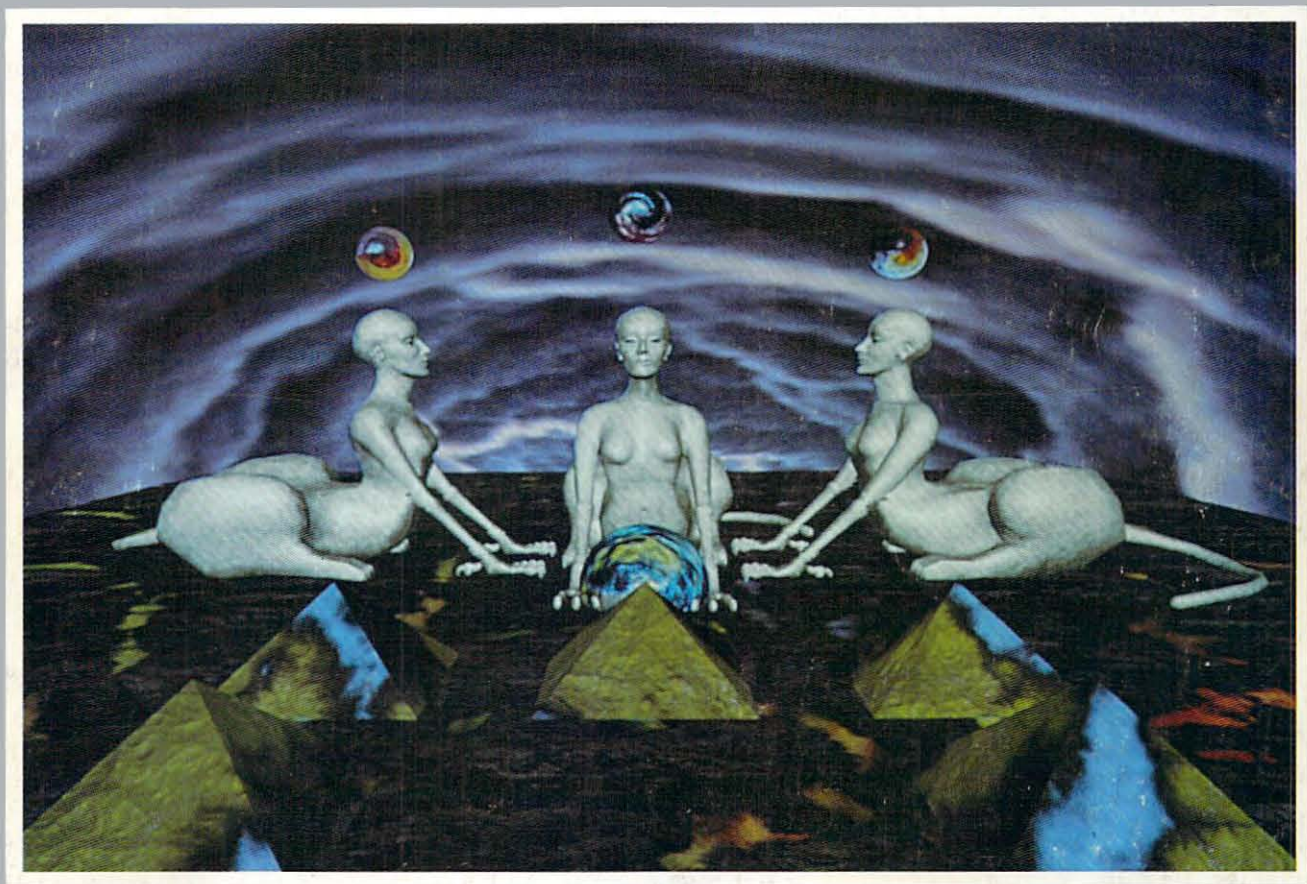


10 CD-ROM DRIVES TESTED—WHICH ONE'S BEST?

COMPUTE

OCTOBER 1991

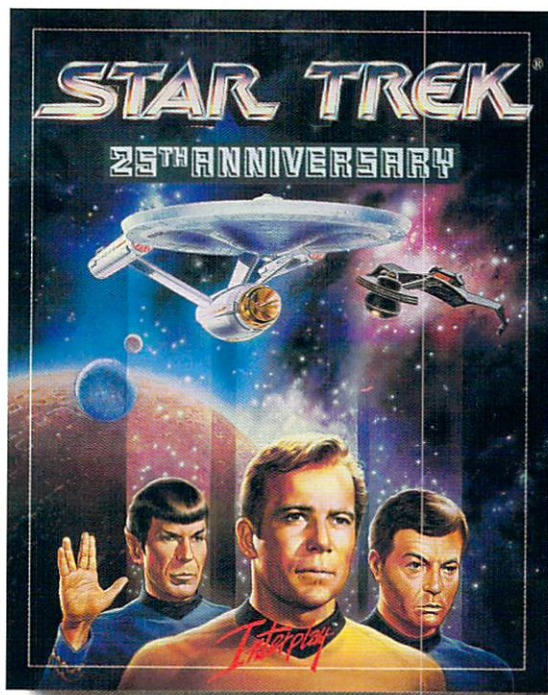
SPECIAL ANNIVERSARY ISSUE



\$25 VIRUS SOLUTION
5 KEY STRATEGIES FOR TELECOMMUTERS
COMPUTE GOES ONLINE
NEW PC TOOLS AND CARMEN SANDIEGO REVIEWED

THE VOYAGE CONTINUES!

STAR TREK: 25th Anniversary™



Fasten your seatbelts, bring your seat backs to an upright position, and stow away those other computer games. You're about to pilot a Federation Starship on a wild roller coaster ride through the final frontier.

STAR TREK: 25th Anniversary combines a realistic, 3D space flight simulator with a wide variety of role-playing adventures to create a gripping game of galactic exploration.

You'll play James T. Kirk and experience the thrill of piloting the U.S.S. Enterprise™ using Interplay's stunning, new, state-of-the-art, digitized model graphics. You'll control phasers, photon torpedoes, shields, communications, and warp drives in 3D space action so real you'll be reaching for your airbag!

Scan and survey hundreds of fractally generated worlds and then join a landing party sent down to map and interact with alien races and artifacts. So beam aboard the



U.S.S. Enterprise™, and continue a quarter century of exploration and high adventure.

- Full 256 color VGA graphics
- Thousands of state-of-the-art, 3D digitized, space action scenes
- Interact with dozens of alien races
- Navigate Kirk, Spock and Bones on a variety of world explorations
- Complete musical score featuring digitized sound effects from the series and major sound board support
- Easy to use, point-and-click, icon interface

To order STAR TREK: 25th Anniversary, call 1-800-969-GAME. Available on MS-DOS compatible machines for \$59.95.



Interplay Productions
3710 S. Susan, Suite 100
Santa Ana, CA 92704
(714) 549-2411

MS-DOS Screens Pictured.

Circle Reader Service Number 134

TM, ® and © 1991 Paramount Pictures. All Rights Reserved. STAR TREK and U.S.S. Enterprise are Trademarks of Paramount Pictures. MS-DOS is a Trademark of Microsoft Corporation.



COMPUTE'S

GETTING STARTED WITH™

WHY YOU SHOULD GO ONLINE 2

Whatever you're into, you can find an online group that's devoted to it.

COMPUTE GOES ONLINE 3

Put away your pen and stationery—*COMPUTE* is just an autodial away.

HOW TO CHOOSE A MODEM 4

Contrary to popular opinion, all modems are not created equal.

HOW TO CHOOSE A COMMUNICATIONS PROGRAM 5

A modem without the right program is like a radio without an antenna.

HOW TO CHOOSE AN ONLINE SERVICE 8

Talk is cheap—even when you pay for your words by the minute.

ONLINE SERVICE SAMPLER 10

Six top online services, each with its own distinct personality.

ONLINE COMMUNICATIONS GLOSSARY 16

How can you communicate if you don't know what the words mean?

WHY YOU SHOULD GO ONLINE

D A V I D E N G L I S H

In the 1970 movie, *Colossus: The Forbin Project*, the largest American computer demands to be connected to the largest Soviet computer so that the two computers can share their enormous data banks. It seems that curious computers and intelligent humans always want to know more about the world around them.

This urge to merge has grown even stronger over the last two decades. In the 1970s, we networked our dumb terminals by wire to the nearest large computer. In the 1990s, we can connect our personal computers by phone to just about any computer—large or small. With personal computers, you can have a network based on choice. The result is a series of global communities created not by geography but by interest.

- If you're a professional musician, you can chat about music with an electronic community of musicians on PAN (Performing Artists Network)—even though you live in a mountain lodge in Arkansas and your electronic neighbor lives in an apartment building in downtown Tokyo.

- If you're an animal-rights activist, you can organize an effective letter-writing campaign by leaving a message on GENie's Pets RoundTable—even though you have no idea where any of the members live.
- If you have to write a research paper and need information on the various federal agency libraries, you don't have to travel to Washington, D.C. You can stay where you are and use your modem to call the Library of Congress BBS.
- If you're a beginning poet, you can find other poets on the major online services who will gladly read and critique your writing.

No More Excuses

Whatever your interests—music, sports, investments, grassroots politics, movies, programming, science fiction—there are online communities devoted to the things that you're into. And now that modems and communications software are cheaper than ever, there's really no excuse for not getting involved in online communications. □

COMPUTE GOES ONLINE

Ever wish you could download an article from *COMPUTE* into your word processor or talk with a *COMPUTE* editor? Maybe you'd like to replace a lost disk from a back issue of *COMPUTE!'s PC Magazine* or find a *COMPUTE* book that's been out of print for several years. Now you can do all these things with a single phone call, 24 hours a day.

Starting immediately, you can go online with *COMPUTE* on either GENie or America Online. You'll find complete back issues of all the *COMPUTE* magazines for the years 1991, 1990, and 1989; previously published disk products for PC, Amiga, Commodore 64, and Atari ST computers; the complete text of out-of-print *COMPUTE* books; excerpts from currently published *COMPUTE* books; digitized NASA photos; special feature sections for *COMPUTE's Getting Started with . . .*

booklets and *COMPUTE's* Test Lab; and application macros and templates. You'll also be able to order *COMPUTE* products online.

Over the coming months, we'll be adding a submarine simulator game and back issues from years prior to 1989. On GENie, we'll also have a complete bulletin board, covering such topics as software tips, *Windows*, industry rumors, feedback to editors, programming, hardware care and maintenance, and much, much more.

To reach us on GENie, type *COMPUTE*. On America Online, make your way to the main menu, click on the Computer and Software icon, click on the Computer News and Magazines icon, and click on the *COMPUTE* icon.

Look for more information in the main part of this month's *COMPUTE*—including instructions on how to sign up for GENie and America Online.

—David English



HOW TO CHOOSE A MODEM

T O N Y R O B E R T S

If you're going to link up with bulletin boards and information services, you'll need a modem. For general telecommunications tasks, such as logging on to bulletin boards and downloading files, nearly any modem will do. The amount you should spend and the features you should look for depend on how much you'll use your modem. Consider these items when selecting a modem:

- **Hayes compatibility.** The Hayes command set is a group of commands that communications software uses to configure the modem. It was introduced in the early 1980s in modems produced by Hayes Microcomputer and has since become the standard. You'll want Hayes compatibility in a modem.
- **Speed.** Currently, there's no point buying any modem slower than 2400 bits per second (bps). Although information services such as GENIE and CompuServe are adding 9600-bps nodes, most casual users will find 2400 bps adequate.
- **Error correction and compression.** Once found only in the most expensive modems, error correction and compression capabilities are now available in many lower-priced models. Error correction protocols include Microcom Network Protocols (MNP) 2-4 and CCITT V.42. Compression schemes include MNP 5 and CCITT V.42bis. In order for error correction and compression to work, modems on both ends of the line must have the same capabilities.
- **Internal versus external.** The choice depends on your setup. An external modem needs a serial port, a data cable, and an AC outlet; it also occupies desk space. On the plus side, you can easily move an external modem from computer to computer. Because internal modems don't require a power supply or case, they're usually a little less expensive. In addition, you can usually configure an internal modem for COM3 or COM4 if your other serial ports are occupied.
- **Fax options.** Many modems include some fax capability. This can be a real convenience, letting you send faxes from your PC rather than having to wait in line for the office fax machine. □

HOW TO CHOOSE A COMMUNICATIONS PROGRAM

M I C H A E L A . B A N K S

While most of the features in communications programs are there because users need them, many others are added simply to keep up with the competition. Because of this, buyers are faced with a dizzying array of features and options—many of which they may not need. Here are some of the more important features to look for.

- Command set compatibility. A communications program must use a command set that's recognized by the modem with which it's used. This will, more often than not, be the AT command set—or a subset of it.
- Variable communications parameters. At the very least, you should be able to change these parameters: communications speed (bits per second), the number of data bits in each character, the number of stop bits used, parity, and echoplex (duplex).
- Automatic dialing support. Most modems can dial a number automatically. They can accept a number from the communications program (or one entered by the user) and dial the number without using a telephone set. If you use this kind of modem, you'll naturally want software that supports autodialing. It should issue the commands necessary to tell the modem to take the phone line "off hook" and dial a number.
- Originate/answer mode switching. If you plan to use your computer and modem to receive as well as make calls, your software must support switching between the originate mode (make a call) and answer mode (receive a call). Manual-dial modems usually have an external switch to perform this function. Autodial modems usually rely on software commands to switch between originate and answer modes.
- Telephone hangup. Most BBSs and online services automatically disconnect at sign-off. There are some systems, however, that rely on

the calling system (your system) to disconnect. A remote system can also become stuck or go berserk and start displaying text or garbage on your screen. If the software can't hang up the telephone, you'll have to turn off your modem or unplug the telephone line.

- Autologon files. Signing on to a BBS or online service requires several steps, including ID and password entry. If you're accessing an online service via a packet-switching network, there are additional steps involving routing your call to the online service. Fortunately, the sign-on process can be automated if your software provides autologon files (also known as script files or command files). Programs such as *Crosstalk XVI*, *Crosstalk for Windows*, and *Mirror III* come with template files for various online services. All you have to do is supply your telephone number, user ID, and password.
- Parameter files. Programs that don't have a full scripting language may at least allow you to store telephone numbers and parameters in files that you can load into memory. Such files save you the trouble of entering communications parameters every time you dial a system, although you still have to go through the sign-on process manually.
- Dialing directories. A dialing directory may store telephone numbers and communications parameters, or it may store only telephone numbers. Numbers (and parameters, if included) are usually stored in a directory format, accessible by name. With the proper command, the program can retrieve a specified number from a directory file and direct the modem to dial it.
- Capture buffer. If you're a slow reader, you may spend more time than you wish online, pausing the screens of text. If your software provides a capture buffer, you can hold and temporarily store text. Most communications programs with capture buffers allow you to access the text in the capture buffer and store it in a disk file.
- Backscrolling. Many programs that provide a capture buffer also provide a feature called backscrolling. This feature allows you to view (scroll back over) text in the capture buffer. Backscrolling is handy when you need to review something that has scrolled off your screen.
- Binary-file transfer protocols. A binary-file transfer protocol (also called error-checking protocol) is necessary if you intend to transfer programs or binary data files. This is because some of the characters used in such files appear as end-of-file markers to a receiving system if

they're being transferred as straight ASCII files. Your communications software package should offer at least one binary-file transfer protocol. The most popular protocols are XMODEM, ZMODEM, and Kermit, although several others are in use on various systems, among them YMODEM and Windowed XMODEM.

Straight Versus Front-End

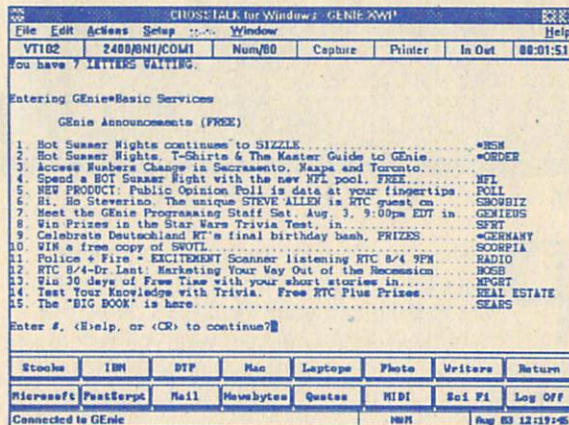
Communications software comes in two broad categories: straight and front-end. A straight program is a general-purpose telecommunications program, while a front-end program is designed to communicate with a specific online service.

Because a front-end program is dedicated to a single service, it's much easier to use it to automate such tasks as E-mail, bulletin board postings, and file transfers. Software packages in this category include *Aladdin* for GENie, *Lotus Express* for MCI Mail, and *CompuServe Information Manager* for CompuServe.

Menu Driven Versus Command Driven

Like most application programs, communications software is either menu driven or command driven. Which way a program operates can be very important in terms of your personal preferences.

A menu-driven program lets you select com-



Crosstalk for Windows 1.2 from DCA

mands from a menu or menus. It may provide one menu containing all the commands, or it may use a main menu from which you can select submenus.

Command-driven software displays no menus; rather, you issue commands on what is called a command or status line, or press a combination of keys (usually including the Ctrl or Alt keys) or special designated keys (such as the function keys).

A number of communications programs are both menu and command driven. This is the most efficient setup if you're new to telecomputing. □

HOW TO CHOOSE AN ONLINE SERVICE

M I C H A E L A. B A N K S

8 **P**erhaps you're new to online communications. Or maybe you've only used your modem to call your local BBS. Now that you've gotten your feet wet, you're probably wondering what the online services—such as CompuServe, GEnie, Prodigy, and America Online—are all about.

An online service provides modem users with a variety of information, entertainment, education, and communication services. In most American cities, you can dial these services directly or through a third-party network (such as Tymnet).

Variety Pack

All these systems offer a mix of E-mail, databases of one type or another, special-interest groups, message bases, and realtime conferences. In addition, most of the consumer services offer some or all of the following:

- News and weather. These services include regional, national, and international news; weather by city, state, or region; and specialized news such as sports and financial news. The news is from the same sources that other media use—newswires and syndicates.
- Financial information and services. Stock and commodity quotes, market reports, and brokerage services are offered online by many of the big-name investment companies. Some systems can automatically update your portfolio.
- Entertainment. Online entertainment is very popular. There are single- and multiplayer games, played realtime or via postings in message bases. Most online games mirror the disk-based computer games, so you'll find a lot of role-playing and adventure games. You'll also find arcade games (most of these require special software or terminal emulation).

- Reference and education. Online encyclopedias head the list here. You can find products such as *Grolier's Academic American Encyclopedia* and *Compton's Encyclopedia* on just about every service. A variety of other references are also available, ranging from *Marquis Who's Who* to the *Magazine Index*. Education services include the *College Board* and *Peterson's College Guide*, as well as online tutoring, study, and degree programs.
- Special-interest groups (SIGs). These are the heart of many online services. Known variously as Forums, RoundTables, and conferences, SIGs host a variety of services, including message bases, databases, upload/download services, and online advertising and sales.
- Travel services. This usually takes the form of travel information that's sponsored by a carrier, destination, or travel agency.
- Shopping and online product support. Online shopping is just now coming into its own. Although specialty retailers and computer and software discount operations have enjoyed some success online over the years, it's taken the presence of major national retailers such as Waldenbooks and Sears to legitimize online shopping. Online product support—almost exclusively for computers and software—has been fairly well received, although there seems to be competition among online services to be the only host for some companies' online product support.
- Specialized news and database services. As you might expect, there are a number of computer news services and columns online. Some are unofficial products in the form of special-interest newsletters, such as "PC Review Online." These are usually found in the public database areas. Others are official products, such as Charles Bowen's "A Networker's Journal" on CompuServe and GENie, that are presented in their own areas or as menu selections. Specialized newsletters that have nothing to do with computing are also showing up. Among these you'll find newsletters for occupations such as writing, public relations, and advertising.
- Full-text versions of magazines and newsletters. Selected computer magazine articles and program listings have been popping up within SIGs for some time, but it's only since the late 1980s that the complete contents of computer magazines have been online. Online versions of noncomputer magazines, such as *National Geographic*, are much less common. □

ONLINE SERVICE SAMPLER

M I C H A E L A . B A N K S

America Online

Introduced in October 1989, America Online (AOL) uses a graphical user interface based on *GeoWorks Ensemble*, complete with icons and pull-down menus.

America Online features a sophisticated E-mail system that lets you review messages you've already read, copy them to disk, attach files to messages, and check to see whether a message has been read. A systemwide member directory lets you see where a member is from and read the member's profile (if he or she has entered one).

Special-interest groups, called Forums, provide message bases and realtime conference areas. The conference areas are referred to as rooms and auditoriums. AOL's Forums cover specific computing, hardware, and software interests, as well as hobby, lifestyle, and personal interests that range from science fiction to veterans' concerns.

You can download files from the individual Forums or from a central area. AOL uses a proprietary binary file-transfer protocol.

The ability to search for software from within a central area makes it easy to find files. You can specify any combination of categories, range of time, or keywords. The search facilities in the message bases are similarly well designed.

Among AOL's other highlights are national news, weather, and sports; stock quotes; travel services such as Eeasy Sabre; shopping with Comp-U-Store online and other vendors; computing and consumer news features and columns; and access to *Grolier's Academic American Encyclopedia*.

Online gaming is popular on AOL. There are several play-by-mail games and single-player games. Of particular interest is *Rabbit Jack's Casino*, which lets you play blackjack, bingo, and other games in realtime with other players or against the house.

AOL's rates are \$5.00 an hour during nonprime time and \$8.00 an hour during prime time, with a \$5.95 minimum charge each month. (The minimum charge includes one hour of connect time.) You can contact America Online at (800) 227-6364.

BIX

BIX is an acronym for *Byte Information eXchange*. Established in 1985, BIX uses the UNIX-based COSY computer-conferencing system. (That's computer conferencing in the traditional sense of the term—meaning conferencing via message bases, not realtime conferencing.)

BIX has four main services: computer conferencing, electronic mail, realtime conferences, and software/file databases. An area called options lets you set up and change how BIX communicates with you. In addition, you can create an online résumé with information about yourself that other users can access from most prompts by typing *show resume <username>*.

The heart of BIX is its computer-conferencing system. The system is based on a series of message-base subject areas called conferences, each of which is a part of a group of related conferences. BIX currently hosts over 200 conferences. Individual conferences are further organized into topics that are appropriate for the conference subject.

The conference system is fairly sophisticated. In addition to letting you read, scan, post, reply to, and search for messages, BIX allows you to locate and follow message threads, and much more. You can participate in (join) as many or as few BIX

conferences as you like. And you can select specific topics within a conference to participate in. (A few conferences are closed, which means that you must ask or be invited to join them.)

BIX's CBix realtime conferencing system is a fairly easy-to-use multiband, multichannel CB simulator. Features include whispers and handles. The system makes interesting use of specific terminal features. If your software can emulate a VT-100 or any of a dozen or so other terminals, you can take advantage of screen clearing, a chat window, a window for whispers, and other special features.

You can find downloads of all types in special BIX areas called listings. ASCII, Kermit, XMODEM, XMODEM/CRC, YMODEM, and ZMODEM protocols are available for file transfer. (Billing is automatically turned off when you upload a file.)

BIX gives users their choice of per-minute billing or a flat rate. The flat rate is \$39 each quarter for unlimited access to BIX, 24 hours a day. The hourly rate is \$4, 24 hours a day, with an annual subscription fee of \$59. Neither plan includes the costs for access via a packet-switching network, such as Tymnet or BIXnet. You can contact BIX at (800) 227-2983.

CompuServe

CompuServe is one of the world's largest public online services. It was also one of the first commercial online services to cater to computer hobbyists. Established in 1979, CompuServe today has more than 750,000 subscribers.

The TOP menu is like the tip of an iceberg. While it shows in general what's there, there's much more than the TOP menu even implies. Literally hundreds of services exist on CompuServe—among them some extremely useful areas dealing with electronic communications. Beyond this menu lie general and specialized news and information services; special-interest groups (called Forums) for computer users, professionals, hobbyists, and others; online games and other entertainment; sophisticated research services; a free online tutorial; and more.

You'll find the standard newswires, including AP, UPI, and Reuters, as well as more exotic services, such as TASS. There's also a clipping service that delivers news stories to your E-mail box, based on the keywords that you specify.

CompuServe is particularly strong in online research facilities, among them *Grolier's Academic American Encyclopedia* and gateways to Dow Jones News/Retrieval Service and several special-

ized services—including IQuest, a collection of more than 700 specialized research databases.

The Forums feature sophisticated message bases, a reasonable database system, and realtime conferencing that's separate from the system's CB Simulator.

Also of interest are CompuServe Mail's two-way gateways to MCI Mail and Internet. CompuServe Mail can handle outgoing fax and telex messages, as well as paper mail. You can also use CompuServe Mail to transfer files to other CompuServe users.

File-transfer options in Forum databases, E-mail, and certain product areas include ASCII, XMODEM, XMODEM/CRC, CompuServe's own B and B+ protocols, and others.

CompuServe's basic rates are \$5.00 an hour at 300 bps and \$12.80 an hour at 1200 or 2400 bps, through CompuServe's own network, 24 hours a day. There are additional charges for higher speeds and for access through other networks. Various optional service plans are available, and gateways and certain other services have surcharges.

As of this writing, CompuServe is testing a plan whereby a specific group of monthly services is made available for \$7.95 a month. You can contact CompuServe at (800) 848-8199.

DELPHI

Established in 1982 as an online encyclopedia (the first of its kind), DELPHI has evolved into a full-service network, providing products and services of all types. It's an especially friendly system with a real sense of community and a good place to meet others who share your interests.

Like CompuServe's TOP menu, DELPHI's Main Menu is just the tip of the iceberg. DELPHI offers a variety of news and information services, online entertainment, special-interest groups, two online encyclopedias (*Grolier's* and the original *Kusmaul Encyclopedia*), a unique gateway to the DIALOG information service, and more.

DELPHI's special-interest groups are noteworthy for the BBS-style communication facilities they provide and for the software and information that are available to download. The SIG message bases are extremely sophisticated, letting you find messages based on almost any criteria imaginable, including content. The SIG database structure is equally sophisticated and lets you use multiple keywords to narrow or widen your searches.

Also of note on DELPHI are the weekly online realtime poker and trivia tournaments, a scrambled word game, and games that take advantage of VT-100 terminal emulation.

You get a personal online storage area, called Workspace, which you can use to store your files or to transfer your documents for E-mailing. File-transfer options in Workspace, SIG databases, and certain other areas include ASCII, Kermit, XMODEM, XMODEM/CRC, YMODEM, YMODEM/Batch, and ZMODEM.

Of all the E-mail systems offered by consumer online services, DELPHI's is the most powerful yet easiest to use (once you learn it). Not only can DELPHI members send fax and telex messages, but they can also receive incoming telex messages free of charge beyond normal connect-time charges.

The basic plan costs \$6.00 an hour during nonprime time, with a \$5.95 a month minimum (this covers your first hour online). DELPHI's 20/20 plan costs \$20.00 a month, for 20 hours of nonprime-time access. Under this plan, additional time costs only \$1.20 an hour. The 20/20 plan is available only for those who access DELPHI through Tymnet and includes the Tymnet charges. Unlike the flat-rate or alternative plans offered by some services, the 20/20 plan covers the entire service. A few areas, such as DELPHI's link to DIALOG, require a surcharge no matter which plan you use. There's also a \$39.00 sign-up charge. You can contact DELPHI at (800) 544-4005.

GENie

Established in 1985, GENie is the fastest-growing service of its kind. It enjoys a tremendous growth rate, thanks to its variety of services, aggressive advertising, and friendly price structure.

GENie offers the same categories of services as CompuServe and DELPHI. News, weather, sports, and travel information are particularly strong areas for GENie, as are its versions of special-interest groups, called RoundTables.

The RoundTables are fairly easy to use, even though the message bases aren't very sophisticated and you can't specify more than one keyword when you search a RoundTable's software library.

Online research facilities include *Grolier's Academic American Encyclopedia* and a gateway to Dow Jones News/Retrieval Service. GENie's news offerings include searchable headline news and columns by a number of well-known writers in the computer field. There's also a clipping service that delivers news stories of interest to your E-mail box, based on the keywords you specify.

With GE Mail—GENie's E-mail service—you can send letters to and receive them from other GENie users, and send paper mail and fax messages. GENie offers a unique option by which a GENie user can have his or her own telex number

for an extra fee. While GENie has no personal file system as such, you can upload messages to send to other GENie users via a special utility. GENie's mail address file features a flexible search system that you can use to find both GE Mail addresses and the names of people online.

In addition to trivia, parlor, sports, role-playing, and single-player adventure games, GENie has some very attractive realtime multiplayer action games. In particular, *Air Warrior* has attracted a large and extremely devoted following.

GENie offers 300/1200/2400 baud access through its own national network of direct-dial local numbers in several hundred U.S. cities. It also has an increasing number of 9600-bps and V.32 nodes, and even some V.42 nodes.

For just \$4.95 a month, you can have unlimited nonprime-time use of E-mail, news, and other selected services. GENie charges \$0.10 a minute during nonprime time for services that aren't included in the flat-rate plan (including the RoundTable software libraries and realtime conferencing). The prime-time rate is \$18.00 per hour with a surcharge for 9600-bps access.

Certain products, such as GENie's gateway to Dow Jones News/Retrieval Service, cost extra. You can contact GENie at (800) 638-9636.

Prodigy

This high-resolution graphics-based service is very different from the other consumer services in both how it's set up and what it offers. If you're a software junkie looking for downloads or you're a realtime conference maven, you won't find those things here. But Prodigy has virtually all the other trappings of a full-service consumer service. And you'll find some unique offerings among its more than 750 products and services.

Prodigy is a partnership of IBM and Sears that's intended to be a simple yet powerful online service for the general consumer market. Given its goals, Prodigy has done a good job in reaching its intended audience—those with computers who aren't technically oriented.

E-mail, news, weather, and travel information head the list of Prodigy offerings. Reading news on Prodigy is a lot like reading a newspaper; you can select news to read by headlines and jump to other articles whenever you wish. Like a newspaper, Prodigy offers pictures and charts—in the form of color graphics—along with the news.

Several nationally known magazines are Prodigy service providers. Among them is *National Geographic*, which provides an especially attractive and enlightening excerpt each month. You'll

also find *Billboard* music charts, *Changing Times* magazine, and magazines for young adults and children (including *Weekly Reader*).

Online gaming is also graphics intensive. Graphics-based games include *Police Artist* (a game that challenges children to combine different elements of faces to match a suspect's picture) and *MadMaze* (a role-playing/adventure game). There's even an online *Where in the World Is Carmen Sandiego?* with a new adventure each week.

Grolier's Academic American Encyclopedia heads the list of reference resources on Prodigy, which also includes columns and clubs on a variety of home, special-interest, and business topics, as well as information from computing and general-interest magazines.

Prodigy costs \$12.95 a month for unlimited access, day or night. You can have as many as six IDs per household—so you are, in effect, getting six accounts for the price of one. Prodigy's 6-, 12-, and 24-month memberships are available for \$65.70, \$119.40, and \$199.95, respectively.

Startup kits are sold for \$39.95 at Sears and computer stores nationwide. However, Prodigy runs constant promotions in which the software is given away, along with a month's free trial. You can contact Prodigy at (800) 822-6922. □

ONLINE COMMUNICATIONS GLOSSARY

16

baud rate A measure of the speed that a modem can send and receive data—specifically, the number of events, or signal changes, that can occur each second. Because an event can contain more than one bit, a modem's baud rate and bps are not always the same. See also **bps**.

bps (bits per second) A measure of the speed that a modem can send and receive data—specifically, the number of bits that can be transferred each second. Often confused with baud rate. See also **baud rate**.

download The process of receiving a file by modem. See also **upload**.

duplex Communication that occurs in both directions at the same time between two computers. One-way communication is called simplex, and two-way communication taking place in only one direction at a time is called half-duplex.

E-mail (electronic mail) The transmission of messages from one computer to another by way of an electronic network. This network can be either a local area network (LAN) or a larger communications network, such as CompuServe or GENie.

MNP (Micom Network Protocol) A set of error-correction and data-compression standards that was developed by Micom and made available to other

modem manufacturers.

modem (modulator/demodulator) A device that allows a computer to send information over a standard telephone line.

parity An extra bit that a modem sends with each character to check the accuracy of that character. Common types of parity are even parity, odd parity, no parity, space parity, and mark parity.

stop bit The bit that signals the end of a character during an online transmission. The data bits that make up a character are usually followed by 1, 1.5, or 2 stop bits.

upload The process of sending a file by modem. See also **download**.

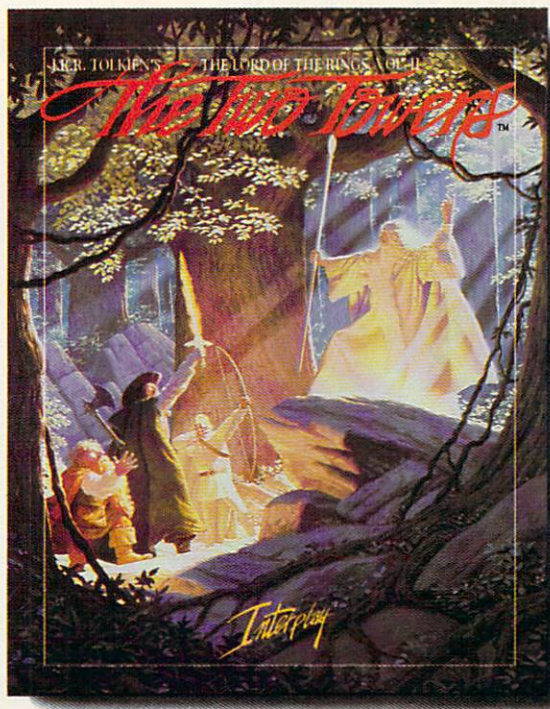
OUR NEXT ISSUE:
COMPUTE'S GETTING STARTED WITH™
EASY WINDOWS PROGRAMMING

COMPUTE'S GETTING STARTED WITH™ ONLINE COMMUNICATIONS
COPYRIGHT © 1991 BY COMPUTE PUBLICATIONS INTERNATIONAL LTD.
ALL RIGHTS RESERVED.



This booklet is printed on recycled paper.

TOLKIEN'S EPIC MIDDLE-EARTH TRILOGY CONTINUES!



ORDER DIRECT
 FROM INTERPLAY AND RECEIVE
 A VIDEOCASSETTE COPY OF
THE RALPH BAKSHI MOVIE
THE LORD OF THE RINGS™
 —ALONG WITH—
THE LORD OF THE RINGS, VOL. II™
CLUE BOOK
 A \$41.95 VALUE
FREE
 WHILE SUPPLIES LAST

J.R.R. TOLKIEN'S THE LORD OF THE RINGS, VOL. II

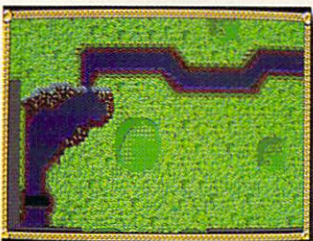
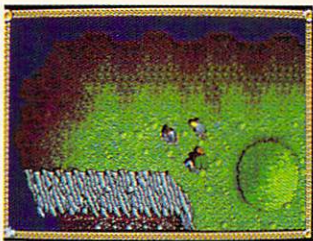
The Two Towers™

The legendary tale lives on, as *The Two Towers™* picks up where the critically acclaimed *The Lord of the Rings, Vol. I™* left off. The wicked Lord Sauron persists in his quest to capture the one true ring of power. But now the Evil Wizard Saruman, with his insatiable lust for power, is after it as well.

You, the player, control a party of benevolent characters in this captivating, role-playing adventure as they battle orcs, trolls, wargs, ghosts, and oliphaunts.

You'll travel through the dark and mysterious Forest of Fangorn, over treacherous mountain passes, past the great fortress cave complex, through the ghastly marsh of the eternal spirits and, ultimately, come face to face with the mysterious two towers.

All the color and imagery of Middle-earth comes to life with state-of-the-art, 256 color VGA graphics, a new and enhanced interface, full musical score, digitized speech, and colorful animations.



MS-DOS Screens Pictured.

The Two Towers™ is a stunning sequel that will involve you deeply in the Tolkien experience.

- Stands alone as a game or plays as a sequel
- Automapping
- Full screen, 256 color VGA graphics
- Complete musical score and digitized speech and sound effects for all major sound boards
- Enhanced, easy to use, point-and-click interface
- Thousands of screens of Middle-earth terrain to explore

To order *The Two Towers™*, call 1-800-969-GAME.

The Two Towers™ is available for MS-DOS machines at \$59.95.



Interplay Productions
 3710 S. Susan, Suite 100
 Santa Ana, CA 92704
 (714) 549-2411

Circle Reader Service Number 135

The program is published with the cooperation of the Tolkien Estate and their publishers, George Allen & Unwin (publishers) Ltd. The plot of *The Lord of the Rings*, characters of the hobbits, and the other characters from the *Lord of the Rings* are ©George Allen & Unwin Publishers Ltd. 1966 1974 1979 1981 © 1991 Interplay Productions. All rights reserved. J.R.R. Tolkien's *The Lord of the Rings, Vol II: The Two Towers™* is a trademark of Interplay Productions, Inc. MS-DOS is a trademark of Microsoft Corporation.

COMPUTE

VOLUME 13, NO. 10, ISSUE 134

OCTOBER 1991

6

EDITORIAL LICENSE

By Peter Scisco
Americans embrace technology even as they debate its effects.

8

NEWS & NOTES

By Alan R. Bechtold
Arcade 3-D, voice control for PCs, a real editor, and more notes on the news.

14

FEEDBACK

Legal copies, cheers and jeers, how to park, bad clusters, and more reader mail.

18

THE STATE OF COMPUTING: U.S.A.

By Gregg Keizer
They're everywhere. Computers have altered the American home and office more than any other appliance.

28

SHAREPAK

By Richard C. Leinecker
This month's disk brings voice capability, 3-D designs, world conquest, and chess to your PC.

30

TEST LAB: 386SX DESKTOP SYSTEMS

This month we take on ten hot SX machines.

44

VIRUSES FROM A TO Z

By Mark Minasi
Computer viruses. Mysterious and malevolent. Be prepared for any contingency.

50

ON DISK

By Tony Roberts
VIRUSCAN, *Useful Notes*, *Directory Size*, *Big Desk*, and *Mr. Filter* help your PC.

52

POINT & CLICK

By Clifton Karnes
GeoWorks Ensemble is here.

54

BUYER'S GUIDE TO VIRUS PROTECTION SOFTWARE

By Chantelle Oligschlaeger and Erin Richter
Here's protection.

61

INTRODOS

By Tony Roberts
Create macros.

62

PROGRAMMING POWER

By Tom Campbell
When speed is essential, assembly language is your ticket to ride.

66

TIPS & TOOLS

Speed up DOS, conserve your handles, and operate *QuickBASIC* rodent-free.

68

HARDWARE CLINIC

By Mark Minasi
Choose a hard drive.

73

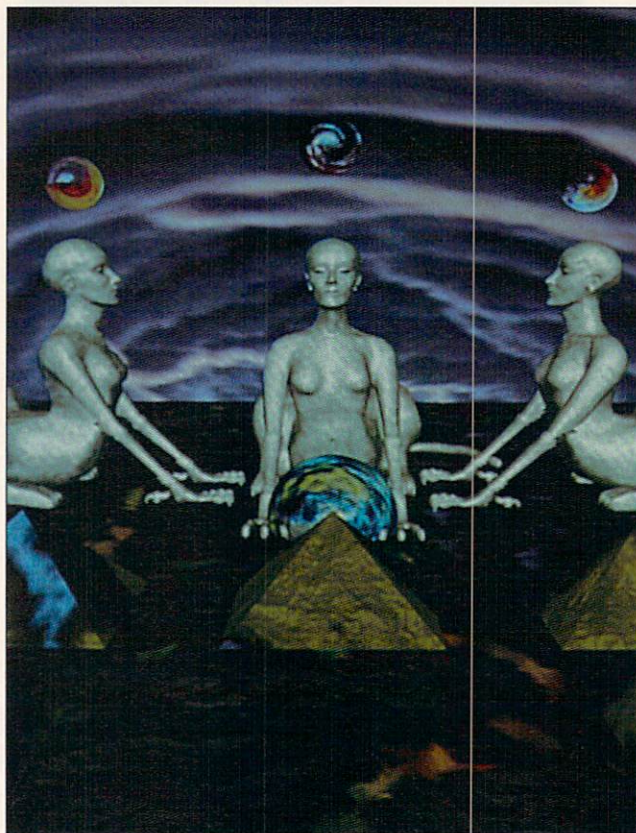
ONLINE

By Denny Atkin
Reach out and play someone.

74

PC TOOLS 7.0

By Tony Roberts
Despite bug reports, it's still a topflight hard disk utility.



The artwork on our October cover, *An Egyptian Dream*, was created by Marcel Achard at *STUDIOS TAARNA*. A computer artist since 1985, Achard used a software package called *Taarna*. The result provokes images of modern mystery and ancient history against a dark desert landscape.

COMPUTE (ISSN 0194-357X) is published monthly in the United States and Canada by COMPUTE Publications International Ltd., 1965 Broadway, New York, NY 10023-5965. Volume 13, Number 10, Issue 134. Copyright © 1991 by COMPUTE Publications International Ltd. All rights reserved. Tel. (212) 496-6100. COMPUTE is a registered trademark of COMPUTE Publications International Ltd. Printed in the USA and distributed worldwide by Curtis Circulation Company, P.O. Box 9102, Pennsauken, NJ 08109. Second-class postage paid at New York, NY, and at additional mailing offices. **POSTMASTER: Send address changes to COMPUTE Magazine**, P.O. Box 3245, Harlan, IA 51537-3041. Tel. (800) 727-6937. Entire contents copyrighted. All rights reserved. Nothing may be reproduced in whole or in part without written permission from the publisher. Subscriptions: US, AFO - \$19.94 one year; Canada and elsewhere - \$25.94 one year. Single copies \$2.95 in US. The publisher disclaims all responsibility to return unsolicited matter, and all rights in portions published thereof remain the sole property of COMPUTE Publications International Ltd. Letters sent to COMPUTE or its editors become the property of the magazine. Editorial offices are located at 324 W. Wendover Ave., Ste. 200, Greensboro, NC 27408. Tel. (919) 275-9609.

You must have heard how **SOUND BLASTER** took the PC market by storm...

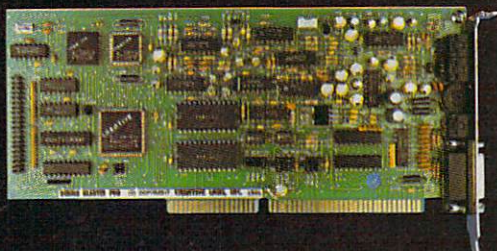
Now the **HURRICANE...**

SOUND BLASTER PRO

Stereo/Music/Voice/Speech/MIDI/CD-ROM Interface/Game Port
The Multimedia Sound Standard



"It's the next-generation sound card and it is loaded! The operative word is "twice." It has twice the sound channels (22) of the original Sound Blaster with twice the quality of sound in stereo, as well as stereo DACs for digitized speech and sound effects."
Computer Gaming World
August 1991



"With its associated software, it has quietly (no pun intended, but what the heck) become the standard sound system for advanced PCs."

Jerry Pournelle, BYTE June 1991

SEE US AT OUR
3,000 SQ. FT. BOOTH
#S2456
COMDEX FALL
SANDS EXPO, OCT 21-25, LAS VEGAS

COMPUTE August 1991

"...Creative Labs is now turning up the volume with the Sound Blaster Pro. It's basically two Sound Blasters on a single card with additional multimedia features thrown in. It has twin FM chips capable of creating 22 individual voices, two DACs for stereo voice and sound-effects playback, a stereo microphone jack, and a built-in stereo mixer that can adjust the volume of all your Sound Blaster audio sources (stereo DAC, stereo FM, microphone, stereo line-in, CD-Audio and PC internal speaker).

The built-in mixer makes the Sound Blaster Pro fully compliant with Microsoft's Multimedia Level 1 Extensions to Windows. Multimedia software will be able to fade-in, fade-out and pan the various audio sources to create elaborate sound montages.

The Sound Blaster Pro includes a CD-ROM interface for either an internal or external CD-ROM player. There's also an internal connector for CD-Audio. The MIDI interface is compatible with the original Sound Blaster's MIDI interface but adds the MIDI time-stamp that's part of Microsoft's new multimedia standard.

All in all, the Sound Blaster Pro is chock-full of new features, yet it's fully compatible with its younger brother."

Reprinted by permission of COMPUTE ©1991,
COMPUTE Publications International Ltd

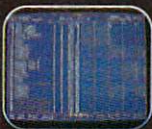
Microsoft and Windows are registered trademarks of Microsoft Corp and Ad Lib is a registered trademark of Ad Lib Inc. Sound Blaster is a trademark of Creative Labs, Inc.

At a devastating price of **\$299.95** and you get a "chock-full of features":

- * Stereo DAC for digitized sound output
- * Stereo voice recording from mic, CD or Line-in
- * Sampling rate 4KHz to 44KHz
- * Stereo 22-voice FM music synthesizer
- * Stereo mixer with digital volume controls
- * MIDI interface with adaptor and cables
- * Built-in CD-ROM interface
- * Joystick Port
- * Microphone AGC amplifier
- * Power amplifier (4W per channel)

and loads of **FREE** bundled software:

- * MIDI Sequencer
- * Pro-Intelligent Organ
- * VEDIT2 - Voice Editor & Utilities
- * SBTALKER - text-to-speech synthesizer with DR SBAITSO2
- * Talking Parrot - voice in/out application.
- * MMPLAY Multimedia Presentation
- * CD music player
- * Windows 3.0 DLL and sound applications



"The big question is, at a list price of \$249.95, is the Sound Blaster worth the investment? Yes, yes, a thousand times yes!!!" **PC HOME JOURNAL**

How many "yes!!!" would you give now that the Sound Blaster list price is reduced to **\$169.95!** And you get:

- * DAC for digitized voice output
- * ADC for voice recording
- * 11-voice Ad Lib FM synthesizer
- * Full duplex MIDI interface
- * Joystick Port
- * Microphone amplifier
- * Power amplifier (4W per channel)
- * Bundled software: • Intelligent Organ
- Talking Parrot • Voice Toolkit
- SBTALKER • DR SBAITSO
- Jukebox for Windows 3.0

Sound Blaster Micro Channel Version is also available.

North America master distributor:
Brown-Wagh Publishing
130D Knowles Drive Los Gatos CA 95030
For your nearest dealer, call **1-800-451 0900**
Tel (408) 378 3838 Fax (408) 378 3577

CREATIVE LABS, INC.

2050 Duane Avenue Santa Clara CA 95054
Tel (408) 986 1461 Fax (408) 986 1777

Outside North America, contact:

CREATIVE TECHNOLOGY PTE. LTD.

75 Ayer Rajah Crescent #02-04 Singapore 0513
Tel (65) 773 0233 Fax (65) 773 0353

THE PC SOUND STANDARD

Largest support of **Multimedia, Music, Education, Entertainment & Productivity software under DOS and Windows 3.0.**

Circle Reader Service Number 125

COMPUTE

76

WORKPLACE

By Daniel Janal
Showing up at work is just fine—as long as you can do it without leaving your house.

78

REMOTE POSSIBILITIES

By Rosalind Resnick
More and more employees are working for the company from home offices. Here's how to get telecommuting to work for you. And how to convince your bosses that it will work for them.

84

ARTS & LETTERS

By Robert Bixby
Get the adventure out of *Ventura Publisher* with some clever supporting products.

86

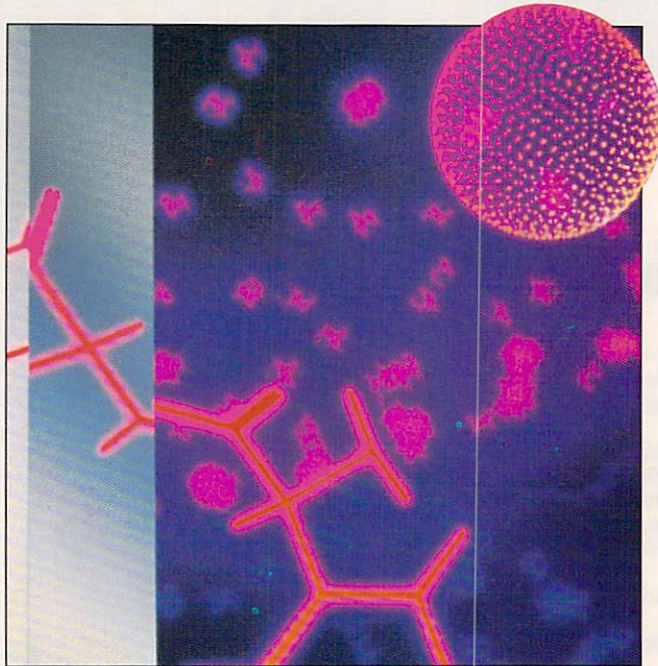
WHERE IN AMERICA'S PAST IS CARMEN SANDIEGO?

By Clayton Walnum
Working proof of an age-old adage—you just can't keep a bad woman down.

97

PATHWAYS

By Steven Anzovin
The whole idea of virtual reality has given birth to a staggering amount of verbal goulash.



160

CONVERSATIONS

What a long, strange trip it's been. Dr. Timothy Leary discusses mind expansion during the computer age.

98

TURN A HOME SWEET HOME INTO A SMART HOUSE

By Howard Millman
This step-by-step guide turns that old XT into a home sentry.

104

FAST FORWARD

By David English
Hot 'Lanta dances to the wild 'n' funky *Windows* multimedia beat.

106

LEMMINGS

By David Sears
Run yourself crazy with this invigorating mental cliff jumper.

108

GAMEPLAY

By Orson Scott Card
If *Prodigy* gets it right, its name is Legion.

110

SPECIAL REPORT

By Tom Netsel and Peter Scisco
From ants to tanks, from outer space to inner sanctums, this summer's Consumer Electronics Show had a little something for everyone.

121

REVIEWS

Sneak peeks at *Headline Harry and the Great Paper Race* and *Elvira II: The Jaws of Cerberus*. Also, more product reviews.

COMPUTE GOES ONLINE

Join *COMPUTE*'s editors and contributors on America Online or GEnie. Get wired with our expert online guide following page 72.

Get over 100 GENie services and the time to enjoy them. Just \$4.95 a month.



Get top news and weather reports

Learn from our online encyclopedia



Send and receive electronic mail

Play single player games



WALL ST.



Check current stock closings

Dozens of informative bulletin boards.



Book flights with EAAsy Sabre



Shop over 25 popular stores



JUST \$4.95

Moneyback guarantee
Sign-up now. If you're not satisfied after using GENie for one month, we'll refund your \$4.95.

Now enjoy unlimited non-prime time usage of over 100 popular GENieSM services for just \$4.95 a month*. You get everything from electronic mail, stock closings, single-player games and a wide range of bulletin boards to news, weather, flight schedules, shopping services and more.

And for an additional \$6 per non-prime-time hour*, you can also enjoy access to a variety of other valuable features like software libraries, computer bulletin boards and multi-player games.

Sign-up today.

1. Set your communications software for half duplex (local echo), at 300, 1200 or 2400 baud.
2. Dial toll free 1-800-638-8369 (or in Canada, 1-800-387-8330). Upon connection, enter HHH

3. At the U#-prompt, enter XTX99423, COMPUTE then press <RETURN>.
4. Have a major credit card ready. In the U.S., you may also use your checking account number.

For more information in the U.S. or Canada, call 1-800-638-9636.



We bring good things to life.

*Applies only in U.S. Mon. - Fri., 6 PM - 8 AM local time and all day Sat., Sun., and select holidays. Prime-time hourly rate \$18 up to 2400 baud. Some features subject to surcharge and may not be available outside U.S. Prices stated are U.S. rates as of Sept. 1, 1991 and are subject to change. Telecommunication surcharges may apply. Guarantee limited to one per customer and applies only to first month of use. Not applicable when accessed at 9600 baud.

EDITORIAL LICENSE

Peter Scisco

You've got a high-maintenance, high-tech rep that precedes you to every neighborhood cocktail party and backyard cookout. Hardly a night passes without your getting a call from a friend of a friend seeking advice about hardware or asking recommendations about good software for kids. You're known around the office as the resident PC troubleshooter, though the title never appears in your job description.

On the day you bought your PC and brought it home, you strapped yourself to a superoctane booster on a high-tech shuttle into the nether regions of information overload. The rarefied atmospherics of this newfound land have propelled you into frenzied, late-night flights across a galaxy of 0s and 1s.

On each successive voyage you get closer to the rim. Each trip into the digital night finds you flirting with full-throttle burnout that threatens to fling brain waves and electrons willy-nilly across the entire technospectrum.

You remember what it was like at first. After a few weeks, you had learned a little about batch files. You started writ-

ing a few of your own. You rewrote AUTOEXEC.BAT, and then you swung your sights onto CONFIG.SYS.

A couple of months later, that wasn't enough. You started to read all you could about PCs. You bought some software to optimize your hard disk. You bought a new word processor. You talked your boss into buying a copy of the spreadsheet program you use in the office so you could work at home.

A couple of months have passed. You've become an expert at using every XCOPY switch. But you're getting tired of lugging those floppies back and forth to work. You suspect that any day your data will self-destruct—the latest versions of the company budget will evaporate into a cloud of dissipated electrons. Anxiety begins to dull your technological edge. You start looking around for answers.

What you see are more computers. Your world is built of systems. Chips control your car's engine and your microwave oven. Your inexpensive pocket data card operates within a frame of silicon. Words like *bandwidth*, *crash*, *virus*, and *interface* creep into your speech. At home, your kids are running up tremendous bills on a cordless phone. Back in the city, lunch is served while conversations are channeled, corpuscular infobits navigating the net like synapses fired into the cerebral cortex.

Welcome to America. Technology is much more than a thread in the fabric of our late-twentieth-century society. It's irrevocably bound up with the way we see ourselves and our place in the world. Our history is a story of progress and setbacks underscored by a practically unwavering belief in the machines we have created. From the cotton gin to

the computer, Americans have embraced technology's benefits even as they have debated its effects.

The advent of the personal computer has furthered this uneasy alliance by placing powerful technological tools in the hands of individual citizens. The air fairly teems with ideas for new computing devices of every imaginable purpose.

This month, we examine some of those advances and the implications of the new technology in "The State of Computing: U.S.A." Writer Gregg Keizer looks at the rise of invisible machines, the advent of pen-based computing, and the roles computers play at work, at school, and in play. He explores the trend toward more powerful, less expensive computer systems that are beginning to fill American households. And he takes a hard look at why so many Americans have yet to open their homes to the personal computer.

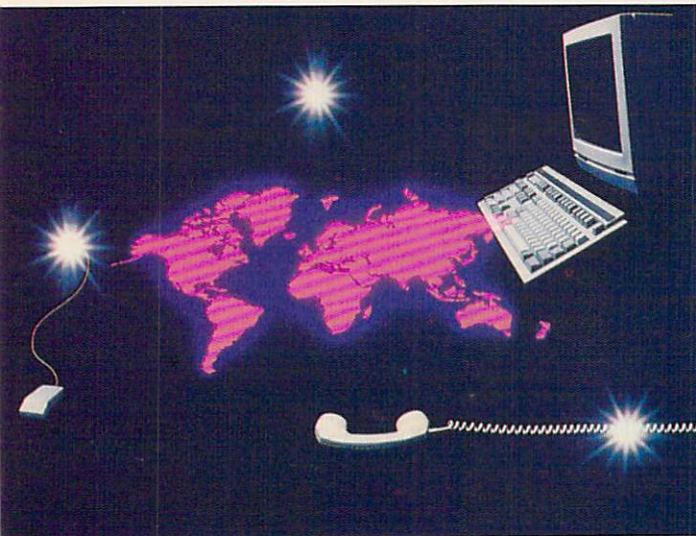
For those of us who have adopted the newest in technology, it's sometimes amazing that more of our neighbors go without. Sometimes it's a matter of economics. Sometimes it's a matter of computerphobia. Sometimes it's a simple matter of priorities—why spend \$1,500 on a computer to balance a checkbook?

PCs are still underused, relegated to the role of fancy calculators and muscle-bound typewriters.

While it's not up to consumers to define what's needed, technologically, to enhance the quality of our lives, we can help by spreading the power of computing to our friends, relatives, and neighbors.

What can you do to further the cause of computing in America? Invite some folks over to see what the fuss is all about. After all, your reputation is at stake. □

From the cotton gin to the computer, Americans have embraced technology's benefits even as they have debated its effects.



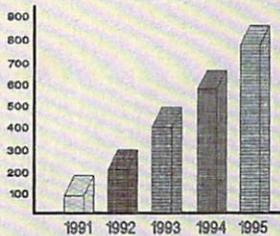
NATIONAL SALES REPORT

Without exception, this year is proving to be our best in every area. From manufacturing to product testing to sales and merchandising, we're in the money.

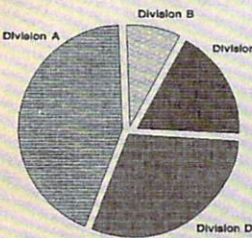
Why the sudden turn-around, you ask? It's simple. Ever since we switched to Citizen color printers, life has been rosy. (That was a pun.) Seriously, on every floor, down every hallway, it seems our staff has renewed energy and gusto.

Partly, it's due to how darned simple it is to use Citizen printers. With the touch of a button or the flip of a switch, you're in total control of countless impressive functions. That's pretty important to staffers who used to struggle with the endless maze of cryptic codes the other printer put us through. But here's the piece de resistance - color.

Imagine having to come up with yet another product design brief or accounts payable statement or even a company memo. We've all done more than our share of at least one of these.



SALES FORECAST



MARKET SHARE

right? Now imagine printing in blue. Or red. Or yellow. Or any one of a whole spectrum of crisp, bold colors!

Suddenly, that same old document has impact. Life. Verve.

Small wonder we're doing so much better all the way down the line. Our Citizen printers have given us more than countless hours of reliable operation and sturdy dependability. They've given our corps a new lease on life.

In fact, the Citizen printers were such a good idea, I'm thinking of granting Carnie's request on behalf of all the folks in accounting and installing a volleyball court out back! (I've already ordered designer water for all the coolers.)

Keep up the good work.

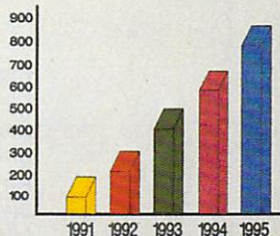
NATIONAL SALES REPORT

Without exception, this year is proving to be our best in every area. From manufacturing to product testing to sales and merchandising, we're in the money.

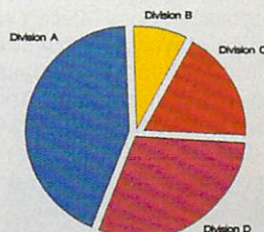
Why the sudden turn-around, you ask? It's simple. Ever since we switched to Citizen color printers, life has been rosy. (That was a pun.) Seriously, on every floor, down every hallway, it seems our staff has renewed energy and gusto.

Partly, it's due to how darned simple it is to use Citizen printers. With the touch of a button or the flip of a switch, you're in total control of countless impressive functions. That's pretty important to staffers who used to struggle with the endless maze of cryptic codes the other printer put us through. But here's the piece de resistance - color.

Imagine having to come up with yet another product design brief or accounts payable statement or even a company memo. We've all done more than our share of at least one of these.



SALES FORECAST



MARKET SHARE

right? Now imagine printing in blue. Or red. Or yellow. Or any one of a whole spectrum of crisp, bold colors!

Suddenly, that same old document has impact. Life. Verve.

Small wonder we're doing so much better all the way down the line. Our Citizen printers have given us more than countless hours of reliable operation and sturdy dependability. They've given our corps a new lease on life.

In fact, the Citizen printers were such a good idea, I'm thinking of granting Carnie's request on behalf of all the folks in accounting and installing a volleyball court out back! (I've already ordered designer water for all the coolers.)

Keep up the good work.

YOUR SOFTWARE. THEIR PRINTER.

Color. It adds impact. Memorability. Charts and graphs come to life. Important information jumps out. Color is the fast, easy way to turn an ordinary document into a vibrant, compelling presentation.

And the Citizen line of superior printers is the fast, easy way to get that color. Because Citizen is the one name in color printers that gives you everything you need. Quality. Reliability. And a very reasonable price.

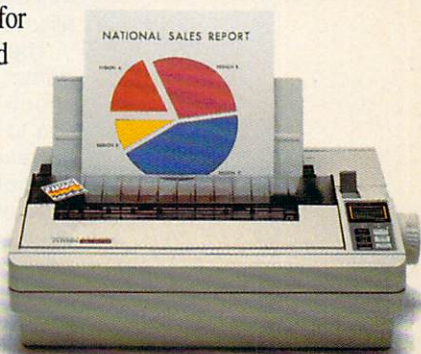
Best of all, Citizen printers communicate with the software you probably already have - just press "print." It's the easy

YOUR SOFTWARE. OUR PRINTER.

way to print in color, from your simplest needs to your most elaborate presentation spreadsheets. Transparencies too.

For the classroom, the office, or the office at home, there's a Citizen printer that's right for you. Look into Citizen. And make a colorful statement. For more information call 1-800-556-1234 ext. 34.

©1991 Citizen America Corporation
Citizen, Color On Command, CommandVue and the
Citizen logo are trademarks of the Citizen Watch Co. Ltd.



 **CITIZEN**[™]
Circle Reader Service Number 166

NEWS & NOTES

Alan R. Bechtold

Proto Holo Deck

Claiming to have the "world's first three-dimensional holographic videogame," Sega of America started shipping *Time Traveler* to arcade halls across the country in July. While most PC game players might not take note of the local mall arcade hall, this game merits attention. With a self-contained Sony 12-inch laser disc player and 20-inch Trinitron monitor, and boasting digital stereo sound and full digital graphics, *Time Traveler* may be as close as we'll

Save the holographic universe in Sega's *Time Traveler* arcade game.



ever get to an interactive 3-D entertainment environment in this decade (unless virtual reality really takes off).

The game itself is straight game hall action—a rowdy shoot-'em-up that requires you to traverse time and battle renegade scientists, ninja warriors, streetwise punks, cowboys, cave dwellers, and every other brand of adversary imaginable to modern arcade game wizards in an attempt to (what else?) save the universe.

Time Traveler should be in your local arcade hall by now, if you're curious. It costs 75 cents a pop, and you can buy more time cubes to keep you alive and kicking—sort of an interactive wallet. A roll of quarters and a willing suspension of disbelief should buy you a couple centuries of fun.

Computing sans Keyboard

A new personal computer accessory can literally bring the world to those who are physically unable to operate a keyboard. IBM's VoiceType is a new multimedia speech recognition product that allows a person to use DOS along with familiar word processing, database, and spreadsheet applications simply by speaking a word or command into the device instead of typing it.

Developed jointly by the IBM Special Needs Systems group and Dragon Systems, VoiceType adjusts to each user's individual speech patterns and language usage and, once it recognizes a user's unique pronunciations, stores them for future speech recognition. The product is intended primarily for those who are unable to use a

keyboard, but anyone can use it as a keyboard alternative—especially if price isn't an issue with the user.

VoiceType uses IBM's M-Audio Capture and Playback Adapter and is supported on IBM PS/2 386 and 486 systems that run 16 MHz or faster. It comes with a user's guide, training videotape, online reference guide, programs on 3½-inch disks, and a headset microphone. The product is available through Dragon Systems for \$3,185.

For more information on VoiceType, contact Dragon Systems at 320 Nevada Street, Newton, Massachusetts 02160; (800) 825-5897.

Power Editing

You've heard of power lunches, power brokers, and power deals. Now there's power editing. Good writers know their best work requires a second pair of eyes to double-check—at the very least—for grammar, spelling, and those inevitable typing errors.

Artificial Linguistics says its new program, *PowerEdit*, is the first software product to intelligently read, manage, and manipulate text. To perform the functions of a human editor and proofreader, *PowerEdit* employs proprietary artificial-intelligence technology—a text engine—that produces a quantifiable database it uses to intelligently manipulate text. It finds and corrects problems associated with business writing—lack of clarity, wordiness, ambiguity, and incorrect grammar.

PowerEdit's text engine recognizes more than 1 million words and their usages and applies 200,000 rules of good writing to your writing. It works directly with word processing software, recommending changes to make writing powerful, clear, precise, and correct. Artificial Linguistics president Doug Kramp says the company plans to eventually license the text engine to software publishers for other applications needing intelligent text manipulation, making it a type of operating system or environment in which word processors and other software programs can run. The program sells for \$295.

For more information about *PowerEdit*, contact Artificial Linguistics, 2301 North Akard, Suite 200, Dallas, Texas 75201; (800) 800-4254.

It's Like Being A Kid In A Candy Store.



**Any Car, Any Day, Anywhere. \$29.95
With Free Unlimited Mileage.**

Just rent from General this September and you'll have some very delectable choices to make. Because for just \$29.95 a day, we'll reserve and guarantee a midsize quality Chrysler car like the delicious Gumball Blue Plymouth Acclaim, and we'll upgrade you to your choice of the best available car on the lot. We'll even sweeten the deal with free unlimited mileage. Plus OnePassSM miles with proof of arrival on Continental. And the kind of fast, friendly service that's truly scrumptious.

This rate applies to drivers 25 and over and is subject to availability, as are colors and flavors. Optional LDW TripsaverSM \$9.99 a day or less. Gas, taxes, airport access fees of 10% or less, if applicable, and other optional items are extra; one way drop-off, if allowed, and additional driver charges may apply.

For reservations and information, nationwide, call your travel agent or General at 1-800-327-7607. Ask for rate plan LO. And find out how sweet it is.

NATIONWIDE LOCATIONS IN: Arizona, California, Colorado, Florida, Georgia, Louisiana, Nevada, New Mexico, North Carolina, South Carolina, Texas, Utah, Washington. More locations opening.



We feature quality products of Chrysler Corporation.
Most are air bag equipped for added safety.

Touch Axxess

New from Oregon Scientific is Axxess, a small, lightweight LCD touchscreen that allows you to quickly and easily store and retrieve information. The large-character, easy-to-read screen features numerous layouts for entering data, including convenient QWERTY and alpha keyboards.

With the mere touch of a finger, you can store and retrieve more than 1000 "busi-

Touch the Axxess screen to speed-dial a phone number.



ness cards" of information, speed-dial any phone number stored, set an audible alarm that displays a two-line reminder message, print reports directly from Axxess when connected to a PC printer, transfer data to and from a PC or from another Axxess unit for memory backup, and perform numerous other handy functions. You can also enter a personal security code to prevent others from accessing your machine.

Axxess can speed-dial from most phone systems and print from most printers, so with the 3½-hour battery supply included, it's especially useful for business travelers. Axxess is priced at \$599.

For more information about Axxess, contact Oregon Scientific, 10950 SW 5th Street, Suite 275, Beaverton, Oregon 97005; (503) 646-9806.

Single Does It

Upgrading a personal computer by simply plugging in a single chip would certainly

make life easier for some of us, considering how fast computer technology changes. Thanks to Acer America's new ChipUp Technology, single-chip upgrades are now more than wishful thinking.

Acer's new system is actually an Intel 486SX-based CPU that allows you to upgrade your system's speed from 20 MHz to 25 or 33 MHz by simply adding a single chip. The ChipUp CPU will accept a 25- or 33-MHz Intel 486DX microprocessor in a low-insertion-force socket that also accepts the Intel 487SX 20-MHz math coprocessor.

Acer's first challenge in creating the ChipUp was how to effectively combine the design of three system boards into a single motherboard—a necessity for accommodating CPUs running at 20, 25, and 33 MHz. Since every CPU type has a different pin assignment and internal architecture, autoswitching and detecting CPU frequency were the biggest design hurdles.

Acer ended up designing a dynamic architecture with a built-in autodetection feature that senses the type of CPU in use and then automatically switches to the proper system speed to match it. The Acer design team then made the upgrade easy enough for users to implement themselves.

Because Intel's chips are readily available off the shelf from component dealers worldwide, Acer's new system gives those wanting to upgrade the opportunity to shop around for the best-priced chips available. Since the specially designed sockets allow users to easily insert the Intel chip of their choice, both users and dealers have an easy way to upgrade systems on their own without technical help. Suggested retail price for the ChipUp is \$2,745.

For more information, contact Acer America, 401 Charcot Avenue, San Jose, California 95131; (408) 922-0333.

Is OS/2 Losing?

The race between OS/2 and Microsoft Windows has been running for a long time, but the finish line may now be in sight. Gartner Group, a leading research firm that analyzes trends in the information technology industry, predicts IBM won't succeed in its efforts to encourage a majority of users to migrate to OS/2. According to Gartner, OS/2's market share will be only half that of Windows by 1995. Windows currently holds 12 percent of the market, which Gartner predicts will grow to 41 percent by that time.

The fate of OS/2's *Presentation Manager* is hotly debated. Gartner believes the operating environment has been dealt a severe, if not fatal, blow by Windows.

Although OS/2 is considered technically superior to Windows, it lacks third-party appeal, according to Jonathan Yarmis, vice president of personal computing at Gartner. "Without that appeal, it doesn't matter how well OS/2 performs. Users buy applications, not operating systems," Yarmis said.

200 Million Miles per Hour

It's hard to imagine, but IBM's newest multichip package is actually capable of speeding electric impulses between computer chips at the rate of 280 million miles per hour. The record-breaking package, which holds 121 silicon chips inside a densely packed ceramic module, is currently in production as part of IBM's new System/390 series of large computers.

To take advantage of the increasing speed of computer chips, computer architects

Ultima® VII

THE BLACK GATE™

ORIGIN presents A LORD BRITISH PRODUCTION
"ULTIMA VII – THE BLACK GATE"

Starring THE AVATAR, IOLO, SHAMINO, DUPRE, and BILL JOHNSON as "The Guardian"

Programming KEN DEMAREST III, HERMAN MILLER, ZACHARY SIMPSON, JEFF WILSON, TONY ZUROVEC

Technical Design Assistants ANDREW MORRIS, JOHN WATSON

Art Direction BOB COOK, JEFF DEE, KARL DOLGENER, GLEN JOHNSON, DENIS LOUBET, GARY WASHINGTON

Audio Director MARTIN GALWAY **Music** DANA GLOVER

Sound Effects MARC SCHAEFGEN, NENAD VUGRINEC **Writing** JACK HERMAN, BETH MILLER

Executive Producer DALLAS SNELL **Associate Producer** ALAN GARDNER **Screenplay** RAYMOND BENSON

Producer and Director RICHARD GARRIOTT

Available in Retail Stores or call 1-800-999-4939 for Visa/MC Orders

VOLUNTARILY
RATED MP-13
(For Mature Players)

THE QUEST BEGINS CHRISTMAS 1991

Ultima, The Black Gate, Avatar, Lord British, Iolo, Shamino, Dupre, The Guardian are trademarks of ORIGIN Systems, Inc. © 1991 ORIGIN Systems, Inc.

Released by

 **ORIGIN**
We create worlds.

must design equally speedy connections between chips. In IBM's new package, 121 chips are tightly packaged just three-eighths of an inch from each other, which is an industry record.

The chips are mounted directly on a new IBM material called glass ceramic, which effectively transmits signals from one chip to another. They're connected by tiny wires made of copper, an excellent conductor of electricity. The package resembles a multilayered sandwich.

Although the new IBM chip package isn't intended for use in microcomputers, once the technology is tried and true, it could eventually trickle down to the PC platform.

Still Alive and Kicking

The advent of *Microsoft Windows* actually breathed new life into BASIC. Visual Basic for *Windows* 3.0 is the latest version of the long-lived, popular programming language. It's a graphical application development system for *Microsoft Windows* 3.0 that combines visual-design tools with a powerful general-purpose programming language and *Windows*' EXE compiler.

Bill Gates, Microsoft founder and chief executive officer, forecasts that many thousands of *Windows* applications will be written in Visual Basic. Forty-five independent software developers have already announced and demonstrated more than 60 such products, ranging from custom controls to add-on DLLs for data access and multimedia applications.

Visual Basic for *Windows* is now available in the U.S. for \$199. Microsoft already started shipment of German and French versions and has also scheduled other language versions to follow.

For more information, con-

tact Microsoft, One Microsoft Way, Redmond, Washington 98052-6399; (800) 426-9400.

Shooting for a Longer Run

Running out of battery power in the middle of a laptop computing session can be frustrating. It can even wipe out the bountiful benefits of using a portable computer in the first place, which is why so many companies are diligently trying to come up with anything that will extend battery life for portable, laptop, and notebook PCs.

Appian Technology's PowerMizer is a new Power Manager Controller chip for laptop and notebook PCs that goes a long way toward achieving the long-life goal. The new chip controls circuits and peripherals during system operation, working in conjunction with Appian's System 90/SX local-bus-based 386SX chip set. Already available to manufacturers, the new chip should start showing up in laptop and notebook PCs soon.

For more information about the PowerMizer, contact Appian Technology, 477 Mathilda Avenue, Sunnyvale, California 94086; (408) 730-8800.

Not Just Nintendo

Super Mario, Princess Zelda, Link, and Donkey Kong. For the first time, these popular Nintendo characters will be hitting home television screens on a video system other than Nintendo. They'll be seen on Compact Disc Interactive (CD-I), a new multimedia technology Magnavox has planned for release this year. Nintendo of America and American Interactive Media (AIM) reached an agreement that will permit AIM to develop and market CD-I titles featuring the popular Nintendo characters.

AIM is the principal developer of software programs for CD-I systems planned for

sale through consumer electronics stores this fall. The Nintendo characters will join such familiar names as Time-Life, Rand McNally, the Smithsonian Institute, ABC Sports, Richard Scarry (of children's book fame), and others who have copublished software through AIM for use on CD-I systems. Other popular children's characters to be available on CD-I software are Big Bird, Elmo, Bert, and Ernie from "Sesame Street," who appear in Children's Television Workshop programs developed for the new system.

For more information on this software, contact American Interactive Media, 11111 Santa Monica Boulevard, Suite 700, Los Angeles, California 90025; (213) 473-4136.

FAX on the Go

Those eleventh-hour rushes to the fax machine only to wait in line for a leisurely transmission may soon become office history now that Ibis has developed a new software program which lets you send faxes with a modem.

On the GoFAX can transmit a one-page document in 20 to 30 seconds—from your computer. If the number you're calling is busy, AT&T's Service Bureau will redial it up to four times during the first half hour, leaving your computer free for you to work on something else. Transmission for the first page is \$3.00, and each additional page costs \$2.00. The product retails for \$69.95.

For more about *On the GoFAX*, contact Ibis Software, 625 Second Street, Suite 308, San Francisco, California 94107; (415) 546-1917.

Alan R. Bechtold is editor of *Info-Mat Magazine*, an electronic news weekly published by BBS Press Service. □

Thanks to
Microsoft Windows,
BASIC has
more than one life
to live.



KICK BACK

and relax, you've got a CH Products Controller!



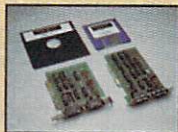
Flightstick™



Mach I™ and
Mach I Plus™



Mach II™ and
Mach III™



GameCard III Automatic™
GameCard III Automatic/MCA™



RollerMouse™

970 Park Center Drive
Vista, California 92083
(619) 590-2518
To order: (800) 624-5804



Available for Apple, Mac, IBM PC/PS2
and compatible computers.

Circle Reader Service Number 207

**Legal copies,
cheers and
jeers, parking
lessons,
bad clusters,
and more**

Copywrong?

Regarding your answer in the June "Feedback," under federal copyright laws everyone who buys a piece of software has the right to make a backup copy for archival purposes. That's why programs like *Copy II PC* and *Twin Copy* are legal to use. You owe it to your readers to check your facts thoroughly before firing off a reply.

DAVID VIERTTEL
AUSTIN, TX

In your June issue, you told Travis May that even a non-working backup copy of commercial software was illegal. I, and the folks in the Computer Science Department of Southern Arkansas University, where I work, have been under the impression that the new copyright law says that it's legal to make a backup copy. As a matter of fact, everyone that I've talked to suffers from this same delusion. How about a clarification of the current copyright/backup situation?

JACK RYAN
EL DORADO, AR

Your point is well taken. Making personal backups of software constitutes "fair use," a loophole in the copyright law that allows a teacher to copy a page out of a magazine for a class, a reviewer to lift quotations from a novel, or (usually) a computer user to copy software for archival purposes. Although that right is extended by the law, you can at any time give up your rights voluntarily by consenting to a license agreement that prohibits making archival copies. The best way to discover whether it's legal to copy is to check your license agreement.

Our understanding of May's letter (only a small part of which was published) was that he had tried making back-

ups with the standard DOS commands and had not been successful, which indicates that he was trying to back up locked software. License agreements on locked software usually specify that no copies can be made. Use of the software constitutes acceptance of the terms of the license. For this reason, copies created by DOS or other means would be in violation of the license agreement—and therefore illegal—whether they worked or not. Thanks for the opportunity to expand and clarify our response to this question.

Hard Disks, Easy Decisions

"How to Choose a Hard Disk" in the May issue was great—clean, informative, and specific. I especially appreciated the warnings about IDE drives.

ARTHUR J. SOINSKI
SACRAMENTO, CA

Headstop

I use a Vendex Headstart III with a hard disk. I've heard a lot about a head-parking command that should be used whenever a computer is moved. What's the command, and when should I use it? Also, can I have two or more hard drives in the same machine?

WILLIAM D. WAGNER
APO NEW YORK, NY

Usually the command to park the heads of a hard disk is PARK. This command automatically moves the heads to a position where they won't do damage to the disk if a shock or sudden movement causes the heads to come into contact with the disk. Some people advise that if your hard disk requires parking, you should park it every time you turn off the machine. Others feel that you should only park your heads if you're transport-

ing your computer by car or freight. Some hard disks are self-parking, and so using the PARK command is unnecessary. On the other hand, if you're not sure whether your hard disk is self-parking or not, prudence would dictate that you should use the PARK command, if you have it. If you don't have it and you're determined to park your drive, SpinRite II includes a PARK command. It's sold by Gibson Research, 22991 La Cadena, Laguna Hills, California 92653.

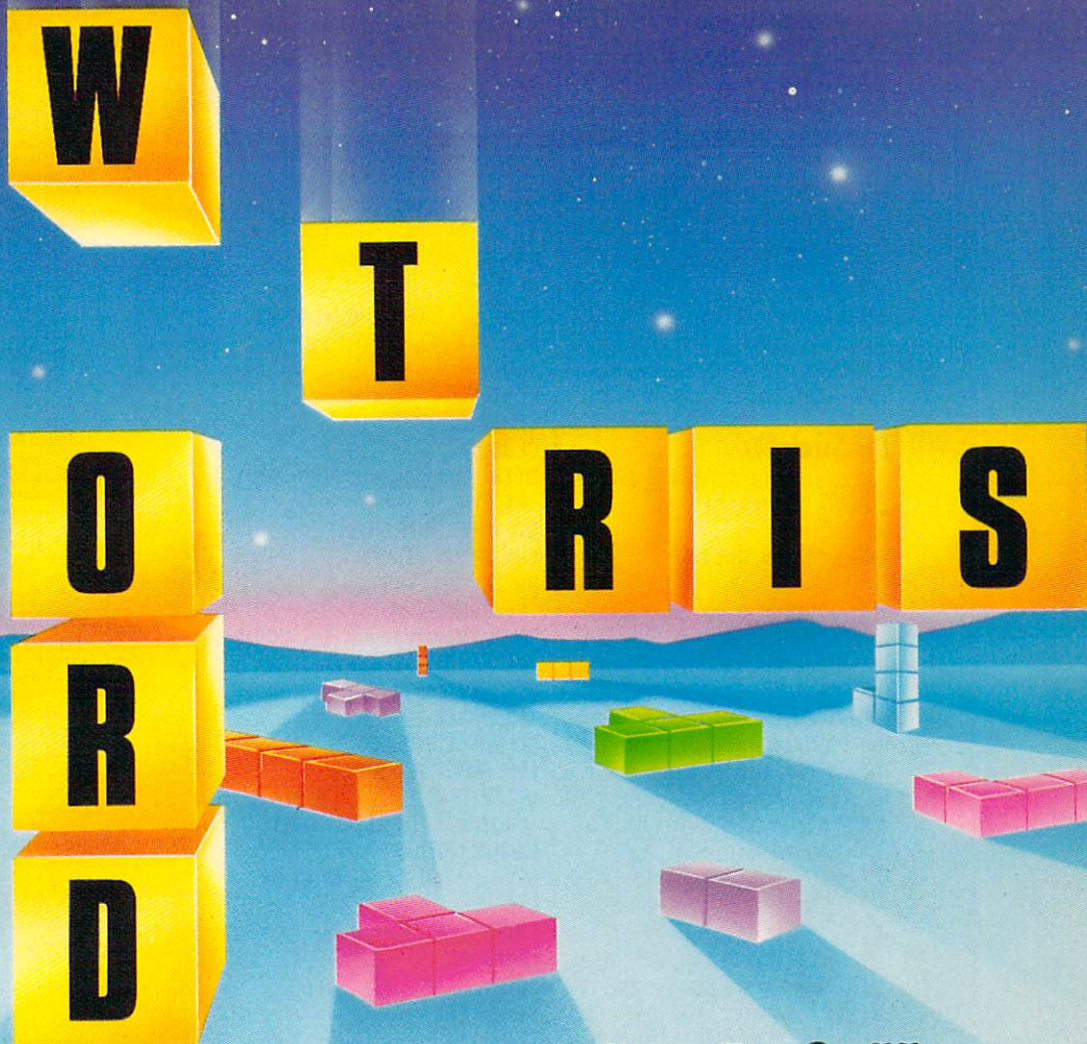
As for adding one or more hard disks, the primary problem with this is the extremely small size of your computer case. The half-height 5¼-inch hard disk you have takes up all the space available.

If you have some free slots, you could add a hard card—a hard disk mounted on a card designed to be installed in the expansion bus. Although the card itself only takes up one slot, most drives stick so far out from the card that the neighboring slot will be inaccessible. An external drive might be a solution.

Not the Same Old Same Old

The magazine that I've been getting for the last year isn't the magazine I started reading back in the early eighties. The last issue of my subscription was no different from at least half a dozen computer magazines on the market. There's very little in your magazine that's of interest to me anymore. I don't care what John Dvorak, Jim Seymour, or Clifton Karnes has to say about networks, laptops, or laser printers because I probably won't ever have one. Your magazine isn't a home computer user's magazine anymore.

EDWARD R. SALYER
DES MOINES, IA



Another Eastern block falls.

There's a new 'TRIS on the block. Its name is WORDTRIS. And if you love TETRIS, this latest fast-action, falling block, Soviet game will boggle your mind.

This time the falling pieces are letter blocks. Form them into words and score points. As each block falls, it pushes down the blocks below, producing an ever-changing kaleidoscope of letters where scoring opportunities appear - and vanish - at the blink of an eye.



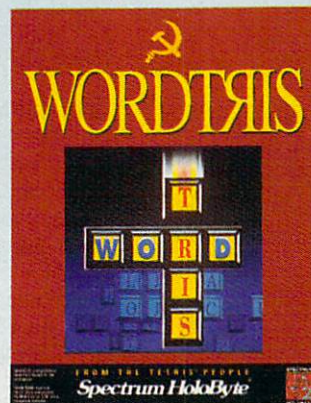
Go for XYLOPHONE if you dare.

Create words horizontally or vertically, but don't put all your E's in one BASKET. Because every time a word lines up, *poof!* those letters disappear, and the blocks below pop up to fill the spaces. So whenever you earn points you stir up the alphabet soup. And suddenly that falling M has no HOME to go to.

WORDTRIS keeps raining vowels and consonants until you've collected enough words to move to the next level, or the well fills up. Of course, each successive round ups the ante as the blocks fall ever faster. But you can choose your difficulty level to match your skills, and select from single player, cooperative, competitive, head-to-head or tournament modes. The built-in 30,000 word dictionary verifies even the most obscure word.

Set the difficulty level at 10 and you'll find WORDTRIS harder to keep up with than the changes in Eastern Europe.

WORDTRIS. Another great game from the TETRIS people.



Available for IBM and Mac/MacII.

Available in retail stores or for Visa/Master Card orders call toll-free, 24 hours a day, 7 days a week: **1-800-695-GAME (Orders Only)**
For technical questions and availability call: **1-415-522-1164 (M-F: 9am - 5pm PST)**

Spectrum HoloByte®

A Division of Sphere, Inc. 2061 Challenger Drive, Alameda, CA 94501

FEEDBACK

Thanks to all who write. We read all your letters and try to be responsive to our readers' interests and concerns.

Dir Straights

After I use the following Quick-BASIC statement

```
SHELL "DIR > DIR.DAT"
```

I would like to be able to examine the entries in DIR.DAT for the subdirectory names and then change to those subdirectories in order to examine the files in each subdirectory. How can I use the various subdirectory names with a CD command within the BASIC program?

RICHARD KIRCHMEYER
UTICA, NY

The following set of QuickBASIC commands places the directory listing in a file and then reads the file, creating a second file containing only the names of the subdirectories. It then goes on to create a file called FILES in a subdirectory called TEMP that contains all the filenames in the current directory and all its subdirectories. You could use some recursive variation on this program to look farther down the tree.

```
dir1$=COMMAND$
IF dir1$="" THEN dir1$="*. *"
SHELL "md \temp"
SHELL "dir "+dir1$+"
">\temp\temp1"
OPEN "\temp\temp1" FOR INPUT
AS #1
OPEN "\temp\temp2" FOR OUTPUT
AS #2
OPEN "\temp\files" FOR OUTPUT
AS #3
DO WHILE NOT EOF(1)
LINE INPUT #1, a$
IF LEFT$(a$,1) << "." THEN
IF MID$(a$,14,1) = "<" THEN
GOSUB cleanup
IF a$ << "." THEN PRINT #2, a$
ELSEIF LEFT$(a$,1) << "." THEN
GOSUB cleanup
```

```
IF a$ << "." THEN PRINT #3, a$
END IF
END IF
LOOP
CLOSE #1
CLOSE #2
OPEN "\temp\temp2" FOR INPUT
AS #1
DO WHILE NOT EOF(1)
LINE INPUT #1, a$
SHELL "dir "+dir1$+"&"+"a$+"
">\temp\temp4"
OPEN "\temp\temp4" FOR INPUT
AS #2
GOSUB cleanup:PRINT #3,:PRINT
#3,"&"+"a$
DO WHILE NOT EOF(2)
LINE INPUT #2, a$
IF LEFT$(a$,1) << "." AND
MID$(a$,14,1) << "<" THEN
GOSUB cleanup
IF a$ << "." THEN PRINT #3, a$
END IF
LOOP
CLOSE #2
LOOP
CLOSE #1
CLOSE #3
SHELL "del \temp\temp*. *"
END
cleanup:
a2$=MID$(a$,10,3)
FOR i=1 TO 8
IF MID$(a$,i,1) = "." THEN EXIT
FOR
NEXT
a3$=LEFT$(a$,i-1)
IF a2$=CHR$(32)+CHR$(32)
+CHR$(32)
OR a2$="" THEN
a$=a3$:RETURN
a$=a3$+"."+a2$:RETURN
```

Readers whose letters appear in "Feedback" will receive a free COMPUTE's PC clock radio while supplies last. Do you have a question about hardware or software? Or have you discovered something that could help other PC users? If so, we want to hear from you. Write to COMPUTE's Feedback, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408. We regret that we cannot provide personal replies to technical questions. □

EDITORIAL

Editor in Chief Peter Scisco
Art Director Robin C. Case
Executive Editor Clifton Karnes
Senior Editor Emeritus Keith Ferrell
Managing Editor David Hensley Jr.
Features Editor Robert Bixby
Associate Editor David English
Editor, Gazette Tom Netsel
Associate Editor Denny Atkin
Amiga Resource
Reviews Editor Mike Hudnall
Assistant Editors Jill Champion
 David Sears
Copy Editors Karen Huffman
 Susan Thompson
Editorial Assistant Dana Stoll
Interns Chantelle Oligschlaeger
 Erin Richter

ART

Assistant Art Director Kenneth A. Hardy
Designer Jo Boykin
Typesetter Terry Cash

PRODUCTION

Production Manager De Potter
Traffic Manager Barbara A. Williams

PROGRAMMING

Programming Manager Richard C. Leinecker
Programmers Bruce Bowden
 Steve Draper
 Troy Tucker

ADMINISTRATION

President Kathy Keeton
Executive Vice President, Operations William Tynan
Office Manager Sybil Agee
Sr. Administrative Assistant, Customer Service Julia Fleming
Administrative Assistant, Receptionist Elfreda Chavis
 Polly Cilpan

ADVERTISING

Vice President Peter T. Johnsmeyer
Associate Publisher (212) 496-6100
Vice President James B. Martise
Sales Development
Marketing Manager Caroline Hanlon
 (919) 275-9809

ADVERTISING SALES OFFICES

East Coast: Full-Page and Standard Display Ads—Peter T. Johnsmeyer, Chris Coelho; COMPUTE Publications International Ltd., 1965 Broadway, New York, NY 10023; (212) 496-6100. New England—Jack Garland, Garland Associates, Inc., 10 Industrial Park Rd., Hingham, MA 02043; (617) 749-5852. East Coast and Midwest: Fractional and Product Mart Ads—Caroline Hanlon, Product Mart Manager; COMPUTE Publications International Ltd., 324 W. Wendover Ave., Suite 200, Greensboro, NC 27408; (919) 275-9809. Southeastern Accts. Mgr.: Full-Page, Standard Display, and Mail-Order Ads—Harriet Rogers, 1725 K St. NW, Suite 903, Washington, D.C. 20006; (202) 728-0320. Florida—J. M. Remer Associates, 3300 NE 192nd St., Suite 192, Aventura, FL 33180; (305) 933-1467; (305) 933-8302 (FAX). Midwest: Full-Page and Standard Display Ads—Starr Lane, National Accounts Manager, 1025 Crescent Blvd., Glen Ellyn, IL 60137; (708) 790-0171. Northwest—Jerry Thompson, Jules E. Thompson Co., 1290 Howard Ave., Suite 303, Burlingame, CA 94010; (415) 348-8222. John Taggart, (415) 547-4102. Lucille Dennis, (707) 451-8209. Southwest—Ian Lingwood, 6728 Eton Ave., Canoga Park, CA 91303; (818) 992-4777. West Coast: Fractional Mail-Order, Shareware, and Product Mart Ads—Lucille Dennis, Jules E. Thompson Co., 1290 Howard Ave., Suite 303, Burlingame, CA 94010; (707) 451-8209. U.K. & Europe—Beverly Wardale, 14 Lisgar Terr., London W14, England; 011-441-602-3298. Japan—Intergroup Communications Ltd.; Jiro Semba, President; 3F Tiger Bldg. 5-22 Shiba-koen, 3-Chome, Minato-ku, Tokyo 105, Japan; 03-434-2607. Classified Ads—Sharon Steinkemper, COMPUTE Publications International Ltd., 1965 Broadway, New York, NY 10023; (212) 724-0911.

THE CORPORATION

Bob Guccione (chairman)
 Kathy Keeton (vice-chairman)
 David J. Myerson (chief operating officer)
 Anthony J. Guccione (secretary-treasurer)
 William F. Marlieb (president, marketing, sales & circulation)
 John Evans (president, foreign editions)
 Patrick J. Gavin (vice president, chief financial officer)

ADVERTISING AND MARKETING

Sr. VP/Corp. Dir., New Business Development: Beverly Wardale; VP/Dir., Group Advertising Sales: Nancy Kestenbaum; Sr. VP/Southern and Midwest Advertising Dir.: Peter Goldsmith. Offices: New York: 1965 Broadway, New York, NY 10023-5965, Tel. (212) 496-6100, Telex 237128. Midwest: 333 N. Michigan Ave., Suite 1810, Chicago, IL 60601, Tel. (312) 346-9393. South: 1725 K St. NW, Suite 903, Washington, DC 20006, Tel. (202) 728-0320. West Coast: 6728 Eton Ave., Canoga Park, CA 91303, Tel. (818) 992-4777. UK and Europe: 14 Lisgar Terrace, London W14, England, Tel. 01-828-3336. Japan: Intergroup Jiro Semba, Telex J25469GLTYO, Fax 434-5970. Korea: Kaya Advtsg., Inc., Rm. 402 Kunshin Annex B/D 251-1, Dohwa Dong, Mapo-Ku, Seoul, Korea (121), Tel. 719-6906, Telex K32144Kayaad.

ADMINISTRATION

VP/Finance, CFO: Patrick J. Gavin; Sr. VP/Administrative Services: Jeri Winston; Sr. VP/Art & Graphics: Frank Devino; VP/Newsstand Circulation: Marcia Orvitz; VP/Director of New Magazine Development: Rona Cherry; VP Director Sales Promotions: Beverly Greiper; VP Production: Hal Halpner; Dir. Newsstand Circulation: Paul Rolnick; Dir. Newsstand Circulation Distribution: Charles Anderson, Jr.; Dir. Subscription Circulation: Marcia Schultz; Director of Research: Robert Rattner; Advertising Production Director: Charlene Smith; Advertising Production Traffic Mgr.: Mark Williams; Traffic Dir.: William Harbutt; EPS Mgr.: Lisa R. Sulgit; Production Mgr.: Tom Stinson; Asst. Production Mgr.: Nancy Rice; Foreign Editions Mgr.: Michael Stevens; Exec. Asst. to Bob Guccione: Diane O'Connell; Exec. Asst. to David J. Myerson: Teri Pisani; Special Asst. to Bob Guccione: Jane Homlish.

Pick Our Brains.



Product support for your IBM or compatible.

CompuServe, the world's largest network of people with personal computers, is also the world's largest network of people with answers to your hardware and software questions.

Brains abound on CompuServe. You'll

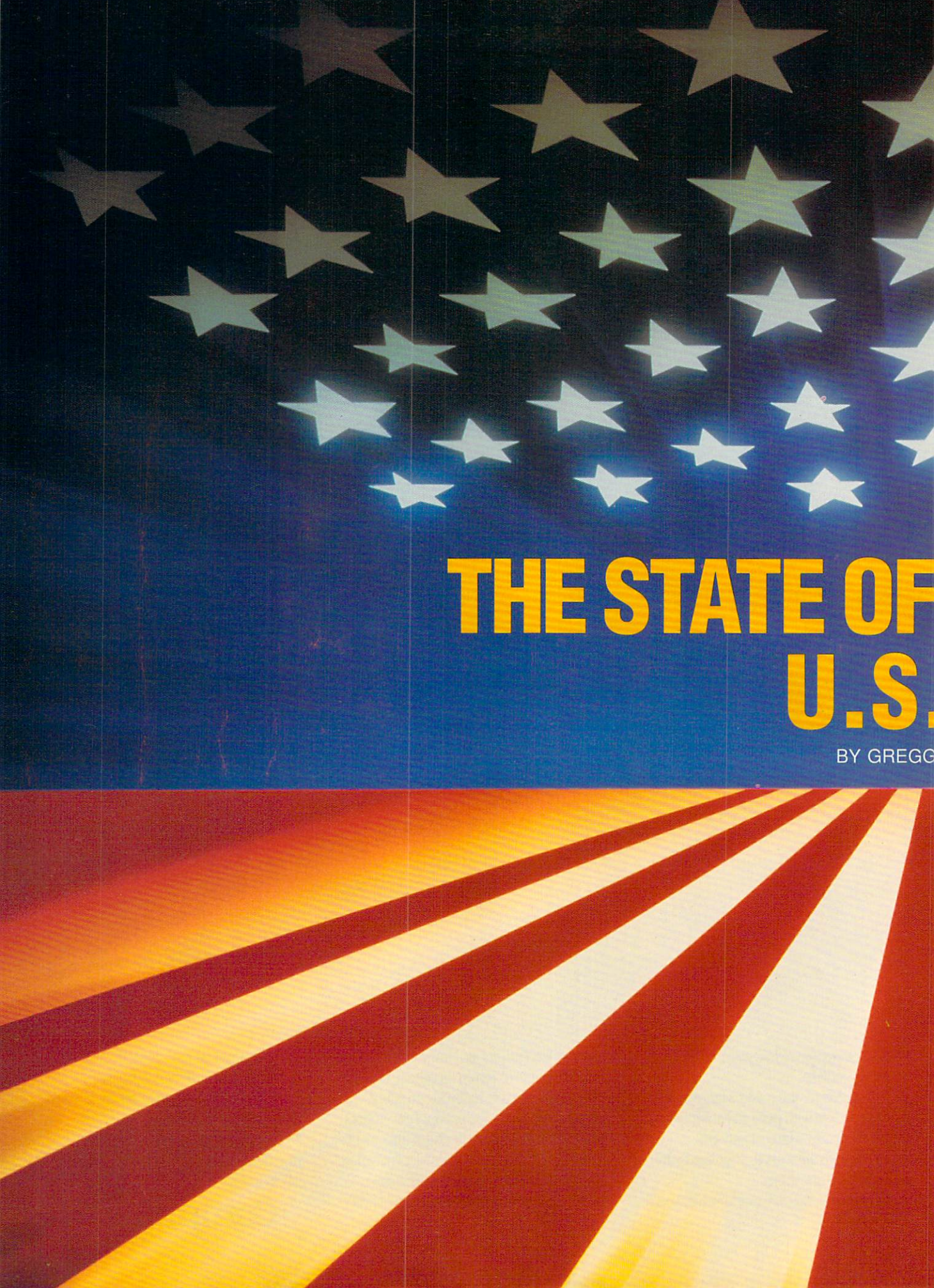
find quick solutions and information from our thousands of forum members, some of whom have already had your problem, some of whom are the product developers themselves. Company decision-makers are online, too, discussing the next generation of products, and giving CompuServe members software updates ahead of every-

one else, and before they hit the market.

Got a question? Got a problem? Get smart. And get some answers, from the many minds of CompuServe.

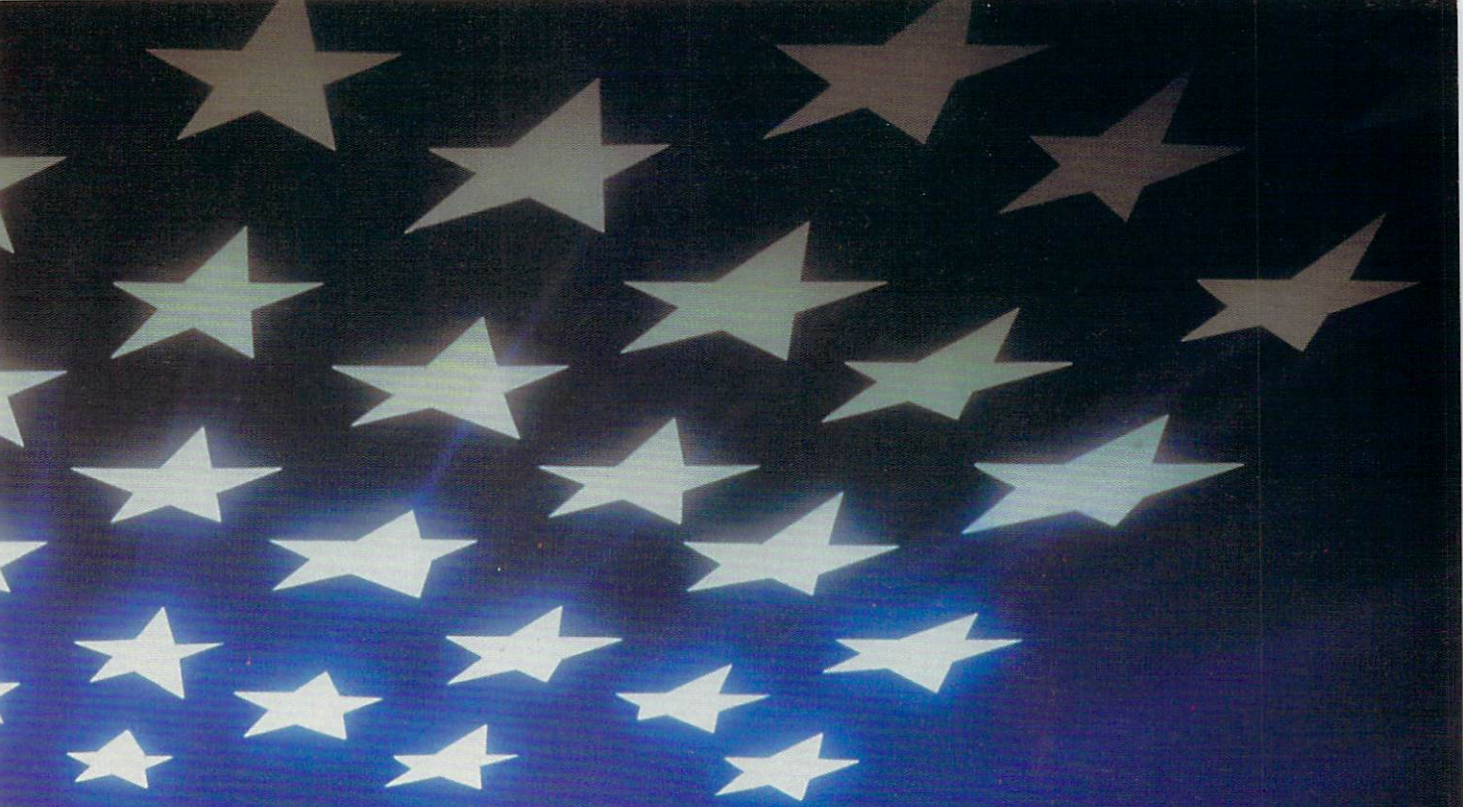
To join, see your computer dealer. To order direct, or for more information, call us today.

CompuServe
800 848-8199



THE STATE OF U.S.

BY GREGG



COMPUTING:

A.

KEIZER



Walk through the door and shout, "I'm home!" and you may get an answer from the kids, a spouse, and half a dozen computers. Computers hide all around your house. Touch the membrane panel of your microwave, and you call on a microchip-based controller. Your telephone-answering machine may record calls not on tape, but in silicon memory. That late-model car out in the garage is smarter than some of the kids you went to school with. And your videogame machine does graphics better than most business computers.

Even if you didn't have a personal computer in your home, you'd still live in a technologically advanced household. But because you do include a computer in your home's inventory, you're part of an important American minority that collectively owns more computing power than such global powers as the Soviet Union, China, and India.

Home computing, once the exclusive province of electronics hobbyists, is now being taken over by millions who might never have touched a soldering iron. As one of those millions, you've got a jump on most Americans. You know how important a PC is for working at home, for accessing immense amounts of information almost instantly, for learning and playing with—a tool and a toy that would have seemed magical only 15 years ago.

Grabbing a snapshot of home computing as it flies by is tough. You've got to lead it a bit, aiming not only where it is today, but where it will be, say, next year. So set your sights on the present *and* the future for a picture of home computing in America.

PC, Go Home

You're in good company. According to Link Resources, a New York-based market research firm, one in four American homes has a computer. Over 30 million computers work at home, not at the office or in the classroom.

Most of these machines run MS-DOS. A smattering of Macintosh, Apple, Amiga, Commodore, and Atari computers may sit at home, but the PC has clearly won on the home front. That's no surprise. The foremost reason new computer owners give for their spending spree is to do job-related work at home. We're most comfortable with what we know—the PCs we use at the office.

And those home PCs are getting more powerful. Where once a floppy disk-based PC with a slow microprocessor and a paltry 512K of memory served, now home PCs typically include a hard disk drive, a color monitor, a megabyte (or more) of RAM, and a 286 or 386SX brain.

HOW DID WE GET HERE?

The path to today's version of home computing, filled with false starts, dead ends, and half-witted ideas, is littered with machines that should never have seen the light of day.

The Handmade Tale

Millions may compute at home today, but less than 15 years ago only a handful of hobbyists had computers at home. Some people built their own from kits while others bought such behemoths as the Radio Shack Model I and the Commodore PET. They rejoiced when the first floppy disk drives replaced cassette tape drives.

Happy Days

Computers shoved their way into American homes by the millions during the early 1980s with games and classic machines like the Commodore 64, Atari 800, and Apple II. Ads played on our suspicions that families without computers produced kids who couldn't cut it at college, even though solid productivity and educational software was nearly nonexistent. The country woke up in 1984 to realize home PCs were one-dimensional appliances that were too temperamental, too hard to use, and too expensive.

The Dark Ages

Computers went home, but no one knew what to do with them. Games started shifting to dedicated machines like Nintendo, and everyone grew tired of filing Christmas-card lists and computing home budgets. PCs ruled the office, but they were still too costly and too tough to use at home.

Taking the Office Home

The late 1980s were a time of excess—including excess work—so people took work home and realized they needed PCs there. Low-priced clones helped. The Mac struggled to hang onto its under-10-percent share; older computers hit the closets.

The Multi Medium

Windows in 1990 and multimedia in 1991 redefined the PC as a graphical tool that could do at home what it could at the office, as well as integrate text, sound, music, video, and still images into stunning educational, reference, and entertainment programs.

The Future

Inexpensive PCs with CD-ROM work in four of ten American homes. Family workstations control notebook and slate computers. Home and office PCs talk to each other via modem and dedicated networks. Kids use slate computers to file homework. High-end simulations make up PC play, but most electronic entertainment comes from the duo of game machine and CD-I player, both connected to a TV.

This trend of high-powered, low-priced home computing is accelerating. Prices of fast 386 PCs have been dropping rapidly. IBM cut prices twice in less than a month. Brand-name compatible manufacturers like Compaq have slashed prices, too, in an attempt to keep profits up and box out the more marginal PC makers. Consumer electronic giants like Samsung and Magnavox are pushing PCs in the mass market, with discount clubs such as Sam's and computer superstores like CompUSA as their ready-made outlets. The recession may have hurt many PC sellers, but it was good news for anyone shopping for a computer. Today you can bring home an amazing machine for around \$1,800: a 20-MHz 386SX complete with two megabytes of RAM, Super VGA, a 40MB hard drive, *Windows*, and a mouse.

And it won't be long before the computer in your home will have even more power. Major-league companies like Digital promise workstationlike graphics in a PC, while AT&T-owned NCR has built a minicomputer based on the 80486 chip. Though your home computer won't be as powerful as these monsters, don't be surprised 12 months from now if you're able to buy a 486SX-equipped PC for what you'd now pay for a 386.

More power for less money. That's one trend you won't have to wait for.

Mobile Clones

We love to take it with us. Even if we're not on the move, we like to pretend that we soon *will* be.

No part of the PC business bloomed as quickly during the last year as the portable computer market. A blizzard of laptop and notebook computers debuted during 1990 and 1991, enticing on-the-go professionals in sales, real estate, insurance, and financial fields to computerize.

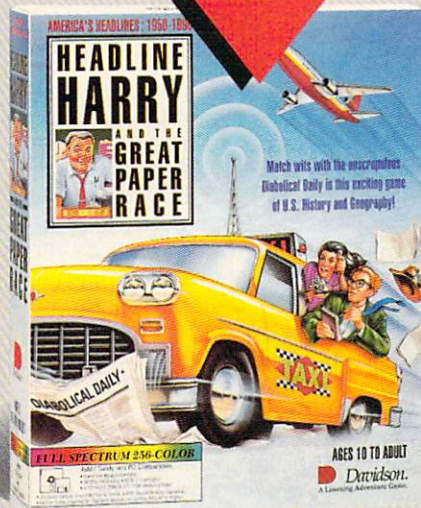
The average portable computer is a no-features featherweight, but recently the market has grown to include 286, 386SX, and even 386 microprocessors; VGA graphics; multiple megabytes of RAM; large capacity hard drives; and long-running batteries. Briefcase-size computers compete with desktop systems in almost every performance area.

Notebooks, the under-seven-pound category, are the hottest draws. Such notable examples as the Sharp 6220, the Texas Instruments TravelMate 2000, and the ZEOS 286 all tip the scales at around five pounds. These machines, and others, are light enough to take everywhere you go.

The rush to faster processors has spun down the prices of older, but still

**CALLING ALL
REPORTERS!
HEADLINE HARRY
NEEDS YOU!**

**NEW! Exciting Game
of U.S. History &
Geography**



Ages 10 to Adult

Grab your press pass and get ready for fun as you match wits with the unscrupulous *Diabolical Daily* in **Headline Harry and the Great Paper Race**. As Harry's ace reporter at the *U.S. Daily Star*, it's your job to outsmart the competition and get the true news stories on the front page first! It's a race to the deadline that takes you across the country and back through time.

Each new assignment will enrich your knowledge of U.S. history and geography as you uncover news events spanning four decades of American history (1950-1990).

Dynamic VGA graphics, animation, and digitized speech and sound effects add excitement as you race against the clock!

Suggested retail prices for
Headline Harry™ and the Great Paper Race

IBM/Tandy & PC Compatibles
Full-Spectrum 256-Color: \$59.95
16-Color Version: \$49.95

ORDER TOLL-FREE
(800) 545-7677 / (800) 556-6141

Satisfaction Guaranteed or your
money back from Davidson.

Davidson.
A Learning Adventure Game

Circle Reader Service Number 148



Help Harry put an end to yellow sheet journalism.



A good reporter always asks the right questions.



Travel across the U.S. in search of headline news.

