graphics or photos, but authors can leave a note in the manuscript if photos are available.



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type of system lets you type in a question or comment which is distributed immediately to all of the users who are signed on in the area. In this way, dozens of writers can respond to your comments or questions within seconds.

I host such an area called the Writers' Forum on QuantumLink, the Commodore-specific service. Up to 20 writers meet in realtime once a week in either a lecture or discussion format.

If you still wonder about how an online forum can help you with your writing, here are comments from some of the writers who frequent Q-Link's forum.

"The Writers' Forum keeps me motivated. When I run out of ideas, the group fires me up! It's a great place to talk to people all over the country who share a love of writing," says Marti Paulin.

"If I didn't have the online forum, I'd have to drive 20 miles each way at night to get to my local group," says Cheryl Turney.

"Where else can I talk with people as insane as I am, from all over the country? Seriously, the forum offers me a great place to talk about what a writer goes through, with people who understand," says Eric Lopkin.

"The forum fires my creative

juices—and adds to my degenerate vocabulary," says Donna Carlene.

"It's fun to chat with folks as poor and stubborn as I am," says Alex Tishchenko.

"I enjoy the writing contest. It forces me to come up with things on a regular basis," says Mike Cervini.

Even though I'm a forum leader and editor of "The Writer's Newsletter," I still learn something from speaking with other writers. We've also been fortunate enough to have guest speakers such as Arlan Andrews, Poul Anderson, and Lawrence Block drop in to answer questions and give writing tips. Occasionally an editor such as Eric Lopkin (Lopkin Publishing) or Tom Netsel (COMPUTE's Gazette) will stop by to offer advice. And remember, the Writers' Forum on Q-Link is only one such network. Imagine what joys await you elsewhere. (See "Writers' Forums" for additional information.)

### Commissions and Submissions

On the national services, you never know when you might speak with an editor who's looking for someone to write an article, and it could be a topic with which you're familiar. At other times, an online conversation might

spark an idea that could lead to an article or story. This very article was partially queried and updated via E-mail and online meetings on QuantumLink.

Most services have online magazines or areas where you can submit work for others to read. This is also a great way to gain feedback on your writing.

Fiction is popular, and some areas ask you to post articles and nonfiction. Another area of considerable interest is poetry. Here, poets can post their works, and readers are encouraged to leave comments.

*Number: 3/26 -Doze with Prose — Poetry*

*Date: 10:59 p.m. Tues., May 19, 1992*

*From: Paul #57*

*Title: More Poetry*

*Today*

*I remembered*

*Our old phone number.*

*Like a long ago children's rhyme*

*It came back to me.*

*I recall phoning late—*

*On the road, still*

*To tell you*

*I'm OK; I'm alive.*

*Sometimes breathless,*

*Sometimes angry,*

*You'd tell me*

*—hurry home.*

*A machine tells me that the number*

*Is disconnected*

*And I wonder*

*Who calls you now?*

*But more,*

*I wonder*

*Why I want to*

*Still.*

*—Paul May 27, 1990*

### Into the Future

Computers are the writing tool of the late twentieth century, but networks are playing a major role as writing moves into the twenty-first. If you write with a computer, you owe it to yourself to use this tool as something other than an electronic typewriter. Use it to exchange ideas with other writers, conduct research, submit articles and ideas to publishers, get feedback on your work, and more.

You could never have this amount of power with a typewriter alone, so harness this power and put it to work for you. Writing is an ancient art, but the tools and technology associated with it are still growing. Don't be left behind! □



"Someday I'm going to pull a Gauguin; chuck all this, move to Newark and devote myself entirely to computer art."



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## KEYDOS VERSION 2

Version 2 of KeyDOS Function ROM for the 128 is similar to DOS for IBM machines in that it lets you change drives easily and defaults to the chosen drive until changed again. KeyDOS ROM is a chip that contains 20 function key definitions and 20 utilities.

It includes Swapper, a utility that lets programmers work on one program in memory, call up KeyDOS to work in another program, and then go back to the original program. There's 1581 Visual Partitioner, RAMDOS, GEOS SuperRBoot, Video Manager, and Hexpert. The main advantage to the KeyDOS program is that it makes it easy to switch drives.