Available at Babbages', CompUSA, Egghead Discount Software, Electronics Boutique, Radio Shack, Software Etc., and other fine retailers.

capable, portables such as the Toshiba 1000 SE and the low-end Bondwell machines. Portables can be found for under \$1,000 and make attractive second-computer alternatives to home-bound desktop PCs. Laptops already account for almost 10 percent of home computers.

One portable trend seems clear, and one more muddled. Notebooks will get slightly lighter, much less expensive, and more powerful, and will have longer battery life. Hand-held computers, called palmtops, probably won't work their way into many homes, but further ahead, slate-like computers (with pen operating systems) built from inexpensive components may.

As laptops, notebooks, palmtops, and slates become better able to handle your computing chores, their impact on home computer purchases will be striking. If so many computers are bought for at-home work, why would you buy a desktop computer for the house when you can take your office machine home with you in your briefcase or your pocket?

Portable computers freed us from the desktop. Will they also be able to free us now from the separation of office and home computing?

We're All Gutenbergs

First impressions are important. They must be, or we wouldn't spend so much time on our home computers churning out slick office documents, school reports, and family newsletters.

The notion that almost anyone equipped with a computer can produce high-quality printed materials is such a powerful idea that millions have bought it—along with the necessary hardware and software. Home office workers in particular like how desktop publishing has made their firms seem larger than life.

A laser printer, the crucial component of good document generation, is a great equalizer. It's difficult to tell whether a letter was printed with a Hewlett-Packard LaserJet III at a business or with a LaserJet IIP at home. Once too expensive for any but the most fanatical home publisher, laser printers have dropped in price and expanded in features nearly as fast as computers.

Several laser printers broke under the \$1,000 list price barrier last year. Leader Hewlett-Packard aimed its LaserJet IIP at the single user and in the process discovered a ready market in homes and home offices. Companies like Okidata, Canon, Toshiba, and Epson all carry laser printers that commonly sell for around \$800. Analysts predict that the popular IIP will sell for as little as \$700 next year.

Other printer technologies are making an impression on the home market as well. Inkjet printing technology, even less expensive than laser, is especially well suited for the home, where high volume and high speed are less important. Portable printers such as the tiny two-pound Citizen PN48 illustrate the trend in miniaturization. Printer additions that transform your laser printer into a plain-paper fax machine are already available.

With price competition so stiff, home computer owners can expect personal laser printers—machines that pump out four pages or less per minute—to settle in the \$600–\$700 range during 1992. More featurebound printers, those with PostScript, for instance, will remain above the \$1,000 mark, but they'll close on that magic number. The Texas Instruments Microlaser PS-17, for example, often sells for \$1,350. Look, too, for laser printers to keep shrinking in size and for specialty printers to include fax reception and printing.

Beaucoup Bits

The promises of CD-ROM entice even the most jaded home computer user. Who wouldn't like an entire encyclopedia on a disk? By packing hundreds of megabytes of data on a platter that looks just like an audio CD, CD-ROM puts vast amounts of information at your fingertips.

CD-ROM may finally find a way home if several computer makers are successful in selling their player-equipped models. Tandy, a giant in the home and home office markets, recently introduced a series of computers with CD-ROM capabilities. With base machines that stretch from a bottom-end 16-MHz 286 model (Tandy M2500 XL/2) to a powerhouse 33-MHz 386 machine (Tandy M4033 LX), this line does much to legitimize home CD-ROM. Magnavox's HeadStart/SX-20 CD computer, part of another CD-ROM series, is especially attractive to the home user; it includes not only a CD-ROM player but also several discs.

Software has been slow to arrive for reference and education, two major applications for CD-ROM in the home, but there are some excellent discs available. Grolier's *Illustrated Encyclopedia* and Bureau Development's *U.S. History on CD-ROM* are outstanding discs that by themselves justify the price of a player. National Geographic's *Mammals: A Multimedia Encyclopedia* teaches kids about animals with 700 color photographs, 150 maps, and 45 full-motion video clips.

The shallow software pool and the added price of players will keep the lid on the CD-ROM market at least through

1991. After that, all bets are off. That's because multimedia, a hot new complex of technology, will push CD-ROM into the limelight and possibly generate some software that home computer users won't want to do without.

An unknown in all of this is how non-computer players like Commodore's CDTV and Philips's Magnavox CD-I model will affect CD-ROM. These players, controlled by hand-held navigators and featuring entertainment and educational software aimed right at the home, are touted by some as the next VCR. With no keyboard or computer to intimidate, their strategy is to infiltrate millions of homes and leave CD-ROM computers in the dust. Will they? Experts are waffling on that question. Only one thing is certain: Some form of CD is in your home computer's future.

Someone's Buying the Stuff

You'd be hard pressed to tell that the economy is in a slump if you looked at the software sales charts. According to the Software Publisher's Association (SPA), North American software sales were 26 percent higher in 1990 than in 1989. Lee Iacocca would kill for a growth rate like that.

Some interesting stories hide among those numbers. Naturally, PCs dominated the software side of the business just as dramatically as they did the hardware, with nearly 80 cents of every software dollar spent on MS-DOS or *Windows* packages during 1990.

Other systems simply tagged along, if they succeeded at all. Macintosh ran a very distant second, accounting for only 13.3 percent of total software sales. The Apple II and Commodore 64 software droughts so evident on store shelves were borne out by the SPA data, which showed a 16.5-percent drop in the former and a whopping 42-percent decline in the latter during the year. And Amiga software couldn't climb out of its small (2-percent) market share.

Meanwhile, *Microsoft Windows* and *Windows* applications ended the year as winners, growing nearly 160 percent over the previous year and cornering over 10 percent of worldwide software sales.

Clearly, PCs rule the software roost now, and with the *Windows* explosion only a little more than a year old, they'll continue to crow for years to come.

Working Hard at Home

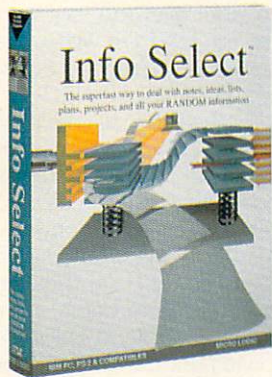
Work is work, no matter where you do it. Increasingly, home computers run the same software and perform the same tasks as machines in the office.

It's the new, powerful PCs that make this possible. With an at-home 286 or

How this \$149 software will:

- 1) Improve the way you work and think,
- 2) Instantly find the info you need, and
- 3) Help you make brilliant decisions ...

Surprisingly, there is a whole new world of uses for your computer! You can use your computer to deal with all the countless bits of "random" information scattered across your desk: plans, notes, lists, actions, contacts, ideas,



and much more. INFO SELECT™ will not only give you instant access to this important information ... it will help you make better decisions and see important new relationships. Try INFO SELECT risk-free and discover a whole new dimension of computing.

Photographic memory

INFO SELECT is like having a 'photographic memory' that gives you perfect superfast recall of up to 64,000 items of information.

Telephone notes

When Harry calls you on the phone, you'll display the six windows on Harry before he finishes his first sentence! No more embarrassing pauses or scrambling for information.



INFO SELECT is easy to use - yet powerful.

INFO SELECT also includes the world's first "3-D" word processor. You'll be amazed at how it works.

Instead of one window or ten, imagine up to 64,000! The uses are endless.

Are you forgetful?

Were you born with a memory situated squarely on the tip of your tongue? Do you forget things like which day you placed an order or important numbers? If you are forgetful you especially need INFO SELECT - the software that remembers almost everything for you.

Thinking tool

Have you ever worked on a complex project and felt lost? With INFO SELECT you'll group, scan, and cross search through all your notes so fast you'll see the big picture in seconds.

Will I be better off doing this now or that later? Keeping priorities straight can make or break your career or your business. INFO SELECT lets you keep on top of what's hot.

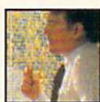
Should you use an east or west coast supplier? To make decisions you need facts. Now you can view the facts any way you like ... as fast as you can think. You'll make the best decisions ever -- and fewer expensive mistakes.



Phone notes



Client info



Decisions



Management

The #1 PIM

What's all the fuss about PIMs (Personal Information Managers)?

Simple - you probably have more RANDOM information than any other type and you need a PIM to properly handle this kind of information. The right PIM will save you time and make everything you do go smoothly.

Why is Info Select the #1 PIM? Because Info Select is based on ideas you can identify with - like stacks of paper. And it's free-form too. You

won't waste days or weeks learning complex structures. Instead you'll be up and running in minutes. Info Select also does more and costs less than other PIMs.



Owners of our TORNADO software (symbolized by the famous "blue tornado") can trade up to the second-generation Info Select under our special offer. There are over 200 improvements.

Feature packed

INFO SELECT is memory resident (if you choose), so you can quickly jump in from other programs. Info Select windows can hold: notes, plans, lists, facts, letters, contacts, and much more. You can search for a window or a group of windows related by a word or phrase. There are five ways to see overviews; hypertext, a fast sort, and line drawing. Save time with the dialer, date tickler; and searching by text or date ranges.

Info Select allows you to: add columns of numbers; store data in EMS; use template or free-form windows; import and export files, screens, and databases; move, join, and duplicate windows and much more.

LAN option

The new LAN version allows integrated E-mail, sharing company rolodexes and distributing company policies. You can share any kind of information. It's your first step into the exciting new world of groupware! Ask about the five node LAN starter pack.

Easy power

Info Select is easy to use yet offers the power you need with infobases up to 10 megabytes; text searches up to 700kb/sec; up to 32,000 characters per window; and up to 64,000 windows per infobase. Even better, Info Select can swap down to as little as 7K memory!

TORNADO owners

INFO SELECT is based on the pioneering TORNADO™ software PC World called "Excellent, Excellent, Excellent, Excellent" and PC Magazine awarded Editor's Choice - twice. Call about our special trade-up offer.

The next generation of **TORNADO** is here at last!

"The most useful software program I have ever owned."
Steve Gibson, InfoWorld

Endless uses

Info Select can do much more than manage all your RANDOM information. Use it to manage business correspondence, sales leads, orders, and client notes. Track facts, plan projects, or interrelate all your ideas. You can catalogue parts, documents, and inventory items. Match buyers and sellers or doctors and patients. Setup an information desk. Edit E-mail. Store notes on magazine articles, software operation techniques, or just names and addresses. Whether you are a lawyer tracking court cases or a zoologist collecting feeding habits you'll find countless uses for Info Select.



Info Select keeps your information in intelligent automatically positioned windows.

Risk-Free Guarantee

Info Select is so effective you will be amazed. That's why we offer our money-back guarantee. Try it for 30 days. If you are not fully satisfied, accept our full prompt refund. Could any offer be more fair?

All for just **\$149.95!** **New: Ver 2.0!**

INFO SELECT has a special price of just \$149.95. You can even try it risk-free with a 30-day money back guarantee. But hurry - this is a limited time offer.

Doesn't it make sense to get the software package that can open up a whole new world of important uses for your computer? Order today. Call toll-free:

(800)342-5930

... and get ready for a new dimension of computing.

MicroLogic

POB 70, Dept. 602
Hackensack, NJ 07602
(800) 342-5930 (201) 342-6518
Fax: (201) 342-0370

Makers of: Tornado, Info Select, Key Watch & Micro Charts

<p>David Harvey</p> <p>"Rarely do I recommend a product as wholeheartedly" David Harvey, Comp. Shopper</p>	<p>Jeffrey Parker, PCM</p> <p>"Beats the pants off just about everything else."</p>	<p>Patrick Marshall</p> <p>"As easy as remembering your own name." Patrick Marshall, Info World</p>	<p>Editor's Choice "First rate" PC Magazine</p>
--	---	---	---

386 PC, you can crunch numbers with 1-2-3, pound out reports with *WordPerfect*, or compile charts with *Harvard Graphics* long after the kids are in bed. This power can also form the foundation of your home business, letting you compete with larger companies because you're using the same hardware and software tools they use.

Productivity is king at home. The top two home computer uses, reports Link Resource, are word processing (69.6 percent of those with a home computer say they use word processing software) and file keeping (62.4 percent). Not far behind are graph and chart making (41 percent), budgeting (40.2 percent), and spreadsheet work (38.6 percent).

Home computer work is changing, though. Integrated software—affordable all-in-one packages combining word processing, spreadsheet, and database modules—once were the home computer user's dream. The gleam's gone, it seems, since integrated software was the only PC category to post a drop from the previous year. One possible reason: It's easy to integrate several separate, full-featured programs with a graphical environment like *Windows* or *GEOS*.

But financial and tax applications show no signs of loosening their grip on home computers. Of people who are looking to buy their first home computer, one out of every four indicates budget making and tax preparation are the reasons for their purchase. The result? *Quicken*, an easy-to-use personal accounting program, appears on virtually every bestseller chart. Conveniences such as electronic bill paying and tax filing will become the rule, not the exception, at home.

Although stripped-down versions of corporate productivity packages are often perfect for the home—*LetterPerfect* instead of *WordPerfect*, *Personal R:BASE* instead of *R:BASE*—the trend is to equip the home with the same software functionality as the office.

What else would you expect when so much work is done at home?

Go Ahead—Teach Me

We only pay lip service to educational computing. We say we're buying a computer for the kids, but we don't often put our money where our mouth is. Prospective home computer owners rank their children's schoolwork as the second most popular reason for wanting to buy a machine. More than half of current owners claim they use their computers for educational applications. But we spend less than a third as much on PC educational software as we do on games.

What's the problem?

Maybe it's the wretched state of

much of what's labeled as educational by software publishers. With many packages crippled by boring and repetitive play, crude graphics, and lack of sound effects, it's no wonder kids turn off the computer and hit the Nintendo instead. Fortunately, a few educational software publishers are waking up to the fact that kids want some sizzle with their electronic schoolwork.

Eduainment, as some call the category, mixes traditional game elements with carefully crafted educational ideas to subtly teach things to kids. Its origins can be found in such long-running lines as Broderbund's Carmen San Diego games, which successfully combine learning geography and history with detective-style gameplay. More recent examples come from the Learning Company and its Super Solver series.

These efforts are paying off. According to the SPA, 1990 was the first year that PC educational programs outstripped the combined sales of Apple II and Macintosh learning software. Educational software sales grew by 48 percent from 1989 to 1990, beating out such stalwart categories as games, word processing, and desktop publishing in the growth race. And though much of this increase is undoubtedly due to an increased emphasis on the PC in the classroom, MS-DOS is the first priority of every major publisher that sells home education software.

Home learning's future depends on more and better CD-ROM software, even more gamelike style, and superior speech. The last may be most important, as impressive new text-to-speech capabilities—like those pioneered by First Byte and now utilized by Davidson & Associates—create entirely new types of educational software.

Pick your packages carefully, and your kids won't know they're learning.

Fun Against All Odds

The numbers are staggering. Over 42 million Nintendo videogame machines sit in American homes. Nintendo sold approximately 8 million copies of its *Super Mario Brothers II* cartridge. Videogame systems and cartridges rang up a whopping \$3.4 billion in sales during 1990.

By comparison, computer software publishers sold only \$355 million worth of disk-based games last year. Computer game makers count themselves lucky if a program sells 50,000 copies.

One of the most significant home computing developments in the last five years is the steady erosion of entertainment. At least one type of game is already lost to the cartridge machines. Arcade games, traditionally built on quick joystick action and rapid fire, are all but

gone from the computer scene. Other categories of computer games are in danger. Sophisticated sports games now show up on cartridge, as do a handful of role-playing games and simulations, such as *Ultima* and *SimCity*.

Game developers fight back with increasingly complex products, especially high-end simulations like *SimEarth*, hybrid arcade/role-playing games like *Strike Commander*, and long-length adventure games like *King's Quest V*. PC entertainment sales climbed slightly faster than the overall average, but cartridge systems returned fire with more powerful machines like Nintendo's Super NES and the CD-equipped NEC TurboGrafx. Looming behind these are players based on CD-I (Compact Disc, Interactive) technologies, which might spell the end of most computer games.

Because PC developers compete for a finite number of electronic entertainment dollars, they must look for new ways to play off the home computer's strengths. The Sierra Network, an online amusement park where you play against opponents via a modem, is an area that shows promise. Another is an increasing reliance on the PC's powerful processor and 256-color VGA graphics to handle games that cartridge systems simply can't duplicate.

Watch for a small flood of CD-ROM games in 1992. Expect to hear more involved soundtracks and digitized speech, see more photographic-style graphics, watch more Disney-style animation, and play more sophisticated simulations in the areas of electronic life, military weapons, and sports.

You'll keep playing on the screen. But unless home computer games fight back, that screen may be your television, not your PC's monitor.

Eyes on the GUI Prize

The Macintosh is on a roll. Last year's lower-priced models—particularly the Classic for under \$1,000—literally sold faster than they could be built. Surprising nearly everyone, the success of the Classic and its color cousin, the LC, will put new Macs in at least half a million homes by the end of 1991.

The Mac's biggest drawing card is its graphical user interface (GUI), the desktop metaphor where icons represent applications and files, mouse clicks launch software, and programs look and often work alike. Apple's new System 7.0 recaptures the lead in GUI expectations from *Microsoft Windows*.

Windows 3.0 is only a year and a half old, and already it's selling half as many programs as those for the Macintosh. The intense interest in *Windows* applications demonstrates that at least some PC owners are drawn to the

SPANISH
30 Cassettes
+ Triple Bonus
\$245.00

FRENCH
30 Cassettes
+ Triple Bonus
\$245.00

GERMAN
30 Cassettes
+ Triple Bonus
\$245.00

ITALIAN
30 Cassettes
+ Triple Bonus
\$245.00

JAPANESE
30 Cassettes
+ Triple Bonus
\$265.00

Mandarin CHINESE
30 Cassettes
+ Triple Bonus
\$265.00

RUSSIAN
30 Cassettes
+ Triple Bonus
\$265.00

Brazilian PORTUGUESE
30 Cassettes
+ Triple Bonus
\$265.00



Learn Foreign Languages... Incredibly Fast!

Conversing in a foreign language is a major social and business asset...and brings new life to the worlds of travel, entertainment, and relationships. The technique of *accelerated learning*, as conveyed by these proven foreign language courses, allows anyone to comfortably converse in a new language within 30 days.

Accelerated learning, developed by famed learning expert **Dr. Georgi Lozanov**, is based on the premise of involving both hemispheres of the brain in the education process. The analytical or logical left side of the brain, when properly activated with the musical or artistic right

side of the brain, both increases the speed and heightens the retention of learning. Utilizing these untapped mental capacities of your learning ability is the basis of this unique, highly effective course.

You will learn the language as *stresslessly* as a child does, by hearing new vocabulary and phrases in alternately loud, whispered, and emphatic intonations, all accompanied by slow rhythmic music in digital stereo. This perfect combination of music and words allow the two halves of the brain to work together to dramatically facilitate your assimilation of the new language.

The first 15 (memory) tapes of this 30-tape package help activate the learning capacities of the brain. The second 15 (study) tapes are the very same tried and proven tapes used by the **Foreign Service Institute** to train career diplomats. This marriage of two concepts literally gives you *two courses in one*, providing the best of both worlds in language instruction.

Best Value! With a total of 32 cassettes plus study materials, this program represents the best

value available today in language instruction. Compared to other programs, the **Accelerated Learning Series** outperforms them with twice the audio and 20 times the study material.

To correctly converse in a foreign language, you must understand the meanings and intent of the native speaker. If, after 30 days of listening to the study and memory tapes, you are not *comfortably understanding and conversing in your new language*, return them for a full refund.

TO ORDER: Phone or send your check, money order or Inst. P. O.

TOLL-FREE 24 HRS: VISA · M/C · AM. EX.
1-800-85-AUDIO
 Rush Orders PHONE 9-5 PDT:
1-818-799-9000
 You may FAX your credit card order or company P.O. to:
1-818-792-7815

INTERNATIONAL ORDERING INFORMATION

"New! Now, for your ordering convenience, you may call our order desk toll-free 24 hours a day from any of the following countries via **AT&T International 800 Service.**"

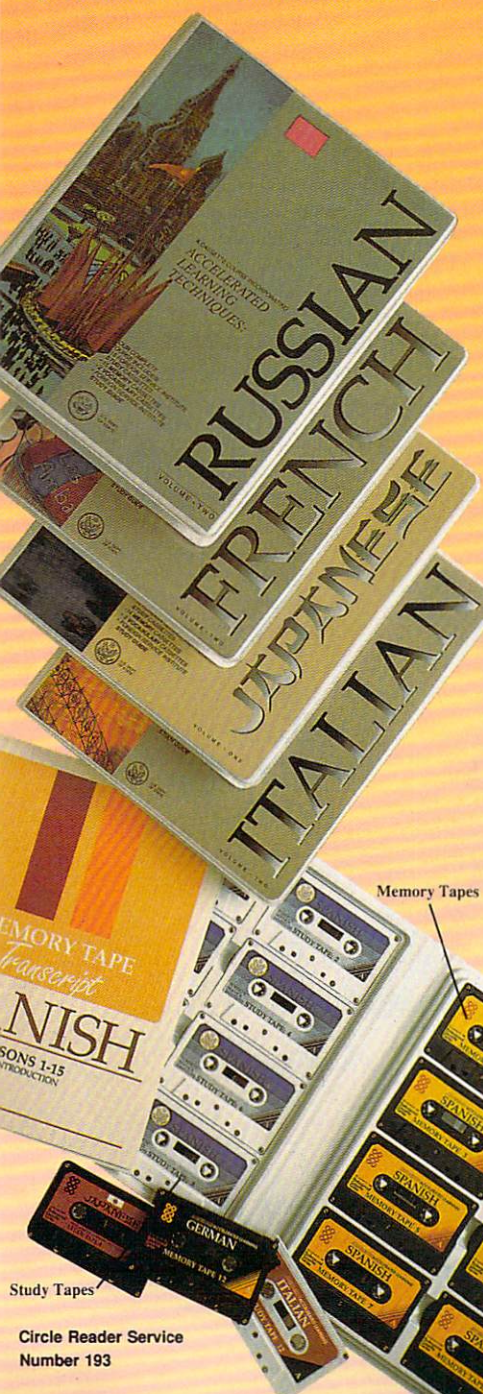
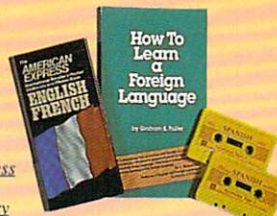
BELGIUM	11-6599	NETHERLAND	06-022-4612
DENMARK	8001-0578	SINGAPORE	800-1625
FRANCE	05-90-1368	SPAIN	900-98-1120
GERMANY	0130-81-1139	SWEDEN	020-793-626
ITALY	1678-70-179	SWITZ	046-05-9632
JAPAN	0031-11-1907	UK	0800-89-7452

"American Managers with Language Skills Open More Doors"
 —Wall Street Journal Editorial

"Company and marketing executives will find after 1992 that it is a handicap not to be fairly conversant with at least one other major European language — and preferably two or three..."
 —The London Times

Triple Bonus !!

- You'll also receive:
- Two 90-minute Vocabulary Tapes
 - The 100-page *How To Learn A Foreign Language*
 - The *American Express International Traveler's Dictionary*



- FRENCH \$245.00
- SPANISH \$245.00
- GERMAN \$245.00
- ITALIAN \$245.00
- JAPANESE \$265.00
- CHINESE (Mandarin) \$265.00
- RUSSIAN \$265.00
- PORTUGUESE (Brazilian) \$265.00

Name _____
 Address _____
 City _____ State _____ Zip _____
 Credit Card No. Exp. _____

Signature (Card Orders Only)
 VISA MASTERCARD AMERICAN EXPRESS
 Need It Tomorrow? Ask Operator for Express Service



PROFESSIONAL CASSETTE CENTER
 350 WEST COLORADO BOULEVARD
 DEPARTMENT CPF
 PASADENA, CALIFORNIA 91105 U.S.A.

Please add \$11.00 shipping and handling.
 California residents add 8 1/4% sales tax.

prospect of a graphical environment.

But is *Windows* something important for the home? Right now? Hardly.

Windows' hardware requirements leave out all but the best-equipped home computer users—those with a 386SX or 386 machine, two megabytes of RAM, and a VGA display. But that's not to say that home computer users aren't casting eyes on GUIs.

GeoWorks Ensemble—a graphical environment complete with minimalist applications—sits atop DOS and provides an elegant solution for anyone with an 8088, 8086, or 286 PC. In some ways slicker than *Windows*, this GUI is perhaps best demonstrated by America Online, a new telecommunications service that simplifies sending E-mail and downloading software.

That's today. What about tomorrow?

Perhaps one in ten home computer users looks at a graphical environment, with most of them seeing a Macintosh. But the trend toward GUIs seems irreversible, especially for the home user. More and more computer makers bundle *Windows* or *GeoWorks Ensemble* with their machines, particularly those sold as just another piece of consumer electronics. And GUI ease of use makes perfect sense in the home, where there isn't always someone around to show you what to do.

Computers must be simpler to use if they're to climb out of their one-out-of-four-households ghetto. GUIs will be a crucial part of the catalyst that takes millions more computers home.

Just Around the Corner

Home computing rarely stands still long enough for anyone to form a complete picture. In a few years, that picture may be nearly unrecognizable.

"I see a division of computing and game playing," says Ken Williams, president and CEO of Sierra On-Line, one of the country's biggest computer game producers. "There'll be something that will sit on top of your TV—maybe it's CD-ROM based—that looks just like a stereo component." That's what we'll play with, says Williams, while we relegate our at-home work to a more familiar personal computer. "The next big leap [in games] will be to get away from text," Williams says. "If the motion picture industry had to depend on silent pictures, it wouldn't be much."

Speech is vital to the future of education on the home computer, too, according to Jan Davidson, president of Davidson & Associates. "I think there will be huge movements in speech technologies," she says, adding, "I'm sure there will be educational applications using very interactive video in

very compelling ways." Unlike Williams, Davidson isn't bullish on players without keyboards. "I don't believe the keyboard is going to go away as quickly as other people think. Players certainly will have their appeal with entertainment, but I wonder if they'll be useful tools for things like education."

Brian Dougherty, CEO of GeoWorks, looks ahead and sees a multicomputer home. "There'll be an under-\$500 slate computer by 1995," he says. Based on a pen approach, where you navigate on a flat screen with a stylus and write by hand, these slate computers are "very plausible," says Dougherty. "It's something that you can throw in your purse. Several people in a home will have these, and they'll link them up with the home's multimedia PC."

These three people—and most others who follow home computing—agree on one thing: Home computing in 1995 will be different, very different.

Home for Some, Not for All

Optimists like to think of the computer as the VCR of the 1990s, a consumer electronic device that soon will end up in virtually every home. That's clearly not in the cards, not soon anyway. At the current rate of growth, it'll be the turn of the century before even 40 percent of America's homes have a person-

al computer. VCRs blink 12:00 in nearly twice as many homes today.

A home computer is a powerful tool all members of the family can use—if they'll use it. Barely half the adults and a quarter of the kids with a computer in their homes use the machine.

People avoid buying computers because they're still too expensive. People avoid using the computers they have because the machines are still too complex. Lower-priced, simple-to-work computers are the key to any dramatic upswing in home computer ownership.

Some progress glimmers in the distance. Graphical user interfaces make many computing chores easier and cushion new users from the arcane ways of computers. Multimedia—if by that you mean integrating sound, graphics, and text into a coherent whole—may shove ease of use up another notch. And prices are slipping, if not tumbling. Whether you're buying a laser printer, notebook computer, or desktop system, you'll spend less this year than last.

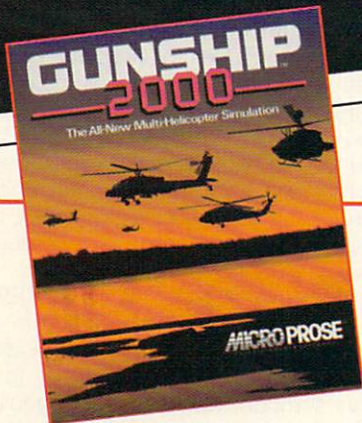
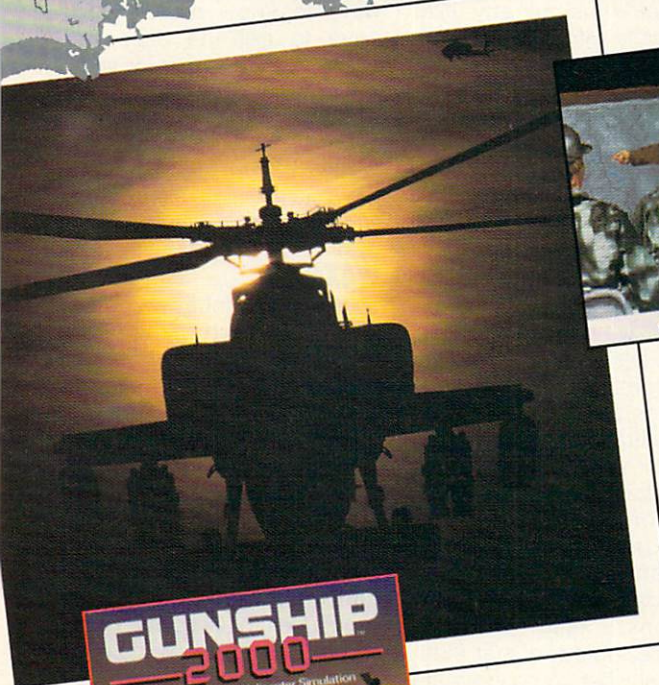
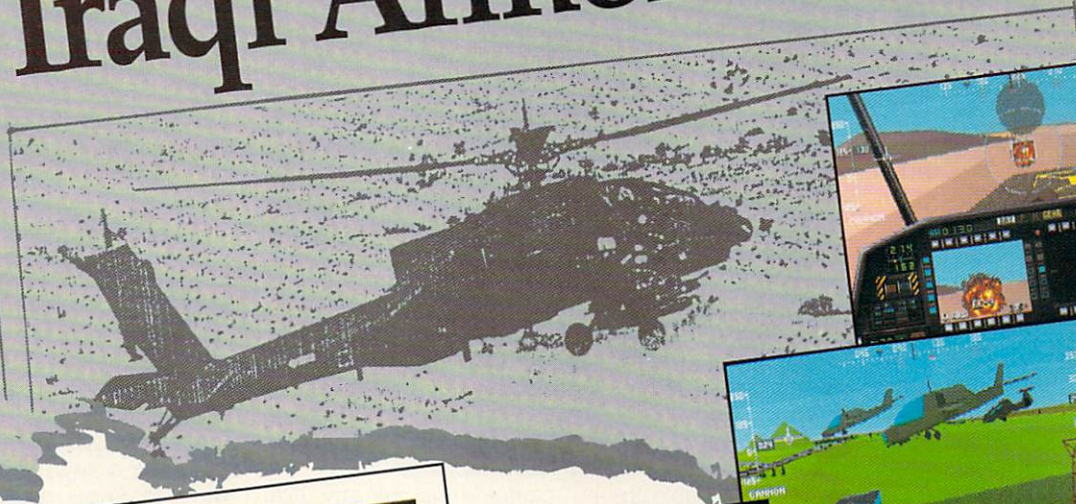
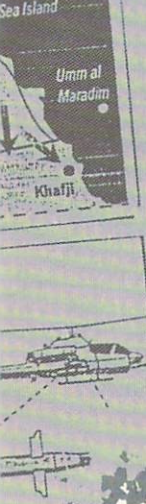
Maybe computers will never occupy space in every home. Maybe they shouldn't. Not in their current form, not in their current roles. But to an increasing number of Americans, today's home computer is as indispensable as the television and the telephone.

America—what a country! □



U.S. Gunships Shred Iraqi Armored Units

Bubiyah Island
Persian Gulf
Sea Island
Umm al Maradim
Khalij



Whirling through the searing desert skies, they swooped down on Soviet-made tanks. In seconds, the Hellfire missiles and 30 mm cannons punched through the hapless units like they were cheap tin cans. Now you can ride the pride of Desert Storm with Gunship 2000, the only multi-helicopter combat simulation. You take total command of a five-copter troop. You pick the combat arena--from 3 in the Persian Gulf, 3 in Central Europe. You meet the kind of challenge that could only come your way from MicroProse, the acknowledged leader in air combat simulation. Gunship 2000. With you at the controls, the enemy has nowhere to hide.

MICRO PROSE™
ENTERTAINMENT • SOFTWARE

For IBM-PC/Tandy/compatibles. For the latest information on release dates and availabilities, call MicroProse Customer Service at 301-771-1151, 9 am to 5 pm EST, weekdays. © 1991 MicroProse Software, Inc., 180 Lakefront Drive, Hunt Valley, MD 21030.

Circle Reader Service Number 157

SHAREPAK

Richard C. Leinecker

FOUR HITS MADE IN THE U.S.A.

Since this month's editorial theme covers the state of computing in the U.S., we bring you four excellent, state-of-the-art shareware products that push the techno envelope.

Straight out of sci-fi flicks, *SPEAK* will give your computer a voice all its own. With *NorthCAD-3D*, you can design and view complex 3-D objects. *Conquest* gives board-game lovers the chance to conquer the world. And finally, *WAXMAN* challenges you to a chess game that pits you against the most formidable opponent of all—your computer.

If you're new to *COMPUTE* and *SharePak*, you'd probably like to know how we select the programs that appear each month. First, we look for shareware programs that match the theme for this month's issue. Second, we spend time downloading files from the online services, saving you the cost of expensive connect time, which would amount to many times the cost of buying a *SharePak* disk. Then, we evaluate every program, choosing those we think will interest you the most. Finally, we work with program authors to fix any bugs and change any features that we feel are necessary to make the programs the best they can be.

You'll be glad to know that every program and disk is carefully checked for viruses. Also, we provide technical support during our regular business hours. Finally, we offer a money-back guarantee—if you don't like your *SharePak* disk, just return it for a full refund.

SPEAK

This program will make your computer "come alive" and speak to you. Use any text editor or word processor to cre-

ate an ASCII file of the text you want your PC to speak. Then, from the DOS prompt, just type *SPEAK filename*. This creates a self-contained COM file that holds all the speech information. Then to listen, you simply type *filename*, and your computer does its thing, "speaking" whatever you've typed in the ASCII file.

Although fun to play with, *SPEAK* is much more than a novelty program. For instance, you can create batch files that speak, and the program is really invaluable for young children or those with reading difficulties and for the visually impaired.

Speak runs on any IBM compatible with 256K of available RAM and any monitor. No special hardware is required for playback.

NorthCAD-3D

NorthCAD-3D is a design and modeling program that lets you create, view, and edit 3-D objects and images. The program is completely menu-driven, which makes it a snap to learn, and it has a versatile command set that emphasizes conceptual design and illustration.

NorthCAD-3D allows you to create drawings from any viewpoint, or you can view the same drawing from several simultaneous viewpoints—even while using the drawing functions. Plenty of sample files are included that illustrate just what you can create with the program—and how.

To run *NorthCAD-3D*, you'll need an IBM compatible with 512K of available RAM and a CGA, EGA, or VGA monitor. Math coprocessors are supported. We suggest one to really speed things up.

Conquest

I'd love to count the hours I've spent playing world-conquest board games. Now I might

have to add to that number since I got a copy of *Conquest*. It's a great continuation of the world-conquest board-game tradition. And should some of your opponents happen to be remote, you can play through a modem—which is a real boon to board-game addicts like me.

The game looks terrific with a lot of colorful screens to portray the world and territories. An easy-to-use menu-driven interface lets you play with no hassles. Optional mouse support adds a nice, professional touch, too, for those who would rather not fool with a keyboard. If you want to know more, you'll have to get the disk and check out *Conquest* for yourself. You'll love it.

To play *Conquest*, you'll need an IBM compatible with 256K of free RAM. You'll need a Hercules, CGA, EGA, MCGA, or VGA monitor.

WAXMAN

This is a great chess program you'll find hard to beat—in more ways than one. First of all, the game itself is a formidable opponent. Even chess enthusiasts will have a hard time beating *WAXMAN*. Second, you can run the game as a stand-alone or as a memory-resident program. For example, you can start a game and then work in your word processor for a while. Then, when your intuition kicks in and you know what the next move should be, you just hit the hot key, make your move, see what the computer does in response, and return to your word processing while thinking of the next move.

WAXMAN runs on any IBM compatible computer with at least 65K of available RAM. The program runs in text mode, which means if you're inside a graphics application, *WAXMAN* won't pop up. □

Checkmate your PC, or let it speak. Every month *Sharepak* brings you the best of shareware.

With COMPUTE's *SharePak*, You'll

SHARE IN THE SAVINGS!

SAVE TIME

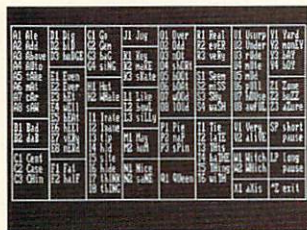
We carefully select and test all programs for you

SAVE MONEY

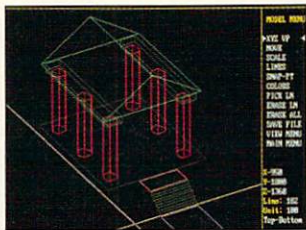
Each disk includes two to five programs for one low price

SAVE KEYSTROKES

Our free DOS shell lets you bypass the DOS command line



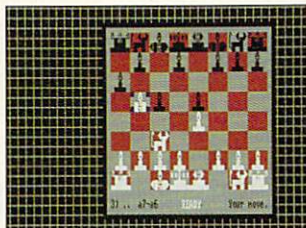
SPEAK



NorthCAD-3D



Conquest



WAXMAN

COMPUTE's SharePak disk contains the best of shareware—handpicked and tested by our staff—to complement this month's focus. You'll sample entertainment, learning, and home office software at a great savings. Each *SharePak* disk includes two to five programs plus complete documentation for one low price:

\$5.95 for 5¼-inch disk

\$6.95 for 3½-inch disk

For even more savings, subscribe to *SharePak* and receive COMPUTE's SuperShell FREE!

For a limited time, you can subscribe to COMPUTE's *SharePak* and save more than 37% off the regular cost of the disks—plus get COMPUTE's *SuperShell* FREE.

With a one-year paid subscription, you'll get

- A new 3½- or 5¼-inch disk delivered to your home every month
- Savings of over 37% off the regular disk prices
- Advance notices of COMPUTE special offers
- COMPUTE's *SuperShell* at no additional cost!

Subscribe for a year at the special rates of \$59.95 for 5¼-inch disks and \$64.95 for 3½-inch disks—and get **COMPUTE's SuperShell FREE!**

COMPUTE's *SuperShell* requires DOS 3.0 or higher. Disks available only for IBM PC and compatibles. Offer good while supplies last.

For Single Disks

YES! I want to share in the savings. Send me the October 1991 issue of COMPUTE's *SharePak* disk. I pay \$5.95 for each 5¼-inch disk and \$6.95 for each 3½-inch disk plus \$2.00 shipping and handling per disk.

Please indicate how many disks of each format you would like:
 _____ 5¼-inch at \$5.95 each _____ 3½-inch at \$6.95 each
 _____ Subtotal
 _____ Sales Tax (Residents of NC and NY, please add appropriate sales tax for your area. Canadian orders, add 7% goods and services tax.)
 _____ Shipping and Handling (\$2.00 U.S. and Canada, \$3.00 surface mail, \$5.00 airmail per disk)
 _____ Total Enclosed

Subscriptions

I want to save even more! Start my one-year subscription to COMPUTE's *SharePak* right away. With my paid subscription, I'll get a FREE copy of COMPUTE's *SuperShell* plus all the savings listed above.

Please indicate the disk size desired:
 _____ 5¼-inch at \$59.95 per year _____ 3½-inch at \$64.95 per year

For delivery outside the U.S. or Canada, add \$10.00 for postage and handling.

Name _____
 Address _____
 City _____
 State/Province _____ ZIP/Postal Code _____
 Total Enclosed _____
 _____ Check or Money Order _____ MasterCard _____ VISA
 Credit Card No. _____ Exp. Date _____
 Signature _____ (Required)
 Daytime Telephone No. _____

Send your order to COMPUTE's *SharePak*, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408.

All orders must be paid in U.S. funds by check drawn on a U.S. bank or by money order. MasterCard or VISA accepted for orders over \$20. This offer will be filled only at the above address and is not made in conjunction with any other magazine or disk subscription offer. Please allow 4-6 weeks for delivery of single issues or for subscription to begin. Sorry, but telephone orders cannot be accepted.

Important Notice: COMPUTE's *SharePak* is not associated with COMPUTE's *PC Disk*. Please order *SharePak* separately.

TEST LAB

Access hundreds of megabytes of data. That's the promise of CD-ROM technology, and it's here today, faster and more affordable than ever. This month's Test Lab examines ten capable CD-ROM drives and gives you the information you need to understand the technology and make wise buying decisions. In addition to benchmark test results and instructive sidebars, this month's Test Lab offers hands-on reviews that explore everything from installation and documentation to special features and software bundles. So whether you plan to consult an online encyclopedia, find a business address, play a game, or take advantage of the educational benefits of multimedia CD-ROM software, read on. This month's Test Lab will help you find the CD-ROM drive that's right for you.



CD TECHNOLOGY PORTA-DRIVE

CD Technology's Porta-Drive does its job well. Whether you're playing a game with your children, researching a report, or learning about the world around you, this CD-ROM drive takes only a reasonable amount of time and effort to accomplish what you've asked it to do.

I found it to be slightly slower

than my hard drive, an adequate speed considering the wealth of sounds (on computer CDs—it doesn't play music discs), sights, and data it allowed me to access. To increase the drive's speed, CD Technology uses a 64K memory buffer.

The Porta-Drive itself is remarkably compact, about the size of a hardcover novel, though heavier at 3.8 pounds. Its two controls—an eject button and a volume slide for the headphone jack—make the Porta-Drive by itself much easier to use than an audio CD player. CDs enter and exit the machine in an accompanying CD caddy.

Installing the Porta-Drive takes little technical knowledge or mechanical skill. After removing your PC's cover, you simply plug the card into an expansion slot and then hook up the cable to the card's port. A separate power

CD TECHNOLOGY
766 San Aleso Ave.
Sunnyvale, CA 94086
(408) 752-8500

List Price: \$895

Street Price: \$849*

**Warranty: 12 months
(no extended
warranty)**

**Service Plan: through
the company
(shipping the
product as an
authorized return)**

box simply plugs into the back of the device. The software driver provided with the Porta-Drive installs itself on a hard drive, automatically altering your AUTOEXEC.BAT and CONFIG.SYS files so the machine is ready to go every time you boot up. The driver allows you to lock and unlock the player and eject the CD caddy using only keyboard controls.

If you run into trouble, the user manual for the Porta-Drive provides adequate information. It's

well organized and generally clear, though it lacks both an index and a section of troubleshooting tips. The machine comes with a two-year warranty. Technical support is available either through a 24-hour bulletin board service or by calling the company directly, though neither call is toll-free. As simple to install and operate as the machine is, though, most people will probably have little trouble.

Despite the cost of CD-ROM drives and their inability to accept data from your computer, their storage potential will obviously appeal to a great number of computer enthusiasts. If you're in the market for one of these mass-storage marvels, the Porta-Drive has a lot to offer in a little package.

EDDIE HUFFMAN

Circle Reader Service Number 301

CHINON CDX-431

A solid performer from setup to shutdown, the Chinon CDX-431 opens the door to laser disc storage at a reasonable price.

This particular Chinon unit comes with the CD-ROM drive housed in a slim case, a CD caddy for loading your discs, a SCSI interface card, an interface cable, and software that includes Microsoft's CD-ROM extensions and the Chinon device driver.

Installation is straightforward and rather simple, provided you're comfortable opening up your computer's case. (If you aren't experienced in this area, ask someone to help you or take your PC to a local technician for assistance.)

Software installation is also easy. You can install either to your hard disk or to a second floppy disk. The setup program will copy the CDX-431 device driver and Microsoft extensions to the directory of your choosing.

**Test Lab street prices are an average of prices advertised in computer magazines and national newspapers during July 1991.*



CHINON AMERICA
 660 Maple Ave.
 Torrance, CA 90503
 (800) 441-0222
List Price: \$795.00
Street Price: \$564.33
Warranty: one year
Service Plan: through the
company (customer ships)

In addition to its CD-ROM capability, the CDX-431 gives you the ability to play audio CDs by means of its CDPLAY program. After you invoke CDPLAY, you can program the player as you would a CD deck connected to your stereo. The CDX-431 includes audio jacks for connecting speakers (using standard RCA plugs) or for connecting the drive to a stereo system. There is also a headphone jack.

In several months of use, I had virtually no problems running the CDX-431, and those few problems I did encounter turned out to be related to various third-party CD-ROM applications and not to the hardware system.

I used the drive with a variety of text-based and graphics-based CDs. The caddy and loading mechanism worked smoothly and without any noticeable degradation in performance throughout my use of it. I was able to launch applications both from the DOS prompt and from with in *GeoWorks Ensemble* and *Microsoft Windows*.

The CDX-431 offers 150-kilo-bytes-per-second continuous throughput, which makes it standard with what Bill Gates has defined as the minimal per-

formance criterion for a multimedia CD device.

The company rates the disc's access time at 350 milliseconds, which is many times slower than that of a hard disk. But keep in mind that the advantage of CD-ROM technology isn't in the speed of the access; it's in the volumes of information available to you at any one time and the potential for providing innovative means for presenting and using that information. This coming year may indeed be the year of the CD, as prices drop and manufacturers like Tandy, Sony, and Magnavox bring CD-ROM drives and CD-ROM-equipped computers to the consumer market.

Whether you want access to extensive databases, the ability to play the latest and most comprehensive entertainment and education programs, or the pleasure of playing audio CDs as you complete your office work, the CDX-431 will meet those needs.

PETER SCISCO

Circle Reader Service Number 302



GENESIS GENSTAR 2000

Setting up the GenSTAR 2000 turned out to be an exercise in plug-and-play simplicity. I just popped the SCSI interface card into an open slot in my PC, connected the cable from the card to the CD-ROM player, and turned the machine on.

To install the software, I ran GenSTAR's setup program, which configured my computer to automatically load two CD-ROM drivers at boot-up. I'm using DOS 5.0, and after a little tweaking, I was able to load both drivers into high memory.

The whole installation process took less than 15 minutes. But I was lucky. The interface's default interrupt, I/O port, and DMA channel didn't conflict with any other hardware devices in my PC. If there had been a conflict, I would've had to know exactly how my current equipment was configured and be able to adjust the SCSI card accordingly. The GenSTAR manual, despite its modest appearance (20 loose-leaf pages stapled together), contained clear instructions and illustrations on reconfiguring the card and would've been an excellent guide had I needed it.

After installing the GenSTAR, I was able to start using it immediately because of its gaggle of bundled CD-ROM software. In-

GENESIS INTEGRATED SYSTEMS
 1000 Shelard Pkwy.,
 Ste. 270
 Minneapolis, MN
 55426

(800) 325-6582
List Price: \$499
Street Price: n/a
Warranty: 12 months
Service Plan: repair
or replacement
through company
within 2 working days



PIONEER COMMUNICATIONS OF AMERICA

600 E. Crescent Ave.
Upper Saddle River, NJ
07458

(800) 527-3766

List Price: \$1,295

Street Price: \$1,199

Warranty: one year,
including technical
support

Service Plan: through
shipment to Pioneer's
service center

cluded are four titles from the Software Toolworks—*Reference Library*, *Illustrated Encyclopedia*, *U.S. Atlas*, and *World Atlas*—plus *Mammals* from the National Geographic Society and *Languages of the World* from the Sony CD-ROM series.

I found *Reference Library* to be extremely useful. It boasts a spelling checker, dictionary, thesaurus, quotation index, general reference, history, listings of business addresses and phone numbers, a legal and corporate handbook, and a concise writing guide. You can run *Reference Library* either as a stand-alone program or as a TSR. Either way, its easy-to-use interface with pull-down menus and mouse support makes browsing a pleasure.

The other bundled titles were nearly as interesting, useful, and entertaining as *Reference Library*. And it's comforting to know that if I ever get tired of accessing this huge chunk of the world's accumulated knowledge, I can take advantage of the fact that the GenSTAR is also a functional music CD player by popping in a disc, plugging in my earphones, and tuning in to Mozart.

CLIFTON KARNES

Circle Reader Service Number 303

PIONEER DRM-600

Pioneer's DRM-600 CD-ROM changer can add volumes of data retrieval power to your system.

The shoebox-size DRM-600 holds up to six discs, inserted together in a special magazine. The configuration software gives each of these discs a drive name. You can switch to these discs, access information, and run programs just as you would from any ordinary disk. The only difference is that you can't write to the read-only CD-ROMs.

Once the interface board is installed inside the PC, the drive itself is connected via the supplied SCSI cable. With only four feet of cable to work with, though, I had difficulty locating a spot to park the rather large DRM-600 while still leaving workspace on my desk.

Installation of the device drivers went smoothly, despite sketchy documentation. The setup program is conscientious about documenting the changes it makes to startup files.

Once you've installed the DRM-600 CD-ROM changer, it's simple to operate. I found that the hardware worked without a hitch. Text searches were fast, and graphics screens drew quickly, though not seamlessly.

In addition to being useful as a computer drive, the Pioneer DRM-600 also plays audio CDs. The music brightened up our office, but the software to control the sound was inconvenient and poorly documented.

The DRM-600 includes a stereo earphone jack as well as RCA jacks so that output can be directed to a stereo amplifier. The drive package includes a set of RCA cables, but again, the short length required me to add my amplifier to an already crowded desk.

Two programs are provided to handle audio CDs. *Multi-Play Control* allows you to select discs or tracks to play, and once the music is underway, you can execute other programs on your PC. Sadly, I found no way to program more than one musical selection at a time.

The other program, *Juke*, allows you to create tables of contents for your audio discs and to select a program of music that can include any or all tracks from any or all of the discs in a magazine. But, since *Juke* isn't a TSR, you can't exit and work with other software while the music plays. The brief documentation for both programs, unfortunately, doesn't fully explain the software.

Being able to insert as many as six discs is convenient, but the magazine that holds them is difficult to manage. The discs must be loaded upside down, which feels awkward and makes it impossible to read the labels.

The Pioneer DRM-600 is a sound piece of hardware. As a SCSI device, it can be daisy-chained with a second drive or other devices, and it's a good bet to remain compatible as the CD-ROM software and hardware evolve. Its great capacity makes it a candidate for networked environments where volumes of resource material could be made available to many users.

TONY ROBERTS

Circle Reader Service Number 304

PROCOM MCD-ROM 650/E

The Procom MCD-ROM 650/E drive offers flexibility that makes it a good choice if you've got more than one type of computer.

The drive that I reviewed included software for both the PC and Macintosh, cables for both units, and a SCSI AT-bus interface card for the PC (CC16 Enabler—\$349). The drive itself is housed in a nicely styled, light-gray external case with the power supply beside the drive. This makes the Procom somewhat wider than some other drives, so you may have trouble fitting it next to your PC on a crowded desk. It's actually large enough to place under most monitor stands, but the plastic case seems a little too thin to support a heavy monitor. Small rubber supports allow you to place the case vertically, but in that position it can be difficult to insert and remove discs—the case can slide around when you push the disc in.

If you lack experience installing hardware and software or if you're just intimidated by such installations, you might want to call on an experienced friend for help. Depending on what other cards you have installed in your

PROCOM TECHNOLOGY
200 McCormick
Costa Mesa, CA 92656
(800) 800-8600
List Price: \$895
Street Price: \$747
Warranty: one year
(extended warranty available)
Service Plan:
through shipment to
the company (repair
and return within 48
hours)

PC, you may find yourself changing jumpers on the board to alter its IRQ numbers and memory addresses, not an easy task for beginners. I found the software easier to install than the hardware, but because there's no installation program, I had to modify my CONFIG.SYS and AUTOEXEC.BAT files myself.

Procom's software and board also support SCSI hard drives, removable media drives, and two standard PC floppy drives; so this setup is a good choice if you need to attach other SCSI devices to your computer. Procom also includes drivers that allow you to use this CD-ROM drive on a Novell network.

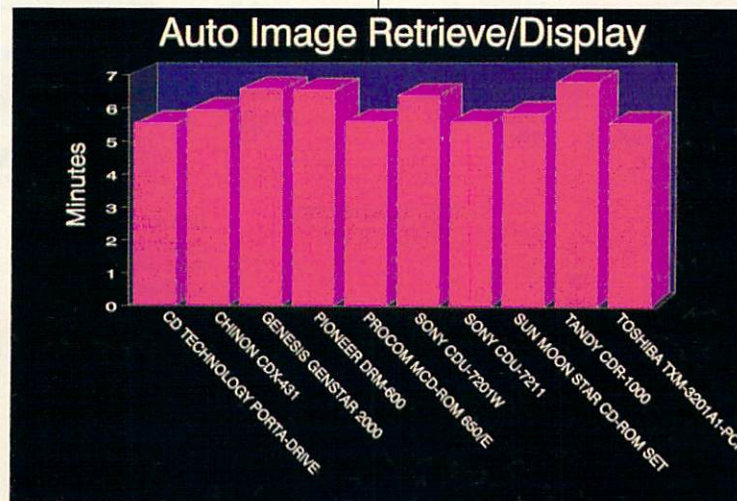
Music lovers will appreciate



PlayCD, an included program that you can use to play regular music CDs through the drive's headphone plug. While you're running *PlayCD*, you can program tracks in any order. It's even possible to listen to a CD while you're working with another program.

Although the documentation for the Procom MCD-ROM 650/E doesn't mention support for the Amiga, I was able to use the Mac cable and a third-party driver disk to connect the Procom drive to an Amiga and access the Fred Fish collection public domain disc and run a CDTV game. The Procom drive is definitely a good choice if you're a family with more than one kind of computer.

I didn't have any compatibility



UNDERSTANDING THE AUTO IMAGE RETRIEVE/DISPLAY TEST

The Auto Image Retrieve/Display Test uses our *TIME_IT* program to record the actual elapsed time in minutes, seconds, and hundredths of seconds required to retrieve and display 28 black-and-white clip-art images from an automated display/viewing program. The source CD for these clip-art images is *Dover's Clip Art* from Alde Publishing.

—TOM BENFORD, PRESIDENT
COMPUTER PRODUCT
TESTING SERVICES



**COMPATIBILITY
GUARANTEE**

BLOWOUT SPECIALS

MICRON TECHNOLOGY
2-8MB
EXPANSION BOARD
PS/2 MODEL 50/50Z/55SX/60
W/2MB \$285 W/4MB \$395

COMPAQ
2-8MB
EXPANSION BOARD
FOR COMPAQ DESKPRO 386/16
W/2MB \$295 W/4MB \$405

PROCOM PS/2
ZERO SLOT
HARD DRIVES
MODELS 50Z, 55SX & 70
60MB 19MS \$625
124MB 19MS \$740
200MB 16MS \$1085

NEW!!!
PROCOM TECHNOLOGY
CD-ROM FOR PC/AT
AND COMPATIBLES
650MB
STEREO OUTPUT AUDIO & DATA
WITH OPTIONAL CD PACK
INTERNAL \$499 W/O CD PACK \$420
EXTERNAL \$590 W/O CD PACK \$520

ORCHID
TINY TURBO 286
PC/XT ACCELERATOR
\$159

CANON
BJ10E
BUBBLE JET PRINTER
\$375

ATI
GRAPHICS VANTAGE
COMBINED SUPER VGA
AND 8514/A GRAPHICS
W/512KB \$389 W/1MB \$429

UNIVERSAL

MEMORY PRODUCTS

EXPANSION BOARDS

ORCHID TECHNOLOGY

RAMQUEST16/32
2-8MB FOR PS/2 50/55/60/70/80
WITH SER & PAR PORT
LIM 4.0 HARDWARE 16 & 32 BIT MC BUS
OKB \$269 1MB \$379 4MB \$489 8MB \$699

RAMQUEST8/16
UP TO 32MB LIM 4.0 PC/XT/AT
USES 256KB, 1MB OR 4MB SIMMS
OKB \$169 OKB \$279 4MB \$389 8MB \$589

BOCA RESEARCH

BOCARAM AT PLUS
2-8MB LIM 4.0 AT'S
OKB \$119 2MB \$227 4MB \$337 8MB \$537

BOCARAM AT/IO PLUS
UP TO 4MB WISER & PAR PORT
OKB \$157 2MB \$267 4MB \$377

BOCARAM XT & BOCARAM 30
UP TO 2MB PC/XT OR PS/2 MODEL 30
OKB \$119 512KB \$155 1MB \$187 2MB \$249

AST RESEARCH

6PAK 286
OKB \$119 512KB \$153 2MB \$227 4MB \$335

RAMPAGE PLUS 286
UP TO 8MB FOR AT LIM 4.0
OKB \$349 512KB \$414 2MB \$459 4MB \$579

RAMVANTAGE
BACKFILLS AT'S TO 640KB
UP TO 3MB EXTENDED MEMORY
W/128K \$59

EVEREX

RAM 3000 OKB \$99 512KB \$129
RAM 8000 OKB \$225 2MB \$325

INTEL

ABOVE BOARD PLUS 8 W/2MB \$559
ABOVE BOARD PLUS W/512KB \$559
FOR PS/2 MICROCHANNEL
ABOVE BOARD 2 PLUS OKB \$349
ABOVE BOARD MC 32 \$559

I/O BOARDS

BOCA RESEARCH

IO/AT41 1 SER & 1 PAR \$46
IO/AT42 2 SER & 1 PAR \$49
IO/AT44 2 SER & 2 PAR \$53
IO/XT CLOCK/CAL 1 SER & 1 PAR \$49
DUAL GRAPHICS ADAPTER W/PAR \$49

FOR PS/2 MICROCHANNEL
MCA 2 SER & 1 PAR \$114
MCA PARALLEL 1 PAR \$79

COMPUTER MICE

MICROSOFT SER-PS/2 \$99
MICROSOFT BUS VERSION \$104
MICROSOFT BALLPOINT \$129
MICROSOFT SER W/WINDOWS \$149
LOGITECH C9 SER-PS/2 \$69
LOGITECH MOUSEMAN \$79
LOGITECH TRACKMAN SER \$85
DEXXA MOUSE BY LOGITECH \$38
LOGITECH CORDLESS \$139

LASER PRINTERS

HEWLETT PACKARD

LASERJET IIP, III, IIID, IIIP
1MB \$88 2MB \$139 4MB \$239
LIFETIME WARRANTY
LASERJET II & IID
1MB \$95 2MB \$149 4MB \$249

PANASONIC

4420 & 44501
1MB \$109 2MB \$169 4MB \$269
4450
1MB \$179

TOSHIBA

PAGE LASER 6
1MB \$129 2MB \$169 4MB \$269

EPSON

EPL 6000
1MB \$129 2MB \$169 4MB \$269

IBM 4019 & 4019E

1MB \$139 2MB \$189 3.5MB \$259

CANON

LBP 4
1MB \$189 2MB \$229 4MB \$319
LBP 8
1MB \$119 2MB \$159 4MB \$259

OKI

OKILASER 400, 800, 820
2MB \$189 4MB \$289

POSTSCRIPT

PACIFIC PAGE FOR HP'S \$349
ADOBE FOR HP II \$289
IMAGESCRIPT FOR HP'S \$281

LAPTOP UPGRADES

TOSHIBA

T1200XE/SE, T1600, T3100E, T3100SX,
T3200SX, T5100, T5200 2MB \$159
T3200SX 2MB \$199
T3200SXC 4MB \$399
T1000SE/XE/LE & T2000SX 1MB \$189
T1000SE/XE/LE & T2000SX 2MB \$269
T1000LE & T2000SX 4MB \$695
T3100SX, T3200SX 4MB \$467
T3200 3MB \$279

AST

EXECUTIVE NOTEBOOK
1MB \$91 4MB \$499

MEGAHERTZ MODEMS

FOR MOST LAPTOPS
2400BD INTERNAL \$149

FOR TOSHIBA LAPTOPS
2400BD INTERNAL \$149 W/INP'S \$210

2400/9600 FAX/MODEM \$367
ETHERNET ADAPTER \$295
LAPLAN TWISTED PAIR
ETHERNET ADAPTER \$199
REMOTE 5250 EMULATION \$499
REMOTE 3270 EMULATION \$499

MODULES

IBM PS/2 MODULES

6450604 2MB MOD 50Z, 55SX, 70 \$129
6450608 2MB MOD 70A21 \$139
6450603 1MB PS/2 SIMM \$69
6450372 2MB FOR 6450367 \$249
6450375 1MB MOD 80-041 \$135
6450379 2MB MOD80-1111311 \$209
34F2933 4MB PS/2 SIMM \$339
87F9977 4MB PS/2 SIMM \$339
30F5360 2MB FOR 30-286 \$139
6451060 4MB MOD80-A21A31 \$495
6450128 4MB MOD 90 & 95 \$399

PS/2 EXPANSION BOARDS

6450609 2-8MB MOD 50, 50Z, 60 \$460
6450605 2-8MB MOD 70 & 80 \$460
34F3077 2-14MB MOD 70 & 80 W/2MB \$485
34F3011 4-16MB MOD 70 & 80 W/4MB \$690
6450185 1-13MB MOD 50, 55SX, 60 W/1MB \$425

PROCOM PS/2 DRIVES

120MB MDL 50/50Z \$849
200MB MDL 50/50Z \$1375
100MB SCSI EXT \$985
200MB SCSI EXT \$1457
320MB SCSI EXT \$2500
1.2MB EXT FDD \$269
MC SCSI ADAPTER \$269

COMPAQ DESKPRO

DESKPRO 386/20/25/20E/25E & 386S
1MB MODULE \$109 4MB MODULE \$299
1MB EXP BOARD \$195 4MB EXP BOARD \$365
DESKPRO 386/33/486/25 SYSTEMPRO
2MB MODULE \$149
1/3 HEIGHT FLOPPY DISK DRIVES
1.44MB \$129 1.2MB \$139

COMPAQ LAPTOPS

PORTABLE LTE 286
1MB \$119 2MB \$179 4MB \$559
PORTABLE LTE 386S/20
1MB \$275 4MB \$685
PORTABLE 386/20
1MB UPGRADE KIT \$237
4MB EXPANSION BOARD \$710
4MB EXTENSION BOARD \$710
SLT 286
1MB \$156 4MB \$569
SLT 386
1MB \$156 2MB \$255 4MB \$569

HARD DRIVES

CONNER

42MB 25MS IDE \$239
104MB 25MS IDE \$457
200MB 16MS IDE \$825
200MB 16MS SCSI \$889

SEAGATE

ST-157A 44MB 28MS IDE \$219
ST-1102A 84MB 19MS IDE \$367
ST-1144A 125MB 19MS IDE \$469
ST-1239A 211MB 15MS IDE \$740

THE NATIONAL LEADER IN MEMORY EXPANSION

UPGRADE TO YOUR SPECIFICATIONS WITH CONFIDENCE

VIDEO GRAPHICS CARDS

ORCHID TECHNOLOGY

PRODESIGNER IIS 512KB \$299 1MB \$339
 PRODESIGNER IIMC FOR PS/2 1MB \$399

ATI

8514 ULTRA PS/2 OR ISA BUS 512KB \$469
 8514 ULTRA PLUS VGA W/1MB \$599
 VGA WONDER W/MOUSE 512KB \$239
 VGA INTEGRA W/256KB \$129
 BASIC VGA 640 X 480 \$99

BOCA RESEARCH

BOCA SUPER VGA 512K \$139 1MB \$179
 BOCA VGA 600 X 800 \$119

MONITORS

SIEKO

CM 1440 MULTISYNC/SUPER VGA
 14 INCH TRINITRON/25DP \$595

CM1450 MULTISYNC/SUPER VGA
 14 INCH TRINITRON NON-INTERLACED/25DP \$725

NEC

MULTISYNC 2A SUPER VGA 14" \$565
 MULTISYNC 3D 14" \$745
 MULTISYNC 4D \$1195

GOLDSTAR

1423 VGA 14" .51 DP \$290
 1425 VGA 14" .39 DP \$349
 1430 VGA 14" .31 DP \$395
 1450 MULTISYNC/SUPER VGA 14" .31 DP \$425
 1460 1024 X 768 INTERLACED .28 DP \$460

MODEMS/FAX CARDS

EVEREX

EVERFAX 24/96 W/MNPS INT \$349
 EVERFAX 24/96 W/MNPS EXT \$349
 EVERCOM 2400BAUD INT \$89

HAYES

JTFAX 9600/2400BAUD \$439
 PERSONAL MODEM 2400 PLUS \$169

ZOOM

EXT 2400 MODEM 9600 SENDFAX \$119
 INT 2400/9600 SEND/REC. FAX/MODEM \$164
 INT 2400 BAUD MODEM \$89
 EXT 2400 BAUD MODEM \$95

PRACTICAL PERIPHERALS

INT 2400 BAUD MODEM W/MNPS \$169
 V.42 BIS \$199
 POCKET 2400 \$109

US ROBOTICS

COURIER 2400 \$258
 COURIER 2400 FOR PS/2 \$295
 COURIER V.32BIS 14,400BPS... \$685

MOTHERBOARDS

AMI

MADE IN THE USA
 EXCELLENT QUALITY

486-33 EISA ENTERPRISE 64KB CACHE \$2990
 486-25 EISA ENTERPRISE 64KB CACHE \$2519
 486-33 VOYAGER 128KB CACHE \$2519
 486-25 VOYAGER 128KB CACHE \$1955
 386-33 MARK IV 64KB CACHE \$1092
 386-25 MARK III 64KB CACHE \$920
 386 SX-20 32KB CACHE \$660

MICRONICS

MADE IN THE USA
 EXCELLENT QUALITY

486-33 EISA 64KB CACHE \$3214
 486-25 EISA 64KB CACHE \$2869
 486-33 ISA 64KB CACHE \$2179
 486-25 ISA 64KB CACHE \$1725
 386-33 AT CACHE IDE/25/1P 64KB CACHE \$1092
 386-25 BCP 64KB CACHE \$948
 386-25 BMP 0KB CACHE \$720

FLOPPY DISK DRIVES

TEAC

5 1/4" 1.2MB HALF HEIGHT \$76
 3 1/2" 1.44MB \$77
 3 1/2" 720K \$73

NEW!!!

3 1/2" 4MB \$159

SCANNERS

PROLAB

256 COLOR 400 DPI \$507
 256 GRAY SCALE 400 DPI \$299
 OCR FOR COLOR/GRAY SCANNER \$39

LOGITECH

SCANMAN 256 400DPI W/OCR \$385
 SCANMAN PLUS \$149
 SCANMAN PLUS FOR PS/2'S \$215
 CATCHWORD OCR \$115

MARSTEK

M-6000CG RAINBOW W/OCR \$599
 M-800 W/CAT READER OCR \$259

TAPE BACKUP

COLORADO

JUMBO 120MB INTERNAL \$249
 JUMBO 250MB INTERNAL \$305
 QFA-500 500MB INTERNAL \$675

GAME CARDS

C & H

2 PORTS AT BUS \$39
 2 PORTS PS/2 BUS \$59

MEMORY CHIPS MODULES

DRAM

1X1-70NS \$5.70 256X1-120NS \$1.60
 1X1-80NS \$5.50 256X1-150NS \$1.40
 1X1-100NS \$5.25 64X4-80NS \$3.00
 256X4-80NS \$5.50 64X4-100NS \$2.75
 256X4-100NS \$5.25 64X4-120NS \$2.50
 256X4-120NS \$5.00 64X1-100NS \$1.75
 256X1-80NS \$2.05 64X1-120NS \$1.60
 256X1-100NS \$1.85 64X1-150NS \$1.35

SIMM/SIPP MODULES

4X9-70NS \$247.00 256X9-70NS \$21.00
 4X9-80NS \$230.00 256X9-80NS \$19.00
 1X9-70NS \$59.00 256X9-100NS \$17.00
 1X9-80NS \$53.00 256X9-120NS \$15.00
 1X9-100NS \$51.00

SIPPS ADD \$3.00 EACH

MATH CO-PROCESSORS

ULSI

THE NEW GENERATION !!!
 30-DAY MONEY BACK GUARANTEE
 LIFETIME WARRANTY

US83C87-16 \$199 US83C87-33 \$199
 US83C87-20 \$199 US83C87-16SX \$129
 US83C87-25 \$199 US83C87-20SX \$149

CYRIX

83D87-16 \$209 83D87-33 \$219
 83D87-20 \$209 83S87-16 \$159
 83D87-25 \$209 83S87-20 \$169

INTEL

80387-16 \$249 80387-16SX \$199
 80387-20 \$249 80387-20SX \$209
 80387-25 \$249 80287-10 \$139
 80387-33 \$249 80287XL \$169

IIT

3C87-16 \$209 3C87-20SX \$169
 3C87-20 \$209 2C87-8 \$79
 3C87-25 \$209 2C87-10 \$99
 3C87-33 \$209 2C87-12 \$119
 3C87-16SX \$159 2C87-20 \$139

SOMETHING NOT LISTED?

WE HAVE HUNDREDS

OF PRODUCTS IN STOCK.

CALL UNIVERSAL MEMORY

PRODUCTS FOR PRICING

AND AVAILABILITY

REASONS TO BUY FROM

UNIVERSAL

MEMORY PRODUCTS

- 1 WE SUPPLY ONLY NAME BRANDS FROM PROVEN INDUSTRY LEADERS.
- 2 OUR CUSTOMER SERVICE IS UNRIVALED.
- 3 ORDERS SHIPPED SAME DAY.
- 4 LOWEST PRICING IN THE INDUSTRY. IF YOU FIND A LOWER PRICE, CALL US.
- 5 TOLL-FREE TECHNICAL SUPPORT.
- 6 100% COMPATIBILITY GUARANTEE.
- 7 NO SURCHARGE ON VISA OR MASTERCARD.
- 8 FAST CREDIT APPROVAL FOR NET ORDERS.
- 9 APO/FPO & INTERNATIONAL ORDERS WELCOMED.
- 10 FIVE YEAR PRODUCT WARRANTY GUARANTEE.

UPGRADE TIPS FOR PERSONAL COMPUTERS

1. Max out your motherboard first. Consult your computer owner's manual to find out which kind of chips your computer takes. If your manual is not available, count the chip or simm sockets and get the part number of the existing chips. Then call us.
2. All LIM 4.0 expansion boards are not created equal. Make sure the board you wish to purchase can run your applications and has the capacity you need.
3. If your short on expansion slots, you should consider a board that has I/O ports to allow future external expansion.
4. If you plan on upgrading to a more powerful computer in the future, you may wish to purchase chips fast enough so they can be used in your new system when you upgrade at a later date.

HOURS MON - FRI 7AM-5PM SAT 8AM-2PM

800 678-8648 5 YEAR WARRANTY ON PARTS 714 258-2818 FAX

UNIVERSAL MEMORY PRODUCTS 15411 RED HILL AVENUE SUITE B TUSTIN, CA 92680 714 258-2018

NO SURCHARGE ON VISA/MASTERCARD, AMEX ADD 4% PURCHASE ORDERS ACCEPTED FROM QUALIFIED FIRMS 20% RESTOCKING FEE ON ALL NON-DEFECTIVE RETURNS PRICES SUBJECT TO CHANGE

Circle Reader Service Number 195



TEST LAB



SONY CORPORATION OF AMERICA
Computer Peripheral Products Company
655 River Oaks Pkwy.
San Jose, CA 95134
(800) 222-0878
List Price: \$800
Street Price: \$699
Warranty: one year, covering parts and labor
Service Plan: through calls or shipment to Sony service centers (listed on the warranty card)

problems with the MS-DOS CD-ROM discs that I tried on the Procom. If you're looking for a drive that has software support for the PC and Macintosh, and that can be used with other SCSI computers like the Amiga, the Procom drive is a good choice.

KIM HORN

Circle Reader Service Number 305

SONY CDU-7201W

The Sony CDU-7201W CD-ROM drive offers solid performance and some attractive features in a long, slim case less than half the width of most system boxes. And while CD-ROM technology isn't brand new, I couldn't help feeling just a bit like a kid at Christmas as I explored the capabilities of this CD-ROM drive.

The CDU-7201W performed without a hitch, whether the disc contained games, information about the Civil War, sounds, images, or just plain music (you can use it to play your audio CDs). The only problem I experienced—not enough memory for one of the games—was not the fault of the Sony drive at all. I was simply trying to load too many things into memory at once, a problem solved by creating a special boot disk for when I use the CDU-7201W.

On the front of the drive, you'll find a jack for headphones and a

volume wheel, as well as an eject button, an emergency eject hole, the caddy insertion slot, and a light to tell you when disc access occurs. I did wish for a light in front to indicate when the drive is on, though. Unless you power on all your computer equipment with an outlet strip, you'll need to check the power switch in back of the box to see if it's on. Behind the box you'll also find stereo phono jacks, DIP switches for assigning a drive number, a ground terminal, and two ports—one to connect you to the proprietary controller card and the other to daisychain with as many as three more drives.

Installing the card and the software to run it is fairly straightforward, thanks to good documentation. Sony gives you the option of installing to your hard drive or to a floppy. If you choose the former, the installation program will replace your startup files and rename the old ones, so I recommend installing to a floppy. Once the program is installed and you boot up, the software tells you what drive letter gives you access to the CDU-7201W. In my case, it's drive S (for Sony?).

There's also a fairly straightforward program allowing you to listen to audio CDs (but scant documentation for it). I like being able to listen to my Bach CD in background mode while using an ap-

plication on one of my other drives. Thanks to the headphone jack, I can listen without disturbing nearby coworkers.

To protect the drive during transportation, Sony employs automatic locking of the optical pickup every time the caddy (the device that holds the disc) is ejected. Also, whenever you load or eject the caddy, the drive automatically cleans the objective lens of the optical pickup. This automatic maintenance proves particularly important when you realize that CD-ROM drives, unlike your stereo turntable and stylus, are not user serviceable. The laser beam used to access disc information could harm your eyes, so Sony cautions you not to open the drive's cabinet.

Sony has established itself as a leader in television and audio technologies. With its CD-ROM drives, Sony is well on the way to making quite a name for itself in computer technologies as well.

MIKE HUDNALL

Circle Reader Service Number 306

MANAGING YOUR MEMORY

Adding a peripheral such as a CD-ROM player can complicate memory management. If you're using DOS 4.01 and a mouse and if you have SHARE loaded, you'll sometimes have so little memory left after loading your CD-ROM driver that you can't run the CD-ROM applications. My experience has taught me to use a memory management program like *386Max*, *QEMM-386*, or *TurboEMS* to place device drivers into high memory areas. The Microsoft extensions will allow you to use extended memory, but even that option may not be enough to free your CD-ROM drivers for use. Another solution would be to update your DOS to version 5.0, which includes the capability of placing device drivers into upper memory blocks, leaving low memory free for applications.

—PETER SCISCO



SONY CORPORATION OF AMERICA

**Computer Peripheral Products Company
655 River Oaks Pkwy.
San Jose, CA 95134
(800) 222-0878**

**List Price: \$950
Street Price: \$824
Warranty: one year,
covering parts
and labor**

**Service Plan: through
calls or shipment to Sony
service centers (listed on
the warranty card)**

SONY CDU-7211

CD-ROM technology is rapidly entering the world of computing. The drives, or players as they're sometimes called, can access enormous amounts of data from compact discs (CDs). They operate quietly, and though CD-ROM drives are slower than hard drives, their performance is quite acceptable. This is my first time using one, and I'm impressed with what they can do, as well as with what they can offer us in the computing world.

The unit I reviewed is a Sony model CDU-7211 SCSI CD-ROM drive. With it, I received Future Domain's TMC-850 SCSI adapter. Installation is fast and trouble-free.

Plug the SCSI adapter card into a computer slot first. The manual that comes with the adapter clearly explains the setup procedure and provides easy-to-follow diagrams. Next, use the supplied cable to connect the CD-ROM drive to the SCSI adapter, and plug in the power cord.

The last step in the setup procedure is to install the software drivers, which are conveniently provided on both 3½- and 5¼-inch disks. To install the drivers, you simply run the SETUP program on the disk. Everything is taken care of for you. All the necessary files are copied, and changes are made to the AUTOEXEC

.BAT and CONFIG.SYS files. When the program is finished, you're ready to go. That's all there is to it.

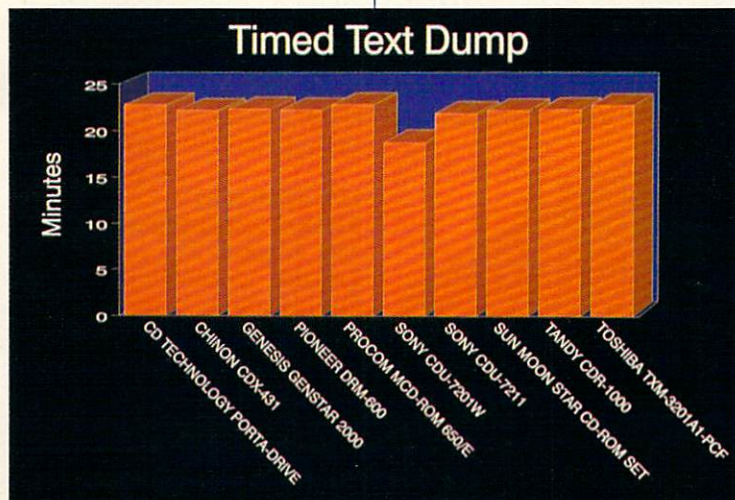
The CDU-7211 is a half-height drive, so it easily fits almost anywhere on your desktop. It features two SCSI bus connectors which conform to ANSI standards, allowing you to daisychain other SCSI devices. The controller has a 64K buffer memory. You place your disc in a caddy before inserting it in the slot in the front of the drive.

This CD-ROM drive is capable of audio playback and provides audio line outputs on the back and a stereo headphone jack on the front. You also get a program that allows you to play your music CDs on the drive. In addition to being able to eject a caddy with the eject button and an emergency eject hole on the front of the unit, you can also use an eject program to eject the disc using only a software command.

If you're considering a CD-ROM drive, the Sony package is a good choice. It contains everything you need to get started except CDs. It's very easy to install, and since it's a Sony, you can bet that it'll be around for a long time.

TROY TUCKER

Circle Reader Service Number 307



UNDERSTANDING THE TIMED TEXT DUMP

How quickly can these CD-ROM drives handle text? The Timed Text Dump Test uses our *TIME_IT* program to show the actual elapsed time in minutes, seconds, and hundredths of seconds required to "type" a huge text file (2,551,206 bytes) from a CD-ROM disc file to the PC screen. The source file is PHRASE.CON from Alde Publishing's *The Amazing Moby Lexicon* CD.

—TOM BENFORD, PRESIDENT
COMPUTER PRODUCT
TESTING SERVICES

SUN MOON STAR CD-ROM SET

If you're looking for a capable CD-ROM drive with an impressive bundle of discs, you owe it to yourself to check out Sun Moon Star's CD-ROM Set.

Connecting the drive to the computer was a breeze, but installing the software proved more of a challenge. The installation process alters your CONFIG.SYS and AUTOEXEC.BAT files, and this seemed to be where my problems were. Luckily, the manual explains what you should find when you examine these files, and I found that the default base address of the controller card was the same as the address for another of my peripherals. To correct the problem, I used one of the card's eight jumper settings for different addresses.

I placed the drive between my system box and the monitor to save space on my crowded desk—a convenient setup. The only other challenge I faced in setting up this drive involved the drive door, which apparently popped out of place during shipping. I managed to fish it out easily, however, and loaded and ejected discs normally without the door.

Once I had the drive up and running, trying out the software bundled with the Sun Moon Star was as exciting as opening packages on Christmas morning.



CHOOSING AN INTERFACE

An interface card lets your CD-ROM drive communicate with the host PC, but which kind of card should you choose?

The decision between a SCSI (Small Computer Systems Interface—called scuzzy for short) and a proprietary interface is a personal one, since many manufacturers offer their drives interfaced either way. For example, the Hitachi CDR-3600 comes with a Hitachi proprietary interface, while the Hitachi CDR-3650 (virtually the same drive except for buffer size) is configured for a SCSI interface. Proprietary interfaces are commonly sold separately, adding to the cost of the drive (typically \$100–\$150 more). The SCSI interface allows daisy-chaining of up to eight SCSI devices, such as additional CD-ROM drives or hard drives, all using the same single interface card. It's not uncommon, however, to have daisy-chaining capability with many proprietary-interface drives as well. For example, the Sony proprietary bus allows for daisy-chaining four CD-ROM drives.

Performance differences between the proprietary and SCSI models of the same drive are negligible (if any exist at all), and in some cases, the proprietary interface actually performs better since it is a custom fit rather than a universal solution.

The "mated pair" proprietary approach very often optimizes the features of a particular drive, such as internal buffer size, and extracts the best performance from both the interface card and the CD-ROM drive itself. The installation/setup procedure is often highly automated with proprietary-interface drives as well.

The SCSI interface provides a standard that is ostensibly hardware independent, thus allowing dealers to sell the same CD-ROM drive to a Macintosh owner (since the Mac has its own built-in SCSI port) or to a PC owner with a SCSI interface kit. Several external drives are *only* available as SCSI models, so that should be taken into consideration when shopping for a drive.

—TOM BENFORD

One disc contains popular games from the Software Toolworks: *Black Hole*, *Life & Death*, *Bruce Lee Lives*, *Chessmaster 2000*, *Gin King/Cribbage King*, *Hunt for Red October*, *Bad Street Brawler*, *Crossword Mania*, *221B Baker Street*, and *Alternate Reality: The City*. Also from Toolworks you'll find *World Atlas* and *Illustrated Encyclopedia*.

Both are topnotch, fun-to-use reference works.

You also get *Microsoft Bookshelf*, which includes *The American Heritage Dictionary*, *Roget's II: Electronic Thesaurus*, *The World Book* and *Book of Facts*, *Bartlett's Familiar Quotations*, and half a dozen other reference aids to writers. Microsoft's *Small Business Consultant & Stat Pack* comes with the package, too.

SUN MOON STAR
Personal Computer Division
1941 Ringwood Ave.
San Jose, CA 95131
(408) 452-7811
List Price: \$995.00
Street Price: \$725.67
Warranty: 18 months mail-in
(extended warranty available)
Service Plan: through tech support,
or shipping a part or the entire
system to the company

These programs provide a library of government publications and statistics, ranging from weekly wage averages in 60 different communities to affirmative action plans, from agricultural commodities to federal regulations, and much more.

Hot Line lets you dial more than 132,000 corporate and government telephone numbers at the touch of a key. And with *Hot Line*, you can find area codes for more than 3,000 cities worldwide with the electronic phone book and automatic dialer.

Music fans will appreciate *CD Guide*, an up-to-date listing of almost everything that has to do with CD music.

The Sun Moon Star comes with an earphone jack and volume control that make it convenient for listening to your favorite musical disc while working at your computer.

In all, despite its large footprint and somewhat flimsy door, the Sun Moon Star CD-ROM drive works well and faster than I expected. The amount of software that accompanies this drive is truly awesome, making the total value of this package something to consider when shopping for a CD-ROM drive.

TOM NETSEL

Circle Reader Service Number 308

RADIO SHACK
A Division of Tandy
Marketing Information
700 One Tandy Center
Fort Worth, TX 76102
(817) 390-3300
List Price: \$399.95
Street Price: n/a
Warranty: one year,
covering parts
and labor
Service Plan:
through retail
outlets

TANDY CDR-1000

The Tandy CDR-1000 CD-ROM is easy to install if you have a spare 5¼-inch half-height bay in your PC, an empty slot in your expansion bus, a Phillips-head screwdriver, and an adventurous spirit. (If you have all but the screwdriver or the adventurous spirit, your local Radio Shack will install the CD-ROM for you.)

It provides the advantages of CD-ROM for a bargain price of only \$399.95. Tandy isn't known for its price leadership, preferring to make a name for itself providing the widest availability of products and service. Still, the under-\$400.00 price is a breakthrough, particularly when you consider



that this CD drive is one of the few that meet or exceed Microsoft's multimedia standard of 150K per second data transmission.

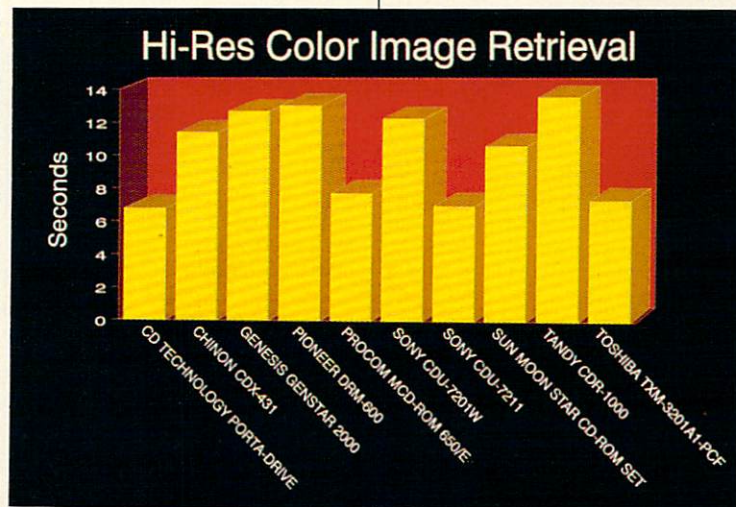
Though the data transmission is very rapid, the CDR-1000 access time is 800 milliseconds—almost a full second to find a particular piece of data on the CD, which means that if you are using your CD for heavy-duty database access, you should look for a faster (and more expensive) unit. Since the CDR-1000's forte is streaming information quickly to the computer once it is found, it's particularly suited to playing games and other applications where animation is important.

To load a CD, you slide the entire unit forward like a bureau drawer. When it's nearly all the way out of the machine, you can lift a

UNDERSTANDING THE HI-RES COLOR IMAGE RETRIEVAL TEST

The Hi-Res Color Image Retrieval Test shows the actual elapsed time, in seconds and hundredths of seconds, required to retrieve three high-resolution scanned color images. Each bar represents an average of three image retrieval times. U.S. postage stamps from Nimbus Information Systems' *Romware Magazine* CD are the source of images used in this test.

—TOM BENFORD, PRESIDENT
COMPUTER PRODUCT TESTING SERVICES



TEST LAB

hinged lid to expose the CD area. Unlike many CD-ROMs, the CDR-1000 doesn't use a CD caddy. You simply place the CD in the unit as you would in a portable CD player. One less piece of cyberjunk to clutter your office.

Recognizing that the CDR-1000 will be the first upgrade many users make to their basic machine, Tandy put the manual/installation guide together with the novice in mind. It covers installation and use of the CD-ROM very gradually in step-by-step procedures.

The CDR-1000 is capable of playing audio CDs as well as reading data CDs. It features a headphone minijack and volume control in the front panel. The back of the expansion card features two female RCA jacks, allowing you to connect the player to your stereo. The audio CD can be controlled from the command line or from the control panel that supports a mouse. It will continue to play when you start up another application, so you won't have to make a choice between playing music and using your computer productively.

The performance, features, and price of Tandy's CDR-1000 are sure to attract attention in today's increasingly important CD-ROM drive market.

ROBERT BIXBY

Circle Reader Service Number 309

TOSHIBA AMERICA INFORMATION SYSTEMS

Disk Products Division

9740 Irvine Blvd.

Irvine, CA 92718

(714) 583-3000

List Price: \$950.00

Street Price: \$685.67

Warranty: one year

Service Plan: through return
of drive to the company



TOSHIBA TXM-3201A1-PCF

Now's a great time to buy a CD-ROM drive. By the time you read this, Microsoft will have released its multimedia extensions for *Windows*, and the number of new CD-ROM titles will be growing exponentially. Manufacturers are falling all over each other as they try to gain the edge on price and features.

If you're the kind of person who buys conservatively—who wants a product to have a proven track record before you'll consider buying it—take a good look at Toshiba's TXM-3201A1-PCF. It's considered by many to be the workhorse of the currently available CD-ROM drives and is one of the first drives that fully meet Microsoft's multimedia specifications.

It's also a highly versatile drive—you can buy an internal version (XM-3201B, \$600) or an external version is available with either a PC interface kit (TXM-3201A1-PCF, \$950) or a Mac interface kit (TXM-3201A1-MAC, \$850). The PC kit includes a SCSI card and requires an available slot, but you can also plug the TXM-3201 into a standard parallel port with a MiniSCSI (Trantor Systems, 5415 Randall Place, Fremont, California 94538; 415-770-1400; \$179).

If you're new to CD-ROM drives, you'll appreciate that this one is easy to install. You simply run a setup program that writes the necessary drivers to your hard drive and adds a few lines to your AUTOEXEC.BAT and CONFIG.SYS files. The PC interface kit is manufactured by Future Domain for Toshiba and includes a half-slot SCSI adapter card and a special SCSI cable. A word of warning—although the Future Domain SCSI cable looks like a standard Macintosh SCSI cable, it isn't wired the same way. If you

THE HISTORY OF SCSI

SCSI was originally based on the architecture of the block-multiplex channel commonly used on the early IBM mainframe computers. This channel had the ability to communicate with several peripherals simultaneously. The SCSI specification for personal computers was approved in 1986 (ANSI X3.131-1986). After Apple's and Commodore's adoption of SCSI, IBM finally offered a SCSI bus as standard equipment on some PS/2 models in 1989.

The SCSI standard has provided outlines for several commands pertaining to different device types

such as hard drives, printers, and tape backups. It also defined physical characteristics such as pin assignments and cable types. While it all looked good on paper, in reality there were often conflicts when several SCSI-interfaced peripherals were simultaneously accessed. The main problem stemmed from too much flexibility in the specification. The result—some peripherals significantly deviated from what was intended to be a "standard." Device conflicts and compatibility problems cropped up frequently.

—TOM BENFORD

All Benchmark/Performance Testing is conducted by Computer Product Testing Services (CPTS), an independent testing and evaluation laboratory based in Manasquan, New Jersey. Every effort has been made to ensure the accuracy and completeness of this data as of the date of testing. Performance may vary among samples.

hook the cable to a Mac, you could damage your computer.

The drive worked fine with every CD-ROM disc that I tried—there was never any loss of data, the sound was clear and steady (a stereo headphone jack is located on the front of the unit), and the SCSI software drivers were always able to locate the drive.

It's not covered well in the manual, but you can also play audio CDs on the TXM-3201. In order to do this, you have to set the last DIP switch (in the back of the unit) to the up position. Place an audio-CD disk in the caddy—just as you would a CD-ROM disk. To move to the next audio track, press the Open/Close button for less than a second. Unfortunately, you can't go backwards or move randomly through the tracks. To eject the disk, press the Open/Close button for more than a second.

For a solid and reliable CD-ROM drive that has weathered the test of time, Toshiba's TXM-3201A1-PCF is an excellent choice.

DAVID ENGLISH

Circle Reader Service Number 310

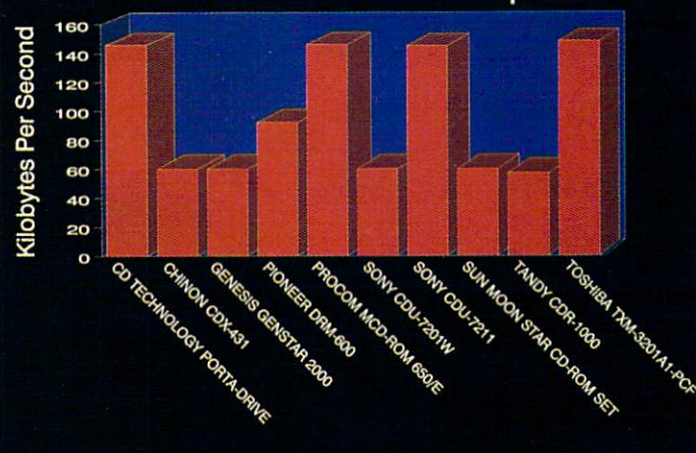
SCSI-2

SCSI-2 (still a draft as of this writing—not yet an officially adopted standard) seeks to alleviate compatibility problems by providing more stringent hardware design guidelines, additional device commands, better error handling and recovery, and enhanced logic for signal routing and device sharing. It should be noted that not all SCSI adapter cards can support newer peripherals built to conform with SCSI-2 protocols, so check the compatibility with your dealer before purchasing to avoid problems and headaches.

If you'd like more information on SCSI and SCSI-2, you can contact ANSI (American National Standards Institute), 1430 Broadway, New York, New York 10018.

—TOM BENFORD

Actual Transfer Rate for the Speed Test



UNDERSTANDING THE SPEED TESTS

We ran these and the other tests using a 16-MHz 386 SX with 2MB RAM and a 512K VGA card attached to a high-resolution monitor.

The speed tests provide two kinds of statistically significant data: the actual transfer rate of the CD-ROM system and the elapsed time for a transfer of a CD-ROM file to the screen.

Here's how the tests worked. We transferred the CAPTIONS.NAM file (1,257,344 bytes) on the Compton's Multimedia Encyclopedia disc to the screen using our CD-SPEED program while at the same time running our TIME_IT program (a stop-

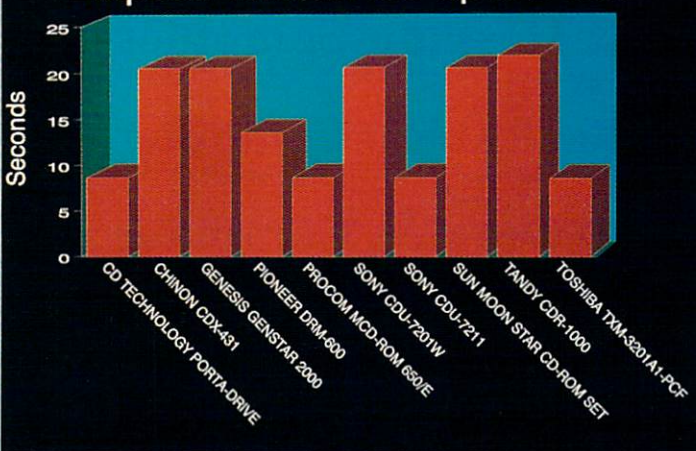
watch program).

The bar graph for actual transfer rates shows the speeds achieved by particular drives as they transferred the CAPTIONS.NAM file to the screen in 16K blocks. The industry standard transfer rate is 150K per second. There are differences in these actual rates because of differences in controller technologies, buffers, and software.

The elapsed time bar graph shows how long it took to make the transfer.

—TOM BENFORD, PRESIDENT
COMPUTER PRODUCT
TESTING SERVICES

Elapsed Time for the Speed Test



PRICES ARE FALL-ING AT **PRE-HOLIDAY SALE!**

COMPUTER DIRECT'S

SINCE 1979

DON'T WAIT UNTIL THE HOLIDAYS TO TRY AND FIND THE BEST COMPUTER VALUES - BUY NOW WHEN OUR PRICES ARE AT THEIR LOWEST EVER

A Complete 12MHz 286 Computer Fully AT® Compatible For Only!

The BEST VALUE Personal Computer for Home, School or Business

Includes: 12MHz 80286 Microprocessor • 512K Memory - Expandable to 4MEG • 5.25" 1.2MEG Floppy Drive • IDE Drive Controller • 1 Parallel, 2 Serial Ports • 200 Watt Power Supply • 101 Key AT® Style Enhanced Keyboard • ByteSize Software Package • Space Saving & Stylish Mini-Tower Case (Case subject to availability) 1 YEAR WARRANTY *\$999.95 system pictured*

Compare Our Prices and Features!

12MHz 80286 Computer	Sugg. Retail \$799	Our Price \$299.95
Byte Size Easy Start	Sugg. Retail \$76	Our Price FREE!
Byte Size Word Processor	Sugg. Retail \$49	Our Price FREE!
Byte Size Home Inventory	Sugg. Retail \$29	Our Price FREE!
Byte Size Calendar	Sugg. Retail \$29	Our Price FREE!
Byte Size Mailing & Phone List	Sugg. Retail \$29	Our Price FREE!

TOTALS \$1011.00 \$299.95!

YOU SAVE OVER \$711!



3.5" Floppy Drive Optional

WHEN OUR HEAD BUYER TOLD ME WE WOULD BE ABLE TO OFFER A 286 COMPUTER FOR \$299 MY FIRST THOUGHT WAS "CAN WE OFFER OUR CUSTOMERS THE SAME QUALITY PRODUCT THEY'VE COME TO EXPECT FROM COMPUTER DIRECT AT THIS PRICE?" THE ANSWER IS YES! WE HAVE EQUIPPED THESE COMPUTERS TO GIVE YOU THE BEST VALUE AVAILABLE, AND WITH OUR 30 DAY NO-RISK TRIAL, IF YOU ARE NOT SATISFIED WITH YOUR PURCHASE YOU CAN RETURN IT FOR A FULL REFUND*. CALL US NOW AND TRY WHAT I THINK IS THE BEST VALUE IN COMPUTE/TODAY!
James M. Scheele - President, Computer Direct, Inc.

\$299.95

\$999.95 286 MINI-TOWER COLOR VGA COMPUTER SYSTEM
Includes - Above Computer & Software Package, Color VGA Monitor & VGA Controller Card, Seagate 45MB Hard Drive, High Resolution Mouse and a 182 cps Printer with Near Letter Quality. **A COMPLETE SYSTEM - OUR BEST VALUE!**

16MHz 386SX Computer\$499.95

With ByteSize Productivity Software Package • 512K RAM Expandable to 8MEG • 1 Parallel & 2 Serial Ports • 1.2M High Density Floppy Drive • IDE Drive Controller and more!

25MHz 386 Desktop Computer\$799.95

32K RAM Cache • 1 MEG RAM, Expandable to 8 MEG • AMI BIOS • 101 Key Enhanced Keyboard • 200 Watt Power Supply • Equipped with IDE Hard & Floppy Drive Controller

33MHz 386 Desktop Computer\$899.95

32K RAM Cache • 1 MEG RAM, Expandable to 8 MEG • AMI BIOS • 101 Key Enhanced Keyboard • 200 Watt Power Supply • Equipped with IDE Hard & Floppy Drive Controller

40MHz 386 Desktop Computer\$999.95

32K RAM Cache • 1 MEG RAM, Expandable to 8 MEG • AMI BIOS • 101 Key Enhanced Keyboard • 200 Watt Power Supply • Equipped with IDE Hard & Floppy Drive Controller

FAX ORDERING 708-382-7545

800-BUY-WISE EXT. 50

800-289-9473 Ext. 50

Outside Service Area, Please Call 708-382-5058

COMPUTER DIRECT, INC.

22292 N. Pepper Road
Barrington, IL 60010

'We Love Our Customers'

UNBEATABLE PRICES PRE-HOLIDAY SALE! EXCELLENT QUALITY SINCE 1979

10 GREAT REASONS TO BUY FROM COMPUTER DIRECT

#1 FREE CATALOGS!

WITH 1000'S OF POPULAR SOFTWARE TITLES, ACCESSORIES & HARDWARE AT UP TO 80% OFF!

#2 QUALITY PRODUCTS

OUR PRODUCTS ARE SELECTED BY TRAINED TECHNICIANS TO ASSURE THE BEST QUALITY AVAILABLE.

#3 30 DAY HOME TRIAL

TRY OUT OUR QUALITY HARDWARE FOR 30 DAYS. IF WITHIN 30 DAYS YOU ARE NOT 100% SATISFIED WITH YOUR PURCHASES, YOU CAN RETURN THEM. HASSLE FREE!

#4 NO CREDIT CARD FEES

NO EXTRA CARD CHARGES WHEN YOU USE YOUR VISA, MASTERCARD OR DISCOVER CARD.

#5 90 DAY IMMEDIATE REPLACEMENT

WE WILL DO EVERYTHING POSSIBLE TO HELP YOU IN GET YOUR PURCHASES OPERATIONAL. IF YOUR MERCHANDISE FAILS TO OPERATE WITHIN 90 DAYS, WE WILL IMMEDIATELY REPLACE IT.

#6 NEW! FEDERAL EXPRESS® DELIVERY AVAILABLE

YOU ASKED FOR IT - COMPUTER DIRECT GOT IT! FEDERAL EXPRESS OVERNIGHT DELIVERY SERVICE IS NOW AVAILABLE. ASK YOUR SALES REP FOR SHIPPING DETAILS.

#7 EXECUTIVE SPEED REPLACEMENT

SHIP US YOUR DEFECTIVE UNIT OVERNIGHT, AND WE'LL RETURN IT TO YOU THE SAME WAY!

#8 TECHNICAL ASSISTANCE

YOU'LL NEVER FEEL LOST IN THE WORLD OF COMPUTERS WHEN YOU HAVE OUR TECHNICAL SUPPORT TO BACK YOU UP. OUR TECHNICIANS ARE TRAINED TO HANDLE MOST PROBLEMS OVER THE PHONE! CALL (708)382-2882

#9 CUSTOMER SERVICE

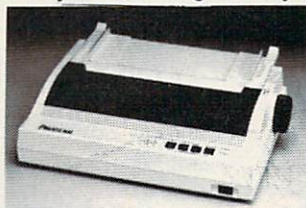
IF YOU NEED HELP WITH YOUR BILLING OR ADDITIONAL SHIPPING INFORMATION, OUR PROFESSIONAL STAFF IS SPECIALLY TRAINED TO HANDLE YOUR NEEDS. CALL OUR CUSTOMER SATISFACTION EXPERTS (708)382-5332 HOURS: 8:30AM TO 4:30PM (CDT) MON.-FRI.

#10 24 HOUR BULLETIN BOARD SERVICE

ORDER 24 HOURS A DAY WITH OUR SPECIAL BBS SERVICE! TECHNICAL TIPS, ON-LINE ORDERING, ELECTRONIC MAIL AND A WHOLE LOT MORE!

SEIKOSHA 192CPS PERFORMANCE PRINTER

Versatile Paper Handling - Compact Design - Excellent Print Quality



Mfr. Sugg. Retail \$299.95

- 192CPS DRAFT - 48CPS NLQ
- 10" CARRIAGE
- AUTO LOAD PAPER PARKING
- 2 RESIDENT NLQ FONTS
- FRONT PANEL CONTROLS
- SLEEK, EUROPEAN DESIGN
- PAPER SAVING PUSH-TRACTOR

\$139⁹⁵

MODEMS

2400 BAUD INTERNAL MODEM

Superior Hayes Compatibility

- Made in the USA! • Full or Half Duplex
- Rockwell Modem Chip Set for Fast, Reliable Communications • Built to Work with the Fastest Computers! Mfr. Sugg. Retail \$129.95

\$49⁹⁵

SEND-FAX INTERNAL MODEM

Modern & FAX All-in-One!

- Hayes & Group 3 Compatible • Full or Half Duplex • Two Year Warranty • Auto Dial/Answer • Internal Speaker with Software Selectable Volume • 7 Status LEDs • Special Combination Software Mfr. Sugg. Retail \$199.95

\$79⁹⁵

FREE PROOBYE TRIAL OFFER*

LOWEST PRICE IN THE COUNTRY!

5.25" DS/DD Floppy Disks
19¢
as low as

100% Certified - Error Free Lifetime Guarantee!

HIGH RESOLUTION SERIAL MOUSE

MOUSE FEATURES:

- 290 - 1450 dpi resolution • pop-up menus for 17 popular applications
- Menu maker utility • Easy installation • 3 buttons opto-mechanical

\$18⁹⁵

Mfr. Sugg. Retail \$49.00



14" VGA COLOR DISPLAY MONITOR



- 720 x 350, 720 x 400 or 640 x 480 Resolution
- RGB analog input
- 14" anti-glare treated screen
- 0.52mm dot pitch
- Tilt & swivel stand included
- PS/2 compatible

\$224⁹⁵

Mfr. Sugg. Retail \$349.95

SEAGATE ST157A 44 MB HARD DRIVE

Quality Seagate IDE Hard Drive

- 44.7 Megabytes of storage
- AT® Interface
- 28ms average access time

\$189⁹⁵

Mfr. Sugg. Retail \$499.00



MARS 105 PLUS SCANNER KIT

400 dpi - 64 Gray Scales:

- With CAT OCR and PC Paintbrush Plus Software. 105 mm scanning width
- 64 halftone levels • ScanKit utility • EMS support • Quick merge.

\$134⁹⁵

Mfr. Sugg. Retail \$349.00



250MB INTERNAL TAPE BACKUP SYSTEM

Backtrax Phantom 250 is a low-cost solution for personal tape backup. The system stores 124MB and comes with easy-to-use data compression software that expands the capacity to 250MB. Full network support, automatic and batch file operations and built-in error correction.

\$279⁹⁵

Mfr. Sugg. Retail \$379.00

THE NEW PRINTSHOP

OUR BEST SELLING SOFTWARE TITLE!

- Make banners, signs, newsletters, or greeting cards. Easy to use, high quality documents and lots of fun!

\$29⁹⁵

Mfr. Sugg. Retail \$59.00

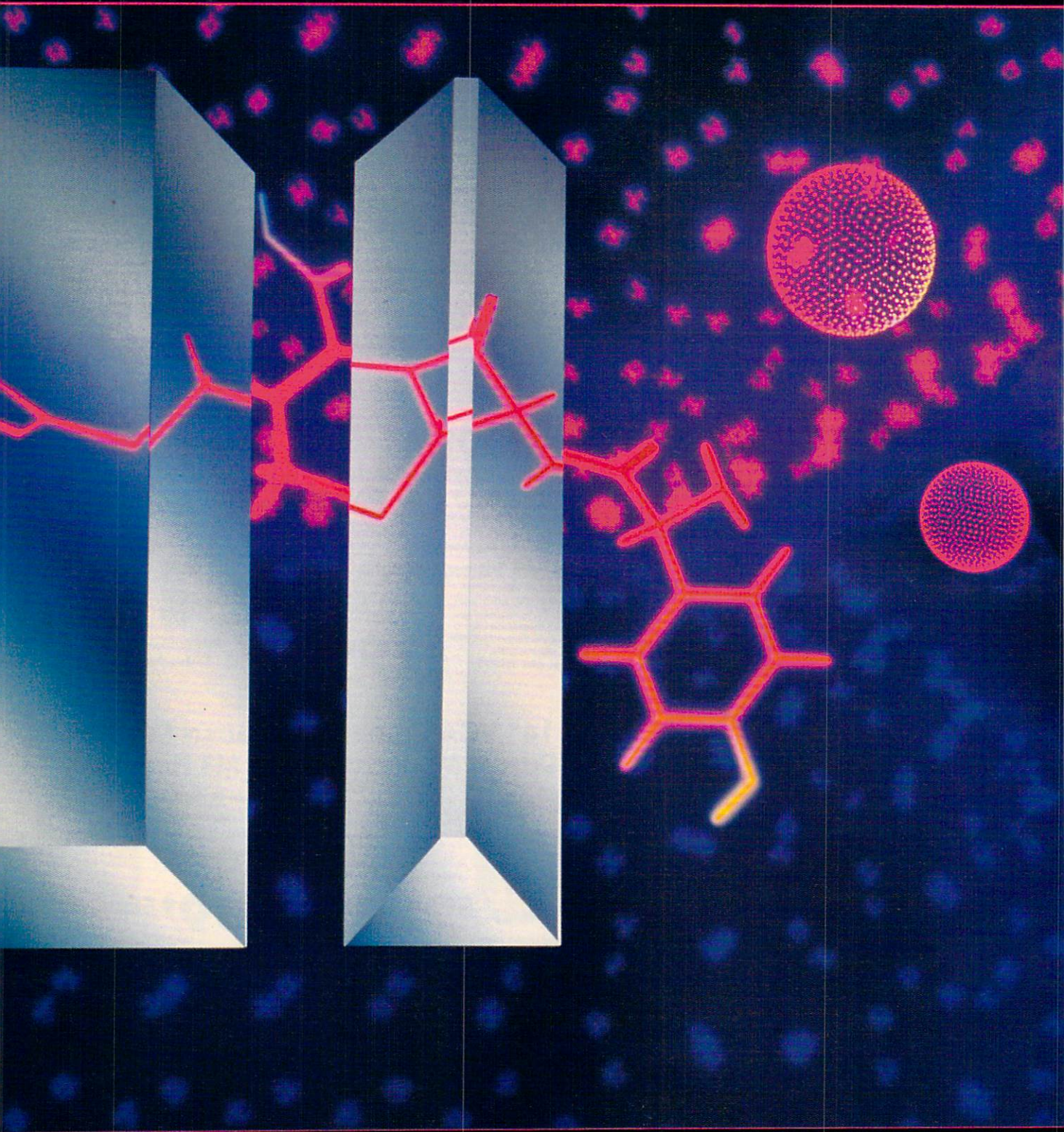



WE CARRY A FULL LINE OF COMPUTERS, SOFTWARE & ACCESSORIES!
CALL FOR YOUR FREE CATALOG TODAY!
1000'S OF ITEMS IN STOCK

HOURS(CDT): MONDAY - FRIDAY 8AM TO 8PM, SATURDAY 9AM TO NOON

Prices do not include shipping charges. Call to get your lowest delivered cost. We insure all shipments at no extra cost to you! All packages are normally shipped UPS Ground. 2nd day and overnight delivery are available at extra cost. We ship to all points in the US, Canada, Puerto Rico, Alaska, Hawaii, Virgin Islands and APO-FPO. Monitors only shipped in Continental US. Illinois residents add 6.5% sales tax. Prices and availability subject to change without notice. Not responsible for typographical errors or omissions. Sales tax not included. Verification required. Pictures for illustration purposes only, actual product may differ. Please see our catalog for specifications.

COMPUTER DIRECT, INC.
22292 N. Pepper Road, Barrington, IL 60010
"We Love Our Customers"





It's easy
to protect yourself
against
computer viruses.
Here's how.

C O M P U T E R VIRUSES F R O M A T O Z

By Mark Minasi

You've heard about computer viruses—those mysterious, malevolent programs that enter your computer in the dead of night and zap all of your data. Some virus experts say we'll see thousands of different viruses floating around the computer world in the next few years. Like Chicken Little, these pundits predict the computer sky will fall, ending computing as we know it. Others say that these virus experts *need* users to be afflicted with virus hysteria so they can keep their jobs. What's going on? Here's the who, what, why, where, and how of viruses.

Virus is a term in popular use that refers to any of a group of unwanted programs—the weeds in your computer garden. By the way, the term is a metaphor only—you can't catch a virus from your computer.

Why are there viruses? Simply put, a virus is a form of computer crime, and often it's not even a particularly inspired crime. Microcomputing has grown up in an atmosphere of trust and cooperation, freeing PC operating environments from the clutter of security systems—much like a rural neighborhood that hasn't had to lock its doors for years.

This open environment has left an opportunity for a few cowardly programmers to create these destructive programs. Believe me—there's not much to writing a virus that runs on DOS machines. There's no more ingenuity in writing one of these than there would be in robbing houses in the aforementioned neighborhood.

The media-inspired vision of virus authors as a class of super-programmers is misinformed. They're just maladjusted twerps looking for some attention in a particularly destructive way.

Parts of a Virus

A virus has two parts, which I'll call the infector and the detonator. They have two very different jobs. One of the features of a computer virus that separates it from other kinds of computer programs is that it replicates itself so that it can spread (via floppies transported from computer to computer, or networks) to other computers. That's what the infector does.

After the infector has copied the virus elsewhere, the detonator per-

forms the virus's main work. Generally that work is either damaging data on your disks, altering what you see on your computer display, or doing something else that interferes with the normal use of your computer.

Here's an example of a simple virus, the Lehigh virus. The infector portion of Lehigh replicates by attaching a copy of itself to COMMAND.COM (an important part of DOS), enlarging it by about 1000 bytes.

So let's say you put a floppy containing COMMAND.COM into an infected PC at your office—that is, a PC that is running the Lehigh program. The infector portion of Lehigh looks over DOS's shoulder, monitoring all floppy accesses. The first time you tell the infected PC to access your floppy drive, the Lehigh infector notices the copy of COMMAND.COM on the floppy and adds a copy of itself to that file.

Then you take the floppy home to your PC and boot from the floppy. (In this case, you've got to boot from the floppy in order for the virus to take effect, since you may have many copies of COMMAND.COM on your hard and floppy disks, but DOS only uses the COMMAND.COM located on the boot drive.)

Now the virus has silently and instantly been installed in your PC's memory. Every time you access a hard disk subdirectory or a floppy disk containing COMMAND.COM, the virus sees that file and infects it, in the hopes that this particular COMMAND.COM will be used on a boot disk on some computer someday.

Meanwhile, Lehigh keeps a count of infections. Once it's infected four copies of COMMAND.COM, the detonator is triggered. The detonator in Lehigh is a simple one. It erases a vital part of your hard disk, making the files on that part of the disk no longer accessible. You grumble and set about rebuilding your work, unaware that Lehigh is waiting to infect other unsuspecting computers if you boot from one of those four infected floppies!

The Worm That Turned

The term for any program that replicates itself, like the infector part of a virus, is a *worm*. Some viruses are pure worms, like the much-publicized Internet worm. This worm ran on minicomputers linked on the Internet network. It made multiple copies of itself in a minicomputer, forcing the computer to waste time executing the worms, slowing down response time for legitimate users. It also copied itself to other computers on Internet, spreading so quickly that it brought the entire network to a halt.

Such a program will not affect PC users, since there are no PC-based networks that can call your computer up and dump messages on it automatically. The kinds of worms found in viruses generally work by injecting copies of themselves into executable programs.

This one fact simplifies the task of antiviral programs. A virus can only infect either an executable program—ones with a COM, EXE, SYS, BIN, or OVL extension—or the area of a disk called the boot sector. We can then talk about two kinds of viruses: program infectors and boot sector infectors.

DOS Boot

A boot sector is a program and data area on a disk that contains a small program that is essential to the initial boot-up process. The unusual thing about the boot sector is that it is not a file. In fact, it lies completely outside the part of the disk that contains files.

The only way to become infected from a boot sector infector virus is to boot from an infected floppy. Think about that for a moment. The only disk you should ever boot from anyway is the original DOS floppy, and that's write-protected, so it couldn't contain a virus unless the Microsoft original was infected. You really never have to boot from any other floppies except for a few old games, so being careful not to boot from floppies is one simple way to avoid virus infections.

That simple advice is quite powerful. More than 70 percent of the viruses out there are boot sector infectors rather than program infectors. Of the five most common viruses found in the U.S., three are boot sector infectors.

Merely making a habit of keeping the floppy drive door open when you boot will instantly make you invulnerable to more than half the viruses out there. (What should you do about the other kind, the program infectors? They're a bit tougher, so hang on for a few more column inches, and I'll get to them.)

Whether a boot sector or program infector, all infectors' *modi operandi* are similar. When you turn your computer on, the virus is not active until the infected portion is loaded. In the case of a boot sector infector, that's immediately upon boot-up, since that's when the boot sector is executed.

For a program infector, the virus becomes active when you run the infected program. For example, if 1-2-3 were the only infected program on your PC, the virus would only be active from the time you ran 1-2-3 until you turned the PC off.

Once active, the virus looks for pro-

grams or boot sectors to infect. While your hard disk has only one boot sector, a program infector may slowly infect every program on your hard disk. Boot sector infectors will infect boot sectors on floppies inserted in your floppy drives, and program infectors will infect any programs on those floppies. The infection process—a sort of COPY command—is very quick, and it generally won't be noticed by the PC's operator.

Note that because viruses can only be spread by booting from floppies with infected boot sectors or by running infected programs, you cannot become infected by a data file—that is, a 1-2-3 spreadsheet, a *WordPerfect* document, or a *dBASE* database cannot spread viruses.

Tick, Tick, Tick

The detonator is usually called a time bomb or logic bomb. It's a piece of code embedded in a program or the operating system itself that waits for a particular event to occur. When that event occurs, the bomb goes off, doing some kind of damage.

Logic bombs have been around nearly since the beginning of computing. An early one showed up in a mainframe payroll program. The program's creator had inserted a clause in the payroll program that said, in effect, "If you find I'm not on the payroll, erase all payroll files."

A time bomb is based on a related idea, but it detonates according to the clock. For example, the detonator portion of the most common virus in the U.S., one called Jerusalem-B, goes off every Friday the 13th. Whenever you try to run a program, it erases the program instead. On other days, it only does minor annoying things to your screen. The detonator program in the Lehigh example is a logic bomb. It says, "Once you've made four copies, do the damage."

Many detonators are fairly harmless, although an annoying intrusion on the use of your PC. The Cascade virus causes letters on your screen to fall to the bottom of the screen. No data's been damaged, but it does make using the computer difficult.

The New Zealand virus, also known as Stoned or Marijuana, occasionally keeps your computer from booting, displaying the message *Your PC is now Stoned*. (There's also a message in the virus saying, *Legalize Marijuana*, but due to a bug in the virus, this message never gets displayed.)

The Fu Manchu virus makes childish, obscene comments whenever you type *Reagan*, *Thatcher*, or *Botha*.

Yankee Doodle, from Bulgaria, plays "Yankee Doodle" on the PC

FREE*

COMPUTE *HOT DISK*

COMPUTE CELEBRATES ITS 12TH ANNIVERSARY WITH A SPECIAL DISK OFFER FOR ALL OF YOU.



SPECIAL
ANNIVERSARY
ISSUE
OFFER

6 Fun and Helpful Programs

- JIGSAW—Create your own jigsaw puzzle; then solve it!
- WRIMAGE—Race the clock in this fast-paced word game.
- POWER POKER—A new twist to an age-old classic.
- EquipList—Check your computer's configuration in a flash.
- DOS Help—Quick, easy-to-use DOS term reference guide.
- COMPUTECalc—Handy alternative to a desk calculator.

Plus A Special Program

that lets you

- ... Read and Print Documentation
- ... Use Icons to Select Programs
- ... Click on Pulldown menus

And . . .

COMPUTE HOT DISK runs on any system with 256K of free RAM and any monitor. EquipList and COMPUTECalc requires DOS 3.3 or higher, and the others need DOS 2.1 or higher. All documentation is included on the disk.

Available for IBM PCs and compatibles only.

Best of All . . .

IT'S FREE for a modest postage and handling fee*. ORDER YOUR COMPUTE HOT DISK TODAY and join COMPUTE in celebrating its 12th anniversary.

P.S. COMPUTE HOT DISK makes a great gift. Pick up several for Birthdays, Stocking Stuffers, or any occasion.



ORDER
YOUR
COMPUTE
HOT
DISK
TODAY!

YES! Send me COMPUTE'S 12th Anniversary HOT DISK for my IBM PC or compatible. I pay only shipping and handling charges to receive this FREE offer.

Please indicate how many disks of each format you'd like.

_____ 5 1/4-inch Disk(s)

_____ 3 1/2-inch Disk(s)

_____ Total Disks

×\$2.95 Shipping & Handling PER DISK*

\$ _____ Order Total

\$ _____ Sales Tax (Residents of NC and NY, please add appropriate sales tax for your area. Canadian orders, add 7% Goods & Services Tax.)

\$ _____ TOTAL ENCLOSED

NAME _____

ADDRESS _____

CITY _____ STATE/PROVINCE _____ ZIP/POSTAL CODE _____

Mail Coupon (or replica) with payment to
COMPUTE'S HOT DISK
324 W. Wendover Ave., Ste. 200
Greensboro, NC 27408

Payment must be in U.S. dollars by a check drawn on a U.S. bank or by money order. For delivery outside the U.S. or Canada, add \$1.00 for surface mail or \$3.00 for airmail. Please allow 4-6 weeks for delivery.

ware that directly controls your disk hardware. Unfortunately, there is a lot of legitimate software that directly controls disk hardware, leading to many annoying false alarms. After a while, you'll get tired of the false alarms, and you'll get rid of the software.

Virus scanners, however, are much more convenient. You just run them now and then, and they detect any viruses that your disks are harboring. There are two potential problems with scanners, but both are surmountable.

The first is the sheer number of viruses out there—more than 500, at last count. A virus scanner must be able to detect any of these monsters, a process that makes scanners big, slow, and potentially expensive. At minimum, it means that you'll be buying updates to your virus scanner program a few times per year.

This issue of *COMPUTE's PC Disk* contains a terrific scanner from McAfee Associates, a California firm specializing in antivirus information, software, and consulting. Its program is called *VIRUSCAN*, and it's now at version 77. You can be sure that the McAfee folks stay on top of this market!

For more information on *PC Disk*, see "On Disk" elsewhere in this issue. McAfee requests a \$25 registration fee

for the use of *VIRUSCAN* if you're a household or home office business—not an unreasonable price for a little computer peace of mind.

Larger businesses and government agencies must get in touch with McAfee to negotiate a registration fee. You can reach McAfee at (408) 988-3832 (voice), or you can get *VIRUSCAN* directly from its BBS at (408) 988-4004.

The second potential problem for virus scanners comes from a class of viruses called stealth viruses. In order for a virus to exist on a PC, it must reside somewhere, generally in the boot sector or a program file on the PC's hard disk. So virus scanners look in those areas for distinctive signatures that characterize particular viruses.

But stealth viruses foil scanners. They monitor attempts to read the part of the disk that the virus lives in. They then intercept the read attempt and hand the scanner program the image of the disk as it would be if it weren't infected. "Nobody here but us chickens," the stealth virus says.

How do you get around stealth? Simple. Stealth only works if the virus is active—if it's been loaded from the infected hard disk. Just cold-boot from a write-protected floppy before running any virus scanner, and you're safe

from stealth. Ensure that the boot floppy was made with *DISKCOPY* using your original write-protected DOS start-up disk after cold-booting from that original startup disk.

What do you do if you find that you are infected? If a program file is infected, simply erase it from your hard disk and restore a clean copy from your backups. If you have an infected boot sector, most virus scanners will create a clean, uninfected boot sector, eliminating the virus; if worst comes to worst, you could remove an infected boot sector by backing up your disk, then low-level formatting, partitioning, and high-level formatting the disk, although measures that drastic shouldn't be necessary.

Viruses are something to worry about, but not a lot. A little common sense and the occasional virus scan will keep you virus-free. Remember these four points:

- Viruses can't infect a data or text file.
- Before running an antivirus program, be sure to cold-boot from a write-protected floppy.
- Don't boot from floppies except reliable DOS disks or your original production disks.
- Stay away from pirated software. □

May 1991

Mike's Airline and Fun Schedule

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
			1 Fix Sprinklers	2 Bil Anzabach Basin	3 Bil Croyer Mtn.	4 Kinetic Sculpture Race in Boulder
5 San Jose State "Aero-Crash" Beach Party Santa Cruz	6 3:11pm DEN-STL :35 STL-DEN 8:13pm	7 3:11pm DEN-STL :35 STL-DEN 8:13pm	8 3:11pm DEN-STL :35 STL-DEN 8:13pm	9 3:11pm DEN-STL :35 STL-DEN 8:13pm	10 OFF	11 Work on Car
Home each night			Los Angeles			
12 Target Practice	13 9:40am DEN-SEA :34 SEA-LAX 3:54 LAX-PDX 8:47pm	14 3:40pm FOX-LAX 1:30 LAX-DEN 10:42pm	15 3:11pm DEN-STL :35 STL-DEN 8:13pm	16 3:11pm DEN-STL :35 STL-DEN 8:13pm	17 Limousine, Tarasco, Burmuda Shorts night on the town!	
Los Angeles			OFF			
19 Rozel	20 9:40am	21	22 3:11pm DEN-STL :35 STL-DEN 8:13pm	23 3:11pm DEN-STL :35 STL-DEN 8:13pm	24 John in Town for 3 days	
OFF			OFF			
27 Suzanne in Town for 3 days	28 3:11pm DEN-STL :35 STL-DEN 8:13pm	29 3:11pm DEN-STL :35 STL-DEN 8:13pm	30 3:11pm DEN-STL :35 STL-DEN 8:13pm	31 Train for 150mi bike ride in July		
OFF			each night			

How pilot Mike O'Neal keeps on schedule between flights.

Before he takes off, Mike uses his PC and Calendar Creator Plus* to merge his busy flight and ground schedules into one great-looking calendar. So he and his friends and associates always know what he's up to. **Time management is a breeze.** Schedule personal appointments, departmental meetings and the office conference room in minutes. Plan trade shows and keep track of a traveling sales staff. Merge any combination of individual schedules on your PC or LAN to print one master calendar. All this in nine calendar formats, including pages for Day-Timers® and other organizers. Put your organization on auto pilot. With Calendar Creator Plus 4.0.

SPECIAL OFFER: Order now and get the best of T/Maker® ClickArt® FREE – a \$59.95 value!**



Calendar Creator Plus

Power Up! To order, or for the dealer nearest you, call 1-800-851-2917 Ext. M306 7 a.m. - 5 p.m. PST

**To receive your free ClickArt, purchase Calendar Creator Plus directly from Power Up or from your favorite software retailer. Send this ad, along with your dated sales receipt and customer registration card to Power Up Software, Free ClickArt Offer, P.O. Box 7600, San Mateo, CA 94403-7600. Offer expires 1/31/92. Calendar Creator Plus is a trademark and Power Up! is a registered trademark of Power Up Software Corp. ClickArt and T/Maker are registered trademarks of T/Maker Company. *Also available for Macintosh (features vary).

Circle Reader Service Number 156

OCTOBER 1991 COMPUTE 49

ON DISK

Tony Roberts

DEBUG YOUR COMPUTER WITH VIRUSCAN

This issue's edition of *COMPUTE's PC Disk* includes a variety of programs that nearly everyone will find useful. These programs were selected from among hundreds we downloaded from bulletin boards and online services.

You can get all the programs on this month's disk or subscribe to a year's worth of *COMPUTE's PC Disk* (which in-

The wide open spaces are yours with Big Desk. It turns your Windows desktop into a huge virtual workspace that's eight screens wide by eight screens high.



cludes a subscription to *COMPUTE*) by sending in the coupon you'll find on the second page of this column.

Please note that the shareware programs featured on our disks are yours to test and evaluate, but if you find the programs useful, you should send the registration fee to the author.

Registering shareware has several benefits. First, registered owners receive notification of program updates and often are entitled to free upgrades. Also, many shareware authors send additional programs as a bonus when you register. Finally, by supporting shareware authors, you encourage them to continue making high-quality, low-cost, try-before-you-buy software available for PC users everywhere.

VIRUSCAN

In every facet of our lives these days, we're forced to be more security conscious. Computers are no exception, especially if they hold thousands of dollars' worth of data or hundreds of hours' worth of your work.

You can read all about computer security in this issue's feature called "Viruses From A to Z" by Mark Minasi on page 44. With *VIRUSCAN* you can take the first steps to protect yourself against possible disaster.

VIRUSCAN, from McAfee Associates, is one of the most widely respected virus detection utilities available today. This program checks your disks for the presence of more than 243 known computer viruses. McAfee works hard to continually update the software to identify newly discovered viruses.

With options for checking files, disks, or memory for viruses, *VIRUSCAN* also sets exit codes, so you can run it from batch files, and its reports can be directed to data files for later reference.

Registration for home use of *VIRUSCAN* is \$25 and includes free downloads of updated versions from McAfee Associates' BBS for one year. In addition, McAfee offers registered home users free information on removing viruses.

If you trade disks with your friends or associates, or download files from bulletin boards, you increase the risk of introducing a virus into your system. Running *VIRUSCAN* regularly can eliminate your fears that a hidden virus

may lurk within your PC. The small registration fee is well worth that peace of mind.

Useful Notes

Here's an information manager that can help you organize the scraps of paper that accumulate on your desk and in your pockets.

Useful Notes, which can run as a stand-alone program or as a memory-resident utility, could be described as a freeform database of computerized Post-it Notes. Notes can range in size from a word or two to thousands of characters.

Need to remember a phone number? Create a note and jot it down. Keep doing this, and soon you'll have a pile of notes that you can sort, edit, and organize. If *Useful Notes* is running memory resident, you can pop it up with a keystroke, locate that phone number, and pop back to your main application in a flash.

Useful Notes allows you to create as many piles of notes as you like, so you can separate business notes from home notes; or if you share your computer, you can separate Mary's notes from Tom's.

Michael Gardi's *Useful Notes* is shareware and carries a \$20 registration fee. Registered users receive an update with the most recent version of the program, plus a version of *Useful Notes* that includes EMS support.

Mr. Filter

This is a program for the toolbox. You won't need *Mr. Filter* every day, but you'll be glad it's there when you do need it. Programmer Jim Gillespie describes *Mr. Filter* as "the first line of defense in dealing with corrupted text files." His goal was to create a quick and easy way to fix files that won't print or can't be called up in your word processor.

Mr. Filter removes false end-of-file markers, deletes extraneous control characters, and wraps lines longer than 80 characters. There are also options to remove extended ASCII characters and to strip high bits.

Mr. Filter works by reading

```

COMPUTE Annotation of MrFilter's report option.
C:\MSDOS\filter -> archive.org
MrFilter ver 3.1 ( (MS-DOS File Repair Utility) )
Copyright 1990 by J. Gillispie and Blue Moon Computing
(Press ESC to Abort)
Scanning: ARCHIVE.PIC (10M)

Total ASCII chars read..... 6303
Extended ASCII chars..... 2
Control chars..... 4
False end-of-file markers..... 1
Number of long lines..... 5

Output -> Screen only
Goodbye from MrFilter
  
```

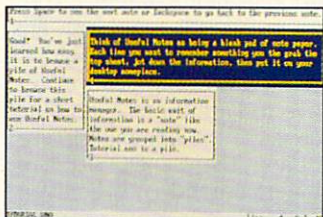
Mr. Filter

an input file, scanning every byte, making its adjustments, and writing a new output file,

Files	Bytes	Directory
15	2,421,864	*N
16	486,339	c:\Nishch
17	1,142,260	c:\Nishch
18	307,472	c:\Nishch\comp\lsh
19	26,487	c:\Nishch\comp\lsh\lsh
5	232,244	c:\Nishch\comp\lsh\lsh
14	963,088	c:\Nishch
20	17,228	c:\Nishch
47	1,146,220	c:\Nishch
21	1,778,360	c:\Nishch
22	477,480	c:\Nishch
17	1,921,988	c:\Nishch
12	67,857	c:\Nishch
9	44,865	c:\Nishch\lsh
6	8	c:\Nishch\lsh
1	125,486	c:\Nishch\lsh\comp\lsh
3	282,325	c:\Nishch\lsh\comp\lsh
28	553,829	c:\Nishch

Directory Size

leaving the original unchanged. The program also contains a report-only option



Useful Notes

that scans a file and reports on problems it finds.

If you use Mr. Filter, you can register your copy with the author for \$12. Next time you have a problem text file, you could grit your teeth, load a disk editor, and manually search for the problems, or you could just run the file through Mr. Filter.

Directory Size

This utility is so simple and so useful you'll wonder why it isn't part of DOS.

Directory Size paints a quick picture of your disk, letting you know the number of files stored in each subdirectory and the amount of disk space those files occupy.

When you're facing one of those "I've gotta make some room on this hard disk" sessions, Directory Size shows you where the fat is. It's like nutrition analysis for your PC.

Virginia programmer Keith Ledbetter, who has a large number of utility programs to his credit, offers Directory Size as a free program.

Big Desk

Here's a program that will help cure those overlapping windows blues for users of Windows 3.0. Big Desk creates a virtual desktop that allows you to spread out your applications neatly and hop from one to another.

Big Desk, written by Ian Heath of Southampton, England, permits you to configure a desktop that's as large as eight screens wide by eight screens high.

The program's icon shows a minimap of your virtual desktop, and with a click of the right mouse button, you can move from application to application effortlessly.

Big Desk is a shareware program. Your donation will help to fund programmer Heath's graduate studies at the University of Southampton.

If you find the program useful, please register it. The registration fee is 20 pounds sterling or about \$35. Simon Phips, a colleague of Heath's, says not to be intimidated by currency exchanges—pay by credit card and let the people at VISA or MasterCard take care of the monetary details. □

FOR SINGLE DISKS

YES! I want to power up my PC. Send me the October 1991 COMPUTE's PC Disk. I'll pay \$9.95 for each 5 1/4-inch or 3 1/2-inch disk plus \$2.00 shipping and handling per disk.

Please indicate how many disks of each format you'd like:

_____ 5 1/4-inch disks at \$9.95 each

_____ 3 1/2-inch disks at \$9.95 each

_____ Subtotal

_____ Sales tax (Residents of NC and NY please add appropriate sales tax for your area. Canadian orders, add 7% goods and services tax.)

_____ Shipping and handling (\$2.00 U.S. and Canada, \$3.00 surface mail, \$5.00 airmail per disk.)

_____ Total enclosed

Send your order to

COMPUTE's PC Disk
W. Wendover Ave., Ste. 200
Greensboro, NC 27408

SUBSCRIPTIONS

I want to save even more! Start my one-year magazine and disk subscription to COMPUTE's PC Disk right away.

_____ 5 1/4-inch \$49.95 per year

_____ 3 1/2-inch \$49.95 per year

For delivery outside the U.S. or Canada, add \$10.00 for postage and handling.

Name _____

Address _____

City _____

State/Province _____

ZIP/Postal Code _____

Total Enclosed _____

Check or money order _____

MasterCard _____

VISA _____

Credit Card No. _____

Expiration Date _____

Signature _____

(Required)

Daytime Telephone No. _____

Send your order to

COMPUTE's PC Disk
P.O. Box 3244
Harlan, IA 51539-2424

All orders must be paid in U.S. funds by check drawn on a U.S. bank or by money order. MasterCard or VISA accepted for orders over \$20. This offer will be filled only at the above address and is not made in conjunction with any other magazine or disk subscription offer. Please allow 4 to 6 weeks for delivery of single issues or for subscription to begin. Sorry, but telephone orders cannot be accepted. Disks available only for IBM PC and compatible computers. Offer good while supplies last.

POINT & CLICK

Clifton Karnes

NEW ENSEMBLE, HOT NEW DOS

There's good news this month for *GeoWorks Ensemble* users. GeoWorks has released an update that adds features many of us have been waiting for (GeoWorks, 2150 Shattuck Avenue, Berkeley, California 94704; 415-644-0883).

The biggest story with *Ensemble 1.2* is that *GeoWrite*, the program's word processor, has been transformed from a desk accessory into a full-fledged writing tool that comes with a search-and-replace engine and a 100,000-word spelling checker.

Both writers and designers

more of *Ensemble* in the future. GeoWorks has announced deals with Laser Computer, Philips, Samsung, Everex, and others to bundle the package with these companies' PCs. Added up, this will mean more than 600,000 additional copies of *Ensemble* in circulation. More *Ensemble* users mean more incentive for publishers to develop programs for the environment.

DOS 5.0

Windows, *Ensemble*, and *DESQView* have one thing in common: If you look below the fancy windows and dialog boxes, you'll find DOS. These environments sit on top of DOS and use DOS services, and so in a sense, they're DOS enhancements. That's why they're called interfaces or environments rather than operating systems.

Does it matter which version of DOS you're using with your GUI?

If you're running DOS programs, it matters a great deal. That's why Microsoft's release last June of DOS 5.0 (Microsoft, One Microsoft Way, Redmond, Washington 98052; 206-882-8080; \$99.95) isn't just important news for command line addicts; it's significant for GUI aficionados, too.

From the first, you'll sense that this version of DOS is different. DOS 5.0 comes with the best installation program I've seen. It walks you through each step of setup and even saves information about your previous DOS configuration so you can *uninstall* 5.0 and return to your older version if you want.

You won't want to go back,

though. Just a few minutes with 5.0 will convince you it's the wave of the future. Here's a rundown of what's new.

First, 5.0 has impressive memory management facilities that allow you to load DOS itself into high memory on 286 and 386 machines and load device drivers and TSRs into high memory on 386 computers. When you're running a DOS app from *Windows* or *Ensemble*, you'll have *much* more room for your programs. After installing 5.0, I have about 615K free left over in *Windows* that I can use to run my DOS programs.

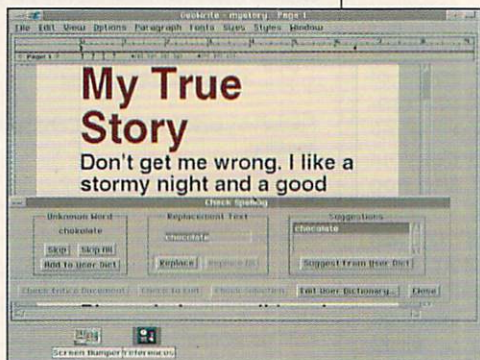
Programmers will be glad to find that an interpreter-only version of *Microsoft QuickBASIC* has replaced *GW-BASIC*. And everyone will be glad to see *EDLIN* finally made obsolete by *EDIT*, an excellent text editor with pull-down menus and full mouse support.

DOS 5.0's *DIR* command is actually useful. Instead of the bleak display option served up by previous versions, this *DIR* comes with a ton of switches that allow you to display directory information in almost any shape or form. There's even an option that displays files in all of a directory's sub-directories. Plus, you can set these switches as an environment variable so you don't have to type them each time you issue the command.

Last, there's *DOSKEY*, a new command line retriever. It stores your most recently used commands in a buffer for quick recall. This kind of program is necessary for extensive command line work, and it's great that DOS finally has this type of command.

All in all, DOS 5.0 is *very* impressive. No matter which GUI you're running, 5.0 will give it more elbow room and make the time you spend at the command line more productive and enjoyable. □

**GeoWorks
shouts out one
message
loud and clear:
Upgrade now!**



will be glad to hear that printer support has been beefed up for this new release, too, with drivers for more than 300 additional printers.

Topping the list of other enhancements are an *Ensemble* version of the Russian game *Tetris*, more than 50 added icons for the DOS room, and more screen savers.

All this certainly sounds good, but here's the best news: This upgrade is being sent *free* to registered users of *Ensemble*. Now that's class! If you're a first-time buyer, the updated retail version, which lists for \$199.99, should be available in stores by the time you read this.

We're going to be seeing

Take **your choice** of these popular children's computer software programs worth up to \$59.95... **FOR JUST \$9.95!**

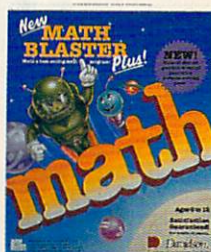
Plus shipping and handling, with membership.



Where in the U.S.A. is Carmen San Diego?: Regular Price: \$49.95 Won Outstanding Software Award! Learn hundreds of U.S.A. facts. Available for IBM and Apple II, ITEM NUMBER 1



Where in Time is Carmen San Diego?: Regular Price: \$49.95 Travel through Time to capture the villain and her gang. Available for IBM and Apple II, ITEM NUMBER 2



New Math Blaster Plus: Regular Price: \$49.95 World's best-selling math program has fun "BlasterNaut" game. New Version Now Available for IBM, Apple II version's MBP, ITEM NUMBER 3



Super Solvers Out Numbered: Regular Price: \$49.95 A highly-recommended program that develops math, problem-solving and other skills. Available for IBM and compatibles only, ITEM NUMBER 4



Mavis Beacon Teaches Typing: Regular Price: \$49.95 Best Home Learning Award! Fun typing skills for all ages. Available for IBM and Apple II, ITEM NUMBER 5



The Oregon Trail: Regular Price: \$49.95 Travel with a pioneer family across the 19th century wilderness, learning how to survive. Available for IBM and Apple II, ITEM NUMBER 6



The New Print Shop: Regular Price: \$59.95 The most popular graphics software in history. Print your own cards, banners and signs. Printer required. Available for IBM and Apple II, ITEM NUMBER 7



Mixed-Up Mother Goose: Regular Price: \$39.95 Help Mother Goose find the missing pieces to her rhymes. Available for IBM and Apple II, ITEM NUMBER 8



Stepping Stones I & II: Regular Price: \$49.95 From early reading to addition, spelling and vocabulary. Colorful graphics. Available for IBM (enhanced version) and Apple II, ITEM NUMBER 9

SOFTWARE SELECTION GUIDE

Key to Colors:

- Blue: Ages 3-7
- Red: Ages 7-10
- Green: Ages 10-13+



Watch your children laugh and learn...with software that's fun!

You've got the children. You've got the computer. Now you can bring the two together and turn leisure time into learning time with software that's fun! The Learning Adventure Computer Club takes the work out of software selection for you. We review hundreds of computer programs for youngsters — invite children like yours to test them — then select only the ones that combine active fun with measurable learning in:

- * MATH * SOCIAL SCIENCE AND GEOGRAPHY * SCIENCE
- * LANGUAGE ARTS AND READING * CRITICAL THINKING SKILLS
- ...AND MORE IMPORTANT SKILLS!

Software Geared to Your Child's Age and Interests

To find out which programs are best for your child, check the colored square by each program: they're keyed in three age groups. Blue programs introduce your 3-7 year-olds to the computer with activities that arouse their curiosity...capture their imagination...and instill a lifelong love of learning. Red programs turn the Three R's into rip-roaring adventures for 7-10 year-olds with programs developed to supplement their education and turn their weaknesses into strengths. Green programs stretch the minds of 10-13+ year-olds with sophisticated software that make academic challenges fun and rewarding!

How the Club Operates:

Try your first computer program FREE for 15 days at no risk or obligation. Just select the software package of your choice, fill out the coupon and mail it today. We'll send you the program you select. If you are pleased with the program, you'll pay for it at the Charter Members' price of just \$9.95 plus shipping and handling, a savings of up to \$50.00 off the retail price.

Then about every four weeks (13 times a year) you'll receive a new Parents Newsletter with details about the next selection for your child. To receive the main selection, you need do nothing — it will be sent automatically. If you wish to order an alternate selection, or wish no selection at all, simply return the card we provide to tell us your choice. You will always have at least 10 days to decide.

Enjoy a 15-Day Free Trial

What's more, you will always have 15 days to preview each shipment and return any program you don't want. Your only commitment is to purchase three additional selections in the next year at regular club prices. You may cancel your membership anytime thereafter. You have absolutely nothing to lose, and a whole new world of fun and learning to gain for your children. So don't wait: return the coupon today!

Exciting Newsletter...FREE!

Charter members receive the Learning Adventure Computer Club Parents Newsletter FREE. Featuring a host of recommended software for children 3-13+!

Mail to: Learning Adventure™ Computer Club

925 Oak Street, Scranton, PA 18515 Dept. TARA1

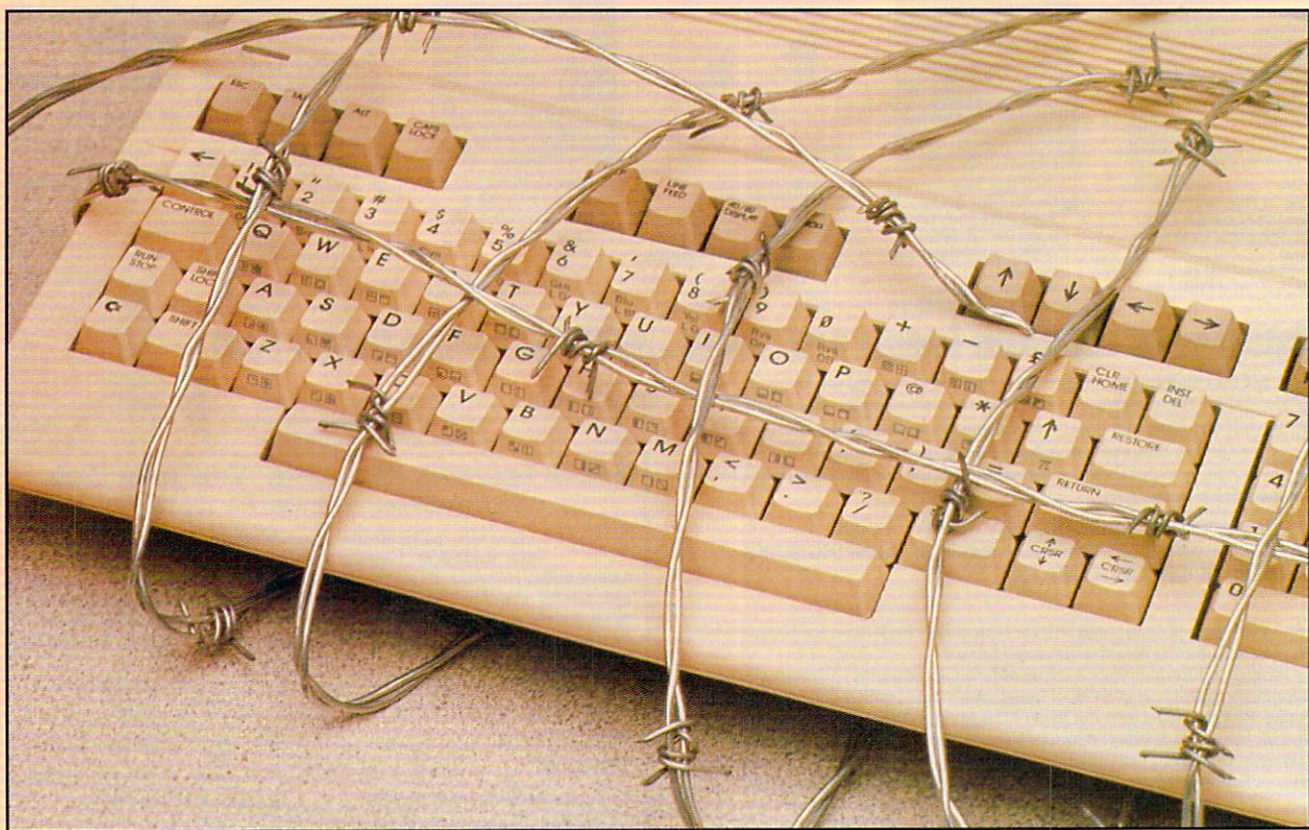
YES! Please send me the program I have indicated below to preview for 15 days at no risk or obligation. I may return the program after 15 days and have no further obligation. If I am pleased with the program, I'll pay for it at the special new member price of only \$9.95 plus \$2.95 shipping and handling, and enroll as a new member under the terms outlined on this page. As a new member, I need to buy just 3 more selections at regular club prices in the next year and may cancel any time thereafter.

Name _____
Address _____
City _____ State _____ Zip _____
Telephone () _____

1. Please send me item number _____ to preview. (Please fill in identification number of program shown above.)
2. AGE of child (check one):
 3-7 7-10 10-13+
3. Computer you own and size of disk required (check one):
 IBM/Tandy & Compatibles with 5 1/4" disk drive
 IBM/Tandy & Compatibles with 3 1/2" disk drive
 Apple II Family & Compatibles with 5 1/4" disk drive
4. Child's name _____
Child's birthdate: Month _____ Day _____ Year _____
5. Please check below if you have a:
 Printer Modem Color Monitor
6. Parent's Signature _____

We reserve the right to request additional information or reject any application or cancel any membership. Limited to new members in the continental USA only excluding AK. Sales tax will be added in PA. We'll send you details of the club's operation with your enrollment shipment, and you have a 15-day no-obligation privilege to decide if you wish to continue as a member.

BUYER'S GUIDE TO VIRUS PROTECTION SOFTWARE



BY
CHANTELLE OLIGSCHLAEGER
AND
ERIN RICHTER

PC Productivity Manager

Work at your peak potential! Break free of cumbersome MS-DOS restrictions and limitations! Single keypresses or mouse clicks do it all for you with COMPUTE's super new PC Productivity Manager.

Packed with 38 PC batch-file extensions and power utilities, this easy-to-use disk includes individual help menus for every program. You don't have to be a computer maven—just press F1 for Help anytime!

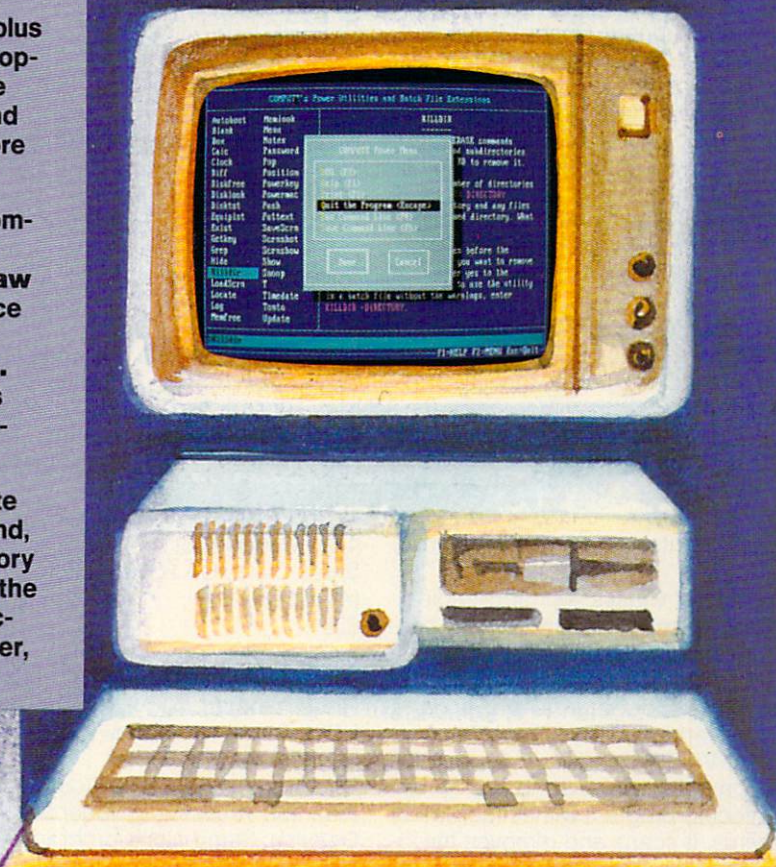
The power utilities alone are worth many times the cost of this disk. Imagine! Programs to speed up your keyboard, edit disk files, edit and search memory, find a specific text string in disk files—plus memory-resident programs such as a pop-up calculator, a programmer's reference tool, an editable macro key program, and a graphic screen-capture utility, and more all included on this jam-packed disk.

Our batch-file extensions add new commands to standard batch-file language. Now you can easily create menus, draw boxes, and write strings in your choice of colors anywhere on the screen—all with simple, easy-to-use commands. Then, add some zest to your batch files with a command that lets you play a series of notes!

Plus handy system tools let you delete an entire subdirectory with one command, find out if the system has enough memory for an application before it runs, cause the computer to remember the current directory so that you can come back to it later, and much, much, more.



Cursor keys change the color; Return goes back to the menu selections.



**ORDER YOUR
PC PRODUCTIVITY
MANAGER TODAY!**

YES! Please send me ___ 5¼ inch disk(s) (\$14.95 each) ___ 3½ inch disk(s) (\$15.95 each).

___ Subtotal
___ Sales Tax (Residents of NC and NY please add appropriate sales tax for your area. Canadian orders, add 7% goods and services tax.)
___ Shipping and Handling (\$2.00 U.S. and Canada, \$3.00 surface mail, \$5.00 airmail per disk.)
___ Total Enclosed

___ Check or Money Order ___ MasterCard ___ VISA

(MasterCard and Visa accepted on orders with subtotal over \$20.)

Credit Card No. _____
Signature _____ (Required)
Daytime Telephone No. _____
Name _____
Address _____
City _____
State/Province _____ ZIP/Postal Code _____

Send your order to COMPUTE's PC Productivity Manager,
324 W. Wendover Ave., Suite 200, Greensboro, NC 27408.

Although your chances of encountering a computer virus are slim, protecting yourself with the right software can give you peace of mind. You may opt to use a resident program that continually monitors your system; you may want to scan new software before you install it. No matter what level of virus protection you're after, you'll find the software you need in this buyer's guide.

Anti-Virus 1.0

Requirements: DOS 3.0 or higher, 512K. *Windows* supported.

Spectrum of viruses: Protects against 400 viruses.

Defense: Memory-resident program removes 95 percent of viruses that it recognizes from infected files, boot sector, or memory. Also immunizes files, giving them their own antivirus capabilities to notify user of any changes and to "heal" themselves.

Network support: Yes.

Customer support: Central Point Software offers a 24-hour virus hotline, quarterly mailings on new virus signatures and upgrade offers, online support on BBS and CompuServe (GOCENTRAL), and a free virus-protection software update coupon.

Comments: Virus Update command allows users to enter newly discovered virus signatures into *Anti-Virus*.

CENTRAL POINT SOFTWARE

15220 NW Greenbrier Pkwy., Ste. 200
Beaverton, OR 97006
(800) 445-4208—customer service
(503) 690-8080—technical support
\$129

AntiVirusPlus

Requirements: DOS 3.0 or higher, 256K.

Spectrum of viruses: Not applicable.

Defense: Memory-resident program prevents any penetration of viruses into files and disks. It does not detect individual virus signatures, but it does send a warning if there is hostile activity. *AntiVirusPlus* also monitors DOS function calls, allowing the user to run an infected program without activating the virus. It scans and removes the virus code from the infected files as it reconstructs the original data.

Network support: Yes.

Customer support: Telephone, fax, and BBS.

Comments: Site licenses available.

TECHMAR COMPUTER PRODUCTS

97-77 Queens Blvd., Ste. 812
Rego Park, NY 11374
(800) 922-0015
(718) 997-6666
\$99.95 (Network prices differ.)

Certus 2.1

Requirements: DOS 3.1 or higher, floppy drive and 128K needed for installation, 3K to 10K needed when resident. Compatible with *Windows* 3.0.

Spectrum of viruses: Protects against more than 300 viruses and variants.

Defense: Memory-resident program detects, identifies, and removes viruses and variants in the computer's memory, boot tracks, and files. Can be configured to prevent infected files from running or to prevent infected files from being copied to or from a system.

Network support: Yes.

Customer support: Toll-free telephone and BBS support. Free quarterly upgrades included with purchase of maintenance program (cost depends on purchase price). Otherwise, upgrades cost \$25 each.

Comments: Corporate licensing is available.

CERTUS INTERNATIONAL

13110 Shaker Sq.
Cleveland, OH 44120
(800) 722-8737
\$189 (LAN version for \$1,399.)

CLEAN-UP

Requirements: DOS 2.0 or higher, 256K.

Spectrum of viruses: Protects against 62 viruses as of June 20, 1991.

Defense: Stand-alone program disinfects by removing the viral code and re-writing the cleaned program.

Network support: Yes.

Customer support: Telephone.

Comments: *CLEAN-UP* is shareware.

MCAFFEE ASSOCIATES

4423 Cheeney St.
Santa Clara, CA 95054-0253
(408) 988-3832
\$35

Dr. Solomon's Anti-Virus Toolkit

Requirements: DOS 2.0 or higher, 512K. Supports *Windows* and OS/2 by booting from DOS.

Spectrum of viruses: Detects more than 450 viruses and variants.

Defense: Stand-alone program guards against duplicate infections, protects from outside infections, and inoculates against specific viruses. Checks all the executable files, boot sector, and hard disk partitions. Looks for the patterns that viruses create, enabling it to check for unknown viruses.

Network support: Yes.

Customer support: Telephone and fax support. Includes first year of quarterly upgrades.

Comments: Site licensing available. Software supplied on read-only disks.

ONTRACK COMPUTER SYSTEMS

6321 Bury Dr.
Eden Prairie, MN 55346
(800) 752-1333

\$279.95 for one year, Virus Immunization Program available for an additional \$395.00 per year.

Flu-Shot+ 1.82

Requirements: 256K. Compatible with *Windows*.

Spectrum of viruses: Protects against more than 500 viruses.

Defense: Memory-resident and stand-alone programs monitor system and stop operation if anything suspicious occurs. Does not disinfect.

Network support: Yes.

Customer Support: Free support is available by telephone, BBS, and CompuServe E-mail. Discounts on upgraded software are available for registered users.

SOFTWARE CONCEPTS DESIGN

594 Third Ave.
New York, NY 10016
(212) 889-6431
\$19 (Includes shipping and handling.)

HardDrive Overlord!

Requirements: DOS 3.0 or higher, 275K. Compatible with *Windows* 3.0.

Spectrum of viruses: Not applicable.

Defense: Memory-resident program detects viruses on disks and hard drives by monitoring activity and notifying the user if any problems occur that could be virus related. Authenticators validate programs to ensure that they have not been damaged by a virus. They also check a program's footprint to ensure that it matches the one on file.

Network support: Yes.

Customer support: Telephone.

Comments: Site licenses available.

POP COMPUTER PRODUCTS

P.O. Box 1389
Evergreen, CO 80439
(303) 674-0200
\$99.95

PC/Assure 3.5

Requirements: DOS 3.0 to 4.0, 640K. Compatible with *Windows* 3.0.

Spectrum of viruses: Not applicable.

Defense: Memory-resident program protects files from any unauthorized changes and keeps unauthorized files from running on computer.

Network support: *NetAssure* is available for each workstation; *NetServer* is available for the file server.

Customer support: Toll-free telephone.

Comments: *PC/Assure* offers security features in addition to virus protection.

Enhance Your Tandy®

Hard Cards For 1000, A, SX, TX, SL, TL, SL/2, TL/2, TL/3, IBM & Compatibles

21 Meg 40 MS	\$229
32 Meg 40 MS	\$239
42 Meg 28 MS	\$299
68 Meg 23 MS	\$359
85 Meg 16 MS	\$399
105 Meg 20 MS	\$469
120 Meg 19 MS	\$499
210 Meg 15 MS	\$689

15 Month Warranty, 30 Day Money Back Guarantee. TOLL FREE Help Line.

1000 EX/HX External Hard Drives

Complete With Controller	
21 Meg 40MS	\$349
32 Meg 40MS	\$359
42 Meg 28MS	\$399
68 Meg 23MS	\$429
85 Meg 16MS	\$449
105 Meg 20MS	\$489
120 Meg 19MS	\$529
210 Meg 15MS	\$699

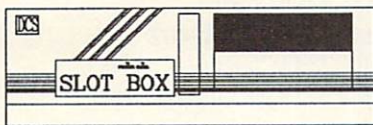
1000 HX Internal Hard Drives

Complete with controller. Replace a Floppy	
42 Meg 28 MS	\$299
85 Meg 16 MS	\$389
120 Meg 19 MS	\$489
130 Meg 15 MS	\$539
IDE 'SmartDrive' For built in Controller of TL/2, TL/3, RL, RLX	
42 Meg 28 MS	\$289

CD ROM For 1000's and SLOT BOX Internal, complete with software \$349

SLOT BOX Seven full length

slots, two 5.25" drive bays, one 3.5" drive bay. Power and hard drive lights. 200 Watt Power supply, cooling fan. Attaches to EX, HX, 1000, A, SX, TX, SL, TL, SL/2, TL/2, RL, TL/3, and RLX **\$279.00**



Floppy Drive Solutions

	Internal	External
360K	\$ 99	\$199
1.2 Meg	\$189*	\$259*
720K	\$109	\$199
1.44 Meg	\$189*	\$259*
* For all except 1000, A, EX, HX, SX		
720K or 360K External for EX / HX	\$129	

VGA Combinations

For SX, TX, SL, TL, SL/2, TL/2, RL, TL/3, 3000's, IBM, Compatibles

Combo \$489
Monitor: 14" CTX
.28 Dot Pitch
Card: Paradise 256K
640 X 480, 256 Colors
Super Combo \$589
Monitor: 14" CTX
.28 Dot Pitch
Card: Trident 1 Meg
1024 X 768, 256 Colors

Memory

1000, A to 640 K W/Clock, Ser.	\$229
256K EX or HX to 640K	\$189
256K 1200 or IBM to 640K	\$189
384K SX, EX, HX, SL to 640K	\$49
TX, TL, TL/2, TL/3 to 768K	\$49
3000NL from 512K to 640K	\$49
1000RL to 768K	\$39
1000RLX to One Meg	\$39

Memory Above 640K

MicroMainframe 5150T EMS Board

More Space for Spreadsheets, Windows, and more

For 1000, A, SX, TX, SL, TL, SL/2, TL/2, RL, TL/3, RLX

1 Meg \$229 2 Meg \$289

1 Meg for 1500 or 2810 Laptops, also for Panasonic CF-170, 270, 370 \$159

Upgrading Your Tandy®



215 information packed pages on performance enhancing upgrades and installation. Covers the 1000, A, EX, HX, SX, TX, SL, TL, SL/2, TL/2, RL, and the new TL/3 **\$19.95** Plus \$5.00 S&H

Modems and Faxes

Hayes Compatible, Includes Software

2400 Baud Internal	\$79
2400 Baud External	\$99
9600 Baud Internal	\$349
Fax/Modem Internal	
9600 Baud Fax, 2400 Baud Modem	\$159
360dpi Mouse W/Software	\$49
Serial Card All Except HX/EX	\$29
Serial Card EX/HX	\$49

Math Coprocessors

For TX, TL, TL/2, TL/3, 80286's up to 12Mhz.

SALE Priced at \$139.00

Math Sprint Socket

makes 80287 up to 200% faster \$59.00

Speed up Chips

50% Faster

For Tandy 1000, A, SX, and IBM XT \$29

For 1000SL, SL/2, and AT&T \$39

PC Sprint \$75

100% Faster. For 1000,A, IBM XT

Tandy, Hayes, IBM, AT & T, Windows, are registered Trademarks. Prices Subject to change without notice.

(614) - 592-4239 Foreign
(614) - 592-1527 FAX
(614) - 594-4180 Local

DCS Industries

5265 Hebbardsville Rd

Athens, Ohio 45701

1-800-537-3539

U.S. and Canada

C.O.D.

AMERICAN EXPRESS



CENTEL FEDERAL SYSTEMS & SERVICES

Information Security Division
11400 Commerce Park Dr.
Reston, VA 22091-1506
(703) 758-7000
\$399

PC-cillin 3.0

Requirements: DOS 2.1 or higher, 6K, one 25-pin parallel port.

Spectrum of viruses: Four-stage program detects and prevents all known and future viruses, quarantines viruses coming from external sources. Hardware Immunizer provides automatic boot-sector damage recovery. Supplies option to remove infected file but does not repair it. Hardware Immunizer contains 1Kb of nonvolatile EPROM memory.

Defense: Device driver and memory-resident program check files, file allocation tables, and the system RAM. Allows a choice of three virus detection sensitivity levels, user definable virus warning messages, and automatic on-line scan for boot sector viruses. Contains built-in self-check.

Network Support: Yes.

Customer support: Toll-free telephone, fax, and BBS support. Updates free for first year through BBS. At the end of first year, upgrades will cost 15 percent of the list price.

Comments: One-year warranty. Site licensing available. Fully compatible with newly developed or upgraded memory management systems, including QEMM, 386Max, and DR DOS 5.0.

TREND MICRO DEVICES

2421 W. 205th St., Ste. D-100
Torrance, CA 90501
(800) 228-5651

\$139 (PC Rx, a software-only version of PC-cillin, is available for \$69. Package includes discount coupon to upgrade with hardware.)

SENTRY

Requirements: DOS 2.0 or higher, 256K.

Spectrum of viruses: Not applicable.

Defense: Stand-alone program creates a log file of system and compares it to the computer's current state. It displays a warning if there's a discrepancy.

Network support: No.

Customer support: Telephone.

Comments: This is a shareware program.

MCAFEE ASSOCIATES

4423 Cheeney St.
Santa Clara, CA 95054-0253
(408) 988-3832
\$25

Vaccine Toolkit 4.0

Requirements: DOS 2.0 or higher, 256K. Compatible with Windows 3.0.

Spectrum of viruses: Scans for and detects more than 400 viruses. When a virus is detected, it offers options to delete the file, leave the file as is, or provide description of the virus for reference.

Defense: Combined memory-resident and stand-alone programs check boot sector files, executable-type files, and overlays. The software utilizes a listing of virus signatures to detect the presence of known viruses and warns user of potential virus activity through creation of executable file checksum. To avoid false alarms, the software can be "taught" which programs on the system are safe.

Network support: VacNet is similar to Vaccine Toolkit but specifically designed for networks. Retail price \$99.95.

Customer support: Toll-free telephone, fax, and BBS support. Updates released approximately monthly on BBS.

Comments: Site licensing and volume discounts available.

WORLDWIDE SOFTWARE

20 Exchange Pl., 27th Floor
New York, NY 10005
(212) 422-4100
\$99.95

Virex-PC

Requirements: DOS 2.1 or higher, 512K. Compatible with Windows 3.0 and Novell networks.

Spectrum of viruses: Detects more than 70 viruses.

Defense: Memory-resident program repairs files damaged by the most common viruses. Once a system is disinfected, the program monitors it to prevent any other virus attacks. The program creates a signature for each file and notifies the user if any changes have been made.

Network support: Yes.

Customer support: Microcom offers virus upgrades on a quarterly basis. Users can subscribe for \$75 or buy each update for \$25. Microcom can be accessed through America Online; it also offers a free file analysis through that network.

Comments: Site-license discounts available; Virex-PC also detects any activities of the Trojan Horse program. Virex is also available for Macintosh computers.

MICROCOM

3700-B Lyckan Pkwy.
Durham, NC 27707
(919) 490-1277
\$129.95

Virucide 2.2

Requirements: DOS 2.11 or higher, two floppy disk drives or a hard disk drive, any monitor or printer, 256K.

Spectrum of viruses: Detects and destroys all currently known viruses as of May 1991, a total of 490 boot, file, and stealth viruses, including those that reside in memory.

Defense: Stand-alone program scans floppy, hard disk, and network drives. Restores affected files to normal whenever possible. Provides descriptions of all known viruses. Able to run unattended. Lets users add to default extensions for scanning overlays.

Network support: Yes.

Customer support: Telephone and fax support. Includes an online reference file containing detailed descriptions of all known viruses. Includes the availability of upgrades (approximately quarterly) as new strains develop. If an upgrade is released within 60 days after purchase, the upgrade is free. After that it costs \$12.

Comments: Site licensing available. Runs in less than a minute under most circumstances. Menu-driven format.

PARSONS TECHNOLOGY

375 Collins Rd. NE
Cedar Rapids, IA 52402
(800) 223-6925—direct sales
(800) 369-5000—dealer sales
\$49

Virusaft 4.02

Requirements: DOS 3.0 or higher, 512K. Compatible with Windows and DESQView.

Spectrum of viruses: Recognizes over 260 known viruses, removes over 160. Updated regularly.

Defense: Memory-resident program seeks, identifies, and removes known viruses in programs. Also checks programs for virus-related changes and guards against new virus attacks.

Network support: Yes. A special feature notifies users of virus in any part of the network.

Customer support: Telephone and fax.

Comments: Site licenses are available for Virusaft. Multisafe, which gives the user control over who uses the computer, is also available for \$180.

XTREE

4330 Sante Fe Rd.
San Luis Obispo, CA 93401
(805) 541-0604
\$99

VRUSCAN

Requirements: DOS 2.0 or higher, 256K.

Spectrum of viruses: Detects 760 viruses as of June 20, 1991.

Defense: Stand-alone program scans all drives for known viruses. It identifies and locates the virus on the system.

Network support: *NETSCAN* is the network file-server version of *VIRUSCAN*. It checks the file server only, while individual stations require *VIRUSCAN*. Its price depends upon the number of units using this program.

Customer support: Telephone.

Comments: *VIRUSCAN* is shareware.

MCAFFEE ASSOCIATES
4423 Cheeney St.
Santa Clara, CA 95054-0253
(408) 988-3832
\$25

Virus Checker

Requirements: IBM PC or compatible.
Spectrum of viruses: Approximately one-third of all viruses.

Defense: Stand-alone program checks disks to see if they have been infected. If it finds a virus, it will alert the user of the infection. It can only detect viruses in EXE files.

Network support: No.

Customer support: Telephone and mail.

Comments: This is a freeware program that can be backed up with *Super Virus Checker* for \$25. *Super Virus Checker* uses six programs that more thoroughly detect or remove 99 percent of known viruses.

LEITHAUSER RESEARCH
4649 Van Kleeck Dr.
New Smyrna Beach, FL 32169
(904) 423-0705
Free

VirusCure Plus

Requirements: DOS 2.1 or higher, 256K.

Spectrum of viruses: Detects more than 500 viruses and removes more than 240.

Defense: Memory-resident program scans memory and prevents viruses from entering the system. If a virus is detected, the program will destroy it before it infects any files. It also repairs and restores damaged files.

Network support: Yes.

Customer support: Telephone, BBS, 24-hour Virus Helpline. Registered users may have free upgrades for two years after purchase. Afterwards, users can buy four upgrades for \$30.

Comments: Site licenses available.

INTERNATIONAL MICROCOMPUTER SOFTWARE
1938 Fourth St.
San Rafael, CA 94901
(800) 833-4674
\$99.95

Virus Prevention Plus

Requirements: DOS 3.1 or higher, 512K.

Spectrum of viruses: Detects more than 400 viruses.

Defense: Stand-alone program prevents unauthorized use of the PC, "fingerprints" all approved programs to tell if program has changed, prevents unapproved programs from running, prevents writing to the boot and partition sectors, detects viruses, scans new and existing programs, and removes viruses.

Network support: Yes.

Customer support: One hour of free telephone support, upgrades for six months after purchase.

Comments: This program uses McAfee Associates' *VIRUSCAN* for detection of viruses. It can also be used with McAfee's *NETSCAN*.

PC GUARDIAN
118 Alto St.
San Rafael, CA 94901
(800) 288-8126
(415) 459-0190—inside CA
\$124.95 (With *VIRUSCAN*, add \$25.00.)

VIRUS-PRO

Requirements: 512K.

Spectrum of viruses: Not applicable.

Defense: Stand-alone program detects any changes to installed software. It also maintains records and checks new scan files against old scan files.

Network support: Yes.

Customer support: Telephone.

Comments: *Corporate VIRUS-PRO* assigns an identifier to each PC and also has a Baseline to compare software with the corporate standard.

INTERNATIONAL SECURITY TECHNOLOGY
515 Madison Ave., Ste. 3200
New York, NY 10022
(212) 288-3101
\$49.95 per copy, single-PC version. Volume discounts available. *Corporate VIRUS-PRO* costs between \$5 and \$15 per PC depending on the number of PCs using the program.

Virus Secure

Requirements: DOS 3.0 or higher, *Windows* 3.0, 1MB.

Spectrum of viruses: Guards against more than 300 varieties of known computer viruses as well as unknown ones, expandable to over 500 through free BBS.

Defense: Stand-alone program scans every file, selected file types, specific directories, or any combination for changes in files. Drives may be included or excluded from disk scans.

Network support: No.

Customer support: Telephone and BBS support. Updates will be available through data information networks, as well as other more traditional means.

Comments: Site licensing available.

ABACUS
5370 52nd St. SE
Grand Rapids, MI 49512
(616) 698-0330
\$95

Virus Stopper 2.01

Requirements: IBM PC or compatible.
Spectrum of viruses: 99 percent of all viruses.

Defense: Memory-resident program helps prevent the spread of viruses from one disk to another. The program also prevents any damage to the system by displaying a warning to the user so that action can be taken.

Network support: No.

Customer support: Telephone and mail.

Comments: This is a shareware program.

LEITHAUSER RESEARCH
4649 Van Kleeck Dr.
New Smyrna Beach, FL 32169
(904) 423-0705
\$10

Vi-Spy 6.0

Requirements: DOS 2.0 to 4.0, 128K.
Spectrum of viruses: Identifies 20 known viruses.

Defense: Memory-resident program checks for known and unknown viruses by showing a map of the system's memory and checking each area for any differences that could be viruses. It also checks disks when they are first entered into the drive.

Network support: Yes.

Customer support: Telephone. Registered users are notified of any updated information; emergency support is available using an ASCII text file.

Comments: Site licenses available. Version 7.0 will soon be available, but the price was not known at press time.

RG SOFTWARE SYSTEMS
6900 E. Camelback Rd., Ste. 630
Scottsdale, AZ 85251
(602) 423-8000
\$250

VSHIELD

Requirements: IBM PC or compatible, DOS 2.0 or higher, 256K.

Spectrum of viruses: Protects against 760 viruses as of June 20, 1991.

Defense: Memory-resident program scans for known viruses and then monitors all program load requests.

**JUST
REDUCED!**

**More than
50% off!**

Mapping the IBM PC

by Russ Davies

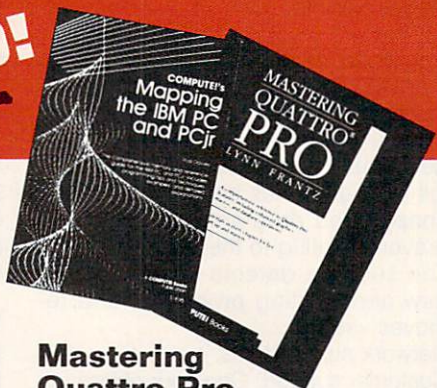
ISBN 0-942386-92-2

~~\$18.95~~ **\$9.00**

A comprehensive memory and reference guide for the IBM PC, this programmer's handbook includes programming tips and techniques, examples, and detailed explanations. In addition to comprehensive memory and port maps, the book provides in-depth discussions of the keyboard, video, and sound; cross-references the IBM documentation; and includes a complete list of BASIC tokens. For IBM PC, XT, XT/370, PCjr, Portable PC, or 3270PC. 336pp

Order your copy today. Send the appropriate amount plus \$2 for shipping and handling for each book (\$4 to Canada, \$6 foreign) and applicable sales tax (if you live in NC, NJ, or NY) or GIS tax (if you live in Canada) to **COMPUTE Books, c/o CCC, 2500 McClellan Avenue, Pennsauken, NJ 08109.**

Please allow 4-6 weeks for delivery. Offer good while supplies last.



Mastering Quattro Pro

by Lynn Frantz

ISBN 0-87455-222-2

~~\$24.95~~ **\$12.00**

Explore *Quattro Pro*'s numerous features in this comprehensive guide that's perfect for both new and experienced users. In this interactive tutorial, you'll learn how to design, create, and get the most from your own spreadsheets. This reference and guidebook will help you master the power of Borland's *Quattro*. 544pp

VSHIELD prevents infected programs from being loaded and infecting the system.

Network support: It does support workstations, but not file servers.

Customer support: Telephone.

Comments: This is a shareware program.

MCAFFEE ASSOCIATES

4423 Cheeney St.

Santa Clara, CA 95054-0253

(408) 988-3832

\$25

WATCHDOG PC Data Security

Requirements: IBM PC, PS/2, or compatibles with a hard disk drive and one floppy disk drive. DOS 2.1 or higher or IBM OS/2 1.1 Standard and 1.1 Extended required. Also compatible with *Windows 3.0*; 17K required for Basic Security; 0K to 50K required for Maximum Security depending on EMS memory available.

Spectrum of viruses: Detects, thwarts, and reports common computer viruses.

Defense: The program (device driver in CONFIG.SYS) prevents a virus from altering or destroying any DOS system file, including the files used to boot the PC from the hard disk and the files used to operate the PC. Protects disk drives, directories, program and data files, and utilities by placing them within the security environment.

Network support: Yes.

Customer support: Toll-free telephone support. One major upgrade per year with other upgrades released when necessary. Upgrades are free with membership (\$35 per year) in the maintenance program. Otherwise, upgrades are \$50 each.

Comments: Site licensing available. (Virus protection is one part of overall security software that features ID and password control, multiple user permission levels, automatic file encryption, and audit trails.)

FISCHER INTERNATIONAL SYSTEMS

4073 Merchantile Ave.

Naples, FL 33942

(800) 237-4510

\$295 (Standard retail; 1/2 card option, called WATCHDOG Armor, \$445.)

Chantelle Oligschlaeger and Erin Richter worked with *COMPUTE* this past summer as participants in the American Society of Magazine Editors 1991 Magazine Internship Program. Chantelle is a rising senior at the University of Missouri in Columbia. Erin was recently graduated from the University of Texas in Austin. The entire staff wishes them the best of luck. □



"Your computer will see you now . . ."

INTRODOS

Tony Roberts

KEYBOARD RESHUFFLE

How would you like to have your own set of DOS function keys? Using the ANSI.SYS device driver, which extends the keyboard and screen functions of DOS, you can establish your own personal set of keyboard macros.

If ANSI.SYS, which is part of the DOS package, isn't installed on your system, add the line `DEVICE=ANSI.SYS` to your `CONFIG.SYS` startup file. (If `ANSI.SYS` is stored in a directory other than your root directory, be sure to include the complete path so DOS can locate the file.)

`ANSI.SYS` allows you to redefine keys through ANSI escape sequences. The general format for an escape sequence is the combination of the Escape character (ASCII 27), the Left Bracket character ([), one or more decimal numbers or strings separated by semicolons, and a Command character.

To create an escape sequence for key redefinition, load the word processor or text editor you use to modify your `AUTOEXEC.BAT` and `CONFIG.SYS` files. Make certain your editor can save unformatted ASCII files or text files.

These commands can't be entered directly from DOS because the commands must contain the Escape character. As you may know, pressing the Esc key in DOS clears the command line—not the effect we're trying to achieve.

Enter the lines below, substituting the Escape character for the letters `ESC` at the beginning of each line. (In many word processors, you can simply press the Esc key to generate the Escape character.)

```
ESC[0;67;"DIR A:"P
ESC[0;68;"DIR A:"13P
```

The numbers 0;67 and 0;68 are the extended character codes for the F9 and F10 keys respectively. The first of the two lines above assigns the string `DIR A:` to the F9 key. The second line adds a carriage return (ASCII 13) to the same command and assigns the string to F10.

Save the file under the name `KEYS.ANS`; then go to DOS and execute the command `TYPE KEYS.ANS` to install the new key definitions. Press the F9 and F10 keys to see how the two versions of the command behave.

Using this procedure, you can assign strings to function keys to run favorite programs with a single keystroke or to simplify data entry chores.

For example, if you're entering name and address information into a label program and you're working on a local list where nearly everyone lives in your hometown, you can save time by putting the string `HOMETOWN, STATE ZIP` on a function key.

Here in Greensboro, North Carolina, we have several ZIP codes, but they all begin with 274. I define my function keys to include `GREENSBORO, NC 274`. I simply press the assigned key, enter the last two digits of the ZIP code, and quickly move to the next record.

There are a few things to keep in mind when using ANSI key redefinitions. First, you can't redefine too many keys. The `ANSI.SYS` driver only allows about 200 characters of redefinitions.

Second, many programs redefine the function keys for their own purposes. When you use those programs, your key definitions will be suspended until you return to DOS.

Third, DOS itself uses a few of the function keys. You're free to redefine them, but you'll overwrite the DOS defaults.

DOS uses keys F1–F6 as command line editing keys.

Lastly, the keys are redefined using your environment space. Make sure you have enough allocated in your `CONFIG.SYS` file. Here's a line from a `CONFIG.SYS` file that gives the environment 512 bytes.

```
SHELL=COMMAND.COM /P/E:512
```

Redefined keys stay in force until you change them or reboot. If you develop a set of redefinitions that you use regularly, you may want to place them in your `AUTOEXEC.BAT` file, so they take effect each time you boot up.

To do this, either have your `AUTOEXEC.BAT` execute the command `TYPE keyfile`, where *keyfile* is the name of the file that stores your redefinitions, or add the `ECHO` command to each of your key redefinitions and include the redefinitions right in the `AUTOEXEC.BAT` file.

For example, `ECHO ESC[0;66;"CHKDSK";13P` reprograms the F8 key to run the `CHKDSK` program on the default disk.

If you're ready to begin setting up your own personal macros, you'll need the extended character codes for the function keys. They are 0;59–0;68 for F1–F10, 0;84–0;93 for Shift-F1–Shift-F10, 0;94–0;103 for Ctrl-F1–Ctrl-F10, and 0;104–0;113 for Alt-F1–Alt-F10.

The 0 that precedes each of these code numbers tells `ANSI.SYS` that the following value is an extended character code. If you leave off the 0, `ANSI.SYS` treats the number you supply as an ASCII value.

You could, if you wanted, redefine the lowercase *a* (ASCII 97) to be an uppercase *A* (ASCII 65) with the command `ESC[97;65P`. To return a changed key back to normal, assign it to itself as in `ESC[97;97P`. □

Create your own set of keyboard macros with a DOS program that you already have.

PROGRAMMING POWER

Tom Campbell

ASSEMBLY MEANS SPEED

This issue's program is a good example of both the benefits and the perils of programming in assembly. It's tiny, but its 100 lines would only require 10 or 12 lines in a higher-level language.

FMFD.COM is a utility that does nothing more than send a form feed to the specified printer. Some text editors and other text-processing tools (such as DOS's COPY command with LPT as the destination) don't offer the courtesy of forcing a page break when a partial page of text is printed. While it's true that you can reach over and push the form feed button on your printer, you may need to perform this operation from a batch file.

The syntax of FMFD is FMFD *port*, where *port* is an optional parallel port number from 1 to 4. If you omit the number, port 1 is assumed. Here are some examples: FMFD, FMFD 1, FMFD 3. The first two examples send a page break to LPT1. The third example sends it to LPT3. If you use a serial port for your printer, you're out of luck.

The first section of FMFD.ASM consists of equates. Like the #define in C, they serve as a single-object text-replacement facility. Assemblers make a secret first pass at your code so they can collect equates and macros (we'll get to macros shortly); then they expand them into a temporary file, which is actually the file that gets assembled. In MASM and TASM, the /L option creates a file with an LST extension exposing the inner workings of macros and equates. The line FormFeed EQU 12 means that we can later use FormFeed instead of a literal form feed character (which would corrupt the

source file) or the number 12 and that the assembler will replace it with 12 internally. You can also use the equal sign for equates.

The PrintMsg macro looks like a subroutine, but it isn't. Macros, like equates, work via text replacement, but they allow parameters and aren't restricted to a single line. So instead of *PrintMsg BadChar*, the assembler will see, on its second pass, this code:

```
mov dx, es
mov ds, dx
mov dx, offset BadChar
mov ah, 9
int 21h
```

The .Model directive, pioneered by Microsoft in MASM 5, is new to assemblers. Its purpose is to make multilanguage programming easier by automatically supplying different default values for procedure calls and data (near versus far in both cases).

No doubt Microsoft's own programmers got tired of writing similar but not identical runtime libraries for all their languages. Ironically, the Tiny model won't work with MASM 5.1, but it will work with 6.0 and *QuickAssembler*, the one you're more likely to own. Many of *QuickAssembler*'s features couldn't be found in 5.1 but were debuting in 6.0. Tiny will work fine with Borland's *Turbo Assembler*.

The .Code directive means executable code will follow. You can alternate several .Code, .Data, and .Stack directives in each file, but few do. It's considered good form to collect each element into one location. The .Code directive stands in for the more archaic _TEXT SEGMENT WORD PUBLIC 'CODE'.

It's said that .Code is a simplified segment directive because of this, and that's absolutely true. The old way was

more flexible but is virtually never needed now, except perhaps for writing device drivers. The old segment directives are barbaric and unreadable, and you should be ashamed to use them.

ORG 100h forces execution to start at address 100 hex, or 256 decimal. All COM files do this. While Microsoft tried to prohibit the practice some years ago, even to the point of dropping COM support from every single one of its language products, popular sentiment was overwhelmingly for COM files. The EXE format lets DOS move the program anywhere it needs to (EXE files, in fact, are not completely linked until just before execution starts), but COM files are always at least 512 bytes smaller. This matters if you're using a laptop or a RAM disk. Plus, there's a vast body of source code for COM files free for the asking.

At this point, not a single line of executable code has appeared. That will change. About half of FMFD's 102 bytes are used in parsing the text of the command line, which is located at offset 81h in the PSP. The PSP, or Program Segment Prefix, is a data structure that DOS loads right before your program and which contains lots of useful values. It so happens that in a COM file the segment registers all point to the PSP, so all we have to do to point DS:SI at the command line is write the value 81h to SI.

The LODSB instruction is a nifty little dude that does several things at once. It copies the byte pointed to by DS:SI into AL; then it increments SI to point to the next byte. (The STD instruction can be used to bump SI backward instead.) The command line is terminated by a carriage return (ASCII 13—see the equates), so we simply loop

When speed is essential, assembly language is your ticket for a ride on the lightning bolt express.

until a nonblank character or CR is encountered. Lines like this aren't all that hard to comprehend.

cmp al, CR ; Reached end yet? je @@Finished ; Yes.

The value contained in AL is compared to 13. If they're equal, control passes (via jump if equal) to the code labeled @@Finished. Note that Turbo Assembler treats any labels starting with two @ signs as local to that procedure, so you can reuse generic labels like @@TryNext or @@Exit as often as you want.

CX was set to 0 before starting and is set to 1 if a valid digit is found. If not, CX is still 0, and the default value of 1 is inserted. INT 17h, subfunction 0 writes a byte to the specified printer port whose number is written to DX. Port 1 is 0, Port 2 is 1, and so on. The instruction SUB AL, '1' normalizes the ASCII digit by subtracting the value 49 from whatever's in AL, leaving the correct binary value.

While I would normally suggest that you use DOS to open the printer as a file and write to it, using INT 17h has the welcome side effect of omitting nasty messages such as *Abort, Retry, Fail?* if the printer device isn't connected properly or is otherwise engaged. It just waits awhile and then quits. There are times when having only a hundred lines is a virtue!

Finally, instead of the usual RET instruction, the more formal technique of exiting with DOS function 21h, subfunction 4Ch is employed. A RET works in COM files but not EXE files, so I avoid it. While it would save a couple of bytes, FMFD.COM still won't occupy even the smallest possible disk sector. After all, this isn't C or Pascal. We can afford the extra two bytes. □

```
; FMFD.ASM -- Complete program to send a form feed to any printer
;
; To assemble using Turbo Assembler:
;
; TASM FMFD
; TLINK /T FMFD
;
; Equates -- these are text replacements, similar to #defines in C.
CR EQU 13 ; ASCII carriage return.
FormFeed EQU 12 ; ASCII form feed character.
LF EQU 10 ; ASCII linefeed.
Tab EQU 9 ; ASCII tab.

PrintMsg macro Message ; A macro, like an equate, is a
mov dx, es ; text-replacement facility.
mov ds, dx ; This loads the correct data
mov dx, offset Message ; segment and uses DOS function
mov ah, 9 ; 9 to print a '$'-terminated
int 21h ; message.
endm

; The Tiny model allows you to create .COM files. It's identical to
; Small model except that 1) Small requires a .Stack directive, and
; 2) Tiny employs the ORG 100h to start execution at address 256 decimal,
; not changeable as in an .EXE file.

.Model Tiny

; The .Code directive indicates that the code segment starts. It lasts
; until the next .Data or .Stack directive. The code segment is where
; executable instructions go.

.Code

; .COM files start at a fixed location--256 bytes above the PSP, which
; contains information used by many programs. The starting address of an
; .EXE file is not known until runtime. ORG sets the program counter to
; 100 hex, or 256 decimal.

ORG 100h

Begin: ; Leave this in as boilerplate.

Main proc ; A PROC is exactly analogous to
; a PROCEDURE in Pascal or BASIC.

mov si, 81h ; Start at cmd line. Add 1 to
; skip the length byte.
mov cx, 0 ; 0 until a digit is found.

GetNextChar:
; LODSB fetches the next char pointed to by DS:SI into
; AL and then increments SI.
lodsb ; Copy next char into AL.
cmp al, CR ; Reached end yet?
je @@Finished ; Yes.
cmp al, ' ' ; Blank?
je GetNextChar ; Yes. Keep parsing.
cmp al, Tab ; Blank?
je GetNextChar ; Yes.
cmp al, '1' ; Nonblank char. Is
; it in range '1'-'4'?
jl @@BadChar ; LPT4 is the farthest
cmp al, '4' ; I've ever seen.
jg @@BadChar ; Flag that a digit was found.
mov cx, 1

@@Finished:
cmp cx, 0 ; Was a digit found?
jne @@Convert ; Yes. Do nothing.
mov ax, '1' ; No. Default to LPT1.

@@Convert:
sub al, '1' ; Convert to binary and subtract 1.
cbw ; Convert AL to a word in AX.
mov dx, ax ; Copy to DX for int 17h call.
mov ah, 0 ; BIOS int 17h function 0: Write char
mov al, FormFeed ; to printer. Char is in AL.
int 17h ; Send char to printer.

@@DOSExit:
mov al, 0 ; Set ERRORLEVEL to 0.
mov ah, 4Ch ; Return to DOS using
int 21h ; the preferred function call.
endp

@@BadChar:
PrintMsg BadChar ; Load the message's offset address,
jmp short @@DOSExit ; display it to stdout, and quit.

; The .Data directive is where program text and other data values
; appear. The 'db' directive means that everything that follows will
; be written unchanged to the data segment. Messages like the one
; below can use either single or double quotes as delimiters. The values
; CR and LF were defined above, and their literal values will be written
; in as ASCII codes. Don't forget the '$' sign, because DOS function 9
; needs it to end any message it prints.

.Data
BadChar db 'Invalid character. Must be 1-4.', CR, LF, '$'
END Begin
```

Learn to troubleshoot and service today's computer systems as you build a 386sx/20 MHz mini tower computer!

Train the NRI way—and learn to service today's computers as you build your own 386sx computer system, now with 1 meg RAM, 40 meg IDE hard drive, and exciting new diagnostic hardware and software!

Jobs for computer service technicians will almost double in the next 10 years according to Department of Labor statistics, making computer service one of the top growth fields in the nation.

Now you can cash in on this exciting opportunity—either as a full-time industry technician or in a money-making computer service business of your own—once you've mastered electronics and computers the NRI way.

NRI's practical combination of "reason-why" theory and hands-on building skills starts you with the fundamentals of electronics, then guides you through more sophisticated circuitry all the way up to the latest advances in computer technology.

Train with and keep a powerful 386sx/20 MHz computer system plus popular Microsoft® Works software!

Only NRI gives you hands-on training with the finest example of state-of-the-art technology: the powerful new West Coast 386sx/20 MHz mini tower computer. As you assemble this 1 meg RAM, 32-bit CPU computer from the keyboard up, you actually see for yourself how each section of your computer works.

You assemble and test your computer's "intelligent" keyboard, install the power supply and 1.2 meg, high-density floppy disk drive, then interface the high-resolution monitor.

Your hands-on training continues as you install a powerful new 40 meg IDE hard disk drive—now included in your course to dramatically increase the data storage capacity of your computer while giving you lightning-quick data access.

NEW!
386sx/20 MHz
Mini Tower
Computer

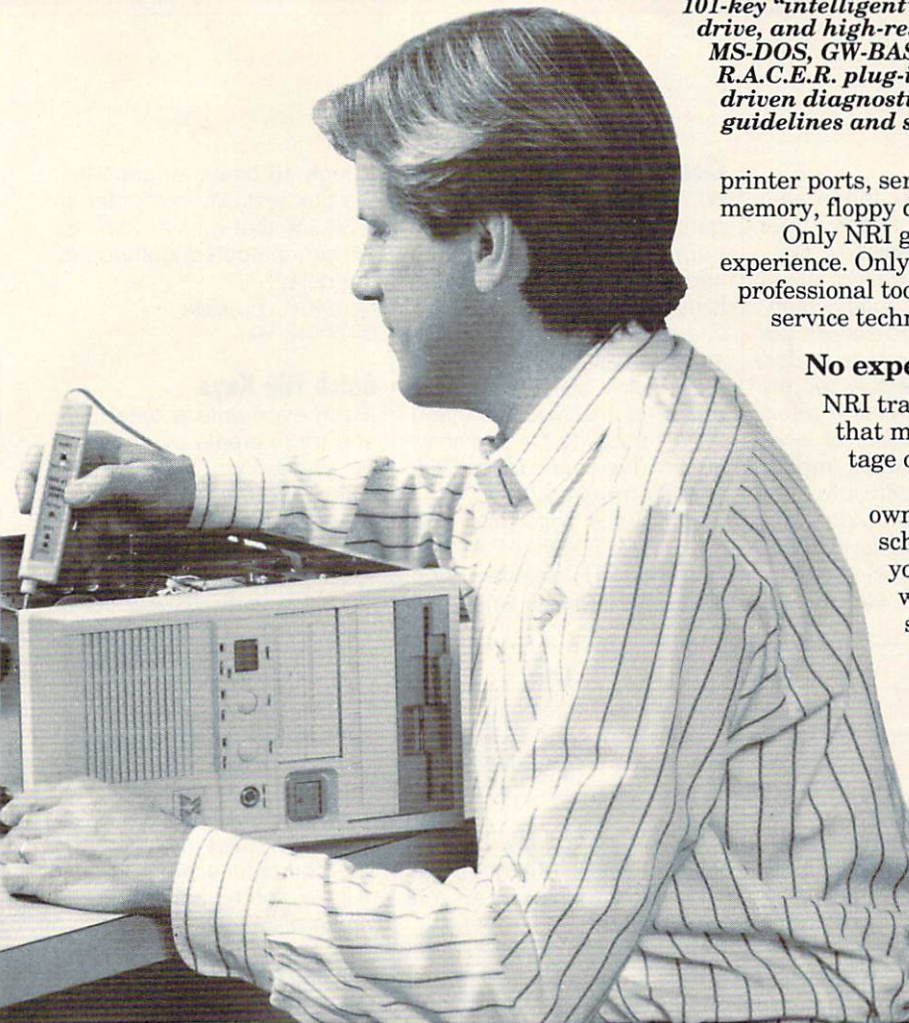


Plus you now go on to work with today's most popular integrated software package, Microsoft Works, learning to use its word processing, spreadsheet, database, and communications utilities for your own personal and professional applications. But that's not all.



Only NRI gives you hands-on training with the remarkable R.A.C.E.R. plug-in diagnostic card and QuickTech diagnostic software from Ultra-X—professional, state-of-the-art diagnostic tools that make computer troubleshooting fast and accurate.

Your NRI computer training includes all this: • NRI's unique *Discovery Lab*® for circuit design and testing • Hand-held digital multimeter with "talk-you-through" instructions on audio cassette • Digital logic probe that lets you visually examine computer circuits • The new West Coast 386sx/20 MHz computer system, featuring a high-speed 80386sx CPU, 1 meg RAM, 101-key "intelligent" keyboard, 1.2 meg high-density floppy drive, and high-resolution monitor • 40 meg IDE hard drive • MS-DOS, GW-BASIC, and Microsoft Works software • R.A.C.E.R. plug-in diagnostic card and QuickTech menu-driven diagnostic software • Reference manuals with guidelines and schematics



printer ports, serial communications ports, video display memory, floppy drives, and hard disk drives.

Only NRI gives you such confidence-building, real-world experience. Only NRI gives you both the knowledge and the professional tools to succeed as today's in-demand computer service technician.

No experience needed ... NRI builds it in

NRI training gives you practical, hands-on experience that makes you uniquely prepared to take advantage of today's opportunities in computer service.

You learn at your own convenience in your own home. No classroom pressures, no night school, no need to quit your present job until you're ready to make your move. NRI starts you with the basics, building on that foundation step by step until you have the knowledge and skills you need for success.

And all throughout your training you've got the full support of your personal NRI instructor and the entire NRI technical staff, always ready to answer your questions and help you achieve your training goals.

FREE catalog tells more. Send today!

Send today for NRI's big, free catalog that describes every aspect of NRI's innovative computer training, as well as hands-on training in other growing high-tech career fields.

If the coupon is missing, write to:
NRI School of Electronics, McGraw-Hill

Continuing Education Center, 4401 Connecticut Avenue, NW, Washington, DC 20008.

NOW! Training now includes Ultra-X diagnostic hardware and software for quick, accurate troubleshooting!

Now you train with and keep the latest in diagnostic hardware and software: the extraordinary R.A.C.E.R. plug-in diagnostic card and QuickTech diagnostic software, both from Ultra-X. Using these state-of-the-art tools, you learn to quickly identify and service virtually any computer problem on XT, AT 80286/80386, and compatible machines.

You discover how to use the R.A.C.E.R. diagnostic card to identify individual defective RAM chips, locate interfacing problems, and pinpoint defective support chips. Plus you learn to use your QuickTech diagnostic software to test the system RAM and such peripheral adapters as parallel



IBM is a registered trademark of International Business Machines Corp. R.A.C.E.R. and QuickTech are registered trademarks of Ultra-X, Inc.

SEND TODAY FOR FREE CATALOG

NRI Schools

McGraw-Hill Continuing Education Center
4401 Connecticut Avenue, NW
Washington, DC 20008



For career courses approved under GI Bill

check for details.

Check one FREE catalog only

MICROCOMPUTER SERVICING

- TV/Video/Audio Servicing
- Telecommunications
- Industrial Electronics
- Security Electronics
- Electronic Music Technology
- Basic Electronics
- Automotive Servicing

- Computer Programming
- PC Software Engineering Using C
- Desktop Publishing
- Word Processing Home Business
- Paralegal
- Building Construction
- Bookkeeping & Accounting

Name _____ (please print) _____ Age _____

Address _____

City/State/Zip _____ Accredited Member, National Home Study Council _____ 198-101

TIPS & TOOLS

Filed Floppies

Here's a tip for those who have so many floppy disks they can't find anything fast.

Begin by labeling all of your disks and putting numbers on them. Be sure to put the disks in a box in order, where you can easily see the numbers. Then, create a text file with a text editor or word processor in ASCII mode. Make a chart with the disk number, filename, description, and other useful information. Make sure that you don't use any capital letters (or if

Closer Paths

When programs are in your path, it's easy to run them from any directory on your hard drive. But if your path is fairly long and each included directory has a lot of files, you might have a long wait for DOS to find the program. For programs that you run often, there's a way to cut to a small fraction the time it takes DOS to find programs.

Run a text editor and load in your AUTOEXEC.BAT file. Find the PATH statement and notice the order in which the

It took 16 times longer than the first test. My computer is a 386DX that runs at 25MHz. Slower computers compound the delay.

RICHARD C. LEINECKER
REIDSVILLE, NC

Batch File Keys

If you ever write a batch file and try to create even a simple menu, you'll be stuck, since you can't get a keypress from the user and then jump to the appropriate section in the batch file. Here's a way to create a COM file that will wait for a keypress and return it to your batch file as an ERRORLEVEL. The code that is returned is the ASCII code for the key that is pressed.

Make sure that the DOS program called DEBUG is in your path. Enter the following. The computer's prompts are in italic; you type the characters in plain text.

```
C>DEBUG GETKEY.COM
File not found
-E 100 2A E4 CD 16 B4 4C
  CD 21
-RCX
CX 0000
:8
-W
writing 0008 bytes
-Q
```

This creates a program file called GETKEY.COM.

The following program returns all alpha characters in capitalized form.

```
C>DEBUG ALLCAPS.COM
File not found
-E 100 2A E4 CD 16 3C 61
  72 06 3C 7A 77
  02 24 DF B4
-E 110 CD 21
-RCX
CX 0000
:8
-W
writing 0011 bytes
-Q
```

Keep track of floppies, speed up DOS, capture keypresses in batch files, conserve your handles, and operate QuickBASIC rodent-free.

#	Name	Description	Type
1	pkzip.exe	archiving utility	program
2	chapter 1.doc	the first chapter of my book	text document
3	cheeta.gif	gif picture of a cheetah	gif picture

you do, make sure that you enter the search string exactly as it appears in the text file). I've written a sample that I named LIST.TXT.

Next, create a batch file as follows (I call it F.BAT, but you can call it anything you want). Make sure the batch file and the DOS FIND program are both in your path or in the current directory. The F.BAT file will only have one line and look like this.

FIND "%1" LIST.TXT

You can name your text file anything you want. Just make sure you change the string LIST.TXT to match whatever your filename will be.

To find a program, type *F chapter1.doc*, and you'll see the line on which the entry appears. It makes finding floppies easy, and you don't have to run a database program to do it. As long as the batch file and FIND are in the path, you can do a search from any directory.

ROY RAZON
MEITAR, ISRAEL

specified directories appear. DOS will search them in that order to find files that you type from the command line. Directories that contain programs that are used often should be first. That way, DOS will find them right away instead of searching most of the other directories first.

How much time can you save? I wrote a COM program that was three bytes long to reduce the loading time. I then disabled my cache program so I could accurately time disk operations. Next, a batch file was created that ran the small program 50 times (making sure ECHO was off so that screen I/O wasn't a factor, either.)

For the first test I placed the small program in my DOS directory, made the DOS directory the first one in my PATH statement, and rebooted. The batch file ran in about four seconds. I then made the DOS directory the very last entry in my PATH statement and rebooted. The elapsed time for the batch file execution was one minute and four seconds.

Here's a sample batch file that uses the GETKEY.COM program.

```
ECHO OFF
:BEGIN
CLS
ECHO 1.Run QuickBASIC
ECHO 2.Run XyWrite
ECHO 3.Run Windows
ECHO 4.Quit Batch File
:GETTHEKEY
GETKEY
IF ERRORLEVEL 52 GOTO END
IF ERRORLEVEL 51 GOTO
WINDOWS
IF ERRORLEVEL 50 GOTO
XYWRITE
IF ERRORLEVEL 49 GOTO
BASIC
GOTO GETTHEKEY
:BASIC
QB45
GOTO BEGIN
:XYWRITE
EDITOR
GOTO BEGIN
:WINDOWS
WIN
GOTO BEGIN
:END
CLS
```

RICHARD C. LEINECKER
REIDSVILLE, NC

WordPerfect Paging

In many programs, pressing PageUp or PageDown will move to the previous or next screen of data. In *WordPerfect* pressing those keys will literally move you to the previous or next page. This is especially frustrating when you want to go to the latter part of a page but don't want to scroll through the page line by line. I have found that pressing - or + on the numeric keypad with NumLock off will allow you to move through data screen by screen with the - key moving you to the previous screen and the + key moving you to the next screen.

JIMMY QUACH
PACIFICA, CA

More Efficient Paths

The search path I use is rather long, and it eats up a lot of environment space. Here's the PATH statement.

```
PATH=C:\BATCH;C:\UTILITY;
C:\DOS;C:\NORTON;
C:\WORDSTAR;C:\DBASE;
C:\GRAMMATIK;C:\
```

I save a considerable number of bytes by using the DOS SUBST command in my AUTOEXEC.BAT file. Here's what I've done.

```
\DOS\SUBST F: C:\BATCH
\DOS\SUBST G: C:\UTILITY
\DOS\SUBST H: C:\DOS
\DOS\SUBST I: C:\NORTON
\DOS\SUBST J: C:\WORDSTAR
\DOS\SUBST K: C:\DBASE
\DOS\SUBST L: C:\GRAMMATIK
```

Next, I define my path. D: is my secondary partition and I define E: as a virtual disk.

Add a line to your CONFIG.SYS file like this:

```
LASTDRIVE=x
```

where x is the last valid virtual drive to be recognized by DOS (in my case, L:).

ROBERT R. DWELLEY
ROCHESTER, NY

Tips for Tips

The PC Hot Tip in the January 1991 issue of *COMPUTE* to swap the contents of two files can be improved upon. Here's the example from the January issue.

```
ECHO OFF
CTTY NUL
COPY %1 TEMP.DOC
COPY %2 %1
COPY TEMP.DOC %1
DEL TEMP.DOC
CTTY CON
```

For some reason DOS uses two file handles to perform a CTTY NUL, yet it only frees

one for a CTTY CON. If the batch file above is run very many times, you could wind up with a Too Many Files Open error. Here's my solution to this rather vexing problem.

```
ECHO OFF
COPY %1 TMP.DOC>NUL
COPY %2 %1>NUL
COPY TEMP.DOC %1>NUL
DEL TEMP.DOC
```

BRIAN WREN
SEATTLE, WA

Mouseless QuickBASIC

Help screens. In *QuickBASIC* I discovered by accident that pressing the first letter of any hypertext link jumps the cursor to that topic. If several topics share a first letter, the cursor will cycle among them until you press Enter. And when looking at a QuickHelp or Details screen, Q and D toggle between those links.

Zoom. You can zoom any window using Ctrl-F10, which I often find more comfortable than clicking the zoom icon.

Opening files. Make short shrift of the Open dialog with Tab and the space bar. Press Tab to move to the file list and press the space bar to select a file. The space bar often works where Enter does in the *QuickBASIC* and *Windows* environments, especially for clicking push buttons.

TOM CAMPBELL
IRVINE, CA

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 and send you a COMPUTE's PC clock radio while supplies last. □

HARDWARE CLINIC

Mark Minasi

TAKING A HARD DRIVE THROUGH ALPHABET SOUP

Growing out of your 40-mega-byte hard drive? You're in good company—plenty of us are looking to upgrade. Up above 80MB, however, there's more to worry about than how big it is.

Computer sellers refer to ESDI, SCSI, and IDE drive types. Some experts even debate the merits, fighting tooth and nail about which is better—ESDI versus SCSI. Here's what all the fuss is about and how to choose the hard drive that's right for you.

First things first: ESDI, SCSI, and IDE are all drive interfaces. No, wait—don't turn the page yet! Give me a minute. To understand what a drive interface is, consider this: You've got a hard drive, and it's attached (inside your computer, of course) to a circuit board called a hard disk controller.

How do they talk to each other? The hard drive and controller must agree on a language—how fast they should communicate with each other, what kind of commands they can pass back and forth, what level of voltage they should use to send information, and other odds and ends. Together, that's what defines the drive interface.

Old Reliable

Currently, you've probably got a drive and controller whose interface is the most common and basic one, called ST506. Having a nice reliable standard like ST506 has served the industry well for the past few years. Because all the hardware vendors understand ST506, you can buy a hard disk from vendor X, connect it to a hard disk con-

troller from vendor Y, and be 99-percent sure they'll work together the first time.

The ST506 interface is good because it's standard, but it's bad because it has limitations that are beginning to chafe. ST506 both limits the disk's data transfer speed and requires too much of the CPU's attention, rendering it less suitable for multitasking environments such as *Windows*.

ST506's maximum data transfer rate of 750,000 bytes per second (750 KBps) must have seemed plenty of room to its designers in the late 1970s.

Even now, most XTs read data from their disks at a maximum speed of 167 KBps, and most AT clones clock in at 250 KBps to 510 KBps. But there are drives available today that could zap out data at 2500 KBps, if their interfaces could handle it.

I know you're thinking, "Only power users need that kind of speed—I don't, not for the things I do." Well, consider this—your computer becomes hundreds of times slower every time it reads or writes to the hard disk. Even the slowest XT has to wait around for its hard disk.

A 16-MHz 386SX's microprocessor could, in theory, benefit from a hard disk that transfers data at a speed of up to 8000 KBps. You'd see an immediate benefit from a faster hard disk interface even if you're already running flat-out at 510 KBps; essentially, it would balance your system's power better.

Adding Some ESDI Smarts

ESDI (Enhanced Small Device Interface) was designed basically as an improved ST506. It's designed to handle a maximum transfer rate of 3000 KBps. It does this partly by moving some of the elec-

tronics from the controller to the drive; it costs a bit more but makes for greater speeds than are possible with an ST506.

The other big difference between ST506 and ESDI is in the basic intelligence in the interface. Under ST506, the microprocessor can't tell the hard disk controller to go to location X on the hard disk and start reading the data that's there.

Instead, the CPU must do most of the work, telling the drive (through the controller) exactly how to move the disk's read head to the location of the data: "Move the disk head a little more . . . now just a little more . . . now just a bit more . . ."

With ESDI, on the other hand, the CPU just says, "Go to location X and read the data there," and then the CPU waits for the controller to do it. It's the difference between being able to tell someone "Go to the living room" and having to say "Take one step forward, then another, and another, and another, then turn left, then . . ." You see ESDI on larger (300MB+) drives.

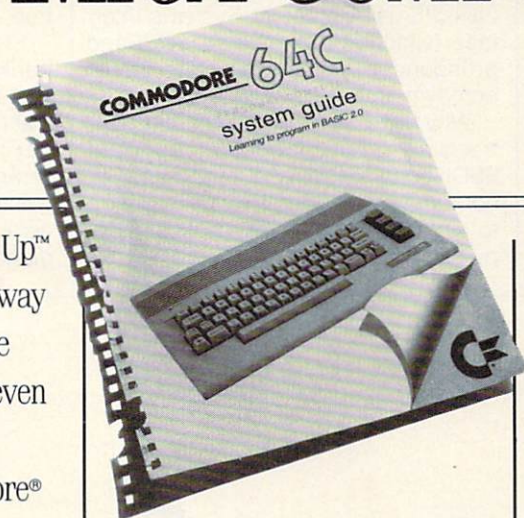
IDE: A Poor Man's ESDI

It's reasonable to ask, "Why didn't they put some of these nifty ESDI features on ST506 in the first place and save us a lot of trouble?" Mainly because those ESDI features would have cost an arm and a leg back in the late 1970s. But nowadays they're much more affordable. That's why most drive vendors are now offering a low-cost alternative to ST506 drives called IDE—Imbedded Drive Electronics (or Intelligent Drive Electronics, depending on whom you ask).

Like ESDI, IDE puts most of the controller electronics on the drive itself. The data

You've decided to buy a new hard drive. Which kind should you choose—ESDI, SCSI, or IDE?

YOUR COMMODORE OWNER'S MANUAL IS WORTH UP TO \$300 OFF AN AMIGA® COMPUTER.



The Commodore Power Up™ program is the easiest way to buy an already affordable Amiga® 500 computer for even less.

If you own a Commodore® 16, 64, or 128; or a Pet, Plus 4 or VIC 20, write the serial number on the cover of the original owner's manual (no photocopies) and take it to your authorized Commodore-Amiga dealer. You can save \$300 on an Amiga 500P (off the MSRP of \$799). And \$200 on an Amiga 500S (off the MSRP of \$599).

* With optional A520 RF modulator.
Subject to dealer participation. See authorized dealer for details.
Not valid with any other offer or special pricing program.
Offer ends 10/31/91. Commodore VIC 20, 64, 128, Plus 4 and
Pet are registered trademarks of Commodore Electronics Ltd.
Amiga 500 series is a registered trademark of
Commodore-Amiga, Inc.

The powerful Amiga 500S hooks up to your TV.* It has incredible graphics – with more than 4,000 colors. Built-in sound, word processing, and three exciting games.

The Amiga 500P includes

one MB of RAM, a word processor, a clock/calendar, paint and music programs, and a challenging graphics-oriented game.

And behind every Amiga is a 24-hour toll-free hotline. Plus a one-year limited warranty with free pick-up and delivery.

Graduating high school or current college students and educators can also qualify for this offer. See your authorized Commodore dealer for details before Oct. 31st, 1991. Or call 1-800-66-AMIGA.

THE AMIGA POWER UP PROGRAM



Commodore®
AMIGA®

is then pumped directly to the CPU at up to 1000 KBps—not as good as ESDI, but better than ST506.

Putting the controller and drive physically together makes IDEs easier to build, which is why IDEs are faster, cheaper, physically smaller, less power-hungry, and more reliable than corresponding ST506s.

There is, of course, one hitch. Many data recovery techniques that are available on ST506 systems can't be used on IDEs. In the words of the chief engineer of a major drive maker, IDEs are disposable. They're great drives, but if anything goes wrong, you throw them—and your data—away. I avoid them at the moment and would recommend that you do the same, but IDE manufacturers claim that they're working on models that are more fixable. When that happens, IDE will hound ST506 out of existence in short order.

SCSI Raises the Ante

While some designers were seeking greater speed (the main goal, recall, of ESDI), others were looking ahead to more sophisticated operating systems. They sought to design an interface that could serve more than just hard disks. This new interface could be used for tape drives, floppies, and optical drives of various kinds, to name but a few.

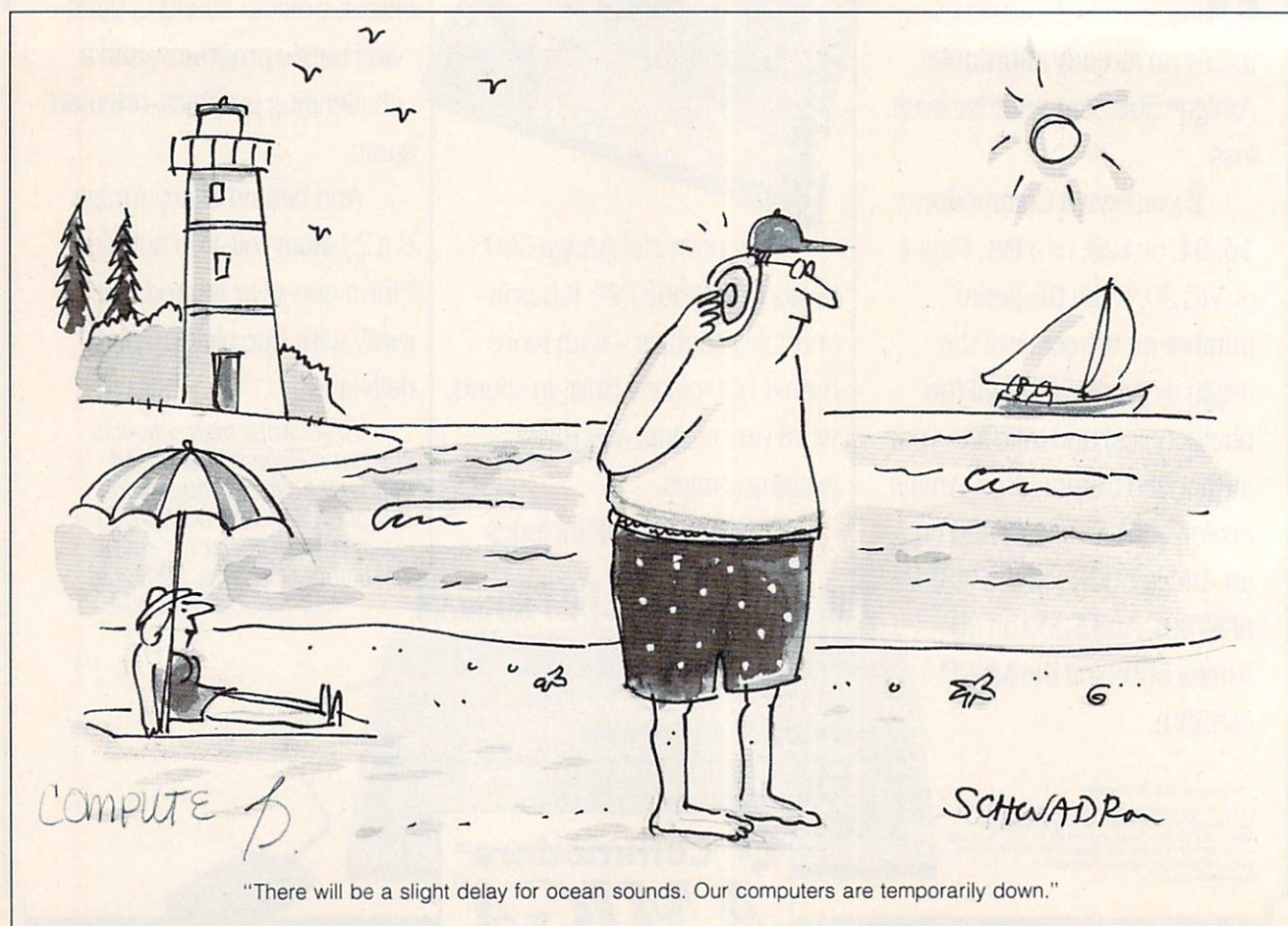
So computer manufacturers have developed another peripheral interface called Small Computer Systems Interface (which is abbreviated SCSI and pronounced *scuzzy*—an unfortunate acronym, if there ever was one).

Why have SCSI in addition to ESDI? It's simple: SCSI doesn't do what ESDI does. SCSI is a bus manager, not a drive manager. It lets you put up to eight different drives—optical, floppy, whatever—on a single SCSI host

adapter (you don't call them controllers, for reasons that will be clear later in this article).

That assumes, of course, that all of these drives are equipped with a SCSI interface, and it also assumes that SCSI is a solid standard. It actually isn't yet, so in reality your SCSI floppy, hard disk, and tape drives probably couldn't run off the same SCSI host adapter. Things are getting better, however, so in a year or two this scenario will be more likely to come true.

Suppose, then, that you wanted to back up your hard disk to tape and you had both a hard disk and tape that ran off the same SCSI interface. Under the normal ST506, IDE, or ESDI arrangement, the microprocessor would have to do a fair amount of work. It would have to issue commands to first read the data from the



DAMARKSM

INTERNATIONAL, INC.

THE "GREAT DEAL" CATALOG
1-800-729-9000
ORDER TODAY!

Bondwell **SUPERSLIM**
286 LAPTOP W/40MB HARD DRIVE

- 80286 microprocessor operating at 12MHz.
- Landmark speed test 16MHz.
- 1MB RAM expandable to 2MB. • 40MB Conner hard drive with super fast 1:1 interleave factor.
- 1.44MB 3.5" floppy disk drive. • 10.5" super twist nonglare LCD screen.
- Removable rechargeable NiCad battery pack.
- Zero wait state.
- 81 key keyboard.
- Real time calendar/clock with battery back-up.
- Built-in rechargeable battery.



- Two RS232 serial ports, Centronics parallel port.
- RGB video port.
- Included software: MS-DOS 3.3, GW-BASIC 3.22.
- Dim.: 13"W x 12.2"D x 2.2"H.
- Weight: 7.6 lbs.
- **One Year Limited Distributor's Warranty!**
- **Factory New!**

Mr. Sugg. Retail: **\$1,795.00**

DAMARK PRICE \$999⁹⁹

Item No. B-3528-168232 S/H \$19.00

Protex **386™ -SX 16MHZ**
COMPUTER WITH
40MB HARD DRIVE AND 14"
COLOR VGA MONITOR

- Intel 386-SX microprocessor, operating at 16 MHz with zero wait state.
- Selectable turbo/normal 8MHz/16MHz speeds.
- 40MB hard drive. • 1MB RAM. • 5 expansion sockets. • One 3.5" 1.44MB floppy disk drive & one 5.25" 1.2MB floppy disk drive.
- IBM compatible.
- 14" VGA color monitor, res: 640x480, .41mm dot pitch.
- 5 expansion sockets.
- 1 parallel and 2 serial ports.
- AT turbo baby case.
- Clock/calendar.



- 101-key keyboard.
- 16-bit VGA display adapter with 800x600 resolution.
- 80387 math co-processor slot.
- Includes DR-DOS 5.0, Spinnaker Eight-in-One software.
- U.L. listed.
- **One Year Mfr. Warranty!**
- **Factory New!**

Mr. Sugg. Retail: **\$3,469.00**

DAMARK PRICE \$999⁹⁹

Item No. B-3528-189036 S/H \$49.00

Bondwell **SUPERSLIM LAPTOP COMPUTER**

- 80C88 8MHz microprocessor.
- 640K RAM.
- IBM compatible.
- Two 720K 3.5" floppy disk drives.
- Slim size, 1.7".
- 10.5" super-twist nonglare LCD screen, resolution: 640x200.
- Wt.: 8 lbs.
- Removable rechargeable Ni-Cd battery pack.
- Centronics parallel and one RS232 serial port.
- One RGBI port.
- Includes DR-DOS.
- **One Year Distr. Warranty!**
- **Factory New!**



Mr. Sugg. Retail: **\$1,295.00**

DAMARK PRICE \$399⁹⁹

Item No. B-3528-175897 S/H \$19.00

Carrying Case:

DAMARK PRICE \$39⁹⁹

Item No. B-3528-175911 S/H \$4.00

Extra Battery:

DAMARK PRICE \$29⁹⁹

Item No. B-3528-175904 S/H \$4.00

TOSHIBA **EXPRESS WRITER 440 WIDE**
CARRIAGE 24-PIN PRINTER

- Letter quality 24-pin wide carriage dot matrix printer.
- IBM compatible.
- High speed printing: letter quality—80cps, draft—300cps.
- Paper handling: bi-directional push tractor, fanfold bypass with paper park, tear bar & single sheet guide.
- Graphics: 180x360 dpi.
- Emulations: IBM Proprinter XL24E and Epson LQ 1050.
- 28K buffer.
- Centronics Parallel interface.
- Fonts: Courier, Prestige



- Elite, High Speed Draft, 15 cpi Script & Helvet. Also accepts downloadable fonts on disk.
- Includes one snap-in black fabric ribbon cartridge and AC power cord.
- Dim.: 22.5"W x 5.1"H x 12.4"D.
- **1 Year Mfr. Warranty!**
- **Factory New!**

Mr. Sugg. Retail: **\$699.00**

DAMARK PRICE \$299⁹⁹

Item No. B-3528-188168 S/H \$19.00

KLH **386SX NOTEBOOK**
COMPUTER WITH 42MB
HARD DRIVE

- Intel 80386SX microprocessor operating at 16MHz.
- 42MB hard drive.
- 2MB RAM on motherboard, expandable to 4MB.
- 1.44MB 3.5" floppy disk drive, includes connector for external floppy disk drive. • VGA backlit screen, 256K video RAM card with 32 shades of gray, 640x480 resolution.
- Includes connector for external monitor.
- 2 serial ports, 1 parallel port. • 80-key tactile keyboard.
- Includes 2.25 hour replaceable, rechargeable battery and AC adapter.
- Includes MS-DOS 4.01.