I was happy to find that installation was easy. It took 5 minutes to take the 128's case apart, 2 minutes to install the chip, 15 minutes to vacuum out cat hair—hey, might as well while you're there—and 4 minutes to put the case back together. Subtract 15 minutes from this if you don't own a cat. In other words, this doesn't take long to install, even for a nontechnician like me. On boot-up, the screen will say *HOLD ALT KEY DURING RESET OR SYS 65366 TO ACTIVATE KEYDOS ROM*. Position cursor over the SYS line, hold Alt, and press Return. You'll get a copyright notice from author Randy Winchester and a message telling you that KeyDOS is installed. Here's a list of how KeyDOS programs your function keys and some other changes.

f1—Load program  
f2—Run program  
f3—Disk catalog  
f4—Run 64 program  
f5—Type SEQ file  
f6—Scratch file  
f7—New active drive  
f8—Scratch and save  
Run—Boot disk/file  
Help—Drive #

The Esc key offers many new commands when used in conjunction with other keys. Commands include Help, a compiler, a 1581 partitioner, a subdirectory key, a batch exec key, GEOS SuperRBoot, CBM RAMDOS, Diskmon, a monitor dump, Hexpert, a drive renumberer, an UNNEW command, a screen

dump, find and replace, an alternate screen, and more. KeyDOS is very useful for running a directory and for running some programs. It's also cool for checking out SEQ files. It allows you to scratch an old file and rewrite a new file in one easy command. If you load it when you first power up, you can examine what's on a disk without loading an extra program.

The program goes downhill from there. I had trouble with the lockups and syntax errors. I needed to reset the 128 almost every third time I attempted different commands. The program includes a demo disk, but it wasn't helpful. It lists nine programs and four sequential files, but I was either denied access or else the 128 locked up whenever I tried to load or run the programs.

Two programs, Write-SEQ-File and Write-List-File, for instance, both tell me that I have no room. I must delete a function key's programming and reprogram a key for these programs, but the manual isn't helpful in telling me how to do this. There are two separate function keys for running 64 and 128 programs. Unless you keep the 64 and 128 programs on separate disks, there's no way of telling a 64 program from a 128 program. Having both types on one disk gives me an error message and forces me to reboot every time I choose the wrong program.

The manual doesn't say which RAM expansion units work with KeyDOS. Since GEOS is the center of my world, I used geoRAM. I tried it and was told to put Desktop 2.0 on the REU, which I had already done. KeyDOS may work with another REU, but not with geoRAM.

Don't worry if programs or files scroll off the screen when a directory is being listed. Go into Utility with Esc-1, and you have a lot of help at your fingertips. KeyDOS has 18 utilities: forward, back, select, unselect, toggle selection, select all, copy, select drive, directory, new disk/list, print, quit, rename, scratch, type, unselect all, 1581 subdirectory, and drive command. Type, for example, sends SEQ files to the screen in PETSCII, true ASCII, and Screen mode.

This utility is great for renaming files, scratching files, and printing

files, but it requires you to call up the directory again. The program doesn't re-display the directory by itself, but this is a small point.

I gave an incorrect command to print, and then realized my printer was not hooked up. The program kept telling me to redo from the start or enter a device number. It would have been handier to default back to the program. As it was, I had to reboot yet again.

The compiler allows you to reassign functions to different function keys. You can save any new configuration to disk and reload it the next time you wish to use it. The 1581 Visual Partitioner lets you not only format a disk but also add a partition to a previously used disk.

The monitor dump sends the monitor output to either a PETSCII disk file or a PETSCII printer. Diskmon and Hexpert should be very useful for machine language programmers.

With KeyDOS you can renumber drives, reset drives, run new collect, rescue a deleted program, execute programs on the alternate screen, install a find/replace/scroll utility, execute a one-drive routine, and run Screen Edit, Clock Manager, and Video Manager.

With Video Manager, you can change the cursor's shape, flash rate, and blink rate. You can use an interlaced monitor, and you can select from 80 colors for text and background. The colors appear only as shades of gray on an RGB monitor. It's also possible to change the background and text to the same color, making the text invisible. This can cause panic city the first time you do it, before you figure out how to undo it. Be prepared for massive button pushing. I had to press f3 at least twice and sometimes three times before I could call up a directory. When I accidentally changed both text and background to the same shade of gray, it took three pushes to change the color. Of course, there's the good old reset button (unless your screen is totally gray). KeyDOS is a specialized product that will appeal to some users more than others. Average users like me probably won't find it as useful as programmers will. If you're a programmer, you'll probably love KeyDOS.

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