- installed file transfer software, and cable for desktop PC. • Dim.: 11"W x 8.66"D x 2"H.
- Weight: 6.5 lbs. w/ battery. • Model #: 2800. • **6 Month On-Site Service Warranty and 6 Month Additional Depot Service.**
- **Factory New!**

Mr. Sugg. Retail: **\$4,789.00**

DAMARK PRICE \$1999⁹⁹

Item No. B-3528-183037 S/H \$12.50

SYMANTEC **NORTON UTILITIES**
VERSION 5.0

- *Disk Monitor* performs maintenance on computer hard drives.
- *File Fix* fixes Lotus 1-2-3 spreadsheets and databases.
- Recovers lost data with *Unerase* and *Unformat*.
- *Norton Disk Doctor II* Repairs damaged disks.
- *Diskreet* stores data in encrypted form, *WipeInfo* meets Pentagon's standards for data deletion ('90).
- *Norton Cache* accelerates software.
- *Speed Disk* effectively tunes disks for higher performance.
- *Calibrat* interleave optimizer.



- Compatible with networks. • Includes both 5-1/4" and 3-1/2" floppy diskettes.
- Requires: DOS 2.0 or higher, IBM PC, XT, AT, PS/2 and compatibles, 512K memory.
- **90 Day Manufacturer's Warranty!**
- **Factory New!**

Mr. Sugg. Retail: **\$179.00**

DAMARK PRICE \$49⁹⁹

Item No. B-3528-189337 S/H \$5.00



FOR FASTEST SERVICE CALL TOLL FREE

1-800-729-9000

CUSTOMER SERVICE: 1-800-733-9070

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

PHONE _____

Check/Money Order _____ Visa _____

MasterCard _____ Discover _____ CARD NO. _____

DELIVERY TO 48 U.S. CONTINENTAL STATES ONLY

Subtotal

In MN add 6.5% Sales Tax

Total S/H

GRAND TOTAL



EXP. DATE _____ SIGNATURE _____ **B-3528**

What Your Computer Was Really Meant For

Free Membership!

EXPANDING HORIZONS

There's a vast world of information and services out there. A world that's current, vital, and constantly updated. DELPHI, your complete online personal resource, brings that world a little closer. With your modem, you can join special interest groups, download software, meet new friends or tap into the world's most comprehensive databases to expand the horizons of your computer.

EXTENSIVE SERVICES

With a simple phone call from your home or office, you get the latest news from the major wire services, discounts on travel reservations, complete business and financial services, stock quotes, online shopping, sophisticated electronic mail, telex, fax, conferencing, interactive games, special interest groups and even a complete encyclopedia.

PARTICIPATE

Chat with other members and computer experts in Conference, and post or respond to messages in Forum. Win great prizes when you jump into a worldwide trivia tournament and play computer games!



WALLET-FRIENDLY

You can reach DELPHI with a local phone call from almost anywhere. There is NO premium for access at 1200 or 2400 bps, and standard connect rates are only \$6/hour. The basic fee of \$5.95 per month includes your first hour of usage. For even lower rates, join DELPHI's new 20/20 Advantage Plan and enjoy 20 hours of usage per month for only \$20!

FREE MEMBERSHIP

For a limited time you can join DELPHI for free!

NO RISK

With DELPHI there is no risk. If for any reason you aren't satisfied, cancel your membership and we'll refund your first monthly fee.



Join now online for FREE:

Dial 1-800-365-4636 (by modem)
At Username: enter JOINDELPHI
At Password: enter PC33

Questions? Call 1-800-695-4005 (voice)

DELPHI

The World's Premier Online Service

Circle Reader Service Number 180

hard disk, then copy it to the tape drive, read some more, and so on.

A Different Story

With a SCSI interface, however, the story's different. The CPU just says, "SCSI bus, get data X, Y, and Z from the hard disk, and copy that data over to the tape drive. Let me know when you're done."

And in the meantime, the CPU can be busy paying attention to something else, like running another program in some multitasking environment.

Under normal DOS, of course, the microprocessor will just twiddle its

thumbs until the SCSI bus reports success, since DOS is a single-tasking, do-only-one-thing-at-a-time operating system.

The way that the SCSI interface can support so many kinds of storage devices lies in its manner of addressing these devices.

As far as it's concerned, your hard disk isn't a hard disk—it's just a storage peripheral with storage areas called sectors numbered from 0 to some large value. The same is true for floppies, tapes, or optical devices.

Which leads to an interesting question. The hard disk doesn't see itself as

a mere collection of sectors—it uses a more complex addressing terminology. So who does the translation from SCSI sector addresses to physical hard disk addresses?

The answer is that every SCSI drive has a controller built right onto it, kind of like IDE. That controller talks both to the drive in whatever language the drive prefers and then to the SCSI adapter in SCSI language.

So here's the punch line: SCSI drives are really drive-and-controller combinations, and those drive-and-controller combinations can use any interface—IDE, ST506, or ESDI, although ESDI is the only one I've seen used. ESDI is used most often because of the raw speed that it offers.

No Guarantees

You can see now that SCSI, in and of itself, is no guarantee of a fast drive, although most drives chosen for SCSI are, in fact, fairly quick. SCSI really has nothing to do with speed, but rather with multitasking.

Remember that ESDI is basically just a souped-up version of ST506. Drive management is handled mainly by the CPU, and that's not a problem for single-user systems.

But what about a local area network server that must manage six or seven ESDI drives and multiple requests from different workstations for data on those drives? Because that's a lot of work for the CPU, it could benefit from distributed intelligence. SCSI provides that distributed intelligence.

In fact, the SCSI host adapter is a CPU all in itself. All the PC's microprocessor would have to do in the six-drive scenario is just to issue six data requests rapid-fire to the SCSI host adapter and then sit back and wait for the data to come in. (Actually, it wouldn't sit back and wait—a good multitasking system would do something else while waiting for the responses to come in.)

In general, you can count on an ST506 interface to transfer data at the rate of 250K-750K per second (using MFM or RLL encoding), an IDE interface to transfer data at the rate of 1MB per second (using ARLL encoding), an ESDI interface to transfer data at the rate of 1MB-3MB per second (using RLL encoding), and a SCSI interface to transfer data at the rate of 1MB-3MB per second (using RLL encoding).

So what's my advice on which kind of drive you should buy today? If you're buying a large drive for personal use, go with an ESDI drive. For a LAN server or a machine that may become a LAN server, buy SCSI for a slightly more efficient drive. □

Denny Atkin

REACH OUT AND PLAY WITH SOMEONE

You sigh with frustration. "Honey, Stephanie is still tying up the phone. Won't she ever tell her friends good-bye and come down and visit the rest of the family?"

"You're right. She should hang up and come down here and watch *Married with Children* with the rest of us. It's important that she spend time doing wholesome, family things like this," your wife responds. "Stephanie Ann! Get off the phone and get down here right now!"

"But moth-er!" she cries. "Only a few more minutes! Dave and I have three orcs cornered, and we're only two dungeon levels away from finding the Great Ark!"

"She's playing *Dungeon Monger* again with that boy from North Dakota. Why can't she just talk to her local friends like I did when I was a teenager?"

That's right, folks. A new excuse for your teenagers to tie up the phone—online games. The biggest inconvenience might not be the important business calls you miss, but the fact that while *they're* tying up the phone line and the computer, *you* can't get online and play the games yourself!

Online gaming has really taken off in the past couple of years. In the early eighties, online gamers on networks such as CompuServe and the Source could play versions of the original mainframe games, including such venerable titles as *Colossal Cave Adventure* and *Star Trek*. While these games were fun, they were generally single-player games, and the only real advantage in playing them online, rather than playing a version on

your personal computer, was that the games were larger in scope than the common 64K machines could handle.

As personal computers became more powerful and the IBM PC replaced CP/M computers and C64s as the de facto BBS platform, online games grew in sophistication. Instead of calling up a national network to play *Adventure* all by yourself, you could just dial your local BBS and challenge a number of other players to games like *TradeWars*, a multiplayer space game. Most of these boards still only supported one user at a time, so players would have to take turns making their moves. Still, it was much nicer to have a human opponent.

The late 1980s saw an online gaming renaissance. The biggest networks, CompuServe and GENie, began to expand their online gaming areas. As the old single-player adventure games dropped in popularity, the networks began to implement multiplayer games that took advantage of the unique features of online services. You could log on and explore dungeons or destroy space armadas with people from around the country. And unlike most of the BBS games, you could interact with several different players at the same time.

The games became more sophisticated. The text-based games grew—GENie's *Gemstone III* adventure game is larger in scope and more complex than any of the disk-based text adventures. Perhaps the biggest groundbreaker was *Air Warrior*, a multiplayer World War II air combat game. No longer were online games trapped in the realm of text-based interfaces.

Even when you're not online, *Air Warrior* is a superb flight simulator, with speedy polygon graphics and a real-

istic flight model. But when you log on, the real fun begins. You're suddenly a WWII pilot fighting for one of three countries, in your choice of aircraft. There may be up to 50 other players from around the country sharing the sky with you—or trying to knock you out of it. The newest version adds both European and Pacific theaters of operation, as well as WWI and Korean-era aircraft. *Air Warrior* is a far cry from the early BASIC games that used to be popular on BBS systems.

The newest entry into the online gaming fraternity is the Sierra Network (TSN). At the moment it's a fairly limited service, offering games such as backgammon, cribbage, checkers, and bridge. But this flat-rate service, currently available in California, plans to expand to offer more sophisticated games in the coming SierraLand and adult-oriented LarryLand extensions. New games should come online as the service moves to national availability.

Interestingly, TSN is a combination of the mainframe and BBS gaming techniques. When you call TSN, you're actually calling the host computer closest to your geographic area. If you want to play a game with someone across the country, you can, as TSN computers are networked using the same Tymnet network used by major online services. Your local TSN computer simply hooks up with your friend's local node, and you can still play across the country without incurring long-distance charges. TSN is still in its infancy, but it may portend what we can expect from online gaming in the future.

What are your favorite online games? Drop me an E-mail note at 75500,3602 on CIS, DENNYA on BIX and GENie, or DENNY on Plink. □

The late 1980s saw an online gaming renaissance. Since then, games have become multiplayer, graphical, and more personal, even on the big networks.

HOME OFFICE

COMPUTE CHOICE. To get your PC housekeeping chores under control, no other toolkit does the job like this longtime favorite.

Tony Roberts

PC TOOLS 7.0

A few versions back, *PC Tools* was a compact set of utilities—an easy-to-handle tool belt of programs to make computing smoother. Today it would take a pickup truck to hold everything that's packed into robust *PC Tools 7.0*.

If you've been computing for any length of time, you've no doubt assembled a collection of programs that do many of the things *PC Tools* does. If you're in the market for any one utility—say a backup program, a disk cache, a DOS shell, hard disk diagnostics, a disk optimizer, or a virus detector—you can get that and a whole lot more in *PC Tools*. While an impressive collection of utilities, *PC Tools 7.0* falls a bit short of perfection. There are some apparent incompatibilities between elements of this software and some memory managers, some versions of DOS, some hardware, and some other software. Part of this problem, though, stems from the fact that much of this software must be or can be run memory resident, and memory-resident software causes conflicts by its very nature. Some users will have difficulty installing and using *PC Tools*. With so many TSRs running loose, there's a good probability of conflict. It will take experimentation and monitoring to set up a *PC Tools* system that's stable and safe.

The difficulty starts during the *PC Tools* installation process. Although it's possible to install individual elements of *PC Tools*, the tendency to want to install it all—all 7.2 megabytes of it—to see what everything does will override most users' intentions to save hard drive space.



This can be like letting a baby organize your button box. Suddenly, your carefully tuned system is choking on a plethora of new TSRs; you're fiddling with command line switches and kicking the dog as crash follows lockup and you don't know what to blame. You can't learn how to run 15 or 20 programs at once, so when you install *PC Tools*, proceed methodically.

PC Tools comes packed with seven books of documentation, each dedicated to a different facet of the software. Despite this segregation, finding information is sometimes difficult because some programs are covered in more than one manual and the indices are not cross-referenced.

The hypertext-style, online help files provide excellent guidance while you're learning the programs, but since the help files occupy 1.2MB, they didn't last long on my overcrowded hard disk.

PC Tools' installation and configuration programs help set things up for you, and they will take care of rewriting your CONFIG.SYS and AUTOEXEC.

BAT files if you like. This is fine with plain vanilla setup files, but *PC Tools* unraveled my AUTOEXEC.BAT, which includes several questions and ERRORLEVEL tests regarding the software I want to load. Still, I put these inconveniences out of mind once I got a handle on what this most recent version of *PC Tools* offers. *PC Tools 7.0* provides a backup program, an undelete utility, and a program launcher that are bona fide *Windows* applications. The *Windows* backup can run in the background and can be scheduled to perform unattended backups at a specified time, if you have a tape drive. The rest of the package, including *PC Shell*, can be run under *Windows* as DOS applications.

Central Point Backup—a solid disk-backup utility that is also sold as a stand-alone program—is aging nicely. This incarnation comes with a DOS version and a *Windows* version that are compatible. You can make a backup in *Windows* and restore it in DOS. Configuration options

are myriad. You can save named setup files so it's easy to do a full backup one day, an incremental backup another day, and a backup of only *PageMaker* documents on a third day.

Like *Central Point Backup*, *Commute* is also offered as a stand-alone program and is just as welcome in this bundle of utilities. A remote computing utility, *Commute* permits connection of two systems across a network, via modem, or by direct link. With this software you can control your computer at work from your laptop or home computer; you can transfer files and run applications from afar.

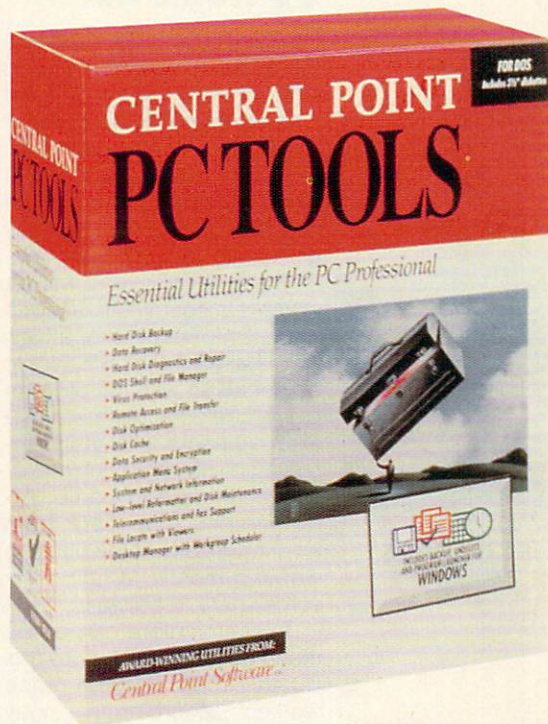
Don't dread the day your PC contracts a virus any longer. *VDefend*, *PC Tools'* memory-resident virus detection utility, scans for hundreds of known viruses. However, running *VDefend* slows performance noticeably, and *VDefend* can only detect, not eradicate, viruses. *Central Point Anti-Virus* (sold separately) takes care of that chore. *PC Tools'* *DiskFix* and *Backup* programs scan for viruses while they work, so you'll have some measure of protection even if you ignore *VDefend*.

Enhancements made to the *DiskFix* utility include interleave tuning and low-level reformatting for those hard drive controllers that will permit it. During repair, you're allowed to save crucial disk information to a floppy so you can undo the repair if you want. *Unformat* will help recover an accidentally formatted disk. *Compress*, the defragmenter and disk organizer, has some useful new options for compression technique and file sorting.

PC Tools 7.0's FileFix pro-

gram adds the ability to repair damaged *dBASE*, *Lotus*, or *Symphony* files. *Undelete* allows recovery of files that have been accidentally erased. This program works similarly to DOS 5.0's *Undelete* command. In fact, Central Point Software licensed versions of its *Mirror* and *Undelete* utilities to Microsoft for use in DOS 5.0. An added feature of the *PC Tools* version, however, is *Delete Sentry*. *Delete Sentry* works by moving deleted files to a hidden subdirectory on your disk rather than actually erasing them. The system then can be set to purge erased files after a specified number of days. All of the memory-resident parts of the *PC Tools* package can be loaded into high memory, if available on your system, leaving acres of conventional memory available for application programs. In addition, much of the software in this package has been made compatible with Netware networks.

PC Tools 7.0 also includes a new *Windows*-like graphical interface for all its components. A new Application Menu System lets you run *PC Tools* utilities and other DOS applications from a configurable cascading menu. *PC Shell*, a DOS-based file management system, now permits viewing of files in more than 35 different formats. *Desktop Manager* offers a suite of functions including appointment scheduling, telecommunications and fax board support, notepad, outliner, autodialer, *dBASE*-compatible database, calculators, and macro editor. The many options offered by *PC Tools* mean flexibility for you. If you like working from a shell, you can use *PC Shell*



as your base and launch programs from there. On the other hand, if the command line suits you, you can execute any program from the DOS prompt. Although few will use every program in this package, I can't imagine anyone who couldn't find almost daily use for some of this software.

While I encountered no major problems with *PC Tools*, I did manage to lock the system up several times. I found that the Find Duplicates portion of the *Find File* program hung up every time under DR DOS 5.0, but it works fine under MS-DOS.

You could buy several products to handle the chores *PC Tools* handles, or you could just buy *PC Tools*. No other package bundles so much in one box. Despite the minor problems mentioned here, *PC Tools* never comes up short in the usefulness department. □

IBM PC and compatibles, 640K RAM, hard disk (Windows applications require Microsoft Windows 3.0 and 2MB RAM); supports mouse, Netware 2.15 and above, and Netware 386—\$179

**CENTRAL POINT SOFTWARE
15220 NW Greenbrier Pkwy.
Beaverton, OR 97006
(503) 690-8090**

WORKPLACE

Daniel Janal

YOU CAN GO HOME AGAIN

How would you like to escape the perilous drive to work and still not miss the excitement and intrigue of office politics? Why not convince your boss to let you do some work at home? After all, the commute is about 30 seconds, and you get to see your kids grow up.

These days, over 5 million workers telecommute, according to Link Resources, a New York-based think tank. Not to be confused with the self-employed, telecommuters make arrangements with their employers to divide work time between office and home. Arrangements can vary from working mostly at the office to working mostly at home—or somewhere in between.

Telecommuters can be as much as 20 percent more productive than full-time office workers, according to a study conducted by the state of California, which has its own telecommuting policies. Brad Schepp, who has documented the phenomenon in his book, *The Telecommuter's Handbook* (Pharos Books, \$9.95), says telecommuting can not only enhance the quality of your life, it can also benefit your employer.

Large corporations such as Pacific Bell, Ap-

ple Computer, AT&T, and JC Penney offer telecommuting as an option for certain employees. Their efforts have paved the way for other companies to formalize policies. "Everything in the program is clearly spelled out," Schepp says, "who can telecommute, how they stay in touch with coworkers and supervisors, and how the company applies workmen's compensation laws."

Such companies aren't the norm, however. Some 90 percent of companies that offer telecommuting do so informally. Mid-level managers don't want to involve top management and the inherent red tape that follows. Telecommuting goes against the grain. MBA programs don't condone it, and employers are only beginning to understand the unique problems of two-income households. You might have to shop around to find a company that's interested in having employees telecommute. That type of company will make it worthwhile.

Other issues that make companies reluctant to offer telecommuting are providing workmen's compensation for accidents at home, managing numerous off-site employees, and determining the best candidates to work at home.

The best telecommuters tend to be those employees who have good working relationships with their supervisors, have been with the company for a long time, can work independently, are good communicators, and are proven performers. And some positions are better suited than others to telecommuting. Computer programmers, writers, translators, sales reps, stockbrokers, and attorneys, to name a few, fall into that category.

Schepp says the best telecommuters are "information specialists" in jobs that involve three basic stages: research,

execution, and presentation. For instance, an architect meets with a client to discuss house plans, goes home to sketch out the blueprints, and then meets with the client again for a presentation.

Schepp says that it's in the second stage, when the work is produced, that telecommuting can be most effective. "That's where you need solitude. You need space and peace to do the best possible job," he says.

Because interaction is limited, the person must become adept at communicating with coworkers and supervisors and work harder to stay in touch via fax, E-mail, and the phone. "You've got to do what you can to ward off feelings of isolation," Schepp says.

Successful telecommuting programs aren't made in heaven, however; they're written on paper, with the guidelines spelled out and paths and tasks clearly defined. Schepp advises companies to hire specialists to set up programs for telecommuting. "They can help you avoid the mistakes other companies have made," he says, "and they can hold your hand through the entire process."

That workstyle isn't for everyone, however. Some 20 percent of telecommuters eventually return to the office for various reasons, often because of an inability to concentrate.

If telecommuting sounds like your answer, Schepp advises you to start slowly. "You'll find it's a learning process. You may find you aren't as productive at first—you have to get used to distractions or not having a support staff or a copy machine. You have to get used to other ways of communicating with people. And you show up at the office fairly often."

Showing up is fine—as long as you can go home. □

Look homeward, boss. That's where you may find your best employees.



ROBERT
BOHNER

INTRODUCING

COMPUTE NET

COMPUTE NET

COMPUTE RoundTable

Welcome to Compute/NET
Hosted by Rick Leinecker
with assistants
Tom Campbell
Stephen Levy
Peer Plaut

GENie

1. COMPUTE Bulletin Board
2. COMPUTE Realtime Conference
3. COMPUTE Software Libraries
4. About the RoundTable
5. RoundTable News (910702)
6. About COMPUTE and the COMPUTE Editors
7. Feedback to the Sysops
8. RoundTable and Library Help
9. COMPUTE Products
10. Coming Soon in COMPUTE
11. COMPUTE Back Issue Database
12. COMPUTE Test Lab
13. Software Publishers' Catalogs
14. COMPUTE Online Game

Welcome to the grand opening of COMPUTE/Net. A wealth of information awaits you. Back issues of COMPUTE, hard-to-find computer books, super software, dazzling pictures, challenging games, prizes, a complete bulletin board, and much more are here. You can even talk to the editors and authors of the magazine. Lots of surprises are planned, so keep your eyes on us.

Make sure that you try the computer trivia game found in the COMPUTE Games section. It's not

FIND US ON GENIE



You Get So Much For So Little.

Now enjoy unlimited non-prime time usage of over 100 popular GENie Service features. For just \$4.95 a month.* You get everything from electronic mail to exciting games and bulletin boards. Nobody else gives you so much for so little.

Plus enjoy access to software libraries, computer bulletin boards, multiplayer games and more for just \$6.00 per non-prime hour for all baud rates up to 2400. And with GENie there's no sign-up fee.

Just Follow These Simple Steps.

1. Set your communications software for half duplex (local echo), up to 2400 baud.
2. Dial toll-free 1-800-638-8369. Upon connection, enter HHH.
3. At the U#=prompt, enter XTX99411, COMPUTE. Then press Return.
4. Have a major credit card or your checking account number ready.

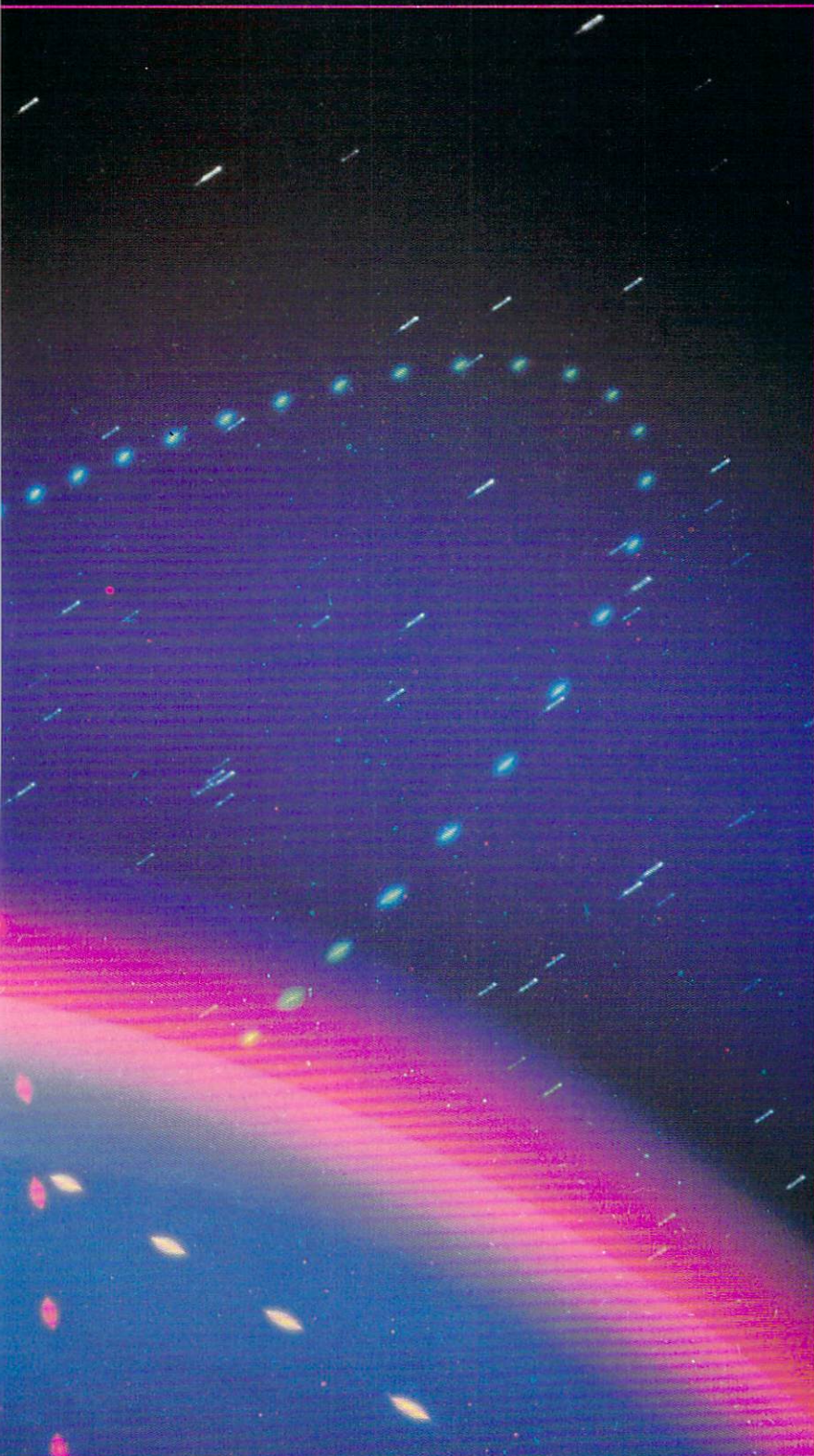
For more information in the U.S. or Canada, call 1-800-638-9636.



*Applies only in U.S. Mon.-Fri., 6PM-8AM local time and all day Sat., Sun., and select holidays. Prime time hourly rate \$18 up to 2400 baud. Some features subject to surcharge and may not be available outside U.S. Prices and products listed as of Oct. 1, 1990 subject to change. Telecommunications surcharges may apply. Guarantee limited to one per customer and applies only to first month of use.

SIGN UP TODAY





MORE AND MORE
EMPLOYEES
ARE WORKING FROM THEIR
HOME OFFICES.
HOW CAN YOU GET INTO
TELECOMMUTING?
READ ON.

REMOTE POSSIBILITIES

BY ROSALIND RESNICK

Ask most people to describe their dream job, and they'll start talking about great pay, top benefits, flexible hours, a short commute, and loads of quality time to spend with the family.

Mention the word *telecommuting*, though, and you'll get a blank stare.

Telecommuting—commonly defined as working from the home or a remote location via personal computer, phone, fax, and modem—has been around for years, but it's only now beginning to catch on in a big way. Link Resources, a New York research firm, estimates that nearly 4 million U.S. employees telecommute on at least a part-time basis with more than half a million telecommuting full-time. Just five years ago, there were fewer than 100,000 telecommuters nationwide.

Who Needs It?

"Telecommuting is like a lot of other new ideas," says Gil Gordon, a Monmouth Junction, New Jersey, consultant and publisher of "The Telecommuting Review," a newsletter for employers. "I always like to remind the skeptics that when the Xerox machine first came out, people said, 'Why do you need that? We have carbon paper.' Telecommuting is one of those rare things that works out well for both employee and employer."

In other words, what's good for the worker has suddenly become good for corporate America. With the recession forcing companies to pinch every penny, more and more managers recognize that there are sizable bottom-line benefits to letting employees work from home. Not only are telecommuters happier and more productive, studies show, but having fewer workers at the

office or production plant means reduced expenses and overhead. Telecommuting also lets employers attract and retain topnotch employees who live far from the office, suffer from a disability, or need to stay home to care for a young child or an elderly relative.

Companies and government agencies that offer telecommuting include IBM, American Express, J.C. Penney, General Electric, Los Angeles County, and the Washington State Energy Office. Apple Computer, whose San Francisco Bay area employees face an arduous commute choked with traffic and pollution, has started giving workers a \$1 credit in the company store every time they work from home.

Productivity and Price

Many bosses say they've been pleasantly surprised by how well their companies' telecommuting programs have worked out. National studies show that productivity can jump by as much as 20 percent when employees are allowed to work from home.

"I was apprehensive at first," says Marti Nurse, director of appeals and state hearings for the Los Angeles County Department of Public Services, who counts 35 telecommuters among the 103 staffers she supervises. "But as our caseloads have gone up, the people who are telecommuting are doing more work, and they're doing it better."

For Los Angeles County, which boasts one of the nation's largest telecommuting programs, employer altruism is a matter of dollars and cents. According to Nancy Apeles, the program's assistant manager, clerks who work from home for the county assessor's office work 64 percent faster than their counterparts in the office and save the county \$30,000 a month. Of the 80,000 people who work for the county, more than 1200 now are telecommuters, up from 78 when the program was launched three years ago. "It's a win-win situation," says Apeles.

Who's Who

Who are America's telecommuters? Many are mothers with young children. Computer programmers tend to gravitate to telecommuting, while other tele-

commuters are technical writers, telephone operators, and data-entry clerks.

Los Angeles County, which numbers more than 1,200 telecommuters among its 80,000 employees, boasts 200 different telecommuting job classifications ranging from clerks and social workers to auditors and department heads.

Jim Mitchell, 50, chief of contract monitoring for the Los Angeles County Health Department and a self-described modem junkie, set up an electronic bulletin board for his 14 telecommuting em-

ployees to swap messages. He himself works from home 4½ days a week.

"I do my real thinking at home," says Mitchell, who still comes to the office for a weekly staff meeting. "I think that companies that do not offer this option are going to find themselves behind the curve when it comes to recruiting."

More typical of the telecommuting population are people like Lisa Kilmain, 28, a senior associate programmer at IBM in Irving, Texas. Kilmain wasn't ready to go back to the office full-time when her daughter, Caitlin, was born two years ago. But part-time work

didn't pay enough to justify what she was spending on day care. Thanks to IBM's Work-at-Home pilot program, Kilmain spent six months as a telecommuter, tapping away at her PS/2 Model 70 while Caitlin napped.

"I got a lot done at home while she was sleeping," Kilmain says. "People couldn't walk into my office and say, 'Hey, what did you do last night?'"

"Being a parent myself, I knew the importance of the mother's being present," says Ed Denson, Kilmain's boss. "It was

good for the company, too.

Lisa was able to accomplish more in her 20 hours at home than she would have in the office."

Though Kilmain is now back at the office, she says she's planning to have more children and hoping to repeat her telecommuting experience.

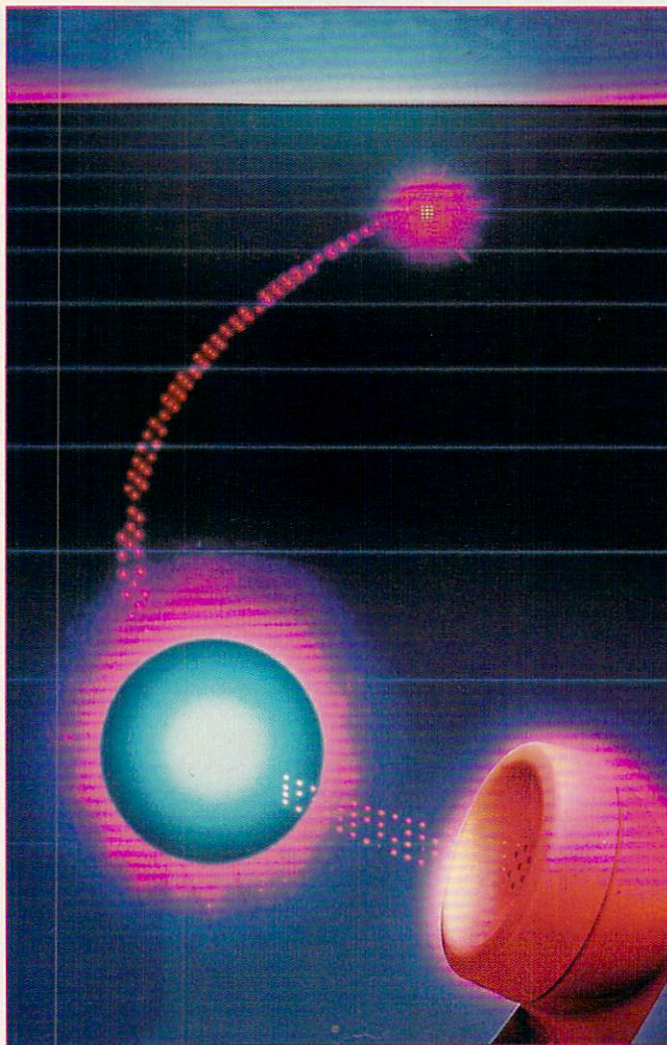
Chris Stroud, vice president of Financial Data Planning (FDP), a Miami software company, tells a similar story about Laura Falco, 28. Falco, a programmer who also fields phone calls from customers, cares for two young children at home while telecommuting 35 hours a week. Though FDP has no formal telecommuting program, the company has allowed Falco to work from home for the last 2½ years because she's a talented self-starter. FDP also picks up the tab for a second phone line.

"After my daughter was three months old, I didn't want to go back to work," Falco says. "I wanted to take care of her. The company said it was willing to try [letting me telecommute] for three months. Now, it's been two-and-a-half years."

Some of her colleagues are even a little envious. "There have been other people who have pointed to Laura and said, 'She's doing it. Why can't we?'" Stroud says. "But Laura's job is very suited to working from home, and she's an extremely productive person."

Out of Sight

As Falco's story shows, telecommuting is still a privilege, not a right, even at the companies that do allow it. The reason: Many managers worry that home-based employees will be tempted to sleep late, watch television, raid the



Try it,
For just \$4.95.*

Plug your computer into
a world of information.

The easy, cost-effective information system from National Videotex, using AT&T's state-of-the-art digital network.

*For a flat fee of \$4.95 per month, you get unlimited access to National Videotex Network, the user-friendly information exchange. This includes free access to six services provided by USA Today Decision-line, "write-your-own" classified ads, and unlimited usage of the gateway functions.

National Videotex Network users may also access the expanding number of pay-as-you-go interactive and transactional services, directories, games, stock exchanges, environmental services and more. NVTEL multi-protocol communication software available at \$14.95.



To register call 800-348-0069

refrigerator, or take their kids to the park rather than do their jobs.

Likewise, many employees fear that, once out of sight, they'll be out of mind—passed over for raises and promotions.

If you're willing to take that risk and you want to persuade your employer to let you telecommute, the experts suggest you try the following approaches:

- Put yourself in your boss's shoes. Show your boss that telecommuting can save the company money by shrinking overhead. Point out that employees who work from home are often more productive and can keep working in spite of minor illnesses and family emergencies. Explain that telecommuting helps boost morale and keep good workers.

- Show initiative. Prove that you've got what it takes to work from home—self-discipline, organization, and the ability to handle tasks and meet deadlines without direct supervision. Demonstrate these qualities at the on-site job you have now.

- Start small. If your boss won't let you telecommute full-time, ask to try telecommuting one day a month. Once your employer feels comfortable with the idea, you can start lobbying for one day a week, two days, or more.

- Work hard. Even if your boss gives you the green light to telecommute, that doesn't mean you can't be hauled back

to the office if your performance falls short. Telecommuters are expected to meet the same productivity standards as staffers who work in the office.

- Be flexible. If your boss wants you to report to the office once a week for a staff meeting, don't fight it.

Trends and Anomies

Telecommuting experts believe that working from home is an emerging trend in the workplace of the 1990s, not just a flash in the pan. With advances in computer and telecommunication technology, people can perform more and more jobs from home.

"It's not just women with kids sitting behind the keyboard," says Gordon, the telecommuting guru. "Many more men are becoming interested in it, too."

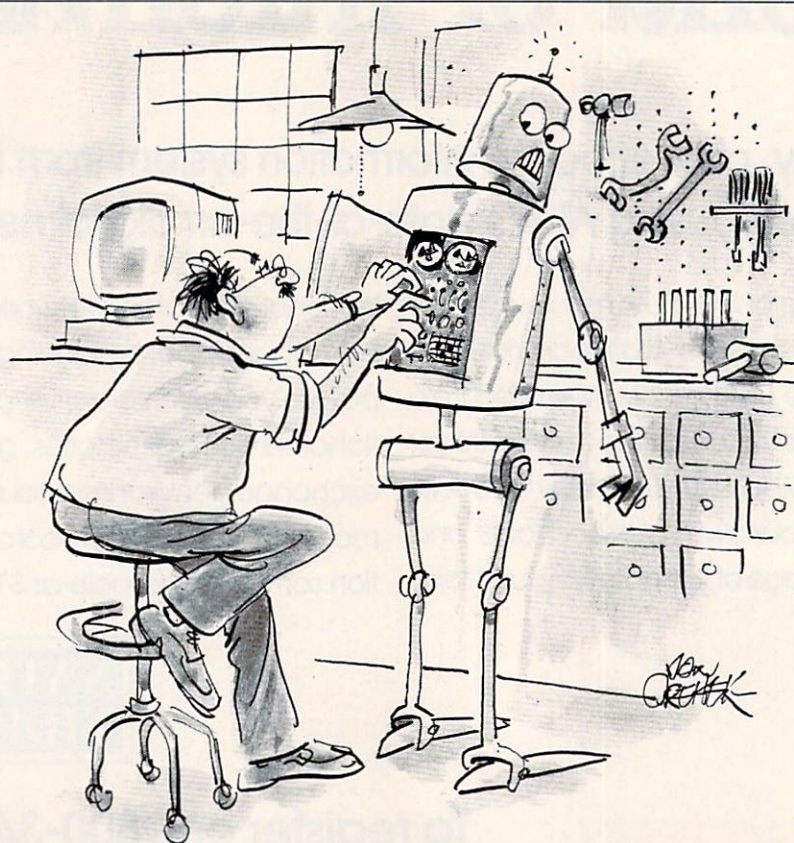
But not even telecommuting's staunchest backers envision a future littered with empty office buildings and urban ghost towns. The reason? A basic human need to talk, meet, and gossip with fellow workers face to face. Gordon predicts that no more than 5 to 10 percent of the nation's work force will telecommute at any one time.

"Telecommuting is not about working at home," Gordon says. "It's about decentralizing the workplace. For the right people and the right reasons, it has tremendous value." □

BOOKS ON TELECOMMUTING

There are several publications on telecommuting, including *Telecommuting: How to Make It Work for You and Your Company*, by Gil Gordon and Marcia Kelly (ISBN 013902339-9, Prentice-Hall). To order a copy, contact Gordon at 10 Donner Court, Monmouth Junction, New Jersey 08852; (908) 329-2266. The price is \$15.95 for U.S. orders and \$25.95 for foreign orders. Price includes shipping. Gordon also edits "The Telecommuting Review," a monthly newsletter geared toward employers. A subscription costs \$157.00 per year. The address and telephone number are the same.

Other books include *The One-Minute Commuter* by Lis Fleming (ISBN 1-877887-14-5; Acacia Books, 1309 Redwood Lane, Davis, California 95616; 916-753-1519; \$9.95 plus \$2.00 postage and handling; California residents should add \$0.75 sales tax), *The Telecommuter's Handbook* by Brad Schepp (ISBN 0-88687-571-4; Pharos Books, World Almanac Education, 1278 West 9th Street, Cleveland, Ohio 44113; 800-521-6600; \$9.95 plus \$1.50 postage and handling), and *Working from Home: Everything You Need to Know About Living and Working Under the Same Roof* by Paul and Sarah Edwards (ISBN 0-87477-582-5; Jeremy P. Tharcher, 5858 Wilshire Boulevard, Suite 200, Los Angeles, California 90036; 213-935-9980; \$14.95).



"Rewind the IPL tape, check the board position and see if the amber light blinks."

**THIS
ISSUE'S
DISK**

THE ULTIMATE POWER DISK

Start getting the absolute most from your PC and *COMPUTE!*
Subscribe to *COMPUTE's PC Disk* today!

Every other month—six times a year—you'll receive *COMPUTE's PC Disk* chock-full of ready-to-run programs, including the very best dazzling applications, powerful utilities, and eye-popping graphics. And each disk contains special programs that tie in with the Tech Support section of the magazine.

You'll get a direct connection to commercial-quality, free programs and the very best in shareware, all painstakingly debugged and fine-tuned by our experts.

Here's a list of the must-have programs coming on the October PC Disk.

- Big Desk**—Make your Windows desktop eight times larger!
- Directory Size**—Help for an overweight hard disk.
- Useful Notes**—Kiss that paper notepad good-bye!
- VIRUSCAN**—Protect your PC from viruses.
- Mr. Filter**—Salvage damaged text files.

SUPER BONUS!

And that's not all. To make *PC Disk* as easy to use as possible, each issue contains *CMOS—COMPUTE's Menu Operating System*—a special menuing program that allows you to fly through installation, run programs, view and print documentation, get special tips on program requirements, and more.

So don't delay! Subscribe now!
Super programs and our special menu can be yours.

All orders must be paid in U.S. funds by check drawn on a U.S. bank or by money order. MasterCard or VISA accepted for orders over \$20.00. This offer will only be filled at the above address and is not made in conjunction with any other magazine or disk-subscription offer. Please allow 4-6 weeks for delivery of single issues or for subscription to begin. Sorry, but telephone orders cannot be accepted.

Disks available only for IBM PC and compatible computers.
Current subscribers to *COMPUTE* or *COMPUTE's PC Magazine* will have their subscriptions extended accordingly.

YES! Start my one-year subscription right away.

The Ultimate Power Combination! Start my one-year subscription to *COMPUTE's PC Disk* and *COMPUTE!*
— 5 1/4-inch \$49.95 per year (6 disks and 12 magazines) — 5 1/4-inch \$39.95 per year (6 disks)
Residents of NC and NY, please add appropriate sales tax for your area. Canadian orders, add 7%
goods and services tax. For delivery outside the U.S. or Canada, add \$10.00 for postage and handling.

— 3 1/2-inch \$49.95 per year (6 disks and 12 magazines)
— 3 1/2-inch \$39.95 per year (6 disks)

Name _____ State _____
Address _____
City _____
Total Enclosed _____
Credit Card # _____
Exp. Date _____
Signature _____
 Check or Money Order MasterCard VISA
Daytime Phone _____

Required

Send your order to
COMPUTE's PC Disk
P.O. Box 3244
Harlan, IA 51539-2424
HWPC4

ARTS & LETTERS

Robert Bixby

TAKING THE VENTURA OUT OF A PUBLISHER

You can't use *Ventura Publisher* for very long without grudgingly admitting that it has a few flaws. It lacks two-up printing, for example, and a few other little things that would be nice to have. Fortunately, *Ventura* is popular enough to make it profitable for small programming companies to create utilities to fill in the gaps.

EDCO (EDCO Services, 12410 North Dale Mabry Highway, Tampa, Florida 33618; 813-960-2356) is such a company. EDCO provides simple solutions to two *Ventura* deficiencies most vexatious to typesetters: hyphenation and kerning.

The hyphenation problem involves words improperly hyphenated according to the standard dictionary. This shows up when a word containing a syllable of a single character appears at the end of a line—*Ventura* often breaks

words incorrectly. The *EDCO Hyphenation Dictionary* is free of these errors, and it allows you to enter new words in the dictionary, complete with specified hyphenations to prevent errors from occurring. You can even specify how many letters should appear before and after a hyphen to prevent short words from breaking at all and long words from breaking before or after single letters.

LetrTuck is an interactive kerning engine that allows you to adjust the kerning of letter pairs in the 24 most popular PostScript fonts: roman, bold, italic, and bold italic forms of Avant Garde, Bookman, New Century Schoolbook, Palatino, Helvetica, and Times. You can specify a change of as little as 1/1000 of an em space. You can even enter letters not ordinarily kerned and specify a kerning value. *LetrTuck* and the *EDCO Hyphenation Dictionary* are available for \$99 each or \$148 for both.

2Up Publisher (Laser Age Software, 3231 Ocean Park Boulevard, Santa Monica, California 90405; 213-470-1397; \$159) is another interesting package designed to make up for what I consider a glaring inadequacy in *Ventura*: the lack of two-up printing. Two-up means setting up your pages so the resulting printout can be folded into booklet form.

With *Ventura* you can create landscape pages with two frames side by side, but then there's the problem of pagination. Laying out a booklet unassisted is both a nightmare and a headache rolled into one. To create a 32-page booklet, you could spend hours cutting and pasting text to get it in the right positions, and page numbers have to be entered by hand. That's a lot of work you shouldn't have to do.

It seems that *Ventura* is designed to frustrate creation of

a simple saddle-stitched booklet, but thankfully, *2Up Publisher* is designed to take care of that problem. You simply create pages in *Ventura Publisher* using a special format described in the *2Up Publisher* manual and then print them to a file. *2Up Publisher* then extracts the pages from the file and rearranges them so they can be saddle-stitched.

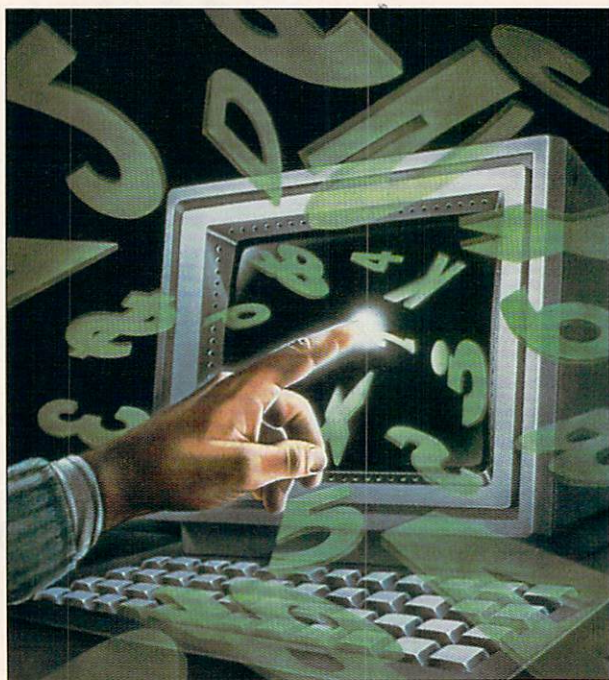
2Up Publisher only prints to a PCL printer, meaning it uses only PCL font files. If you're used to printing from *Ventura for Windows* to a PostScript device, the result is an unacceptable change of available fonts. Nonetheless, once you've set up *Ventura* to print in the appropriate format and made the necessary adjustments, *2Up Publisher* will generate perfect pages as advertised.

As I've mentioned before, I'm a man on a quest; I'm looking for the perfect pointing device to replace the mouse. The news from Quixoteland is that I may have found my true love—a device that makes pointing easier and allows me to draw with a natural motion. The creature's name is MousePen (Appoint Systems, 1332 Vendels Circle, Paso Robles, California 93446; 800-448-1184; \$109), and though it's a little fat around the middle, it works like a real pen.

You can hold it like a pen, draw on your mouse pad as if it were a sketch pad, and even draw with it on other surfaces, provided they aren't too slick. The mouse ball is a bead with a smooth finish rather than the rubber-coated ball bearing found in most mice.

Although I have several standard mice standing by to take the MousePen's place, I haven't rushed back to them yet. If the MousePen barrel can be made thinner, this sharp new input device will border on perfection. □

Ventura Publisher seems designed to frustrate the simple creation of a saddle-stitched booklet.

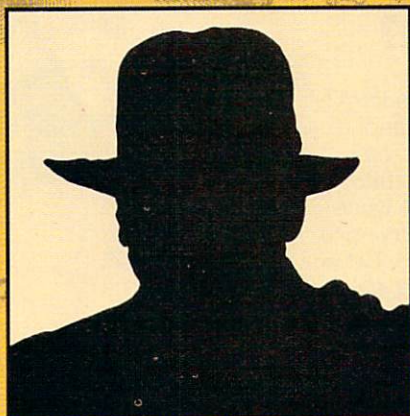


10° 20° 30° 40°

10°

The man with
the hat is back.

20°



30°

This time he's
in over his head.

40°

50°

INDIANA JONES
and the
FATE of ATLANTIS

COMING THIS FALL
TO A SOFTWARE STORE NEAR YOU.

10° 20° 30° 40°

LucasArts™
Lucasfilm™ Games

Circle Reader Service Number 111

DISCOVERY

COMPUTE CHOICE. With you on the job, even Carmen Sandiego can't toy with the great American past.

Clayton Walnum

WHERE IN AMERICA'S PAST IS CARMEN SANDIEGO?

Ever since the indomitable Carmen Sandiego began her capers back in 1985, computerists the world over have been trying to track her down. But whenever she's busted, Ms. Sandiego gets back on the streets faster than a jail door swings. You just can't keep a bad woman down. After wreaking havoc in *Where in the World Is Carmen Sandiego?*, *Where in the U.S.A. Is Carmen Sandiego?*, *Where in Europe Is Carmen Sandiego?*, and *Where in Time Is Carmen Sandiego?*, she's back with her trusty time machine, causing trouble across the length, breadth, and history of the United States of America.

In *Where in America's Past Is Carmen Sandiego?*, you hop in your Chronoskimmer 450SL and follow the Sandiego gang as they leap from time to time, starting prior to 1800 and going all the way up to the present day. (Well, up to 1988, anyway.) Although your goal may be a good arrest, along the way you'll learn much about important times in America's history, from the discoveries of the first explorers to the inventions of Thomas Edison to the introduction of rap music.

A typical game begins when ACME headquarters briefs you on the most current V.I.L.E. (Villains' International League of Evil) caper and issues you a Chronoskimmer for a specific period of time. At

the start of a case, you know only the crime and the criminal's gender. To complete your mission, you must identify, locate, and arrest the criminal before your time expires. The execution of most commands consumes time, so you must examine clues carefully and avoid taking unnecessary trips or requesting redundant information.

Because Brøderbund's America is divided into five geographic regions, each of which can be visited in any of nine time periods, guesswork will yield poor results. You must examine each clue to determine both the region and time period to which the criminal has fled. The game's documentation advises you to "refer to your personal volume of *What Happened When*." Study this impressive tome carefully and become thoroughly familiar with its organization. The book contains far too much information for anyone

to simply memorize.

Luckily, your first time jump is automatic, zapping you to the last place the criminal was sighted. When you arrive at your destination, your view screen offers a scene from the region in the appropriate time period, after which you start your investigation by choosing Ask a Bystander, Consult a Source, or Listen In. Whichever clue you choose, the interviewee will give information that may point to the criminal's next destination, time period, or both.

For example, a typical clue may read, "She said she was going to donate copies of the new book, *Uncle Tom's Cabin*, to a library in Austin." By looking up books in *What Happened When's* index, you find *Uncle Tom's Cabin* listed with a publication date of 1852. You now know your target has fled to the Southwest (Austin) in the year 1852 (you've also learned a little about classic



literature, but don't let that worry you), and you didn't even have to read the full entry in the book! Pressing the Chronoskimmer's map button brings up a map of the U.S. on your view screen. You select the 1850-1875 time zone and the Southwest region and press the launch button, and you're off.

When you arrive in the Southwest, you learn that "the first Texas cattle drive began in 1866 when a herd of 260,000 cattle was moved north, proving that cattle could be driven to market." Interesting though this fact may be, it doesn't help your search. But pressing the Search button allows you to question the witnesses.

As you search for clues, headquarters may send electronic mail, which gives you the latest lowdown on your suspect. Clues like "She had ruby-colored hair" let you narrow down the suspects. Enter the information into your crime computer. Once you know enough about the villain, you're issued a warrant.

The game continues in this fashion until you capture the suspect or run out of time. Sometimes, you may catch up with the suspect before you have a valid warrant, in which case, the suspect gets off—and you get chewed out by headquarters. If you end up with a warrant for the wrong person, you'll really feel like a dink.

Where in America's Past Is Carmen Sandiego? supports most graphics modes, including CGA, EGA, and VGA. Although obviously best played in VGA mode, the game's EGA mode is an acceptable alternative, with the CGA graphics being better than one might expect but still tough on the old orbs. The VGA graph-

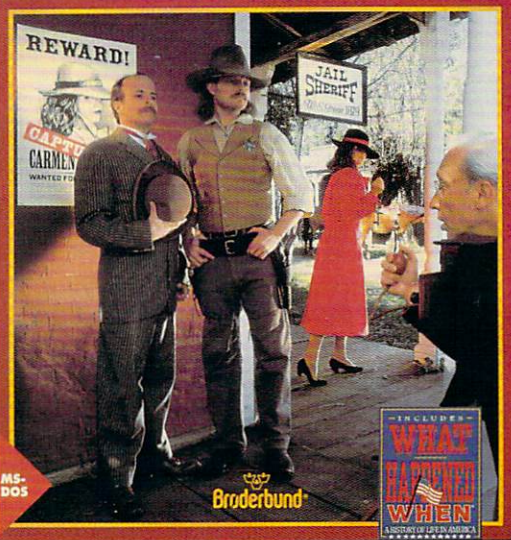
ics are stunning, with many scenes rendered from digitized photos.

Not all the graphics are static scenes, however. Each time you jump to one of V.I.L.E.'s locations, a Sandiego henchperson makes an appearance in a carefully crafted, always amusing animation. I won't give away any of the surprises. Suffice it to say that, with a full dozen of these cartoonlike intermissions built in, you'll continue to enjoy them for many games. (If you don't see an intermission after a time jump, you jumped to the wrong location or time.)

While the straight PC-generated sound effects are OK, this game puts sound cards like Ad Lib and Sound Blaster through their paces. The professionally composed music is reminiscent of that of hard-boiled detective dramas, with a splash of sexy-cool jazz thrown in to keep you grinning and bobbing. The sound effects accompanying a time jump rattle your chair and echo spookily as you snap into your chosen slot in history.

No software is perfect, of course. When played using a Sound Blaster card, *Where in America's Past Is Carmen Sandiego?* sometimes leaves a note or two hanging, yielding a droning sound that can drive you wacky if it goes on too long. (This also may happen with other sound cards.) I also didn't care for the method by which the player gathers clues. Any software built upon a fictional scenario must maintain that all-important suspension of disbelief. Clicking on a button labeled *Ask a Bystander* or *Listen In* reminds you that you are, after all, just playing a game. It would've been much more effective to

WHERE IN AMERICA'S PAST IS CARMEN SANDIEGO?



have a person's portrait pop up, as though you were truly questioning people met randomly in the street. As the game stands, the Clue buttons might as well be labeled *Clue 1*, *Clue 2*, and *Clue 3* for all they add to the game's scenario. These are minor quibbles, however, when compared with the overall quality of the program.

Although the gameplay varies only slightly from one title to the next, these games continue to be entertaining and, best of all, painlessly educational—a tough combination to beat. As parents proved to their kids over five years ago when the first charming Carmen Sandiego adventure was released, learning can be fun. *Where in America's Past Is Carmen Sandiego?* is a must-have package for anyone interested in superior and engaging educational software. □

IBM PC and compatibles; 512K RAM for CGA, EGA, Tandy 16-color, and Hercules; 640K for MCGA and VGA; hard drive; supports mouse or joystick; supports Roland MT-32, Sound Blaster, Ad Lib, LAPC-1, and CM-32L—\$59.95

BRØDERBUND SOFTWARE
17 Paul Dr.
San Rafael, CA
94903-2101
(800) 521-6263

Come Visit Our Warehouse/Showroom



SIIG, Inc. **MiniSys**

Microcomputer Series

Petite and Much More than a Powerful Computer...

MiniSys 2000

SIIG's 12 MHz 80286 mini system Standing Slightly taller than a 3-1/2" diskette, the extremely compact MiniSys 2000 has many advantages over conventional microcomputers. Because of its unique small size, the MiniSys 2000 opens the doors of possibilities for PC based applications closed due to size concerns by larger, standard PCs. Utilizing the surface mount technology and an extreme cost-efficient design, the MiniSys 2000 now makes microcomputer solutions affordable.

The Minisys 2000 ... a foundation for countless applications!

- Data Entry Workstation
- Point-of-sale Workstation
- Home Computer
- Lan Workstation
- Voice Mail System

Standard Feature includes...

- 1 MB system memory expandable to 2.5 MB
- 3-1/2" 1.44 Floppy Drive
- 2 Serial, 1 Parallel, 1 game port, TV port
- Mono/CGA switchable, IDE Interface
- 110/220V Autosensing Power Adapter
- 1 year On-site/ Mail-in Warranty

\$449

MiniSys 2000 with VGA Adapter **\$499**



MiniSys Options:

- 9" Monochrome (White) Monitor MN-W-QC918 **\$129.00**
- 9" VGA Monochrome Monitor MN-V-VS0931 **\$159.00**
- Suntouch Jr. 84K Keyboard KB-MINI-84K **\$49.00**
- Keypad for Suntouch Jr. KB-MINI-Keypad **\$39.00**
- Additional Power Adapter NEW!! **\$49.00**
- 40 MB Hard Disk Drive HD-TE-HD340 **\$269.00**
- MS DOS 4.01 (3.5") SW-MS-DOS4.01-1 **\$65.00**

MiniSys 3000SX

SIIG's 16 MHz 80386SX Mini System Standard Feature includes...

- 1 MB expandable up to 5 MB
- 3-1/2" 1.44 Floppy Drive
- 2 Serial, 1 Parallel, 1 game port, TV port
- Super VGA with 512 KB, 1024 x 768 controller
- IDE Interface
- 110/220V Autosensing Power Adapter
- 1 year On-site/ Mail-in Warranty

\$849

MiniSys 3000

SIIG's 25 MHz 80386 Mini System Standard Feature includes...

- 2 MB expandable up to 16 MB
- 3-1/2" 1.44 Floppy Drive
- 2 Serial, 1 Parallel, 1 game port, TV port
- Super VGA with 512 KB, 1024 x 768 controller
- IDE Interface
- 110/220V Autosensing Power Adapter
- 1 year On-site/ Mail-in Warranty

\$1,099

(Bundled with MiniSys)
1.2 MB External Floppy Disk Drive with 15W P.S.
FD-E-12A-1 **\$149.00**

SIIG, Inc On-Site Warranty

- SIIG stands behind its microcomputer with a full year on-site warranty.
- Through the service facilities of Integrated Automation International, on-site service on SIIG computer is available from coast to coast, including parts of Canada and Puerto Rico.
- Integrated Automation International (IAI) contacts every computer owner/user when the service contract is initiated to verify their hardware support needs. After this initial contact, a plan for support for that system, should it require servicing. SIIG and IAI, together offer a comprehensive warranty service to meet the needs of SIIG microcomputer owners. On-site warranty details included with each computer system purchase. Extended warranty contracts available from IAI.

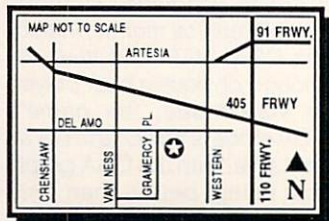
We buy and sell excess inventories..call or fax list.

20308 Gramercy Place, Torrance, CA 90501 • (FAX: (213) 328-2907

(800) 345-5568 / (213) 328-3344

WE ACCEPT: NSI CHARGE, VISA, MC, AMEX, COD, PO's from qualified firms.
20% restocking fee on all non-defective returns. All returns/adjustments must be made within 15 days. CA residents Add 7% Sales Tax. PRICES SUBJECT TO CHANGE . \$8.50 Minimum Shipping.

No Surcharge On Credit Card Orders. We Accept...



Come Visit Our Warehouse/Showroom

S486-25

A Powerful, High Performance 486/25 MHz Tower System

Designed for use as a file server in a multi-user/multi-tasking environment. The use of Intel's 80486 microprocessor is the basis for the S486-25's impressive performance. The S486-25 achieves its phenomenal performance (Landmark v1.12 equals 112.7-113.2) while still retaining downward compatibility with software designed for the less powerful 80286 and 80386 systems.



Standard Feature:

- 4 MB of system memory expandable to 16 MB on-board
- 128KB memory cache
- 5-1/4", 1.2 Floppy Drive
- 2 serial, 1 parallel, 1 game port
- 101 enhanced keyboard
- Comes with 1 year On-Site/Mail-In warranty
- Socket for Weitek 4167 floating point math coprocessor
- 8 expansion slots

\$2,495

SN386-25

A High Performance, High Quality 386/25 MHz System



The SN386-25 can serve as an excellent file server. UNIX & OS/2 compatible

Standard Feature:

- 1 MB of system memory expandable to 8 MB on-board and up to 16 MB with the use of an optional 32-bit memory card
- 5-1/4", 1.2 Floppy Drive
- 2 serial, 1 parallel, 1 game port
- 101 enhanced keyboard
- Comes with 1 year On-Site/Mail-In warranty
- PLCC socket for Intel 80387 and/or Weitek 3167 math coprocessor
- 8 expansion slots

\$1,099

S286-12F

High Performance/Cost Effective 80286/12 MHz System

Standard Features:

- 512 MB of system memory expandable to 4 MB on-board
- 5-1/4", 1.2 Floppy Drive
- 2 serial, 1 parallel, 1 game port
- 101 enhanced keyboard
- Comes with 1 year On-Site/Mail-In warranty
- Socket for Intel 80287 math coprocessor
- 7 expansion slots

\$599

SX386-16

SIIG's response to consumer demand for low cost, high performance microcomputer

Based on Intel's 80386SX-16 MHz microprocessor, the SX386-16 offers complete 80386 compatibility at 80286 price.

Standard Feature:

- 1 MB of system memory expandable to 8 MB on-board
- 5-1/4", 1.2 Floppy Drive
- 2 serial, 1 parallel, 1 game port
- 101 enhanced keyboard
- Comes with 1 year On-Site/Mail-In warranty
- PLCC socket for Intel 80387SX math coprocessor
- 8 expansion slots

\$799

SX386-20

Based on Intel's 80386SX-20 MHz microprocessor, the SX386-20 offers complete 80386 compatibility at 80286 price.

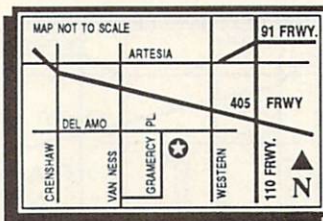


Fully compatible with software written for the 80386 based computers while maintaining compatibility with programs designed for the less powerful 80286 machines.

Standard Feature:

- 1 MB of system memory expandable to 8 MB on-board
- 5-1/4", 1.2 Floppy Drive
- 2 serial, 1 parallel, 1 game port
- 101 enhanced keyboard
- Comes with 1 year On-Site/Mail-In warranty
- PLCC socket for Intel 80387SX math coprocessor
- 8 expansion slots

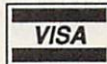
\$899



We buy and sell excess inventories..call or fax list.
20308 Gramercy Place, Torrance, CA 90501 • (FAX: (213) 328-2907
(800) 345-5568 / (213) 328-3344

WE ACCEPT: NSI CHARGE, VISA, MC, AMEX, COD, PO's from qualified firms.
20% restocking fee on all non-defective returns. All returns/adjustments must be made within 15 days. CA residents Add 7% Sales Tax. PRICES SUBJECT TO CHANGE. \$8.50 Minimum Shipping.

No Surcharge On Credit Card Orders. We Accept...



NSI
Computer Products

COMPUTER SYSTEMS

LAPTOPS/MONITORS

Come Visit Our

HALIKAN
CHAPLET SYSTEMS

LAPTOP COMPUTERS

LA-50 Laptop

Fast 80386SX 16/20MHz CPU

The LA-50 puts all the speed and performance features of a 386SX into one attractive, high resolution laptop.



Features Include...

- 1MB RAM expandable to 5MB
- Built-in 1.44 Floppy & 40MB Hard Disk Drives standard
- 640 x 480 Black & White supertwist CCFT LCD display
- Fully VGA, EGA, Double Scan CGA, HGC and MDA compatible
- Removable/rechargeable Ni-Cd battery
- Two two-third size 16-bit/8-bit expansion slots
- MS-DOS 4.01 & GW-BASIC
- MS-Windows 3.0 & MS-Works 2.0 are optional
- FCC approved

w/ 40MB Hard Drive ... **\$2,299**
w/ 80MB Hard Drive **\$2,499.00**
w/ 120MB Hard Drive **\$2,599.00**



LX2020
LAPTOP

Warehouse/Showroom

NBA386SX Notebook

At less than 6.6 lbs., the unique NBA386SX Notebook PC is the newest star in Chaplet's lineup of portable computers.



Features Included...

- 80386SX microprocessor with 20MHz or 16MHz
- 1MB RAM expandable to 5MB
- Built-in 1.44 Floppy & 20MB Hard Disk Drives standard
- 640 x 480 Black & White supertwist CCFT LCD display, up to 32 grade scale
- Fully VGA, EGA, Double Scan CGA, HGC and MDA compatible
- Removable/rechargeable Ni-Cd battery
- Weight 6.6 lbs. with battery pack
- MS-DOS 4.01 & GW-BASIC
- MS-Windows 3.0 & MS-Works 2.0 are optional
- FCC approved

\$2,399

LX2020 Laptop

Ideal for Beginning PC Users

Economical and Easy-to-Use Laptop with a contrast-adjustable LCD screen

Features Included...

- V20 microprocessor with 12/4.77MHz
- 640KB RAM with AMI Bios
- 20MB Hard Disk and one built-in 1.44MB Floppy Disk Drive
- 640 x 200 Supertwist LCD Display
- MDA and CGA compatibility
- RS-232, Parallel Printer, External Video and External Keyboard Ports
- MS-DOS 3.3 & GW-Basic
- MS-Works 2.0 is optional
- FCC approved (adaptor is also UL approved)

\$1,029⁰⁰

ARCHE MONITORS

DX-214MH Super VGA

NEW!! Non-Interlaced

- SVGA—1024 x 768, 800 x 600, 640 x 480
- Auto-Size, Super Fine VGA Graphics
- Hitachi CRT—Dot Pitch Super Fine 0.28
- Black Screen for 50% better contrast
- Non-Glare Screen
- Triple Focus 3 Beam System for crisp bright colors
- Tilt & Swivel Stand & Cables Included
- Dual Voltage Power Supply (50-60 Cycle)

\$449



DX-14S Super VGA

- SVGA—1024 x 768, 800 x 600, 640 x 480
- Comb Filter to eliminate smearing
- Super Fine VGA Graphics Monitor
- Hitachi CRT—Dot Pitch Super Fine 0.28
- Non-Glare Screen
- Triple Focus 3 Beam System for crisp bright colors
- Tilt & Swivel Stand & Cables included
- Dual Voltage Power Supply (50-60 Cycle)

\$349

DX-14S VGA

- VGA—640 x 480
- Comb Filter to eliminate smearing
- Fine Grain VGA Graphics Monitor
- Hitachi CRT—Dot Pitch 0.39
- Non-Glare Screen
- Triple Focus 3 Beam System for crisp bright colors
- Tilt & Swivel Stand & Cables included
- Dual Voltage Power Supply (50-60 Cycle)

\$299

We buy and sell excess inventories..call or fax list.

20308 Gramercy Place, Torrance, CA 90501 • (FAX: (213) 328-2907

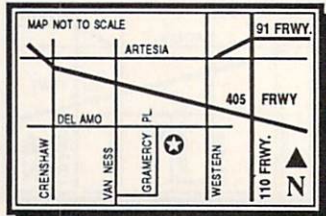
(800) 345-5568 / (213) 328-3344

WE ACCEPT: NSI CHARGE, VISA, MC, AMEX, COD, PO's from qualified firms.
20% restocking fee on all non-defective returns. All returns/adjustments must be made within 15 days. CA residents Add 7% Sales Tax. PRICES SUBJECT TO CHANGE. \$8.50 Minimum Shipping.

No Surcharge On Credit Card Orders. We Accept...



NSI
Computer Products



Come
Visit Our

Warehouse/Showroom



SIIG, Inc

SIRIUS-32GS GRAY-SCALE

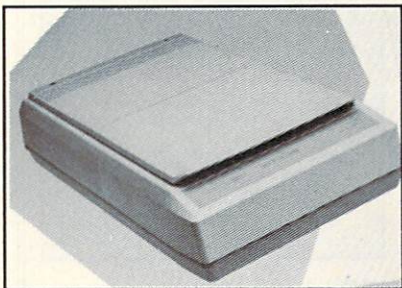
The SIRIUS-32GS offers Gray-scale mode, as well as virtual gray-scale and single-bit scanning modes.

The SIRIUS-32GS scanner is a valuable tool for transforming photos and other images into graphic images for use in computer applications. With its 256 shades of gray, image clarity and accuracy are unsurpassed. Industry standard 1-, 4-, 8- and 24-bit TIFF file formats are fully supported. The scanner package includes IMS (Image Manipulation System) software, gray-scale graphic manipulation program developed by VI&C Technology.

FEATURES WITH IMS

(Image Manipulation System):

- Manipulate 10 windows simultaneously with full & reduced views
- Supports expanded, extended, and virtual memory configuration
- Supports popular Laser and Dot Matrix printer, color or monochrome monitors
- Mouse driven & graphic based
- True WYSIWYG color selection to help image manipulation
- On-line user support
- Auto detection for device drivers and configurations
- On-screen dither pattern and gray shade index guidance
- Extensive tools for gray-scale enhancement, editing, and graphic drawing



SIRIUS 32 FLATBED IMAGE SCANNER

Increase the graphic performance of your office with SIIG's Sirius 32 Image scanner. To optimize and utilize the veracity of this scanner, we offer several interface kits, software geared to your business needs.

\$599

INTERFACE KITS

GRAPHIC INTERFACE KIT

S32-DB Interface Card, Scanner Cable, DSart Software, PC Paintbrush IV Plus **\$149⁰⁰**

BUSINESS INTERFACE KIT

S32-DB Interface Card, Scanner Cable, DSart Software, OmniPage/386 OCR Software **\$599⁰⁰**

DELUXE INTERFACE KIT

S32-DB Interface Card, Scanner Cable, DSart Software, PC Paintbrush IV Plus, OmniPage/386 OCR Software **\$699⁰⁰**

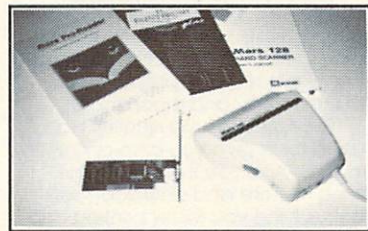
- Exchangeable editing between gray-scale and binary data
- Many VGA modes supported

\$1,399

OTHER OPTIONAL EQUIPMENT:

- Automatic Document Feeder (ADF) Scans up to 25 pages at once. **\$299⁰⁰**
- ReadRight 2.0 by OCR Systems, for OCR scanning on 80286 or 8088 based computer. **\$299⁰⁰**
- PC Paintbrush IV Plus for advanced graphic uses **\$99⁰⁰**

Marstek 128 HAND SCANNER



COMPLETE PACKAGE INCLUDES...

- Mars 128 5" Scanner & Interface Card
- Scan Kit Utility Software & User's Manual
- Cat Reader OCR Software & PC Paintbrush Plus
- One Year Warranty

\$119⁹⁵

CHINON ScanFAX 96 /DS-2000

Scanner & Fax Card packaged together for a fraction of the cost.

- 9600 Baud facsimile & Scanner
- Auto-Retial, Telephone Directory & Automatic Cover Sheet
- Log of faxes sent and received

COMPLETE PACKAGE INCLUDES...

- Chinon DS-2000 Scanner
- ScanFax 96 Add-In Board
- Facsimile & DS-2000 Utility Software
- Scanner Cable & AC Adapter
- Optional OCR Software.



\$299

QMS IS 300 FULL PAGE SCANNER

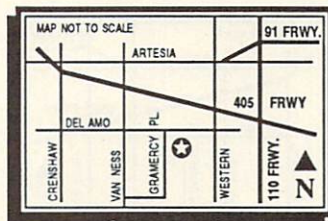


- 300 dpi resolution
- 6 seconds per page
- Complete with Controller Card, Cable & Graphics Software

\$318⁹⁵

OCR Software Add \$149.00

SCANNERS



We buy and sell excess inventories..call or fax list.

20308 Gramercy Place, Torrance, CA 90501 • (FAX: (213) 328-2907

(800) 345-5568 / (213) 328-3344

WE ACCEPT: NSI CHARGE, VISA, MC, AMEX, COD, PO's from qualified firms.

20% restocking fee on all non-defective returns. All returns/adjustments must be made within 15 days. CA residents Add 7% Sales Tax. PRICES SUBJECT TO CHANGE. \$8.50 Minimum Shipping.

No Surcharge On
Credit Card Orders.
We Accept...



NSI
Computer
Products

Come Visit Our

Warehouse/Showroom



TurboScript 3

PostScript Emulation Cartridge

UDP's PostScript cartridge gives you more than other leading brands!

- 47 Postscript fonts—scalable to any point size
- Requires only 1 MB of additional printer memory
- Works on LaserJet II, IIP, IID, and III printers
- Supports Adobe Type 1 font formats

The TurboScript cartridge give you 47 high quality scalable Postscript fonts in any point size, that 12 more than HP's Adobe PostScript or Pacific Data's Pacific Page III Cartridge. It requires 1 MB less printer memory.

TurboScript is ideal for use with desktop publishing and WP applications such as Windows, Pagemaker, Ventura Publisher, Micrografx Designer, WordPerfect, Microsoft Word, Illustrator, Corel Draw and many more.

Postscript features include scaling, reverse type, rotation, shading, patterns, stretching, circles, arcs, clipping path, etc.

Two identical versions available for printer compatibility... TurboScript II for the HP LaserJet II and compatibles and TurboScript III for the HP LaserJet IID, IIP and III.

Compatible with IBM computers and compatibles. An additional appletalk-to-parallel connector box allows you to interface with the Macintosh computer.

\$299⁰⁰

Save \$100.00
\$399.00 Retail Price



47 Scalable Postscript Fonts... that's 12 more fonts than your standard postscript cartridges!

Postscript Effects



Skewed

Outline

Reverse



Clipping path

Impressive

Perspective

Turbo25

More Printing Power with 3.6 to 30 point Fonts

- Turbo25 gives you fonts from 25 HP cartridges plus headline and zingbat fonts
- Contains 152 fonts, 22 character sets and 220 "zingbats"
- Includes drivers for most WP software, including the new Windows 3 environment



The Turbo25 is designed to provide you with economy, flexibility and versatility. You get the most from your laser printer. Name the application: word processing, mathematics, legal, scientific and technical, tax forms, big bold headlines, spreadsheet...

Turbo25 cartridge adds all the right touches, with headline fonts, 22 symbol sets, 3.6 & 4.8 point type for spreadsheets to 30 point type for headlines; portrait and landscape, mono-spaced and proportionally spaced fonts, and much more.

Exceptional type quality. Hand tuned fonts give you crisp and sharp images. And you'll eliminate the need to store and download soft fonts, giving you faster printing and more computer memory.

Works with the HP LaserJet II, IIP, IID and III as well as other HP cartridge compatible printers.

\$178⁰⁰
Save \$120.00
\$298.00 Retail

NSI
Computer Products

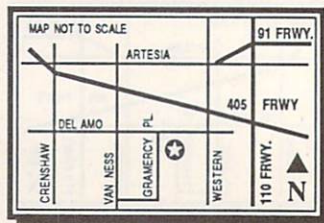
We buy and sell excess inventories...call or fax list.

20308 Gramercy Place, Torrance, CA 90501 • (FAX): (213) 328-2907

(800) 345-5568 / (213) 328-3344

WE ACCEPT: NSI CHARGE, VISA, MC, AMEX, COD, PO's from qualified firms.
20% restocking fee on all non-defective returns. All returns/adjustments must be made within 15 days. CA residents Add 7% Sales Tax. PRICES SUBJECT TO CHANGE. \$8.50 Minimum Shipping.

No Surcharge On Credit Card Orders. We Accept...



Come
Visit Our
Pro-65

HP ProCollection Equivalent



- 65 Fonts from the most popular HP typestyle. Many in portrait and landscape.
- Lots of legal character sets
- Font sizes from 3.6 to 14 points
- Largest selection of drivers, provided by software vendors

The Pro-65 gives you more of the fonts you use everyday. This cartridge is compatible with all HP LaserJets, including compatibles like Epson EPL-6000 and Toshiba PageLaser6.

\$129⁰⁰ Save 50%
\$249.00 Retail

Paper & Envelope Trays

For LaserJet II and IID

Letter Size Tray, 200 sheet capacity (#T-LT) \$59.00

Legal Size Tray, 200 sheet capacity (#T-LG) \$59.00

Envelope Size Tray, 15 envelope capacity (#T-EN) \$69.00

Buy 2 Trays
SAVE 15%
Buy 1 set of 3 Trays
SAVE 25%

Warehouse/Showroom

TurboGold

167 complete font sets,
22 symbol sets and
222 graphic symbols

- It's 3.6 body copy pt. to its 48 pt. headline font makes this cartridge great for word-processing
- 3.6 & 4.8 pt. fonts for Spread sheets
- Script fonts from 12 pt. to 48 point makes terrific certificates
- 14 different fonts for scientific and technical typing
- Driver support for many popular wordprocessing & spreadsheet programs, including Windows
- Works with HP LaserJet II, IIP, IID, III, IIID, Epson EPL-7000, Star Macronics, & Star LaserPrinter 4. Other printers may be able to use this cartridge if they emulate one of printers mentioned.



\$239⁰⁰ Save \$100.00
\$339.00 retail

New!!

UDP MEMORY BOARD for
HP LaserJet IIIP. Call.

All UDP Products comes
with 60-day unconditional
money back guarantee.
Ten year warranty on
all products.

IBM 4019



Laser Font Card

UDP Compatible
Font Card for
IBM 4019 & Compatible Printers

- Packed with 209 Fonts.
- Emulates Pacific Data's "25 in One" cartridge
- All font in portrait; the printer rotates all fonts to landscape
- Come with drivers for many popular applications and Windows 3.0 (with VGA screen fonts) in both HP emulation and IBM native modes.
- **Plus...** access to Pacific Data's "25 in One" driver, HP's ProCollection driver, IBM's Universal Card (#800) driver and other drivers for HP and IBM fonts.
- Typestyles: UDP Helv, UDP Trms, Trms Math, Prestige Elite, Math Elite, Courier, Letter Gothic, Presentation, Presentor, Line Draw, PC Line and Tax Line
- Headline fonts, 16 symbol sets, 3.6 to 18 point type

\$250⁰⁰ Save \$100.00
\$350.00 Retail

C6 Bar Codes & More

Zip+4 Bar Code
Save 5.7 per Envelope*

Barcode 3-of-9 12 pt./8.1 pitch 12pt./4.6 pitch	Letter Gothic 9.5 point Letter Gothic 12 point Letter Gothic 14 point Line Draw 12 point 401 OCR-A 12 point OCR-B 12 point US ZIP
EAN/UPC 10 mil 13 mil	

Plus...

*Bar Code 3 of 9 & *UPC Codes
... All in 1 Cartridge!!

\$119⁰⁰ SAVE!!!
\$195.00 Retail

* Call U.S. Post Office for further information.



We buy and sell excess inventories...call or fax list.
20308 Gramercy Place, Torrance, CA 90501 • (FAX: (213) 328-2907
(800) 345-5568 / (213) 328-3344

WE ACCEPT: NSI CHARGE, VISA, MC, AMEX, COD, PO's from qualified firms.
20% restocking fee on all non-defective returns. All returns/adjustments must be made within 15 days. CA residents Add 7% Sales Tax. PRICES SUBJECT TO CHANGE. \$8.50 Minimum Shipping.

No Surcharge On
Credit Card Orders.
We Accept...



NSI
Computer
Products

LASER ACCESSORIES

MEMORY PRODUCTS

Come Visit Our Warehouse/Showroom

IBM PS/2 MEMORY

CAT. #	DESCRIPTION	NSI
30F5348	512KB Upgrade PS/2 30 286	44.00
30F5360	2MB Upgrade PS/2 30 286	128.00
6450372	2MB Memory Adapter 6450367	395.00
6450603	1MB SIMM PS/2 70-E61; 121	68.00
6450604	2MB SIMM PS/2 50Z-70	108.00
6450608	2MB SIMM PS/2 70 - A21	128.00
34F2933	4MB SIMM PS/2 55SX; 65SX	279.00
6450375	1MB Mem. BD PS/2 80-041	96.00
6450379	2MB Mem. BD PS/2 80 111-321	158.00
6451060	4MB Mem.BD PS/2 80-A21-A31	298.00
6450605	2-8MB Xpand Mem. PS/2 70&80 w/2MB	348.00
34F3077	2-14MB Xpand BD. PS/2 70&80 w/2MB	388.00
6450609	2-14MB Xpand BD. PS/2 50-65SX w/2MB	388.00

CALL FOR PS/1 MEMORY

AST MEMORY

CAT. #	DESCRIPTION	NSI
500510-001	512K Upgrd Kit Prem 286 FASTRAM	39.00
500510-002	2MB Upgrd Kit Prem WS 386SX; WS 286; Bravo 286 & 386SX; Rampage Plus 286; Advmtg Prem 4/2; Ram Advmtg Advantage	118.00
500510-003	1MB Upgrd Kit Premium 386	98.00
500510-004	4MB Upgrd Kit Prem 386; Rampage Plus/MC; Advmtg 286 & 386	310.00
500510-007	1MB Upgrd Kit Prem 386C; 386/16	65.00
500510-008	4MB upgrd Kit Prem 386C; 386/16	230.00
500510-010	512K Upgrd Kit Prem WS 386SX & WS 286; Bravo 286, Rampage + 286	39.00
500510-011	128K Upgrd Kit Bravo 286	40.00
500709-001	512K Upgrd Kit Adm /2; Rampage PC	40.00
500709-003	512K Upgrd Kit Rampage Plus/MC	40.00
500718-001	1MB Mod. Prem 386/25 & 386SX/16	65.00
500718-002	1MB Mod. Prem 386/33-25; SX/16; 486/33,25T; 25T; 25; 25E; Adapter Board 500722-004	75.00
500718-004	2MB Upgrd Kit Prem 486 Series	186.00
500780-001	8MB Kit Prem 486 Series	870.00
500818-004	1-16MB Exp Bd Prem 386/25-33; Prem 486's	450.00
ASTSX20	1MB Mod Prem II 386SX/20	84.00

HP (CPU) MEMORY

Cat. #	DESCRIPTION	NSI
D1354A	2MB Up-Kit Vectra QS/16S & ES12 PC	114.00
D1640A	1MB Up-Kit VECTRA QS/20PC; RS25PC & 20C	62.00
D1642A	1MB Up-Kit VECTRA QS/20PC; RS25PC & 20C	234.00
D1540A	1MB Up-Kit VECTRA QS/16S	62.00
D1540A	1MB Up-Kit VECTRA QS/16S	62.00
D2150A	1MB Mod VECTRA 486 PC	78.00
D2151A	4MB Mod VECTRA 486 PC	282.00
D2152A	8MB Mod VECTRA 386/25; 486PC	930.00
D2381A	2MB Mod VECTRA 386/25 PC	144.00

ZENITH MEMORY

CAT. #	DESCRIPTION	NSI
ZA180-64	2MB Card Super Sport SX; 286E	240.00
ZA180-66	1MB Card Super Sport 286; 286E	180.00
ZA180-86	2MB Card Super Sport SX (ALPHA)	240.00
ZA180-87	2MB Card Super Sport SX (BETA)	240.00
ZA3034ME	1MB Card Turbo Sport 386E	199.00
ZA3034ME2	4MB Card Turbo Sport 386E	590.00
ZA3034ME2	4MB Card Turbo Sport 386E	590.00
ZA3600ME	1MB Mod. Z-386/20-25-33-33E	79.00
ZA3600MG	2MG Mod. Z-386/20-25-33	130.00
ZA3800ME	1MB Mod. Z-386/20-25-33-33E	79.00
ZA3800MK	4MB Mod. Z-386/20-25-33-33E	268.00

TOSHIBA MEMORY

CAT. #	DESCRIPTION	NSI
PC6-PA7137U	3MB Mem Card Port. T3200	228.00
PC7-PA8301U	2MB Mem Card Port. T5100	168.00
PC8-PA8302U	2MB MemCard Port. T1600	162.00
PC9-PA8340U	512K Mem Card Port. T3100E	120.00
PC9-PA8341U	2MB Mem Card Port. T3100E	168.00
PC10-PA8304U	2MB Mem Card Port. T5200 Toshiba Desktop T8500	168.00
PC12-PA8307U	2MB Mem Card Port. T3200SX	168.00
PC12-PA8309U	4MB Mem. Card Port. T3200SX	389.00
PC14-PA8306U	2MB Mem Card Port. T1200XE	168.00
PC14-PA8311U	1MB Mem Card Port. T1000SE; T1000XE	218.00
PC14-PA8312U	2MB Mem Card Port. T1000SE; T1000XE	276.00
PC15-PA8308U	2MB Mem Card Port. T3100SX	162.00

COMPAQ MEMORY

CAT. #	DESCRIPTION	NSI
107331-001	512KB Upgrade Portable III	38.00
107332-001	2MB Upgrade Portable III	118.00
107651-001	1MB Module Portable 386	218.00
107653-001	4MB Xpand Mem. Portable 386	630.00
107654-001	4MB Mem. Xtension Portable 386	630.00
108069-001	1MB Xpand Memory DP386-16	288.00
108070-001	4MB Xpand Memory DP386-16	630.00
108071-001	1MB Memory Upgrade DP386-16	108.00
108072-001	4MB Memory Upgrade DP386-16	438.00
110235-001	1MB Memory BD Slt 286	162.00
110237-001	4MB Memory BD Slt 286	630.00
112534-001	4MB Module DP386S-16	298.00
113131-001	1MB Module DP386S286E, 386 20-25E	96.00
113132-001	4MB Module DP2886E, 386 20-25E	228.00
113633-001	1MB Xpand Mem. DP386S-16	148.00
113634-001	4MB Xpand Mem. DP386S-16	358.00
113644-001	1MB Xpand Mem. DP386 20E, 25E	148.00
113645-001	4MB Xpand Mem. DP386 20E, 25E	358.00
113646-001	1MB Module DP386S-16	110.00
115144-001	1MB Module DP386S-33, 486-25, Syspro	158.00
116561-001	8MB Module 486-25, Syspro	899.00
116568-001	32MB Module DP486-25, Syspro	4,990.00
117077-001	512KB Mem. BD Portable LTE	119.00
117081-001	1MB Mem. BD Portable LTE 286	99.00
117081-002	2MB Memory BD Portable LTE 286	158.00
118304-001	1MB Module for SLT7386	174.00
118304-002	2MB Module for SLT7386	276.00
118305-001	4MB Module for SLT7386	630.00
118688-001	1MB Module DP286N, 386N	90.00
118689-001	2MB Module DP386N, 386S-20	168.00
118690-001	4MB Module DP286N, 386N, 386S-20	396.00
118700-001	0-4MB Exp-BD DP286N, 386N	108.00

NEC MEMORY

Cat. #	DESCRIPTION	NSI
APCH655X	2MB Mod Powermate 386/25	458.00
APCH656X	8MB Expansion Bd. Powermate 386/25	1,190.00
APCH657X	3MB Base Bd. Powermate 386/25	1,250.00
APCH850E	1MB Expansion Bd. Powermate SX Plus	240.00
APCH852E	4MB Expansion Bd. Powermate SX Plus	690.00
PC21-21	1MB CD ProSpeed 286; 386SX	245.00
PC21-22	4MB CD ProSpeed 286; 386SX	569.00
PC21-26	2MB CD ProSpeed 286; 386SX	309.00
PC31-21	2MB CD ProSpeed 386	319.00
PC31-22	8MB CD ProSpeed 386	1,190.00
KTN2000SX	2MB Exp. Bd. Powermate SX Plus	440.00
KTN8000SX	8MB Exp. Bd. Powermate SX Plus	1,190.00

LASER PRINTER MEMORY

Cat. #	WORKS WITH	NSI
H33474B	1MB HP Laser Jet IIP, III, IID	99.95
H33475B	2MB HP Laser Jet IIP, III, IID	139.95
H33477B	4MB HP Laser Jet IIP, III, IID	214.95
H33434B	1MB HP Laser Jet II & IID	99.95
H33444B	2MB HP Laser Jet II & IID	139.95
H33445B	4MB HP Laser Jet II & IID	214.95
EP1000	1MB Epson EPL-6000	129.00
EP2000	2MB Epson EPL-6000	169.00
EP4000	4MB Epson EPL-6000	249.00
T11000	1MB Texas Instrument MicroLaser PS	129.00
TB1000	1MB Toshiba Page Laser 6	118.00
TB2000	2MB Toshiba Page Laser 6	164.00
TB3000	3MB Toshiba Page Laser 6	208.00
TB4000	4MB Toshiba Page Laser 6	248.00
1039136	1MB IBM Laser 4019; 4019E	129.00
1039137	2MB IBM Laser 4019; 14019E	169.00
1038675	3.5MB IBM Laser 4019; 4019E	229.00
M6005	1MB Apple LaserWriter II/NTX	85.00
M6006	4MB Apple LaserWriter II/NTX	319.00
S63-1300	1MB Canon LBP-8II	119.00
S63-1880	2MB Canon LBP-8II	189.00
N/A	4MB Canon LBP-8II	269.00
PA1000	1MB Panasonic KXP4420; KXP4450I	118.00
PA2000	2MB Panasonic KXP4420; KXP4450I	164.00
PA3000	3MB Panasonic KXP4420; KXP4450I	208.00
PA4000	4MB Panasonic KXP4420; KXP4450I	248.00

MEMORY BOARDS BOCA RESEARCH

BOCARAM/XT—Provides up to 2MB of expanded memory for 8 bit bus. Operates up to 12 Mhz. Uses 256K D-RAM—		
with OK	.....	\$120.00
with 512K	.....	139.00
with 2MB	.....	199.00
BOCARAM/AT PLUS—Provides up to 8MB of extended, expanded or backfill memory. Operates up to 33Mhz and is set software. Uses 256K D-RAM—		
with OK	.....	\$109.00
with 2MB	.....	199.00
with 4MB	.....	\$289.00
with 8MB	.....	459.00
BOCARAM/AT-IO PLUS—Provides up to 4MB of Extended, Xpanded or backfill memory. For 16 bit bus. Operates up to 33 Mhz and is set software. has serial and parallel port. Uses 1MB D-RAM—		
with OK	.....	\$149.00
with 2MB	.....	239.00
BOCARAM 30—Provides up to 2MB of expanded memory for IBM PS/2 model 25, 30 and 8-bit bus utilizing 3.5" floppy disks. Uses 256K D-RAM—		
with OK	.....	\$109.00
with 2MB	.....	199.00
BOCARAM 50/60—Provides up to 4MB expanded, extended or backfill memory for PS/2 model 50, 60. Uses 1MB D-RAM—		
with OK	.....	\$119.00
with 2MB	.....	209.00
with 4MB	.....	299.00
BOCARAM 50Z—Provides up to 2MB, 0 wait state, expanded or extended memory for IBM, PS/2 model 50, 50Z, 60. Uses 11MB D-RAM—		
with OK	.....	\$99.00
with 2MB	.....	189.00

SIMM MODULES

	150	120	100	80	70	60
256x8	15.00	17.00	19.00	22.00		
256x9	17.00	19.00	21.00	24.00		
1MBx8			50.50	51.00	60.00	65.00
1MBx9			53.50	54.95	65.00	68.00
4MBx8					224.00	234.00
4MBx9					234.00	244.00
					274.00	284.00

DRAM CHIPS

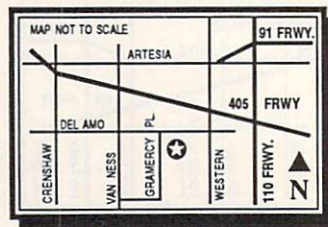
	150	120	100	80	70	60
64x1	.90	1.20	1.50			
64x4		2.00	2.15	2.50		
256x1	1.25	1.40	1.60	1.85	2.10	
256x4		5.35	5.70	6.00	6.75	7.75
1MBx1			5.45	5.65	6.50	7.50

Catalog/municipal part numbers are for your convenience. All products are 3rd party manufactured. 100% Compatible. ALL MEMORY PRODUCTS COME WITH 5 YEAR UNCONDITIONAL WARRANTY. CALL FOR QUANTITY PRICES.

We buy and sell excess inventories..call or fax list.
20308 Gramercy Place, Torrance, CA 90501 • (FAX: (213) 328-2907
(800) 345-5568 / (213) 328-3344

WE ACCEPT: NSI CHARGE, VISA, MC, AMEX, COD, PO's from qualified firms.
20% restocking fee on all non-defective returns. All returns/adjustments must be made within 15 days. CA residents Add 7% Sales Tax. PRICES SUBJECT TO CHANGE. \$8.50 Minimum Shipping.

No Surcharge On Credit Card Orders. We Accept...



Come Visit Our
HARD DRIVES

Warehouse/Showroom

Model Name Description NSI Price

SEAGATE

ST151(MFM)	40MB 24ms 3.5"	\$278.00
ST157R-1(RLL)	49MB 28ms 3.5"	218.00
ST251-1(MFM)	42MB 28ms HH	208.00
ST4096(MFM)	80MB 28ms FH	508.00
ST4144R(RLL)	122MB 28ms FH	468.00
ST157A(IDE)	44MB 28ms 3.5"	198.00
ST1102A(IDE)	84MB 20ms HH	408.00
ST1144A(IDE)	125MB 20ms HH	468.00
ST1162A(IDE)	143MB 15ms 3.5"	638.00
ST1239A(IDE)	211MB 15ms 3.5"	778.00
ST2274A(IDE)	193MB 16ms HH	1,178.00
ST2383A(IDE)	338MB 16ms HH	1,980.00
ST2106E(ESDI)	94MB 18ms HH	598.00
ST2182E(ESDI)	160MB 15ms HH	958.00
ST2383E(ESDI)	337MB 15ms HH	1,298.00
ST4182E(ESDI)	160MB 16.5ms FH	828.00
ST4383E(ESDI)	328MB 18ms FH	1,288.00
ST442E(ESDI)	373MB 16ms FH	1,419.00
ST4766E(ESDI)	660MB 15.5ms FH	1,878.00

CONNER

CP3044(IDE)	42MB 25ms 3.5"	224.00
CP3184(IDE)	84MB 25ms 3.5"	370.00
CP3104(IDE)	104MB 25ms 3.5"	409.00
CP30104(IDE)	120MB 17ms 3.5"	449.00
CP3204(IDE)	209MB 16ms 3.5"	669.00

MAXTOR

XT4170E(ESDI)	157MB 14ms FH	\$855.00
XT4230E(ESDI)	203MB 16ms FH	1,129.00
XT4380E(ESDI)	338MB 16ms FH	1,240.00
XT8380E(ESDI)	360MB 14ms FH	1,265.00
XT8760E(ESDI)	676MB 16ms FH	1,865.00
8051A(IDE)	42MB 28ms 3.5"	279.00
7040A(IDE)	42MB 19ms 3.5"	299.00
7080A(IDE)	81MB 19ms 3.5"	399.00
LXT200A(IDE)	207MB 15ms 3.5"	829.00

CALL FOR ALL OTHER DRIVES & CONTROLLER CARDS

MousePen



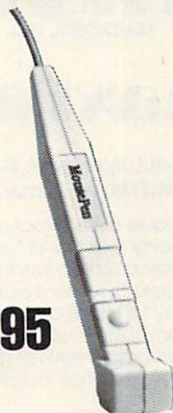
Works like a mouse, shaped and held like a pen! Light, Responsive, Easy to Use!

The Mouse Pen is comfortable with either hand and requires minor wrist movement to operate and adjust its response automatically to your movement. It is the most advanced pointing device technology available today. Uses existing drivers in Windows and works with Microsoft or IBM OS/2 drivers.

Includes...

- Microsoft compatible driver
- Menu Maker utility software for non-mouse applications
- TelePAINT TM, a color paint program with VGA support
- IBM PS/2 mouseport connector
- Adapter for DB9 and DB25 serial ports
- 5-1/4" and 3-1/2" diskettes
- User Manuals & Custom Pen holder

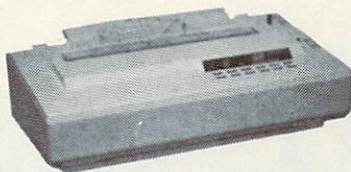
\$48⁹⁵



Color Plotter

- Handles paper sizes up to 14" x 26-1/2"
- High Resolution Matrix Printer Output of 240x480 dpi
- Four Resident Character Fonts w/ 19 optional fonts available
- Emulates Epson, IBM & Diablo
- Large Alphanumeric LED display

\$519



intel Math-Co Processors

Most MS-DOS machines and turbo boards can accept an optional math co-processor chip like Intel's 8087, 80287 or 80387 in order to dramatically speed up the system's floating point (or real number) arithmetic calculation. This increase is only realized if the software the user is running is designed to utilize these chips. Many programming languages, spreadsheets and CAD packages are developed to do so. To select the right co-processing chip, the processor's series and clock speed must match. If the machine has a multispeed CPU, the chip should match the system's highest clock speed.

The Intel Math CoProcessor is an inexpensive way to make over 1000 powerful software programs run even faster. The Math CoProcessor offloads the complicated math function from your computer's main processor, and handles in one instruction what would have required many steps with the standard processor. Depending on your application, your software will run up to five times faster.

INTEL 387 DX-33

Math CoProcessor for 33MHz 386 DX-based computers including the Zenith Z-386/33, Compaq DeskPro 386/33, and CompuAdd 333. The fastest Intel technology. Cat. # BOX387DX-33 \$269.00

INTEL 387 DX-25

Math CoProcessor for 25 MHz 386 DX-based computers, including 25MHz IBM PS/2 Model 70, Compaq DeskPro 386/25, and CompuAdd 325. Up to 20% faster than the previous Intel 387 DX-25 Math CoProcessor. Cat. # BOX387DX-25 \$259.00

INTEL 387 DX-20

Math CoProcessor for 20MHz 386 DX-based computers including 20MHz IBM PS/2 Model 70, Compaq DeskPro 386/20, and CompuAdd 320. Up to 20% faster than the previous Intel 387 DX-25 Math CoProcessor. Cat. # BOX387DX-20 \$249.00

INTEL 387DX-16

Math CoProcessor for 16MHz 386 DX-based computers, including 16MHz IBM PS/2 Model 70 and 80, CompuAdd 316sl, and Intel InboardTM 386/PC. Up to 20% faster than the previous Intel 387DX-16. Cat. # BOX387DX-16 \$179.00

INTEL 387 SX-20PC

Math CoProcessor for 20MHz 386 SX-based computers, including the CompuAdd 320s and Dell 320LX. Cat. BOX387SX-20 \$199.00

INTEL 387 SX-16

Math CoProcessor for 16MHz 386 SX-based computers, including the Compaq 386, IBM PS/2 55SX, and CompuADD 316s. Cat. # BOX387SX-16 \$159.00

80287 Math CoProcessor

Math CoProcessor for all 286-based computers (except those specially designed for the s87XLT) Up to 50% faster than previous Intel 287 Math Co-Processors.

80287 XL	\$99.00
80287-10 MHz	\$89.00
80287-8 MHz	\$69.00
80287-6 MHz	\$49.00

8087-1

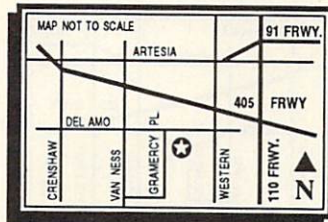
Math CoProcessor for 8088 or 8086 based computers or accelerator boards running at 10MHz or less, such as the CompuAdd 810. Cat. # BOX8087-1 \$99.00

8087-2

Math CoProcessor for 8088- or 8086-based computers running at 8MHz or less, including the IBM PS/2 Model 30 and Compaq DeskPro. Cat. # BOX8087-2 \$79.00

8087-3

Math CoProcessor for 8088- or 8086-based computers running at 5MHz or less, including the IBM PC, XT, and Compaq Portable Plus. Cat. # BOX8087 \$59.00



We buy and sell excess inventories..call or fax list.
20308 Gramercy Place, Torrance, CA 90501 • FAX: (213) 328-2907
(800) 345-5568 / (213) 328-3344

WE ACCEPT: NSI CHARGE, VISA, MC, AMEX, COD, PO's from qualified firms. 20% restocking fee on all non-defective returns. All returns/adjustments must be made within 15 days. CA residents Add 7% Sales Tax. PRICES SUBJECT TO CHANGE. \$8.50 Minimum Shipping.

No Surcharge On Credit Card Orders. We Accept...



MATH-CO/DRIVES/&MORE...

FAX / MODEM CARDS

Come
Visit Our

Warehouse/Showroom



FAX/MODEM CARDS

For IBM Compatible Desktop & Portables

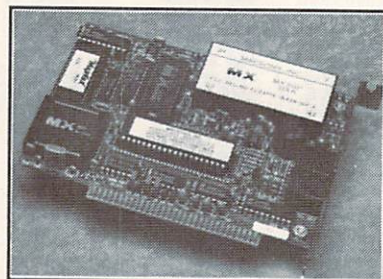
MaxFax 9624

Powerful, Intelligent, Group 3 Compatible 9600 bps Fax and Hayes Compatible 2400 bps Modem Card

- Unique auto direct compatibility
- Background and "unattended" operation
- Dedicated on-board microprocessor & powerful software package
- Supports several popular printer and page scanners
- Easy to install and setup
- Compatible with IBM PC, XT, AT, PS/2 Model 30, Compaq DeskPro 386 and all other IBM compatible PCs.
- Compact half-card size to fit most portable & laptops

SEND & RECEIVE

\$128⁹⁵

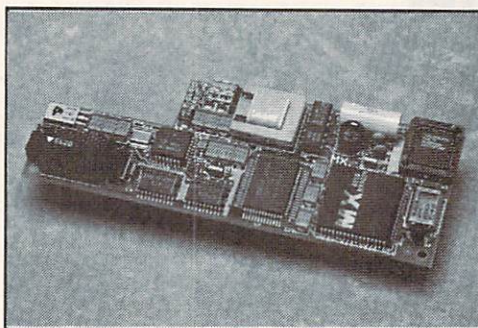


MaxFax 9624LT-T

For Toshiba Laptops... Custom Designed to Occupy the Internal Dedicated Modem Slot of Most Toshiba Laptops

- 9600 bps Group 3 compatible facimile
- 2400 bps Hayes compatible Modem
- Designed to fit the Internal T24C/D slot of Toshiba's T1000SE, T1000XE, T1200, T1200XE, T1600, T3100SX and T3200SX, Laptops
- Equipped with a powerful, user-friendly, menu-driven software package
- Multiple phone books with Edit function
- Word processing and graphics programs

\$298⁹⁵



MaxFax 9264LT-C

Designed For the Compaq LTE Family of Notebook Computers (Same features as the MaxFax 9624LT-T)

MaxLite/PC

Pocket Size Portable Fax/Modem Designed for Use with the IBM Compatible Desktop and Portables

- Send and receive Fax/Modem with 9600 bps, Group 3 compatible Fax & Hayes compatible 2400 bps Modem
- Interface with the PC via the RS232 Serial Port
- Dedicated on-board microprocessor to support background and "unattended" operations
- Unique Auto Direct feature automatically differentiates a Fax call from a Modem call and process accordingly
- Optional Software converts the MaxLite into a Macintosh version
- Operates on AC or Battery power
- On/Off switch to prevent battery drainage

ALSO AVAILABLE FOR MACINTOSH

\$298⁹⁵



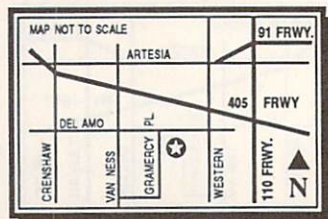
All Macronix Products come with 1 year limited warranty

INSI
Computer Products

We buy and sell excess inventories...call or fax list.
20308 Gramercy Place, Torrance, CA 90501 • (FAX: (213) 328-2907
(800) 345-5568 / (213) 328-3344

WE ACCEPT: NSI CHARGE, VISA, MC, AMEX, COD, PO's from qualified firms.
20% restocking fee on all non-defective returns. All returns/adjustments must be made within 15 days. CA residents Add 7% Sales Tax. PRICES SUBJECT TO CHANGE . \$8.50 Minimum Shipping.

No Surcharge On Credit Card Orders. We Accept...



PATHWAYS

Steven Anzovin

CYBERWOCKY

*'Twas brillig, and the slithy toves
Did gyre and gimble in the wabe;
All mimsy were the borogoves
And the mome raths outrage.*

Those lines from Lewis Carroll's "Jabberwocky" may not sound like the future of computing to you, but if you listen closely, you can hear them in all the talk about VR (Virtual Reality), perhaps the ultimate computer buzzconcept.

The whole idea of VR, which we'll define here as "a computer-generated simulation of real experience," has given birth to a staggering amount of verbal goulash, much of which makes "Jabberwocky" sound sensible.

Virtual reality, artificial reality, synthetic reality, cyberspace, cyberarts, multimedia, hypermedia, or whatever it is—you know there's some basic confusion here when the experts can't agree on what to call it—is hot stuff right now.

It's attracting plenty of press, including this magazine, and the attention of some big players in the industry—Autodesk, Apple, IBM, Microsoft, VPL Research, Evans & Sutherland, and many more. But since researchers really don't know what they're doing yet, VR stuff tends to stay in the labs. In fact, most of it's just theorizing—virtual VR, so to speak.

Not much VR has filtered down to the real-world level—a few pieces of hardware, like the Gold Brick for the Mac, and some innovative software like *Vista* for the Amiga. You have to look in the journals and attend the conferences to get a real sense of where VR research is headed.

Writing in last year's summer issue of *Multimedia Review*, Randal Walser, manager of the Autodesk Cyberspace project, outlined a VR world sys-

tem that involves a puppet (a virtual actor in the virtual world) controlled by a patron (a real person in the real world). This puppetmaster paradigm leaves me cold—too schizophrenic. Remember the "Twilight Zone" episode in which the evil dummy takes over the ventriloquist?

I go for the virtual telepresence model espoused by Scott Fisher, formerly of the NASA Ames Research Center. In this concept you can take on an entirely different identity (someone rich and famous, for example) and interact with others in their virtual identities. In other words, instead of just watching "Star Trek," you can be in it. As you can see, conceptualizing about VR is still at the infotainment level.

Some thinkers warn us to ground our virtual realities in some aspect of true reality, lest we lose our way in them. (Maybe it's the VR theorists who have lost touch with reality.) While moral and ethical questions don't come up often in mainstream VR research, VR does have its own Moses.

At the last Virtual Reality Conference held in San Francisco in December 1990, Professor Michael Benedikt of the Univer-

sity of Texas brought down from the mountain seven commandments for the design of virtual realities, including:

- The world is indifferent to the user.
- One may not enter a space invisibly.
- Shared spaces exist by the consensus of those sharing them.

It seems that Benedikt's main concern is to prevent cyber-spatial voyeurism. That takes all the fun out of it for me, but my personal favorite is, "Each world contains fewer dimensions than itself." Think about that for a minute.

The academic approach to VR, however, is not for everyone. The really interesting action is elsewhere. For a look at the outlaw fringe of VR—as well as other bizarre manifestations of the electronic age—check out *Mondo 2000* magazine (P.O. Box 10171, Berkeley, California 94709).

Self-described as a "mutazine" for cyberpunks, hackers, crackers, and wild-eyed visionaries, *Mondo 2000* is kind of a blend of *Interview*, *Mother Jones*, *Shaman's Drum*, and *New Media Age*. It covers everything from weird electronic conspiracies—if you believe the letters to the editor, there are a lot of them out there—to the latest trends in drug-free expansion of the senses.

The race for VR (as *Mondo 2000* likes to call it) is fascinating to follow, and the VR toys are fun to play with, but you really have to wonder, why are we so anxious to escape into alternate realities? And given the state of the real world, what makes us think the virtual worlds we create will be any better than the real thing?

Such questions make me a bit anxious about the "frabjous day" when VR is—you'll excuse me—a reality. □



What makes us think the virtual worlds we create will be any better than the real thing?



PART 1

USE YOUR
PC FOR INTELLIGENT
HOME SECURITY

TURN A HOME SWEET HOME INTO A SMART HOUSE

BY HOWARD MILLMAN
PHOTOGRAPHY BY MARK WAGONER

Want to make a computer happy? Give it something to do over and over again. Let it check a window several times a second to see if it's been forced open, or take indoor and outdoor temperatures and constantly adjust the heat accordingly, or "look" to see if someone's entered a room and then turn on the lights if it's after 7:00 p.m. These are typical activities in a computer-controlled Smart House.

In 1984, the National Association of Home Builders (NAHB), who coined the term *Smart House*, developed the idea of a computer-controlled home—whether a house, condominium, or apartment—that would allow owners to spend more time pursuing life's rewards and less time performing routine household tasks. The result of that idea is a 40-million-dollar prototype the NAHB hopes will evolve into an industry standard.

In the meantime, the Electronic Industries Association (EIA) is already promoting a competing standard: the Consumer Electronics Bus, or *CEBus*. The primary difference between NAHB's Smart House and EIA's CEBus is that the Smart House uses a central computer, while the CEBus requires individual devices to have on-board intelligence and computers to exchange data with each other through a common language. Generally, the NAHB standard appears well suited to control equipment and processes while the CEBus delivers greater versatility in controlling appliances.

In addition to NAHB and CEBus, existing standards such as X-10 are also

clamoring for a piece of this quickly expanding market. X-10 devices are popular because they use the home's existing electrical wiring to carry a superimposed signal that controls lights and appliances. However, a major problem with X-10 is that because they're line-carrier devices, line voltage electrical noise sometimes falsely triggers wired-in appliances.

A Low-Cost, High-IQ Security System

The computer-in-residence system designed by *COMPUTE* uses a central computer for two reasons: It involves a lower initial cost, and it's easier to retrofit into an existing building, which makes it a good system to use as a model for your own smart house.

COMPUTE's system consists of four elements: sensors to sample physical events such as temperature, light, sound, motion, and heat; analog/digital cards to convert data received from the sensors into digital form so the computer can understand it; a personal computer with compatible control software to analyze and act on the data it receives; and a series of relays to control different pieces of equipment, processes, and appliances. Since many data-acquisition and control (DA&C) functions are time based, your computer should contain a battery-backed clock and calendar.

This may all sound expensive, but in fact, you can assemble it for less than \$600 if you already have a PC. In fact, if you have an old XT collecting dust in the closet, that's the one you should use. Control software that

operates the security system is written in BASIC and will run under BASICA or GW-BASIC on essentially any PC, including older ones (see Programming Your Smart House below).

The first task you'll want to assign your computer is providing perimeter security. According to a recent U.S. Justice Department survey, burglaries are four times more likely to occur in homes without intrusion alarms. In addition to your improved peace of mind and the property protection, an added bonus to having a system is that some insurance companies provide premium reductions for homes protected by security systems. Be sure to check with your insurance company to find out if you're eligible for such a premium. You may want to switch carriers if not.

At some time or another, most any alarm system is going to inconvenience you—and your neighbors—to some degree, usually in the form of nuisance alarms. A major reason for nuisance alarms is dumb alarm systems that "think" every occurrence warrants an all-hands alert. Such systems are usually activated by a solitary event.

Conversely, a smart alarm system will compare data received from its different sources to determine if a verifiable alarm condition exists. The system we've designed here employs two sensor circuits. Circuit 3 on the analog/digital board you'll use monitors windows and doors with magnetic contacts; circuit 4 uses a low-cost passive infrared detector. When the two data-reporting sources independently confirm activity, the alarm will sound.

While you'll design in some safeguards, you should also recognize that excessive caution is undesirable. Too many precautions mean an overencumbered alarm system may not operate when it should.

PLEASE NOTE: THE FOLLOWING SECTION INVOLVES WIRING YOUR SYSTEM TO DANGEROUS HOUSEHOLD ELECTRICAL CIRCUITS. UNLESS YOU ARE EXPERIENCED WITH HOUSE-HOLD CIRCUITS, LEAVE ALL HIGH-VOLTAGE WIRING TO A LICENSED PROFESSIONAL.

BASE SYSTEM SUPPLIES

Alpha RE-140 eight-relay output card	\$142
Alpha AD-142 eight-channel analog/digital input card	\$142
Alpha AR-133 PC bus adapter	\$ 69
Alpha CA-162 ribbon cable for two cards	\$ 34
Alpha PS-126 12-V power supply	\$ 12

Alpha offers a special package for \$379 that includes these components as well as its CD-113 light sensor and TS-111 temperature sensor, which you'll learn about in January's *COMPUTE*.

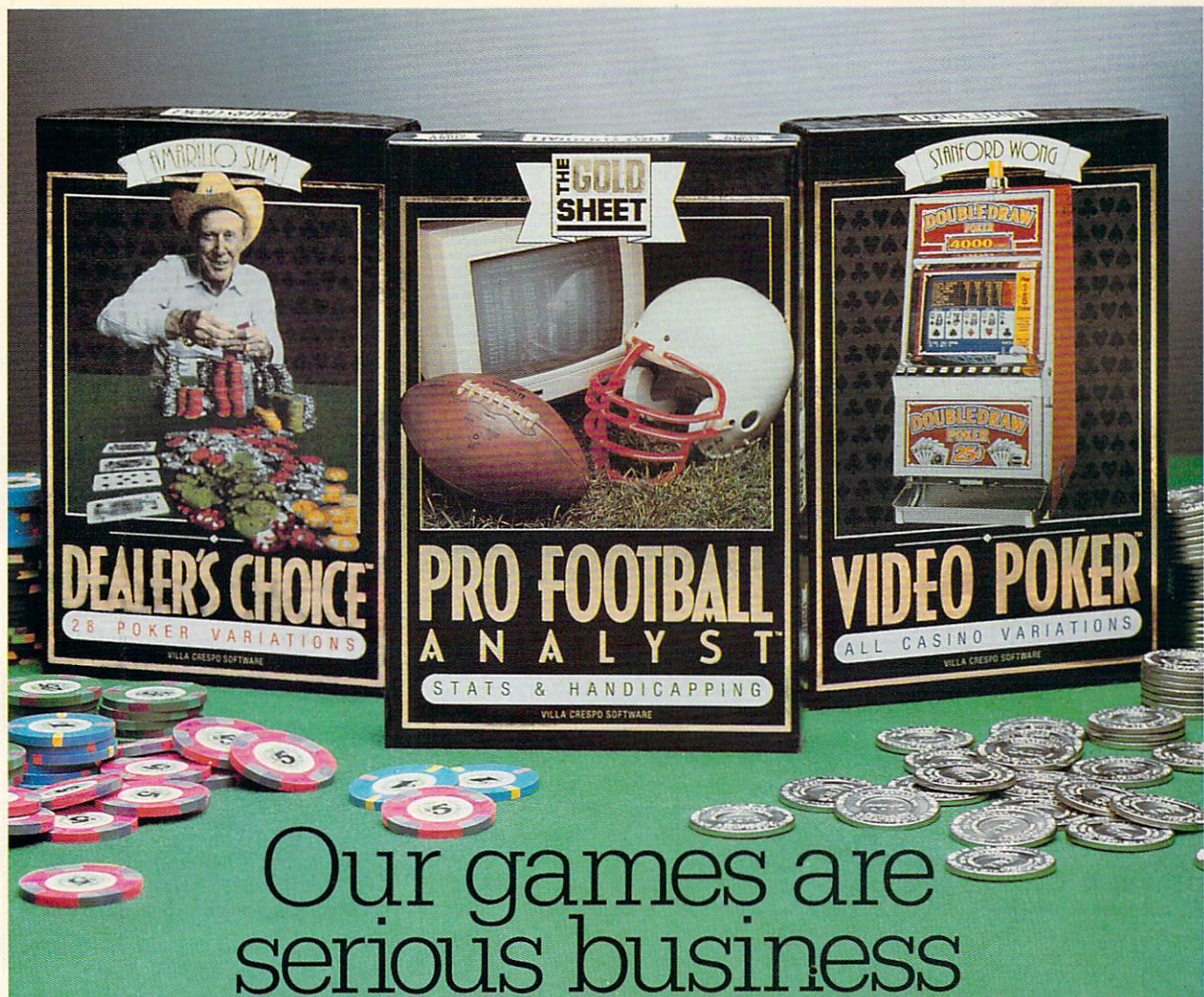
ALARM SYSTEM SUPPLIES

Radio Shack 49-488 internal/external 12-V siren	\$19.95
Radio Shack 49-495 surface-mount magnetic contact	\$ 3.59
Radio Shack 49-496 magnetic contact for concealed mounting	\$ 3.99
Radio Shack 49-521 glass-break sensor	\$ 3.95
Radio Shack 49-531 passive infrared detector	\$59.95
Radio Shack 278-777 double-shielded cable for analog inputs	\$ 7.95
Radio Shack 278-874 six-conductor telephone station wire for digital inputs and all low-voltage outputs	\$14.99
Radio Shack 278-1440 100-foot SPT-2 16-gauge lamp cord for interior 120-V circuits (use weatherproof cable for exterior locations)	\$21.95
Radio Shack 22-127 120-V AC/2-V DC power supply	\$26.95

Installing the Smart Security System

The first step of installing the system is to define the areas of your home you want to include. Depending on the number and type of sensors you choose, the cost of your alarm system components should only total between \$20 and \$150.

Your computer's interface will remain the same for all installations. Alpha Products' DA&C cards are recom-



Our games are serious business

Villa Crespo Software presents a trio of exciting new products for your computer. We are the leading publisher of casino gaming software. Our guarantee: the finest in entertainment and professional instruction. Our critically acclaimed products are recognized for their substance and depth of features. Now, you can gain the winning edge!

And you will have fun as well. Your computer comes alive with casino realism. Built-in tutors and on-line help increase your skill level. Expert endorsing professionals provide you with proven techniques.

Amarillo Slim, *Stanford Wong*, and *The Gold Sheet* invite you into the world of real casino gaming. The action is about to start. . . Join us now.

"With the most opponents, most options, and best gameplay, *Amarillo Slim Dealer's Choice* wins the pot, hands down!" — *Computer Gaming World Magazine*

"The quality and versatility of *Stanford Wong Video Poker* make it a must for players of any skill. Video Poker is entertaining and is fast becoming the most popular of all casino games." — *Casino Player Magazine*

"For statistics and handicapping, nothing we have seen comes close. In actual use ourselves, we found *The Gold Sheet Pro Football Analyst* accurate, easy to use, and rewarding." — *Western Gambler Magazine*

Available at all leading software dealers.
For information write, or call 1-800-521-3963.
1725 McGovern St., Highland Park, IL 60035



HOMEBOT

Samsung's SCOUT-ABOUT may not be R2D2, but it's the closest thing yet to a personal droid—particularly if you're looking for a convenient way to guard your home and, according to its makers, if you're on a budget. The robot will sell for less than \$1,000 when it arrives in stores and catalogs next February.

The SCOUT-ABOUT is what Samsung calls a home service robot, but its main function is to guard your personal property. It will roam any area of your home for up to 50 hours at a time, making its way around objects over two inches high, stopping to check out the conditions of the area it patrols. Using a dual-detection ultrasonic and passive infrared sensory system, the SCOUT-ABOUT alerts an automatic digital dialer by way of radio signals if it detects body heat, motion, a consistent change in air temperature, or shattering glass.

If it isn't convenient for the robot to roam, you can plug it into a wall socket where it acts as a stationary monitor. Running on batteries alone, it will monitor from an idle position for about 70 hours before needing a recharge.

The robot is perfect for apartments, condominiums, vacation homes, small businesses, or any other place needing effective intruder security that's

simple to implement. And at under 16 pounds, it's portable enough to use in automobiles, boats, and campers.

Since SCOUT-ABOUT is equipped with a radio transmitter, it can act as a one-way monitor for the baby's room, allowing you to hear everything within 150 feet of the robot. The SCOUT-ABOUT package also includes a medical alert pendant with a button that directly acti-



vates the autodialer. So if you've fallen and can't get up, the SCOUT-ABOUT may not come to your rescue, but the autodialer will.

For \$1,000, you can assemble a much more elaborate security system than the SCOUT-ABOUT—one that monitors your entire house. Robots won't roam your house, but you'll be secure. —JILL CHAMPION

mended for their excellent quality, ease of use, availability, and competitive prices, and because Alpha's control software, *SMART1*, is included free of charge with orders. However, you should certainly feel free to shop around for what you consider the best components and prices.

One recommended card is Alpha's AR-133 PC bus adapter, which plugs into any available 8- or 16-bit expansion slot of a PC. Also, Alpha makes a CA-162 ribbon cable, which contains two connectors that accept the RE-140 eight-relay output card and the AD-142 eight-channel analog/digital input card, which you'll use.

Circuit 3 on the Alpha AD-142 uses magnetic contacts to detect open doors and windows. For surface-mount contacts, Radio Shack's 49-495 surface-mount magnetic contact works well. For concealed mounting, use Radio Shack's model 49-496 contact. Although circuit 3 appears to have only two sensors, it will accommodate many more, including a glass-break sensor such as Radio Shack's model 49-521. Circuit 4 uses a passive infrared detector, such as Radio Shack's model 49-531, to confirm an intruder's entry.

Install the sensors in series so that power flows through each one. Since this is normally a closed system, an alarm condition exists if any one sen-

sor "opens." You can install multiple detectors (in the same or different areas) by wiring them into a series circuit.

The RE-140 card, mentioned earlier, governs the output—flashing lights and a siren. Wire the flashing-light circuit to 120-volt output 0 on the RE-140 card.

Connect the siren to low-voltage output 7 on the RE-140. For the external siren alarm, use Radio Shack's 12-volt model 49-488 or an equivalent model.

Wires for low voltage (outputs 4, 5, and 6) on the RE-140 can be 24 gauge. Use a minimum three-pair cable to allow for future expansion and spares. Wiring between the 120-volt outputs to the light or lights must be at least 16 gauge and rated for 120-volt service. Be sure to install a snubber circuit here, or make sure your electrician installs it, to protect the relay's points against arcing and to protect the computer against stray signals.

Programming Your Smart House

You must have the right software to operate any computer-based security system. You can order a free copy of Alpha's GW-BASIC control software, *SMART1*, when you buy Alpha components. Data Systems Services also offers an easy-to-use, menu-driven BASIC program for \$134. Both companies are listed in the product information box at the end of this article.

Your basic security alarm system

should now be complete. That's all there is to it. In January's issue of *COMPUTE*, you'll learn how to expand the base system you just set up to include two more elements of intelligent home security—temperature control and lighting management.

Your March issue of *COMPUTE* will conclude the smart house series. There, you'll learn about sophisticated applications that range from using remote control to operate your appliances by telephone to transmitting realtime still video images over ordinary telephone lines to using infrared as well as direct-voice command of your computer's control programming. □

This computer-in-residence system is designed to be installed by you. If you're not familiar with 120-volt circuits, or if your local building codes prevent you from installing line-voltage wiring, have a licensed contractor install the wiring to the lights.

PRODUCT INFORMATION

For more information about buying security-system components and control software, contact the following companies. Radio Shack products can be purchased through a local Radio Shack store.

Alpha Products

303 Linwood Ave.
Fairfield, CT 06430
(800) 221-0916
(203) 259-8813

B&B Electronics

4000 Baker Rd.
Ottawa, IL 61350
(815) 434-0846

Data System Services

38 Amber Dr.
Croton, NY 10520
(914) 271-6883

Electronic Energy Control

380 S. Fifth St.
Columbus, OH 43215
(800) 842-7714

Real Time Devices

820 N. University Dr.
P.O. Box 906
State College, PA 16804
(814) 234-8087

You're encouraged to request home automation catalogs from the following companies, which carry a fascinating assortment of equipment and devices to control practically every appliance and process in your home.

Heath Company

P.O. Box 1288
Harbor, MI 49023
(800) 444-3284

Home Automation Laboratories

5500 Highlands Pkwy., Ste. 450
Atlanta, GA 30082
(800) 445-9605
(404) 319-6000

THE ULTIMATE FLYING MACHINE...

Congratulations – it's 1995 and you've been selected for the hottest seat in helicopter history: the cockpit of the Pentagon's new AH-73M Thunderhawk™. So zip up your flight suit, adjust your sunglasses, and control your nerves 'cause this one makes Nam look like a day at the beach! AH-73M Thunderhawk is the most advanced helicopter combat simulation ever brought to the computer screen.



Thunderhawk™ soars above the rest with these features:

- A helicopter armed with the latest in weaponry, electronic countermeasures, functioning displays and computer-aided targeting systems.
- Realistic missions involving actual military conflicts and contingency plans.
- A true interactive "world" outside your cockpit, with other locations and characters that respond to your actions.
- Campaign scenarios with a multitude of missions.



Available soon for IBM and Amiga.
Thunderhawk is a trademark of Virgin Games, Inc.
Virgin is a registered trademark of Virgin Enterprises, Ltd.
©1991 Virgin Games and Core Design. All rights reserved.
Virgin Games, Inc. 18061 Fitch Ave.
Irvine, CA 92714 1(800)VRG-INO7

FAST FORWARD

David English

WE'RE OFF TO SEE THE WIZARD

They call it Hot 'Lanta. It's the home of Ted Turner, a movie theater that only runs *Gone with the Wind*, and Spring COMDEX, the massive computer trade show. In past years, COMDEX has been a hardware show, but this year the organizers added WINDOWS WORLD, a *Windows* show-within-a-show. Guess where the biggest crowds were. That's right—most of the attendees spent most of their time check-

enough, Upgrade Kits). If you choose the upgrade path, you'll generally get the *Windows* multimedia extensions, a CD-ROM player, and a sound card.

Not surprisingly, the two biggest PC manufacturers were busy showing off their soon-to-be-released Multimedia PCs and Upgrade Kits. IBM is offering two Upgrade Kits that can transform a PS/2 into either a Training System or an Information Delivery System (more product names for lawyers). A Training System is a 386-based PS/2 that includes a

VGA monitor, a laser disc player, and IBM's M-Motion sound card, as well as support for touch input. An Information Delivery System is a 286-based PS/2 with VGA graphics, a CD-ROM, and

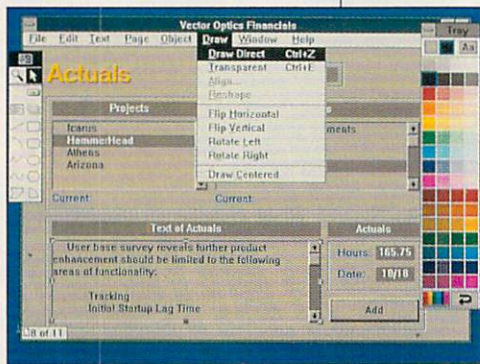
Turtle Beach Systems showed its new 16-bit sound card, called MultiSound, which provides CD-quality sound for \$995. With a top-selling Proteus synthesizer built into the card, this represents a truly significant price breakthrough for adding professional-quality sound to *Windows* applications.

In software, Passport Designs announced that its latest version of *Master Tracks Pro* (\$395.00) supports *Windows* with *Multimedia*. It's currently the top *Windows*-based MIDI-sequencer program, but expect one of the major Macintosh MIDI-software developers to announce a competing *Windows* product real soon now. Brown-Waugh showed its new *Cyber Animator* (\$199.95), a low-cost *Autodesk Animator* competitor that can read *Animator FLI* files. You can have individual animation frames trigger sound effects that play through a Sound Blaster.

Asymetrix demonstrated a faster version of *ToolBook* (version 1.5, \$395). It displays objects on the screen 30–40 percent faster than before. A special multimedia version of *ToolBook* should be available by the time you read this. And U-Lead wowed the crowd with its new *PhotoStyler* (\$795), a slick new image-processing program that's similar to *Adobe Photoshop* and *ColorStudio* on the Macintosh. It's the first serious 24-bit-color photo-editing program for the PC. More are on the way.

The rest of the new multimedia hardware and software will have to wait for future columns. Spring COMDEX proved that multimedia isn't all smoke and mirrors. These are real products that can turn frustrated nonprogrammers (or tinkering weekend programmers) into professional-level multimedia wizards. □

Asymetrix's *ToolBook 1.5* was just one of the new multimedia products shown at COMDEX.



ing out the latest offerings in *Windows* programs.

Within WINDOWS WORLD, you could find a section devoted to *Windows*-based multimedia products (sort of a show-within-a-show-within-a-show). Microsoft was touting the imminent release of *Microsoft Windows graphical environment 3.0 + Multimedia Extensions 1.0*. That's the official name for what Microsoft used to call *Multimedia Windows*. It's a name only a lawyer could love and journalists and computer users will quickly come to hate. According to Microsoft, the official informal name is *Windows with Multimedia*.

Whatever you call it, it should be available by the time you read this, either in the form of new PCs (officially called Multimedia PCs) or upgrade kits (called, oddly

an 8-bit sound card.

Tandy, the other big PC manufacturer, announced three Multimedia PCs—a 16-MHz 80286, a 20-MHz 80386SX, and a 16-MHz 80386DX. All three include an internal CD-ROM drive, Tandy's multimedia sound board (with full MIDI support and Sound Blaster compatibility), and a VGA Plus video card and monitor (for a resolution of 640 x 480 with 256 colors). Tandy's Upgrade Kits include *Windows with Multimedia*, a CD-ROM drive, and Tandy's multimedia sound board. The kits sell for \$799.95 (with an internal CD-ROM drive) and \$899.95 (with an external CD-ROM drive). By the way, Tandy's new internal CD-ROM drive is a real bargain at \$399.95, and it fully meets the Microsoft multimedia specifications.

MORE BABES. MORE BREWSKIS. MORE BAD JOKES.



nights, however, are a different story!

ERNIE IS BACK!

Welcome to *Spellcasting 201: The Sorcerer's Appliance*. Ernie Eaglebeak is back at Sorcerer University for his sophomore year and he wants to join a fraternity. No problem, except for those quaint, harmless initiation rituals known collectively as... HELL WEEK!

RETURN TO ANIMAL HOUSE

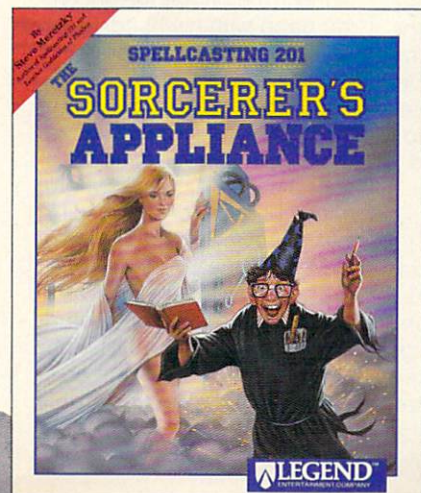
Every night, in a mysterious chamber below the fraternity house, a vindictive pledgemaster dons a ceremonial chicken suit and burdens Ernie with a series of ridiculously impossible hazing tasks. Fortunately, Ernie knows where to get help. He creates it!

A TALE OF HIGH EDUCATION AND LOW MORALS

Harnessing the powers of the mysterious Sorcerer's Appliance, Ernie creates a woman. Meet Eve. (It's only been done once before, and that time it cost the guy a rib). Eve is the ideal woman. Well, maybe not ideal, but certainly entertaining.

LEGEND[™]
ENTERTAINMENT COMPANY

Marketed by MicroProse Software, Inc.
ORDER DESK 1-800-879-PLAY
9:00 AM-5:00 PM Monday-Friday
180 Lakefront Drive • Hunt Valley, MD 21030



Ah, college life! Tree-lined walks. Hushed study halls. Ivy-covered professors. The days are filled with the quiet pursuit of knowledge. The

WE HOPE YOU'VE DONE YOUR HOMEWORK

Join Ernie and Eve in this hilarious romp through the bedrooms, turrets, and tunnels of both Sorcerer University and nearby Barmaid U (where grading on a curve takes on a whole new meaning). To pass this course you'll need to cast ridiculous spells, solve ribald puzzles and "interact" with gorgeous women. Any questions? We didn't think so. Class dismissed.

From the scandalous imagination of Steve Meretzky, *Spellcasting 201* is the sequel to his award-winning hit, *Spellcasting 101: Sorcerers Get All The Girls*. These games may be considered unsuitable for young minds, as they contain material and situations that children have already seen in far greater detail on daytime television. Available for MS-DOS and compatibles.



©1991 Legend Entertainment Company. *Spellcasting 201: The Sorcerer's Appliance* is a trademark of Legend Entertainment Company. ALL RIGHTS RESERVED. EGA graphics shown above. Actual screens may vary.

ENTERTAINMENT

COMPUTE CHOICE. Ride herd over a passel of adorable—but shortsighted—rodents in this subterranean diversion.

David Sears

LEMMINGS

I feel driven to play *Lemmings*, and it's not just for the entertainment value. Perhaps Psygnosis has tapped into the human instinct for survival in formulating this perfect blend of puzzle, strategy, and action.

Better known for its less sedate titles that have you blasting every object that dares scroll past on a starscape, Psygnosis downshifts here with surprising results. Unlike most of its other games—unlike most games from many software houses—*Lemmings* doesn't exasperate. Though at times you'll be hard pressed to move all your lemmings from point *a* to point *b*, you'll sense a solution to every level just around the corner, no matter how difficult the gamut of pitfalls appears. Nor does *Lemmings* depend heavily on your manual dexterity. Don't expect to mistime the same segment of play over and over again. Sure, you'll plummet to your death a couple of times, but you'll do better. Your onscreen brothers depend on you.

As the primary controller for all the characters in *Lemmings*, you not only must plan a mass exodus from each perilous level but also must learn the personality traits of your charges. First and foremost, your cartoonish brethren need guidance because they possess the brainpower of common hamsters. Once the hatch opens in the ceiling of each cavernous level, lemmings drop at an alarming rate. They amble forward in their baggy tunics, little green tufts of hair bouncing, until they smack into a wall or rocky



outcropping. Then it's full reverse and off in the opposite direction until they encounter a similar barrier. We might respect the little guys' determination; like most rodents, they'll pace back and forth, slamming into objects and swarming in a manner that renders them all but impervious to your selection and guidance of individual lemmings. If you have a task for a particular lemming to perform, you'd best assign the duty before you lose him in the crowd.

To provoke a lemming to a specific action, position the crosshairs over the standard-issue lemming and click. Depending on which attributes you've chosen on the icon bar, you've just designated a specialized worker, or hero, if you prefer. On the icon bar, you'll find what might seem a perplexing array of customization choices, but that confusion will fade fast. If you don't alter at least a few lemmings in each level, you won't see much of the quirky, exhilarating, and torturous world that

lemmings populate. Of course, they don't experience the apprehension of future levels as much as you might, since they see only the walls in front of them.

Often you'll want to send a scout ahead to pave the way for the masses and to reveal the traps. To do this, let the first lemming out of the gate pass; then change the next lemming to a Blocker. He'll stand in the path of the oncoming gang with his hands up in defiance. The others will bump into him and rebound toward the gate. You might need to plant another Blocker to stem the tide in that direction; pitfalls exist everywhere, and your entire crew could fall into a crevice, lost forever.

Meanwhile, your intrepid explorer may encounter a vertical cliff, a column, or another sheer surface. Select the Climber icon and transfer that ability to the explorer, and he'll clamber straight up. Should

he face a fatal drop on the other side of the mountain, activate the Floater icon and transfer that safety feature to your trailblazer, and no matter how far the drop, he'll parachute serenely down thanks to a trusty umbrella. Unlike most of the attributes you can imbue, Climbing and Floating have staying power. Until the lemming gifted with either or both of those powers dies or reaches the next level, he will retain those abilities.

When your front runner clears the first mountain only to be stopped by a lava flow, do you worry? No, just add Builder to his list of talents, and he'll construct a bridge that will support any amount of pedestrian traffic. You can't use bridges for everything, though. Sometimes you'll have to tunnel horizontally, vertically, or diagonally through a piece of rock or other substance. *Lemmings* supplies you with suitable iconic options for surmounting these obstructions—Basher, Digger, and Miner, respectively. When excavating drones run out of material to displace, they revert to type and won't dig again unless you reassign them special abilities.

With diligence, you'll guide the first of your lemmings out of the worst culs-de-sac and to the egress. There, he'll happily bail out of the cavern, showing you the bottoms of his feet as he crawls up and over to safety. But what about the others? Up to 99 lemmings might have been involved in this subterranean peregrination, and we've left them back at the entrance, bouncing off the walls and one stolid Blocker. Here *Lemmings* teaches the art of sacrifice. To finish the level, that Blocker—the one who's

done such a commendable job deferring his brothers' date with destiny—well, he'll have to die. Choose Bomb and click on your poor, dutiful Blocker. A five-second countdown display begins over his head and stays there until the fateful explosion occurs.

Don't expect remorse or gratitude from the rest of the group. For them, the Blocker just delayed progress. With their mindless intent to go places, the surviving lemmings will troop over the crater left by their defunct comrade, through tunnels excavated by their long-gone nameless kin, and over bridges erected especially for them. Rather like a civil servant, no lemming should expect thanks for a job well done; neither should you.

Your reward for completing a level and orchestrating the actions of so many myopic, disaffected jokers is a password; with it you can return to this point in the game without performing any sort of disk-based save-game procedure. You also merit the intense satisfaction that comes from surviving—even vicariously—the worst the world (or game designers) can throw at you.

You'll have to play *Lemmings* for the PC solo. The design team left behind the two-player version offered for other machines. Don't fret over that loss too much; the two-player game might seem more entertaining at first because players can cooperate, but soon enough, they'll start killing off each other's lemmings just because they can. Playing *Lemmings* on your own should provide adequate challenge and allow you to focus on the real object of the game—saving as many lemmings as possible.



Though not the most graphically detailed creatures, lemmings animate flawlessly, and when they combust, explode, drown, or grind themselves into hamburger, you'll be quite aware of what they go through. With a sound card, *Lemmings* supplies a satisfactory array of thuds and chirps and—while not traditional Psygnosis disco by any stretch—a charming soundtrack.

Squint at *Lemmings*, and you'll see a number of metaphors ideal for mention in the conversational circles of the sociologically minded. Draw comparisons between *Lemmings* and the me-first, me-now generation; your friends who never play computer games will marvel at your insight and wonder if they shouldn't buy a machine of their own. Mention the fun, too, of course—that sells more games than any amount of political correctness. □

IBM PC and compatibles, 512K RAM, CGA, EGA, VGA, or Tandy 16-color; supports Ad Lib and Sound Blaster, supports mouse and joystick—\$49.99
Also available for Amiga—\$49.99 and Atari ST—\$49.99

PSYGNOSIS
29 St. Mary's Ct.
Brookline, MA
02146
(617) 731-3553

GAMEPLAY

Orson Scott Card

CENSORING THE FUN OUT OF PRODIGY?

A few columns back I talked about the online service Prodigy. All the good things I said are still true: It still has the simplest interface I've seen for allowing complete novices to access everything the service offers. But in one area, at least, Prodigy has succumbed to the principle that guides far too many software companies: "Do it my way, you poor ignorant user."

Oddly, the area where Prodigy is blowing it in a big way is with one of its *best* ideas: editing the bulletin boards.

The bulletin boards are major sources for online entertainment. A witty few engage in scintillating conversation while others listen and think and occasionally interject comments of their own. It's the electronic equivalent of the general store.

People often post "public conversation" that should have been private, so when you sign on, you have to wade through mountains of

meaningless personal trivia. Prodigy had the right idea when it installed editors for the bulletin boards to weed out messages that ought to have been sent privately. When you browse through the board, you're given a menu of all the possible subjects and can take a look at any that seem interesting. You waste far less time trudging through things that don't interest you before getting to the things that do.

Alas, there are problems.

First, when Prodigy returns a message to you, its explanation is cold and impersonal and tells you almost nothing about why your message was deemed unworthy. It can be frustrating when a message you spent time composing is rejected without an apology.

Second, it has run into a standard problem with all editors everywhere—Correction Anxiety Syndrome: The editor is reading along and hasn't corrected anything in a long time and gets more and more nervous (*what mistakes am I missing?*) until finally he starts correcting things that aren't wrong at all. When I talked to a Prodigy troubleshooter (a person without authority whose job is to listen patiently until the complainer feels better), I was told proudly, "After all, more than 26,000 messages have been posted." "Out of how many?" I asked. "More than 28,000," he said.

Since Prodigy is rejecting almost 8 percent of the members' postings, practically everyone is going to have a message rejected for every dozen postings.

Third, its rules are too rigid. For instance, some users were playing games they had invented in the Writing topic of the Arts Club. Under subject headings like "12-Word Love Stories" and "3-Word Stories," they were inventing clever and resourceful phrases and sen-

tences that implied whole novels of characters, relationships, and events; many were screamingly funny.

Suddenly Prodigy wiped out the game, rejecting all new postings to those subjects. Why? Because the Writing topic was "not meant to be used for posting original literature."

How absurd! These people weren't posting the stories and poems they meant to mail off to magazines. They were playing *games* together, and the games were killed because the editors didn't understand them.

Here you have an entertainment network that sells advertising time for public conversations, many of which are wonderfully clever and entertaining and informative.

Then, as if it entirely missed the point of its own enterprise, Prodigy hires people to step into the room and, with almost no understanding of what the conversation is about, say, "You've gotten off the subject. You'll have to talk about something else." Or, "We never thought of anybody's using this topic this way, so stop it."

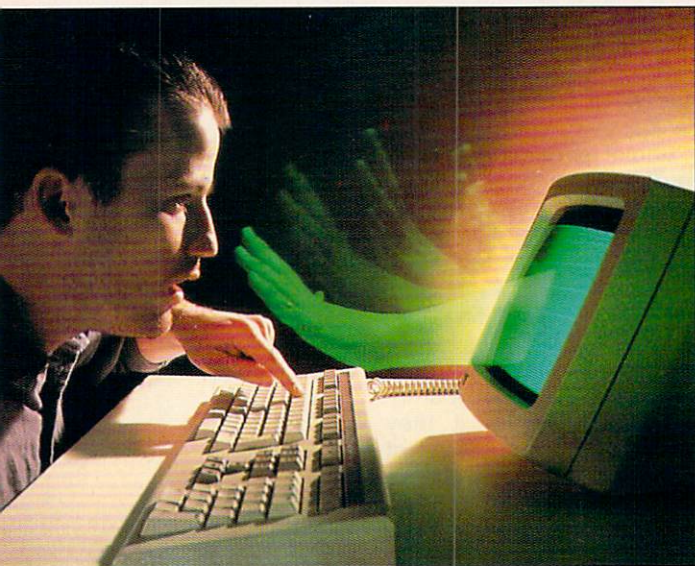
Prodigy, you've got a great thing going. All you have to do to make it perfect is to tell your editors to lighten up.

Let your users create entertainment for themselves. Keep on rejecting the *truly* private conversations, but let the rest of the messages through.

If you don't, I'm afraid you'll find the best and most creative of the conversationalists going to some other service, and you'll soon find Prodigy—both the good and the bad—dead and buried.

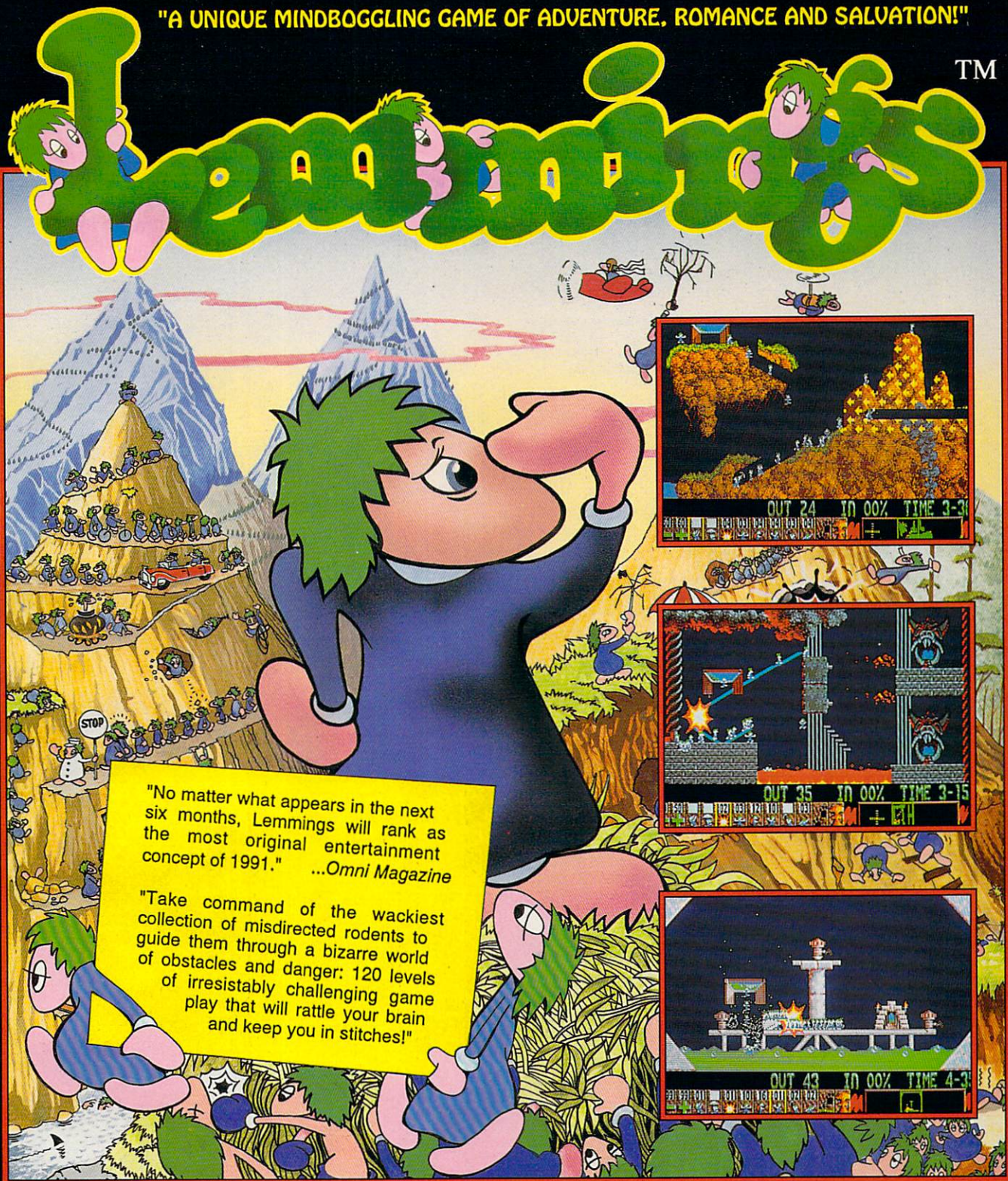
I hope other services are looking at what Prodigy is doing right, because if they learn the right lessons and avoid the "Do it my way" principle, we will eagerly embrace those services the way we've tried to embrace Prodigy. □

Prodigy, you've got a great thing going. All you have to do to make it perfect is to tell your editors to lighten up.



"A UNIQUE MINDBOGGLING GAME OF ADVENTURE, ROMANCE AND SALVATION!"

TM



"No matter what appears in the next six months, Lemmings will rank as the most original entertainment concept of 1991." ...Omni Magazine

"Take command of the wackiest collection of misdirected rodents to guide them through a bizarre world of obstacles and danger: 120 levels of irresistibly challenging game play that will rattle your brain and keep you in stitches!"

LEMMINGS™

from

PSYGNOSIS

PC COMPATIBLE
 AMIGA
 ATARI ST
 (COMING SOON)
 CDTV & MACINTOSH

Available from your local
 dealer or call: (617) 739 7478
 PSYGNOSIS
 29 SAINT MARYS COURT
 BROOKLINE MA 02146

SPECIAL REPORT

BY TOM NETSEL AND PETER SCISCO

This summer's Consumer Electronic Show had a little bit for everyone.

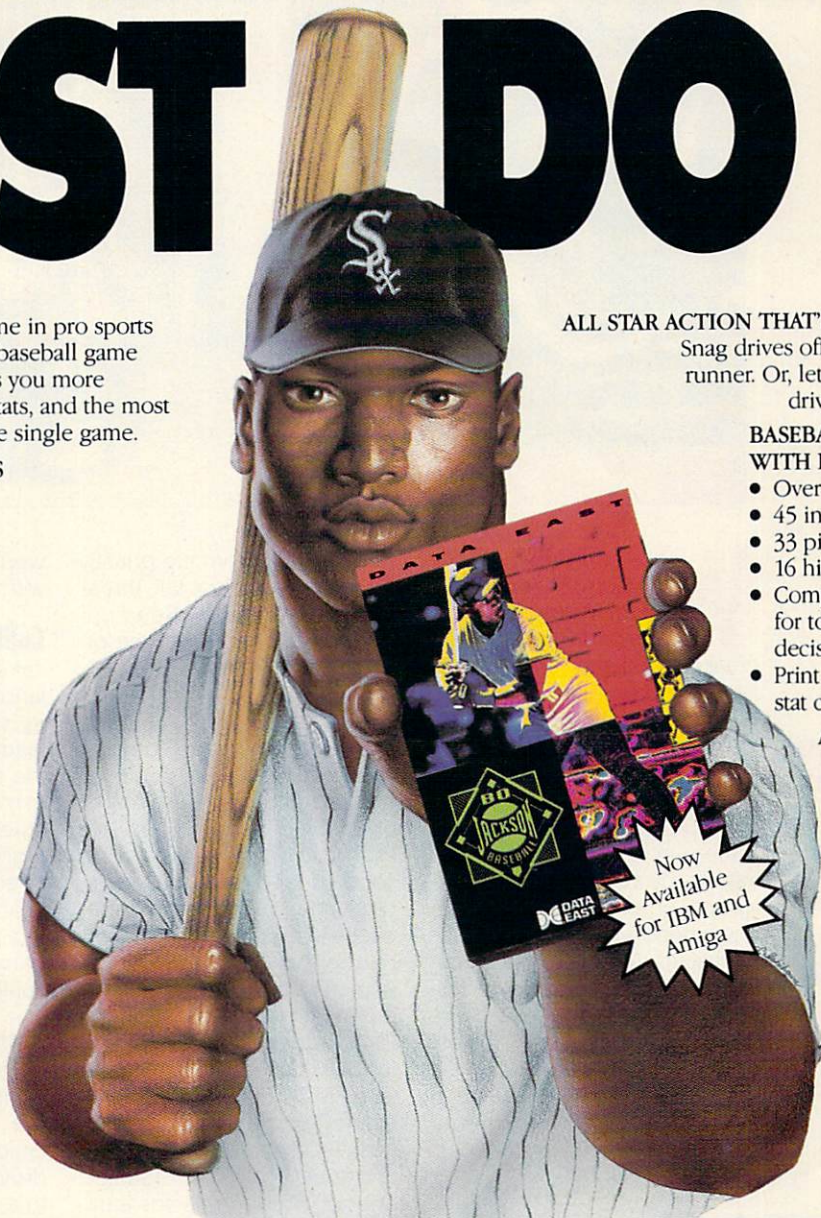


BO JACKSON BASEBALL JUST DO IT.

Now, from the biggest name in pro sports today, comes the greatest baseball game ever assembled! Bo brings you more realistic action, far more stats, and the most impressive graphics in one single game.

CATCH THESE FEATURES

- Authentic lifelike player animations
- Digitized sound and atmospheric effects
- Arcade style 256-color VGA graphics
- Create your own team of righthanders and southpaws
- Edit players for batting and pitching, by arm strength, running speed, and much more
- Make play by play decisions
- Go head-to-head or against the computer with as many as 26 players
- Authentic 162 game series, play-off series and championship play



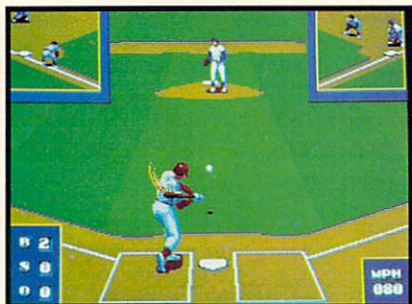
ALL STAR ACTION THAT'S JACKSON PACKED!
Snag drives off the wall and nail the runner. Or, let Bo show you how to drive one over the fence.

BASEBALL STRATEGY WITH BONA FIDE STATS!

- Over 100 recorded ratings
- 45 individual stats
- 33 pitching categories
- 16 hitting categories
- Complete player control for tough fielding decisions
- Print stats for every major stat category

All this is baseball the way it's supposed to be—What are you waiting for?

JUST DO IT.



Complete view of all the action on the bases when you are at bat.



Detailed, crisp graphics.

PITCHING ROTATION										
	T	IP	H	BB	SO	U-L	SV	ERA	HR	AVG
ROBERTO	11	33	34	43	145	2-3	0	3.52	16	247
SCOTT	11	33	34	19	54	7-15	0	3.32	37	237
MALASQUEE	11	33	187	20	52	11-10	0	3.53	36	233
MULLIKEN	11	33	221	20	514	10-14	0	3.45	35	228
DARWIN	11	33	27	430	11-4	2	3.53	30	211	

BULLPEN										
	T	IP	H	BB	SO	U-L	SV	ERA	HR	AVG
SHANKE	10	133	120	55	7	15	0	3.73	33	233
CLANCY	11	75	100	13	202	2-3	1	3.38	18	233
ANDERSON	11	26	73	33	455	5-3	7	3.68	17	230
SMITH	11	60	45	28	153	6-8	33	3.45	14	18

More than 100 stats that you can track on an authentic 162 game schedule.

Circle Reader Service Number 165

Bo Jackson Baseball: © and TM 1991
Data East USA, Inc. All rights reserved.
Manufactured by Data East USA, Inc.
under license from Tiger Electronics, Inc.
IBM PC is a registered trademark of IBM.

Data East USA, Inc.,
1850 Little Orchard St.,
San Jose, CA 95125
(408) 286-7074





Better sound, improved graphics and adventures, more creative play, and a host of roles are on the way with this year's crop of consumer entertainment software and hardware.

While the rest of the consumer electronics industry languishes in recession, computer makers and software developers are experiencing steady, if less than spectacular, growth. The thrills surrounding the PC and videogame exhibits at the 1991 International Consumer Electronics Show in Chicago were bolstered by advances in PC software entertainment and a new generation of videogame consoles. More than 250 companies that had never participated in a Summer CES, including IBM, Wang Labs, Leading Edge, and Prodigy, picked up on the excitement. Here's a preview of some of the products that are heading your way this fall.

Accolade

Who is kidnapping the biggest stars in Hollywood? To help you solve this sinister mystery, call in the man who found the world's greatest entertainer in Accolade's first graphic adventure, *Search for the King*, and now stars in the sequel, *Les Manly In: Lost in L.A.* (\$59.95).

Mike Ditka Ultimate Football (\$54.95) is the first football simulation to feature multi-angle player perspective, allowing computer coaches to view the action from any of four different viewing angles.

In *Elvira II: The Jaws of Cerberus* (\$59.95) players must

rescue Elvira from the ghastly Cerberus, a 60-foot tall, three-headed demon. See our Sneak Peek of this game on page 121 in this issue.

Ad Lib

The competition among sound-card makers heats up with Ad Lib's announcement of its Gold Series. The Gold PC-1000 (\$300) is a basic sound card for disk-based applications that features a microphone jack and tabletop microphone, game and MIDI ports, and standard stereo input/output jacks. The Gold PC-2000 (\$400) adds a SCSI interface for CD-ROM applications. The Gold MC-2000 (\$500) is designed for the IBM PS/2 MCA bus. All of the cards carry 20 channels of synthesized sound, 2 channels for sampled sound, stereo recording and playback, enhanced FM synthesis, 12-bit stereo digital-to-analog conversion and other professional features. Originally scheduled for a late summer release, Ad Lib says chip shortages have delayed release of the Gold Series until late fall at the earliest.

Broderbund

Game designer Chris Crawford is back with *Patton Strikes Back* (\$59.95). This strategy game puts you in command of Allied or Axis troops during the Battle of the Bulge. This war game emphasizes tactical thinking over

weapons skills. It's packed with data and analysis.

California Dreams

Take over as leader of Poland's workers union in *Solidarity* (\$59.95) and attempt to lead the country to freedom in the face of tremendous Soviet military and economic pressures. Or, take the helm of a high-tech submarine in *Wreck Hunters* (price not available at press time), the working title of a new interactive game in which you search for sunken treasure.

Data East

Data East's latest combat game is—get this—compatible with Novell networks. Guide a fleet of mechanized droids against an alien race that has practically obliterated humanity from the face of the planet. Operate scout, supply, and soldier robots over a harsh landscape. A two-player mode allows for cooperative play against the mysterious aliens. The network version will support from six to seven players. The stand-alone version of *Ultrabots Sanction: Earth* will ship to stores this month. The company expects to have the network version ready by late November (just in time for that Christmas office party). The price wasn't available at press time.

Data East's other introductions included *Battlefield*

KEEP YOUR FRIENDS ON THE CUTTING EDGE OF COMPUTING WITH A GIFT SUBSCRIPTION TO COMPUTE!



**SAVE UP TO
\$25.43**

Keepp your friends up-to-date on the latest news, technologies, hardware, software and lots, lots more in the world of home office computing. Give them a holiday gift subscription to COMPUTE!

Special Options

Every month COMPUTE is published in four different editions, each with a special section devoted to a specific computer type... IBM & Compatibles, Amiga, Commodore 64/128 and the multi edition which includes all three special sections. You choose the edition that will be best for your friends.

Added Value

Take your friends beyond the pages of the magazine! Give them the COMPUTE Disk, a bi-monthly, hands on companion to COMPUTE Magazine... and a valuable addition to your gift!

Special Low Holiday Prices

The first 12 issue gift subscription you give is only \$12.97. That's a savings of \$22.43 (63%) off the newsstand price. Each addi-

tional gift is only \$9.97—a huge savings of \$25.43 (71%). To include the COMPUTE Disk with a subscription, add an additional \$30 per subscription.

Use the coupon below to send us your gift list. As soon as we receive it we'll send you attractive gift cards you may use to announce your generous gifts to your friends.

YES, send a one year (12 issues) subscription to COMPUTE to my friends as listed below.

Send to:

Name _____

Address _____

City _____ State _____ Zip _____

Check magazine edition:

- IBM/IBM Compatible Amiga
 Commodore 64/128 Multi Edition
 Also, send the companion disk along with the subscription

Send to:

Name _____

Address _____

City _____ State _____ Zip _____

Check magazine edition:

- IBM/IBM Compatible Amiga
 Commodore 64/128 Multi Edition
 Also, send the companion disk along with the subscription

	First Gift	Each Additional Gift
MAGAZINE ONLY	\$12.97 (SAVE \$22.43)	\$9.97 (SAVE \$25.43)
MAGAZINE & DISK	\$42.97	\$39.97

From (You must fill out this portion):

Name _____

Address _____

City _____ State _____ Zip _____

Payment enclosed Bill me

Charge VISA MasterCard

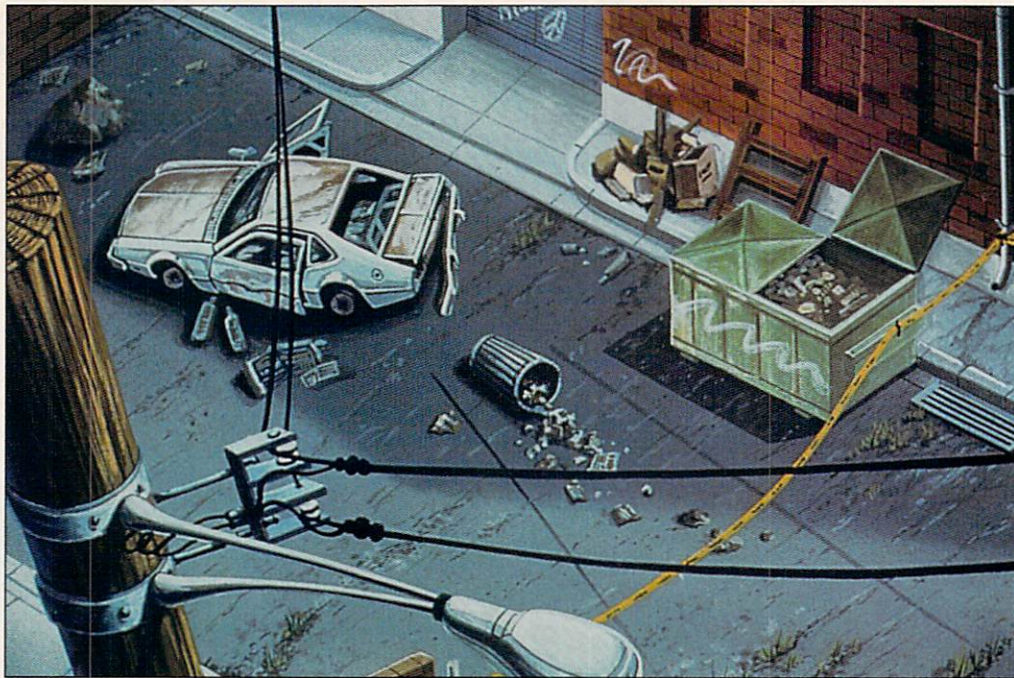
Account # _____ Exp. Date _____

Signature _____

Please allow 6-8 weeks for delivery of first issue. Regular subscription price is \$19.94 for 12 issues. All foreign orders add \$10 per subscription for postage & handling. Canada add \$10 plus 7% G.S.T. Payment acceptable in U.S. funds only. Gifts cards will be sent to you to announce your gifts.

YWDN2

Mail to: COMPUTE P.O. Box 3244 Harlan Iowa 51593



Adventure games that move from city streets to outer space, from underground to the magic realms of imagination—plus sports, flight simulators, and laser television.

2000, the working title for a tank-battle game (\$59.95), *Bo Jackson Baseball* (\$49.95), and *ABC Wide World of Sports Boxing* (price unavailable at press time).

Electronic Arts

Big new products from EA include *Chuck Yeager's Air Combat* (\$59.95) and *Earl Weaver Baseball II* (\$49.95). A Sneak Peek of *Air Combat* appeared in the July issue of *COMPUTE*. Racing fans can get behind the wheel of *Mario Andretti's Racing Challenge* (\$49.95).

Powermonger (\$49.95), from the makers of *Populous*, casts you as the leader of a displaced tribe newly arrived in an uncharted territory.

Electronic Zoo

This fall, look for *Eco Phantoms* (\$49.95), a struggle for earth's survival; *The Ball Game* (\$49.95), a test of strategy and reflexes; *Geisha* (\$49.95), the Orient of the future; *Star Collection* (\$29.95), a collection of great arcade hits; and *Peghole* (\$49.95), a classic tactical game.

Konami

Simpson fans can get radical with *Bart Simpson's House of Weirdness* (\$49.95), an adventure/strategy game that challenges players to be as resourceful as Bart. *Simpson's Arcade* (\$49.95) is a conversion of the coin-op.

Challenge your ninja skills

and fight crime in Manhattan with *Teenage Mutant Ninja Turtles: The Adventure* (\$49.95). If you want more Turtle action, try *Teenage Mutant Ninja Turtles: The Arcade Game* (\$49.95). More movie action is heading your way with *Back to the Future III* (\$39.95) and *Predator 2* (\$19.95).

Baseball card collectors have a new utility to help them manage and track their collections. It's the *Official Collector Series—Baseball Card Collector* (\$49.95). This could make an excellent holiday gift for the hardball fan on your list.

Topping the long list of Konami's brand-new role-playing games is Steve Peterson's

LASERWARE

Recent innovations could change the way we regard our favorite optically-based storage device.

The Commodore booth at CES was almost entirely devoted to CDTV, a portent of the impending consumer interest in CD technology.

North American Philips/Magnavox was once again showing their long-delayed CD-I (Compact Disc-Interactive) player, this time promising that it would ship in October. Similar in concept to CDTV, the CD-I player has a few advantages: it sports a 16-million-color palette, a slightly faster processor and, most important, has the marketing muscle of Magnavox, Sony, and Matsushita (Panasonic) behind it. However, it also has its share of disadvantages: It's more expensive (\$1400 compared to CDTV's \$999), and its "thumbstick" controller is less familiar to American kids

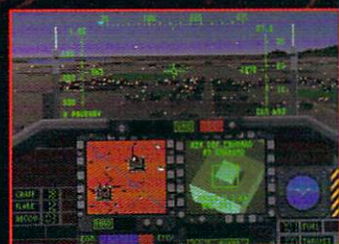
than the CDTV's Nintendo-like joypad (and more fragile).

Another CD product making the rounds was Sony's consumer-oriented CD-ROM drive for the IBM PC. Called the Laser Library, the system consists of an external CD-ROM drive with audio capability and a collection of six topnotch CD-ROM titles. The entire library retails for \$699.

With Kodak's new Photo CD, you can take pictures using conventional 35mm film, and then have those photos developed and stored on compact disc for viewing on a TV or for use in image-processing software. Photo CDs will work with either a CDTV, CD-I, or dedicated Photo CD player. Kodak expects Photo CD processing to be available by June 1992.

DENNY ATKIN and DAVID SEARS

Rule the Desert Skies

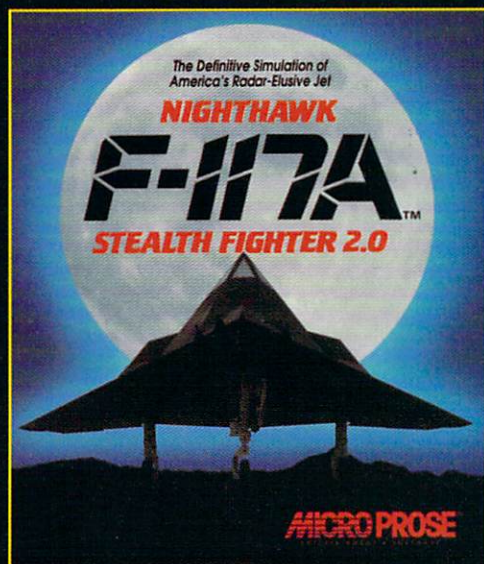


Like some sleek, metallic bird of prey, it slices through the thin air of the desert night. Below, the enemy's radar frantically scans, searching for a sign. But the only warning is the deafening roar of ordnance demolishing its target. Before fighters can scramble, this airborne apparition vanishes, like a ghostly dream.

It's the Persian Gulf, January, 1991. And the F-117A has just come calling.

Now you can fly the Stealth Fighter that ruled the desert skies, thanks to MicroProse, the acknowledged leader in air combat simulation. Slide silently through the Kuwaiti Theatre, or any of 8 other worlds. Test yourself against challenging enemy artificial intelligence. Tangle with battle-hardened pilots, using the exclusive MicroProse option that allows you dogfighting action. Feel your adrenalin surge as you penetrate dense threat environments, destroying high value targets with pinpoint accuracy.

F-117A Nighthawk Stealth Fighter 2.0. Find out how it feels to own the night.



MICROPROSE™
ENTERTAINMENT • SOFTWARE

180 Lakefront Drive • Hunt Valley, MD 21030

VID NEWS

The war for the hearts and minds of America's videogame players reached a peak at this summer's CES, with volleys from all major players. The smoke won't clear until after the holiday season. Sega announced a new CD-ROM accessory for the Genesis, Nintendo aligned itself with N.V. Philips and CD-I, NEC launched a new line of CD-ROM interactive videogames, and SNK added 12 new titles to its NEO GEO library.

On the Sega front, an affordable CD-ROM accessory for the Genesis was announced for an early 1992 release. The player's high-speed laser pick-up drive mechanism, 16-bit microprocessors in both the Genesis machine and the CD-ROM drive, a large-capacity RAM buffer, advanced biaxial rotation and zoom functions, and eight-channel digital stereo sound source should add up to supersonic game action, CD-quality audio, arcade-style sound effects, and graphics to the max.

Sega's biggest game news was *Sonic the Hedgehog*. Faster than a speeding bullet and sure to gain the quick allegiance of arcade gamers everywhere, *Sonic* is reason enough for anyone to buy the Genesis machine. *Sonic the Hedgehog* replaces *Altered-Beast* as the game packaged with Genesis machines.

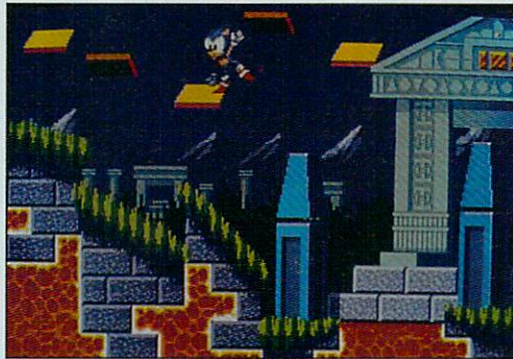
By year's end, Sega plans to have 17 new Genesis games out. Those include *Toe Jam & Earl*, featuring two very cool, rhythmically inclined, junk-food-loving aliens from the planet Funkatron; *Fantasia*, taken from the Walt Disney classic; and the underwater military simulation *688 Attack Sub*.

Digital stereo sound, multiple scrolling screens, three-dimensional graphics, and a palette of 32,768 colors blast through Nintendo's Super NES, scheduled to reach store shelves this September. Despite the troubled economy, Nintendo predicted it will sell more than 2 million Super NES units by year's end, priced around \$200 each, and 6 million games for the ma-

chine, most of which will cost around \$50 apiece. Nintendo has no plans to abandon either its 8-bit Nintendo Entertainment System or the popular hand-held Game Boy machine.

The company also announced that it would work with N. V. Philips to develop a CD-ROM accessory for the Super NES that would be compatible with both the new video game system and CD-I. Nintendo also intends to pursue its work with Sony on a separate CD-based game system.

NEC dropped the price of its TurboGrafx-



16 system to \$99.99 and concentrated its efforts on the TurboGrafx-CD player, which sells now for \$299. For \$149.99, a new version of the TurboGrafx-16 system, called Bonk SuperSet, is packaged with two TurboPad controllers, a TurboTop adaptor that allows for up to five players at once, and NEC's most popular game, *Bonk's Adventure*.

NEC also sealed a deal with Paramount Pictures to release ICOM Simulations' CD-ROM version of *The Addams Family*. Based on the popular sixties television show, the movie is scheduled to premiere in November. Also in NEC's new CD-ROM library, *Sherlock Holmes, Consulting Detective*, based on the renowned clever guy, uses digitized movie footage of live actors. For *J.B. Harold Murder Club*, digitized still photos blended with voices will be used.

For an educational tour through prehistoric times, *Magical Dinosaur Tour* is an animated encyclopedia featuring 200 types of dinosaurs. The games will retail for \$61.99 each.

SNK attracted more players to its pricey, but graphically superior, NEO GEO system with 12 new action games ranging from sports to fantasy.

For sports buffs, there's *Top Players Golf*, which gives players a bird's-eye view of the course and then lets them "stand" behind the onscreen golfer to drive the ball with real-life perspective. *League Bowling*'s multilink capability adds more zest than real lanes can offer. *Riding Hero* puts gamers in the fast lane of motorcycle racing, whizzing around mountain curves and barreling down ocean straightaways. Baseball buffs should delight over *Baseball Stars Professional*, with real-voice announcers and umpires making the calls for over 20 different teams.

For the combat thirsty, there's the fast-reflex action of *Ninja Combat*, dog-fights galore in the enemy-filled air zones of *Ghost Pilots*, and bloody jungle battles as veterans return to Vietnam in *NAM-1975*. James Bond wannabes go up against a formidable terrorist group in *The Super Spy*.

Sci-fi fanatics get the challenge of a lifetime trying to destroy the super computer that controls thousands of lunatic androids in SNK's *Cyber-Lip*. Fantasy lovers can wreak havoc on cities while wrestling monsters in *King of the Monsters*.

In *Magician Lord*, players assume the role of Elta, a young magician able to assume new identities while searching for books of wisdom and magic in four uncanny dimensions—a real treat for fantasy arcade fans. Rounding out the selection, fast-action arcade game fans should love the challenge of jumping Blue through a host of strange cities in *Blue's Journey*.

JILL CHAMPION, CHANTELE OLIGSCHLAGER, ERIN RICHTER

Champions (\$59.95), a multipart adventure with more than 20 villains to conquer. *The Killing Cloud* (\$49.95) has you fighting an organized gang in San Francisco. For the more fantastically oriented, *Riders of Rohan* (\$49.95) gives players a chance to build their own saga in true Tolkien flavor. If Middle Earth doesn't appeal to you, perhaps outer space does. Try *Spacewrecked: 14 Billion Light Years From Earth* (\$49.95). Or venture into inner space in the ancient thriller *Bloodwych* (\$39.95). For couch potatoes, *Mission: Impossible* (\$49.95) combines action, adventure, and role-playing—if you choose to accept it.

Two Konami simulations include *Team Suzuki* (\$39.95) and *Top Gun*

Head-to-Head Dogfighting Simulator (\$49.95). Action gamers can test their roller derby skills in the high-contact game *RollerBabes* (\$39.95). *Speedball 2* (\$39.95) is a futuristic sport featuring armor and weaponry.

LucasArts Entertainment

Guybrush Threepwood is back in a swashbuckling adventure called *The Secret of Monkey Island II: LeChuck's Revenge* (\$59.95). Visit new puzzle-packed islands with many of the zany characters from the first game. And look for an original game not based on a movie in *Indiana Jones and the Fate of Atlantis* (\$59.95). Indy is drawn into the ancient mysteries of the fascinating and legendary undersea world.

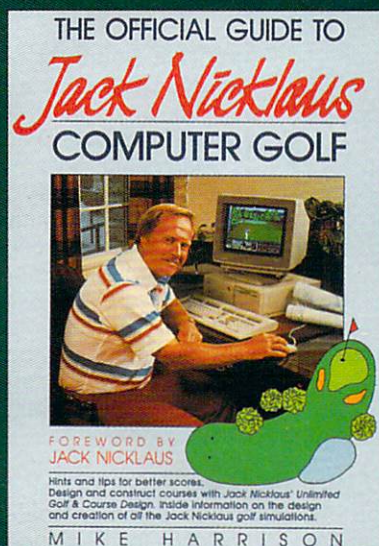
Maxis

This fall's oddest game just might be *SimAnt* (price unavailable), an ant colony simulation (no kidding) complete with rival bands of black and red ants, a hungry spider, a nosy kid with a mean garden hose, and a pesky dog. Try to get your colony inside the house, where the really good food is.

MicroProse

MicroProse has a large slate of products scheduled for fall and spring releases. Topping the list is Sid Meier's *Civilization* (price unavailable). This simulation begins in 4000 B.C. and players must develop an entire civilization from a small, nomadic tribe. By balancing economics, politics, and defense,

WHETHER IT'S GOLF, AIR COMBAT, OR ADVENTURE COMPUTE HAS THE OFFICIAL GUIDE



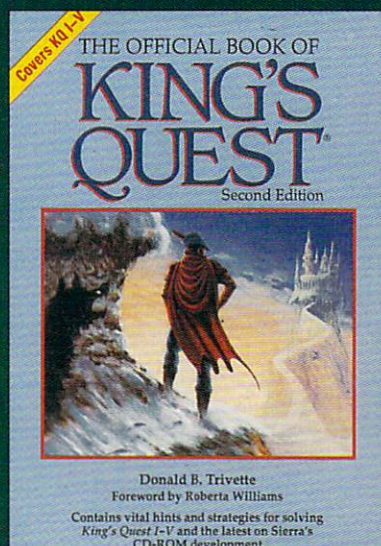
THE OFFICIAL GUIDE TO JACK NICKLAUS COMPUTER GOLF

by Mike Harrison

Foreword by Jack Nicklaus 225 pages
\$12.95

Here's the inside story. Learn how professional course designers decide where to put bunkers, trees, and greens. Also includes tips for all the Jack Nicklaus golf games, including *Jack Nicklaus' Unlimited Golf & Course Design*.

This is the only authorized guide to all the Jack Nicklaus computer simulations from Accolade.

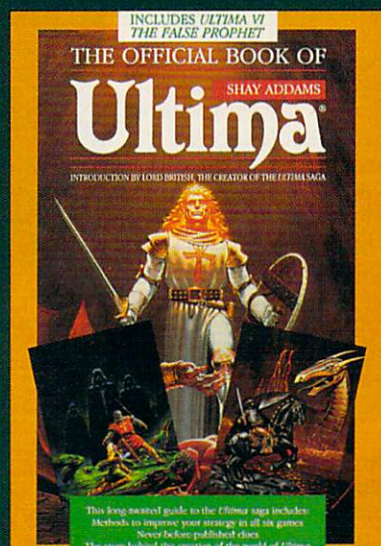


THE OFFICIAL BOOK OF KING'S QUEST, SECOND EDITION

by Donald B. Trivette

Foreword by
Roberta Williams 176 pages
\$12.95

Finally you'll be able to find the magic treasures in all five *King's Quest* games.
Covers *King's Quest I-V*.



THE OFFICIAL BOOK OF ULTIMA

by Shay Addams

Introduction by Lord British 244 pages
\$14.95

Written with the assistance of Lord British, *Ultima's* creator, this official guide includes inside information nowhere else. Packed full of found hints, tips, anecdotes, and never-before-published clues for all six *Ultima* adventures.

OTHER OFFICIAL GUIDES FROM COMPUTE:

The Official F-19 Stealth Fighter Handbook • The Official F-15 Strike Eagle Handbook • The Official Book of Leisure Suit Larry

YES!

I want the official guides checked below.

- The Official Guide to Jack Nicklaus Computer Golf (236-2) \$12.95
- The Official Book of Ultima (228-1) \$14.95
- The Official F-15 Strike Eagle Handbook (231-1) \$12.95
- The Official F-19 Stealth Fighter Handbook (217-6) \$14.95
- The Official Book of King's Quest, 2nd Ed. Covers KQ I-V (245-1) \$12.95
- The Official Book of Leisure Suit Larry (215-X) \$12.95

Subtotal

Sales tax (Residents of NC, NY, & NJ add appropriate sales tax.
Canadian orders add 7% goods and services tax.)

Shipping and Handling: \$2 per book US; \$4 Canada; \$6 foreign

Total Enclosed

Check or money order MC VISA

Signature _____ (required)

Acct. No. _____ Exp. Date _____

Name _____

Street Address _____

City _____ State _____ ZIP _____

All orders must be paid in U.S. funds drawn on a U.S. bank. Orders will be shipped via UPS Ground Service. Offer good while supplies last.

Mail to Compute Books
c/o CCC
2500 McClellan Ave.
Pennsauken, NJ 08109

7191C



it's possible for the tribe to evolve into a civilization of tomorrow. The game may be played for an entire 6000-year span or in 100-year periods—not real time, of course.

Flight simulator fans can fly in nine worlds in *F-117A* (\$69.95). Look for enhanced graphics, replay options, night views, sprite explosions, and more.

The spring of 1992 will bring MicroProse's first fantasy role-playing game. Live in fifteenth century Germany, a violent time of three popes, powerless emperors, gangster nobles, and venal clergymen. *Darklands* emphasizes people's belief in witches, magic, alchemists, and dragons. Guide your party of four on a quest for fame, fortune, and immortality in the Dark Ages.

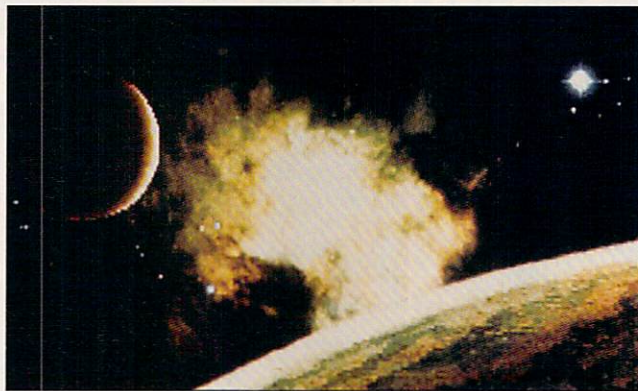
Also slated for future release from MicroProse and its Paragon subsidiary are *Codename: White Shadow* (price unavailable), *Flames of Freedom* (\$49.95), and *Twilight 2000* (\$59.95).

Origin

Once again Richard "Lord British" Garriott and Origin have plans to transport you to another world in the popular Ul-

tima series. Look for improved technology and better narrative elements in *Ultima VII: The Black Gate* (\$79.95), scheduled for release in December.

The popular sword and sorcery elements combine with more screen detail, 256-color VGA graphics, new methods of conversing and interacting with



characters, and sounds so real that you can actually hear rivers flowing and crickets chirping.

Another eagerly awaited release is *Wing Commander II: Vengeance of Kilrathi* (\$79.95). This starfighter sequel offers exciting 3-D VGA graphics set on digitized backgrounds and will take advantage of speech synthesis that employs the speech chip in the CMS

Sound Blaster. Also, another step in the *Wing Commander* series is Chris Roberts' *Strike Commander* (\$79.95). This time you are part of a mercenary squad, flying a fine line between right and wrong, profit and loss. You must determine the viability of missions from a moral as well as a logistical standpoint. Pilot a staggering array of aircraft from a P38 to an F22 Lightning 2 as you engage rival squadrons and renegade Third World dictators.

Spectrum HoloByte

Wordtris (\$39.95) is a must buy for any fan of word games and puzzle challenges. Manipulate falling letter blocks so that they spell words either horizontally or vertically on the screen.

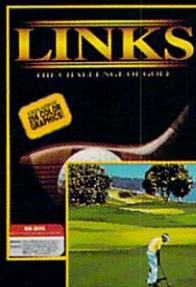
The Cyrillic connection continues with *Crisis in the Kremlin* (\$59.95), in which you assume the role of Soviet President. Guide the U.S.S.R. out of its present economic quagmire and inherent instability, or risk social disintegration.

Sierra On-Line

The folks in the California mountains are moving boldly into CD technology,

LINKS

It's such a great time of year for a round of golf. Crisp fall air, awesome colors, pristine golf course...no crowds, no hassles, and unlimited tee times. Is this a dream? *Absolutely not!* This is LINKS The Challenge of Golf. The only golf simulator with the power to transport you to the finest championship golf courses in the world!



- 256 color VGA graphics
- Full 3-D contoured terrain
- Digitized graphics & sound
- Exact renditions of famous golf courses.
- Supports major sound boards

"Links from Access sets new standards for golf simulation software" - **PC Magazine**

"It's graphics are the best yet...far superior to any other computer golf game." — **Golf World**

(Torrey Pines Golf Course included with LINKS)

LINKS Retail Price \$59.95

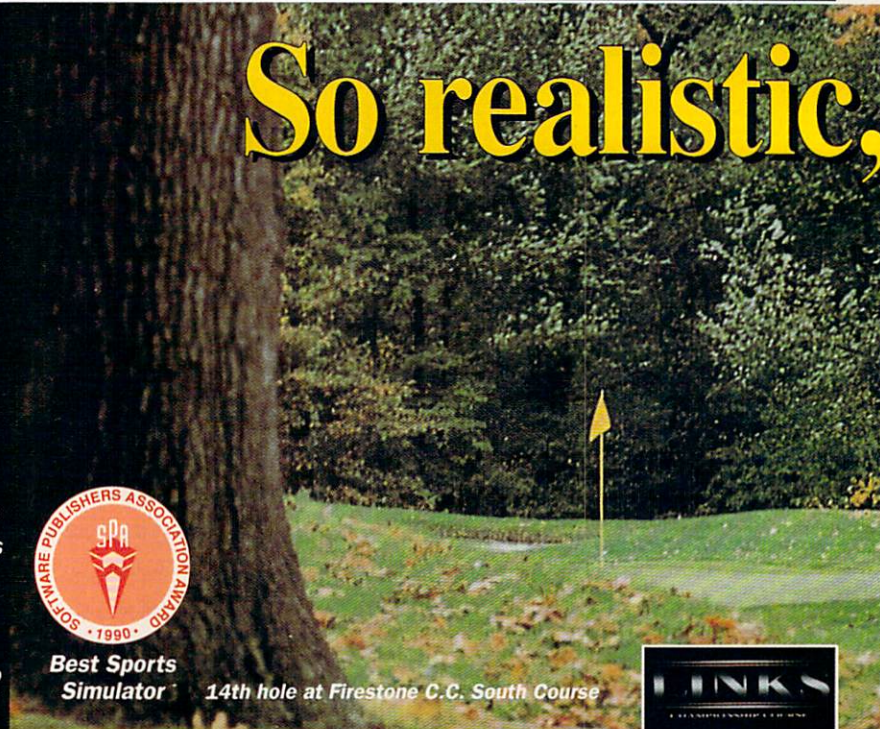
If you enjoy golf, we guarantee you'll love LINKS!
30-day Money Back Guarantee if you're not satisfied.

To get on the course with LINKS, see your software retailer or give us a call at **1-800-800-4880**. VISA, MC & AMEX accepted.

ACCESS 4910 Amelia Earhart SLC, UT 84116
SOFTWARE INCORPORATED 801-359-2900

Circle Reader Service Number 161

So realistic,



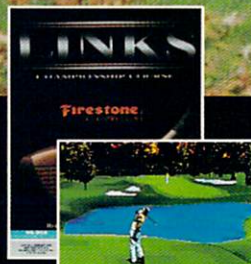
Best Sports Simulator

14th hole at Firestone C.C. South Course

CHAMPIONSHIP COURSES

Sold Separately • Retail Price \$24.95 ea.

The LINKS Design Team has taken special care in acquiring & producing some of the most outstanding golf courses in the world. Each course has its own unique challenge and personality. LINKS delivers graphics so realistic, you'll think you're there. **Experience the challenge!**



Firestone Country Club
Akron, OH

with several of their more popular games slated for CD-ROM release. They include *Space Quest IV*, *Leisure Suit Larry I*, and *King's Quest V*. All of the CD-ROM titles are priced at \$59.95 and are designed for the IBM PC.

On the MS-DOS disk side, you'll be seeing *Mixed Up Fairy Tales* (\$49.95), *Castle of Dr. Brain* (\$49.95), *EcoQuest: The Search for Cetus* (\$59.95), *Leisure Suit Larry 5: Passionate Patti Does a Little Undercover Work* (\$59.95), *The Laffer Utilities* (\$34.95), *Conquests of the Longbow: The Legend of Robin Hood* (\$59.95), and *Police Quest 3: The Kindred* (\$59.95).

Sierra's Dynamix subsidiary will bring *Nova 9* (\$34.95), a sequel to *Stellar 7*, and *Adventures of Willy Beamish* (\$59.95) to the PC screen this fall and winter.

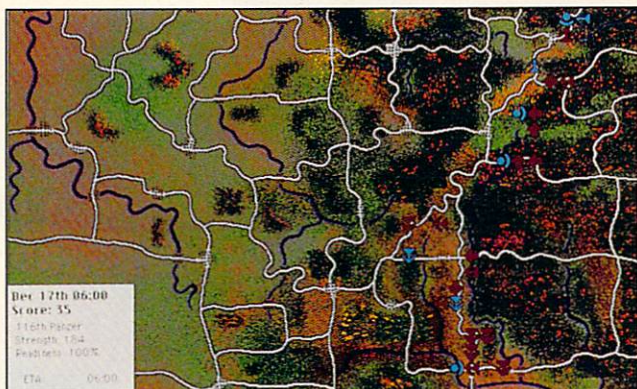
Strategic Simulations

SSI introduced its first IBM sports game, *Tony La Russa's Ultimate Baseball* (\$49.95). Every essential detail of major league baseball is provided; play a whole season or one game in a variety of levels. As current as today's headlines, *Conflict: Middle East*

(\$59.95) is a new strategy war game focusing on desert combat. SSI also has a new AD&D "goldbox" game, *Gateway to the Savage Frontier* (\$49.95).

Three-Sixty

Three-Sixty's fall lineup includes two war games and a sports package. *The-*



atre of War (\$49.95) is a strategy war game boasting a 3-D filled-polygon environment. *Patriot* (\$59.95) is a land-based war game. The *ABC Wide World of Sports Winter Olympics 1992* (\$49.95) gets the events down cold.

UBI Soft

In *Battle Isle* (\$49.95) your goal is to capture the most terrain possible in a

world made of islands. For sports fans, *Pro Tennis Tour II* (\$49.95), improves on the original by including female opponents, the choice of strong or weak points of your player, doubles play, a training mode, improved graphics and better music. Here's your chance to improve your net play.

Virgin Games

Fantasy and flight fill the bill here. *Conan the Cimmerian* (\$49.99) puts you in the role of Conan. You must avenge the deaths of your family and friends who were massacred by the ravaging hordes of Thoth Amon, high priest of the vile cult of Set. If that sounds like a little too much fun, you can get down to business with *Corporation* (\$59.99), an action game that has you tracking

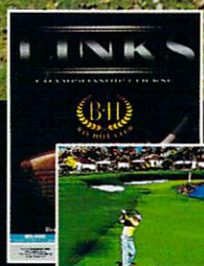
down a mutant robot.

If flying is more in your line, then *Thunderhawk* (\$49.99) puts you in the seat of the AH-73M Thunderhawk helicopter gunship. *Shuttle* (\$59.99) is designed as an accurate simulation of NASA's Space Shuttle. During play you'll be asked to perform various feats like repairing satellites, maneuvering your spacecraft, and—oh yes—landing. □

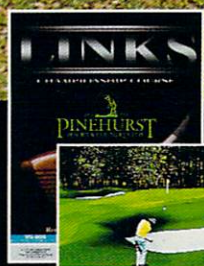
you'll think you're there.



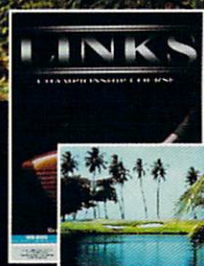
Bountiful Golf Club
Bountiful, UT



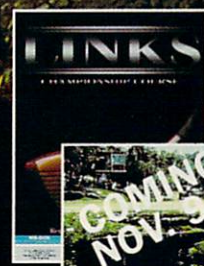
Bay Hill Club & Lodge
Orlando, FL



Pinehurst Country Club
Pinehurst, NC



Dorado Beach Resort
Puerto Rico



Barton Creek Country Club
Austin, TX

WORLD OF COMMODORE

DECEMBER 6, 7 & 8, 1991
International Centre
Toronto, Canada

AMIGA

Toronto's 9th Annual Commodore and Amiga Show and Sale

It's the world's biggest show and sale of Commodore and Amiga computers and compatible products. This is the time and place to check out:

- ★ NEW HARDWARE – Hands-on browsing!
- ★ LATEST SOFTWARE – Thousands of titles!
- ★ MEET THE EXPERTS – 60,000 sq. ft. of exhibits!
- ★ FREE SEMINARS AND PRESENTATIONS

Whether you use an Amiga, Commodore 64/128, Commodore PC or CDTV, you'll save money, have fun and learn from the experts at Toronto's 9th annual World of Commodore/Amiga.

Toronto International Centre, 6900 Airport Rd. (at Derry)
Friday, December 6, 10:00 am – 9:00 pm
Saturday, December 7, 10:00 am – 6:00 pm
Sunday, December 8, 10:00 am – 6:00 pm



world of
Commodore
AMIGA

Adults \$8, Students & Seniors \$6 (Admission includes seminars and presentations.)
COMING EVENTS: World of Commodore/Amiga, New York, April 24 – 26, 1992
and World of Commodore/Amiga, Sydney, Australia, July 3 – 5, 1992.
For more information, call The Hunter Group at (416) 595-5906 or fax (416) 595-5093.

NEW
CDTV
PRODUCTS

FANTASTIC
BARGAINS!



9th RECORD-BREAKING YEAR!

64/128 VIEW

You've asked for it,
so here it is. Gazette goes online
with QuantumLink.

Tom Netsel

Gazette is going online. Many of you have asked for it, and now it's here. Gazette will soon have its own area on QuantumLink, the Commodore-specific online service. Soon you can call a local telephone number with your computer and modem, connect to Q-Link, and then move to the Gazette area. Once connected, you'll have access to millions of bytes of 64/128 information from our back issues of Gazette. Right now our staff is busy compiling more than six years' worth of articles, reviews, and programs to have them available by the September 15 target date.

Q-Linkers (Q-Link members) will be able to download practically any of the material that has ever appeared in Gazette. If you want to learn about disk drives, printer care and selection, music, graphics, GEOS, telecommunications, or other 64-related subjects, chances are that it's been covered in Gazette and it'll be online for downloading.

If you're planning to buy software for your 64 or 128 and you don't know which of several possible titles might best suit your needs, check the Gazette reviews. There will be hundreds of software reviews available of both current and classic 64 and 128 titles. Best of all, this information will be available when you want it and as close as your telephone. Think of all the great type-in programs that have appeared in Gazette over the years: games, utilities, educational programs, and productivity pieces. Now you

can obtain any or all of these great programs without going through the effort of typing them in. Simply download and run.

Look for message areas, product information, and more. Each month Gazette publishes the best articles and programs that we can find, and we're constantly looking for new and exciting programs to offer our readers. As a convenience to programmers and to expedite our search for new software, programmers will be able to upload their submissions. We'll download them, test them, and reply to the authors much faster than we can by mail. Artists can also upload their "Gazette Gallery" submissions. Of course, we'll still accept submissions mailed on disk, but the upload feature will speed up the process.

Are there COMPUTE books dealing with the 64 or 128 that you want but find they're out of print? We'll have many of these titles online for downloading. That's right: Download a whole book, read it onscreen, and print out the sections you need. This will be the only source for some of this 64/128 information.

We are excited about this new venture. We may not have every feature up and running on opening day, but we expect the Gazette section to be a valuable online resource for 64 and 128 users. If you're not familiar with QuantumLink or you're not yet a member, check elsewhere in this issue for a special introductory Q-Link offer. When online, feel free to say hello or send some E-mail. My handle is Gaz. □

CONTENTS

64/128 VIEW G-1

Gazette is going online. Look for it soon on QuantumLink. Download your favorite programs, reviews, articles, and books. By Tom Netsel.

TOO VALUABLE TO WASTE G-2

Despite the shift to IBM compatibles, schools in Nova Scotia still put their 64s to valuable use. By John Elliott.

REVIEWS G-8

Bible Search, Star Control, Dragons of Flame, Centauri Alliance, and Screen-Pro 64.

FEEDBACK G-16

Questions and answers.

MACHINE LANGUAGE G-19

Handle most of your input/output commands with just six easy Kernal calls. By Jim Butterfield.

BEGINNER BASIC G-20

Crashproof your programs. (Part 2.) By Larry Cotton.

PROGRAMMER'S PAGE G-22

128 SYS calls, the midnight bug, and more. By Randy Thompson.

GEOS G-23

Fight the jaggies, and be proud to display your GEOS documents. By Steve Vander Ark.

D'IVERSIONS G-24

Virtual reality at the mall. By Fred D'Ignazio.

PROGRAMS

Speedway	G-25
MOB Mover	G-26
HoverJet	G-30
Add Check	G-33
Song Machine	G-34

TOO VALUABLE TO WASTE

JOHN ELLIOTT



**SCHOOLS IN NOVA SCOTIA
PUT 64S TO WORK,
DESPITE A MOVE TOWARD IBMS.**



One Commodore 64 sits at the back of an elementary classroom. That's the way it is in many Canadian schools now. The 64 is used only as a reward for students who have completed their work. During those moments of use, the computer becomes an arcade-style game machine. Commodore 8-bit computers are a largely underutilized resource in Canadian schools, and a number of boards of education are replacing the 64s with IBM-compatible PCs at a cost many times that of the 64s. I am told at educational technology conferences that this is a common situation throughout North America.

I teach at Nova Scotia Teachers College. The college is located in the city of Truro (population 14,000), about 50 miles north of Halifax, Nova Scotia. While many of the people in this province speak English and are of Scottish and Loyalist descent, significant minorities speak Micmac (an Indian language), French, or Gaelic. The campus is the academic center for 600 students who practice their teaching throughout Nova Scotia. As a member of the faculty, I meet with student teachers and get to see how they and other teachers utilize computers in their classrooms. With school budgets being what they are, not everyone has made the switch to PCs. In many cases teachers and learners are employing existing equipment to further current curricular aims. This means using the 64 for something more useful than playing arcade games. Here are some examples of what I've found.

Word Processing

Grade 1 children are using a word processor (*SpeedScript*) to compose two-page stories. In this case they work with a battery of six 64s in the central computer room. During their language period they may be found either in their classroom or working on the 64s. At one point while the teacher and I were chatting, we were politely interrupted. A child wanted to know how to format his paragraphs.

As my teachers in training entered the province's classrooms, they learned the benefits of using an idea organizer to prepare before composing their documents. An idea organizer such as *Thinking Cap* allows a writer to brainstorm, switch sequences, easily erase, and do most word processing tasks. The outliner automatically organizes the document into appropriate categories. Most students are eager to begin writing, and they resist preparing an organizing outline before composing a document, but *Thinking Cap's* ease of use usually placates their objections.

Word Processing Enhancements

My teaching interns have learned a number of other computer techniques that they can share with the children they teach. Once they use a spelling checker on their files, they then use a frequency check and a thesaurus program to deal with excessively used words. Since the 64's memory is limited, separate programs must be loaded sequentially.

The *Write Stuff* word processor for the 64 has an auditory option that, when activated, will say letters, words, or sentences with different intonations. There are educational possibilities with such features that can benefit both the visually impaired and students who are learning to touch-type.

Classroom Newspapers

Some elementary classes are preparing school newspapers with *Newsroom* publishing software. This is an effective way of providing a means for communicating both within a school and with the community. Students also get a good idea of the different aspects of newspaper production, from writing to publishing.

Modems allow both text and images to be shared between buildings or between a 64 and a PC as long as they both are working with *Newsroom*. The possibility remains for an electronic newspaper that can be read exclusively from the monitor.

Electronic Communications

Several elementary classes are communicating between buildings via modem. They either link up directly or leave messages on a local bulletin board. In the latter case they are also in contact with members of the general public who have a wide range of backgrounds and ages. Many smaller schools do not use modems because administrators are reluctant to tie up their one voice line. If an electronic bulletin board is used, messages can be composed and saved to disk before the destination is dialed. This keeps telephone tie-up time short. Now that 1200-baud modems for the 64 cost less than \$50, message sending and capturing times should be very short. Received messages can be read from disk or buffer after the phone is hung up.

The One-Computer Classroom

A few schools manage to block out weekly computer time during which a class may visit the school computer lab for an extended period of time. However, most of computer activities I have described work with one 64 in each classroom. Many of these activi-

ties occur during language period and are consistent with the whole philosophy of language instruction.

The single-computer classroom can also use a student-controlled database. Students select the topics under which information about several events, places, or people will be entered. As they do their research, they enter the appropriate categories in the database. Higher level thinking begins when comparisons are made among entries under the same category.

Classroom Management

Much of the software recommended here can effectively help teachers equally as well as students. The word processor can be used to compose student handouts. The idea organizer can help plan a unit of work. *Newsroom* can be used to develop a parent-teacher newsletter. Some teachers use short BASIC programs to alphabetize a class list, enter and average grades (or marks), and rank the class by grade.

I allow my student teachers the option of submitting papers on disk. Using the insert option of the word processor, I place comments where they are relevant. The authors make their alterations and resave the document, with or without the insertions.

For classroom display purposes, I use a scroll program that rolls my comments from the top to the bottom of the screen. It permits a choice of screen and text colors and accompanying melodies. For my convenience, I videotape these sequences and take them into any class that has access to a VCR. These tapes help me demonstrate points during lectures.

Student Programming

Many of my teachers in training have taught young children to program in BASIC. These elementary students can develop simple multiple choice tests or programmed learning sequences for each other. It takes them about an hour to learn the required BASIC commands. As the children develop quizzes, they gain a sense of control over the machine, while analyzing the content of the test material itself.

Both student teachers and children learn to develop sequences in which a wrong answer causes the program to suggest what kind of thinking could have led to the correct answer. If the answer is correct, an explanation appears as to why it is correct.

Music and Sound

I look forward to demonstrating my SID Symphony stereo cartridge and accompanying program to those of my college and elementary classes who are

FOR ORDERS AND INFORMATION IN USA & CANADA CALL

1-800-759-6565

Order Hours: Mon-Thurs, 9am-7pm/Fri, 9am-5pm/CLOSED Sat/OPEN Sun, 9:30-6(ET)

MONTGOMERY GRANT

TM
COMPUTE
GAZETTE
10/91

WE CAN RECONFIGURE ANY OF OUR COMPUTER PACKAGES TO YOUR SPECIFICATIONS. CALL FOR DETAILS!

WE INVITE CORPORATE & EDUCATIONAL CUSTOMERS - DISCOUNTS FOR QUANTITY ORDERS - RUSH, 2ND DAY & NEXT DAY AIR SERVICE AVAILABLE!

OUTSIDE USA & CANADA CALL **(718)692-0790**
 OR WRITE TO: MONTGOMERY GRANT: MAIL ORDER DEPT.
 33 34th ST., DEPT. A, BROOKLYN, N.Y. 11232
 FAX #7186923372 / TELEX 422132 MGRANT
 ESTABLISHED 1967
 RETAIL OUTLET PENN STATION, MAIN CONCOURSE
 (Beneath Madison Sq. Garden) NYC, NY 10001
 Store Hrs: MON-THURS 9:30-7/FRI 8:30-5/CLOSED SAT/OPEN SUN 9:30-7
 FOR CUSTOMER SERVICE OR ORDER STATUS CALL: (718) 692-1148
 CUSTOMER SERVICE HOURS: MON-THURS 9am-5pm/FRI 9am-4pm/SUN 10am-4pm

Commodore®
1084 MONITOR \$279



COMMODORE
AMIGA™ 500 \$469



64C BACK IN STOCK

Commodore®
64C®

Includes:
 Quantum Link Software



\$149.95

Special Purchase Blowouts!

MONOCHROME COMPOSITE MONITORS (RECONDITIONED)

\$39.95

IBM® 80 COL. THERMAL PRINTER INCLUDES COMMODORE INTERFACE

SPECIAL! 5 Free Games with Purchase!

\$29.95

MAGNAVOX 13 COLOR/COMPOSITE/RGB MONITOR W/SOUND! (RECONDITIONED)

\$149.95



SAVE BIG \$\$\$
 WHEN YOU BUY ONE OF OUR ALL IN ONE PACKAGES

64C TEST PILOT PACKAGE

- Commodore 64C Computer
- Commodore 1541 Disk Drive
- Joystick
- Quantum Link Software

5 SOFTWARE PACKAGES INCLUDED:

- Advanced Tactical Fighter
- Infiltrator II • Harrier
- Crazy Cars • Tomhawk

\$289

64C COMPLETE PACKAGE

- Commodore 64C Computer
- Commodore 1541 Disk Drive
- 80 Column Printer
- 12" Monitor
- Quantum Link Software

\$359

64C COLOR PACKAGE

- Commodore 64C Computer
- Commodore 1541 Disk Drive
- 80 Column Printer
- Color Monitor
- Quantum Link Software

\$449

COMMODORE 64/128 SOFTWARE TOP HIT LIST!

Big Blue Reader.....\$31.00	Maverickv5.0.....\$29.00	Rings Medusa.....\$19.00
Carmen Time.....\$26.00	ML Baseball II Enhan.....\$27.00	Secret Silver Blades.....\$32.00
Carmen USA.....\$28.00	Newsroom.....\$14.00	Sim City.....\$21.00
Carmen World.....\$25.00	North & South.....\$20.00	Tetris.....\$14.00
Death Knights Kryinn.....\$40.00	Paperclip III.....\$40.00	Turican II.....\$20.00
Elementary Grd Building.....\$25.00	Pocket Writer.....\$19.00	Ultima VI.....\$49.00
Geo Publish.....\$33.00	Pocket Writer II.....\$34.00	Word Writer VI.....\$34.00
GEOS v2.0.....\$40.00	Print Master Plus.....\$24.00	
Jr. High Grade Builder.....\$19.00	Print Shop.....\$32.00	

PRINTER SPECIALS

STAR	PANASONIC	CITIZEN
NX-1000C.....\$166.95	KXP-1180.....\$159.95	GSX-140.....\$279.95
NX-1000C Rainbow.....\$195.95	KXP-1191.....\$234.95	GSX-145 (Wide Carriage).....\$385.95
NX-1001.....\$149.95	KXP-1123.....\$239.95	200GX.....\$159.95
NX-1020Rainbow.....\$189.95	KXP-1124i.....\$299.95	Color Option Kits.....CALL
NX-2420.....\$279.95		
NX-2420 Rainbow.....\$299.95		

Commodore® MPS-1270 Inkjet \$139.95

PERIPHERALS FOR COMMODORE

COMMODORE 1541II DISK DRIVE **\$159** CALL

COMMODORE 1571 DISK DRIVE

1750 Clone RAM Expansion.....\$189	Micro C-128 Power Supply.....\$59.95
Aprotek 2400 Baud Modem for 64/128.....\$99.95	Super Snapshot 5.0.....\$59.95
Cardco G-Wiz Interface.....\$49.95	Xetec S. Graphix Jr. Interface.....\$29.95
Commodore 1660 Modem.....\$14.95	Xetec S. Graphix Sr. Interface.....\$49.95
64, 64C Power Supply.....\$29.95	
Excellerator Plus FSDII Power Supply.....\$19.95	

OTHER ACCESSORIES FOR YOUR COMMODORE COMPUTER AVAILABLE

NO SURCHARGE FOR CREDIT CARD ORDERS

VISA MasterCard AMERICAN EXPRESS OPTIMA

Certified check, Bank Check Money Orders, Approved P.O.s, Visa, Mastercard, Amex, Optima, Diners Club, Carte-Blanche, COD's & Wire Transfers accepted. Please call before submitting P.O.s. Non-certified checks must wait 2-4 weeks for clearance. Prices and availability subject to change without notice. Not responsible for typographic errors. Return of defective merchandise must have prior return authorization number or returns will not be accepted. Shipping & Handling additional. Second Day & Next Day Air available at extra cost. Canadian orders please call for shipping rates. APO/FPO orders please add 10% shipping & handling (minimum \$15). All APO/FPO orders are shipped first class priority air. We check for credit card theft. DCA #800233.

interested in music. While the 64 normally allows three simultaneous music channels, the stereo cartridge doubles this range. Much of today's popular music is composed and performed via multi-track computers. Most students would benefit from gaining some experience and understanding of this process.

I purchased a Voice Master Jr. digitizer that allows my 64 to recognize spoken words. Handicapped students or those who simply wish to limit their keyboard contact can benefit from this input device.

Elementary Economics

All of the hardware and software I have described here would cost \$300 at most. A full-featured word processor for any of the PC compatibles could easily cost that much. The 64s are already in place in many of our classrooms. For as little as \$30 each, these computers could be effectively utilized with one or two pieces of productivity software. For a couple of hundred dollars more, a school could share all of the other hardware and software I have mentioned.

I'd like to make a final point about making effective use of what you have, and this is true whether you're a school administrator or an individual computer owner. A friend of mine

found some PETs in a school store-room. He had his elementary children compose their documents with *Paperclip* loaded on these older machines. They then loaded their compositions into *Paperclip III* on a 64 for final formatting and printing. The point is that the children learned about writing and they were able to take copies of their completed papers home to show their parents. The children didn't care how old the computers were or how much they cost.

As I write this article with *SpeedScript* on a VIC 20 with 24K expansion, my wife is organizing a report employing *Thinking Cap* on our 64. I will later port this article via cassette to the 64 for word counting, word use analysis, spelling check, formatting, and printing.

In our family, the 64 and VIC 20 get used almost daily, handling a variety of sophisticated chores and projects. With very little additional expenditure of time, energy, or money, we should be able to use the 64 and its ancestors in our classrooms to expand our students' learning experiences. These resources are too valuable to waste.

John Elliott teaches both curriculum and research paper courses at Nova

Scotia Teachers College. He also directs workshops regarding the classroom use of computers. □

PRODUCT LIST

Not all of the products John Elliott mentions in his article are readily available. Some titles are out of print, and some of the publishers have gone out of business. Many of the items can be found at larger software retailers, such as Software Support International, (800) 356-1179. The following products, however, should still be available at the addresses given.

SID Symphony—\$39.95
CREATIVE MICRO DESIGNS
15 Benton Dr.
P.O. Box 646
E. Longmeadow, MA 01028
(413) 525-0023

SpeedScript—\$11.95
COMPUTE PUBLICATIONS
Gazette Disks
324 W. Wendover Ave.
Greensboro, NC 27408
(919) 275-9809

The Write Stuff—\$19.95
BUSY BEE SOFTWARE
P.O. Box 2959
Lompoc, CA 93438
(805) 736-8184

World Geography

for Commodore 64 and Apple II



Full-color 3-D rotating globe!

World Geography is the fun way to learn the world's countries, flags, capitals, populations, languages and currencies in an entertaining 1- or 2-player educational game for the whole family.

"The entire presentation is outstanding... This is really an achievement!"

—Commodore Magazine

"An awesome achievement... the execution is flawless."

—COMPUTE!'s Gazette

C64 only \$19.95, Apple II \$24.95 postpaid!

Also available in Spanish and German

Injured Engine (C64 only) \$14.95

An engine diagnostic simulation by IMAGIC

Fish-Ed (C64 or Apple II) \$17.95

Elementary spelling and number concepts

Speller's Duel (C64 only) \$12.95

Spelling program in a game show format

Full refund if not completely satisfied!

800 829-5551

Outside US call 408 462-1551

BOBCO Interactive Software

200 7th Ave., Suite 111, Santa Cruz, CA 95062



"You can never eliminate the human being. This one was programmed by an idiot."

INTRODUCING

COMPUTE NET



- About COMPUTE/NET
- Product Ordering
- Feedback Board
- Coming Events
- Monthly Contest



Welcome to the grand opening of COMPUTE/NET. A wealth of information awaits you. Back issues of COMPUTE, hard-to-find computer books, super software, dazzling pictures, challenging games, prizes, a complete bulletin board, and much more are here. You can even talk to the editors and authors of the magazine. Lots of surprises are planned, so keep your eyes on us.

FIND US ON Q-LINK



FREE Q-LINK STARTER KIT. FREE TIME. ORDER TODAY!

Just call our toll-free number or return the coupon, and we'll send you the Q-Link Starter Kit and software free, waive your first month's membership fee, and credit you with one hour of "Plus" time to try the service. Your \$9.95 monthly fee gives you unlimited access to all of our "Basic" services online, including a searchable encyclopedia, AND one free*hour of "Plus" services. After your free hour, you'll pay only \$4.80/hour—just 8 cents per minute—for additional use of the service.

Q-Link is a registered service mark of Quantum Computer Services, Inc.

*Long-distance charges may apply. Surcharges apply if you are a resident of Alaska, Hawaii, or Canada. Allow four to six weeks for delivery.

YES! Send me my FREE Q-Link software, waive my first month's membership fee, and credit me with one FREE* hour of Plus time to explore the service and try COMPUTE/NET.

Name _____

Address _____

City _____ State _____ Zip _____

Home Phone _____



Use of Q-Link requires a VISA, MasterCard, or checking account.

MAIL TO

Q-Link

8619 Westwood Center Drive
Vienna, Virginia 22182-9897

Call 1-800-782-2278, Ext. 2414 today

BIBLE SEARCH

"The apple of his eye" and "Escaped with the skin of my teeth." Recognize these phrases? They are two of the most common clichés—the kind that got you into trouble with your high school English teacher. Do you know what else they have in common? Their origin is the Bible, and now they can also be found on disk for your 64 or 128.

"Let all the people say, 'Amen,'" is another commonly used phrase.

SOGWAP Software presents *Bible Search* 3.1 in which Michael Miller has achieved the remarkable by offering the complete King James Version of the Bible on four double-sided 1541/71 disks, with an exhaustive cross-referenced concordance on two more. The program itself uses one disk.

Bible Search can search for and display words or verses easily and swiftly, even allowing for disk swaps. This speed allows you to spend more of your time meditating on scripture rather than looking for it.

The program opens with a setup menu that allows you to manipulate screen colors. In addition, you can alter the colors that indicate italics, the words of Christ, basic Bible text, the computer prompts, and the user's responses. After you have set your colors, pressing Return takes you into the program, where you can request to see a specific verse or begin a search for a word or specific phrase.

When a verse is displayed, you can view it in context with the verses that immediately precede and follow it. You can scroll forward and backward through surrounding text or skip to the first verse of the previous or

next chapter. You can request a range of verses, too. Output can be directed to screen, disk, or printer. By successive moves you could print out the entire Bible straight from the program or save it to disk for use with a word processor, which would allow you to customize your printout.

Bible Search will find sin-

less than three minutes. Pressing f3 displays the first verse that contains the search words. Press f3 repeatedly to bring up more verses with matching words.

Bible Search utilizes a compressed database composed of eight relative (REL) files. It has the complete text of the King James Version of the Bible and an exhaustive

program on our 64 with two FSD Excelerator Plus drives and a Star NX-1000 printer with MW350 interface in Commodore emulate mode. The two drives made the program quite comfortable to use, but with the various drive configurations it offers, *Bible Search* provides a good excuse to buy more hardware.

Generally, churches, Bible study groups, and Bible scholars don't have much money. Miller himself says that students for whom money is no concern should equip themselves with a PC and the IBM version of his program. For many people this is not a viable alternative. For them, the 64 version of *Bible Search* is a handy tool. It's fast, thorough, and easy to use. In fact, for some people, it would be worthwhile to buy a 64 just to run this program. Use it for Bible trivia quizzes. Print out passages of scripture to be highlighted, picked apart, criss-crossed, and written on. With a word processor's special fonts, you can print out cards or posters of your favorite Bible quotes.

The manual is clear and well written. It even has a glossary that includes the definition of SOGWAP. Like many programs, *Bible Search* suggests you make and use a backup copy. A reasonably good copy program is included. Because of their size, however, the cross-reference disks cannot be copied on a 1541. There is a warning to this effect—but the suggestion to copy disks is on page 3, and the warning about the reference disks is buried on page 18.

We found only two other problems with the program. You have to pound Run/Stop-Restore to get a response (its function is to reset the program to the first



Locate any phrase in the Bible in less than two minutes.

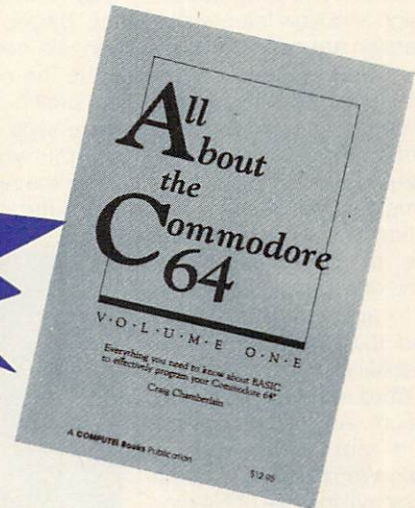
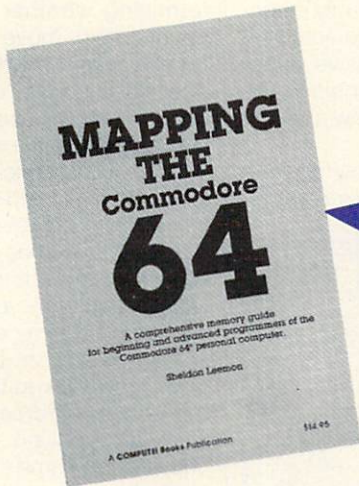
gle words or groups of words. It divides the Bible into four sections (hence the four disks) and searches one section at a time. Being a smart program, it not only tells you when you have inserted the wrong disk or side in the drive but also tells you which one to put in. When it has found all the verses in the section that contain the search word(s), it informs you of how many there are. You can display the reference list of verses in a search buffer. A screen dump allows you to print out the list.

For example, the word *judge* appears in 170 verses. To search the entire Bible for this information and print out the list of verses took

English concordance of 12,800 words and 700,000 indexed verses. A single-disk word search takes five seconds. Miller has noted a worst-case word-search time, using the 1541, of two minutes for the whole Bible. This is believable, judging by our experience.

This program will run on several hardware configurations. The 128 version of *Bible Search* 3.1 supports REU and has an 80-column screen option. It is Fast Load/JiffyDOS compatible, although they aren't really needed. *Bible Search* 3.5 (not reviewed) is available for the 1581 and hard drives. This version reputedly can search the entire Bible in five seconds. We ran the pro-

COMPUTE BOOKS GIANT WAREHOUSE CLEARANCE SALE



- | | |
|---|--|
| <input type="checkbox"/> First Book of Commodore 64 Games (37X) | <input type="checkbox"/> Mapping the Commodore 64 (0823) |
| <input type="checkbox"/> First Book of Commodore 64 (34X) | <input type="checkbox"/> More Machine Language Games for the Commodore 64 (0947) |
| <input type="checkbox"/> Third Book of Commodore 64 (728) | <input type="checkbox"/> Machine Language for Beginners (116) |
| <input type="checkbox"/> All About the Commodore 64, V. 1 (040X) | <input type="checkbox"/> 40 Great Submarine Simulator Adventures (1722) |
| <input type="checkbox"/> Beginners Guide to Commodore 64 Sound (54X) | <input type="checkbox"/> 40 Great Flight Simulator Adventures (0224) |
| <input type="checkbox"/> Commodore 64/128 Power Basic (0998) | <input type="checkbox"/> 40 More Great Flight Simulator Adventures (0432) |
| <input type="checkbox"/> Commodore Collection (701) | <input type="checkbox"/> Flying on Instruments with Flight Simulator (0912) |
| <input type="checkbox"/> Creating Arcade Games on the Commodore 64 (361) | <input type="checkbox"/> Official Book of King's Quest (1552) |
| <input type="checkbox"/> Machine Language Games for the Commodore 64 (0610) | |

Please place a check next to the books you want. Complete the form below and mail entire coupon to the address below. Be sure to enclose a check or credit card information.

A. _____ Total number of books ordered

Enclosed is _____ Check _____ MC# _____ VISA#

B. _____ Total cost of books ordered:

MC or VISA # _____ Expiration date _____

1 book—\$6 3 books—\$15 5 books—\$22
2 books—\$11 4 books—\$19 6 books or more—\$4 each

Signature _____

Name _____

C. _____ Shipping and Handling: Please add \$1 per book US, \$2 per book Canada, or \$6 per book foreign

Address _____

City _____ State _____ Code _____

D. _____ NY, NJ, NC orders please add appropriate sales tax. Canadian orders add 7% Goods and Services Tax

Mail to: COMPUTE Books
c/o CCC
2500 McClellan Ave.
Pennsauken, NJ 08109

Please allow 4 to 6 weeks for delivery.
Offer expires December 31, 1991 or while supplies last.

_____ Total Cost (B+C+D)

CLEAR

menu). And where is the Revised Standard Version of the Bible? The King James Version and New International Version are currently available; a Revised Standard Version would be a welcome addition to this series.

Bible Search is one of those programs so deceptively simple to use that its sophistication is overlooked. You have to think about the scope of what you're searching to appreciate just how good this program is. Michael Miller has transcribed the Word of God onto a new medium. As a Christian, he could not have spread God's Word better than he has by making use of his programming talents this way. Bible students, Christian or not, can be thankful he did.

Oh, yes. Our Bible references? "The apple of his eye" is found in Zechariah 2:8 and in Deuteronomy 32:10. "Escaped with the skin of my teeth" is from Job 19:20, and "Let all the people say, 'Amen'" is from Psalms 106:48.

DAVE and ROBIN MINNICK

Commodore 64 or 128—\$59.95 for KJV, \$69.95 for NIV, \$5.00 for gospel demo

SOGWAP SOFTWARE
115 Bellmont Rd.
Decatur, IN 46733
(219) 724-3900

Circle Reader Service Number 344

STAR CONTROL

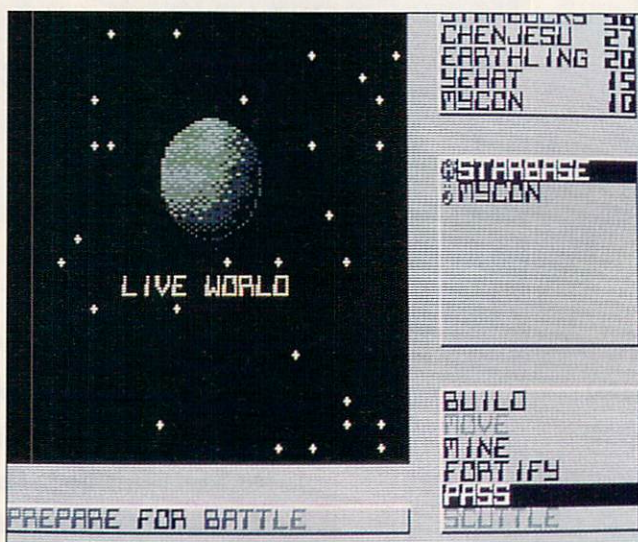
The time: the twenty-seventh century. The place: outer space. The Ur-Quan Hierarchy, a confederation of intergalactic slave traders, is on a deadly rampage.

Held at bay for centuries by the Alliance of Free Stars, the Hierarchy is now on the verge of grinding the Alliance into space dust. Earth, formerly judged too weak to be part of the Alliance, is

called upon for assistance in stemming the tide of the Ur-Quan menace. Is it a case of too little too late, or will the Alliance's newest member be up to the challenge? Blending strategic elements with arcade-style action, *Star Control* pits you (commanding either the Alliance's or Hierarchy's forces) against a hu-

er, for example, fires heat-seeking tactical nuclear weapons and, for its special power, has a primarily defensive laser that also acts as a short-range offensive weapon. On the downside, the Cruiser is both slow and vulnerable.

Each player may operate one fleet of seven ships.



Star Control is an outer space blend of strategy and action.

man or computer opponent in a fight for control of the other's star base. Initially, it's difficult to coordinate both strategic and combat elements, but you can have the computer do the thinking or fight the battles for you.

From your Fleet Command View—a gridlike, planet-filled screen—you and your adversary send ships out from your star bases. Your objectives are to develop colonies, build mines and fortifications, and attack the enemy or defend yourself.

All of the four Alliance and four Hierarchy races fly their own distinctive aircraft, each with unique weaponry, special powers, maneuvering characteristics, and weaknesses. The Earthling Cruis-

er, for example, fires heat-seeking tactical nuclear weapons and, for its special power, has a primarily defensive laser that also acts as a short-range offensive weapon. On the downside, the Cruiser is both slow and vulnerable. Each player may operate one fleet of seven ships.

These may be replaced as long as there is money to pay for them. The prices of spacecraft vary, so deciding whether to buy a less expensive but weaker ship immediately or risk possible annihilation while waiting for the cash to purchase the best is a strategic choice. Colonies, mines, and fortifications, though equally important, provide different benefits. Colonies are recruiting areas for new members and quick routes for ship movement. Mine production earns you star bucks, which may be spent at the star base to purchase new ships. Fortifications make it difficult for your opposition to destroy your mines and colonies and reach your strate-

gically important star base.

Because you can perform only three actions per turn, determining whether to construct a ship, move a piece, build a mine or fortification, develop a colony, or attack an enemy requires an accurate reading of the situation. To further complicate matters, you can't build on or develop some planets.

After a player has completed a turn and has placed a ship on one or more planets containing enemy craft, the screen shifts from the Fleet Command View to the Combat Transition Screen. In this mode all opposing ships occupying the same sector go at each other until a victor emerges.

Most combat screens consist of a star-laden canvas occupied by a pair of ships. Two gauges—one measuring crew strength and the other fuel usage—fill the bottom quarter of the screen. Your crew is depleted with every hit you take; however, it's possible to recruit new members. Fuel is expended by firing weapons or by using special powers and is replenished when your ship stops moving. Unfortunately, the more you stand still, the more vulnerable you are.

At first there are no pushovers among the competition, so you'll need to build to the challenge slowly. For this reason it's best to begin in the practice mode and in the easiest of three difficulty levels. Without having to worry about the strategy required in the full game, you can set your mind to inflicting destruction on enemy spacecraft.

When you've tired of practicing, you may engage in a melee with the enemy fleet. This pits your four ships against your adversary's four, one pair at a time. The

GAZETTE DISK LIBRARY

VALUE-PACKED SOFTWARE AT AFFORDABLE PRICES

All *Gazette* disks are menu-driven for ease of use—and they feature complete documentation. Just load and you're ready to go!

SpeedScript

\$11.95

COMPUTE Publications' most popular program ever. Powerful word processing package includes *SpeedScript* for the 64, *SpeedScript 128*, spelling checkers for both 64 and 128 versions, plus an additional dozen support programs, including mail-merge and word-count utilities.

Gazette Index

\$7.95

Every article and department from *Gazette*—July 1983 through December 1989 issues—is indexed: features, games, reviews, programming, "Bug-Swatter," "Feedback," and the other columns. Disk features pull-down menus, help screens, superfast searching/sorting capabilities, and much more.

Best Gazette Games

\$9.95

Best dozen arcade and strategy games ever published in *Gazette* all on one disk. All games for Commodore 64. Titles: *Crossroads II: Pandemonium*, *Basketball Sam & Ed*, *Delta War*, *Heat Seeker*, *Omicron*, *Powerball*, *Q-Bird*, *Trap*, *Arcade Volleyball*, *Mosaic*, *Power Poker*, and *Scorpion II*.

Gazette's Power Tools

\$9.95

Fourteen of the most important utilities for the 64 ever published in *Gazette*. For serious users. Titles: *MetaBASIC*, *Disk Rapid Transit*, *Mob Maker*, *Ultrafont+*, *Quick!*, *Disk Editor*, *Basically Music*, *PrintScreen*, *1526 PrintScreen*, *Fast Assembler*, *Smart Disassembler*, *Comparator*, *Sprint II*, and *Turbo Format*.

The GEOS Collection

\$11.95

Gazette's best 13 programs for GEOS and GEOS 128 users. Selection includes utilities, applications, and games. Titles: *Super Printer Driver*, *Skeet*, *File Saver*, *Help Pad*, *Word Count*, *Directory Printer*, *Quick Clock*, *SlideShow*, *File Retriever*, *Screen Dumper*, *Font Grabber*, *GeoPuzzle*, and *GeoConverter*.

128 Classics

\$11.95

Thirteen of *Gazette's* best 128 programs, including utilities, games, and applications. Titles: *MetaBASIC 128*, *RAMDisk 128*, *80-Column Disk Sector Editor*, *MultiSort*, *Block Out*, *Miami Ice*, *The Animals' Show*, *Cribbage*, *XPressCard*, *Sound Designer*, *Video Slide Show*, *Math Graphics*, and *3-D BarGrapher*.

SPECIAL OFFER!

All 6 DISKS FOR ONLY \$49.95!

A \$13.00 SAVINGS!

All prices include shipping & handling.

SpeedScript	<input type="checkbox"/>	\$11.95
Gazette Index	<input type="checkbox"/>	\$ 7.95
Best Gazette Games	<input type="checkbox"/>	\$ 9.95
Gazette's Power Tools	<input type="checkbox"/>	\$ 9.95
The GEOS Collection	<input type="checkbox"/>	\$11.95
128 Classics	<input type="checkbox"/>	\$11.95
Special 6-Disk Offer	<input type="checkbox"/>	\$49.95

Subtotal _____

Tax* _____

Outside U.S. or Canada** _____

Total _____

Name _____

Address _____

City _____ State _____ ZIP _____

Amount enclosed \$ _____ Method of payment Check or Money Order

VISA or MasterCard

Mail to Gazette Disks
324 W. Wendover Ave., Ste. 200
Greensboro, NC 27408

Credit card no. _____ Exp. date _____

Signature (required) _____

Daytime phone number _____

* Residents of North Carolina and New York add appropriate sales tax. Canadian orders, add 7% goods and services tax.

** For delivery outside the U.S. or Canada, add \$1 for surface mail or \$3 for airmail. All orders must be in U.S. funds drawn on a U.S. bank.

winner of each dogfight continues against another from the loser's roster until one side has eliminated all opposing vessels.

Though fast moving and exciting, the battle sequences are a throwback to the early days of electronic gaming. In fact, the graphics, animation, joystick control, and play action are reminiscent of that venerable videogame antique *Asteroids*—except now asteroids shoot back.

Graphically, the strategic screen is less sophisticated than the combat screen. Star bases, ships, mines, and the like are represented by simple, two-dimensional shapes. Stars are represented by simple dots.

Documentation consists of a 30-page illustrated manual that does a good job of setting forth the rules and describing the races of participants and their spacecraft.

As a solo contest, *Star Control* is a disappointment. Even with the difficulty settings favoring the computer, you'll soon find it relatively easy to outwit and outfight it. The game shines in the two-player mode, where equals can battle it out or mismatched opponents can balance the odds by playing at different difficulty settings.

The bad news about *Star Control* is that it has little to offer anyone looking for something new or original. The good news about it is that players who like an outer space setting, a capture-the-flag-style challenge, and an emphasis on action and strategy will not be disappointed.

LEN POGGIALI

Commodore 64 or 128—\$39.95

ACCOLADE
550 S. Winchester Blvd.
San Jose, CA 95128
(800) 245-7744

Circle Reader Service Number 345

DRAGONS OF FLAME

Imagine an Advanced Dungeons & Dragons session coming to life on the computer screen, and you'll have *Dragons of Flame*. It's an exciting combination of magic and might.

Strategic Simulations' role-playing epics in the gold boxes take a traditional approach to role-playing games (RPGs). They present an overhead view of the landscape and a side view of the action during combat. Silver box action games, such as *Dragons of Flame*, rely heavily on arcade combat in addition to the skills, magic, and monsters found in other RPGs.

Unlike its predecessor, *Heroes of the Lance*, *Dragons of Flame* is not too difficult and, as a result, is a lot more enjoyable. Other features and changes make *Dragons* the better of the two and an example for the future.

The appeal of *Dragons* and *Heroes* is the quick action found in both games. When you play AD & D on paper, there is no way to see the results of slaying a giant spider or defeating a hobgoblin. The gold box AD & D games show combat, but it's not controlled by a joystick. *Dragons* brings to life the imagined action and adds a lot of neat elements to round out the adventure. This is no arcade game, and you'll have the large amount of time spent solving the game as proof.

The goal of *Dragons* is to rescue a number of slaves held by the evil Draconians in the fortress of Pax Tharkas. Along the way, you'll befriend the elves of Qualinesti and travel through the wilderness and caves of Sla-Mori.

This game is based on the second AD & D Dragonlance game module and reflects the thought and preparation that goes into these modules. The wilderness maze is large and keeps you from reaching the fortress and caves. Many challenges await before you must tackle the maze, so don't feel lost if you don't find it immediately.

More than half of the screen is filled by the action window. It can show either the wilderness view or combat view. The overhead wilderness view depicts your immediate surroundings and helps to guide you through the landscape. This view is new to *Dragons*.

When enemies draw near, it's necessary to switch to the combat view. You view combat from the side and only see the leader of your party and the opponent. Using the joystick and the keyboard for spells, you battle it out with the monster. This is the fun part of the game. It's very rewarding to take out a monster and watch it disappear after a few well-placed blows. It makes all those years spent playing arcade games worthwhile.

The other parts of the game screen are a collection of icons for up to ten members of your party and a compass rose that indicates the party's current orientation. The icons indicate player status and damage. You can rearrange the party at any time except during battles. Rearranging your party becomes necessary at times because only certain characters have the abilities, skills, or magic to defeat particular monsters. You have to exercise your brainpower to decide on the proper leader, but these decisions in real-time are exactly what would

happen if the AD & D world actually came to life.

You use the joystick to move the party icon around the landscape or to fight battles. The space bar activates other options and commands, such as Take, Drop, Open, Shut, and Save Game. It takes no time at all to learn the game system. The game relies heavily on how quickly you can make decisions, win battles, and complete miniquests. *Dragons* will send you to many locations to look for special objects and weapons. Major goals reveal themselves at the appropriate time.

Graphics in *Dragons* are very nice, particularly in the combat view. This side view shows a lot of detail, both indoors and outdoors. The monsters move well, although a lot of them are the same size as your party leader. The wilderness view accurately reflects the overall map found on the back of the game manual. You won't need this view for much more than orientation. The animation of the monsters and characters is smooth. You'll need to move quickly to defeat your opponents.

Sounds and music are not extensive in *Dragons*, but they keep the atmosphere of the game ominous. After seeing this game on more powerful computers, I was surprised with the power that the designers pulled out of the 64. SSI does the machine justice.

Once again, SSI's manual in *Dragons* serves as an example of fine documentation. Unlike other AD & D computer games, there is not a lot to read. The bulk of the manual is for background information and character descriptions. Game commands and controls are on a quick-start card. The end re-

The Lowest Prices in the World on Commodore-Ready Printers! Really!!

stair
THE COMPUTER PRINTER



ONLY
\$159⁹⁵

ONLY
\$139⁹⁵

Full color &
Commodore-ready!

Ready to plug into your
Commodore and go!

NX-1000C Rainbow

Print in full color! Near-letter quality at 36 cps and high-speed draft at 144 cps features the new paper parking function. Convenient front panel controls. Great for extra-impact graphics and text. This is the Commodore-ready version—no additional interfaces or cables are required. Sug. Retail

NX-1000C Rainbow Color Printer,
Commodore Ready 75783 ~~\$249.95~~
LOWEST PRICE EVER! **\$159.95**

Printer Accessories

Black Ribbon for NX-1000C/NX-1000C
Rainbow Color Printer 75471 \$5.95
Color Ribbon for NX-1000/NX-1000C
Rainbow Color Printer 75485 \$9.95
Dust Cover for NX-1000C/NX-1000C
Rainbow Color Printer 77789 \$8.95

NX-1000C

This is the Commodore-ready version of the NX-1000. You can just plug it in and start printing—no additional interfaces or cables are required. Sug. Retail

NX-1000C Printer 75060 ~~\$479.95~~
LOWEST PRICE EVER! **\$139.95**

Quality TENEX Power Supplies



From
\$34⁹⁵

Lifetime Warranty!

TENEX MW 701-A. Conservatively rated at 5V and 1.8A, this unit for the C64 features a double-fused system. Its new heat-sink design allows cooler operating temperatures inside the case. Lifetime warranty. Sug. Retail \$49.95

TENEX MW 701-A 84513 \$34.95

TENEX MW 705. Perfect for your C-128! This is a heavy-duty, switching power supply rated at 3 amps at 5VDC. Lifetime warranty. Sug. Retail \$69.95

TENEX MW 705 90686 \$49.95

Don't miss out on the hottest new products and great prices on the most popular hardware and software!!
Call Today for your **FREE** catalogs!!



IBM Compatibles



Commodore
& Amiga

TENEX
Computer Express

TENEX Computer Express
P.O. Box 6578
South Bend, IN 46660
(219) 259-7051 — FAX (219) 259-0300

We gladly accept mail orders!



No Extra Fee For Charges!

*Shipping, Handling, Insurance

Order Amount	Charge
less than \$19.99	\$4.50
\$20.00-\$39.99	5.75
\$40.00-\$74.99	6.75
\$75.00-\$98.99	7.75
\$99.00-\$149.99	8.75
\$150.00-\$299.99	9.75
\$300.00 & up	\$CALL

ORDER TODAY CALL 1-800-PROMPT-1

COMMODORE 64 and COMMODORE 128 are registered trademarks of Commodore Electronics, Ltd. AMIGA is a registered trademark of Commodore Amiga Inc. NOTE: Due to publishing lead-times, product prices and specifications are subject to change without notice. * APO, FPO, AK, HI, CN, VI, GU, and foreign orders are subject to additional shipping charges. G5P
Circle Reader Service Number 170

The GRAPEVINE GROUP Inc.

COMMODORE UPGRADES

NEW POWER SUPPLIES

• A super-heavy, repairable C-64 power supply with an output of 4.3 amps (that's over 3x as powerful as the original). Featuring 1 year warranty, ext. fuse, schematics, UL approved. This supply is used for multiple drives, additional memory and "packet." Cost is **\$37.95** and includes as a bonus either the Commodore Diagnostic II (valued @ **\$6.95**) or the "programmers utility" plug-in cartridge (valued @ **\$9.95**).

Our Biggest Seller

- 1.8 amp repairable heavy duty supply for C-64, (Over 120,000 sold.) **\$24.95**
- 4.3 amp supply for C-128. Same features as above—**\$39.95** (includes bonus package)
- 1541 Commodore Power Supply **\$34.95**
- 1541 II/1581 **\$26.50**

PRINTHEAD REFURBISHING

Save time and money by having your tired, worn-out or damaged printhead refurbished or remanufactured at a fraction of the cost of a new one. Features low cost, 5 day service and 1 year warranty Call for prices/info.

COMMODORE DIAGNOSTICIAN II

Originally developed as a software package, then converted to a readable format, the Diagnostician has become a fantastic seller. With over 32,000 sold worldwide, Diagnostician II utilizes sophisticated cross-reference grids to locate faulty components (ICs) on all C-64 and C1541 computers (C-128/64 mode). Save money and downtime by promptly locating what chip(s) have failed. (No equipment of any kind needed.) Just updated with 30 changes to take advantage of the new 64C combination chip/RAM changes found on new CBM boards. Success rate from diagnosis-to-repair is 98%. Includes basic schematic **\$6.95** (Avail. for Amiga computers with 3 1/2" disk at **\$14.95**.)

PROGRAMMERS UTILITY CARTRIDGE

This Utility Cartridge by Share Data saves you time and energy. In just two keystrokes you can perform BASIC functions that normally take several steps to complete. You get 30 additional machine language programming commands such as: reset button, recover lost programs, instantly accesses disk directory, dumps screen to printer and renumbers program lines. Works with Commodore C-64 and C-128. Comes with 8 page instructional manual. **\$6.75**

RIBBONS

MPS801/2/3, 1526, MX80/100 **\$2.95**

EMERGENCY STARTUP KITS

Repair your own Commodore/Amiga and save lots of money. Originally blister packaged for government PXs worldwide, these kits are now available to you (no soldering). Kits for Amiga, C64 and drives. Each kit contains all chips, 4164 memories, schematic, Commodore Diagnostician II, fuse, chip puller and diagnostic test diskette with 9 programs. ... Send for full details.

REPLACEMENT/UPGRADE CHIPS & PARTS

- | | |
|---|--|
| 6510 CPU \$11.50 | C-128 Serv. Manual. 44.50 |
| 4164 (C-64/RAM) ..... .60 | 1541 Serv. Manual. 34.95 |
| 6526 CIA 12.25 | 1750 RAM Expander. 159.95 |
| 6581 SID 12.25 | C-64 Keyboard (new). 19.95 |
| 6567 Video 14.95 | C-64 Case (new) 14.95 |
| PLA 906114 12.95 | SX64 Kybd/Cable 49.95 |
| 8563 CRT 19.95 | 1541/1571 Parts Call |
| All 901/225-6-7 10.95 | Commodore Cables Call |
| 1571 Upgrd ROM. 11.95 | Super Graphics 57.50 |
| C-128 ROMs 24.95 | Super Graphics Jr. 49.95 |
| C-128 RAM Upgrd. 56.95 | 300 Baud Modem 6.95 |
| C-64 Serv. Manual. 34.95 | C-64 & 1541 Pc Brds. Call |
| CBM to IBM Printer Cable Adapter 34.95 | Computer Saver (C-64 protection system) 17.95 |

All Commodore chips in stock. See catalog.
COMMODORE REPAIRS—CALL FOR PRICES

Send For Free Catalog

36 page FREE catalog containing parts, upgrades, memories, power supplies, diagnostics, and other items not found anywhere else.

3 CHESTNUT ST., SUFFERN, NY 10901
Order Line 1-800-292-7445
Fax 914-357-6243 Hours: 9-6 E.S.T. M-F 914-357-2424
We Ship Worldwide Prices subject to change

Circle Reader Service Number 128

REVIEWS

sult is that you'll be playing *Dragons* shortly after you open the package, and the blend of action and adventure will make you forget about your pen-and-paper AD & D sessions. *Dragons of Flame* takes the spirit of AD & D adventures and the action of imaginative battles and colorfully blends them on your computer's screen.

RUSS CECCOLA

Commodore 64 or 128—\$29.95

STRATEGIC SIMULATIONS
Distributed by Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94414
(415) 571-7171

Circle Reader Service Number 346

CENTAURI ALLIANCE

As a member of the rebel coalition, you must complete a series of dangerous missions in *Centauri Alliance*. Michael Cranford, designer of *Bard's Tale*, has set this role-playing adventure in the Star Wars-like world of the twenty-third century. Missions entail journeying to various planets, where you will negotiate mazes, combat menacing aliens, encounter deadly traps, and locate valuable items.

You assemble a party of eight individuals from six races of beings. Friendly aliens and mechanoids you meet along the way may also join your party. Characters differ not only racially but in terms of their attributes (strength and IQ, for example) and disciplines.

The four disciplines are an expertise in weapons and fighting, skills in maintaining and repairing biological and mechanical systems, metamorphic ability (being able to change shapes), and psionic talent (the ability to focus brain waves to achieve desired ends).

Most interesting are the over 80 psionic skills. Some are as simple as being able to slow down an opponent. Others are more exotic, such as encasing enemy forces in shifting sheets of rubble or bringing on earthquakes that affect only your adversaries.

No single race is competent in all four disciplines. Donsai, for instance, are capable warriors; Praktors are the only beings able to change shape. As a result of this specialization, it is essential that you assemble a well-balanced team, if you hope to succeed.

Initially, a character is skilled in one aspect of a single discipline. For example, a warrior might be adept at hurling weapons or using explosives but not at close-quarter fighting in a melee. Only by gaining experience can a character become trained in other disciplines.

Gameplay is made easy by a series of menus accessed via joystick, keyboard, or mouse. The game's combat system is also uncomplicated—if uninspired. A single figure representing your party and one or more enemy figures are placed on a small hex grid. From this position you can attack, move to an adjoining space, or flee. Before attacking, you may command individuals to engage in a melée, fire a weapon, dodge, or use psionic or metamorphic powers. After all options are chosen, the message screen displays the results of the battle.

You travel through and view your surroundings in either the first-person perspective, 3-D mode, or from overhead. Although the 3-D perspective is more attractive, the top view is more practical. It provides a better overall sense of your location and includes an automapping feature. Unfortunately, when you move to another maze, the program does not retain your previous map for later use. Fortunately, you can save a game in progress.

Centauri Alliance comes on three double-sided disks, so players will spend dozens of hours with the game. Less worthwhile is the time spent waiting for each battle to load. Use those occasions to study the lengthy manual and field guide, which do a good job of providing atmosphere and explaining the rules. The manual itself is an entertaining addition to this software package.

Before long, some players will grow tired of searching rooms, traveling between planets, increasing weaponry, and fighting battles. Diehard fans of role-playing games, however, will consider *Centauri Alliance* a solid addition to their software libraries.

LEN POGGIALI

Commodore 64 or 128—\$29.95

BRØDERBUND
17 Paul Dr.
San Rafael, CA 94903
(415) 492-3200

Circle Reader Service Number 347

SCREEN-PRO 64

If you're looking for a useful program to help you design screens and simple animated sequences, consider *Screen-Pro 64*. You'll find it handles these chores easily.

One of its many features is that *Screen-Pro 64* allows you to save load screens you have designed. BASIC doesn't give you this freedom. In addition, it lets you copy screens so that minimal changes are required when chaining together screens for animation. *Screen-Pro* augments the editing commands that are built into the 64 and makes them easier to use.

Screen-Pro 64 comes

packaged with two disks. One is for the different color modes available on the 64 and the other is for single color only. The color version lets you chain a maximum of 17 screens in an animation sequence. The monotone version lets you use 34.

Demonstration programs show how to design for a 3-D effect, change colors of key screen elements, and other effects. The program is great for creating dynamic and colorful title screens.

RUSS CECCOLA

Commodore 64 or 128—\$24.95

ACCUTONE PRODUCTIONS
36 Myers Ct.
Medford, OR 97501
(503) 772-4890

Circle Reader Service Number 348

Big Blue Reader 128/64

Read & Write IBM PC Disks!

Big Blue Reader 128/64 is a fast, easy-to-use, menu driven program for novice and expert alike. Transfers word processing, text, ASCII, and binary files between Commodore 64/128 and IBM PC compatible 360K 5.25" and 720K 3.5" disks. Includes both C64 & C128 programs. Requires 1571 or 1581 Disk Drive. Does not work using 1541. BBR 128 Version 3.1 upgrade, \$18+ original BBR disk.

Big Blue Reader 128/64 only \$44.95

Bible Search 3.1

The only Bible Study Program with:

- 1) Entire Old and New Testament on (4) 1541/71 or (2) 1581 disks.
- 2) An Exhaustive English Concordance on (2) 1541/71 or (1) 1581 disks; includes more than 700,000+ references.
- 3) Incredible five (5) second look-up time, per/word, per/disk.
- 4) Instant, automatic spell checking of more than 12,800 words.
- 5) Boolean Search operators including AND, OR & NOT logic.
- 6) Search entire Bible in 5 seconds with 1581 or Hard Drive (v3.5).
- 7) A Money Back Guarantee!

Includes: Easy-to-use, C64 and C128 (40/80 column) programs, printer and disk output, users guide, disk case, and more.

Available on (7) 1541/71, or (4) 1581 disks. (Demo disk \$5)

KJV \$49.95 ☆☆☆☆☆ NIV \$59.95

Any questions? Call or write for more information.

NOW Available! AMIGA Bible Search

Order by check, money order, or COD. US Funds only.

FREE shipping in North America. No Credit Card orders.

Foreign orders add \$5 S/H (\$12 whole Bible)

SOGWAP Software (219)724-3900

115 Belmont Road; Decatur, Indiana 46733

SAVE TIME AND MONEY

Yes, save time and money! Subscribe to the *Gazette Disk* and get all the exciting, fun-filled *Gazette* programs for your Commodore 64 or 128—already on disk!

Subscribe today, and month after month you'll get all the latest, most challenging, and fascinating programs published in the corresponding issue of *COMPUTE*.

New on the *Gazette Disk*! In addition to the programs that appear in the magazine, you'll also get outstanding bonus programs. These programs, which are often too large to offer as type-ins, are available only on disk—they appear nowhere else.

As another *Gazette Disk* extra, check out

"Gazette Gallery," where each month we present the very best in original 64 and 128 artwork.

So don't waste another moment. Subscribe today to *COMPUTE's Gazette Disk* and get 12 issues for only \$49.95. You save almost 60% off the single-issue price. Clip or photocopy and mail completed coupon today.

Individual issues of the disk are available for \$9.95 (plus \$2.00 shipping and handling) by writing to *COMPUTE*, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408.

YES! Start my one-year subscription to *COMPUTE's Gazette Disk* right away for only \$49.95.*

Payment enclosed (check or money order)

Charge MasterCard Visa

Acct. No. _____ Exp. Date _____

Signature _____
(Required)

Name _____

Address _____

City _____
State/Province _____ ZIP/Postal Code _____

Mail to *COMPUTE's Gazette Disk*, P.O. Box 3250, Harlan, IA 51593-2430

*Residents of NC and NY, please add appropriate sales tax for your area. Canadian orders, add 7% goods and services tax. OCTOBER 1991 *COMPUTE* G-15

Questions and answers about previous programs, printer ribbons, and more

Bug-Swatter

SpeedScript users who've been editing their dictionaries with the *SPEEDCHECK.DM* program have been seeing SYNTAX ERROR IN 260. The problem is the part of program line 260 which follows the colon and looks like this:

```
IFSTORFTHENRETURN
```

Commodore BASIC tries to make sense of it with the interpretation

```
IF S TO RF THEN RETURN
```

Since this statement is meaningless in BASIC it results in a SYNTAX ERROR. It's a textbook illustration of the danger of running together the elements of a BASIC instruction, even though the 64 and 128 allow you to do so. The actual logic should read:

```
IF ST OR F THEN RETURN
```

To make the correction, just load *SPEEDCHECK.DM* like any other BASIC program, list line 260, make the change above by adding spaces, and save the program back again. If you have any uncertainty about how to do any of these steps, either experiment with a copy of the *SpeedScript* disk or ask someone who is certain.

Several readers have written to complain that William Chin's *Memo Card* program (September 1989 and the 1991 *Gazette PowerPak* disk) will not reload data from disk without an occasional STRING TOO LONG ERROR appearing. The problem can easily be fixed by replacing line 1350 in the *Memo Card* BASIC program with the following and adding some additional code.

```
1350 INPUT#1,HR
```

```
1352 FOR I=0 TO HR:T$=""
1354 GET#1,A$:IF A$=CHR$(13)
THEN 1358
1356 T$=T$+A$:GOTO 1354
1358 IF T$="←"THEN T$=""
1359 M$(I)=T$
```

I would like to commend the author of *CoilCalc*, which ran in the June 1991 issue. It is a fine program that will be of interest to many electronic hobbyists. However, the program will not function in Option 1 because of errors in lines 580 and 585. Here are the corrections that should fix the problem.

```
580 IN=INT(100*((.5+VAL(CDS))
↑2)*((TN(GA)*VAL(CL))↑2))
585 IN+INT(IN/((4.5*VAL(CDS))+
(10*VAL(CL))))
```

ROLAND BURGAN
HANCOCK, MI

More Niche Programs

Robert Marcus' *CoilCalc* (June 1991) is one of the best and most useful programs you've published in years. In the user group of which I am a member (and "stuckee" called the president), a substantial percentage of members are radio amateurs, technicians, or engineers. Many of us are photographers, pilots, rebuilders of elderly automobiles, model airplane flyers, chemists, and otherwise technically interested in the world around us. How about some more niche programs of interest to any or all of the above?

B. CHANDLER SHAW (WA6EWY)
GRANADA HILLS, CA

We'll be happy to consider such programs. So how about it, readers? Do you use your 64 with some hobby or avocation? If you've written a program that helps you get more enjoyment out of some other activity, send a copy of it with instructions on disk to the Gazette Submissions Reviewer

for possible publication. We pay for programs we publish.

Graphs Wanted

There is a program called *128 Graph Designer* written by Danny Komaromi in the July 1987 issue. I would like to see it written for the 64.

RUSSELL WRIGHT
MILWAUKEE, WI

128 Graph Designer is a good program that lets users create pie charts, bar graphs, and line charts on the 128, but there is no 64 version. If a bar chart will fill your need, Tim Ruiz wrote a program called EZ Bar Charter (September 1989) that works with either the 64 or 128. It plots up to eight items on a vertical bar chart and prints the resulting graph to screen or printer. If someone would like to submit a good chart program for the 64, we'll consider it for publication.

Printer Ribbons

Where can I obtain ribbons for my VIC 1525 printer? I understand the printer is no longer made.

DON SYWASSINK
SIERRA VISTA, AZ

Try Ramco Computer Supplies, P.O. Box 475, Manteno, Illinois 60950; (800) 522-6922. Canadian readers can call (800) 621-5444. Ramco has them in stock, but call for the latest prices and shipping information.

Printer Plug Revisited

In July's "Feedback" Bob Chalfant said he was looking for a 36-pin plug so he could print documents in Epson mode with his SR 2000 Dual Interface printer. Radio Shack stocks a connector that they apparently use for their own printers. It might work. It's called a 36-Position Male Printer Connector and the catalog number is 276-1533.

The Gazette Productivity Manager

(Formerly PowerPak)

Harness the productivity power of your 64 or 128!

Turn your Commodore into a powerful workhorse, keep track of finances, generate reports in a snap, manage your money in minutes—all with the new 1991 *Gazette Productivity Manager!* Look at all your 64/128 *Productivity Manager* disk contains.

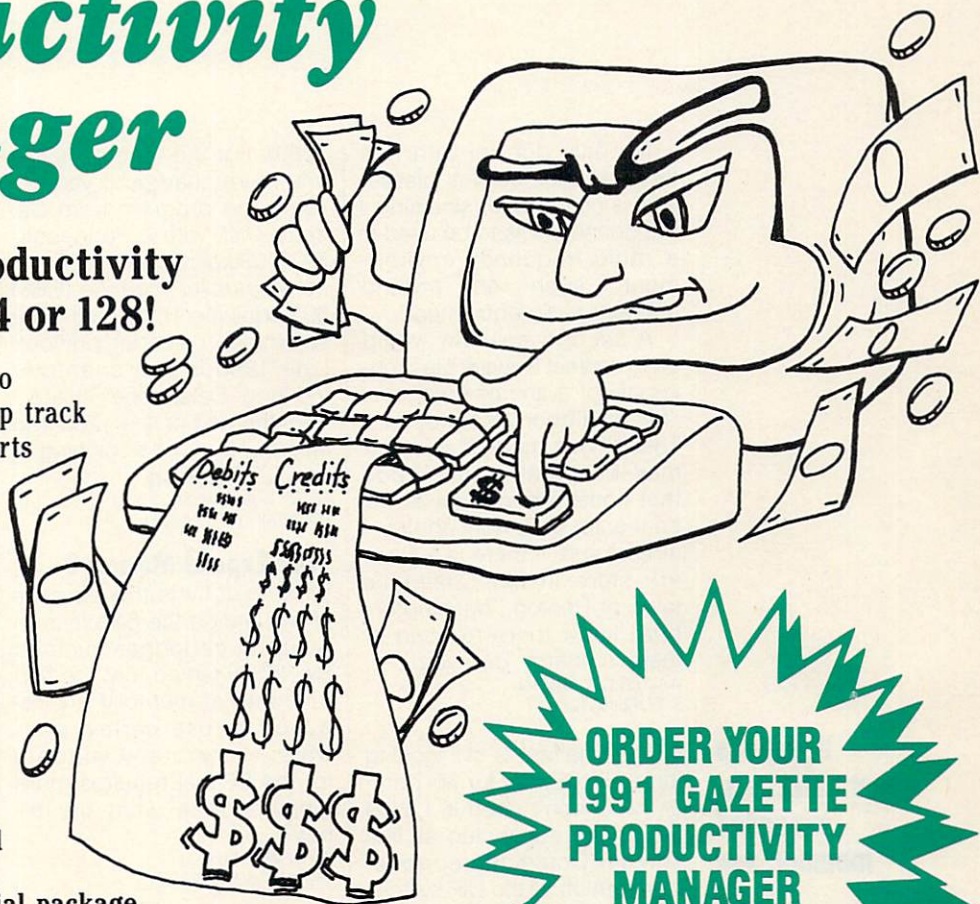
GemCalc 64 & 128—

A complete, powerful, user-friendly spreadsheet with all the features you'd expect in an expensive commercial package (separate 64 and 128 versions are included). Most commands can be performed with a *single* keypress!

Memo Card—Unleashes the power of a full-blown database without the fuss! **Nothing's easier**—it's a truly simple computerized address file. Just type in your data on any one of the index cards. Need to edit? Just use the standard Commodore editing keys. Finished? Just save the data to floppy. What could be easier?

Financial Planner—Answers all of those questions concerning interest, investments, and money management that financial analysts charge big bucks for! You can plan for your children's education and know exactly how much it will cost and how much you need to save every month to reach your goal. Or, decide whether to buy or lease a new car. Use the compound interest and savings function to arrive at accurate estimates of how your money will work for you. **Compute the answer at the click of a key!**

DON'T MISS OUT ON THIS POWERFUL WORKHORSE!



**ORDER YOUR
1991 GAZETTE
PRODUCTIVITY
MANAGER
TODAY!**

(MasterCard and Visa accepted on orders with subtotal over \$20).

YES! Please send me ___ *Productivity Manager* disk(s)
(\$14.95 each).

___ Subtotal
___ Sales Tax (Residents of NC and NY please add appropriate sales tax for your area. Canadian orders, add 7% goods and services tax.)
___ Shipping and Handling (\$2.00 U.S. and Canada, \$3.00 surface mail, \$5.00 airmail per disk.)
___ Total Enclosed
___ Check or Money Order ___ MasterCard ___ VISA

Credit Card No. _____

Signature _____ (Required)

Daytime Telephone No. _____

Name _____

Address _____

City _____

State/Province _____ ZIP/Postal Code _____

Send your order to Gazette 1991 Productivity Manager,
324 W. Wendover Ave., Ste. 200, Greensboro, NC 27408.

My only quarrel with it is that the back shell is plastic. This is no good for shielding if the connector is to be used in a radio frequency environment, such as around amateur radio equipment.

A second solution would be to contact Newark Electronics about a line of Amphenol "Micro-Ribbon" connectors. These have metal shells and may be obtained in styles that come straight out of the connector or at right angles. I am not sure if there is a Newark store in Mr. Chalfant's town of Renton, Washington, but I know there are two of them in nearby Bellevue.

WALTER C. WARMAN
S. BURLINGTON, VT

Questions about calendars, expanded memory, and static

If Bob Chalfant is still looking for a 36-pin plug for his printer, he doesn't need it. Leave the printer connected as it is now for Commodore mode, then turn off all the DIP switches except for number 8.

This works because the necessary interface is already built into the printer and it would be the same as connecting a serial cable to an interface, then running a 36-pin cable to the printer.

In my opinion the SR 2000 is one of the best 9-pin dot matrix printers available because of this dual interface. If some utility program requires a Commodore printer, you can change back by turning on DIP switches 3, 6, and 8. Any time you change the DIP switches, you must turn the printer off and on again for the changes to take effect, otherwise the printer will continue to operate in whatever mode it was in before you changed them.

JACK STANTON
MARTINEZ LAKE, AZ.

More Calendar Comments

Apparently Gazette's most famous lament has become *Monthly Calendar* (March

1989). For the record, here's one more change. If you are using the program from *Gazette Disk* with a Panasonic KX-P1090 printer with a PPI serial to parallel interface (CBM 801 equivalent), you will get a scrambled calendar printout. Line 1280 is one character too long. Delete one Shifted * from the end of line 1280 and insert one at the beginning of line 1290's string.

PETER KUBISCHTAL
FOUNTAIN VALLEY, CA

Why Expand Memory?

What exactly is the purpose of expanding the 64's memory, using cartridges such as the 1750? On an IBM, certain amounts of memory are required to use certain software. Is there any software for the 64 that requires more memory than what the 64 has?

JOHN VEILLEUX
ORRINGTON, ME

There's no software that we know of that requires a 64 to have more memory than was built into it. On the other hand, several software packages, such as GEOS, can make use of RAM expansion if it's available. And many programs—games particularly—use the disk drive for virtual storage when either the program or its data is too large to be loaded and maintained in memory all at one time.

Games are one example of why more memory is better, but here are some others. Business applications can use larger spreadsheets and data bases. Programmers can write larger programs which allow for more highly-developed code and more sophisticated interpreters or compilers.

Extra memory can help graphics when several scenes must reside in memory at once for smooth screen updates. A computer can do great things with digitized

sound, but a lot of storage space is needed to contain reasonable sound samples

Where speed isn't a critical factor, disk drives are a practical means of extending the 64's 64K limit. But where speed and quick responses are needed, more memory is very handy indeed.

Monitor Static

I've noticed that whenever I put my hand near the screen of my 1701 monitor I can feel the hairs on the back of my hand stand up. Is this something I should be worried about?

GEORGE W. BLACK
ATLANTA, GA

What you feel helps your monitor's screen to glow, but it won't induce the same effect in humans. You're feeling static electricity, a natural phenomenon produced on every monitor. You can also feel the same tingling sensation by touching the back of your hand to a television screen. An electron tube in a TV or monitor fires a beams of electrons at the screen which causes portions of it light up, producing the image you see. This process causes a static electric charge to build up on the screen and this charge acts like a magnet, either attracting or repelling the hairs on your arm. It won't harm you, but static electricity can damage semiconductor materials. That's why it's a good idea to touch something metal to drain away the charge before you touch any computer chips or components.

If you have a question, comment, or problem, we want to hear from you. Send your letters to Gazette Feedback, COMPUTE Publications, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408. □

MACHINE LANGUAGE

Jim Butterfield

SIX COMMANDS ARE KEYS TO INPUT/OUTPUT

Input and output are easy from BASIC—the authors of BASIC made it that way. Trying to comprehend them in machine language, however, can make a grown programmer cry.

It doesn't have to be that hard. Commodore made it confusing by including several Kernal jump locations that are generally only used by the Kernal itself—calls like UNTALK and UNLISTEN. Most programmers could code for a career and never use them. Why? Because you can do almost all your ML input and output with just six Kernal calls. You might need a little help from the BASIC language, which is always in place on the 8-bit machines; but it's not hard to learn six system calls. The programmers' manuals often list dozens of calls, but most of them are rarely needed. That's confusing to a beginner. CHROUT or BSOUT (\$FFD2) sends a character to the output stream. GETIN (\$FFE4) gets a character from the input stream. STOP (\$FFE1) scans the Run/Stop key. CHKIN (\$FFC6) switches the input stream to a logical file. CHKOUT or CKOUT (\$FFC9) switches the output stream. CLRCHN or CLRCH (\$FFCC) restores input/output streams to defaults.

Mnemonics vary among the manuals, but the routines' locations—and their jobs—are the same for all Commodore 8-bit machines. You'll even find them on the original PET computer from clear back in 1977.

To use these call addresses, all you need to do is set up any needed registers and then make the call with a JSR instruction. Some of these calls destroy the contents of

your registers; you'll need to know about this and preserve the register contents if you need to use them later.

To output a character, load the ASCII character code into the A register, and JSR \$FFD2. The character will go to the output stream (the screen, if you haven't changed things by using \$FFC9). All three data registers (A, X, and Y) have their values preserved.

To get an ASCII character into the A register from the input stream, use JSR \$FFE4. If you haven't changed the input stream (with \$FFC6), the character will come from the keyboard input buffer. This call will not wait; it always returns immediately. If there's no character available (often the case when you're reading the keyboard), A will contain a value of binary 0. When reading data files (with the input stream switched via \$FFC6), system call \$FFCF, CHRIN, performs an identical action to that of GETIN. All three data registers may have their contents changed by this call. Save these values to memory if you will need them.

To check Run/Stop, use \$FFE1. If the Run/Stop key is being pressed at this instant, the call will return with the Z flag set. A BEQ (Branch Equal) instruction allows you to take appropriate action, such as stopping the program. A machine language program will not respond to a press of the Run/Stop key unless you include calls to \$FFE1 in your code. The contents of registers A and X will be affected by this call. You'll find that register A contains information about a few other important keys.

Switch your computer's input/output streams with \$FFC6 and \$FFC9. Load the logical file number into the X register, and then call \$FFC6

to switch the input stream or \$FFC9 to switch the output stream. The stream should be restored to its default later by means of a call to \$FFCC. The logical file number means that the file should previously have been opened; this may be done from machine language, but you'll find that it's often easier to use the BASIC OPEN command.

Once the file is open, you may switch the input or output stream to it as many times as you wish.

When you're finished with the file, you must always remember to close it. If you have both input and output streams switched at the same time, it would cause confusion on the serial bus. All three data registers may be changed by this call. Save their contents in memory if you expect to need them later.

Restore default input/output streams with \$FFCC. This command sets the input stream to the keyboard input buffer and the output stream to the screen. It takes care of all necessary cleanup work. For example, devices on the serial bus may be told to untalk or unlisten. Registers A and X will be affected by this call.

To demonstrate how this procedure operates, here's a short program to enter that accepts input characters from the keyboard and then processes them. If you tap the B key, the letter A will print, tap the C key and B will print, and so on. A will transform to Z.

```
GO      JSR   $FFE4
        CMP   #$41
        BNE   NEXT
        LDA   #$5B
NEXT    BCC   PASS
        SBC   #$01
PASS    JSR   $FFD2
        CMP   #$0D
        BNE   GO
        RTS
```

Manuals list dozens of machine language calls, but you can handle most input and output requirements with six Kernal calls.

BEGINNER BASIC

Larry Cotton

CRASHPROOF DATA ENTRY PART 2

Last month we started working on a way to make the most user-friendly programs ever written. This subroutine would let computer novices enter data into your programs without a chance of their crashing them or being presented with a cryptic REDO FROM START.

Continuing with the crashproof program, let's have another look at line 150.

```
150 IFA$<CHR$(32)ORAS>  
CHR$(95)ORAS=CHR$(34)  
THEN120
```

We want to restrict the user's input to numbers, letters and certain punctuation. The above line will do just that. Here's how to analyze what it will and will not accept.

Refer either to your computer's *User's Guide* or *Programmer's Reference Guide* for an ASCII and CHR\$ Code chart. This list shows what characters will show on your TV or monitor screen if you type PRINT CHR\$(X), for most of the values of X from 0 to 255.

Conversely, the list also shows the values which would be obtained by typing PRINT ASC("X"), where X is any keyboard character. Type in a few examples of each in immediate mode.

As mentioned last month, each character has a unique ASCII value. The ASCII value of E, for instance, is 69.

GET A\$ in line 120 waits for user input. If he or she types E, A\$ could be thought of as either E or CHR\$(69); likewise 6 can be treated as either 6 or CHR\$(54).

ASCII values 32-47 and 58-64 print a space and most of the punctuation. Values 48-57 print the numbers,

while 65-90 cover the capitalized alphabet. You could cut it off there, but I included five more printable characters with ASCII values 91-95.

The symbols < (less than) and > (greater than) are usually used to compare numeric values; for example, IF A < 5 THEN . . . means if the value of A is less than five, then some action is taken. You can also use < and > to compare strings' CHR\$ values.

Thus IFA\$ < CHR\$(32) OR A\$ > CHR\$(95) THEN 120 means if the ASCII value of the entered character is less than 32 or greater than 95, then program control jumps back to line 120 for another GET. If the value falls in the range 32-95, the character will be accepted, and control will fall to the next line.

We don't want the cursor to move if the user enters a quotation mark, thus the statement ORAS=CHR\$(34) near the end of line 150. The routine will accept apostrophes.

Also, we don't want the cursor to move if the first character entered on a line is a space, so we add this line:

```
160 IFA$=CHR$(32)THENIFL=0  
THEN120
```

L is line length, which is set to zero in line 100—the cursor appears in the leftmost screen position. If it's there when the space bar is pressed, program control just goes back for another GET. If the ASCII value of the entered character falls within the range 33-95, inclusive, control passes to the next line.

```
170 PRINTD$A$;B$=B$+A$;L=L+1:  
IFL=80THENPRINTCHR$(32);:  
GOTO190
```

This rather long BASIC line first deletes the cursor, then prints the entered character with PRINTD\$A\$. Note the

semicolon, which keeps the printed information on the same line.

B\$ will be the sum of all the individual A\$s until the Return key is pressed. It starts out life as nothing, then begins lengthening as the A\$ characters are added. L increments by 1 as the line gets longer. The IF-THEN tests for an arbitrary maximum line length of 80 characters (two screen-width lines). If L becomes 80, a space is printed and control is passed to a line which waits for either the Return or Del key to be pressed.

After the character is printed to the screen, we want to advance the cursor one position to the right and wait for another character to be typed. Go back to line 110.

180 GOTO110

The next line was called from line 170. Two full screen lines have been entered without a press of the Return key; L is 80. The only two things we want the user to press are the Return key itself or the Del key.

```
190 GETA$:IFA$< >R$AND  
A$< >D$THEN190
```

This line will loop indefinitely until one of the above-mentioned keys is pressed, in which case control passes to the next line:

```
200 IFA$=D$THENGOSUB210:  
GOTO110
```

Pay close attention now. If the Del key is pressed (defined in line 20 as D\$), we call a subroutine to take the necessary action.

If the Return key is pressed (A\$=R\$), control just falls through to line 210 or 220, which then becomes the end of the subroutine called in line 30.

The last two lines are the

**Make your
programs so friendly
that even
beginners can input
data without
strife or hassle.**

subroutine for pressing the Del key.

```
210 IFL=0THENPRINT$;:RETURN
220 PRINT$A$;:L=L- 1:B$=LEFT$(B$,L)
:RETURN
```

The first line checks to see if L=0. If so, the cursor is at its beginning position, it's deleted, and control returns to 110.

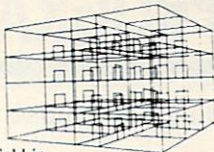
If L is anything but zero, line 220 kicks in, prints two deletes and decrements L. B\$ becomes the L-length left end of B\$ and control returns to line 110 (sent there by line 140 or 200).

Try running the program now. A nonblinking horizontal-line cursor will greet you. Try typing anything, randomly, as fast as possible, including spaces, deletes, and so on. Just don't press the Shift Lock key. After typing several characters, press Return.

Then, in immediate mode, type PRINT X\$. You should see an exact clone of the originally input characters. X\$ is the input string, with which you may do as you wish.

Remember, any key repeats. The routine accepts all capital letters, all numbers, and most punctuation except double quotes. It will not accept lower case letters, cursor control characters, and so forth. Once you've hit Return, there's no going back. □

CAD-3D
3-D GRAPHICS DESIGN
☆ Voted Best Graphics Program
—Run Magazine 1988
For Commodore 64/128 in 64 mode
View Designs in Multiple Perspectives



Professional-Educational-Home Applications
Architects, Engineers, Designers,
Programmers, Students

ih Software
2269 CHESTNUT STREET
SUITE 162
SAN FRANCISCO, CA 94123

ORDER LINE • (415) 923-1081
FAX • (415) 923-1084
Dealers/Distributors inquiries welcomed.

CAD-3D!! enter me into the fastest growing field in graphic technology. At a special introductory price \$53.95. Add \$4.00 for shipping and handling, for C.O.D. add an additional \$4.00. (California residents please include 6% sales tax).

Circle Reader Service Number 177

Use the handy
Reader Service Card
in the back of the
magazine to receive
additional information
on our advertisers.

2 FUNctional Weekend Projects for C-64 Ultra-Users!

• **Automotive Dwell/Tach Diagnostics**
Program with Interface Schematics \$5.00

• **Home Sentry - Residential Security**
On Disk with Interface Schematics \$20.00

Send Check or Money Order to:

CREATIVE SPECIALTIES
P. O. Box 7361
Richmond, VA 23221
• Allow 3-4 Weeks for Delivery •

Circle Reader Service Number 139

COMPUTE's SpeedScript Disk

**ONLY
\$11.95**

A powerful word processing package for Commodore 64 and 128 owners

A Great Deal for Commodore Users!

- SpeedScript for the 64
- SpeedScript 128—80-column version
- Spelling checkers
- Mail merge
- Date-and-time stamp
- 80-column preview for the 64
- Turbo save and load
- Plus more than a dozen other SpeedScript support utilities all on one disk (including full documentation)

YES! Send me _____ copies of COMPUTE's SpeedScript Disk.

I've enclosed \$11.95 plus \$2.00 postage and handling. (Outside U.S. and Canada add \$1.00 for surface mail or \$3.00 for airmail.)

_____ Amount
_____ Sales Tax*
_____ Total

ORDER NOW!

Name _____

Address _____

City _____ State _____ ZIP _____

Mail personal check or money order to

Commodore SpeedScript Disk
324 W. Wendover Ave., Ste. 200
Greensboro, NC 27408

Residents of North Carolina and New York, add appropriate tax for your area. Canadian orders, add 7% good and services tax.

Please allow 4-6 weeks for delivery. Program available only on 5¼-inch disks.

PROGRAMMER'S PAGE

Randy Thompson

SYS CALLS, UNTIMELY BUGS, AND MORE

Towering stacks of "Programmer's Page" submissions are taking over my computer room. It must be time for another column of reader tips (cleaning my room wouldn't hurt, either).

SYS 128

SYS calls such as the ones below are an important addition to any programmer's bag of tricks. The following are specific to the Commodore 128.

SYS Command	Function
SYS 42977	Calls the ARE YOU SURE? message and returns the ASCII code of the key pressed in the accumulator
SYS 57416	Goes directly to 64 mode (does not collect \$200)
SYS 51069	Cancels quote mode and reverse mode
SYS 51328	Switches to lowercase mode
SYS 51346	Switches to uppercase mode
SYS 51598	Rings bell
SYS 50341,,x	Clears screen line x (0-24)
SYS 51794	Clears the current screen line
SYS 51830	Clears from cursor to the end of the line
SYS 51851	Clears from the start of the line to the cursor
SYS 51871	Clears from the cursor to the end of the screen
SYS 51900	Scrolls the screen up one line
SYS 51954	Enables block cursor
SYS 51966	Enables underline cursor

ROD BENNETT
BALTIMORE, MD

Strange Swap

Here's a trick that's sure to make you think—think about how it works, that is. It's an unusual way to swap the values of two variables, something that's quite common in sorting algorithms. What's unique about this method is that it doesn't use a third variable. It uses the XOR function instead. Here's how the swap works in BASIC 7.0 on a 128:

```
10 INPUT "A = ";A
20 INPUT "B = ";B
30 A = A XOR(A,B)
40 B = A XOR(A,B)
50 A = A XOR(A,B)
60 PRINT "A = ";A
70 PRINT "B = ";B
```

Since the 64 lacks an exclusive OR (XOR) function, here's how the program can be entered on that computer:

```
10 INPUT "A = ";A
20 INPUT "B = ";B
30 A=(A OR B) AND NOT(A AND B)
40 B=(A OR B) AND NOT(A AND B)
50 A=(A OR B) AND NOT(A AND B)
60 PRINT "A = ";A
70 PRINT "B = ";B
```

This program takes advantage of the fact that (A OR B) AND NOT(A AND B) produces the same result as A XOR B.

MARK LINTON
BALTIMORE, MD

What Time Is It?

Shortly after completing August's column, I received a letter that further explains the inconvenient CIA chip midnight bug documented in that column. This letter, sent by Anthony Garza of Creative

Specialties, has been edited slightly for size:

As you know, the 64 contains two 6526 CIA chips, each having an independent TOD clock. Each clock's hour register has an a.m./p.m. flag that's controlled by bit 7. You clear bit 7 when it's a.m. and set bit 7 when it's p.m. When setting one of the hour registers, I noticed that bit 7 is reversed whenever you select a time within the hour of 12:00. A simple cure for this is to set the a.m./p.m. flag to the incorrect value when choosing times between 11:59 and 1:00. For example, if you set the time to 12:47 p.m., you must set the hour register to a decimal 18 (that's 12 in binary coded decimal) instead of 146 (18 + 128). Interestingly, if you read the hour register after setting it to 18, the CIA chip returns the desired value of 146! This a.m./p.m. flag reversal occurs only during the hour of 12:00.

I thought that this quirk in the TOD chip might be a problem with my 64, but the a.m./p.m. bug occurs on a backup 64 that I use as well as seven other machines that belong to some of my friends and associates. Programmers should add this information to their *Commodore 64 Programmer's Reference Guide*, since it's not mentioned in that book or in any other book that I can find.

Thanks for all the great tips, guys. It's always a pleasure to share such useful information as this with our readers.

"Programmer's Page" is interested in your programming tips and tricks. Send all submissions to *Programmer's Page*, COMPUTE's Gazette, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408. We pay \$25-\$50 for each tip we use. □

Here are some tips from readers about 128 SYS calls, the midnight bug, and more.

Steve Vander Ark

FIGHTING THE JAGGIES

A friend of mine recently commented that he could spot a *GEOS* document a mile away. With those blocky fonts, he jeered, there wasn't one yet he'd care to use for his own correspondence.

As a bona fide *GEOS* fanatic, I felt compelled to impart a little of the gospel according to Berkeley, to share with him the delight one can experience from a proportional font coming off a 9-pin printer.

A 9-pin printer is capable of some truly remarkable printouts. Then why is it necessary for *GEOS* to use such a jaggy print routine?

The *GEOS* system does all its work, whether graphics or text, on an internal hi-res "screen" in RAM. This bitmapped image is larger than the screen displayed by *geoPaint* or *geoWrite*; the only way to see it all is with a preview option. The printer routine puts a dot on the page wherever there was one on this internal screen, producing a faithful dot-for-dot image of what was created with the application.

Two factors affect the resulting printout from any application: the printer doing the printing and the software telling it how to do it. A laser printer can print astoundingly clear images, but it will still have the jaggies unless you use one of the ten or so *GEOS* laser fonts. A 24-pin printer has built-in fonts as crisp and clean as any you'll see from a daisy-wheel printer or fancy typewriter, but *GEOS* can't use them. Your best bet, actually, is still a 9-pin Epson-compatible dot-matrix printer, using a new ribbon for nice dark printing. The rest of the responsibility then lies with the software. In *GEOS*'s case, the job is assigned to printer drivers.

Perhaps an explanation is in order as to what drivers really do. The world of computers has never settled on a standard way of doing things in the way that video recorders have pretty much settled on VHS. Each device comes preset with its own set of codes and commands for operation; each piece of software has to know them all if it wants to communicate with all these different devices. This is true of hard drives, light pens, and printers. The code one printer uses to initialize itself might switch on the boldface option for another model.

GEOS was designed to be as generic as possible, whether you use an Okidata or an Epson printer. It's up to you to customize *GEOS* with the translation routine it needs for your particular setup. Those routines are called device drivers—input drivers for light pens and joysticks, printer drivers for printers. Each driver contains the needed codes for *GEOS* to tell the device what to do. In the case of printers, it's supposed to put dots on paper wherever there are dots on the screen.

Those jaggies, which are the stairstep pattern along any diagonal line or curve in a dot-matrix printout, are the necessary product of creating lines out of individual dots. Of course, the closer the dots can be squished together, the cleaner the printout should look, but a *GEOS* screen contains dot location information for only 60 or 80 dots per inch, no more. The fancier fonts some packages offer get their slick appearance simply from having more dot data for each area of the page. Since *GEOS* has no such capability, we are out of luck.

But we can cheat. Instead of putting a dot for each screen dot and leaving it at that, we can go back over

those dots with another set that's just a little bit off from where we printed on the first pass. This process will smooth out the printing by filling some of the jaggies with extra dots. Printer drivers which tell the printer to print the image more than once, each time offset by a fraction of an inch, are called multistrike drivers. There are a number of them available for *GEOS*. Most are double-strike drivers, which add one set of dots to the original set. There are also quad-strike drivers, which produce a total of four dot images, each slightly offset.

There is even a six-pass driver called EX-800 available for Epson and compatible printers. It's a program by Kevin McConnell that's available for downloading from QuantumLink and many BBSs. Its printouts are impressive, sometimes rivaling a laser printer's for clarity, especially on smaller fonts. The extra dots take a while to print, so printing time is noticeably longer.

It is also possible to turn the printing chore over to a program called *Lasermatrix*, which interprets the page as it prints it. You have to customize the basic driver with a number of technical details related to your printer for it to do the job, but the resulting printout is very clean with a minimum of jaggies.

Lasermatrix comes with an elaborate and rather technical customizer routine for use with your particular printer. The procedure takes some time and requires a careful reading of your printer manual, but the results are worth it. If you use an Epson compatible, which includes the Panasonic line, there is a *Lasermatrix* version already worked out for you. This ingenious shareware program is available on QuantumLink and on local bulletin boards. □

Here are some tips to help you eliminate the jaggies from your *GEOS* documents.

D'IVERSIONS

Fred D'Ignazio

VIRTUAL REALITY HITS THE SHOPPING MALLS

Recently I was a speaker at the National Educational Computing Conference (NECC) in Phoenix, Arizona. While at the conference, I stopped at the Commodore booth and saw the Mandala Exhibit.

Mandala is a virtual music studio, complete with several virtual (computer-synthesized) instruments that you play by whisking your hands through thin air. By making the right movements, you can play instruments that only exist on a mosaic of computer screens—and in your imagination.

I immediately saw a use for Mandala-type exhibits in the entranceways of large stores at shopping malls. There already are touchscreen kiosks inside all major department stores that tell you where to buy jewelry, china, wedding dresses, and blue jeans. A Mandala-style kiosk would go one step further. It would let you select items in the store for possible purchase, then try them on in virtual space. You could combine your image with that of anything in the store. You could try on new hats, shoes, coats, and coiffures.

Smaller virtual-space kiosks could also be inside retail stores in the mall. Virtual dressing rooms would let customers see themselves in clothing much faster than having to enter a real room, take off old and try on new garments. There would be no more twisting and turning in front of mirrors, trying to see how a garment looks from all directions.

Virtual-reality kiosks and rooms in the mall's stores would attract customers for their novelty value and for the sheer convenience of being able to see yourself in the

store's products in a fraction of the time it would normally take to try things on.

Game arcades at the mall would be revolutionized by Mandala-style videogames. The small boxes that attract kids and their quarters would be replaced by game walls where one or more players or combatants would stand, ready to be blasted into a virtual game world where they could interact with objects appearing on the game wall's picture screens.

Other kids would prefer renting bodysuits that included virtual sunglasses. These glasses would actually be tiny flat-screen computer monitors that let you see, in color and 3-D, the game world that you had paid to enter. Each time you moved in your body suit, you'd see that movement reflected in your player's position inside the computer's virtual game world. You would literally see the world through the eyes of a player inside that world!

Down the road I see Kinko's photocopying stores transformed into virtual-reality service bureaus. Who could resist the opportunity to enter a store and experience a thrilling vacation in the Himalayas or a hang-gliding journey over the Smoky Mountains or a white-water rafting expedition down the Colorado River?

These stores could shape a reality for you that is so vivid, so multisensory, so complete that you would swear you were there—where *there* could be anywhere from the driver's seat of a souped-up Ferrari to the helm of Donald Trump's yacht. You could replace J.R. on the TV soap "Dallas" and be surrounded by beautiful stars, or have Arnold Schwarzenegger's body with your head on it.

Virtual-reality copy stores would feature cut-and-paste re-

alities that you could sample in the store; copy onto videotape, disk, or CD; and take home to show your friends.

You want to sing like Madonna, Sting, or Pavarotti? You could go to a virtual-reality copy store and create a videotape of you singing in the Houston Astrodome or the Toronto Skydome, where your stage high jinks and your favorite singer's voice would ignite a crowd of thousands.

Like the Kinko's of today, many of the virtual-reality workstations would be self-service. You could pop in a videotape, disk, or optical disc and make several virtual-reality copies. Virtual-reality copy stations could be a hit with people looking for a gift to give someone on their birthday, wedding, graduation, or other special occasion. They would also be used to create virtual-reality postcards, letters, and multimedia faxes to family and friends in distant locations. Show them the fun you're having.

Virtual-reality kiosks, arcades, and copy stores might be a hit in future malls. The only danger is that they would be too delicious and seductive ("Create a new reality in ten minutes for only \$9.95!") that those people who drop in to a new virtual reality may elect to drop out of their dreary, humdrum real reality.

Chain-hopping from reality to reality may become a new social disease. Reality hoppers may eventually become as ubiquitous as today's drug addicts and panhandlers.

"Can you just spare two bucks?" pleads the wild-eyed reality hopper to a passerby in a late 1990s shopping mall. "I was on the Orient Express racing across Europe toward Istanbul, and my quarter ran out. I've got to get back on that train, man. Someone committed a murder, and only I can figure it out." □

Try on
a new coat, a
hairstyle,
or even a new
life at a
virtual reality
kiosk.

PROGRAMS

SPEEDWAY

Daniel Lightner

Speedway is a *SpeedScript* file reader and disk management program. You can view any information that may be in a *SpeedScript* file while you are writing a BASIC program or even while another program is running.

Speedway also gives you access to a command window that allows you to enter disk commands or view a disk directory.

Speedway is written in machine language. To enter it, use *MLX*, our machine language entry program. See "Typing Aids" elsewhere in this section. When *MLX* prompts, respond with the following values.

Starting address: CA71

Ending address: CFB8

Be sure to save a copy of the program before exiting *MLX*.

Put It to Use

To use *Speedway*, load it with the .8,1 extension. After it has loaded, type NEW and press Return. Then type SYS 51825 to activate the program. Right away you'll see a prompt for a *SpeedScript* file. To view a file, place the proper disk in drive 8, enter the filename, and press Return. The listing can be halted for easy reading by pressing any key. Then press any key to continue. A listing can be aborted by pressing the Run/Stop key. This will also return you to BASIC. Enter SYS 51825 to activate the program again at any time.

To activate the disk command window when the program is asking for a *SpeedScript* file, enter \$ and press Return. You'll then be presented with a menu of seven commands.

1. Directory
2. Scratch
3. Rename
4. Copy
5. Validate
6. Format
7. Quit disk

Simply enter the number of the command. To see a directory, press 1.

Should a directory have more files than can be displayed on one screen, press any key to halt the listing and press any key to restart it.

Press 2 to scratch a file. If you change your mind after making this selection, simply enter a name that doesn't exist on the disk.

The Copy and Rename commands will ask you for new and old filenames. For example, to rename COMPUET to COMPUTE, press 3, enter COMPUTE as the new name, and press Return. Enter COMPUET (the old name) and press Return again. The Copy function works in a similar manner.

The Format command will format a disk, asking first for a disk name and then an ID. If you should accidentally enter Format, Rename, or Copy, just enter an asterisk (*) at the first prompt to abort the command.

Press 6 to validate a disk in drive 8.

The Quit option will return you to the *SpeedScript* filename prompt. To abort this screen and return to BASIC, enter an asterisk and press Return.

SPEEDWAY

```

CA71:A0 00 A9 00 8D 20 D0 8D A8
CA79:21 D0 A9 93 20 D2 FF A9 38
CA81:9A 20 D2 FF 20 D0 CB 20 C2
CA89:AC CB A0 00 B9 A9 CF 20 B0
CA91:D2 FF C8 C0 0C D0 F5 20 65
CA99:BE CB 20 49 CB AD 35 03 9C
CAA1:C9 24 F0 07 C9 2A F0 09 95
CAA9:4C B3 CA 20 DE CB 4C 71 DD
CAB1:CA 60 AC 34 03 A2 00 BD FD
CAB9:BA CF 99 35 03 EE 34 03 E3
CAC1:C8 E8 E0 05 D0 F1 CE 34 82
CAC9:03 AD 34 03 A2 35 A0 03 31
CAD1:20 BD FF A9 02 A2 08 A0 CC
CAD9:02 20 BA FF 20 C0 FF A2 76
CAE1:02 20 C6 FF 20 CF FF 20 B9
CAE9:CF FF A0 00 20 42 CB A5 C2
CAF1:CB C9 40 D0 37 20 CF FF CE
CAF9:C9 1B B0 0D 18 69 40 4C 55
CB01:0A CB C9 5B B0 0A 18 69 C6
CB09:10 C9 1F F0 17 20 D2 FF EC
CB11:20 B7 FF C9 00 D0 03 4C D8
CB19:F0 CA A2 00 20 C6 FF A9 F5
CB21:02 4C C3 FF A9 0D 20 D2 D9
CB29:FF 4C 11 CB A5 CB C9 3F E1
CB31:F0 E8 20 42 CB A5 CB C9 F9
CB39:40 F0 FA 20 42 CB 4C F0 59
CB41:CA A5 CB C9 40 D0 FA 60 59
CB49:A0 00 A9 00 8D 34 03 20 C9
CB51:E4 FF C9 00 F0 F9 C9 14 AB
CB59:F0 38 C9 0D F0 20 C9 7B 98
CB61:B0 ED C9 20 90 E9 C9 22 E9
CB69:F0 E5 C9 2C F0 E1 AC 34 8B
CB71:03 C0 14 F0 DA 20 D2 FF 49
CB79:20 89 CB 4C 50 CB AC 34 01
    
```

```

CB81:03 C0 00 F0 CA 4C D2 FF 07
CB89:AC 34 03 99 35 03 EE 34 46
CB91:03 60 AC 34 03 C0 01 B0 69
CB99:03 4C 50 CB 20 D2 FF 38 11
CBAL:AD 34 03 E9 01 8D 34 03 C5
CBA9:4C 50 CB A9 0D 20 D2 FF 1E
CBB1:20 D2 FF A9 12 20 D2 FF 5F
CBB9:A9 96 4C D2 FF A9 9A 20 EF
CBC1:D2 FF 20 D2 FF A9 9A 20 EF
CBC9:D2 FF A9 3E 4C D2 FF A0 32
CBD1:00 B9 5B CF 20 D2 FF C8 55
CBD9:C0 4E D0 F5 60 EA A0 00 CE
CBE1:B9 8F CE 20 D2 FF C8 C9 08
CBE9:00 D0 F5 20 66 CE 20 E4 0A
CBF1:FF A5 CB C9 38 F0 1E C9 94
CBF9:3B F0 20 C9 08 F0 22 C9 1E
CC01:0B F0 28 C9 10 F0 2E C9 68
CC09:13 F0 30 C9 18 F0 03 4C E1
CC11:EF CB 4C E4 FF 20 6F CD 9A
CC19:4C DF CB 20 42 CC 4C DF 0A
CC21:CB A9 01 85 FB 20 77 CC 9F
CC29:4C DF CB A9 00 85 FB 20 23
CC31:77 CC 4C DF CB 20 F5 CC D8
CC39:4C DF CB 20 0F CD 4C DF 94
CC41:CB 20 E4 FF A9 0D 20 D2 F9
CC49:FF 20 20 CE 20 49 CB A0 3A
CC51:00 B9 51 CF 99 48 03 C8 3D
CC59:C0 03 D0 F5 A0 00 B9 35 3B
CC61:03 99 4B 03 C8 CC 34 03 61
CC69:D0 F4 18 AD 34 03 69 03 0A
CC71:8D 34 03 4C 02 CE 20 E4 74
CC79:FF A9 0D 20 D2 FF 20 3C 34
CC81:CE 20 49 CB AD 35 03 C9 82
CC89:2A F0 68 A5 FB C9 01 D0 B5
CC91:10 A0 00 B9 57 CF 99 48 6C
CC99:03 C8 C0 03 D0 F5 4C AF D5
CCA1:CC A0 00 B9 54 CF 99 48 C2
CCA9:03 C8 C0 03 D0 F5 A0 00 DE
CCB1:B9 35 03 99 4B 03 C8 CC 34
CCB9:34 03 D0 F4 AD 34 03 85 61
CCC1:FB A9 0D 20 D2 FF 20 2E 6C
CCC9:CE 20 49 CB A0 00 A6 F0 07
CCD1:A9 3D 9D 4B 03 E8 B9 35 5C
CCD9:03 9D 4B 03 E8 C8 CC 34 2E
CCE1:03 D0 F3 8A 8D 34 03 18 B3
CCE9:AD 34 03 69 03 8D 34 03 18
CCF1:4C 02 CE 60 20 E4 FF A0 47
CCF9:00 B9 4E CF 99 48 03 C8 85
CD01:C0 03 D0 F5 A0 00 A9 03 92
CD09:8D 34 03 4C 02 CE 20 E4 0E
CD11:FE A9 0D 20 D2 FF 20 4A 1B
CD19:CF 20 49 CB AD 35 03 C9 1C
CD21:2A F0 D0 A0 00 B9 4B CF 7F
CD29:99 48 03 C8 C0 03 D0 F5 3A
CD31:A0 00 B9 35 03 99 4B 03 BF
CD39:C8 CC 34 03 D0 F4 AD 34 0D
CD41:03 85 FB A9 0D 20 D2 FF 68
CD49:20 58 CE 20 49 CB A6 FB A9
CD51:A9 2C 9D 4B 03 E8 A0 00 32
CD59:B9 35 03 9D 4B 03 E8 C8 5A
CD61:C0 03 D0 F4 18 8A 69 03 48
CD69:8D 34 03 4C 02 CE A9 0D A9
CD71:20 D2 FF A9 01 A2 5A A0 54
CD79:CF 20 BD FF A9 02 A2 08 5F
CD81:A0 00 20 BA FF 20 C0 FF 1F
CD89:A2 02 20 C6 FF A9 9A 20 63
CD91:D2 FF A0 00 20 CF FF 20 0B
CD99:CF FF 20 CF FF 8D B0 02 B7
CDA1:20 CF FF 0D B0 02 F0 49 CA
CDA9:20 CF FF AA 20 CF FF 20 54
    
```

```

CDB1:CD BD A9 20 20 D2 FF 20 47
CDB9:CF FF F0 26 20 D2 FF 4C 56
CDC1:B8 CD A5 CB C9 3F F0 29 F4
CDC9:C9 40 F0 1E 20 DC CD A5 10
CDD1:CB C9 40 F0 FA 20 DC CD BC
CDD9:4C EB CD A5 CB C9 40 D0 81
CDE1:FA 60 A9 0D 20 D2 FF 4C B1
CDE9:C3 CD A9 00 85 C6 4C 9B 8B
CDF1:CD A5 CB C9 40 F0 FA A9 59
CDF9:00 20 C6 FF A9 02 4C 28
CE01:FF A9 0F A2 08 A0 0F 20 16
CE09:BA FF AD 34 03 A2 48 A0 D0
CE11:03 20 BD FF 20 C0 FF A9 9D
CE19:0F 20 C3 FF 4C CC FF A0 F4
CE21:00 B9 2C CF 20 D2 FF C8 C4
CE29:C0 07 D0 F5 60 A0 00 B9 A1
CE31:16 CF 20 D2 FF C8 C0 0B AE
CE39:D0 F5 60 A0 00 B9 21 CF CB
CE41:20 D2 FF C8 C0 0B D0 F5 F9
CE49:60 A0 00 B9 33 CF 20 D2 C6
CE51:FF C8 C0 0C D0 F5 60 A0 B9
CE59:00 B9 3F CF 20 D2 FF C8 5F
CE61:C0 0C D0 F5 60 20 CC FF F8
CE69:A5 BA 20 B4 FF A9 6F 85 E2
CE71:B9 20 96 FF A9 0D 20 D2 5B
CE79:FF A9 20 20 D2 FF 20 D2 31
CE81:FF 20 A5 FF C9 0D D0 F6 F6
CE89:20 D2 FF 4C AB FF 93 0D 42
CE91:20 44 49 53 4B 20 43 4F 5F
CE99:4D 4D 41 4E 44 20 4D 45 C0
CEA1:4E 55 0D 20 20 31 20 2E 62
CEA9:2E 2E 2E 2E 20 53 43 77
CEB1:43 54 4F 52 59 0D 20 32 86
CEB9:20 2E 2E 2E 2E 20 53 43 77
CEC1:52 41 54 43 48 0D 20 33 81
CEC9:20 2E 2E 2E 20 52 45 87
CED1:4E 41 4D 45 0D 20 34 20 56
CED9:2E 2E 2E 2E 20 43 4F 50 BF
CEE1:59 0D 20 35 20 2E 2E 2E 0B
CEE9:2E 20 56 41 4C 49 44 41 D6
CEF1:54 45 0D 20 36 20 2E 2E 6B
CEP9:2E 2E 20 46 4F 52 4D 41 42
CF01:54 0D 20 37 20 2E 2E 2E C9
CF09:2E 20 51 55 49 54 20 44 67
CF11:49 53 4B 0D 00 20 4F 4C CF
CF19:44 20 4E 41 4D 45 20 3E BE
CF21:20 4E 45 57 20 4E 41 4D 8C
CF29:45 20 3E 20 4E 41 4D 45 94
CF31:20 3E 20 44 49 53 4B 20 07
CF39:4E 41 4D 45 20 3E 20 55 DD
CF41:4E 49 51 55 45 20 49 44 5B
CF49:20 3E 4E 30 3A 56 30 3A 1B
CF51:53 30 3A 43 30 3A 52 30 61
CF59:3A 24 0D 54 48 45 20 53 F0
CF61:50 45 45 44 57 41 59 0D E6
CF69:43 4F 50 59 52 49 47 48 AC
CF71:54 20 31 39 39 31 20 43 0F
CF79:4F 4D 50 55 54 45 0D 50 95
CF81:55 42 4C 49 43 41 54 49 8B
CF89:4F 4E 53 20 49 4E 54 4C 49
CF91:20 4C 54 44 0D 41 4C 4C 75
CF99:20 52 49 47 48 54 53 20 D5
CFA1:52 45 53 45 52 56 45 44 35
CFA9:53 50 45 45 44 20 46 49 7C
CFB1:4C 45 20 3F 2C 50 2C 52 0E
    
```

Daniel Lightner lives in Sidney, Montana. He is the author of *Plotter*, which was published in September. □

MOB MOVER

Brian Schkerke and Dave Farquhar

Have you ever tried to position sprites onscreen? At best it is a tedious and frustrating process, and you can waste hours in a futile attempt to use direct POKEs to position them. Even 128 owners with built-in sprite commands at their fingertips face an uphill battle.

To alleviate this problem and reduce the time required for this vital but difficult task from hours to minutes, we give you *MOB Mover*.

MOB Mover allows programmers to position and manipulate up to eight sprites onscreen; then it prints the BASIC code required to duplicate the screen for use in other programs. The program even lets you enter text and position the sprites around the text.

Every sprite register can be manipulated, and the program is packed with features! The coordinates of each sprite are displayed onscreen, and upon quitting the program, you are given all the necessary commands (POKEs in the 64 version and various others in the 128) to achieve the same effects that you had before exiting.

Typing It In

Both *MOB Mover 64* and *MOB Mover 128* are written in BASIC. To avoid typing mistakes, use *The Automatic Proofreader* to type them in. See "Typing Aids" elsewhere in this section. When you've finished, save the program to disk before running.

Note to 128 owners: You can type in either version of the program in 128 mode, but it requires the following direct mode command after running *The Automatic Proofreader*.

POKE 828,173

This command sets the function keys to return the same values as in 64 mode. To return the keys to their previous definitions, enter POKE 828,183.

Using the Program

Before loading and running *MOB Mover*, you should consider several things. First, if you wish to use your own sprite definitions, you must load them with a binary load (,8,1), define them by using direct POKEs, or use a

sprite editor, such as *Sprite Magic*, which resides out of the way of BASIC memory. (Owners of 128s should use the BLOAD command or use the built-in sprite editor.)

If you wish to use a custom character set, load and activate it, also. *MOB Mover* doesn't clear the sprite definition area unless so commanded, so your sprite definitions will remain safe in memory, and unless your character set lies on a page of memory you command *MOB Mover* to fill, it should also be in no danger of being overwritten.

A Few Terms

Some terms used within the program need explaining. The active sprite is the sprite which is currently being moved and whose data line appears in reverse video. The header is made up of the topmost two screen lines and is where all prompts appear. The operating screen is the screen which is normally seen, and the display chart is the table of numbers on the left side of the screen. In the 64 version only, an asterisk that appears before a sprite's data line signifies that the sprite is beyond x-coordinate 255 onscreen and must have the MSB X set for it. No need to worry—the POKEs given when you exit the program will tell you how to set that.

After loading and running *MOB Mover*, you'll see the title screen briefly, and then the operating screen will appear. In the 64 version, sprite 0 will be set to the middle of the screen and appear as garbage unless page 192 is the location where you defined your sprites.

In the 128 version, if sprite 1 is activated, it will be black (and thus invisible) and will "hide" all sprites below it. Sprite 0 is the only sprite currently on, so only its data line is displayed. The numbers in the data line represent the sprite number, x-coordinate, and y-coordinate, respectively.

Help is available at any time by pressing the H key. As a convenience to 128 owners, help screens are also printed to the 80-column screen. This screen is otherwise unused by the program and can be activated by simply switching your display. For those of you who don't have an 80-column display, the H command is still available.

Commands

The first command to learn is how to move a sprite. This is done by using either the cursor keys or a joystick in port 2. In the 128 version, the keypad may also be used. This moves the sprite by one pixel at a time. Because this could become tedious, the step value may be increased. Press S and enter the new value you wish to have sprites move by. You can also press I and directly enter x- and y-coordinates for the sprite. However, using this method, you cannot move the sprite beyond the first 255 positions onscreen; you must do this manually. (The 128 version, due to its sprite commands, doesn't have this limitation.)

To change the active sprite, press A. You'll be prompted to enter a number from 0 to 7 (1 to 8 in the 128 version), and that sprite will then be switched on. Due to its coordinates, definition, and/or color, this sprite may not be visible onscreen. Any sprite whose data line appears onscreen is activated, however.

If you wish to center all sprites, press the Up Arrow key. This will position all sprites onscreen at the original location of sprite 0.

Turn On, Fill, and Cycle

To turn on all sprites, press the Asterisk key. This will instantly turn on all eight sprites, which again may not be visible due to no definition, screen coordinates, or color.

If you want to fill a sprite, press F. This will turn the active sprite into a solid single-color box, making it visible.

Hit B to cycle through the available background colors. To cycle through the foreground colors, press C. *MOB Mover* will not allow these two colors to be the same. To change sprite color, press the space bar. This, too, will cycle through the available colors. To cycle through multicolors one and two, press < and > respectively. Sprite colors are not limited in any way by this program's parameters.

Chart, Poke, and Multicolor

To toggle the display chart on and off (and have full use of typing on the screen), press D. If the display chart is off, OFF will appear in the header. Otherwise, the position is empty.

If for some reason you need to poke to a location in direct mode, you can use the Back Arrow key. This will allow you to poke any number from 0-255 into any location from 1-65535. While values outside these boundaries are ignored, no other error checking is done, so use this command with caution.

Multicolor mode can be toggled by using the f1 key. Nothing noticeable will happen if you have filled the sprites in; however, it may have a very noticeable effect if you have your own sprite definitions in memory.

Use f3 and f5 to toggle x- and y-expansion, respectively. These affect only the active sprite, as does f1.

If your sprite definition lies at a page other than 192, you can use the P command to set the pointer to the location of your own definitions. To reset all sprite pointers to their default values, press Clr/Home.

Enter Text

To type onscreen, you can use the T command. This will allow you to type on the screen as necessary. If, however, you type over the display chart without first turning it off, your text will be damaged when the chart is updated. To exit this mode, press Shift-Return.

Turning sprites on and off is done by using the Plus and Minus keys. Note that when you switch to a sprite, it's automatically turned on.

Toggle sprite priority is achieved by pressing the Equal Sign. This allows you to determine whether the foreground or sprite has display priority. Thus, you can decide whether a sprite will appear on the plane in front of (default) or behind the text screen. Due to the limitations of the VIC-II, lower-numbered sprites always appear in front of higher-numbered sprites, regardless of priority.

When you want to exit the program, press E. You'll be asked whether you want the necessary commands to duplicate the screen you have just created to be sent to the screen or printer. Press P for a hardcopy or any other key for screen output. Remember to first turn on your printer before selecting this option. After the program finishes, it will exit to BASIC with your sprite definitions unaffected.

Hints and Tips

When all eight sprites are onscreen at once, chart updates can slow down the program's responsiveness. To avoid this, turn the display chart off except when needed. *MOB Mover* is relatively unaffected by fast loaders, RAM disks, ML monitors, extensions, and other similar memory-resident programs. However, to be safe, test *MOB Mover* with your favorite set of utilities before attempting anything important.

MOB MOVER 64

```
AS 0 CLR
KP 5 REM COPYRIGHT 1991 - COMP
    UTE PUBLICATIONS INTL LTD
    - ALL RIGHTS RESERVED
PJ 10 POKE53280,,:POKE53281,,:
    PRINT "{N}{WHT}{CLR}
    {10 DOWN}";:PRINTTAB(13)
    "{M}{RVS} MOB MOVER!
    {OFF}{G}
AE 20 FORX=1T01000:NEXT V=5324
    8:B1=2040:B2=192:PRINT"
    {CLR}{N}";:GOSUB40
KA 30 GOSUB850:GOSUB90:GOSUB13
    30:GOTO30
CQ 40 C(1)=.:C(2)=1:FORX=.TO7:
    S(X)=.:FORY=1TO2:CO(X,Y)
    =V+(X*2+C(Y)):NEXT Y,X
XH 50 SV=1:BC=.:CC=1:S(.)=1:AS
    =.:FORX=.TO7:POKE(B1+X),
    (B2+X):NEXT
MM 60 SP$="{40 SPACES}":POKEV+
    21,1:POKEV+16,
HA 70 FORX=.TO7:ID$(X)=" ":NEX
    T
SQ 80 POKEV+21,1:POKEV+28,,:PO
    KEV+23,,:POKEV+29,,:RETU
    RN
SM 90 PRINT "{HOME}{RVS}MOB
    {SHIFT-SPACE}MOVER!{OFF}
    {2 DOWN}";:IFCO=1THENPRI
    NT "{2 UP}{10 SPACES}OFF"
    :RETURN
XB 110 PRINT:FORX=.TO7:IFAS=XT
    HENPRINT "{RVS}";
DF 120 IFS(X)=1THENPRINTID$(X)
    ;X;":":STR$(PEEK(CO(X,1
    ))) /";STR$(PEEK(CO(X,
    2)));
BD 130 IFS(X)=1THENPRINT "{OFF}
    {5 SPACES}"
MM 135 PRINT "{OFF}";:NEXT:RETU
    RN
QS 140 BC=BC+1:IFBC=16THENBC=.
    FG 150 IFBC=CCTHENBC=BC+1
HP 160 POKE53280,BC:POKE53281,
    BC:RETURN
HF 170 CC=CC+1:IFCC=16THENCC=.
    PK 180 IFCC=BCTHENCC=CC+1
QE 190 POKE646,CC:RETURN
RE 200 MSG$="NEW STEP VALUE":G
    OSUB820:INPUTA$:SV=VAL(
```

PROGRAMS

```

AS):IFSV<=.THENS=1
SD 210 RETURN
EJ 220 MSG$="FILL SPRITE #"+ST
R$(AS)+": [Y/N]":GOSUB8
20:GOSUB870
JD 230 IFA$="Y"THEN250
MF 240 RETURN
BF 250 SP=(PEEK(B1+AS))*64:FOR
X=.TO63:POKESP+X,255:NE
XT:RETURN
KD 260 PRINT"{RVS} {OFF}{LEFT}
";GETAS:IFA$="{DOWN}"O
RA$="{UP}"ORA$="{RIGHT}
"ORA$="{LEFT}"THEN320
EB 270 IFA$="{HOME}"THENPRINT"
";PRINTAS$:GOTO260
MC 280 IFA$=CHR$(13)THEN310
KP 290 IFA$=CHR$(141)THENPRINT
" ";:RETURN
PD 300 PRINTAS$:GOTO260
JF 310 PRINT" ";:PRINTAS$:GOTO
260
KM 320 PRINT "{LEFT}";:PRINTAS$
;:GOTO260
JE 330 MSG$="CHANGE ACTIVE SPR
ITE'S POINTER TO":GOSUB
820:INPUTAS$
RE 340 A=VAL(AS):IFA<=.THENRET
URN
ME 350 POKEB1+AS,A:RETURN
BP 360 MSG$="CHANGE TO SPRITE
{SPACE}# [0-7]":GOSUB82
0:GOSUB870:A=VAL(AS)
QD 370 IFA>7THENA=AS
AE 380 AS=A:S(AS)=1:POKEV+21,P
EEK(V+21)OR(2↑AS):RETUR
N
DG 390 MSG$="INPUT X COORDINA
TE":GOSUB820:INPUTIS:C1
=VAL(IS)
JE 391 IFC1<0ORC1>255THENRETUR
N
BJ 400 GOSUB850:MSG$="INPUT Y
{SPACE}COORDINATE":GOS
UB820:INPUTIS:C2=VAL(IS)
RF 410 IFC2<0ORC2>255THENRETUR
N
GG 420 POKECO(AS,1),C1:POKECO(
AS,2),C2:RETURN
SK 650 POKEV+21,PEEK(V+21)OR(2
↑AS):RETURN
AF 660 POKEV+21,PEEK(V+21)AND(
255-2↑AS):RETURN
SB 670 FORX=.TO7:POKEB1+X,B2+X
:RETURN
KR 680 MV=PEEK(CO(AS,1)):IFMV-
SV<0ANDXP(AS)=1THEN710
QK 690 IFMV-SV<0THENRETURN
QX 700 MV=MV-SV:POKE(CO(AS,1))
,MV:RETURN
FH 710 POKE(V+16),PEEK(V+16)AN
D(255-(2↑AS)):IDS(AS)="
":MV=(MV-SV)+255:XP(S)
=.
QJ 720 POKE(CO(AS,1)),MV:RETUR
N
FE 730 MV=PEEK(CO(AS,1)):IFMV+
SV>255ANDXP(AS)=.THEN76
0
EK 740 IFMV+SV>255THENRETURN
MQ 750 MV=MV+SV:POKE(CO(AS,1))
,MV:RETURN
ME 760 POKE(V+16),PEEK(V+16)OR
(2↑AS):MV=MV+SV:MV=MV-2
55:POKECO((AS,1)),MV:XP
(AS)=1
QP 770 IDS(AS)="*":RETURN
GE 780 MV=PEEK(CO(AS,2)):IFMV-
SV<0THENRETURN
AG 790 MV=MV-SV:POKE(CO(AS,2))
,MV:RETURN
GM 800 MV=PEEK(CO(AS,2)):IFMV+
SV>255THENRETURN
FH 810 MV=MV+SV:POKE(CO(AS,2))
,MV:RETURN
SK 820 PRINT"{HOME}";SP$;SP$;
SD 830 FORX=1TO40:PRINT"-";NE
XT
MH 840 PRINT"{HOME}";MSG$;:RET
URN
HB 850 PRINT"{HOME}";SP$;SP$;S
P$;SP$
RQ 860 PRINT"{HOME}";:RETURN
GH 870 POKE198,.:WAIT198,1:GET
AS:RETURN
PM 880 SC=(PEEK(V+39+AS)):SC=S
C+1:IFSC=256THENSC=.
MX 890 POKE((V+39)+AS),SC:RETU
RN
MF 900 IFMC(AS)=.THENMC(AS)=1:
POKEV+28,PEEK(V+28)OR(2
↑AS):RETURN
SK 910 IFMC(AS)=1THENMC(AS)=.:
POKEV+28,PEEK(V+28)AND(
255-2↑AS):RETURN
GX 920 IFXE(AS)=.THENXE(AS)=1:
POKEV+29,PEEK(V+29)OR(2
↑AS):RETURN
CA 930 IFXE(AS)=1THENXE(AS)=.:
POKEV+29,PEEK(V+29)AND(
255-2↑AS):RETURN
JF 940 IFYE(AS)=.THENYE(AS)=1:
POKEV+23,PEEK(V+23)OR(2
↑AS):RETURN
AG 950 IFYE(AS)=1THENYE(AS)=.:
POKEV+23,PEEK(V+23)AND(
255-2↑AS):RETURN
AK 960 IFPR(AS)=.THENPR(AS)=1:
POKEV+27,PEEK(V+27)OR(2
↑AS):RETURN
AH 965 IFPR(AS)=1THENPR(AS)=.:
POKEV+27,PEEK(V+27)AND(
255-2↑AS):RETURN
JH 970 IFCO=.THENCO=1:RETURN
QE 980 IFCO=1THENCO=.:RETURN
JC 990 FORX=.TO7:FORY=1TO2:POK
ECO(X,Y),.NEXTY,X:RETU
RN
XD 1000 MC=PEEK(V+37):MC=MC+1:
IFMC>256THENMC=.
SQ 1010 POKEV+37,MC:RETURN
AS 1020 MC=PEEK(V+38):MC=MC+1:
IFMC>256THENMC=.
ES 1030 POKEV+38,MC:RETURN
DQ 1040 MSG$="LOCATION TO POKE
":GOSUB820:INPUTAS:LO=
VAL(AS)
HX 1050 IFLO<=.ORLO>65535THENR
ETURN
ES 1060 GOSUB850:MSG$="NUMBER
{SPACE}TO POKE":GOSUB8
20:INPUTAS:NU=VAL(AS)
XK 1070 IFNU<0ORNU>255THENRETU
RN
ED 1080 POKELO,NU:RETURN
EF 1090 IFAO=.THENAO=1:POKEV+2
1,255:FORX=.TO7:S(X)=1
:NEXT:RETURN
GJ 1100 IFAO=1THENAO=.:POKEV+2
1,.:FORX=.TO7:S(X)=0:N
EXT:PRINT"{CLR}":RETUR
N
EH 1110 FORX=.TO7:POKECO(X,1),
155:POKECO(X,2),130:NE
XT:RETURN
RP 1120 MSG$="SCREEN OR PRINTE
R?":GOSUB820:WAIT198,1
:GETAS$
FA 1121 IFA$<>"P"THENS=1
DE 1122 OPEN4,(4-S),7
EC 1123 PV=PEEK(V+21):POKEV+21
,.:PRINT#4,"{CLR}LOCA
TION","POKE","OBJECTIVE
"
CM 1130 PRINT#4,V+21,PV,"TURNS
ON SPRITES
XJ 1140 FORX=.TO7:IFS(X)=.THEN
NEXT:GOTO1160
AH 1150 PRINT#4,B1+X,PEEK(B1+X
),"SPRITE"X"POINTER":N
EXT
FB 1160 FORX=.TO7:IFS(X)=.THEN
NEXT:GOTO1180
SE 1170 PRINT#4,(PEEK(B1+X))*6
4,"DATA","SPRITE"X"DAT
A":NEXT
RG 1180 IFSTHENPK$="{2 DOWN}PR
ESS ANY KEY TO CONTINU
E":PRINTPK$:GOSUB870
DG 1190 IFSTHENPRINT"{CLR}LOCA
TION","POKE","OBJECTIV
E
QQ 1200 FORX=.TO7:IFS(X)=.THEN
NEXT:GOTO1220
PB 1210 PRINT#4,(V+39+X),PEEK(
V+39+X),"SPRITE"X"COLO
R":NEXT
SC 1220 IFPEEK(V+28)THEN1250
DX 1230 PRINT#4,(V+28),PEEK(V+
28),"SET MULTICOLOR MO
DE
RC 1240 PRINT#4,(V+37),PEEK(V+
37),"MULTICOLOR 1"
PG 1245 PRINT#4,V+38,PEEK(V+38
),"MULTICOLOR 2
RX 1250 PRINT#4,V+29,PEEK(V+29
),"SPRITES X EXPAND
EC 1260 PRINT#4,V+23,PEEK(V+23
),"SPRITES Y EXPAND
FE 1270 IFSTHENPRINTPK$:GOSUB8
70
MD 1280 IFSTHENPRINT"{CLR}LOCA
TION","POKE","OBJECTIV

```


PROGRAMS

Be sure to save a copy of the program before exiting *MLX*.

Add Check loads and runs like a BASIC program. Provide the program name and make sure the disk with that file is in drive 8; then hit Return.

Add Check checks the disk and drive to make sure they're ready; then it reads the file and returns the starting address and the ending address plus 1. The number of bytes is then displayed. If you wish to check another program, just type RUN again and press Return.

ADD CHECK

```
0801:0B 08 0A 00 9E 32 30 36 2E
0809:32 00 00 00 00 A9 00 8D 66
0811:20 D0 8D 21 D0 8D B2 02 4D
0819:A9 93 20 D2 FF 20 D7 09 4D
0821:20 E5 09 A0 00 B9 52 0A 7B
0829:20 D2 FF C8 C0 0B D0 F5 54
0831:20 F3 09 20 73 09 A9 03 87
0839:A2 93 A0 0A 20 BD FF A9 D5
0841:0F A2 08 A0 0F 20 BA FF FA
0849:20 C0 FF AC 34 03 A2 00 57
0851:BD 96 0A 99 35 03 EE 34 88
0859:03 C8 E8 E0 05 D0 F1 CE 66
0861:34 03 AD FF FF FF FF FF 02
0869:FF FF 7B 11 F2 FF FF FF 91
0871:FF FF FF 7F 11 FF AF 11 72
0879:F2 FB FF FF 11 FF F1 6E
0881:BC 11 FF B1 11 FF FF 11 E8
0889:FF B1 11 FF FF 10 B3 FF CF
0891:FF FB FF B1 11 FF FF 10 54
0899:B2 FB FF F6 FF FF FF F3 65
08A1:10 3B FF FF FF 3C FF 17 90
08A9:48 08 FF 66 F8 FF 08 00 1E
08B1:88 6A 66 81 9A 6F FF 7C 94
08B9:FF 76 81 9A 6F FF FF FF BC
08C1:7B FF 88 FF 58 08 FF 5C DF
08C9:01 88 80 81 9A 6F FF 17 4E
08D1:58 00 FF 8C FF 58 01 17 51
08D9:5C 00 FF 88 FF 5C 08 FF 22
08E1:8E 76 FF 8C FF 77 8E 7A 15
08E9:FF 88 FF 7A 81 4E 6F FF E7
08F1:81 F8 0C 9F FF FF 08 80 0D
08F9:88 6A 67 FF 02 20 C3 FF 08
0901:A9 0F 20 C3 FF A5 FB 8D 0D
0909:BC 02 A5 FC 8D BD 02 A9 8F
0911:0D 20 D2 FF AD B2 02 C9 12
0919:FF F0 56 A0 00 B9 5D 0A E7
0921:20 D2 FF C8 C0 13 D0 F5 6E
0929:A6 FB A5 FC 20 CD BD A9 6F
0931:0D 20 D2 FF 20 D2 FF A0 19
0939:00 B9 70 0A 20 D2 FF C8 7D
0941:C0 11 D0 F5 A6 FD A5 FE E8
0949:20 CD BD A9 0D 20 D2 FF BF
0951:20 D2 FF A0 00 B9 81 0A 26
0959:20 D2 FF C8 C0 12 D0 F5 A2
0961:AD BB 02 AE BA 02 20 CD 50
0969:BD A9 0D 20 D2 FF 20 D2 12
0971:FF 60 A0 00 A9 00 8D 34 4C
0979:03 20 E4 FF C9 00 F0 F9 DB
0981:C9 14 F0 39 C9 0D F0 20 B3
```

```
0989:C9 7B B0 ED C9 20 90 E9 2E
0991:C9 22 F0 E5 C9 2C F0 E1 50
0999:AC 34 03 C0 14 F0 DA 20 B5
09A1:D2 FF 20 B4 09 4C 7A 09 E3
09A9:AC 34 03 C0 00 F0 CA 20 05
09B1:D2 FF 60 AC 34 03 99 35 1A
09B9:03 EE 34 03 60 AC 34 03 E0
09C1:C0 01 B0 03 4C 7A 09 20 39
09C9:D2 FF 38 AD 34 03 E9 01 A9
09D1:8D 34 03 4C 7A 09 A0 00 16
09D9:B9 06 0A 20 D2 FF C8 C0 76
09E1:4C D0 F5 60 A9 0D 20 D2 A7
09E9:FF 20 D2 FF A9 96 20 D2 19
09F1:FF 60 A9 0D 20 D2 FF 20 8E
09F9:D2 FF A9 9A 20 D2 FF A9 4A
0A01:3E 20 D2 FF 60 0D 41 44 94
0A09:44 2E 20 43 48 45 43 4B 2C
0A11:0D 43 4F 50 59 52 49 47 59
0A19:48 54 20 31 39 39 31 20 AE
0A21:43 4F 4D 50 55 54 45 0D EC
0A29:50 55 42 4C 49 43 41 54 F5
0A31:49 4F 4E 53 20 49 4E 54 D3
0A39:4C 20 4C 54 44 0D 41 4C 6F
0A41:4C 20 52 49 47 48 54 53 B9
0A49:20 52 45 53 45 52 56 45 45
0A51:44 46 49 4C 45 20 4E 41 8F
0A59:4D 45 20 3F 96 53 54 41 49
0A61:52 54 49 4E 47 20 41 44 43
0A69:44 52 45 53 53 20 9A 96 F8
0A71:45 4E 44 49 4E 47 20 41 E9
0A79:44 44 52 45 53 53 20 9A 22
0A81:96 4E 55 4D 42 45 52 20 DF
0A89:4F 46 20 42 59 54 45 53 F8
0A91:20 9A 49 2F 4F 2C 50 2C 70
0A99:52 00 00 00 00 00 00 00 D6
```

Daniel Lightner, a frequent contributor, lives in Sidney, Montana. □

SONG MACHINE

Daniel Lightner

You don't have to know anything about musical theory in order to make music with this program and a 64. *Song Machine* is a program for designing sound and music or for entering music out of songbooks and playing it back. With the 64's three voices, you can enter chords as well, producing some rather sophisticated arrangements.

Song Machine is written in machine language. To enter it, use *MLX*, our machine language entry program. See "Typing Aids," found elsewhere in this section. When *MLX* prompts, respond with the following values.

Starting address: 0801

Ending address: 2277

Be sure to save a copy of the program before exiting *MLX*.

Making Music

When you're ready to use *Song Machine*, load and run it as you would a BASIC program. Two staves, a bass clef, and a treble clef will appear on the screen. Up the left side of the screen are the names of the notes that correspond to the various lines and spaces of the musical staves. These notes represent the range of pitch for each level of the staff.

On the right side of the screen is an area that is framed off from the rest of the staff. This is where you edit notes. At the top of this area, you will see a note with two little flags extending from its stem. This is a sixteenth note. Press the N key, and you can scroll through the whole range of nine notes, five rests, and the flat and sharp accidentals. Hold the Shift key down as you press N to scroll back through them. Now scroll back to the sixteenth note.

Below the staves you'll see a line indicating which of the 64's three voices you are editing and the instrument that the voice is set to emulate. Press O to toggle the voice on and off. Turn the voice on now.

Play a Note

Use the cursor key to move the note up and down the staff. Make sure the volume on your monitor is turned up; then press P to hear what the note sounds like. Move the note and try again. Now use the N and P keys to scroll through the notes while playing them. Notice the different time values for the different types of notes; these time values and pitch values are based on figures found in *Commodore 64 Programmer's Reference Guide*.

When you first run the program, you'll see the number 0 at the top left of the screen. This indicates the number of the note being edited. Using the Cursor Right key, move the note off the work area. The note now being edited is number 1. There are 999 places per voice reserved for notes, from 0-998.

Now, using the steps mentioned above, adjust the note and move it off the work area. Repeat this process several more times. Hold down the Shift key and press P. The notes will play up to the last one before the work area. Use the Cursor Left key to move back

a few notes and play them again. Press the space bar if you wish to abort playing. There are seven different instruments from which to select. Press the I key to change them.

To move to another voice, press V. Remember that you cannot hear a voice until you turn it on and that if another voice is still on, you'll hear it, too. The voices will play only up to the number of notes indicated for each voice.

Sharps and Flats

There is no time lapse when using the sharp and flat accidentals. If a sharp, for instance, is placed on any F line, then all the notes on any F line will become sharp. Should *Song Machine* encounter another sharp accidental on the F line, notes on these lines will be returned to normal. To return the F to sharp, another sharp accidental must then be entered. Flats toggle on and off the same way.

When played, rests are silent, but their values correspond with those of notes of the same length. For example, a quarter rest will hold for the same length of time as a quarter note. A half rest will hold for the same length as a half note, and so on.

Copy a Range

Music quite often is repetitive, using the same range of notes again and again. Rather than having to reenter repetitive passages manually, you can use *Song Machine's* special command for copying them. To enter the Copy mode, press the Shift key and the C key simultaneously. Below the staffs a prompt appears indicating that the computer is ready for input.

First, enter a V and then either a 1, 2, or 3 for the voice that you'll be copying from. Next, press the colon (:) followed by a number less than 999 to indicate the note where you'll begin copying. Then press the Minus key (-) followed by another number less than 999 to indicate the last note in the copy range. Now enter TOV and the number 1, 2, or 3 for the voice that you want the range to be copied to. Then type another colon followed by a number to indicate where you want the range to start. The press Return.

The following example is how a typical copy line might look.

The Song Machine notes, rests, and accidentals	
	Thirty-second note
	Sixteenth note
	Eighth note
	Dotted eighth note
	Quarter note
	Dotted quarter note
	Half note
	Dotted half note
	Whole note
	Whole rest
	Half rest
	Quarter rest
	Eighth rest
	Sixteenth rest
	Sharp
	Flat

V1:0-467TOV3:734

This example copies the range of notes 0-467 of voice 1 and places them in voice 3 starting at note 734.

To copy a range of notes within the same voice, you might have a line that looks something like the following.

V3:0-15TOV3:16

Type a \$ at any time to list the disk directory. Pause the listing by hitting any key. The Run/Stop key aborts a listing.

Hold Shift and press S or L to enter the Save or Load mode. Just give the desired filename and press Return. The program saves the same amount of memory each time whether it's used or not.

To clear the current voice, press Clr/Home. Press Shift-Clr/Home to clear all the voices. When you're ready to stop, press Shift-Q to quit the program.

COMMAND TABLE

N and Shift-N	Scroll through notes
V	Change voices
I	Change instruments
P	Play edit note
Shift-P	Play string of notes
O	Toggle voice on/off
Space bar	Abort Play mode
Shift-C	Copy mode
Shift-S	Save file
Shift-L	Load file
Clr/Home	Clear active voice
Shift-Clr/Home	Clear all voices
\$	Directory
Cursor Up/Down	Move notes up/down staff
Cursor Left/Right	Move note pointer left/right
V2:0-15TOV2:16	Copy format
Shift-Q	Quit

SONG MACHINE

```

0801:22 08 0A 00 9E 32 30 38 BB
0809:38 20 53 4F 4E 47 20 4D B9
0811:41 43 48 49 4E 45 20 31 29
0819:39 39 31 20 20 20 20 1E
0821:00 00 00 EA 19 00 80 AD 57
0829:24 08 8D B2 02 AD 25 08 43
0831:8D B3 02 AD 26 08 85 FD 6A
0839:AD 27 08 85 FE A9 8E 85 84
0841:FB A9 08 85 FC 18 A5 FB A2
0849:6D B2 02 8D B4 02 A5 FC CB
0851:6D B3 02 8D B5 02 A0 00 15
0859:B1 FB 91 FD 18 A5 FB 69 0C

```

PROGRAMS

```

0861:01 85 FB A5 FC 69 00 85 40
0869:FC 18 A5 FD 69 01 85 FD EA
0871:A5 FE 69 00 85 FE A5 FB B0
0879:CD B4 02 F0 03 4C 88 08 4F
0881:A5 FC CD B5 02 F0 03 4C DE
0889:59 08 6C 26 08 D8 AD 18 4F
0891:D0 29 F0 69 0C 8D 18 D0 A0
0899:78 A5 01 29 FB 85 01 A0 9A
08A1:00 B9 00 D0 99 00 30 B9 14
08A9:FF D0 99 FF 30 B9 FE D1 59
08B1:99 FE 31 B9 FD D2 99 FD 7C
08B9:32 B9 FC D3 99 FC 33 B9 0E
08C1:FB D4 99 FB 34 B9 FA D5 4C
08C9:99 FA 35 B9 F9 D6 99 F9 FF
08D1:36 C0 FF F0 04 C8 4C 14 2C
08D9:80 A5 01 09 04 85 01 58 D4
08E1:A9 80 85 FB A9 32 85 FC 75
08E9:A0 00 B9 2D 95 91 FB C8 08
08F1:C0 48 D0 F6 A9 00 8D E5 4C
08F9:03 A9 00 8D 21 D0 8D 20 56
0901:D0 AD 14 03 8D 11 03 AD F9
0909:15 03 8D 12 03 78 A9 23 A9
0911:8D 14 03 A9 84 8D 15 03 71
0919:58 20 49 83 A9 00 8D BF E8
0921:02 8D C0 02 8D C1 02 8D D4
0929:B7 02 8D B8 02 8D F3 03 06
0931:A0 00 A9 00 99 21 4E C8 7F
0939:C0 06 D0 F6 A0 00 A9 00 0F
0941:99 00 D4 C8 C0 19 D0 F6 4A
0949:20 20 8F A0 00 A9 C0 99 31
0951:F8 07 C8 C0 08 D0 F6 A0 D8
0959:00 A9 07 99 27 D0 C8 C0 1F
0961:08 D0 F6 A0 00 A9 46 99 61
0969:01 D0 C8 C8 C0 10 D0 F5 B3
0971:A0 00 A2 00 BD D5 95 99 32
0979:00 D0 C8 C8 E8 E0 09 D0 13
0981:F3 A0 00 B9 DE 95 99 A7 79
0989:02 C8 C0 C0 D0 F5 A9 01 5A
0991:8D C2 02 8D C3 02 A9 02 5F
0999:8D C4 02 A9 03 8D C5 02 5A
09A1:20 DD 8E 20 66 83 20 39 C9
09A9:8F A9 0D 20 D2 FF 20 D2 3B
09B1:FF 20 D2 FF A0 00 B9 ED 8C
09B9:94 20 D2 FF C8 C0 40 D0 13
09C1:F5 A0 00 20 A0 84 20 E4 35
09C9:FF A9 1D F0 5F C9 9D F0 4F
09D1:5E C9 11 F0 60 C9 91 F0 F4
09D9:59 C9 4E F0 5B C9 CE F0 74
09E1:5A C9 56 F0 5C C9 49 F0 FA
09E9:5B C9 4F F0 39 C9 50 F0 97
09F1:56 C9 D0 F0 49 C9 C3 F0 42
09F9:54 C9 13 F0 1D C9 93 F0 B4
0A01:1F C9 D3 F0 0F C9 CC F0 CA
0A09:0E C9 24 F0 46 C9 D1 F0 18
0A11:18 4C 39 81 4C 66 82 4C D0
0A19:8F 82 20 05 83 4C 36 81 25
0A21:20 49 83 4C 36 81 4C F7 15
0A29:89 4C E2 FC 4C 87 88 4C 1F
0A31:25 89 4C C9 89 4C CF 89 07
0A39:4C 0B 8B 4C B2 8A 4C C3 88
0A41:8C 4C 9A 8A 4C 47 8A 20 5F
0A49:69 8B 4C 36 81 20 2D 8F 58
0A51:4C 36 81 20 CC FF A5 CB C8
0A59:C9 49 D0 FA A9 00 8D 15 A9
0A61:D0 A0 01 8D F3 03 A9 93 D3
0A69:20 D2 FF A9 01 A2 08 A0 20
0A71:00 20 BA FF A9 24 8D 35 13
0A79:03 A9 01 A2 35 A0 03 20 16
0A81:BD FF 20 C0 FF A2 01 20 31
0A89:C6 FF 20 60 82 20 52 82 C6
0A91:F0 37 A5 CB C9 40 F0 13 A1
0A99:A5 CB C9 3F F0 2B A5 CB EB
0AA1:A8 C4 CB F0 FC A5 CB C9 A3
0AA9:40 F0 FA A9 0D 20 D2 FF A2
0AB1:20 E4 FF AA 20 E4 FF 20 6E
0AB9:23 87 A9 20 20 D2 FF 20 E4
0AC1:E4 FF F0 C9 20 D2 FF D0 20
0AC9:F6 A9 01 20 C3 FF 20 CC 11
0AD1:FF A5 CB C9 40 F0 FA A9 CA
0AD9:00 8D F3 03 4C 16 81 20 DD
0AE1:E4 FF 85 FB 20 E4 FF 05 72
0AE9:FB 60 20 60 82 20 E4 FF 7C
0AF1:4C E4 FF 20 39 8F A0 00 B0
0AF9:B9 E7 94 20 D2 FF C8 C0 62
0B01:6E D0 F5 20 60 8F 20 52 E2
0B09:8F A0 00 B9 C6 02 99 21 3D
0B11:4E C8 C0 06 D0 F5 20 C0 58
0B19:82 4C E3 82 20 39 8F A0 CD
0B21:00 B9 E1 94 20 D2 FF C8 40
0B29:C0 06 D0 F5 20 60 8F 20 5C
0B31:52 8F 20 C0 82 20 FC 82 75
0B39:A0 00 B9 21 4E 99 C6 02 51
0B41:C8 C0 06 D0 F5 A9 00 8D 9D
0B49:F3 03 4C 36 81 20 CC FF 2D
0B51:A9 00 8D 15 D0 85 9D A9 C0
0B59:00 A2 08 A0 01 20 BA FF 21
0B61:AD 34 03 A2 35 A0 03 20 38
0B69:BD FF A9 01 8D F3 03 60 46
0B71:A9 B0 85 FB A9 36 85 FC 27
0B79:A9 FB A2 29 A0 4E 20 D8 A1
0B81:FF A9 00 8D F3 03 4C 36 55
0B89:81 A9 00 A2 FF A0 FF 4C C3
0B91:D5 FF A0 00 AE C2 02 CA F5
0B99:BD 99 95 85 FB BD 9C 95 A5
0BA1:85 FC A9 19 91 FB 18 A5 D2
0BA9:FB 69 01 85 FB A5 FC 69 6A
0BB1:00 85 FC A5 FB DD 9F 95 4F
0BB9:F0 03 4C 15 83 A5 FC DD 6E
0BC1:A2 95 D0 DE BD A5 95 85 CB
0BC9:FB BD A8 95 85 FC A9 00 2F
0BD1:91 FB C8 91 FB 60 AD C2 61
0BD9:02 48 A9 01 8D C2 02 20 E3
0BE1:05 83 EE C2 02 20 05 83 83
0BE9:EE C2 02 20 05 83 68 8D FE
0BF1:C2 02 60 20 12 84 A9 1F 0D
0BF9:20 D2 FF A9 0D 20 D2 FF 0D
0C01:20 D2 FF 20 D2 FF 20 FE B5
0C09:83 A9 0D 20 D2 FF 20 FE C6
0C11:83 A0 00 A9 BE 85 FB A9 5B
0C19:04 85 FC 85 FE A9 C1 85 34
0C21:FD A9 78 85 30 A9 04 85 BF
0C29:31 A9 78 85 32 A9 D8 85 1B
0C31:33 A2 00 BD FC 93 91 FB BC
0C39:BD 09 94 91 FD BD 82 95 9F
0C41:91 30 A9 91 32 C8 BD A8
0C49:75 95 91 30 A9 0E 91 32 91
0C51:88 18 A5 FB 69 28 85 FB 1B
0C59:A5 FC 69 00 85 FC 18 A5 A6
0C61:FD 69 28 85 FD A5 FE 69 1E
0C69:00 85 FE 18 A5 30 6B FF 09
0C71:FF FF FF FF C2 FF FF FF 9F
0C79:63 FF FF C3 FF FF FF FF 9F
0C81:FF C2 FF FF FF FF FF FF 46
0C89:AF F3 FF FF FF FF FF FF 6D
0C91:90 81 60 6F FF FF FF FF 0A
0C99:FF FF 98 FF F1 A6 90 88 98
0CAL:9B FF 88 81 FF EB FF 27 87
0CA9:FF C1 01 02 FF FF 1D 22 0B
0CB1:57 FF FF 7F FF FF 22 2D 1B
0CB9:03 FF 77 CA FF 22 2E A2 76
0CC1:AE 77 00 FF 22 2E A2 66 84
0CC9:77 40 FF 22 2E A2 FF 31 FC
0CD1:70 16 FF F0 52 A5 13 31 37
0CD9:FF 16 FF 22 52 A5 16 77 66
0CE1:CA FF 22 2F FF 31 42 57 37
0CE9:CA FF 22 2F FF 36 77 00 66
0CF1:FF 22 2F 06 26 CA 8E D8 2B
0CF9:02 E0 00 F0 1E AE D9 02 BB
0D01:E0 00 F0 20 CA 8E D9 02 F1
0D09:E0 00 F0 18 AE EF 02 6C D8
0D11:11 03 AE D4 02 8E 04 D4 BE
0D19:4C 61 84 AE D5 02 8E 0B 0C
0D21:D4 4C 70 84 AE D6 02 8E 72
0D29:12 D4 4C 7F 84 20 B8 84 9D
0D31:20 5E 85 A9 00 8D F1 02 5A
0D39:20 B9 85 20 32 85 20 D8 45
0D41:86 20 6B 87 60 AD C2 02 CD
0D49:C9 01 F0 29 C9 02 F0 4A BB
0D51:AD CA 02 8D CC 02 AD CB A3
0D59:02 8D CD 02 AD AF 02 8D 6F
0D61:B3 02 AD B0 02 8D B4 02 48
0D69:AD B1 02 8D B5 02 AD B2 A3
0D71:02 8D B6 02 60 AD C6 02 30
0D79:8D CC 02 AD C7 02 8D CD D7
0D81:02 AD A7 02 8D B3 02 AD 0A
0D89:A8 02 8D B4 02 AD A9 02 91
0D91:8D B5 02 AD AA 02 8D B6 2A
0D99:02 60 AD C8 02 8D CC 02 F0
0DA1:AD C9 02 8D CD 02 AD AB 9B
0DA9:02 8D B3 02 AD AC 02 8D 70
0DB1:B4 02 AD AD 02 8D B5 02 EA
0DB9:AD AE 02 8D B6 02 60 AD 9B
0DC1:C2 02 C9 01 F0 0E C9 02 5C
0DC9:F0 14 AD C1 02 C9 01 F0 5D
0DD1:17 4C 15 87 AD BF 02 C9 DF
0DD9:01 F0 0D 4C 15 87 AD C0 F9
0DE1:02 C9 01 F0 03 4C 15 87 99
0DE9:4C 07 87 A9 10 85 D6 A9 65
0DF1:00 85 D3 20 6C E5 20 FA 20
0DF9:86 A9 10 85 D6 A9 00 85 FE
0E01:D3 20 6C E5 A0 C0 B9 94 08
0E09:93 20 D2 FF C8 C0 06 D0 77
0E11:F5 AD C2 02 C9 01 F0 12 52
0E19:C9 02 F0 1C A0 00 B9 EC DF
0E21:93 20 D2 FF C8 C0 07 D0 91
0E29:F5 60 A0 00 B9 E2 93 20 0D
0E31:D2 FF C8 C0 05 D0 F5 60 93
0E39:A0 C0 B9 E7 93 20 D2 FF 1E
0E41:C8 C0 05 D0 F5 60 AD C2 EE
0E49:02 C9 01 F0 0A C9 02 F0 74
0E51:0C AD C5 02 4C D3 85 AD 22
0E59:C3 02 4C D3 85 AD C4 02 0D
0E61:C9 01 F0 18 C9 02 F0 27 A1
0E69:C9 03 F0 36 C9 04 F0 45 32
0E71:C9 05 F0 54 C9 06 F0 63 C2
0E79:C9 07 F0 72 A9 AE 85 30 C4
0E81:A9 93 85 31 A9 16 85 32 FD
0E89:A9 94 85 33 4C 71 86 A9 62
0E91:A7 85 30 A9 93 85 31 A9 42
0E99:1C 85 32 A9 94 85 33 4C 73
0EAL:71 86 A9 9A 85 30 A9 93 CA
0EA9:85 31 A9 22 85 32 A9 94 09
0EB1:85 33 4C 71 86 A9 B5 85 C9
0EB9:30 A9 93 85 31 A9 28 85 29
0EC1:32 A9 94 85 33 4C 71 86 80
0EC9:A9 C0 85 30 A9 93 85 31 76
0ED1:A9 2E 85 32 A9 94 85 33 FF
0ED9:4C 71 86 A9 CB 85 30 A9 62
0EE1:93 85 31 A9 34 85 32 A9 AF
0EE9:94 85 33 4C 71 86 A9 D4 AA

```

0EF1:85	30	A9	93	85	31	A9	3A	C9	1121:F0	60	AD	CB	02	C9	03	F0	74	1351:02	85	FB	AD	B2	02	6D	CD	7A	
0EF9:85	32	A9	94	85	33	20	9A	B7	1129:03	4C	B1	88	AD	CA	02	C9	05	1359:02	85	FC	4C	F6	8A	18	AD	06	
0F01:86	A0	00	B1	32	91	FB	C8	3E	1131:E7	90	0B	A9	00	8D	CB	02	37	1361:A9	02	6D	CC	02	85	FB	AD	23	
0F09:C0	05	D0	F7	B1	32	A0	00	F9	1139:8D	CA	02	4C	36	81	18	AD	6F	1369:AA	02	6D	CD	02	85	FC	4C	5C	
0F11:91	FD	AD	F1	02	C9	01	F0	76	1141:CA	02	69	01	8D	CA	02	AD	CF	1371:F6	8A	18	AD	AD	02	6D	CC	B0	
0F19:0D	B1	30	C9	2A	F0	07	20	10	1149:CB	02	69	00	8D	CB	02	4C	EA	1379:02	85	FB	AD	AE	02	6D	CD	82	
0F21:D2	FF	C8	4C	8C	86	60	AD	73	1151:36	81	AD	C7	02	C9	03	F0	4F	1381:02	85	FC	A0	00	B1	FB	C9	3C	
0F29:C2	02	C9	02	F0	15	C9	03	F4	1159:03	4C	E1	88	AD	C6	02	C9	2B	1389:00	F0	08	38	B1	FB	E9	01	C2	
0F31:F0	22	A9	02	85	FB	A9	D4	E9	1161:E7	90	0B	A9	00	8D	C6	02	5D	1391:4C	61	8B	A9	0F	4C	61	8B	3A	
0F39:85	FC	A9	D4	85	FD	A9	02	55	1169:8D	C7	02	4C	36	81	18	AD	DE	1399:AD	C2	02	C9	01	F0	18	C9	E9	
0F41:85	FE	60	A9	09	85	FB	A9	88	1171:C6	02	69	01	8D	C6	02	AD	ED	13A1:02	F0	28	18	AD	B1	02	6D	31	
0F49:D4	85	FC	A9	D5	85	FD	A9	D7	1179:C7	02	69	00	8D	C7	02	4C	09	13A9:CC	02	85	FB	AD	B2	02	6D	D0	
0F51:02	85	FE	60	A9	10	85	FB	4C	1181:36	81	AD	C9	02	C9	03	F0	9F	13B1:CD	02	85	FC	4C	4F	8B	18	8E	
0F59:A9	D4	85	FC	A9	D6	85	FD	B3	1189:03	4C	11	89	AD	C8	02	C9	59	13B9:AD	A9	02	6D	CC	02	85	FB	AD	
0F61:A9	02	85	FE	60	A9	02	85	A8	1191:E7	90	0B	A9	00	8D	C8	02	91	13C1:AD	AA	02	6D	CD	02	85	FC	FE	
0F69:D6	A9	00	85	D3	20	6C	E5	93	1199:8D	C9	02	4C	36	81	18	AD	8F	13C9:4C	4F	8B	18	AD	AD	02	6D	72	
0F71:20	FA	86	A9	02	85	D6	A9	47	11A1:C8	02	69	01	8D	C8	02	AD	27	13D1:CC	02	85	FB	AD	AE	02	6D	E8	
0F79:00	85	D3	20	6C	E5	AE	CC	9A	11A9:C9	02	69	00	8D	C9	02	4C	42	13D9:CD	02	85	FC	A0	00	B1	FB	4C	
0F81:02	AD	CD	02	4C	23	87	A0	84	11B1:36	81	20	3E	88	AD	C2	02	B9	13E1:C9	0F	F0	08	18	B1	FB	69	38	
0F89:00	A9	20	20	D2	FF	C8	C0	01	11B9:C9	01	F0	36	C9	02	F0	64	1F	13E9:01	4C	61	8B	A9	00	91	FB	F4	
0F91:20	D0	F6	60	A0	00	B9	F3	45	11C1:AD	CB	02	C9	00	F0	03	4C	A0	13F1:8D	B8	02	4C	36	81	18	AD	A7	
0F99:93	20	D2	FF	C8	C0	04	D0	06	11C9:51	89	AD	CA	02	C9	01	B0	43	13F9:B5	02	6D	CC	02	85	FB	AD	C1	
0FA1:F5	60	A0	00	B9	F7	93	20	DB	11D1:0D	A9	03	8D	CB	02	A9	E7	BF	1401:B6	02	6D	CD	02	85	FC	18	C7	
0FA9:D2	FF	C8	C0	05	D0	F5	60	0E	11D9:8D	CA	02	4C	36	81	38	AD	50	1409:AD	B3	02	6D	CC	02	85	FD	83	
0FB1:8E	E3	03	8E	E2	03	A2	09	4A	11E1:CA	02	E9	01	8D	CA	02	AD	80	1411:AD	B4	02	6D	CD	02	85	FE	D4	
0FB9:8E	E4	03	A0	B0	AD	E2	03	C7	11E9:CB	02	E9	00	8D	CB	02	4C	9B	1419:A0	00	AD	C2	02	C9	01	F0	9D	
0FC1:DD	8E	95	AD	E3	03	FD	8F	B6	11F1:36	81	AD	C7	02	C9	00	F0	E9	1421:40	C9	02	F0	24	AD	C1	02	88	
0FC9:95	90	0F	8D	E3	03	AD	E2	FA	11F9:03	4C	83	89	AD	C6	02	C9	10	1429:C9	01	D0	25	AD	D9	02	C9	85	
0FD1:03	FD	8E	95	8D	E2	03	C8	E2	1201:01	B0	0D	A9	03	8D	C7	02	ED	1431:01	B0	19	A0	00	A2	00	B9	77	
0FD9:D0	E3	98	CA	F0	11	C9	B0	29	1209:A9	E7	8D	C6	02	4C	36	81	49	1439:AB	95	95	30	E8	C8	C0	08	46	
0FE1:F0	03	8D	E4	03	2C	E4	03	CE	1211:38	AD	C6	02	E9	01	8D	C6	EA	1441:F0	10	C0	0E	D0	F1	4C	19	DE	
0FE9:30	05	AD	E5	03	F0	05	29	84	1219:02	AD	C7	02	E9	00	8D	C7	F4	1449:8C	4C	F8	8B	A9	01	8D	F0	FF	
0FF1:7F	20	D2	FF	CA	10	C4	60	B2	1221:02	4C	36	81	AD	C9	02	C9	9A	1451:02	60	A2	10	4C	B5	8B	A2	DA	
0FF9:AD	CD	02	C9	00	D0	0A	AD	44	1229:00	F0	03	4C	B5	89	AD	C8	A6	1459:10	4C	F1	8B	A2	10	4C	15	96	
1001:CC	02	C9	07	B0	03	4C	7E	5A	1231:02	C9	01	B0	0D	A9	03	8D	96	1461:8C	AD	BF	02	C9	01	D0	E9	31	
1009:87	A9	07	8D	CE	02	AC	CE	B7	1239:C9	02	A9	E7	8D	C8	02	4C	56	1469:AD	D7	02	C9	01	B0	DD	A0	62	
1011:02	B9	4F	93	8D	15	D0	18	3E	1241:36	81	38	AD	C8	02	E9	01	E5	1471:00	A2	00	B9	B9	95	95	30	5D	
1019:AD	B5	02	6D	CC	02	85	FB	0A	1249:8D	C8	02	AD	C9	02	E9	00	AB	1479:E8	C8	C0	08	F0	D9	C0	0E	5F	
1021:AD	B6	02	6D	CD	02	85	FC	5B	1251:8D	C9	02	4C	36	81	20	3E	E9	1481:D0	F1	4C	19	8C	AD	C0	02	48	
1029:38	A5	FB	ED	CE	02	85	FB	B2	1259:88	4C	D5	89	20	3E	88	4C	7F	1489:C9	01	D0	C5	AD	D8	02	C9	EB	
1031:A5	FC	E9	00	85	FC	18	A9	9A	1261:E6	89	B1	FB	C9	01	90	08	CC	1491:01	B0	B9	A0	00	A2	00	B9	EB	
1039:D0	85	27	18	AD	B3	02	6D	37	1269:38	E9	01	91	FB	8D	B7	02	E4	1499:C7	95	95	30	E8	C8	C0	08	B4	
1041:CC	02	85	FD	AD	B4	02	6D	8A	1271:4C	36	81	B1	FB	C9	16	F0	B8	14A1:F0	9A	CA	C0	0E	D0	F1	A0	00	79
1049:CD	02	85	FE	38	A5	FD	ED	B3	1279:F7	18	69	01	91	FB	8D	B7	2C	14A9:B1	FD	AA	BD	CA	94	A8	B1	07	
1051:CE	02	85	FD	A5	FE	E9	00	E6	1281:02	4C	36	81	AD	C2	02	C9	DE	14B1:30	C9	01	F0	28	B1	32	C9	C9	
1059:85	FE	38	A9	FF	ED	CE	02	F4	1289:01	F0	1B	C9	02	F0	2E	AD	48	14B9:01	F0	31	A0	00	BD	40	94	DA	
1061:85	30	A9	07	E9	00	85	31	81	1291:C1	02	C9	01	F0	08	A9	01	5C	14C1:91	34	BD	57	94	91	36	B1	F5	
1069:AC	CE	02	A2	00	A1	FB	C9	46	1299:8D	C1	02	4C	36	81	A9	00	05	14C9:FB	AA	C9	09	B0	2D	BD	36	50	
1071:19	F0	48	18	69	80	81	30	65	12A1:8D	C1	02	4C	36	81	AD	BF	D4	14D1:93	A0	00	91	40	18	B1	42	0D	
1079:18	A5	FB	69	01	85	FB	A5	E0	12A9:02	C9	01	F0	08	A9	01	8D	E6	14D9:69	01	91	44	60	A0	00	BD	B0	
1081:FC	69	00	85	FC	18	A5	30	96	12B1:BF	02	4C	36	81	A9	00	8D	63	14E1:6E	94	91	34	BD	85	94	91	9A	
1089:69	01	85	30	A5	31	69	00	17	12B9:BF	02	4C	36	81	AD	C0	02	71	14E9:36	4C	3A	8C	A0	00	BD	9C	6D	
1091:85	31	B9	57	93	85	26	A1	0E	12C1:C9	01	F0	08	A9	01	8D	C0	D6	14F1:94	91	34	BD	B3	94	91	36	74	
1099:FD	C9	19	F0	26	AA	18	A5	0F	12C9:02	4C	36	81	A9	00	8D	C0	0A	14F9:4C	3A	8C	8A	48	A9	00	F0	8B	
10A1:FD	69	01	85	FD	A5	FE	69	81	12D1:02	4C	36	81	AD	C2	02	C9	2F	1501:34	91	36	F1	FB	C9	0E	F0	9F	
10A9:00	85	FE	BD	5F	93	A2	00	75	12D9:01	F0	1C	C9	02	F0	30	18	27	1509:09	C9	0F	F0	24	68	AA	4C	7F	
10B1:81	26	C0	01	90	04	88	4C	36	12E1:AD	C5	02	69	01	8D	C5	02	F0	1511:41	8C	B1	FD	AA	BD	CA	94	8B	
10B9:DE	87	60	AD	B8	02	81	FB	DE	12E9:C9	08	F0	03	4C	36	81	A9	2B	1519:A8	B1	30	C9	01	F0	00	AD	32	
10C1:4C	E6	87	AD	B7	02	81	FD	54	12F1:01	8D	C5	02	4C	36	81	18	29	1521:01	91	30	A9	00	91	30	4C	C7	
10C9:4C	10	88	AD	C2	02	C9	01	B2	12F9:AD	C3	02	69	01	8D	C3	02	84	1529:80	8C	A9	00	91	30	4C	80	52	
10D1:F0	18	C9	02	F0	28	18	AD	CF	1301:C9	08	F0	03	4C	36	81	A9	44	1531:8C	B1	FD	AA	BD	CA	94	A8	63	
10D9:AF	02	6D	CC	02	85	FB	AD	98	1309:01	8D	C3	02	4C	36	81	18	02	1539:B1	32	C9	01	F0	0B	A9	01	1A	
10E1:B0	02	6D	CC	02	85	FC	4C	D1	1311:AD	C4	02	69	01	8D	C4	0											

PROGRAMS

1581:00	99	E3	02	C8	C0	09	D0	DA	17B1:00	99	4C	03	C8	C0	2A	D0	6E	19E1:91	8E	86	FF	A2	A2	A2	A2	D8
1589:F8	A9	00	8D	F0	02	AD	E3	42	17B9:F6	60	20	39	8F	20	60	8F	60	19E9:A3	FF	FF	73	FF	FF	3A	32	CB
1591:02	CD	C6	02	F0	06	20	29	32	17C1:20	99	90	4C	52	8F	A9	13	74	19F1:FF	FF	A2	AB	FF	FF	FF	FF	33
1599:8E	4C	25	8D	AD	E4	02	CD	6E	17C9:85	D6	A9	00	85	D3	20	6C	CD	19F9:FF	FF	26	FF	22	FF	FF	FF	02
15A1:C7	02	F0	06	20	29	8E	4C	BD	17D1:E5	20	FA	86	A9	13	85	D6	3E	1A01:FF	FF	22	FF	FF	0F	71	73	0C
15A9:25	8D	A9	01	8D	E9	02	4C	73	17D9:A9	00	85	D3	4C	6C	E5	A9	54	1A09:FF	FF	B2	FF	AF	FF	A3	73	CB
15B1:3D	8D	AD	F0	02	C9	01	F0	CC	17E1:13	85	D6	A9	00	85	D3	20	4E	1A11:FF	FF	B3	C4	F8	FF	FF	40	10
15B9:11	18	AD	E3	02	69	01	8D	AB	17E9:6C	E5	4C	FA	86	20	E4	FF	7F	1A19:F0	88	FF	44	F0	4E	91	17	27
15C1:E3	02	AD	E4	02	69	00	8D	A5	17F1:A0	00	A9	3E	20	D2	FF	A9	7F	1A21:0D	08	FF	FF	05	17	FF	08	6A
15C9:E4	02	A9	00	8D	F0	02	AD	FD	17F9:9A	20	D2	FF	A9	00	8D	34	74	1A29:FF	FF	05	17	FF	08	FF	DF	6F
15D1:E5	02	CD	C8	02	F0	06	20	B5	1801:03	20	E4	FF	C9	00	F0	F9	81	1A31:05	17	18	08	FF	FF	0C	97	E0
15D9:65	8E	4C	66	8D	AD	E6	02	3D	1809:C9	14	F0	40	C9	7B	B0	F1	D4	1A39:91	FF	17	1C	08	FF	FF	05	20
15E1:CD	C9	02	F0	06	20	65	8E	BE	1811:C9	11	F0	ED	C9	13	F0	E9	CD	1A41:17	8F	08	FF	FF	05	17	1F	47
15E9:4C	66	8D	A9	01	8D	EA	02	36	1819:C9	1D	F0	E5	C9	22	F0	E1	8C	1A49:08	FF	DF	05	17	19	08	FF	FA
15F1:4C	7E	8D	AD	F0	02	C9	01	92	1821:C9	2C	F0	DD	C9	0D	F0	10	B1	1A51:FF	0C	97	91	FF	17	0F	08	17
15F9:F0	11	18	AD	E5	02	69	01	C9	1829:AC	34	03	C0	14	F0	D2	20	53	1A59:FF	FF	05	17	C8	08	FF	FF	06
1601:8D	E5	02	AD	E6	02	69	00	9A	1831:D2	FF	20	B5	8F	4C	74	8F	50	1A61:05	17	CC	08	FF	DF	05	17	98
1609:8D	E6	02	A9	00	8D	F0	02	AA	1839:AC	34	03	C0	00	F0	C2	4C	CE	1A69:48	08	FF	FF	04	81	FF	FF	E9
1611:AD	E7	02	CD	CA	02	F0	06	71	1841:D2	FF	AC	34	03	99	35	03	9F	1A71:FF	16	F1	18	FF	16	E9	04	1B
1619:20	A1	8E	4C	A7	8D	AD	E8	0C	1849:EE	34	03	60	AC	34	03	C0	61	1A79:B6	FD	08	FF	75	16	ED	04	6D
1621:02	CD	CB	02	F0	06	20	A1	DC	1851:01	B0	03	4C	74	8F	20	D2	48	1A81:B6	69	08	FF	FF	FF	16	FF	98
1629:8E	4C	A7	8D	A9	01	8D	EB	D5	1859:FF	38	AD	34	03	E9	01	8D	DF	1A89:04	B6	FD	08	FF	77	16	FF	B7
1631:02	4C	BF	8D	AD	F0	02	C9	41	1861:34	03	4C	74	8F	4C	20	93	BE	1A91:04	B6	69	08	FF	7B	88	81	A3
1639:01	F0	11	18	AD	E7	02	69	40	1869:AD	7E	03	C9	01	F0	09	C9	B4	1A99:FF	FF	05	FF	EF	0C	FF	FF	1E
1641:01	8D	E7	02	AD	E8	02	69	EC	1871:02	F0	14	C9	03	F0	4F	60	D8	1AA1:FF	05	F0	F9	9F	55	FF	91	B8
1649:00	8D	E8	02	AD	E9	02	C9	F8	1879:A9	00	8D	F6	02	AD	7F	03	68	1AA9:1F	FF	0C	FF	FF	04	81	FF	02
1651:01	F0	0A	20	F2	8D	C9	0D	EB	1881:38	E9	30	8D	F5	02	60	AD	4D	1AB1:FF	FF	16	F0	68	FF	16	E9	11
1659:F0	2F	4C	FC	8C	AD	EA	02	16	1889:7F	03	38	E9	30	A8	A9	00	57	1AB9:04	B6	FD	08	FF	C1	16	ED	FE
1661:C9	01	F0	0A	20	F2	8D	C9	23	1891:8D	F6	02	8D	F5	02	C0	00	98	1AC1:04	B6	69	08	FF	CC	16	FF	9C
1669:0D	F0	1E	4C	3D	8D	AD	EB	48	1899:F0	16	18	AD	F5	02	69	0A	3A	1AC9:FF	04	B6	FD	08	FF	41	16	8E
1671:02	C9	01	F0	14	20	F2	8D	D4	18A1:8D	F5	02	AD	F6	02	69	00	C3	1AD1:FF	04	B6	69	08	FF	45	80	BF
1679:C9	0D	F0	0D	4C	7E	8D	A5	D9	18A9:8D	F6	02	88	C0	00	D0	EA	B9	1AD9:00	B9	89	03	99	7F	03	C8	77
1681:CB	C9	3C	F0	01	6E	A9	0D	86	18B1:AD	80	03	38	E9	30	18	6D	6A	1AEL:CC	88	03	D0	F4	AD	88	03	7E
1689:60	AD	DA	02	8D	B3	02	AD	B9	18B9:F5	02	8D	F5	02	AD	F6	02	2D	1AE9:8D	7E	03	20	D8	8F	C9	0D	8C
1691:DB	02	8D	B4	02	AD	DC	02	AB	18C1:69	00	8D	F6	02	60	AD	7F	34	1AF1:F0	4F	18	AD	7A	03	6D	F5	01
1699:8D	B5	02	AD	DF	02	8D	B6	ED	18C9:03	38	E9	30	A8	A9	00	8D	43	1AF9:02	85	34	AD	7B	03	6D	F6	AB
16A1:02	AD	E0	02	8D	C2	02	AD	9F	18D1:F5	02	8D	F6	02	C0	00	F0	A2	1BF0:02	85	35	18	AD	7C	03	6D	94
16A9:E1	02	8D	CC	02	AD	E2	02	54	18D9:16	18	AD	F5	02	69	64	8D	3C	1B09:F5	02	85	36	AD	7D	03	6D	A5
16B1:8D	CD	02	4C	36	81	AD	A7	D7	18E1:F5	02	AD	F6	02	69	00	8D	F5	1B11:F6	02	85	37	18	AD	7A	03	D6
16B9:02	8D	B3	02	AD	A8	02	8D	82	18E9:F6	02	88	C0	00	D0	EA	AD	F9	1B19:69	E7	8D	7A	03	AD	7B	03	20
16C1:B4	02	AD	A9	02	8D	B5	02	CC	18F1:80	03	38	E9	30	A8	C0	00	6E	1B21:69	03	8D	7B	03	18	A5	30	2A
16C9:AD	AA	02	8D	B6	02	A9	01	A2	18F9:F0	16	18	AD	F5	02	69	0A	9A	1B29:69	01	85	30	A5	31	69	00	CC
16D1:8D	C2	02	AD	E3	02	8D	CC	9F	1901:8D	F5	02	AD	F6	02	69	00	25	1B31:85	31	A5	FC	C5	31	B0	03	52
16D9:02	AD	E4	02	8D	CD	02	AD	84	1909:8D	F6	02	88	C0	00	D0	EA	1B	1B39:4C	BB	92	A5	FC	C5	31	F0	83
16E1:BF	02	C9	01	D0	47	A9	01	AF	1911:AD	81	03	38	E9	30	18	6D	0C	1B41:01	60	A5	FB	C5	30	B0	F9	CE
16E9:8D	F1	02	20	B9	85	20	69	29	1919:F5	02	8D	F5	02	A9	00	6D	FB	1B49:A0	00	B1	FB	91	34	B1	FD	84
16F1:8B	60	AD	AB	02	8D	B3	02	1C	1921:F6	02	8D	F6	02	60	AD	34	91	1B51:91	36	18	A5	FB	69	01	85	48
16F9:AD	AC	02	8D	B4	02	AD	AD	F7	1929:03	C9	0C	90	13	C9	13	B0	70	1B59:FB	A5	FC	69	00	85	FC	18	55
1701:02	8D	B5	02	AD	AE	02	8D	24	1931:0F	AD	36	03	C9	31	F0	09	4B	1B61:A5	FD	69	01	85	FD	A5	FE	95
1709:B6	02	A9	02	8D	C2	02	AD	91	1939:C9	32	F0	20	C9	33	F0	37	31	1B69:69	00	85	FE	18	A5	34	69	1E
1711:E5	02	8D	CC	02	AD	E6	02	C7	1941:60	AD	A7	02	8D	76	03	AD	1E	1B71:01	85	34	A5	35	69	00	85	3F
1719:8D	CD	02	AD	C0	02	C9	01	3F	1949:A8	02	8D	77	03	AD	A9	02	9D	1B79:35	18	A5	36	69	01	85	36	F8
1721:D0	0B	A9	01	8D	F1	02	20	18	1951:8D	78	03	AD	AA	02	8D	79	95	1B81:A5	37	69	00	85	37	A5	FC	D6
1729:B9	85	20	69	8B	60	AD	AF	19	1959:03	4C	02	91	AD	AB	02	8D	27	1B89:C5	31	F0	0A	A5	34	CD	7A	C1
1731:02	8D	B3	02	AD	B0	02	8D	1C	1961:76	03	AD	AC	02	8D	77	03	48	1B91:03	F0	0C	4C	BD	92	A5	FB	4B
1739:B4	02	AD	B1	02	8D	B5	02	C6	1969:AD	AD	02	8D	78	03	AD	AE	D0	1B99:C5	30	F0	0D	4C	FF	02	A5	DA
1741:AD	B2	02	8D	B6	02	A9	03	20	1971:02	8D	79	03	4C	02	91	AD	A2	1BA1:35	CD	7B	03	F0	03	4C	06	B7
1749:8D	C2	02	AD	E7	02	8D	CC	39	1979:AF	02	8D	76	03	AD	B0	02	4F	1BA9:93	60	A9	0D	60	A0	00	B9	07
1751:02	AD	E8	02	8D	CD	02	AD	7E	1981:8D	77	03	AD	B1	02	8D	78	BC	1BB1:7F	F0	C9	30	90	F4	C9	3A	CA
1759:C1	02	C9	01	D0	CF	A9	01	4C	1989:03	AD	B2	02	8D	79	03	AD	25	1BB9:B0	F0	C8	CC	7E	03	D0	EF	FB
1761:8D	F1	02	20	B9	85	20	69	A2	1991:35	03	C9	56	D0	AA	AD	37	81	1BC1:4C	DB	8F	08	10	18	20	30	D8
1769:8B	60	A0	00	A9	00	85	FB	DD	1999:03	C9	3A	D0	A3	A0	00	B9	6D	1BC9:40	61	80	04	80	40	20	10	1E
1771:A9	20	85	FC	A9	EA	85	FD	FE	19A																	

1C11:20	54	48	45	20	53	4F	4E	07	1E41:D9	02	D6	02	12	D4	4C	03	65	2071:00	00	00	00	00	00	00	00	00	00	B1
1C19:47	20	4D	41	43	48	49	4E	D6	1E49:61	03	01	D4	00	D4	D7	02	69	2079:00	00	00	00	00	00	00	00	00	00	B9
1C21:45	96	56	4F	49	43	45	20	63	1E51:D4	02	04	D4	53	03	68	03	C0	2081:00	00	00	00	00	B0	00	00	00	84	
1C29:48	41	52	50	53	49	43	48	B3	1E59:08	D4	07	D4	D8	02	D5	02	79	2089:80	00	00	B0	00	00	00	00	80	16	
1C31:4F	52	44	2A	20	46	4C	55	D8	1E61:0B	D4	37	55	73	91	AF	CD	A3	2091:00	B0	00	00	80	00	1E	80	BE		
1C39:54	45	2A	20	50	49	41	4E	AC	1E69:EB	0A	80	B0	36	98	3A	80	42	2099:00	3F	80	00	3F	80	00	1E	D3		
1C41:4F	2A	20	58	59	4C	4F	50	20	1E71:3E	68	42	50	46	38	4A	00	DB	20A1:00	00	00	00	00	00	00	00	E1		
1C49:48	4F	4E	45	2A	20	41	43	2F	1E79:00	00	00	00	00	00	00	00	B5	20A9:00	00	00	00	00	00	00	00	E9		
1C51:43	4F	52	44	49	41	4E	2A	A3	1E81:00	00	00	00	00	B0	00	00	80	20B1:00	00	00	00	00	00	00	00	F1		
1C59:20	54	52	55	4D	50	45	54	E0	1E89:80	00	00	B0	00	00	80	00	12	20B9:00	00	00	00	00	00	00	00	F9		
1C61:2A	20	53	54	45	45	4C	20	5E	1E91:00	80	00	00	80	00	1E	80	AE	20C1:00	00	00	00	00	00	00	00	02		
1C69:47	55	49	54	41	52	2A	20	D0	1E99:00	3F	80	00	3F	80	00	1E	CF	20C9:00	00	00	00	00	00	00	00	0A		
1C71:4F	4E	45	9A	20	54	57	4F	87	1EA1:00	00	00	00	00	00	00	00	DD	20D1:00	00	00	0F	C0	00	0F	C0	E7		
1C79:9A	20	54	48	52	45	45	9A	E2	1EA9:00	00	00	00	00	00	00	00	E5	20D9:00	00	00	00	00	00	00	00	1A		
1C81:1C	20	4F	4E	1C	20	4F	46	E4	1EB1:00	00	00	00	00	00	00	00	ED	20E1:00	00	00	00	00	00	00	00	22		
1C89:46	70	6B	6B	6B	6D	20	70	E6	1EB9:00	00	00	00	00	00	00	00	F5	20E9:00	00	00	00	00	00	00	00	2A		
1C91:6B	6B	6B	6D	20	20	6E	73	70	1EC1:00	00	00	00	00	B0	00	00	C0	20F1:00	00	00	00	00	00	00	00	32		
1C99:73	73	7D	20	6E	73	73	73	B5	1EC9:80	00	00	80	00	00	80	00	4F	20F9:00	00	00	00	00	00	00	00	3A		
1CA1:7D	20	20	E1	00	41	09	00	D9	1ED1:00	80	00	00	80	00	1E	80	EE	2101:00	00	00	00	00	00	00	00	43		
1CA9:40	00	00	11	60	00	10	00	36	1ED9:00	3F	80	00	3F	80	00	1E	10	2109:00	00	00	00	00	00	00	00	4B		
1CB1:00	21	09	00	20	00	00	11	65	1EE1:00	00	00	00	00	00	00	00	1E	2111:00	00	00	00	00	00	00	00	53		
1CB9:00	F0	10	00	00	11	66	00	41	1EE9:00	00	00	00	00	00	00	00	26	2119:00	00	00	00	00	00	00	00	6A		
1CC1:10	00	00	21	60	00	20	E1	39	1EF1:00	00	00	00	00	00	00	00	2E	2121:C0	00	0F	C0	00	00	00	00	B1		
1CC9:00	51	5A	09	50	32	2C	2A	FF	1EF9:00	00	00	00	00	00	00	00	36	2129:00	00	00	00	00	00	00	00	6B		
1CD1:25	21	1F	1C	19	16	15	12	E7	1F01:00	00	00	00	00	B0	00	00	02	2131:00	00	00	00	00	00	00	00	73		
1CD9:10	0F	0E	0C	0B	0A	09	08	FA	1F09:80	00	00	80	00	80	00	80	90	2139:00	00	00	00	00	00	0C	00	93		
1CE1:07	07	06	05	3C	C1	3E	A2	78	1F11:00	80	00	00	80	00	1E	80	30	2141:00	06	00	00	03	00	00	01	1E		
1CE9:87	A5	30	1E	60	1F	D1	C3	1E	1F19:00	3F	80	00	3F	80	00	1E	51	2149:80	00	07	C0	00	0F	00	00	F4		
1CF1:D2	18	8F	30	8F	68	61	E9	59	1F21:30	00	00	00	00	00	00	00	77	2151:0E	00	00	06	00	00	03	00	01		
1CF9:0C	47	98	35	2F	2A	27	23	04	1F29:00	00	00	00	00	00	00	00	67	2159:00	01	80	00	06	00	00	0C	28		
1D01:1F	1D	1A	17	15	13	11	0F	EC	1F31:00	00	00	00	00	00	00	00	6F	2161:00	00	00	00	00	06	00	00	3D		
1D09:0E	0D	0B	0A	09	08	07	07	0D	1F39:00	00	00	00	00	00	00	00	77	2169:01	80	00	00	00	00	00	00	4C		
1D11:06	05	39	6B	3E	DF	86	A5	91	1F41:00	00	00	00	00	80	00	00	81	2171:00	00	00	00	00	00	00	00	B3		
1D19:DF	9C	B5	1F	EF	C3	D2	EF	37	1F49:80	00	00	80	00	80	00	00	D0	2179:00	00	00	00	00	00	00	00	BB		
1D21:4E	DA	8F	F7	E1	E9	77	A7	F7	1F51:00	80	00	00	80	00	1E	80	70	2181:00	00	00	00	00	00	00	00	C3		
1D29:ED	2F	2C	27	23	21	1D	1A	10	1F59:00	3F	80	00	3F	80	00	1E	91	2189:00	00	00	20	00	00	20	00	0E		
1D31:17	16	13	11	10	0E	0D	0B	CD	1F61:00	00	00	00	00	00	00	00	9F	2191:00	20	00	00	20	00	00	20	FC		
1D39:0B	09	08	08	07	06	05	05	1C	1F69:00	00	00	00	00	00	00	00	A7	2199:00	0C	20	00	1E	20	00	1E	72		
1D41:6B	C1	DF	86	87	DF	9C	B5	B0	1F71:00	00	00	00	00	00	00	00	AF	21A1:A0	00	0C	20	00	00	00	00	B7		
1D49:60	EF	C3	C3	EF	4E	DA	30	03	1F79:00	00	00	00	00	00	00	00	B7	21A9:00	00	00	00	00	00	00	00	EB		
1D51:F7	E1	61	77	A7	ED	98	06	CF	1F81:00	00	00	00	00	80	00	00	C1	21B1:00	00	00	00	00	00	00	00	F3		
1D59:05	04	03	02	01	00	06	05	B0	1F89:80	00	00	80	00	80	00	00	11	21B9:00	00	00	00	00	00	00	00	FB		
1D61:04	03	02	01	00	06	05	04	D4	1F91:00	80	00	80	00	80	00	1E	80	B0	21C1:00	00	00	00	00	00	00	00	04	
1D69:03	02	01	00	06	05	4C	4F	F1	1F99:00	3F	80	00	3F	B0	00	1E	92	21C9:20	00	0C	20	00	1E	20	00	58		
1D71:41	44	20	3F	53	41	56	45	E6	1FA1:30	00	00	00	00	00	00	00	F7	21D1:1E	A0	00	0C	20	00	00	20	2D		
1D79:20	3F	43	4F	50	59	52	49	C6	1FA9:00	00	00	00	00	00	00	00	E7	21D9:00	0C	20	00	1E	20	00	1E	B2		
1D81:47	48	54	20	31	39	39	31	10	1FB1:00	00	00	00	00	00	00	00	EF	21E1:A0	00	0C	20	00	00	00	00	F7		
1D89:20	43	4F	4D	50	55	54	45	29	1FB9:00	00	00	00	00	00	00	00	F7	21E9:00	00	00	00	00	00	00	00	2C		
1D91:0D	50	55	42	4C	49	43	41	84	1FC1:00	00	00	00	00	80	00	00	02	21F1:00	00	00	00	00	00	00	00	34		
1D99:54	49	4F	4E	53	20	49	4E	1B	1FC9:80	00	00	80	00	80	00	00	51	21F9:00	00	00	00	00	00	00	00	3C		
1DA1:54	4C	20	4C	54	44	0D	41	F0	1FD1:00	80	00	80	00	1E	80	F0	2201:00	00	00	00	00	00	00	00	00	45		
1DA9:4C	4C	20	52	49	47	48	54	92	1FD9:00	21	80	00	21	80	00	1E	99	2209:00	00	00	00	00	00	00	00	4D		
1DB1:53	20	52	45	53	45	52	56	E6	1FE1:00	00	00	00	00	00	00	00	20	2211:00	00	00	0C	C0	00	1F	E0	3B		
1DB9:45	44	00	00	00	00	3C	66	86	1FE9:00	00	00	00	00	00	00	00	28	2219:00	0C	C0	00	0C	00	1F	FA			
1DC1:60	6E	66	66	3C	00	7E	60	3A	1FF1:00	00	00	00	00	00	00	00	30	2221:E0	00	0C	C0	00	00	00	00	63		
1DC9:60	78	60	60	7E	00	3C	66	37	1FF9:00	00	00	00	00	00	00	00	38	2229:00	00	00	00	00	00	00	00	6D		
1DD1:60	60	60	66	3C	00	18	3C	15	2001:00	00	00	00	00	80	00	00	43	2231:00	00	00	00	00	00	FF	00	75		
1DD9:66	7E	66	66	66	00	7E	60	AA	2009:80	00	00	80	00	80	00	00	92	2239:00	00	00	00	00	00	00	00	7D		
1DE1:60	78	60	60	60	00	78	6C	DC	2011:00	80	00	80	00	80	00	1E	80	32	2241:00	00	00	00	00	00	00	00	85	
1DE9:66	66	66	6C	78	00	7C	66	A7	2019:00	21	80	00	21	B0	00	1E	9B	2249:00	00	02								

THE AUTOMATIC PROOFREADER

Philip I. Nelson

The *Automatic Proofreader* helps you type in program listings for the 128 and 64 and prevents nearly every kind of typing mistake.

Type in *Proofreader* exactly as listed. Because the program can't check itself, type carefully to avoid mistakes. Don't omit any lines, even if they contain unusual commands. After you've finished, save a copy before running it.

Next, type RUN and press Return. After the program displays the message *Proofreader Active*, you're ready to type in a BASIC program.

Every time you finish typing a line and press Return, *Proofreader* displays a two-letter checksum in the upper left corner of the screen. Compare this result with the two-letter checksum printed to the left of the line in the program listing. If the letters match, the line probably was typed correctly. If not, check for your mistake and correct the line.

Proofreader ignores spaces not enclosed in quotation marks, so you can omit or add spaces between keywords and still see a matching checksum. Spaces inside quotes are almost always significant, so the program pays attention to them.

Proofreader does not accept keyword abbreviations (for example, ? instead of PRINT). If you use abbreviations, you can still check the line by listing it, moving the cursor back to the line, and pressing Return.

If you're using *Proofreader* on the 128, do not perform any GRAPHIC commands while *Proofreader* is active. When you perform a command like GRAPHIC 1, the computer moves everything at the start of BASIC program space—including the *Proofreader*—to another memory area, causing *Proofreader* to crash. The same thing happens if you run any program with a GRAPHIC command while *Proofreader* is in memory.

Though *Proofreader* doesn't interfere with other BASIC operations, it's a good idea to disable it before running another program. To disable it, turn the computer off and then on. A gentler method is to SYS to the computer's built-in reset routine (65341 for the 128, 64738 for the 64).

```
AS 0 CLR
KK 10 VE=PEEK(772)+256*PEEK(77
3):LO=43:HI=44:PRINT"
```

```
{CLR}{WHT}AUTOMATIC PROO
FREADER FOR ";
EB 20 IF VE=42364 THEN PRINT "
64"
AA 30 IF VE=17165 THEN LO=45:H
I=46:GRAPHIC CLR:PRINT"1
28"
KK 40 SA=(PEEK(LO)+256*PEEK(HI
))+6:FOR J=SA TO SA+166:
READ B:POKE J,B:CH=CH+B:
NEXT
QF 50 IF CH<>20570 THEN PRINT
{SPACE}"*ERROR* CHECK TY
PING IN DATA STATEMENTS"
:END
PD 60 FOR J=1 TO 5:READ RF,LF,
HF:RS=SA+RF:HB=INT(RS/25
6):LB=RS-(256*HB)
XB 70 CH=CH+RF+LF+HF:POKE SA+L
F,LB:POKE SA+HF,HB:NEXT
SB 80 IF CH<>22054 THEN PRINT
{SPACE}"*ERROR* RELOAD P
ROGRAM AND CHECK FINAL L
INE":END
PH 90 IF VE=17165 THEN POKE SA
+14,22:POKE SA+18,23:POK
ESA+29,224:POKESA+139,22
4
JS 100 POKE SA+149,PEEK(772):P
OKE SA+150,PEEK(773):PR
INT"{CLR}PROOFREADER AC
TIVE"
FA 110 SYS SA:POKE HI,PEEK(HI)
+1:POKE (PEEK(LO)+256*P
EEK(HI))-1,0:NEW
PS 120 DATA120,169,73,141,4,3,
169,3,141,5,3,88,96,165
,20,133,167
PS 130 DATA165,21,133,168,169,
0,141,0,255,162,31,181,
199,157,227
XS 140 DATA3,202,16,248,169,19
,32,210,255,169,18,32,2
10,255,160
JC 150 DATA0,132,180,132,176,1
36,230,180,200,185,0,2,
240,46,201
XJ 160 DATA34,208,8,72,165,176
,73,255,133,176,104,72,
201,32,208
GM 170 DATA7,165,176,208,3,104
,208,226,104,166,180,24
,165,167
KH 180 DATA121,0,2,133,167,165
,168,105,0,133,168,202,
208,239,240
RM 190 DATA202,165,167,69,168,
72,41,15,168,185,211,3,
32,210,255
BR 200 DATA104,74,74,74,74,168
,185,211,3,32,210,255,1
62,31,189
RM 210 DATA227,3,149,199,202,1
6,248,169,146,32,210,25
5,76,86,137
HJ 220 DATA65,66,67,68,69,70,7
1,72,74,75,77,80,81,82,
83,88
XR 230 DATA 13,2,7,167,31,32,1
51,116,117,151,128,129,
167,136,137
```

ONLY ON DISK

In addition to the type-in programs found in each issue of the magazine, *Gazette Disk* offers bonus programs and original 64 and 128 artwork.

WorldMap 64/128
Bruce M. Bowden
Greensboro, NC

WorldMap 64 and *WorldMap 128* give you three different ways of looking at our planet. View it as seen in a Mercator projection, from any position above the equator, or from above either pole. You can save any of these high-resolution screens for use in paint programs or for creating your own slide shows.

Order this disk (\$9.95 plus \$2.00 shipping and handling) from *Gazette Disk*, COMPUTE Publications, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408. Save by calling (800) 727-6937 and ordering a year's subscription—12 disks and 12 magazines for only \$39.95.

TYPING AIDS

MLX, our machine language entry program for the 64 and 128, and *The Automatic Proofreader* are utilities that help you type in *Gazette* programs without making mistakes. To make room for more programs, we no longer include these labor-saving utilities in every issue, but they can be found on each *Gazette Disk* and are printed in all issues of *Gazette* through June 1990.

If you don't have access to a back issue or to one of our disks, write to us, and we'll send you free copies of both of these handy programs. We'll also include instructions on how to type in *Gazette* programs. Please enclose a self-addressed, stamped envelope.

Write to Typing Aids, COMPUTE's *Gazette*, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408.

REVIEWS

Get a head start on Headline Harry's Great Paper Race, take a look at the sequel to Elvira, and scrutinize an abundance of other evaluations.

HEADLINE HARRY AND THE GREAT PAPER RACE

You have only three hours left before your deadline. Miss it and Marvin Muckraker's devious reporters will print their falsified stories on the front page of the *Diabolical Daily*. Not only will you have to face your angry editor, Headline Harry, but the public will never learn the true story. Such is the life of a reporter in *Headline Harry and the Great Paper Race*, a game that combines lessons in modern history, geography, and problem-solving.

Both older children and adults will enjoy sifting through the abundant facts when they join Headline Harry's crusade to stop the presses of the scheming competition. Choose the region of the United States that you most want to tackle and decide which historical event from that area warrants a lead story. File the story before your deadline arrives. To make matters more difficult, you might lose time traveling, discovering information, or falling prey to one of Marvin Muckraker's reporters.

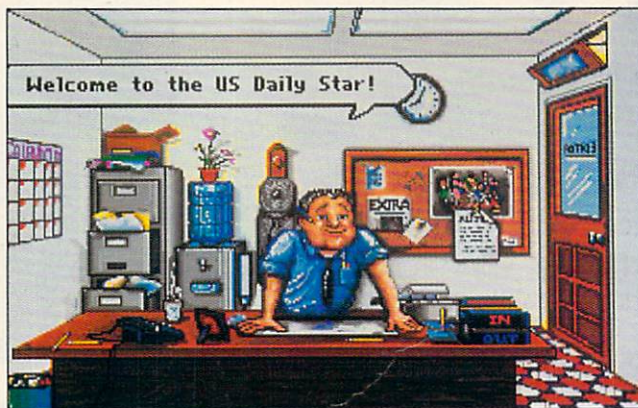
The animated adventures include digitized speech and music, and are available in 16- or 256-color versions. Players can only explore 12 stories, but the upcoming teachers' edition will allow for three times that many. A convenient save-game feature allows you to save stories in progress.

Headline Harry doesn't promise that scooping the *Diabolical's* reporters will be easy; it takes perseverance. But students, especially, will find this fact-chasing mission a welcome break from clunky history books. Com-

plex, but not frustrating, *Headline Harry* is good news for rookie reporters looking to build their problem-solving skills.

CHANTELLE OLIGSCHLAEGER

Scheduled for release: August 1991
IBM PC and compatibles, 512K RAM
(640K for MCGA and VGA 256 col-



Your interstate journey begins in Headline Harry's office where he assigns you a front-page story.



Elvira II: The Jaws of Cerberus will curdle your blood and raise your hackles with its strikingly morbid graphics.

or); CGA, EGA, MCGA, VGA, Tandy 16-color, and Hercules; requires hard drive; supports Ad Lib, Sound Blaster, PS/1 sound cards; supports mouse—\$49.95 for 16-color version, \$59.95 for 256-color version

DAVIDSON & ASSOCIATES
3135 Kashiwa St.
Torrance, CA 90505
(213) 534-4070

Circle Reader Service Number 312

ELVIRA II: THE JAWS OF CERBERUS

As a horror movie queen, Elvira seems to encounter more than her share of problems. In this impressive se-

Somewhere in the studios of Black Widow Productions, on one of three sound stages, you'll find the kidnapped Elvira. Whether she's prisoner within the traditionally haunted Victorian house, the spider-infested catacombs, or the foreboding graveyard, as her rescuer you can expect to encounter chilling special effects and surprises, including some decomposing corpses. Accolade intended *Elvira II: The Jaws of Cerberus* to out-shock and out-creep every other adventure game on the market and they succeed. The detailed, macabre sets and horrific, animated monsters engender an atmosphere of perfectly delightful dread.

As in the first game, you'll find the controls necessary to explore Elvira's world on screen at all times. New and notable, however, is a clever health icon in the shape of a human body that clearly indicates your character's status, including number of hit points per body part. This indicator becomes skeletal as you take damage. Eerie!

Better than a horror double feature, *Elvira II: The Jaws of Cerberus* will test the mettle of experienced adventurers. And while Elvira herself might offer some moments of comic relief, this frightfest packs more gasps than laughs.

DAVID SEARS

Scheduled for release: October 1991

IBM PC and compatibles, 512K RAM; CGA, EGA, VGA, or Hercules; supports Ad Lib, Game Blaster, Roland MT-32, and Sound Blaster; supports mouse and joystick—\$59.95

Also available for Amiga—\$59.95 and Atari ST—\$59.95

ACCOLADE
550 S. Winchester Blvd.
San Jose, CA 95128
(408) 985-1700

Circle Reader Service Number 313

quel to the first Elvira adventure game, the demonic, three-headed Cerberus kidnaps our favorite delicate creature and makes off with her to a darksome location. As always, your job entails saving the day using your wits, a full complement of spells, and persistence.

SOME OF



The greatest hero for the Hyborean Age was a fierce barbarian born of the harsh northlands,

CONAN THE CIMMERIAN

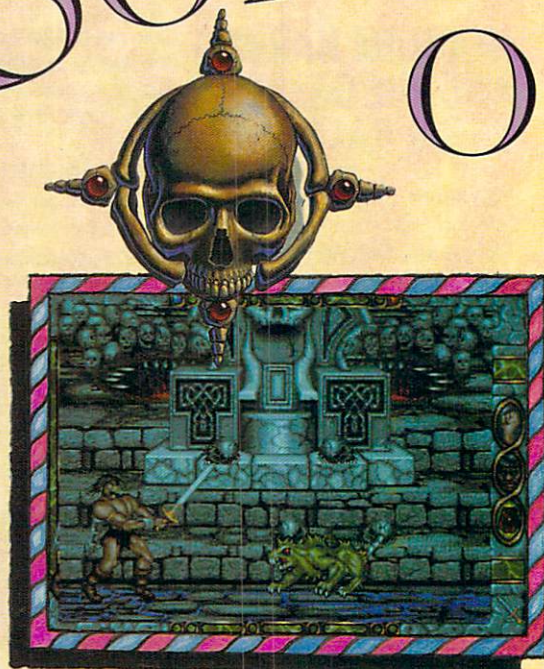


ou have heard the tales of Conan's adventures. Only now will you have the opportunity to live the life of this fierce barbarian from the land of Hyborea.

Our odyssey begins with murder most foul. When Conan's village is massacred by the ravaging hordes of Thoth Amon, high priest of the vile cult of Set, Conan vows to avenge the death of his family and friends.

In your search for vengeance, you as Conan, will explore Hyborea to seek out its hidden secrets and learn of its powers. Visit over 200 locations – taverns and inns, crypts and dungeons, temples and tombs, lavish homes and poor hovels – to learn the mysteries of Hyborea's sorceries to help Conan overcome its many natural and supernatural perils.

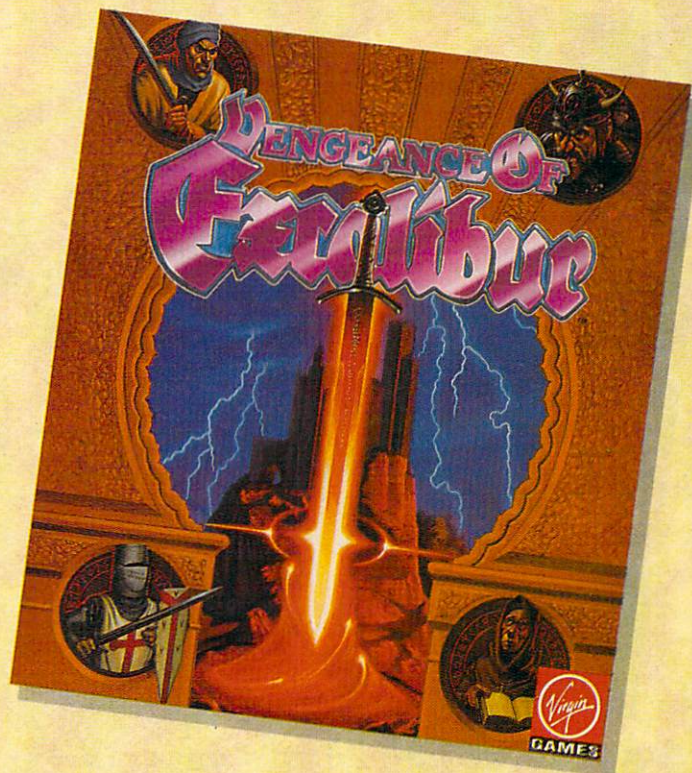
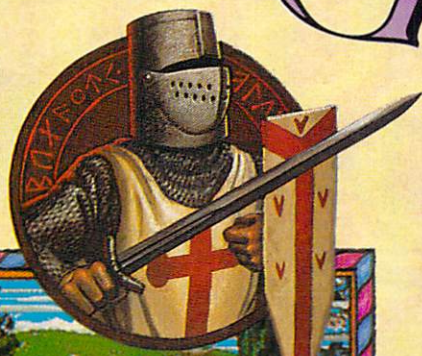
Only with luck, courage and constant struggle will Conan have the chance to force a reckoning with the powerful Thoth Amon.



AVAILABLE FOR THE IBM AND AMIGA THIS SUMMER.
SUGGESTED RETAIL – \$49.99

TM and © 1991 Conan Properties Inc.
Cover illustration © 1990 Boris Vallejo.
© 1991 Virgin Games, Inc. All rights reserved.
Virgin® is a registered trademark of Virgin Enterprises, Ltd.
Virgin Games, Inc. 18061 Fitch Ave., Irvine, California 92714

THING D



In Spirit of Excalibur, the Knights of the Round Table fought to defend medieval Britain from the evil sorceress, Morgan Le Fay. Morgan, dabbling in dark arts beyond even her ability to control, had summoned a great Lord of Demons, the Shadowmaster.

With Morgan's death, the Shadowmaster was freed to work his evil will against the unprepared folk of Britain. Striking in the night, he imprisoned the King with a spell, stole the greatest treasures of the realm and kidnapped Nineve, the court enchantress. With the loss of the sword Excalibur and the newly recovered Holy Grail, Britain begins to sicken and die. The Shadowmaster must be stopped!

Command knights and whatever followers they are able to recruit to track the Shadowmaster through hazardous, beautiful and mysterious medieval Spain. Explore the hundreds of villages and cities, fortresses and castles, dungeons and palaces and all the secret places where the Shadowmaster may dwell.

Seek what aid you can as you acquire and learn the use of the sorceries of Moorish Spain, for only with the aid of enchantments and the loyalty of strong allies will you stand a chance of ridding the world of the demonic Shadowmaster once and for all.

AVAILABLE FOR THE IBM, AMIGA, ATARI ST AND MAC THIS SUMMER.
SUGGESTED RETAIL - \$49.99

Developed by Synergistic Software.
© 1991 Virgin Games, Inc.

Virgin® is a registered trademark of Virgin Enterprises, Ltd.
Vengeance of Excalibur is a trademark of Virgin Games, Inc.
Virgin Games, Inc. 18061 Fitch Ave., Irvine, California 92714



SOME NE

ALSO TAKING OVER A
SEGA
GENESIS
NEAR YOU
THIS FALL



ARE YOU TOUGH ENOUGH TO TAKE ON THE 21st CENTURY AND SAVE MANKIND FROM HIS UNTIMELY DESTRUCTION BY A GENETICALLY ENGINEERED WAR MACHINE?!

Talk about your work-related stress! As a ZODIAC special agent, your job is to crack the complex security systems of the Universal Cybernetics Corporation and track down the mutant robot they have designed as the ultimate killing machine.

You'll arm yourself with a whole arsenal of weapons - everything from hologram projectors to special vision enhancement visors to thermal infra-red image intensifiers. If all else fails - you'll have to rely on your own psychic powers!

FEATURES INCLUDE:

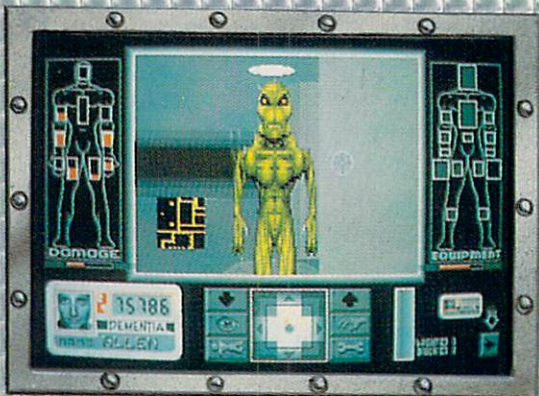
- 16-level 3-dimensional environment complete with fast, smooth scrolling
- Realistic action control of six characters: 2 male, 2 female and 2 droid
- 360 degree vision
- Environmental sound effects

"Tension and unease, with danger lurking around every corner.... This Number One European Hit will keep you on your toes and coming back for more."

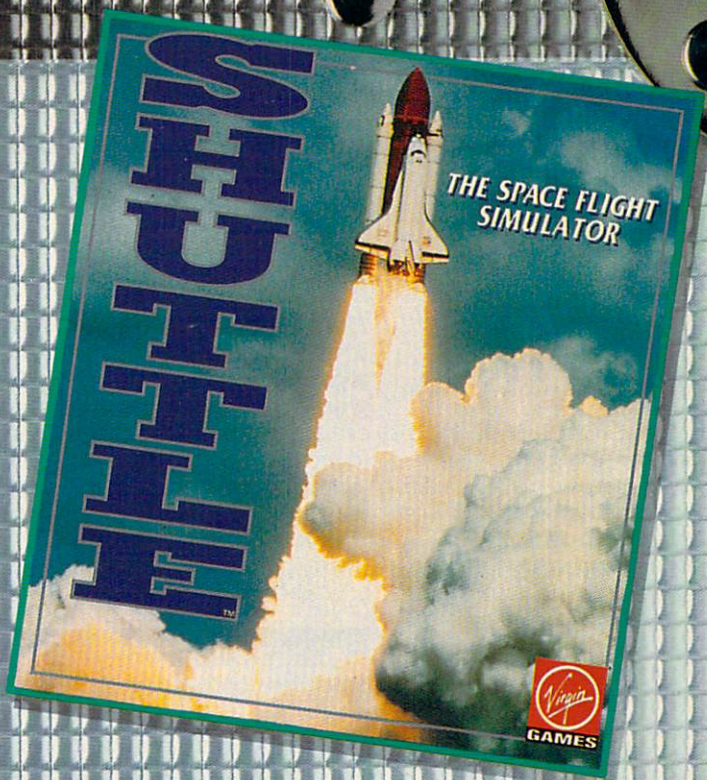
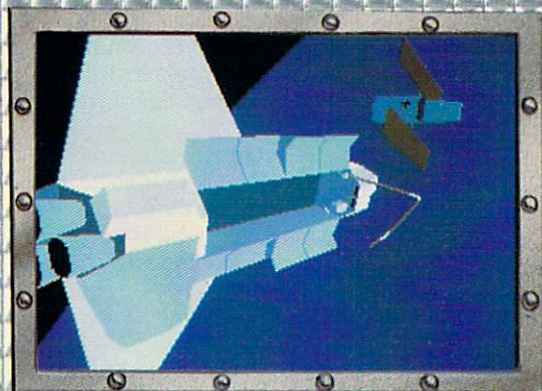
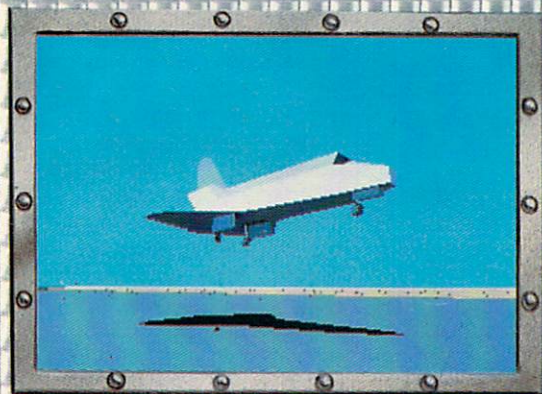
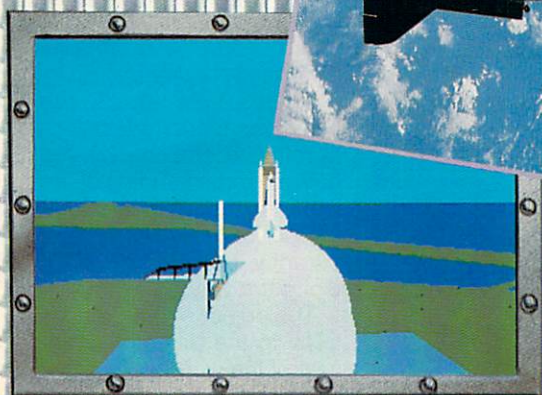


AVAILABLE FOR
THE IBM, AMIGA AND ATARI ST THIS SUMMER.
SUGGESTED RETAIL - \$49.99

TM and © 1991 Virgin Games, Inc. and Core Design.
All rights reserved.
Corporation & Virgin® are registered trademarks of
Virgin Enterprises, Ltd.
Virgin Games, Inc. 18061 Fitch Ave., Irvine, California 92714



SHUTTLE W



The space flight simulator to end all simulators, SHUTTLE is the most accurate and comprehensive simulation of NASA's Space Shuttle ever produced for the home computer.

With the aid of Mission Control, you will master such challenges as deploying and repairing satellites, launching spy satellites, maneuvering your craft in zero gravity, attaining the correct re-entry trajectory, and pulling off complicated landings.

Advanced polygon and elliptical graphics, along with actual land and star maps were used to create the breathtaking 3D panoramas of the Orbiter and its environment, which can be viewed from any angle at any time.

Other features include:

- Authentic control panel display
- Detailed comprehensive training and reference manual
- Numerous training, scientific and "Star Wars" (SDI) Missions
- Multiple help levels from "novice" to "veteran"
- Various launch and landing sites
- Orchestral quality music
- Fold-out Shuttle flight deck poster

AVAILABLE FOR
THE IBM, AMIGA AND ATARI ST LATE SUMMER.
SUGGESTED RETAIL - \$59.99

AdLib™ and Roland™ sound boards supported on IBM
Shuttle™ and Virgin® are registered trademarks of
Virgin Enterprises, Ltd.

Virgin Games, Inc. 18061 Fitch Ave., Irvine, California 92714

Circle Reader Service Number 179



PUBTECH FILE ORGANIZER

To judge from third-party developers' efforts, Microsoft really missed the mark with the Program Manager and File Manager in *Windows 3.0*. A dozen replacement file managers and shells (program launchers)—and a few products that do both—promise an improved *Windows* environment. One of the best of these, *PubTech File Organizer 3.0*, makes good on that promise.

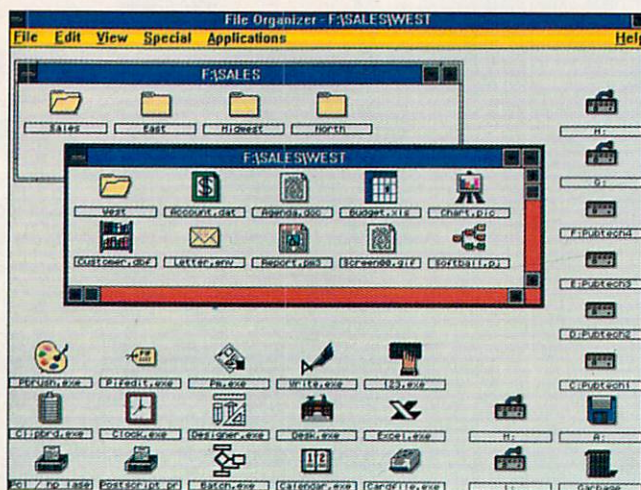
File Organizer strives to simplify controlling the computer within *Windows*. As with many simplifications, it gets harder before it gets easier. If you have several hard disks and many files, for instance, the first screen you see after installing *File Organizer* is downright scary. The 320-meg hard drive on my Arche Legacy 386-33 is partitioned into ten drives with an assortment of installed printer drivers. The initial screen displays a double stack of drive icons along the right side and a row of printer driver icons across the bottom. A row of icons representing minimized applications runs above the printer icons. Of the 22 icons on the screen, none will run an actual program. Not even the *Windows* desktop accessories are available. To launch an application, click on the icon for the program's hard drive. That opens a window with a folder icon for each directory in the drive and icons for all the files in the root directory. If your desired executable file is in a subdirectory, click on its folder and find the appropriate file icon. Double-click, and you're running.

That's not easier than the *Windows* Program Manager.

File Organizer provides three easier ways to launch a program: putting the program's icon on the desktop, assigning a special hot key to the program, or adding it to the pull-down applications menu. All work well.

If you put icons on the desktop, though, you'll fill your already-crowded desk-

manipulation. To move an entire subdirectory from one drive or directory to another, grab its folder and drag it to where you want it. Dragging a file to the trash can icon deletes the file. To print a file, drag its icon onto the printer icon. To start an application and load a file, drag the file icon onto the application



PubTech File Organizer grants you superior control of *Windows* files through improved icon control.

top quickly. Instead, move to the Desktop Utilities function (which has its own separate manual) to create any number of custom desktops. For instance, you could have a desktop with *Excel* and its associated subprogram icons along with icons for your most frequently used spreadsheet files. Pull up your *Excel* desktop, and you're ready to work. Or if you have a regular task that involves several separate applications, create a desktop with those applications already running. Although creating the desktop files can take some time, you have an endlessly customizable front end for *Windows*.

File Organizer has features, however, that you can enjoy right out of the box, most notably icon-based file

icon. Almost any file management task is done solely by clicking on and moving icons.

For file management by icon, *File Organizer* is top-notch. As a Program Manager replacement, it takes a shift of gears and extra time to set up an appropriate batch of customized desktops. If you persist, though, and thoughtfully customize, you'll have a *Windows* shell that suits you perfectly.

RICHARD O. MANN

IBM PC AT and compatibles (286, 386, or 486), 640K RAM, DOS 3.0 or *Windows 3.0*, hard disk; mouse recommended—\$199.95

PUBLISHING TECHNOLOGIES
7719 Wood Hollow Dr., Ste. 260
Austin, TX 78731
(800) PUB-TECH (sales)
(512) 346-2835

Circle Reader Service Number 314

BUSHBUCK CHARMS, VIKING SHIPS, & DODO EGGS/ GEOJIGSAW

A scavenger hunt by any other name could never be this much fun. *BushBuck Charms, Viking Ships, & Dodo Eggs* (yes, that's the name) is superior educational software. Not only will you gain an understanding of the world's cultures and increase your knowledge of geography, but you'll have fun along the way.

The object of the game is to fly to the different countries of the world and gather various common objects in each country you visit. Each location offers a special attraction or contains some historical significance; their descriptions can help you later, so read them all carefully. Points accumulate as you discover objects. Colorful, detailed maps and creative, animated sequences add interest, while the musical scores tend to stick with you for hours after you play.

Play alone, against another player, or against one of the included villains: Pierre, Natasha, and Otto von Slinkenrat, a real stinker who slithered his way to the top of the PICKLE (Preserving Individual Cultures and Knowledge in Lands Everywhere) Foundation.

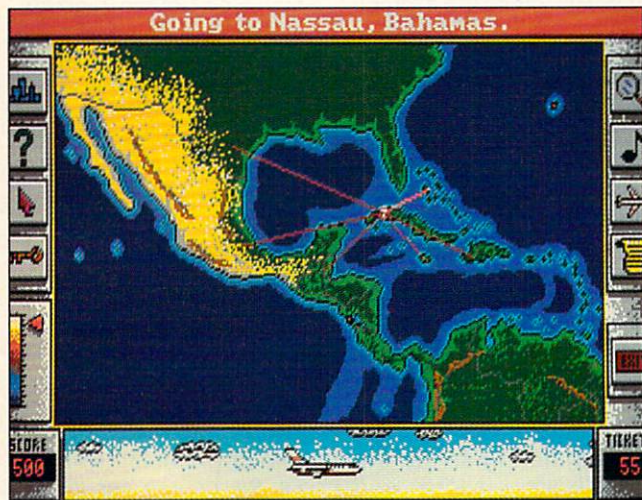
My complaints are minor. Gathering all 15 objects requires some time; a save-game feature would be appreciated. And although recommended for all ages, I wouldn't expect *BushBuck Charms* to hold the interest of very young children unless they're able to read and decipher maps. Children

with those skills will love the game, if they can persuade Mom and Dad to quit playing for a while.

Another PC Globe educational game, *GeoJigsaw*, is far more suitable for young children. The color-cycling feature (available for VGA systems only) creates an illusion that the 12 puzzles are ani-

While *GeoJigsaw* not as strong a teaching tool as *BushBuck Charms*, both games offer children an opportunity to learn and enjoy themselves at the same time. And at a cost of \$39.95 for *GeoJigsaw* and \$49.95 for *BushBuck Charms*, learning comes at bargain prices.

JOYCE SIDES



Scavenger hunts go global and show their educational side in *BushBuck Charms*, *Viking Ships*, & *Dodo Eggs*.

imated. Puzzle choices range from depictions of dinosaurs to the solar system. Additional puzzle disks would offer variety, but none were offered on the order blank included in the game box.

Puzzles may be cut into as few as 6 or as many as 294 puzzle pieces—just remember that you have to put the pieces back together. Puzzle pieces are easy to move with a mouse or joystick. A keyboard option is available, but maneuvering pieces using this option is difficult. The game supports only the PC speaker, but it does reward a completed puzzle with musical notes. A puzzle is automatically saved in its current state if you quit the game.

BushBuck Charms, Viking Ships, & Dodo Eggs

IBM PC and compatibles, 512K RAM, CGA, EGA, or VGA; mouse and Ad Lib sound card optional—\$49.95

GeoJigsaw

IBM PC and compatibles, 512K RAM, CGA, EGA, MCGA, VGA, or Tandy 16-color; mouse optional—\$39.95

PC GLOBE
4700 S. McClintock
Tempe, AZ 85282
(602) 730-9000

Circle Reader Service Number 315

PC DISKLOCK

Data security is increasingly becoming a top-priority issue for small business owners and corporate MIS managers alike. Now Fifth Generation Systems, maker of the *Mace Utilities*, offers a solu-

tion to this growing problem with *PC Disklock*.

Disklock provides comprehensive protection of sensitive data through the use of primary and secondary passwords, selective locking and encryption of files, and an audit trail of unsuccessful log-on attempts.

Disklock's password system draws the first line of defense. When installing the program, the user selects a primary password and, optionally, a secondary password. When using the primary password, the user has full access to all files and directories on the system, while someone logged on under the secondary password cannot access locked or encrypted files. This sort of simple security is useful in situations where several users, some of whom do not require access to sensitive files, share one computer.

In addition to the general security provided by the password system, *Disklock* provides two methods of safeguarding selected files. By locking a file, you make it inaccessible to users logged on under the secondary password. Encrypting a file, in addition to making it inaccessible to secondary users, also encodes the data in a way that makes it unintelligible. You can decrypt files only with the primary password you chose earlier.

As a final safety feature, *Disklock* keeps a log of all unsuccessful log-on attempts. *Disklock* stores the time and date of each failed entry attempt in a file called *Disklock.log*, which you may review periodically.

Does the average user need a data guardian such as *Disklock*? Probably not. Its main use will be to provide security in business environments where several us-

ers share computers containing sensitive information. Because of its thoughtful design, *PC Disklock* places a minimal burden on legitimate users while keeping the bad guys, and the merely curious, at bay.

RICHARD RAPP

IBM PC, and compatibles, 512K RAM, hard drive; mouse optional—\$189

FIFTH GENERATION SYSTEMS
10049 N. Reiger Rd.
Baton Rouge, LA 70809-4559
(504) 291-7221

Circle Reader Service Number 316

HARD NOVA

Nova's not your typical twenty-first century housewife content to sit home tending the antigravity machine. Armed with a generous supply of Sonic Mace and a Stun Club, this spacegoing barracuda seeks a more fulfilling life of contract kidnapping, assassination, and smuggling assignments. Nova's a mercenary, and she stays alive by never dropping her guard or her weapons.

Hard Nova offers a combination of arcade action, role-playing, and strategy—providing a little something for everyone, including a choice of playing a male lead (Stark) instead of a female (Nova). First-rate graphics begin with the opening screens and culminate in a visual explosion as you traverse a stargate (providing you keep your Bremar-Nav sentient alive long enough to lead you through).

The graphics do more than just provide colorful eye-wash, however; they serve to help orient you to your rapidly changing alien surroundings, reveal the whereabouts of your few friends and many enemies, and occasionally supply a way to rest your war-



From the command chair in *Hard Nova*, you'll conduct serious, but diverting, mercenary action.

wearily brain by playing Zero-G Roulette.

The gee-whiz technology evidenced throughout *Hard Nova* extends beyond its top-quality graphics to encompass numerous ingenious ways to pillage, plunder, maim, and murder. In the four distant frontier worlds where you ply your trade, the power of your weapons contributes directly to the length of your life.

Hard Nova provides one of the deadliest and most diabolical assortments of personal or ship-based armament this side of, well, Ariel. Weapons alone, however, do not guarantee survival; you still need what on Earth would be called people skills. Most often when you encounter aliens or humans, you try to kill them (or they kill you).

Remaining alive and victorious requires that you collect useful, strategic, and current information. You do that by questioning foul-smelling bartenders, beautiful women, and spiritless aliens. You need not be polite—say (or do) whatever is needed to get your answers.

It's all in a day's work for a mercenary, and you'll fight anything, if the price is

right. You've come a long way, baby. . . .

HOWARD MILLMAN

IBM PC and compatibles, 512K RAM, EGA, MCGA, or VGA; supports mouse, hard drive recommended, supports Roland MT-32, Ad Lib, and PS/1 sound boards—\$49.95

ELECTRONIC ARTS
1820 Gateway Dr.
San Mateo, CA 94404
(800) 245-4525

Circle Reader Service Number 317

FASTBACK PLUS

Let's face it; most of us don't back up our hard drives as often as we should. We see it as a tedious, time-consuming, and generally unpleasant experience. But thanks to the award-winning *Fastback Plus*, this doesn't have to be true.

Fastback Plus includes a host of features, such as support for floppy, tape, and removable drives, as well as multiple hard drives. Advanced data compression, error detection, incremental and differential backups, and automatic disk formatting make backup chores less onerous and more rewarding. A macro facility allows you to automate your backups. The only major fea-

tures missing from *Fastback Plus* are disk image backups and LAN support. The omission of disk image backups, used most often when saving data to a streaming tape drive, seems odd considering the wealth of options you're offered in other areas of the program.

Be that as it may, *Fastback Plus* offers the average user more than enough choices. The data compression option allows you to choose between minimizing either the number of disks used or the amount of time used to perform the compression. The macro facility is extensive enough for all but the most demanding backups, and you can even choose between the original command line interface or the new point-and-click one. This allows users of the original *Fastback* to upgrade to the new package without having to rewrite their existing macros and batch files.

You are buying a well-conceived package when you pick up *Fastback Plus*. The *Fastback Plus* manual offers advice on developing a regular backup regimen and explains the program's features in understandable terms. You can choose from a multitude of options and, most importantly, *Fastback Plus* is fast. So unless you need specialized features such as disk image backups or LAN support, *Fastback Plus* is the program to make hard drive failure a temporary condition at worst.

RICHARD RAPP

IBM XT and compatibles, 330K RAM, hard disk—\$189

FIFTH GENERATION SYSTEMS
10049 N. Reiger Rd.
Baton Rouge, LA 70809
(504) 291-7221

Circle Reader Service Number 318

LINKS CHAMPIONSHIP COURSES

Access Software's hot 1990 release, *LINKS: The Challenge of Golf*, came with an incredibly detailed, digitized version of Torrey Pines South Golf Course in southern California. The designers promised additional courses—these are the first out of the chute.

Just a few miles from Access's former offices, you'll find the setting for the Bountiful, Utah, course—high in the foothills of the spectacular Wasatch Front Mountains. Access captured the course in the fall, with gorgeous colors festooning the mountainside in the background. (Firestone is also dressed in its autumn best.)

Since Bountiful is in the hills, the course has lots of up- and downhill fairways moving across steep hillsides. A ball hit out of the fairway may end up anywhere. Watch out for the windows of the nearby condos! I live on the Wasatch Front. I can testify that playing this course on the computer captures the look and feel of a brisk 18 holes in the mountains on a sunny fall day.

The Firestone Country Club of Akron, Ohio, is a world-class course, the site of many PGA tournaments. It's also a duffer's nightmare. The densely tree-lined fairways continually obscure your view of the pin. If you don't have precise control of your hooks and slices, you'll spend hours in the woods, hitting trees on almost every stroke.

In short, it's a challenge. You'll fine-tune your skills here—or vie for a spot in the Hall of Shame. There's no mid-

Can You Do A Better Job Than Gorby?



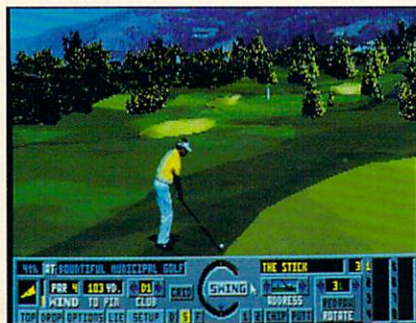
© Jeffrey Aronson

CRISIS IN THE KREMLIN

Coming live in October from
Spectrum HoloByte

2061 Challenger Drive, Alameda, CA 94501 (510) 522-1164

Circle Reader Service Number 167



Access brings an autumnal Bountiful home to LINKS fans.

dle ground. These beautiful courses have been lovingly re-created in astounding detail, right down to the types, shapes, and colors of the trees, buildings near the course, and scenery in the distance. LINKS is a great game. With these realistic courses (and many more to come), it should remain popular indefinitely.

RICHARD O. MANN

IBM PC and compatibles, requires LINKS: The Challenge of Golf—\$24.95 for Bountiful Golf Course—\$24.95 for Firestone Country Club

ACCESS SOFTWARE
4910 W. Amelia Earhart Dr.
Salt Lake City, UT 84116
(800) 800-4880
(801) 359-2900

Circle Reader Service Number 319

VOLKSWRITER 4

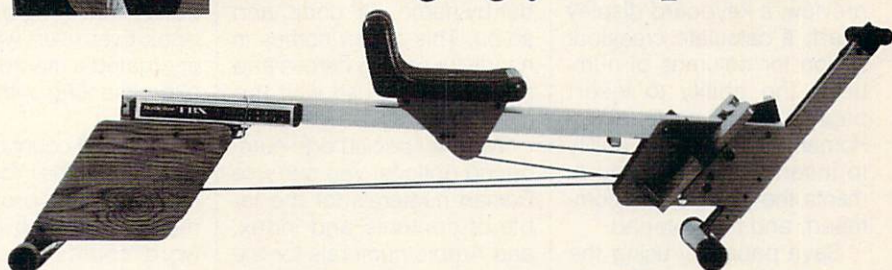
Do the words *advanced*, *powerful*, and *professional* intimidate you? To the rescue comes the Volkswriter line of word processors, offering power and advanced capabilities with an inviting menu interface and simple commands. And while *Volkswriter 4* targets managers and professionals, anyone who's familiar with word processing will quickly pick up the commands.

Six tutorial files introduce such basics of word processing as storage, retrieval, and creation of files. These tutorials end with more complex capabilities, like changing type styles and layouts, using embedded commands, and creating macros. Extensive online help is also available at the touch of a key. By the time you work through the tutorials, you'll realize that even advanced word processing really isn't difficult, and you just might begin to enjoy it.



NordicTrack introduces...

Simple instructions for changing your spare tire:



- 1 Burn more calories.** Studies show that the combined use of both your upper and lower body during exercise burns more calories in less time. Unlike exercise bikes, treadmills, and stairclimbers that only work your lower body, NordicRow TBX is a total-body exerciser.
- 2 Put NordicRow TBX to work for you.** Split-resistance settings for the upper and lower body allow you to fine-tune your own workout and burn maximum calories. A revolutionary *Back Stress Management System* works to support your lower back for safe, effective exercise.
- 3 Take just 20 minutes a day, three times a week.** With NordicRow TBX there's no need to drive to the health club. You can work out in the comfort and convenience of your own home! NordicRow TBX gives you a superior cardiovascular workout that tones and shapes *all* the muscles in your *entire* body.

Try NordicRow TBX in your own home for 30 days!

NordicRow TBX
BY NORDICTRACK

FREE VIDEO AND BROCHURE CALL 1-800-468-4491 Ext. 328J1

Or write: NordicTrack, 141 Jonathan Blvd. N., Dept. 328J1, Chaska, MN 55318

Circle Reader Service Number 119

©1991 NordicTrack, Inc., A CML Company

Maybe you want to carry work to and from the office. Don't worry if you receive files from coworkers in a different file format. *Volkswriter 4* automatically reads *WordStar* (3.3-5.5), *WordPerfect* (5.0 and 5.1), *Microsoft Word* (3.0-5.0), *Lotus 1-2-3* (releases 1 and 2), and *Displaywrite* files. And for an additional \$69, you can purchase *Volks Word for Word*, a file-conversion utility that converts more than 30 file formats.

Unlike some other word processors, *Volkswriter 4* doesn't require you to change the type style of a document to print it with a different printer driver. *Volkswriter 4* tries to match the layout type styles with those of the new printer driver, or you can alter the type styles manually. Install or create type styles for specific purposes, such as inserting headers at the top of pages.

Noteworthy features in *Volkswriter 4* include page preview, a keyboard display chart, a calculate crossfoot option for columns of numbers, the ability to insert page numbers as Arabic or Roman numerals, the ability to insert nonprinting comments, the change case command, and the notepad.

Save paper by using the page preview option. (This option is only available for systems with a graphics card.) Embed special printing characteristics such as bold, italic, underline, subscript, and superscript easily, or send Escape codes to your printer with the CMD command. Or display the little known Ctrl key assignments in a box at the top of the screen with the keyboard assignment command; that way, you won't have to laboriously search for elusive key assignment tables in your DOS manual.

Calculate in column or row format, and use the crossfoot method to figure rows and columns simultaneously—instead of loading your spreadsheet for such simple calculations. You also can sort text columns in ascending or descending or-

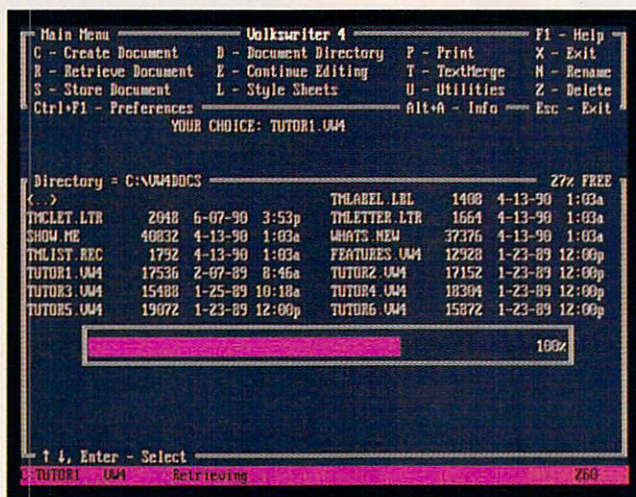
characters to draw boxes around text. With *Volkswriter 4*, you simply highlight a block of text and use the Alt-B command to draw a double or single line box around the highlighted block of text.

Creating macros with *Volkswriter 4* poses no more

a reasonable sum. These include an extended 610,000-word thesaurus; specialized dictionaries with computer, legal, and medical words; and multilingual dictionaries, thesauruses, and dictionaries.

This version of the program doesn't include mouse or bitmap graphics support or an indexing feature, but it wasn't intended to be another desktop publishing package, either. *Volkswriter 4* can be a useful tool for managers and other professionals and even students who need to meet term-paper deadlines (the footnote feature is outstanding). And with a 30-day money-back guarantee, you can't lose. This word processor truly puts the power of words into the hands of the people.

JOYCE SIDES



Here the user-friendly *Volkswriter 4* displays some of its myriad available options on the main menu.

der by name, ZIP code, and so on. This option comes in handy for sorting names and addresses for use with the mail-merge option.

With the special page-numbering options, you can use Roman numerals for the table of contents and index, and Arabic numerals for the rest of the document. And since capitalization typos occur often, the caps change command offers a quick way to correct the errors without retyping an entire word or line. *Volkswriter 4*'s notepad option lets you keep notes for yourself. If you think of something while working on a document, key it in and send it to the notepad. It will be cut from the current document and appended to a file that you specify.

Most word processors lack an easy way to use line

threat than tying your shoelaces. Even users who've never created a macro will enjoy experimenting with this feature.

The word count command saves you time. You needn't move to the top of a document to get an accurate word count. To count the words in a specific section of a document, merely highlight the text in question before choosing the word count command.

More special features include mail merge, undelete (up to 900 characters), storage of blocks of text to a separate file, and printing in landscape or portrait modes. The most impressive capabilities of this package include the 310,000-word thesaurus and *Grammatik IV*.

You can purchase several accessories separately for

IBM PC and compatibles; 640K RAM; CGA, EGA, VGA, or Hercules (for print preview); hard disk—\$249

VOLKSWRITER
One Lower Ragsdale Dr.,
Bldg. 2, Ste. 100
Monterey, CA 93940
(408) 648-3000

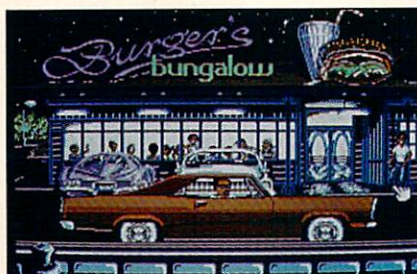
Circle Reader Service Number 320

STREET ROD 2

Do you want to be King of the Road without spending the big bucks for a top-quality racer? Do you lack the smarts to build a monster machine from scratch or the guts to push the pedal to the floor? If so, then *Street Rod 2* might be just your ticket.

You'll begin by selecting your first set of wheels and spare parts from the want ads. Even though there are 25 autos and 60 parts to choose from, with only \$1,200 to spend, a Ford Fairlane and a few new tires are about all you'll be able to afford.

Next it's into the garage, where you can perform cos-



After a brief pit stop, cruise the streets searching for racing action.

metic surgery by spray-painting your monster, chopping its roof, and removing the bumpers. To improve your chances against the competition, pop the hood and tune your engine or bolt on a new part. With *Street Rod 2*, you can even roll under the body and do some serious work, adding differentials, mufflers, and exhaust manifolds. Eventually, substitute a top-performance manual transmission for that easy-to-shift, but decidedly inferior, automatic.

When you arrive at the local drive-in, sit tight until a beatable car cruises by. Then challenge the driver (male or female) to a drag race on a mile-long straight track or to a road race on either of two 2½-mile courses.

If you're not off the line fast enough on the drag strip, you'll eat mouthfuls of your opponent's dust. If you jump off too quickly, you'll blow your engine and yourself right out of the competition.

On the road, controlling your speed on turns and sensing when to brake and downshift are essential for victory and for continued good health. Be warned: Cops are everywhere, ready to ticket you if you can't outrun them.

A ruined engine, a dropped transmission, and other damages can be repaired—if you have the cash. At other times, you might want to write your heap off as a loss and junk it for a few bucks.

Three months is all the time you'll have to go from rank amateur status to being an opponent worthy of the King of Street Racing. Winning lots of races and regularly upgrading your vehicles with your earnings are the keys to victory. Don't expect to complete the program in one sitting; the save-game option comes in handy.

Though enjoyable and exciting, the racing sequences add little new to the

The World's Newest Superpower.



SUPER TETRIS™

Coming soon from

Spectrum HoloByte®

2061 Challenger Drive, Alameda, CA 94501 (510) 522-1164

THE BIG BOOK OF PC SPORTS

BY KEITH FERRELL, EDITOR OMNI
PETER SCISCO, EDITOR IN CHIEF, COMPUTE

Here it is—the PC sports book that covers all the bases. If you're looking for a PC sports game, or need help with the ones you have, this is your ace in the hole. Collected here are in-depth reviews and strategies for more than 60 of the hottest PC sports games. Also includes software discounts worth over \$100. Order your copy today.

Send \$14.95 plus \$2 shipping and handling for each book (\$4 Canada, \$6 foreign) and applicable tax* to:

COMPUTE Books
c/o CCC
2500 McClellan Ave.
Pennsauken, NJ 08109

* Residents of NC, NJ, and NY add appropriate sales tax. Canadian orders please add 7% Goods and Services tax. All orders must be paid in U.S. funds drawn on a U.S. bank. Please allow four to six weeks for delivery. Offer good while supplies last.

10SP91C

genre in terms of action or challenges. Whether using a mouse, joystick, or keyboard, you'll experience more than your share of killer crashes before you begin to master the controls. The garage segment is more original, and, thanks to a responsive point-and-click interface, easier to handle. In all locations the graphics, animation, and sound are excellent.

If you fantasize about the ultimate machine but you drive a ho-hum buggy, consider taking to the road with *Street Rod 2*. It won't make you think your Chevette is a Corvette, but it'll let you experience the sensation of driving a superfast monster car—without the danger and at a fraction of the cost.

LEN POGGIALI

IBM PC and compatibles, 512K RAM (640K for Tandy), CGA, EGA, Tandy 16-color, or Hercules; Ad Lib and Sound Blaster supported, mouse and joystick optional—\$39.95

Also available for Amiga—\$39.95

CALIFORNIA DREAMS
Distributed by Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404
(800) 245-4525

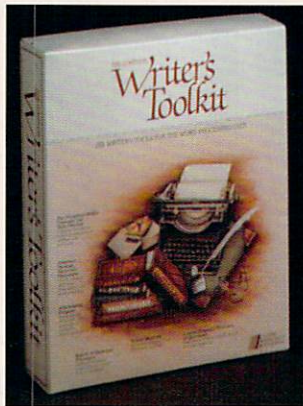
Circle Reader Service Number 321

THE COMPLETE WRITER'S TOOLKIT

While it won't replace a serious writer's reference library and while one of its functions isn't quite up to scratch, *The Complete Writer's Toolkit* is a welcome addition to the resources available to the writer. *The Toolkit* contains six modules, as many or as few of which you can install as you like. Five of these—The American Heritage Electronic Dictionary, Roget's II Electronic Thesaurus, Written

Word III, The Abbreviation Expander, and The Concise Columbia Dictionary of Quotations—can be made memory resident and hot-keyed in windows over your text within your word processor.

Three of these modules may get limited use: Written Word III is a reliable handbook on the basics of gram-



Every serious writer needs a serious toolkit.

mar, spelling, and punctuation, though its sections dealing with research papers and résumés are too general to be very useful. On the infrequent occasions you need it, The Abbreviation Expander provides the full terms for abbreviations you type into the Lookup Screen and allows you to add to its list, and The Dictionary of Quotations may actually slow down your writing—chiefly because of the temptation to linger and browse through the 6000 quotations which can be accessed by topic, author, or index, and imported directly into your text file.

In a writer's toolkit, though, the real test cases are the dictionary and the thesaurus—and these are, surprisingly, better than I had hoped for. While not as comprehensive as its hardcover parent, The American

Heritage Electronic Dictionary contains 115,000 entries and provides succinct but detailed definitions; you can also look up words *within* the definition simply by placing the cursor on the word and hitting Enter. The Spelling and Wildcard modes let you search for words even if you're unsure of their spelling, and there's even an Anagram mode for people who want to cheat at word puzzles.

While I wish Roget's II Electronic Thesaurus had been based on a more traditional model, its versatility makes it attractive. Type in your word, and the thesaurus window splits into two columns—one with the word's definitions, the other with its synonyms. Moving the cursor from definition to definition changes the displayed list of synonyms; tab over to the synonym column, and you can check the definitions for each of its words.

The sixth module, The Houghton Mifflin Grammar and Style Checker, is not memory resident but can be accessed from DOS if you want to check an imported text file for grammar, spelling, punctuation, and style. It also contains a Stats option that counts the words in your file and rates its readability. Anything that would reduce the drudgery of proofreading is welcome, but unfortunately, using The Checker is a little like having your work proofed by a C-level freshman comp student. Though it usually catches the most blatant errors, some subtleties escape it. For example, it may confuse participles with verbs or fail to recognize a gerund as a subject. And sometimes its advice is just wrong; in the sentence "The Grammar and Style Checker

is weak," it reads *Grammar* and *Style Checker* as separate nouns and recommends you change *is* to *are*. The Checker allows you to enable or disable its grammar rules and thereby customize it to some extent; however, to use this option, you have to know enough about proper usage not to need it in the first place. Use it with caution.

Despite this weakness, the other modules of *The Toolkit* are serviceable on-line references. *The Toolkit* may conflict with some memory-resident programs, so you'll need to experiment a bit to see what it works well with. If you do have problems, check with the people on the support line listed below; I found them to be helpful and patient even with idiot-level questions.

ANTHONY MOSES

IBM PC and compatibles; 512K RAM, 70K in TSR portion (requirement lowered to 10K in latest version—*Ed.*); requires 5MB disk space (for all six modules)—\$129

SYSTEMS COMPATIBILITY
401 N. Wabash, Ste. 600
Chicago, IL 60611
(312) 329-0700 (sales)
(312) 527-4357 (support)

Circle Reader Service Number 322

PLAN IT!

Do you worry that Social Security won't be enough after retirement? If so, take a look at *Plan It!*. This software adviser helps you plan for financial security in your golden years. *Plan It!* provides a clear picture of what you must save now and how much your yearly retirement withdrawals can be, in order to preserve your retirement spending power.

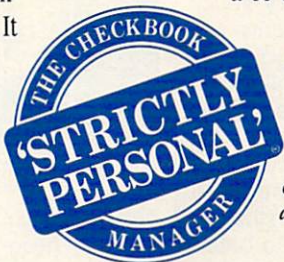
Plan It! also offers investment strategies for insurance and college planning. The insurance module calcu-

Just what you need to manage your checkbook. And just what you don't.

If all you need is an easy way to manage your checkbook and budget, why buy an accounting software program laden with confusing jargon? Amortization and payroll capabilities? Properties tracking? It doesn't make sense.

'Strictly Personal' is an easy-to-use checkbook management and budgeting program. Period. It works just like a checkbook, but takes less paperwork and time.

The program organizes and balances your checking account, lets you set up a yearly budget with up to 90 expense categories and



tracks it on a quarterly basis. The program also provides banking activity reports and prints checks. Just what you need.

Plus, you get free telephone support. With answers to your questions in a language you can understand — English. And a 60-day, money-back guarantee.

So, if all you've been looking for is a checkbook management and budgeting software program, look no further. 'Strictly Personal' is all you need.

Call **1-800-682-2140** now to order your copy — just \$39.95 + \$3.50 shipping. SC residents, add 5% sales tax. If not 100% satisfied, return within 60 days for a full refund (shipping excluded).

PERSONAL CHECKBOOK MANAGEMENT AND BUDGETING. PERIOD.

Order from 9 a.m. to 9 p.m. EST, 7 days a week. VISA & MasterCard. IBM® PC, XT, AT, PS/2 and 100% Compatibles, Hard disk, Monochrome/color. PC/MS-DOS version 2.0 or higher. ©1991 The Merryl Group, Inc. All rights reserved worldwide. Merryl Software Div., The Merryl Group, Inc., P.O. Box 100, Bluffton, SC 29910. 'Strictly Personal' is a registered trademark of The Merryl Group, Inc. All other trademarks acknowledged.

Circle Reader Service Number 191

lates the value of your current policy and analyzes your life insurance needs and benefits. The college module suggests three financial options to safeguard a sufficient nest egg for your children's college education.

Each of *Plan It!*'s three modules calculates how much you need to save in order to attain your economic goals. Dollar projections depend upon financial data that you enter (that is, your income needs, age, interest earnings, and the annual inflation rate). You can print reports concerning "what if" scenarios, keep track of your investments with the software's portfolio management system, and use the financial calculator to determine loan payments. The program's menu-driven interface and context-sensitive online help simplify operation. If you feel like a financial ostrich, *Plan It!* pulls your head out of the sand and plants your feet squarely on the path to a secure retirement.

CAROL HOLZBERG

IBM PC and compatibles, 512K RAM, 80286 or faster microprocessor—\$79.95

HALO SOFTWARE CONCEPTS
P.O. Box 64
4300 Old Barker Hill Rd.
Jamesville, NY 13078
(800) 484-1008, #3571

Circle Reader Service Number 323

STUDYWARE FOR THE SAT

Competition can be a good thing, but it sometimes means heartbreak for high school students who've set their sights on attending a prestigious college or university. These students need an edge to improve SAT (Scholastic Aptitude Test) scores to get into those institutions, and help comes from *StudyWare for the SAT*.

StudyWare comes not only with an informative and easy-to-understand user's manual that offers strategies and tips for taking the SAT, but also with *Cliffs SAT Preparation Guide*, a sister publication of *Cliffs Notes*. *Cliffs*

Guide offers two practice exams with removable SAT-like answer sheets. Also included in *Cliffs Guide* are a study guide checklist, a discussion of two approaches to taking the SAT, and strategies for completing each SAT section, including antonyms, analogies, sentence completion, reading comprehension, mathematics, and quantitative comparisons. All of these topics are covered in *StudyWare*'s useful practice exams.

Special features in the program include mouse support, pull-down menus, and an onscreen glossary with over 450 listings. There's also an onscreen clock to help you keep up with the amount of time you've used for each question.

To start, choose Test, Drill, or Exam. If you're interrupted, use the Pause option to stop the exam clock until you're ready to continue. Drills help to improve your speed, and with the Math Drills you can choose to practice squares and square

roots, units of measure, word problems, algebraic operations, ratio/proportion, quantitative comparisons, geometry, and more. In Tutor mode, an explanation appears for the answer you choose, whether the answer's right or wrong.

Your scores are automatically tallied, and you can view the results in three ways: Topic Priority Breakdown, Items Missed, or Results Graph. The Topic Priority Breakdown displays 20 categories with the composite results of your correct answers. This report lists the page numbers in *Cliffs Guide* where you can study that topic.

I encountered a few curious typographical errors and a mismatched explanation for one of the math problems. When I called StudyWare, a spokesperson thanked me for calling and promised to send a disk with fixes to me and any registered user who calls the full-time technical support department.

I was impressed that *Stu-*

dyWare holds its own when compared with other SAT programs. It offers more than 800 onscreen questions and more than 4000 explanations. It also displays more true math symbols than the two other leading SAT programs by Barron's and Davidson and Associates.

If you're looking for a way to help your children score higher on the SAT, put *StudyWare* on your shopping list. Whether they're taking the SAT for the first time or the tenth time, they can't go wrong by studying more. *StudyWare for the SAT* is the perfect tutor, and with a price tag of \$49.95, it's an investment in the future with potentially great returns.

JOYCE SIDES

IBM PC and compatibles, 256K RAM; graphics card, mouse, and hard drive optional—\$49.95

STUDYWARE
4760 Murphy Canyon Rd., Ste. A
San Diego, CA 92123
(619) 495-0190

Circle Reader Service Number 324

Q-DOS 3

Even if you feel right at home with the DOS directory and file structure, you may find hard disk housekeeping tedious using only DOS. You may also have trouble every now and then remembering where you put a particular file, or, if you have more than one disk partition, where you put a particular directory.

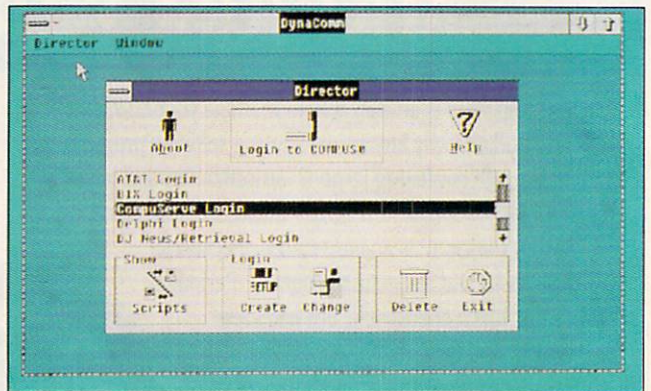
One solution calls for a graphical user interface (GUI). Some of us don't like GUIs. They tend to be slow and to require such involved procedures that by the time you finish with all the GUI protocol, you might as well be back with DOS. A prime example of a better solution, *Q-DOS 3* won't slow you down at all. The program installation puts *Q-DOS 3* in your path

statement, so you can call it from any directory. *Q-DOS 3* occupies only about 9.5K RAM and provides very convenient mouse support, though a mouse is not essential. The first option on its command line is Directory, and if you click on that option or type *D*, the directory structure of your current drive appears as a tree with your current directory highlighted. Want to change directories? Use the mouse or arrow keys to choose your destination, click again, and you'll see a listing of files in that directory, with size and date.

Want to look at another drive? Click on the Change Drive box, and you'll see a list of your drives. Click on a drive, and you'll see a tree of the directories and subdirectories of that drive. Click on your choice, and you move to that directory of the drive.

The *Q-DOS 3* command line remains available always. Can't find a file? Click the Find box on the command line. You'll be asked for the filename as well as whether you wish to search all drives or only the current drive.

Deletion of a directory which has subdirectories seems interminable using DOS. You must go from one subdirectory to another, deleting files, then return to the parent directory and delete the subdirectories one by one. Finally, DOS will let you delete the directory—unless there are hidden files somewhere, which the DOS Delete command will not touch. Not so with *Q-DOS*. One click brings up the tree, another highlights the undesired directory or subdirectory, a third gives the Erase command, and a fourth confirms that you really wish to do this, after which the directory and all its subdirectories and files, hid-



Use DynaComm's script editor to automate your log-in procedures.

den or not, go away.

The program boasts many other fine features. To name just a few, you can alter file attributes (hidden, system, read only, and so on), rename files and directories, and erase or unerase files. Its response is snappy, and its documentation is good. Personally, I have habitually despised file handlers, grumbling, "I know how to handle my files and directories, thank you. I don't need any help from any dumb program." *Q-DOS 3* has changed my mind.

CHARLES IDOL

IBM PC and compatibles, 384K RAM—\$99.95

GAZELLE SYSTEMS
42 N. University Ave.
Provo, UT 84601
(800) 233-0383

Circle Reader Service Number 325

DYNACOMM ASYNCHRONOUS

For those who prefer mice and icons, telecommunicating in the PC environment can prove a tortuous affair. Many *Windows 3.0* users were probably delighted to find a basic telecom and terminal emulation program, *Terminal*, right in *Windows*. FutureSoft, the company that

wrote the admittedly limited *Terminal* for Microsoft, offers a fully loaded version called *DynaComm*.

No matter what network or computer you need to connect with, you'll find *DynaComm's* built-in flexibility comforting. *DynaComm* supports the most common binary transfer protocols, including XMODEM (checksum and CRC), YMODEM (batch mode), YTerm, Kermit, and CompuServe B+, but not ZMODEM, the fastest and most advanced protocol. The long list of terminal emulations includes DEC VT52, VT100, VT220 (but not VT102), ADDS VP/60, HP 700/94, IBM 3101, Televideo 925/950, and CompuServe's VIDTEX. Keyboard remapping proves an essential feature when communicating with a terminal that uses a keyboard layout different from that of the standard PC. The manual contains tables that list all the keyboard ASCII values for the terminals *DynaComm* emulates, if you really need to know.

Since you may carry out text transfers in the background, you can run other applications during uploads. In fact, *DynaComm* fully supports Microsoft's Dynamic Data Exchange (DDE). So, for example, the text file you've

COMPUTE HAS THE WINNING HINTS, TIPS, & STRATEGIES

FOR THE MOST POPULAR PC GAMES!

THE OFFICIAL BOOK OF ULTIMA

by Shay Addams

Introduction by Lord British

Written with the assistance of Lord British, *Ultima's* creator, this book includes inside information found nowhere else. Packed full of hints, tips, anecdotes, and never-before-published clues for all six *Ultima* adventures. 244 pages

TURN & BURN: THE AUTHORITATIVE GUIDE TO FALCON

by Howard Bornstein

Foreword by Gilman Louie

For both the beginner and experienced *Falcon* pilot, this book has a wealth of information, special tips, and proven strategies that will make you the master of the skies. Covers all versions of *Falcon* and each of the 12 missions. 248 pages



THE OFFICIAL BOOK OF

LEISURE SUIT LARRY

Covers *Larry* 1, 2, and 3.

Includes information found nowhere else.

Packed full of hints, maps, and tidbits.

RALPH ROBERTS

WITH HELP FROM

AL LOWE Creator and designer of *Leisure Suit Larry*

COMPUTE! Books

THE OFFICIAL F-19 STEALTH FIGHTER HANDBOOK

by Richard Sheffield

Foreword by

Major "Wild Bill" Stealey

Take to the skies with *F-19 Stealth Fighter* and test this amazing aircraft. Learn all the thrilling maneuvers of this fantastic new fighter. Here's the key to mastering MicroProse's *F-19 Stealth Fighter* simulator. 184 pages

THE OFFICIAL F-15 STRIKE EAGLE HANDBOOK

by Richard Sheffield

Foreword by Sid Meier

Fly like an ace with MicroProse's best-selling *F-15* simulators. Covers both *F-15 Strike Eagle* and *F-15 Strike Eagle II*. You'll perform tactics and maneuvers you never thought possible. Filled with step-by-step instructions and clear diagrams. 224 pages

THE OFFICIAL BOOK OF LEISURE SUIT LARRY

Written with the help of the creator and designer of *Leisure Suite Larry*, this best-selling book covers *Larry* I, II, and III. Packed full of all the hints and tips any *Larry* enthusiast could want. This official book also includes *Larry's* life story, an exclusive interview with *Larry* Laffer, and some candid comments from *Larry's* women. 228 pages

YES!

I want more hints and tips.
Please send me the books checked below.

- The Official Book of Leisure Suit Larry (215X) \$12.95**
- The Official F-15 Strike Eagle Handbook (2311) \$12.95**
- The Official F-19 Stealth Fighter Handbook (2176) \$14.95**
- The Official Book of Ultima (2281) \$14.95**
- Turn & Burn: The Authoritative Guide to Falcon (1978) \$12.95**

Subtotal

Sales tax (residents of NC, NY, & NJ add appropriate sales tax).
Canadian orders add 7% goods and services tax.

Shipping and Handling: \$2 U.S. and Canada; \$6 foreign

Total Enclosed

Check or money order MC VISA

Signature _____

Acct no. _____ (required) Exp. Date _____

Name _____

Street Address _____

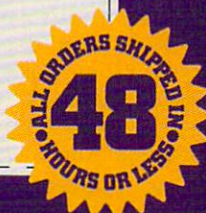
City _____ State _____ ZIP _____

Offer good while supplies last.

All orders must be paid in U.S. funds drawn on a U.S. bank.
Orders will be shipped via UPS Ground.

MAIL TO: **Compute Books**
c/o CCC
2500 McClellan Ave.
Pennsauken, NJ 08109

7E91C



just received can be automatically inserted into a *Microsoft Word* document, or, with the right script, a *Word* document can be uploaded automatically from *DynaComm*. Data can run both to and from *DynaComm* and other programs in multiple channels. Expect a severe reduction in program speed if there's much data exchange going on, though.

Another useful feature for avid telecommunicators is *DynaComm's* ability to open up to eight terminal windows simultaneously. Fully editable, terminal windows come with options for custom text styles, colors, tabbing, and formatting. You can also perform full search-and-replace operations, which become very useful when you receive lots of junk characters in a file.

The *Director* program (really a special script) is *DynaComm's* home base. *Director* functions as an integrated phone dialer and phone book, and provides easy access to settings, files, and log-in parameters. You can choose most actions by clicking on buttons and making menu choices, so communicating becomes about as simple and friendly as possible. Through *Director* you can also create function key macros and scripts that automate communications chores. Many other environments are possible with *DynaComm*, but most users will stay primarily in *Director*.

If you need to write elaborate scripts, *DynaComm* includes a powerful, event-driven script language that also contains the tools to create custom user interfaces, complete with user-definable menus and dialogs. A 400-page manual shows you how to use the script language, but unless you have

some programming experience you won't find it easy going.

Simple log-in scripts aren't too difficult (one is thoroughly explained in the manual), but a typical segment of one of the more elaborate sample scripts confounded me. Log-in procedure scripts for several of the more popular services, such as CompuServe and GEnie, come with *DynaComm*, so you may not need to wrestle with scripts until you're quite comfortable with the program.

Probably the easiest way to begin involves the Record-

LAN interfaces built in; most other communications programs make you buy special LAN versions. This in itself would recommend *DynaComm* to businesses using a LAN. The other attractive capability for *Windows*-based businesses is that users familiar with *Terminal* can use *DynaComm* right away and learn the more complex functions of the program as necessary. Or an industrious network administrator can write and install custom scripts so that the average user doesn't have to worry about advanced functions at all.

As powerful a telecom pro-

STEVEN ANZOVIN

IBM PC and compatibles, *Windows* 2.11 or higher; *Windows* 3.0 recommended—\$295

FUTURESOFT
1001 S. Dairy Ashford
Houston, TX 77077
(713) 496-9400

Circle Reader Service Number 326

PC-IQ

I am enamored of icons, pull-down menus, and point-and-click control. However, I work in a DOS world, with its command line interface and cryptic error messages. As every PC computing enthusiast knows, typing appropriate commands at the infamous DOS prompt requires utmost precision. Typographical errors return puzzling responses such as *Invalid number of parameters* or *File creation error*. Enter *PC-IQ*, a natural-language DOS interface that uses artificial intelligence to translate DOS computerese into everyday language. Not only does *PC-IQ* understand plain English, but it asks for clarification when it can't interpret a command or when it requires more information to execute an instruction. Online help is always available. All documentation is clearly written. Even computer novices will not be intimidated.

In order to run *PC-IQ* and its associated utilities, you must install it on a hard disk. Installation is a breeze even though the *PC-IQ* directory takes up almost two megabytes of disk space. Be aware that *PC-IQ's* Install option modifies the path statement in your AUTOEXEC.BAT file and also makes changes to the default settings of your CONFIG.SYS file. You'll be able to retrieve the original files, however, because *PC-IQ* renames them



PC-IQ makes the austere DOS environment a more temperate one.

er script, which creates scripts of your actions as you make a connection. You can edit scripts created with Recorder as you gain proficiency. The manuals, especially the Script Reference, seem reasonably well written and complete, but they might be hard to follow if you only recently took up computer communications. I'd recommend the online tutorials instead. The online help's a possible supplement to the tutorials, but too often brief to the point of uselessness.

DynaComm has LAN support for NetBIOS and other

program as you could ask for and definitely the most powerful one currently available for *Windows*, *DynaComm* still isn't for everyone, and not everyone should ask for it. If you communicate with only a few easily accessible systems, such as CompuServe or your boss's PC, then *Terminal* may be all you need; why pay for more? But for the professional telecommunicator with a need for advanced LAN compatibility and a desire to customize the *Windows* environment, *DynaComm's* the only choice.

SOFTWARE HEADQUARTERS

A full selection of software and accessories for the IBM and Amiga.
Specialists in International Sales • Competitive Pricing • Same day shipping

MISSION CONTROL

GAMES

4-D Boxing	33
688 Attack Sub Combo	24
A-10 Tank Killer	37
A. Slim's Dealer's Choice	32
A. Slim's Real Poker	19
A.T.P. Flight Commander	37
ABC's Monday Night Football	31
Action Stations	32
Altered Destiny	34
Ancient Art of War	31
Ancient Art of War at Sea	31
Andretti's Racing Challenge	33
Ante-Up	27
Arachnophobia	22
Arachnophobia w/Sound Source	32
Are We There Yet?	33
Armada 2525	33
Armor Alley	29



Gravis PC \$39

Cybergenic Ranger	32
Das Boot Submarine	19
Days of Thunder	27
Death Knights of Kyrnn	33
Dick Tracy	37
Dick Tracy Print Kit	32
Dragon Strike	33
Dragon Wars	33
Dragon's Lair II: Timewarp	43
Drakken	37
Dream Team	32
Duck Tales: Quest for Gold	22
E. Thorp's Real Blackjack	32
Eagle's Rider	32
Earl Weaver Baseball 2	33
Earhshire	22
Elite Plus	29
Elvira	34
Empire	33
Escape From Hell	21
Eye of the Beholder 2	39
Eye of the Beholder	33
F-14 Tomcat	27
F-15 II Scenario Disk	20
F-15 Strike Eagle II	34
F-19 Stealth Fighter	37
F-29 Retaliator	33
F-117A Stealth VGA	47
Falcon 3.0	43
FireKing	25
Flight of the Intruder	27
Freakin' Funky Fuzzballs	23
Full Metal Planet	31
Future Wars	32
Game Pack I	33
Games People Play	29
Gateway to Savage Frontier	33

Life & Death	24
Life & Death II: The Brain	33
Links Bayhill/Bountiful Firestone	18
Links: The Challenge of Golf	37
Loom	23
Lord of the Rings	34
Lord of the Rings II	37
Lost Patrol	33
M1 Tank Platoon	41
Mac Arthur's War	29
Magic Candle 2	39
Martian Dreams	37
Martian Memorandum	36
Mean Streets	36
MechWarrior	32
Medieval Lords	39
Medieval Warriors	25
MegaFortress: Flight of Old Dog	40
MegaTraveller II	37

Search for the King	36
Secret of Monkey Island II	40
Secret of Monkey Island VGA	39
Secret of the Silver Blades	33
Secret Weapons of Luftwaffe	44
Shadow of the Sorcerer	33
Shanghai II: Dragon's Eye	31
Shuttle Space Flight Simulator	37
Siege	39
Silent Service II	37
Sim City	30
Sim City Graphic Set 1/2	23
Sim Earth	41
Sliders	32
Space Ace	37
Space Quest IV	37
Spellcasting 101	37
Spellcasting 201	42
Spirit of Excalibur	32
Stanford Wong's Video Poker	32
Star Control	31
Star Trek: 25th Anniversary	37
Starflight II	22
Storm Across Europe	38
Strategic Forces	25
Stratego	52
Street Rod II	29
Strip Poker 3	33
Stunt Driver	32
Stunts	33
Super Car Pak	37
Super Off-Road	26
Swap	32
Team Yankee	37
Teenage Ninja Turtles	26
Terminator	34
Test Drive III	35
Tetris	24



Flight Stick w/FALCON \$49

Tunnels & Trolls	17
Tunnels of Armageddon	29
Twilight 2000 VGA	37
Typhoon of Steel	39
U.S. Atlas	38
Ultima VI	40
UMS II: Nations at War	37
Uncharted Waters	43
Vaxine	28
Vengeance of Excalibur	32
Vette	33
Video Poker	32
War of the Lance	33
Warlords	29
Wayne Gretzky Hockey II	34
Western Front	32
White Death	49
Wing Commander 2	49
Wing Commander 2 Speech Pak I	37
Wing Commander 2 Speech Pak II	39
Wings of Fury	32
Wizardry	32
Wizardry V	32
WolfPack	37
Wonderland	28
World Champion Backgammon	25
World Champion Cribbage	25
Worlds at War	32
Wrath of the Demon	32
Zac McKracken	17

Writer Rabbit	32
Writing/Publishing Center	42

PRODUCTIVITY

Animation Studio	79
Bannermania	25
Copy II PC	28
Deluxe Paint Animation	87
Deluxe Paint II Enhanced	87
Dream House Professional	48
Dvorak on Typing	32
Eight in One	37
FloorPlan	32
Home Video Producer	32
Lottery Trend Analysis	18
Mavis Beacon Typing	33
Mavis Beacon for Windows	39

The Sound Card That Makes Your PC Come Alive!

AdLib

Music Synthesizer Card \$79
Personal Music System \$129

SOUND BLASTER

\$139.95

with purchase of any 2 titles

MARTIAN memorandum

No Other Game Even Comes Close! digitized graphics, sound & music! \$37

B.A.T.	19
Bad Blood	32
Bandit Kings of Ancient China	37
Bane of the Cosmic Forge	37
Bard's Tale III	31
Battle Chess	32
Battle Chess II	32
Battle Command	33
Battle Isle	34
BattleHawks 1942	22
BattleStorm	32
BattleTreach II	31
Berlin 1945	32
Bill Elliot's NASCAR Challenge	24
Billy the Kid	32
Black Gold	32
Blitzkrieg	32
BlockOut	28
Blue Max	17
Breach 2	20
Bridge 6.0	26
Buck Rogers	33
Budokan	21
California Games II	27
Captain Comic II	17
Cardinal of the Kremlin	27
Carmen in America's Past	37
Carmen USA/World/Time	32
Carmen World Deluxe	48
Carriers at War	33
Casino Master	59
Castles	37
Chamber Sci Mutant Priestess	17
Champions of Kyrnn	33
Checkmate	34
Chessmaster 2100	33



Flight Yoke by MAXIMUM with Foot Pedals ONLY \$109

Mickey & Minnie's Print Kit	17
MicroLeague Basketball	27
MicroLeague Football	29
Night & Magic 1 & 2	33
Night & Magic III	39
Missions Disk 2	22
Monday Night Football w/ Video	37
Monopoly	27
MoonBase	27
NCAA: Road to the Final Four	34
Night Breed	14
Night Hunter	19
Night Shift	19
No Greater Glory	37
Nobunaga's Ambition II	37
Nuclear War	34
Obitus	39
Operation COMBAT	25
Overlord	32
Penthouse Jigsaw (Adult)	25
Personal Pro Golf	32
PGA Tour Golf (Limited Edition)	46
PGA Tour Golf	33
Pick 'N' Pile	28
Planet's Edge	39
Playroom	29
Pool of Radiance	33
Pools of Darkness	39
Populous	19
Prince of Persia	27
Pro Football Analyst	37
Pro Tennis Tour 2	33
Quest for Clues III	19
Railroad Tycoon	34
Reach for the Stars	25
Red Baron	37
Renegade Legion Interceptor	39
Rise of the Dragon	37
Road & Cars 1 for Test Drive 3	19
Romance of Three Kingdoms 2	43
Rommel	25
Rotax	28
Rules of Engagement	37
Savage Empire	37
Scenery Disks	22
Scrabble Deluxe	32

Wing Commander II

Free Wing Commander Hat!

While Supplies Last \$49

The Immortal	28
The Manager's Challenge	31
The Sound Source	25
Their Finest Hour	38
TimeQuest	37
Tony LaRussa Baseball	33
Tracon II	43



Weapons Control Systems or Flight Control System by THRUSTMASTER! \$89 ea

Treasure Trap	27
Triple Action Pak	47
Trivial Pursuit	28
Trump Castle II	32

SOUNDCARDS

AD Lib Card (Micro Channel)	139
CMS Chips	30
Sound Blaster Midi Interface	79
Sound Blaster Voice Editor	59

Ad Lib Software In Stock!

ACCESSORIES

DiskHolder for 5.25 or 3.5	9
Dual Gameport	22
Gameport (MicroChannel) by CH 48	18
Hi res Serial mouse w/software	32
Genius 4500 Scanner	132

JOYSTICKS

Suncom Icontroller PC	49
Analog Plus	27
ErgoStick	42
Flight Stick by CH	27
Tac 1+	24
Mach III by CH Products	33
Maxx Flight Pedals	49
Maxx Flight Yoke	70
Thunderstick by Kraft	35
Wico Analogue	12

EDUCATIONAL

Algeblaster Plus	32
Berenstein Bears: Counting	18
Berenstein Bears: Letters	18
Berenstein Bears: Junior Jigsaw	18
Challenge of Ancient Empire	32
Designasaurus II	28
Donald's Alphabet Chase	14
Goofy's Railway Express	17
Geo Jigsaw	27
Grammar Gremlins	32
Math and Me	22
Math Blaster Mystery	32
Math Blaster Plus	32
Math Rabbit	27
Mickey's Runaway Zoo	14
Mickey's 123	27
Mickey's ABC	27
Mickey's ABC/Sound Source	37
Mickey's Colors & Shapes	37
Mickey's Crossword Puzzle	22
Mickey's Jigsaw Puzzle	32
Midnight Rescue	32
Outnumbered	32
PC Globe V4	41
PC U.S.A. 2.0	41
Read & Roll	32
Reader Rabbit	32
Super Spellcopter	27
Think Quick	32
Treasure Mountain	32

VIDEOS

DOS Level I, II or III	
Intro to Dbase IV	
Intro to DOS	
Intro to Lotus 1-2-3	
Intro to Microsoft Word 5.0	

GamePak I

Chuck Yeager, Hunt Red October, ChessMaster, Life & Death, Airplane Factory \$32

Intro to Word Perfect 5.0	
Lotus Level I, II or III and more	\$24

BUDGET

Advance to Boardwalk	14
Big Boggle	14
Dick Tracy Print Kit	17
Duck Tales: Quest for Gold	17

MODEM INSTA-COM

2400 Internal Modem \$69
2400 External Modem \$79

Expert Astronomer	14
Expert Calendar	14
Expert Checkwriter	14
Expert DOS Tutor	14
Expert Fax Forms	14
Expert Home Design	14
Expert Labels	14
Expert Landscape	14
Expert Lottery Expert	14
Expert Maps	14
Expert Resume Writer	14
Expert Utilities	14
ExpertPerfect Typing	14
Jeopardy 25th	14
Super Password	14
Who Framed Roger Rabbit	14
Wheel of Fortune Gold	14

IF YOU DON'T SEE IT, GIVE US A CALL!

Media Fax STORAGE SYSTEM

Posso Media Box imported from Switzerland! 5.25 or 3.5 \$29.95

Chessmaster 2400	33
Chessmaster 2400 Windows	39
Chuck Yeager's Air Combat	40
Circuit's Edge	28
Civil War	39
Civilization	43
Clue Master Detective	27
Command HQ	32
Conan the Cimmerian	32
Conflict: Middle East	37
Conspiracy: The Deadlock Files	35
Continuum	33
Corporation	32
Countdown	36
Covert Action	37
Crime Does Not Pay	32
Crime Wave	36
Curse of the Azure Bonds	33

Call us and use your Mastercard or Visa

800-999-7995

In NY State 212-962-7168

Fax 212-962-7263

Hours: 9am to 7pm Monday - Friday (Saturday 10am - 5pm)

Methods of Payment: We accept Visa, M/C, certified checks & Money orders. Personal checks allow 14 days to clear. COD add \$4.00. School, State & City purchase orders accepted.

Shipping: UPS (\$4 min), APO/FPO (\$5 min), 2 Day Air (\$7 min.) CANADA, HI, AK & PR (\$9 min). Overseas minimum \$20 (please fax orders if possible).

NY residents add 8.25% Sales Tax.

Send money orders or checks to: MISSION CONTROL, 170 Broadway, Suite 201, New York, NY 10038

FREE Demo Disks and Catalogue with order!

with the extension OLD rather than overwrite them.

PC-IQ acts as an interface between DOS and the computer user, translating a variety of natural-language instructions into conventional DOS commands. When it operates in natural-language mode, it shows users how it translates "English" instructions into DOS, thus providing an opportunity for interested parties to learn DOS as they work. For example, in natural-language mode, individuals who want to view all directories on a particular disk simply type TREE C (where C is the name of the desired disk). *PC-IQ* also accepts SHOW, GET, and LIST as TREE synonyms.

Once you're in a directory, you can obtain a listing of all files simply by typing SHOW ALL FILES. To open a new directory, type SWITCH x (where x is the actual directory name). *PC-IQ* also accepts GOTO, GO, CHANGE, ACCESS, and even CD, the actual DOS command. Novices who prefer a menu-driven interface over natural-language typing can switch to the program's point-and-click mode. This directs *PC-IQ* to display program options from pop-up menus. Menu choices include directory- and file-level operations and several utilities. Each option, in turn, calls up a submenu of additional choices.

PC-IQ offers a convenient alternative to typing and provides a great way to avoid the DOS command line. Regrettably, *PC-IQ* doesn't support all DOS commands, and it doesn't always recognize backslashes. You can't issue batch commands or use strict DOS syntax. The program does let you create or remove a directory, recover a deleted file, and view or

change the contents of an ASCII file, however. Supported file operations include copy, find, move, rename, create, and print, while disk-level commands consist of check disk, format disk, and diskcopy. The Autoload function makes it possible to run a designated application from a pop-up menu. The Set command enables you to configure your system with the correct time and date. A simple text editor lets you create and save ASCII files up to 64K in length.

PC-IQ has some nifty features. It comes with a built-in screen saver. Its database manager allows you to add new programs to the Autoload list or customize *PC-IQ*'s vocabulary so it recognizes alternate command synonyms. Entertainment files offer you a chance to play a game like Trivial Pursuit or read a series of famous quotations and interesting facts.

Primarily for computer novices, *PC-IQ* will benefit individuals who want to learn something about DOS without having to grapple with unwieldy commands. However, if the DOS prompt does not seem intimidating, you may find the program limiting. It supports relatively few DOS commands, it may run out of memory when other memory-resident programs run simultaneously, and its interface might slow you down. In the final analysis, it might be better to improve your PC IQ with a primer on DOS instead of using *PC-IQ*.

CAROL HOLZBERG

IBM PC or compatible, 640K RAM, hard drive—\$99.95

A.I. SOLUTIONS
58 Creekview Dr.
West Seneca, NY 14224
(800) 677-6670
(716) 675-5311

Circle Reader Service Number 328

EYE OF THE BEHOLDER

On the fifth day of Marpenoth in the year of the Shadows Piergeiron, the chief lord of Waterdeep summoned me to a most solemn meeting. There was trouble in Waterdeep, and the source lay deep within the city itself. It would be my du-

character generation, and general gameplay. More importantly, however, the game represents a dramatic advance in sound and graphic quality for the Advanced Dungeons & Dragons line. For instance, as you search through the many labyrinths beneath Waterdeep, you hear the distinct sound of dripping water and the muffled footsteps of undead crea-



Eye of the Beholder takes you and your party deep into deadly, labyrinthine sewers.

ty to uncover this evil and destroy it before it destroyed Waterdeep. With a Letter of Marque in hand, I quickly assembled a small band of hearty adventurers and set out to face the unknown source of evil. Unfortunately, the most logical place to begin my search was also the least hospitable—the sewers beneath the city.

Eye of the Beholder joins Strategic Simulations' Advanced Dungeons & Dragons line of fantasy role-playing games, and it's the first title in the groundbreaking new Legend Series. *Eye of the Beholder*, like all games in the new series, utilizes Advanced Dungeons & Dragons Second Edition game rules for combat resolution,

During combat, you hear the metallic clang of heavy weapons on armor and the ghastly cries and hisses of your dying foes as your party battles with bizarre monsters. The sewers are inhabited by a variety of creatures ranging from Giant Spiders and Zombies to Kobolds and Mantis Warriors. All monsters are carefully drawn and animated.

You can begin the game either by creating your own characters from scratch or, if you want to dive right in, by using a prebuilt party. *Eye of the Beholder* can be played entirely with keyboard input, or you can point and click your way through the adventure with a mouse or other pointing device.

As you explore the sewers below Waterdeep, the area directly in front of your party is visible through a large 3-D view window. To the right are character portraits of the four player characters and up to two nonplayer characters (NPCs) who may join your group during the adventure. Hand-held items such as weapons and spell books are shown alongside each portrait, and both combat and spell casting are accomplished by clicking on the appropriate icons. Below each portrait, characters' hit points are displayed either as a bar graph or, if you prefer, a numeric value. By clicking on a specific character's portrait, you access an equipment screen that graphically displays all of the character's belongings. Here, you can easily outfit a character by dragging weapons and armor from backpack to body. To feed your fearless warrior, you simply drag food from his or her backpack over to a small table setting and drop it on the plate.

A separate character screen supplies all the vital statistics on each character such as class, alignment, race, sex, ability scores, experience, and character levels. Convenient Next and Previous buttons on both the equipment and character screens let you access similar information on other members of your party without your having to first return to the main screen.

Eye of the Beholder is not without a couple of annoying faults. First, each time you load the game, you must specify the graphic mode and sound board you wish to use and indicate whether or not you want to use your mouse. Second, unlike many games that allow you to save multiple games by as-

signing each a unique name, *Eye of the Beholder* makes every game that you save automatically replace the previous one. Even with these glitches, *Eye of the Beholder* remains one of the most engaging fantasy role-playing games I've seen in a long time and one that no *Advanced Dungeons & Dragons* fan should be without.

BOB GUERRA

IBM PC and compatibles, 640K RAM, CGA, EGA, MCGA, VGA, or Tandy 16-color; supports Ad Lib and Sound Blaster, requires hard drive or two floppy drives—\$49.95

Also available for Amiga—\$59.95

STRATEGIC SIMULATIONS
Distributed by Electronic Arts
1820 Gateway Dr.
San Mateo, CA 94404
(800) 245-4525

Circle Reader Service Number 329

MAPVIEWER

Have you ever looked at a map and wanted to see the information displayed differently? Perhaps a job presentation or sales close could have benefited from a jazzier visual aid than an uninspired photocopy from an old sales manual?

MapViewer, from Golden Software, could be your answer. It allows you to use standard maps or create your own and customize them any way you want. This *Windows 3.0* program helps you create great presentations and is a terrific aid to schoolwork.

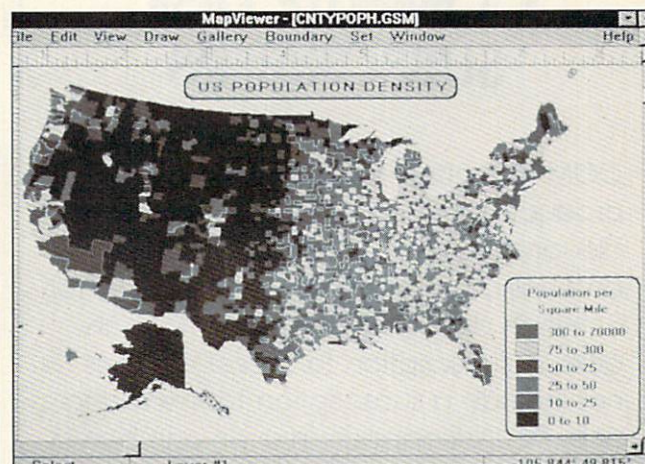
Any discussion of technical software should start with a review of its most important and often most neglected component—the documentation. *MapViewer* comes with an intimidating 312 pages plus appendices to sift through. The manual contains an introduction, start-up procedures, a tutorial, an advanced features

section, and a handy reference section.

Although the sheer volume of documentation may at first seem a bit overwhelming, it took me only about two hours to work

readable; even the index appeared complete and dependable.

Most people will first experience *MapViewer* by running through the tutorial. When you first boot the pro-



MapViewer puts useful geographical data at your disposal.

through the tutorial and two hours to read the rest of the manual. Then I was ready to use *MapViewer*. I found the manual to be well written, concise, and generally

gram, a standard *Windows* screen with icons for map customization greets you. The tutorial then instructs you to import a data file of the fifty American states and

a data file detailing the populations of each state. Then, using a simple spreadsheet, the tutorial reshapes the information into a variety of maps that display population ranges. For instance, a hatch map color-codes the country according to population density. A symbol map places appropriately sized human figures in each state. The bigger the person, the bigger the population. Choosing a prism map gives you three-dimensional states with the height of the state corresponding to the size of the population. A dot-density map fills each state with dots in proportion to the population. For incorporating more than one variable, a pie map inserts a pie

chart into each state and allows for population breakdowns into categories such as male and female.

Next, you may print your data. Finally, the tutorial runs through the help screens and index. A tutorial in any manual is an indispensable tool in learning how a program works. You learn best by doing, and Golden Software deserves applause for including such a complete and usable tutorial in the manual.

After running the tutorial, you're ready to explore *MapView* on your own. The features included allow you to make your map three-dimensional, display two data variables for each geographical area, put several

maps on one page, cover up parts of the map, or use the clipboard. In order to test the usefulness of the program, I constructed a map representing the spread of my personal business. This was an adequate test of the agility of the program, since my client base spans a large geographical area but is concentrated in very small groupings. I expanded the four counties surrounding me into an enlarged area and showed the remainder of the United States in a secondary map. For good measure and aesthetics, I then made the map three-dimensional and added color. Altogether, it took about four hours—one hour to enter the information into the spreadsheet and three hours to use the manual to figure out what I wanted to do.

The quality of printing was fine on my HP laser printer at work, but the legibility on my inexpensive dot-matrix printer at home was quite poor; distinguishing the different shades in each map area proved difficult. A representation in the manual of how the different colors will show up in black-and-white printing would've been handy and certainly saved time. Another problem is the definition of the geographical representations. Blowing up the area in and around Kuwait (which we've all become familiar with) revealed a very simplistic rendering of the borders. Honestly, though, these quibbles with an otherwise unique and useful program don't begin to undermine its strength.

When I first received *MapView*, I struggled to justify its utility. Though undeniably well made, *MapView* made me wonder, "What can I use it for?" I found my an-

swers. While other graphic business programs might sit on my shelf after reviews are written, *MapView* will stay on my hard disk. My son and I discovered (in my case rediscovered) the versatility and usefulness of maps. I know of no other tool as handy for supplementing a child's geographical education. In addition, its usefulness in supplementing business proposals recently became apparent—and since then, indispensable. I incorporated *MapView* into two presentations, and the results pleased me tremendously; my presentations were simply more impressive. For a program that on first glance appeared all but useless, a trip through the workings of *MapView* soon convinced me that its appeal should, geographically speaking, reach far and wide.

ADAM STARKWEATHER

IBM PC and compatibles, *Windows* 3.0—\$249

GOLDEN SOFTWARE
809 14th St.
Golden, CO 80402
(303) 279-1021

Circle Reader Service Number 330

PERSONAL LAW FIRM

Save a bundle on professional attorney's fees by minimizing time spent in a lawyer's office. *Personal Law Firm*, BLOC Publishing's electronic do-it-yourself legal adviser, can help you do just that. You can generate 30 legal documents to take care of important personal, family, and business affairs. Menu driven and easy to use, this electronic law firm will have even computer novices more sure of their legal footing after even a minimal effort.

Personal Law Firm includes forms for a last will

IMPORTANT NOTICE FOR COMPUTE DISK SUBSCRIBERS

COMPUTE offers two different disk products for PC readers; the *SharePak* disk and *PC Disk*. *SharePak* is monthly and has a subscription price of \$59.95 for 5¹/₄-inch disks and \$64.95 for 3¹/₂-inch disks. A subscription to *SharePak* does not include a subscription to the magazine. *PC Disk* appears in even-numbered months and has a subscription price of \$49.95, which includes a subscription to the PC edition of *COMPUTE*. You can subscribe to either disk or to both, but a subscription to one does not include a subscription to the other.

and testament, living will, and residential lease. You can set up or revoke a power of attorney; create prenuptial, postnuptial, or marital settlement agreements; and authorize a temporary guardian for your children. Other forms help you put together a commercial real estate lease, agreements that safeguard trade secrets or intellectual property, work-for-hire contracts, promissory notes, and personal guarantees. Draw up a bill of sale, make a formal offer to purchase, issue demand letters, and more.

Once the program has been installed, just push a few buttons, answer some questions, and out pops a customized form. The program allows individuals to create a new document, revise an existing document, or print a hardcopy of a completed document. Onscreen prompts give directions every step of the way, and you can expect online help for any question you might have.

Our family lawyer, a practicing attorney in the state of Massachusetts, says that *Personal Law Firm* has potential. Ordinary folks shouldn't have to run to a legal professional for routine paper processing, especially when it comes to documents like a power of attorney, promissory note, or bill of sale. While the laws of different states may vary, these basic forms often prove legally valid in most jurisdictions.

On the other hand, our lawyer points out that blind faith in some *Personal Law Firm* documents could spell danger. For example, in the matter of a commercial real estate lease, virtually no such thing as consumer protection exists. If you execute a commercial lease without go-

ing to a lawyer, you can inadvertently leave out important provisions that protect your interests.

Your unease may heighten when you consider that *Personal Law Firm* documents were created by a member of the California bar. Laws tend to differ from state to state. For example, if landlords use the standard form for a residential lease (designed for nationwide application) in Massachusetts, they could get into serious trouble by overlooking specific state requirements concerning move in/move out inspections, escrow accounts for damage deposits, maximum limit for damage deposits and last month's rent, and other landlord obligations. These landlords could be forced to return tenant damage and security deposits before the end of the lease. They could even end up paying their tenants up to triple damages and attorney's fees.

A step in the right direction, *Personal Law Firm* could benefit people preparing a document for legal review. Clients might not save any money in attorney's fees, however, because lawyers often charge a set fee for completing particular documents, regardless of whether or not the client prepares an outline.

Probably best suited for a typing service run by a skilled independent paralegal, *Personal Law Firm's* forms require the attention of someone who knows when it's appropriate to fill in the blanks and when it's necessary to approach a lawyer. Our lawyer cautions that a little bit of knowledge, posing as expert advice, can be as dangerous as an outdated law book.

The whole thrust of *Person-*

—Wizardsry—

And the visions
Appeared
as they never had
before

CRUSADERS of the DARK SAVANT

Now with 256-color VGA Graphics

Circle Reader Service Number 136

al Law Firm seems to suggest that individuals do not need a lawyer for certain documents. The packaging states that the software "creates documents that are valid in 49 states and the District of Columbia." Yet a tiny note at the bottom of the box says, "BLOC Publishing offers no warranty, express or implied, as to the legality of these documents in your particular state." This disclaimer appears intended to absolve BLOC Publishing of any liability. With the possible pitfalls in mind, exercise caution when creating your legal documents. Ultimately, the price of mistakes will be paid by you.

In future versions of *Personal Law Firm*, I'd like to see documents tailored to the laws of specific states. I'd also like BLOC Publishing to have its attorneys include the citations which specify the legal basis for the documents included. If nothing else, the program provides some insights into the legal system that laymen might oth-

erwise never investigate. Citations would add to the educational value. For safety's sake, though, don't rule out an attorney or a typing service run by an independent paralegal. In law, as with the medical profession, it's sometimes wise to seek second opinions.

CAROL HOLZBERG

IBM PC and compatibles, 256K RAM, hard drive, 80-character display (color or monochrome); supports virtually any printer, includes both 3½- and 5¼-inch disks—\$99.95

BLOC PUBLISHING
800 SW 37th Ave.
Coral Gables, FL 33134
(305) 445-0903

Circle Reader Service Number 331

STUDYMATE— THE GRADE BOOSTER

One commonly held educational theory states that a critical aspect of learning is the development and strengthening of study skills. Capitalizing on this notion is Compu-

REVIEWS

Teach's *Studymate—The Grade Booster 2.2*.

Studymate does not pretend to be a program that teaches study skills. It leaves that multifaceted task to David H. Griswold's *How to Study*, a 148-page paperback enclosed as a bonus. Essentially a test-construction kit, *Studymate* provides a tool to help students organize their learning, review it in many different formats, and absorb it through repetition.

The main program consists of two parts—Editing Functions and Taking a Test—both accessed via a series of keyboard-controlled menus. From the Editor menu, you may create, edit, review, print, delete, or copy a test. In addition, you can

call up a disk directory that contains not only each filename but also a brief description of all exams on the disk, the style of questions they use, and who wrote them.

Taking for granted that you already know how to write a test, the documentation offers only a few tips on how to go about doing so. Fortunately, viewing some of the 75 different 20-question quizzes included on the Vocabulary Power Disk will give you ideas for framing questions, as well as help you improve your word usage.

Teachers using software for their pupils or parents generating quizzes for their children should have no trouble manipulating the Create function or thinking of ideas for

tests. Likewise, bright students who need review in certain subjects will find the program easy to handle.

Slower learners, however, will be hard-pressed to locate the relevant facts and ideas and to formulate them into meaningful questions. Although the program is best employed for teaching knowledge- and comprehension-based material, to construct items for it requires higher levels of learning, such as analysis and synthesis. This might make the Create function of *Studymate* inaccessible to many of the very people it is trying to help.

In the right hands, the Create module may be used to produce a wide variety of tests: true/false, multiple

choice, fill in the blanks, spell scrambles, missing letters, and combinations of the above. Noticeably absent are matching columns, a test format commonly used by teachers of all grades.

Each test type has its own unique options and template. For instance, from the Multiple Choice menu you may determine the total number of responses and enter your own incorrect choices or have the program randomly assign them. After making your selections, you move to the template and fill in your first question, the correct reply, and the incorrect answers (unless randomly chosen) in the spaces provided. In this way you may create

Available exclusively by subscription!

COMPUTE's Amiga Resource edition

Your authoritative source for Amiga information

Amiga owners: Each month, the Amiga Resource edition of *COMPUTE* brings you all the news, reviews, and home office information found in the regular newsstand edition of *COMPUTE*, plus a special section devoted exclusively to Commodore's multitasking marvel—the Amiga. Whether you use your Amiga for multimedia, games, video, desktop publishing, or home office work, you'll find plenty of useful information in the Amiga Resource edition.

Amiga Resource includes:

**PREVIEWS OF NEW AMIGA SOFTWARE
INDUSTRY NEWS AND RUMORS
AMIGA ART GALLERY
COLUMNS BY AMIGA EXPERTS
HARDWARE AND SOFTWARE REVIEWS
A BIMONTHLY DISK SECTION
AND MORE!**



SUBSCRIBE TODAY and get a year (12 issues) of *COMPUTE* with Amiga Resource for only \$12.97!
Or get 12 issues and 6 bimonthly disks packed with original software for just \$49.95.

Mail completed coupon to

COMPUTE's Amiga Resource
P.O. Box 3244
Harlan, IA 51593

or call **1-(800)-727-6937**

YES! Send me a 1 year subscription to the Amiga Resource edition of *COMPUTE* for only \$12.97.

Send me 1 year of the Amiga Resource edition of *COMPUTE* (12 issues) and the Amiga Resource Disk (six disks) for just \$49.95.

Payment Enclosed Bill Me

Name _____

Address _____

City _____ State _____ ZIP _____

Canadian residents add \$4.91 (postage and Canadian Goods and Services Tax) for magazine only; add \$7.50 for magazine and disk. Other foreign orders add \$4.00. U.S. funds only.

If you're a *COMPUTE* subscriber who wishes to receive the Amiga Resource edition instead, send a photocopy of your cover and mailing label along with a request to Amiga Resource Subscriptions, 324 W. Wendover Ave., Ste. 200, Greensboro, NC 27408, or call toll-free (800) 727-6937.

as many items as disk space allows.

After completing your exam, you may administer it either on screen or via hardcopy. If you choose the former, access the Take a Test module and then load in the file, and you're ready to go. As a test giver, the computer flags mistakes and will usually offer you a second chance. If you're still in the dark, the program supplies the correct answer. When you're done, you're told the number and percentage of correct replies and the time it took to complete your work. Then you may decide to print the results, to be retested on the items answered incorrectly, or to re-take the entire examination.

If you're preparing to take a test, *Studymate* provides solid value at a reasonable price. It won't study for you, but it will help when you decide to crack the books.

LEN POGGIALI

IBM PC and compatibles, 384K RAM—\$49.95

Also available for Apple II Series—\$49.95 and Macintosh—\$49.95

COMPU-TEACH
78 Olive St.
New Haven, CT 06511
(800) 44-TEACH

Circle Reader Service Number 332

CENTRAL POINT ANTI-VIRUS

You know that feeling you get when, after a complete physical examination, the doctor shakes your hand and tells you you're as fit as a fiddle? Well, that's how I feel since installing *Central Point Anti-Virus* on my hard drive. The program assures me that my system is free of computer viruses. *Central Point Anti-Virus* not only checks your entire system

for any signs of viruses but also can remove viruses from infected files and provide continuous protection from infection. That supplies invaluable peace of mind.

Central Point Anti-Virus recognizes more than 400 viruses—nasty little bugs with names like Dark Avenger, Chaos, Disk Killer, Leprosy, Beast, and Friday the 13th. Even more frightening than the names of viruses is the wide range of symptoms you're likely to encounter if the viruses manage to infect your system. Symptoms range from the annoying (files increase in size, your system slows down, music plays over your PC speaker, or mysterious messages appear) to the disastrous (your hard drive reformats!).

Two memory-resident utilities, *VSafe* and *VWatch*, provide continuous protection. The highly configurable *VSafe* uses 22K of system memory and monitors your system at all times for suspicious activity. If free memory's scarce on your system, substitute the 8K *VWatch* instead. *VWatch* checks for the presence of known viruses each time a program executes or a disk is accessed.

You can install either utility as a COM file or as a driver. As COM files, the utilities can easily be removed from memory at any time with a couple of keystrokes. You can't disable the driver versions of these utilities, but since they load into memory before *COMMAND.COM*, they automatically check this file for viruses.

Bootsafe, a utility run from your *AUTOEXEC.BAT* file, protects your system against viruses that try to infiltrate the boot sector on your hard drive. During installation, the program creates images of your boot sector and parti-

tion table and stores them in a hidden image file in the root directory of your hard drive. Then each time you boot your system, the program looks for existing boot sector viruses by comparing the current boot sector and partition table with those in the image file.

As with *VSafe* and *VWatch*, *Bootsafe* is completely optional during installation. If you don't think you need continuous protection, you can simply load *Central Point Anti-Virus* periodically to scan for viruses. If you choose to use the program in this manner, it will even remind you at regular intervals (user-selectable from one week to three months) to scan your system. Despite the sophistication of *Central Point Anti-Virus*, the program remains very easy to use, with context-sensitive help available at all times and a clear and extremely thorough manual. Besides telling you everything you need to know to use the program, the manual explains how the program works and includes a

43-page Virus Dictionary, which lists close to 200 viruses and describes in some detail their symptoms and infection mechanisms. In addition, you can count on support from the Virus Protection Service Plan, which provides registered users with a virus hotline, quarterly mailings, online support via Central Point's BBS (or CompuServe), and one free upgrade. Now, that's a comprehensive PC health package.

BOB GUERRA

IBM PC and compatibles, 512K RAM—\$129, \$30 for registered owners of other Central Point products

CENTRAL POINT SOFTWARE
15220 NW Greenbrier Pkwy.,
Ste. 200
Beaverton, OR 97006
(503) 690-8090

Circle Reader Service Number 333

WINDOWS 3 POWER TOOLS

If you're interested in becoming a *Windows* power user, this is the book for you. Instead of concentrating on get-

—Wiz—ardry—

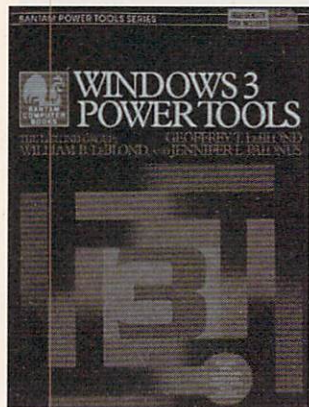
*I have died
of untold fear
and horror,
but my secret is safe—
for now*

CRUSADERS of the DARK SAVANT

As rich a tale as ever told

Circle Reader Service Number 136

ting-started information or the basics of using *Windows* accessories, this book-and-disk combination focuses on *Windows* itself, and it includes solutions to lots of knotty problems that plague intermediate and advanced *Windows* users.



Windows 3 Power Tools works the kinks out of *Windows*.

Windows 3 Power Tools delivers information on almost every aspect of running *Windows*. Early chapters deal with mastering *Program Manager*, *File Manager*, fonts, and *Recorder*. More advanced sections follow on *Clipboard* and *DDE*, memory management, and customizing *Windows*. The final chapters concentrate on improving the performance of *Windows* and using *Windows* on a network.

The section on *Windows* memory management is especially noteworthy. It's the clearest discussion of *Windows*' three modes of operation and how *Windows* uses expanded and extended memory I've read. There's also useful information on high-memory managers like QuarterDeck's *QEMM*.

The chapter on improving *Windows*' performance is excellent as well. If you've wondered what arguments you should *really* use to optimize

SMARTDrive's performance, this chapter will clear up the confusion.

In addition to these tips and techniques, *Windows 3 Power Tools* includes a disk full of some notable *Windows* software. Included are *Oriel*, a batch language for *Windows*; *Command Post*, Wilson Windowware's replacement for *Program Manager*; *Aporia*, a true object-oriented interface to *Windows*; and *IconDraw*, an icon editor. All are worth a look.

Since *Windows 3.0* hit the scene, scores of *Windows 3.0* books have appeared. *Windows 3 Power Tools* is the best one yet.

CLIFTON KARNES

Authors: The LeBlond Group—Geoffrey T. LeBlond, William B. LeBlond, and Jennifer L. Palonus
664 pages—\$49.95

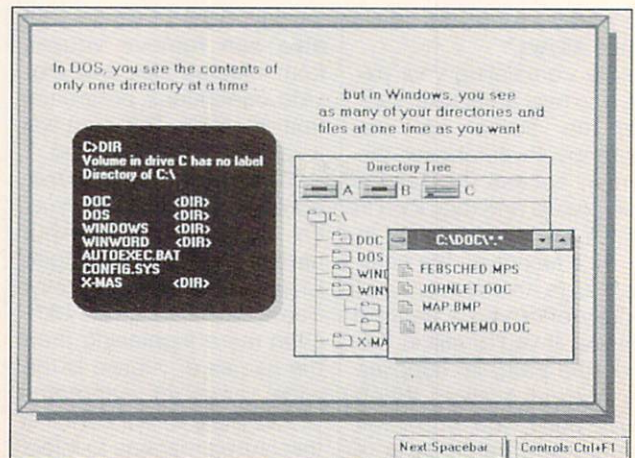
BANTAM COMPUTER BOOKS
666 Fifth Ave.
New York, NY 10103

Circle Reader Service Number 334

MICROSOFT PRODUCTIVITY PACK

If *Professor Windows* is for the computer-shy, *Microsoft Productivity Pack* is intended for the computer-literate. Its purpose is the same, teaching basic *Windows* skills to the new user, but it places greater confidence in that user's study habits and familiarity with computers.

The largest of the three modules included in *Productivity Pack*, *Learning Windows* provides sections on Getting Started, *Windows* Essentials, Working with Applications, Managing Your Files, Organizing Your Work, and A Day with *Windows*. Graphical representations of historical and fictional charac-



Microsoft Productivity Pack explains the fundamental differences between *Windows* and *DOS*.

ters lend each presentation a creative touch. *Cleopatra*, for instance, multitasks several *Windows* applications while designing the pyramids.

Productivity Pack doesn't quiz you as lessons proceed, so take notes like a good detective. You'll conclude *Learning Windows* by using the environment to help Sherlock Holmes solve a case. This calls on all your recently developed skills, and while you can always tab through this section to get at *Productivity Pack*'s answers, who wants to fail Sherlock Holmes?

The other two *Productivity Pack* modules, *Quick Troubleshooting* and *Working Smarter*, are simply fancy titles for problems and hints. Both topics offer *Windows* Help-style access to simple but effective information. These two areas give the impression of providing more material than they actually cover because many of the extensive help subbranches lead back to a relatively small number of answers.

Productivity Pack is a refreshing, hands-on approach to learning about the

GUI that conquered America. While you may find all the same information in the *Windows* manual, you won't get all the fun pictures.

BARRY BRENESAL

IBM PC and compatibles, *Windows 3.0* or later—\$59.95

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

Circle Reader Service Number 335

OPTIONS

Does the dreaded *DOS* command line interface get you down? Do your typing skills give rise to a *File Not Found* response more frequently than you care to admit? Do you have difficulty remembering obscure nested directory paths? Then replace the infamous *DOS* prompt with *Options*' point-and-click interface.

Options typically installs in the C drive and modifies your *AUTOEXEC.BAT* file to execute automatically at start-up. Alternatively, you could access the system by entering *MENU* at the *DOS* prompt. Menu options execute *DOS* commands,

Wizardry

A Fantasy Role-Playing Simulation by D.W. Bradley

CRUSADERS *of the* DARK SAVANT



Welcome to the sequel to Bane of the Cosmic Forge and the only game that could possibly follow its lead. It's everything Bane was...and more.

**256 Colors • Outdoor Campaigns • Full Musical Score & Sound Effects • Auto Mapping
True Point & Click Mouse Interface • Unprecedented depth of story**



Ogdensburg Business Center, Suit 2E Ogdensburg, New York 13669

To order or for a dealer nearest you call

1-800-447-1230

launch programs, or run batch files.

The program features time-saving macro capabilities, password protection to limit access to designated users or particular directories, plus a screen saver that blanks the screen after a user-specified length of time. You also get Tracking Control to keep records of computer usage, a Stopwatch function for time tracking (great for keeping time records on client phone calls), and pop-up calendar, calculator, and memory map accessories.

Options automatically loads functions into extended memory in order to lessen the amount of conventional memory required to run the application. Pull-down menus in the Edit mode and context-sensitive online help assist with program operation. The package provides users with several convenient features in one handy location. Isn't it time you considered your options to maximize productivity, guarantee system security, and minimize operator error?

CAROL HOLZBERG

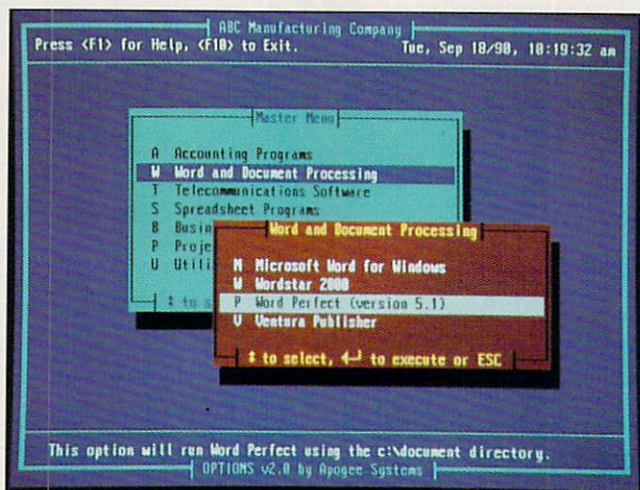
IBM PC and compatibles, 384K RAM, hard disk; mouse recommended—\$89.95

APOGEE SYSTEMS
717 630 Eighth Ave. SW
Calgary, AB
Canada T2P1G6
(403) 265-0675

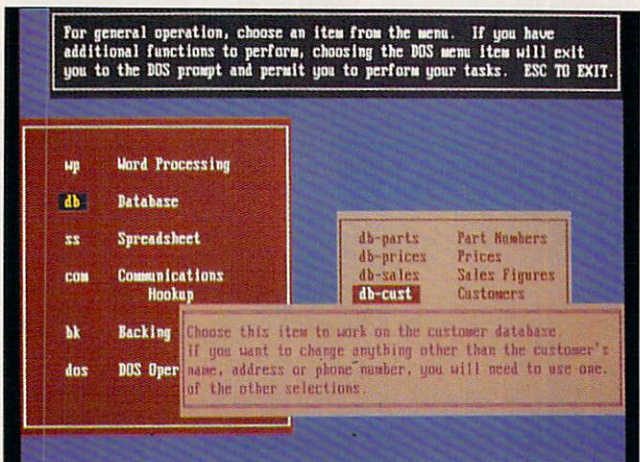
Circle Reader Service Number 336

PROKEY PLUS

Popular with experienced computer users, macros sometimes perplex or intimidate computer novices. Even a novice, however, can appreciate the advantages of macros. Substituting a single keystroke for a series of strokes, macros save time and prevent typing errors.



Exercise your options and do away with the DOS prompt.



ProKey Plus helps you write macros for every occasion.

Like most shortcuts, macros have some drawbacks. Creating macros so that Ctrl-E produces the closing lines of a letter and Ctrl-H writes letter headers only saves time if you can remember which key does what. *ProKey Plus* solves this problem. To help you write macros, *ProKey Plus* lets you annotate them. When you list your macros, you'll see a description of what a hot key does, rather than the usual litany of the component keystrokes. *ProKey Plus*, which occupies about 67K of RAM, interposes itself between your key-

board and any application you may be running. This means that you can use the program to define or execute macros from within your application programs.

Modern word processors are notorious for the complex keystroke sequences necessary to invoke their commands. *ProKey Plus* provides an alternative; I tested it with *WordPerfect*, arguably the word processor that puts you through the most rigorous keyboard gymnastics, and it worked satisfactorily. *ProKey Plus* is quite rapid in its response. I fault it only on

its documentation. The manual is not tutorial in nature and needs more explicit examples. Even so, *ProKey Plus* in your library might go a long way toward easing the tension between you and your word processor!

CHARLES IDOL

IBM PC and compatibles—\$129

ROESOFT
P.O. Box 70337
Bellevue, WA 98007
(206) 562-0225

Circle Reader Service Number 337

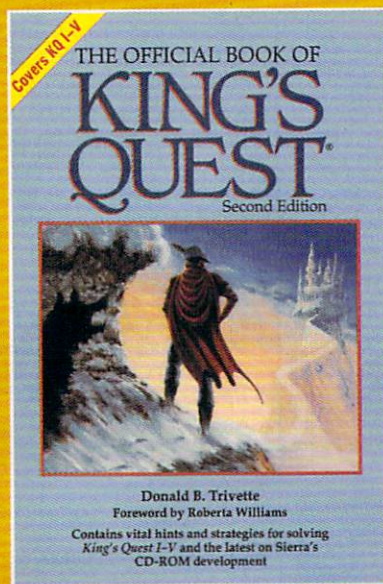
PC USA

How many outdated atlases, dictionaries, and encyclopedias do you have gathering dust? Well, for the atlas at least, the days are numbered. *PC USA*, a computer atlas program available from PC Globe, offers both a graphic representation of the United States and a comprehensive database of all sorts of useful and trivial facts. Now you need never miss a question in the geography section of your favorite trivia game.

In order to access all this great information, you use a standard imitation *Windows* interface. Commands lined all along the top of the United States map allow you to determine which database you want to enter and the level of detail involved. You'll also find mighty helpful the small insert that describes how to run *PC USA* through *Windows 3.0*.

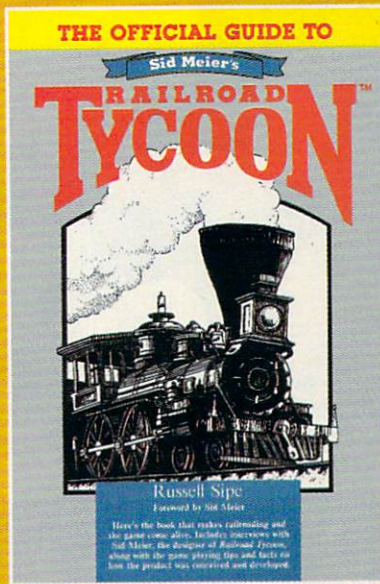
The manual itself adequately describes installation and all the various databases, though I ran the program effectively without much preparation. You also get a complete bibliography, which proves vital when determining the accuracy and currentness of the abundant information utilized in the program.

GET THE OFFICIAL CLUES TO THE HOTTEST GAMES!



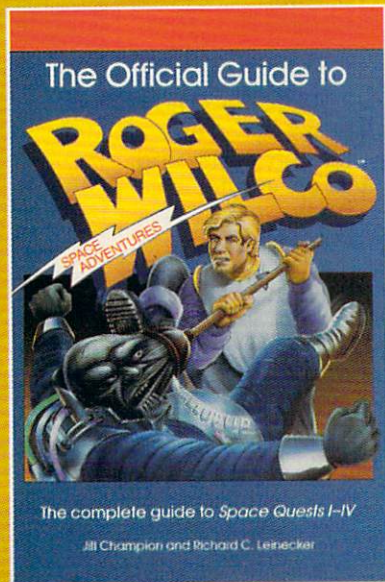
THE OFFICIAL BOOK OF KING'S QUEST, SECOND EDITION

Here's the source for hints, tips, and background for the newest adventure, *King's Quest V*. This new volume includes more clues, maps, and inside details, along with more ways to add even more fun to all five of the best-selling King's Quest games. Covers *King's Quest I - V*.



THE OFFICIAL GUIDE TO SID MEIER'S RAILROAD TYCOON

This is the book that makes railroading and the game come alive. Inside players will find interviews with Sid Meier, the designer of Railroad Tycoon, along with facts on how the product was conceived and developed. Also includes formulas the program uses to determine income and expense.



THE OFFICIAL GUIDE TO ROGER WILCO'S SPACE ADVENTURES

For the first time, Space Questers can learn what goes on in the mind of the most legendary janitor in the universe. Inside, you'll find complete maps for every Space Quest scenario, point values for every reaction, and Roger's walk-through to the finish of all the games. Covers *Space Quest I - IV*.

YES!

I want more hints and tips! Please send me the books checked below.

- The Official Book of King's Quest, Second Edition (2452) \$12.95
 The Official Guide to Roger Wilco's Space Adventures (237) \$14.95
 The Official Guide to Sid Meier's Railroad Tycoon (2443) \$12.95

_____ Total Number of Books

_____ Total Cost of Books Ordered

_____ Sales Tax (Residents of NY, NC, and NJ add appropriate sales tax for your area. Canadian orders add 7% goods and services tax.)

_____ Shipping and Handling: \$2 per book U.S.; \$4 Canada; \$6 foreign.

_____ Total Enclosed

Check or Money Order MC VISA

Signature _____ (Required)

Acct. No. _____ Exp. Date _____

Name _____ Please Print

Street Address _____

City _____ State _____ Zip _____

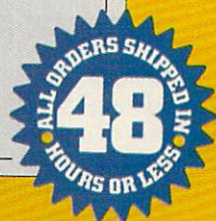
All orders must be paid in U.S. funds drawn on a U.S. bank.

Mail this entire coupon to:

COMPUTE Books
 c/o CCC
 2500 McClellan Ave.
 Pennsauken, NJ 08109

Offer good while supplies last.

10H91C



PC USA's database contains a staggering number of facts about every state in the U.S. The information ranges from age distribution, population, ethnic groups, and education statistics to annual pay by industry, taxes, gross state products, and (my personal favorite) state songs. There are dozens more information categories accessible. Search and enjoy; the information appears to be as current as possible.

The rather lackluster relief maps of the various states disappointed me a bit. Whether the Rockies or the Appalachians, all mountains resemble anthills, and with the exception of rivers, no real terrain differentiation shows. Also, even though PC USA utilizes music, no sound boards are supported. Finally, technical support calls aren't toll-free.

The abovementioned minor problems hardly mar the most comprehensive and useful geographical database I have seen. PC USA's applications seem as numerous and varied as the people who will use them, and I can't recommend this program more highly. Now, if I could just find something to replace those clunky volumes of encyclopedias.

ADAM STARKWEATHER

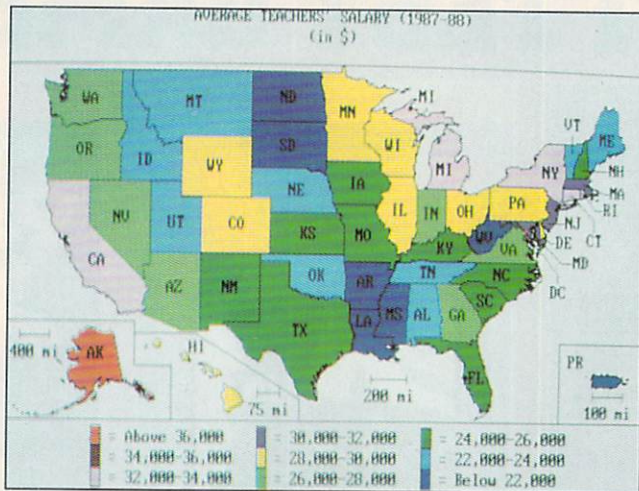
IBM PC and compatibles, 640K RAM, CGA, EGA, MCGA, VGA, Tandy 16-color, or Hercules—\$69.95, annual update—\$25.00

PC GLOBE
4700 S. McClintock
Tempe, AZ 85282
(602) 730-9000

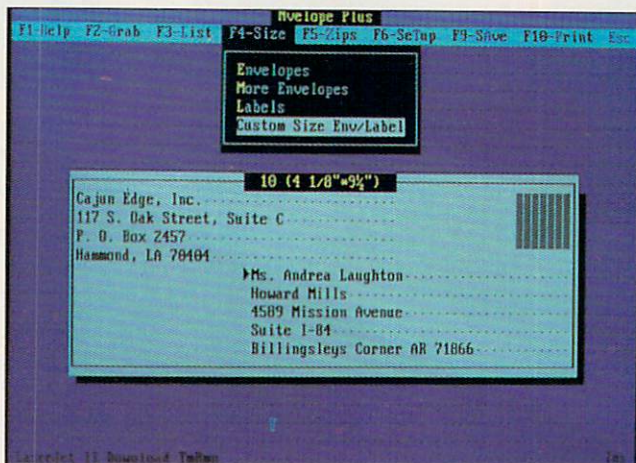
Circle Reader Service Number 338

NVELOPE PLUS

Designed to make envelope printing a snap, *Nvelope Plus* offers several features which account for the *Plus* in the title: the ability to print addresses easily in different



PC USA puts all manner of intriguing statistical and geographical data at your fingertips.



Lick envelope-addressing problems with *Nvelope Plus*.

fonts, to choose one of many envelope and label types offered or customize your own, to add ZIP codes from a comprehensive ZIP code database, and to create a thorough personal database of addresses.

As a memory-resident program with readily modified hot keys, *Nvelope Plus* pops up easily in an existing address database, in a word processing program, or anywhere else you might have addresses tucked away. Once summoned, *Nvelope Plus* makes grabbing an address for printing onto an en-

velope or address label marvelously simple. You can easily specify the size and type of envelopes and address labels, as well as whether they have a preprinted return address.

Nvelope Plus has a clear, effective user's manual, though once the program has been loaded, it needs little explanation. The envelope screens clearly display how the end product will look. If you place an envelope properly in your printer, you get what you expect.

Nvelope Plus performs its primary task quite well, with

enough extras to elevate it above the status of a typewriter substitute. Finding a ZIP code for any city in America with the built-in ZIP code directory, for instance, can save quite a bit of time. Without *Nvelope Plus*, the simple task of printing an envelope isn't as simple as it seems. With it, there's one less hassle to slow you down.

EDDIE HUFFMAN

IBM PC and compatibles, 256K RAM, LaserJet, PostScript-compatible, or Epson-compatible impact printer; hard disk recommended—\$49.95

CAJUN EDGE
117 S. Oak St., Ste. C
P.O. Box 2457
Hammond, LA 70403
(800) 448-2970 (outside Louisiana)
(504) 542-0410

Circle Reader Service Number 339

CONTACT MANAGEMENT

Success in a sales office hinges on productivity. Beacon's *Contact Management* provides an individual salesperson or networked sales office a way to manage daily sales calls more productively. *Contact Management* provides reams of useful information to salespeople and managers.

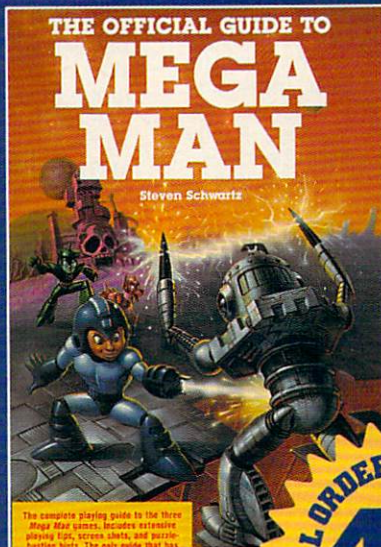
With a simple, one-line menu across the bottom of the screen, *Contact Management* proves simple to use. If you need to see additional program options, a simple touch of the F1 key brings up a full-blown menu/help screen, showing the software's options. As sales calls come in or go out, salespeople will have complete information about prospects or customers right at their fingertips.

Having this information readily available is much more important when you have incoming calls and

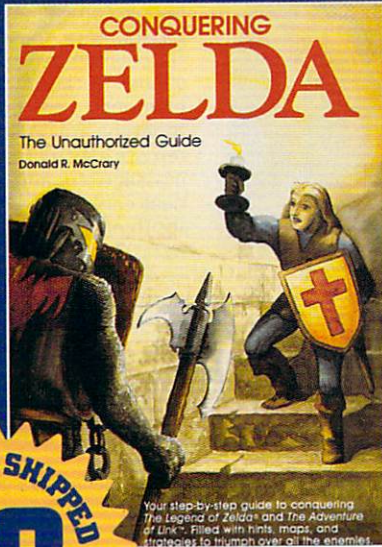
CONQUER NINTENDO®

WITH THESE BOOKS FROM COMPUTE

THE OFFICIAL GUIDE TO MEGA MAN



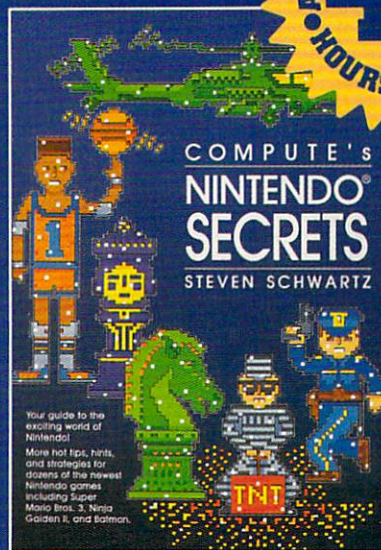
Defeat the power-mad scientist, Dr. Wily! Make your way through Monsteropolis! Defend all of Mankind! Finally, here it is—the complete playing guide to all three of the best-selling Mega Man games. 144 pages, \$7.95



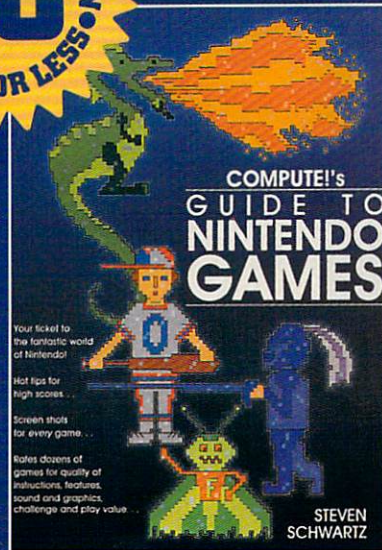
CONQUERING ZELDA: THE UNAUTHORIZED GUIDE

Finally—the hints and techniques you need to conquer two of the most popular Nintendo games, *The Legend of Zelda®* and *The Adventure of Link™*. Step-by-step instructions to rescue the princess! 128 pages, \$7.95

COMPUTE'S NINTENDO SECRETS



More strategies, hints, tips, reviews, and ratings for dozens of the newest, most popular Nintendo games. Maxout scores on Super Mario Bros. 3, Batman, Ninja Gaiden II, and more. 198 + 8 color pages, \$8.95



COMPUTE'S GUIDE TO NINTENDO GAMES

Packed with hints and tips for better play and dozens of reviews of available game cartridges for the Nintendo Entertainment System. 272 pages, \$9.95

ALL ORDERS SHIPPED IN 48 HOURS OR LESS

YES! I want more hints and tips.

Please send me the books checked below.

- COMPUTE!'s Guide to Nintendo Games (2214) \$9.95**
- COMPUTE!'s Nintendo Secrets (2346) \$8.95**
- Conquering Zelda: The Unauthorized Guide (2397) \$7.95**
- The Official Guide to Mega Man (2417) \$7.95**

Subtotal _____
 Sales tax (Residents of NC, NY, & NJ add appropriate sales tax. Canadian orders add 7% goods and services tax.) _____
 Shipping and Handling: \$2 per book US; \$4 Canada; \$6 foreign. _____
 Total Enclosed _____

Check or money order MC VISA

Signature _____ (Required)

Acct no. _____ Exp. Date _____

Name _____

Street Address _____ (No P.O. Boxes please)

City _____ State _____ ZIP _____

All orders must be paid in U.S. funds drawn on a U.S. bank. Orders will be shipped via UPS Ground Service. Offer good while supplies last.

**MAIL TO Compute Books
 c/o CCC
 2500 McClellan Avenue
 Pennsauken, NJ 08109**

Nintendo and *The Legend of Zelda* are registered trademarks of Nintendo of America, Inc. *The Adventure of Link* is a trademark of Nintendo of America, Inc.

10G91C

MAIL ★ ORDER ★ MALL



▼ BACK RELIEF BY POLLENEX

Are you one of the millions of Americans who suffers from low back pain? Do hours of prolonged sitting leave you aching or numb? If so, then the Pollenex Back Relief is just what the doctor ordered. Back Relief's unique design cradles your back in comfort and features multiple combinations of massage and heat. The inflatable lumbar cushion conforms to the shape of your back. Dual massaging elements can be used separately or together for full back massage. Handy remote control lets you select upper/lower massage, low and high intensity as well as heat control. And the soothing massager works 2 ways—adapter

#1 plugs into any indoor electrical outlet while adapter #2 plugs into car, van, or truck cigarette lighter. So Back Relief is perfect for car, home, or office. Plush, durable fabric cover adds extra comfort. **\$119.98** (\$6.75) #A2001.



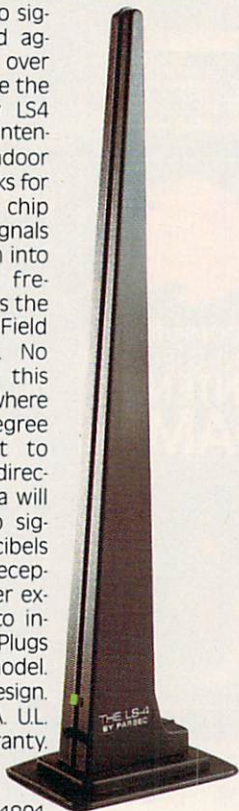
▼ INNOVATIVE IONIZER

A sophisticated electronic device that uses nature's way of cleaning air — emitting trillions of negatively charged ions that act like magnets, attracting microscopic particles of dust, smoke and pollen. One belongs in every room, but sometimes a table-top ionizer just isn't practical or desirable for reasons of space or your decor. This tiny unit (1½" x 3") provides an ingenious solution, plugging right into any wall outlet, where it will remain inconspicuous while performing its mighty task. With "on" indicator light and collector pad that can be rinsed and, eventually, replaced. By Pollenex, for fresher air in home or office. **\$39.98** (\$4.00) #A1867.



▼ THE BEST RECEPTION EVER!!

Eliminate radio signal fade and aggravating cross over signals that garble the sound. The new LS4 omni-directional antenna is the only indoor antenna that thinks for itself. The micro chip brain receives signals and isolates them into individual clear frequencies. Features the Gallium Arsenide Field Effect Transistor. No need to redirect this antenna. Leave it where it is and its 360 degree radius allows it to receive from any direction. This antenna will boost your radio signals up to 24 decibels for the clearest reception you have ever experienced. Easy to install, light weight. Plugs into any stereo model. Unique modern design. Made in the USA. U.L. listed. 1 year warranty. Dimensions: 3" x 4.125" x 17.25". **\$58.98** (\$5.25) #A1891.



▼ EVERYTHING BAG

People on the go always have so much to carry around. The Everything Bag makes it a snap. This oversized shoulder bag is constructed of tough, water-resistant canvas material and features nine roomy pockets. Plus, an unusual zipper design enables the bag to expand to double its normal width—to a full eight inches. Adjustable 2" wide straps provides a real comfort feature. In 3 great colors. **\$24.98** (\$4.00) #A1955-Blue, #A1956-Khaki, #A1957-Gray.



▼ FOOD FOR WOOD

Most of the convenience waxes you buy actually dry out wood instead of nourishing it. What's the alternative? Our choice is Williamsville Wax. It is made of beeswax and lemon oil, heat-blended with other natural oils. It can be used on any type of wood, any type of finish, on paneling or kitchen cabinets as well as fine furniture. Williamsville Wax is super for restoring neglected or mistreated wood. Two 8-oz. bottles cost **\$13.98** (\$3.25) #A14312.



▼ NIGHT TRACKER™

Light up your night! Night Tracker™, the cordless, rechargeable hand-held spotlight packs a 500,000 candlepower beam to give you a light whenever, wherever you need it. The beam is 10 times brighter than your automobile headlights and will carry over 1 mile. Operates on rechargeable batteries or recharge it from 110 volt AC outlet or from any 12 volt car or boat outlet. Perfect for home, travel, boating and camping. Made in the USA and comes with a 90 day warranty. Now featured with amber and red lens attachments. **\$79.98** (\$6.25) #A1975.



CALL TOLL FREE 24 HRS. 7 DAYS 1-800-722-9999

TO ORDER: Send check with item number for total amounts, plus shipping & handling shown in () payable to **MAIL ORDER MALL**, DEPTCP-101; P.O. Box 3006, Lakewood, N.J. 08701, or call TOLL FREE **1-800-722-9999**. NJ residents add 7% sales tax. We honor MasterCard, Visa, and American Express. Sorry, no Canadian, foreign, or COD orders. **30 day money back guarantee for exchange or refund.**

▼ CAR-THEFT PROTECTION — WITH NO INSTALLATION

With Sonic Sentry, the value of a car alarm brings you peace of mind — without the expense and bother of installation. You can switch it from one vehicle to another. Just plug Sonic Sentry into the cigarette lighter; cord reaches 5 feet, so the unit can occupy dash or seat when vehicle is parked, where the flashing lights can make a browsing thief think twice. The petite 4½" x 4¼" x 2" box is capable of emitting a truly ear-piercing alarm, concentrated inside the car, where it can most effectively repel an intruder. Activated by the light that accompanies the opening of car door, hood or trunk, it also senses impact or "unnecessary roughness"; the shriek lasts for one minute and only the key stops it — unplugging the lighter activates a back-up battery. Stuck on the road? Switch Sonic Sentry to its mode showing HELP in flashing red lights and put in the window to attract aid. It's protection you can't afford not to have, at **\$74.98** (\$7.00) #A1989.



▼ STEP UP TO A HEALTHIER YOU

Doctors, physical trainers, and athletes agree that stair climbing is one of the best forms of aerobic exercise. You can achieve your fitness goals without the severe jarring or pounding associated with running or jogging. That's why the foldaway ExerClimb™ is the perfect piece of exercise equipment. The ExerClimb™ improves cardiovascular function, increases endurance, burns body fat, and conditions major muscle groups to tighten and tone upper body, thighs, hips, buttocks, and calves. And results can be seen with a twenty minute workout three times a week. It is quiet enough to let you exercise while watching TV, or listening to your favorite music. The hydraulic powered ExerClimb™ features sturdy steel construction, magnum series shocks and individual tension adjustment to insure a high intensity, low impact workout. Compact and lightweight (28 lbs.) this incredible machine fits in virtually any size room. When opened for use, it measures 28"H x 27"L x 16"W. Plus, its unique fold-away feature makes carrying and storage a snap. Perfect to take along to your office, trips, or almost anywhere. Some assembly



required, using only screwdriver and pliers. For all these great features, one would expect to pay much more, but the ExerClimb™ has a very trim price tag. So now there is no reason not to "step" into better shape. Ninety day warranty. **\$119.98** (\$15.00) #A1998.



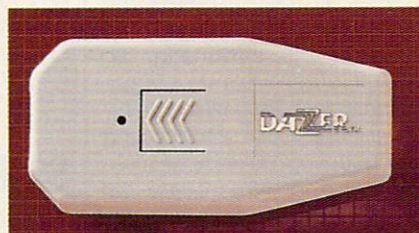
▼ SHARPEST OF THE SHARPENERS



The classic knife sharpening tool is the butcher's steel, but most people find it intimidating. The Chantry Knife Sharpener duplicates butcher steel action but makes it so simple anyone can sharpen and realign a blade edge perfectly in moments. As the knife edge is drawn between a pair of hard (Rockwell 64-65) Sheffield Steel rods, spring-loaded at just the proper angle, both sides of the blade are aligned. Works on stainless or carbon steel knives, straight or serrated edges. The Chantry is made of heavily enameled steel, can be countertop mounted. It is included in the permanent design collection of the Museum of Modern Art. **\$34.98** (\$5.00) #A1878.



▼ THE DAZER™



Even the most dedicated canine aficionado can sometimes encounter unfriendly dogs. Dazer™ provides a humane way to repel their advance, emitting ultrasonic sound waves inaudible to humans and totally safe for dogs (unlike mace and other common deterrents). Pocket size (4¾" long) plastic case can also clip on belt; takes 1-9V battery, included. For joggers, hikers, bikers, seniors and kids—plus the proverbial postman. **\$29.98**, (\$3.00) #A1829X.

CALL TOLL FREE 24 HRS. 7 DAYS 1-800-722-9999

TO ORDER: Send check with item number for total amounts, plus shipping & handling shown in () payable to **MAIL ORDER MALL**, DEPTCP-104; P.O. Box 3006, Lakewood, N.J. 08701, or call TOLL FREE **1-800-722-9999**. NJ residents add 7% sales tax. We honor MasterCard, Visa, and American Express. Sorry, no Canadian, foreign, or C.O.D. orders. **30 day money back guarantee for exchange or refund.**

PENTHOUSE MAGAZINE COMES ALIVE ON YOUR COMPUTER!



Try the New **ONLINE SERVICE** of PENTHOUSE MAGAZINE. It's incredible! You can finally use your computer for something that you will truly enjoy. You'll be able to:

- DOWNLOAD beautiful color images of Penthouse Pets**
- Have UNINHIBITED CHAT with Penthouse Pets and special guests from around the world**
- Receive revealing ELECTRONIC MAIL from other members**
- Experience much more!**

We'll even provide the software to maximize your computer's graphic abilities!



**TO GET YOUR COPY OF OUR SOFTWARE,
AND INFORMATION ON HOW TO ACCESS THE SYSTEM IN YOUR AREA, USE YOUR MODEM TO DIAL:**

1-900-463-8300

Just 50¢ Per Minute. You Must Be 18 Years Of Age Or Older.

don't have time to prepare your presentation. When a customer calls, there's no need to tell him to hang on for a few minutes while you frantically fumble through a dozen legal pads, looking for what you last discussed on the telephone. Just pull the appropriate information up on *Contact Management*, and then, before taking an order from your customer and scheduling delivery or making an appointment, you can quickly key up your calendar to check for any conflicts on your end.

Contact Management also provides you with preconfigured reports. You can use this information in a sales office to analyze top salespeople. Whom do they call? How many calls a day do they make? How often do they contact their customers? All this information makes this software an invaluable tool for the salesperson or sales office and will likely boost productivity. Though priced a bit high for many home us-

ers, those with the capital and the need shouldn't miss this opportunity to improve efficiency.

PEER PLAUT

IBM PC and compatibles, 512K RAM, hard drive—\$349 single user, \$695 multiuser, \$75 per node

BEACON SOFTWARE
222 N. Huron St.
Toledo, OH 43604
(419) 242-3888

SANTÉ

Can't afford the services of a registered dietitian to put you and your menus in a healthful frame of mind? *Santé* puts one in your kitchen. The government's nutritional guidelines come built in and make eating for optimum health less troublesome.

Developed by Hopkins Technology with the assistance of a registered dietitian, *Santé* describes the nutritional content of over 2000 foods and analyzes how your meals measure up against the U.S. Recommended Dietary Allowances

(USRDA) for your age and gender. The program offers analyses of food, which check specifically for 29 nutrients, compare saturated and unsaturated fats, and calculate the percentage of protein, carbohydrates, and fats in your diet.

Analyze a single food, recipe, meal, day, or range of days; the results are displayed or printed in easy-to-read reports and bar charts. Some discoveries prove unpleasant: Your Sunday eggs, bacon, and biscuits give you double the maximum USRDA for cholesterol.

You say you want healthful alternatives to your old standbys? Try the 12 included recipes and the hundreds you receive once you've registered as a *Santé* owner. All recipes are dietitian tested, and you can import them—and your own recipes—with the touch of a key.

Plan a week's worth of meals and make adjustments to reduce the fat or in-

crease the calcium. See how you've done over a month's time—some days you may not do well, but over the long haul, *Santé* keeps you on track, nutritionally speaking.

The program's friendly interface features pull-down menus you navigate with the arrow and Enter keys. Online help nearly makes the manual dispensable, explaining program functions and providing information about each nutrient.

If you consume something not in the database, you can personalize the food list. You can also enter ingredient prices; *Santé* calculates the cost of meals.

Hopkins promises to provide personal replies to all questions about the program and nutrition. Believe the promise. I found a bug, and tech support went to work, fixed it, and had a new version in the mail in no time. *Santé* is inspirational. I'm more conscientious about my diet, and I know I'm eat-

Advertisers Index

Reader Service Number/Advertiser	Page	Reader Service Number/Advertiser	Page	Reader Service Number/Advertiser	Page
159 900 Software	158	Magalog Marketing Group	150,151	132 The Other Guys	A-13
107 Abracadata	155	146 Meggido	A-5	195 Universal Memory	34, 35
161 Access Software	118,119	MicroLogic	23	198 Villa Crespo	103
142 Action Management	154	138 MicroMiga	A-28	178 Virgin Games	122,123
162 Bare Bones Software	A-11	158 MicroProse	105	179 Virgin Games	124,125
112 BOBCO	G-6	157 MicroProse	27	105 Virgin Games	103
207 CH Products	13	169 MicroProse	117	172 Wedgwood Computer	157
166 Citizen	7	153 Mission Control	137	118 WOL/Learning Adventure	53
184 Commodore	69	186 Montgomery Grant	A-3		
103 CompuServe	17	187 Montgomery Grant	G-5		
118 Computer Business Services	157	133 Motion Blur Publishing	A-19		
114 Computer Direct	42,43	176 My Storybook	156		
141 Computer Productions	157	National Videotex Network	81		
137 Covox	158	153 New World Computing	IBC		
125 Creative Labs	2	119 Nordic Track	129		
139 Creative Specialties	G-21	122 NRI/McGraw Hill	64,65		
Damark	71	196 NSI Computer Products	88,89,90,91,92,93,94,95,96		
165 Data East	111	104 Origin	11		
148 Davidson	21	185 Poor Person Software	A-19		
120 DCS Industries	57	199 Power-Up	48		
180 Delphi	72	157 Power-Up	49		
131 DemoSource	156	193 Professional Cassette	25		
171 Digital Dynamics	A-25	151 Professor Jones	154		
Disk-Count Software	155	168 Psynosis	109		
General Car Rental	9	116 SeXy Software	158		
197 GEnie	5	154 Sierra OnLine	BC		
149 GFXBase	A-15	136 Sir-Tech	139,141,143,145		
128 The Grapevine Group	G-14	109 Smart Luck Software	156		
117 Holosoft Technologies	A-28	121 Software of the Month Club	155		
The Hunter Group	120	126 SoftShope, Inc.	156		
177 IHT Software	G-21	SOGWAP	G-15		
190 I. Leonard & Company	156	152 Spectrum Holobyte	15		
134 Interplay	IFC	173 Spectrum Holobyte	131		
135 Interplay	1	167 Spectrum Holobyte	129		
111 Lucasfilms	85	130 Starware Publishing	157		
183 Lucky Computer	155	191 Strictly Personal	133		
127 LWS Software	157	170 Tenex	G-13		

Amiga Disk Resource	A-23
Amiga Resource Subscription	142
Best Amiga Utilities Disk	A-29
COMPUTE Books	60,115,131,135,147,149,156,G-9
COMPUTE Subscription	113
COMPUTE's GEnie OnLine	55
COMPUTE's Quantum Q-Link	G-7
COMPUTE's "The Hot Disk"	47
Gazette Disk Library	G-11
Gazette Disk Subscription	G-15
Gazette Productivity Manager	G-17
Mean 18 Golf Course	A-7
PC Disk Subscription	51
PC Power Disk Subscription	83
PC Productivity Manager	77
Penthouse	152
SharePak Disk Subscription	29
SpeedScript Disk	G-21

ing better now than before I installed *Santé*. After all, now I have a dedicated dietician looking over my shoulder.

KAREN LEE SIEPAK

IBM PC and compatibles, 512K RAM, hard drive with minimum 2MB available—\$59

HOPKINS TECHNOLOGY
421 Hazel Ln.
Hopkins, MN 55343
(800) 397-9211
(612) 931-9376

Circle Reader Service Number 341

PROFESSOR WINDOWS

A graphically oriented environment's bound to throw longtime DOS users a curve or two, but learning the basics of *Windows* shouldn't cause any anguish. If you've been holding off installing *Windows* because you dread the climb up the learning curve, look to *Professor Windows* for a lift. It's a friendly program that walks you through the sometimes con-

fusing world of *Windows*.

Using either the mouse or the keyboard, you can learn about such matters as simple graphics objects, *Windows* accessories, getting help, and printing. Subjects are arranged in six areas (startup, basics, tasks, printing, accessories, and advanced), and you can move ahead or back one screen, or jump completely out of a tutorial at any time.

Though elementary, treatment of the material proves effective within its defined boundaries. Users answer simple multiple-choice questions on newly learned facts. A bar display of continuing progress through each lesson sustains the sense of accomplishment.

Ironically, in spite of *Windows*' multitasking environment, *Professor Windows* won't load when anything else remains open, excluding *Program Manager*. It will freeze if you run it under a *Windows* shell (like *DC Windows Express* or *PubTech*

File Manager).

Professor Windows won't help everyone; it's strictly for novice users and probably not advanced enough for longtime PC users. *Professor Windows* does assuage computer anxieties if you have them, and if you need a little assistance to jump-start your *Windows* career, *Professor Windows* could be

just the patient tutor that you've been waiting for.

BARRY BRENESAL

IBM PC and compatibles, hard drive, *Windows* 3.0 or later—\$49.95

INDIVIDUAL SOFTWARE
5870 Stoneridge Dr., #1
Pleasanton, CA 94588
(800) 822-3522 (sales)
(415) 734-6767

Circle Reader Service Number 342

CREDITS

Page 6: Grant Faint/Image Bank; pages 18–19: Uniphoto; page 30: Mark Wagoner; page 31: Mark Wagoner; page 32: Mark Wagoner; page 37: Mark Wagoner; page 38: Mark Wagoner; pages 44–45: Steven Hunt/Image Bank; page 54: Grant Faint/Image Bank; pages 74–75: Mark Wagoner; page 76: Robert Tinney/The Stock Market; pages 78–79: Steven Hunt/Image Bank; page 80: Steven Hunt/Image Bank; page 84: Jeanette Adams; page 86: Mark Wagoner; page 87: Mark Wagoner; page 97: Elle Schuster/Image Bank; pages 98–99: Mark Wagoner; page 106: Mark Wagoner; page 108: Peter Simon/PhotoTake; page A-2: John Banagan/Image Bank; pages A-8–9: Myron J. Dorf/The Stock Market; page A-16: David Maenza/Image Bank; page A-20: Lisa Pomerantz/Image Bank; page A-32: Hans Welder/Image Bank; pages G-2–3: Elle Schuster/Image Bank.

COMPUTE's Product Mart

is a special advertising section designed to benefit you, the PC direct marketer, by letting you advertise directly to the readers that buy. We offer:

• Marketing Assistance

Each ad receives a complementary reader service number that generates a targeted sales lead mailing list.

• Qualified Readers

Our readers search the Product Mart for quality hardware, software, and peripheral products they can buy.

• Guaranteed Audience

Our rate base is guaranteed at 275,000 per issue, with an actual monthly circulation of over 300,000.

• Cost Effectiveness

Ad sizes range from 1/9 (2¼ x 3¼) to 1/2 page (vertical or horizontal), and you can request frequency rates of up to 12 times per year. Second color is available.

Space closing: First day of the second month preceding issue date (for example, November issue closes Sept. 1). Space limited to a first-reserved, first-served basis.

For ad specifications
or more information call

East Coast & Midwest
Caroline Hanlon • (919) 275-9809

New England
Jack Garland • (617) 749-5852

West Coast
Lucille Dennis • (707) 451-8209

Call now to reserve your space!

PRE-SCHOOL SOFTWARE

NEW! TALKING SOFTWARE for Kids 0-4 Years Old

*(At Last! Software Designed to
Make Your Child Smarter!)*

Now! You can Easily give your Child a Learning Headstart with Kiddyware Pre-School Software. Developed by Elementary Teachers, Kiddyware is the most Complete & Easy To Use, Pre-School Software available Today. Here's Why:

• Over 12 Fun Lessons that teach your child:

- Alphabets & Numbers
- Shapes, Colors & Directions
- People, Places & Things
- Body Parts (Eyes, Nose, Etc.)

• **137 Graphic Screens** filled with Exciting Animation, Sound, Pictures, Colors and Music.

• **AMAZING!** 93 Word Built-In Speech & Sound Vocabulary

• **TALKS THROUGH YOUR PC**
No Additional Hardware Required.

• NO SPECIFIC KEY-PRESSES REQUIRED!

(Kids Press Any Key To Operate)

• NO ADULT SUPERVISION REQUIRED!

Start it, Adjust it & Leave.

• **Tested & Proven Effective** with children Ages 0-4.

Put your child ahead of the pack! Order Kiddyware Pre-School. Don't Wait. Start your child's education today. **100% Money-Back Guarantee**

Act Now! **\$23.95** + \$3 S&H To:

Send **\$23.95** S&H To:
Action Management, Inc.
915 S. Grand Traverse, Suite B7
Flint, MI 48502
1-800-964-KIDS

MC/VISA/COD/CHECK/MO
CGA, EGA, or VGA Req'd. Demo only \$5
Dealer Inquiries Invited

HOT!



Circle Reader Service Number 142

Stockmarket • Baseball • Basketball • Lottery

DEMO
DISKS

PROF. JONES INC.

Free
Catalog

"1991"
Football

A. Grid Master	\$ 99.95
B. Pro Football	199.95
C. Bookie Buster	149.95
D. Collegiate Football	199.95
E. Bulletin Board	150.00

1991 Football Special
items A, B, C, D, & E
\$499.95

64.3%
1990

1-800-553-2256

1940 W. State St., Boise, ID 83702

Thoroughbred • Greyhound • Standardbred

Circle Reader Service Number 151

\$25.
Resource
Pkg.

Voice Mail Money Making Toolkit

\$50.
Trade-in
Value

Get CASH From Your Personal Computer!

Press 1 for Sales,
2 for Customer
Support, 3 for a
Live Operator...

Up to 16
channels
supported
on an AT

Generate thousands of dollars monthly in your spare time by adding our voice processing hardware and software to your existing IBM 286/386 personal computer or clone.

Starting at only \$299, your personal service bureau will offer voicemail/pager rentals, talking yellow-page advertising, senior's monitoring, or outbound prospecting for profit.

Our \$25 **Entrepreneur's Toolkit** provides a complete list of proven PC based opportunities, clip-art materials, and invaluable insight into starting your own business.

After your review, we invite you to cash-in your toolkit towards over \$50 in discounts on **DemoSource** products.

To ask questions / order your toolkit!



24
HRS

1 800 283-4759

LIVE



818 772-2514
COD's Welcome

A Few Home Based Ventures Featured In Our \$25 Toolkit!

NAME	DESCRIPTION	PACKAGE	DEMO KIT
BigmOuth	Voice Mailbox Rentals	\$299	818 772-7729
Voice BBS	Electronic Matchmaking	\$799	\$25
QuickLine	Write Programs in Basic	\$1125	\$25
ElderChek	Senior Citizen Check-In	\$1625	\$25

Trademarks represented belong to their respective publishers • Check state regulations before using outbound software

DemoSource

8646 Corbin Avenue • Northridge, CA • 91324 • USA

Circle Reader Service Number 131

Personalized Children's Books



Cash In On High Profits
Home Based or On Location

- Join the Fastest Growing Personalized Children's Book Company in the Industry
- Unlimited Support For Your Success.
- High Quality Hard Bound Books
- Each Color Story . . . An Educational Tool
- Limited Number of Dealerships Available

For More Information,
Call or Write:
MY STORY BOOKS, INC.

11408 Audelia Rd.
Suite 4845
Dallas, TX 75243

1-800-245-7757

A PROUD SPONSOR OF
CHILDREN'S LITERACY



The Official
Hint Book
from
Legend Entertainment Company

To order a copy of *Spellcasting 101 Hint Book* send \$9.95 plus \$2 shipping and handling (\$4 Canada, \$6 foreign) and applicable tax* to:

COMPUTE Books
c/o CCC
2500 McClellan Ave.
Pennsauken, NJ 08109

*Residents of NC, NJ, and NY add appropriate sales tax. Canadian orders please add 7% Goods and Services tax.

All orders must be paid in U.S. funds drawn on a U.S. bank. Please allow four weeks for delivery.

Offer good while supplies last.

10SP91C

SOFTSHOPPE, INC.
ASP Member

- ✓ Selected Programs
- ✓ Latest Versions
- ✓ As Low as \$1.50

FREE CATALOG
IBM PD/SHAREWARE
POB 3678, Ann Arbor, MI 48106

Call 800-829-BEST (2378)
or 313-761-7638
Fax 313-761-7639

Circle Reader Service Number 126

IBM SHAREWARE
EXCITEMENT

\$1.25 Per 5.25" Disk
\$1.50 Per 3.5" Disk

All The Popular New Programs
For XT's, AT's, and Windows.

No Minimum Order.
FREE CATALOG

In Hawaii 808-935-4614
All Others 1-800-654-2467
I. Leonard Co.
P.O. Box 5476, Hilo, HI 96720

Circle Reader Service Number 190

BEAT THE LOTTERY

29 Lotto Jackpot Winners Have Won
\$71.3 Million With GAIL HOWARD'S Systems!

ALL NEW COMPUTER ADVANTAGE™ \$49.50 + \$3 S/H
The ROLLS ROYCE of Lottery Software!!! Comes Loaded
With ALL State Lottery Results. Has 22 Charts & Reports.
Incredibly Fast-On Screen Instant Help-Printed Manual.

SMART LUCK® COMPUTER WHEEL™ \$39.50 + \$3 S/H
Has 252 Lotto Systems With Specific Win Guarantees.
Find One System That Fails Its Win Guarantee. And You
Get DOUBLE Your Money Back!

SMART LUCK COMPUTER WHEEL FIVE™ \$37.50 + \$3 S/H
220 Systems for pick-5 Lottos. Has Won EIGHT Jackpots.

FULL WHEEL GENERATOR™ \$28.50 + \$3 S/H Guarantees
a Jackpot If You Trap the Winning Numbers in Your Group.

COMPUTER WHEEL™ AND COMPUTER ADVANTAGE™
SAVE \$10.00! Buy BOTH For Only \$79 + \$3 S/H

We ship IBM/comp. 5.25" disk. Add \$1 for EACH 3.5" disk

SMART LUCK SOFTWARE

Dept. C-13, P. O. Box 1519
White Plains, NY 10602



1-800-876-G-A-I-L(4245) or 914-761-2333

Circle Reader Service Number 109

Where Adults Come To Play!

ODYSSEY

- Local Numbers Covering 700 U.S. Cities!
- CB-Style Group and Private Chat!
- 1000's Of Shareware Programs!
- Business and Personal Services!
- Travel & Flight Scheduling with OAG!
- Giant Message Forums & Classifieds!
- Live Multiplayer Games!
- Matchmaker Dating Database!
- Designed For Adult Users!

**FOR YOUR FREE DEMO
AND A LOCAL NUMBER NEAR YOU CALL
818-358-6968**
BY MODEM, 8/N/1-3/12/2400 BAUD

Circle Reader Service Number 141

SOFTWARE PREVIEWS

are only a phone call away
... the mail takes a little longer.

1-800-433-2938

Wedgwood Computer

5312 Woodway Drive
Fort Worth, Texas 76133



Circle Reader Service Number 172

Windows 3.0 BACKGROUNDS



**Easily
Convert
Images to
BMP, GIF,
IMG, MAC,
PCX, RLE**

MEGABYTES of color images in every product

- # 601 Swimsuits 16 color 14.88 256 color 19.88
- # 602, 603, 604, 605 and 606
X-Rated 16 color 14.88 256 color 19.88
- # 105 601 - 603 16 color 37.88 256 color 49.88
- # 106 604 - 606 16 color 37.88 256 color 49.88
- # 107 601 - 606 16 color 72.88 256 color 94.88

Send Check or Money Order to:
Starware Publishing Corporation
P.O. Box 4188 - Dept. 28
Deerfield Bch. FL 33442

Include \$3 S&H Add \$3 for 3.5"
Add \$3 for foreign (305) 426 - 4552 FL add 6%

MUST STATE AGE 21

Circle Reader Service Number 130

Earn \$4,000 Per Month From Your Home With A Computer!



FREE CBS 386SX Computer

Quit spending money on your computer and let it earn money for you. This is a proven turn key business an individual or couple can run. If you purchase our software and business program, we will give you the computer and printer. If you already own a computer, you may receive a discount. You do not need to own, or know how to run, a computer — we will provide free, home office training. Financing available.

Find out how other couples, and individuals like yourself, are building a lifetime income!

To receive a free cassette and color literature, call toll-free:

1-800-343-8014, ext. 303

(in Indiana: 317-758-4415) Or Write:

**Computer Business Services, Inc., CBC Plaza, Ste. 303,
Sheridan, Indiana 46069**

Circle Reader Service Number 118

Go WILD with STRATEGIC VIDEO POKER™

VERSION 3.0 is here! Now play Jacks or Better, Joker Wild, Deuces Wild, and Tens or Better video poker games with Strategic Video Poker — you'll never tire of the excitement, as you play like an expert.

We've selected 25 popular game versions, and added loads of new features, to provide you with more entertainment. With our on-line strategy advice, hand-tester, and hold-tester, you'll play like a pro. Select from our Standard or Expert modes. Use the Simulator to run millions of hands. Set your own payoffs, bet, coins, bankroll.

Not only do you get an on-line tutor, you can print any of the optimum playing strategies to take to the casino. You don't have to figure out payoffs, or "create" a strategy. Just use our pull-down menus to select games to play, print rankings, run the Simulator, or change parameters.

"It is the zenith of perfection," says Mario Graziosi of Mt. Ephraim, NJ.

"It simulates a 'casino-quality' video poker screen with excellent graphics," reports *PCM Magazine*.



For IBM PC and compatibles. Offers true VGA high-res graphics, as well as support for EGA, CGA, Hercules, and Mono.

Play all of the Joker Wild strategies of Bradley Davis — renowned author of the popular book *Mastering Joker Wild Video Poker*



LWS Software
Dept 4C • PO Box 688
Broomall, PA 19008
215-449-9767

Only \$49.95 + \$5 s/h (PA add \$3.30);
\$6 Canada; \$10 outside U.S. territories

MC/V: 800-828-2259 ext. 410

Circle Reader Service Number 127

EASY ACCESS TO OVER 15,000 TITLES



900 Software, Inc.

Presents Shareware & Public Domain

That you can have **INSTANTLY**
using your 1200 or 2400 Baud modem

FOR ALL IBM COMPATIBLE PC's

No Disk Fees • Tested Virus Free

Call Now & Get It Now! Avoid The Mail Order Mess & Risk

No need to order and wait, download and use it now.

SHAREWARE, the "Try Before You Buy"
concept is brought to you instantly. Most titles
transferred in 7 minutes or less*

Windows
3.0
Utilities

**THE BEST TITLES ...
THE MOST TITLES ... NOW!**

TOP NAME SOFTWARE FROM CATEGORIES INCLUDING:

- Business
- Desk Top Publishing
- Education
- Games
- Children's Programs
- Programming
- Power Users
- Special Interest
- Windows 3.0
- Desk Top Organizers
- Utilities
- Graphics
- Communications
- Reference
- Computer Aided Design (CAD)

**CALL NOW! AVAILABLE 24 HOURS
1-900-RUN-SOFTWARE**

1-900-786-7638 Set Modem To: 8,1,N
98¢/min. - \$2.50 1st minute - * 2400 Baud Modem

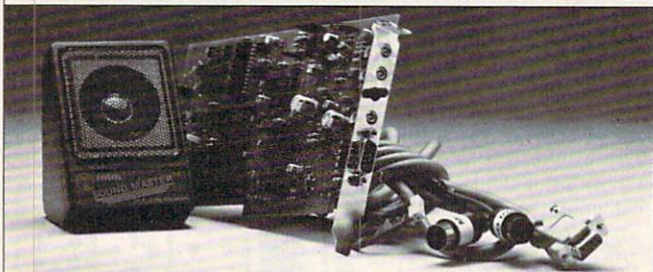
**"Use Your Modem To Select From A Menu
of Over 15,000 Titles Organized For Easy Selection
By Even Inexperienced Modem Users"**

900 Software, Inc. Voice Line (714) 289-0287
4642 E. Chapman, Suite #285 • Orange, CA 92669

Circle Reader Service Number 159

SOUND MASTER® II

THE MOST COMPATIBLE SOUND CARD IN THE WORLD



- A high quality alternative to "Sound Blaster". Better sound, less noise, more features.
- 100% AdLib™ Compatible.
- Covox Voice Master® (voice commands), Speech Thing®, and MIDI Maestro™ compatible. Internal PC speaker supported.
- All digitized speech and sound formats supported, including synthesized speech, PCM, ADPCM, & CVSD.
- "Direct-to-disk" DMA digitizer, variable sample rates to 25K/sec for recording, 44K/sec for playback.
- Full duplex MIDI interface. Cables and software included.
- FM Music, MIDI, and Digitizer can function together.
- Audio amplifier with volume control. Low noise, low power electronics. Speaker included.
- Proudly Made in the U.S.A.

Your Best Choice For Multi-Media Sound.

ONLY \$229.95 (plus \$5 Shipping & Handling)

ORDER HOTLINE: (503) 342-1271 M-F 8 AM to 5 PM PST.
VISA/MC/AMEX phone or FAX orders accepted. NO CODs. 30 Day Money
Back Guarantee if not completely satisfied. One year warranty on hardware.

CALL OR WRITE FOR FREE PRODUCT CATALOG



COVOX INC. 675 Conger Street • Eugene, OR 97402

Phone (503) 342-1271 • FAX 503-342-1283



Circle Reader Service Number 137

This
spot
is
seen
by
more
than
355,000
readers
each
month.



ADULT SOFTWARE

CONNOISSEUR COLLECTION

ALL NEW! In 256 Color VGA!!

- Disk #1 • An unbelievable visual encounter - MUST SEE!!
 - Disk #2 • NEW! 3 encounter games for friends and lovers guaranteed to shed both clothes and inhibitions.
 - Disk #3 • An anatomical arcade game with unusual ammunition.
 - Disk #4 • 2 more incredible visual encounters -impress your friends.
 - Disk #5 • Create your own fantasies about friends & lovers.
 - Disk #6 • NEW! View, print, or edit ten sizzling pictures including celebrities.
- \$7 each, any 3 for \$17, or all 6 for \$32. For IBM & compat. CGA, EGA or VGA graphics req'd.

Disk #CC1 • ★ YOU BE THE STAR ★ The FIRST CUSTOMIZABLE movie allows you to write the dialog and the title. You can star with the partner of your choice. Incredible scenes display with your dialog. ONLY AVAILABLE FROM US!

Disk #CC2 • THE FIRST SOUND MOVIE! The first computer movie with SOUND. See the incredible 256 color VGA graphics while hearing the actual dialog. OURS EXCLUSIVELY!

Disk #CC3 • THE BEST MOVIE! The best computer movie available. Only for the serious collector. 256 stunning VGA colors.
1 Movie \$29 2 Movie \$49 3 Movie \$65
All CC Disks Require VGA monitor and hard disk —over 1 MB of action.

SeXXcapades

- The FIRST adult game with TRUE SOUND and 80 sizzling color VGA scenes!
- Options for gender preference and game intensity
 - Play with 2-8 close friends • Over 5MB of pure action!
 - Fulfill your carnal passions with new experiences
 - Find out how you and your partner can better relate.
- \$79 — Special offer: \$69 with purchase of any CC1, CC2, CC3 disks above
OURS EXCLUSIVELY!

ADD \$3 S/H • 3.5" OR FOREIGN ORDERS ADD \$2 PER DISK • IN PA ADD TAX. MUST STATE AGE OVER 21.

VISA/MC Orders only
800-243-1515 Ext. 600FM

24 HRS./7 DAYS • Or check/MO to:
SeXxy Software, 2880 Bergey Rd., Dept 600FM, Hatfield, PA 19440
THE COMPETITION ISN'T EVEN CLOSE!!

Circle Reader Service Number 116

Conquering Super Mario Bros.®

Here's the book you need to beat all three Super Mario Bros. games. No matter where you're stuck, this is the book that will help you get back on the winning path. Bowser doesn't stand a chance!

To Order send \$7.95 plus \$2 shipping and handling for each book (\$4 Canada, \$6 foreign) and applicable tax* to:

COMPUTE Books
c/o CCC
2500 McClellan Ave.
Pennsauken, NJ 08109

* Residents of NC, NJ, and NY add appropriate sales tax. Canadian orders please add 7% Goods and Services tax.

All orders must be paid in U.S. funds drawn on a U.S. bank. Please allow four weeks for delivery.

Offer good while supplies last.

Super Mario Bros. is a registered trademark of Nintendo of America, Inc.

OCT91CSM

CLASSIFIEDS

BOOKS

DISCOUNT COMPUTER BOOKS. Thousands of titles available. Please call or write for your free catalog today. **BOOKWARE**, 147 Campville Rd., Northfield, CT 06778 (203) 283-6973 (800) 288-5662

BUSINESS OPPORTUNITIES

TRAVEL AGENCY

Start your own at home. \$2870. No license or bond. For free info/newsletter call: 1-800-926-5600

COMPUTER REPAIR

24 HOUR Computer Repair. Commodore, Amiga, IBM, Apple. A & M Computer Repair, 20 Guernsey Dr. New Windsor, NY 12553. 914-562-7271 1-800-344-4102

Auth. Comm. repairs C64/128, 1541/1571, SX64, 128D & Amiga. Selling DTK-comp computers. Quick service-30 day warranty MOM & POP's Computer Shop. 114 N. 16th, Bethany, MO 64424 (816) 425-4400

EDUCATION

B.S. & M.S. in COMPUTER SCIENCE

The American Institute for Computer Sciences offers an in-depth correspondence program to earn your Bachelor of Science and Master of Science degrees in Computer Science at home. BS. subjects covered are: MS/DOS, BASIC, PASCAL, C, Data File Processing, Data Structures & Operating systems. MS program includes subjects in Software Engineering and Artificial Intelligence, and other topics.

AMERICAN INST. FOR COMPUTER SCIENCES
2101 CC Magnolia Ave. South, Suite 200
Birmingham, AL 35205

800-767-2427

CALL (205) 933-0339

ENTERTAINMENT

SPEECH & MUSIC for IBM Comp!

Uses internal speakers. For demo disk send \$2.00 to: Bravo! Software, Demo/CO 1045 Griffin Ave., Mahtomedi, Mn 55115

GAMES

GAME MAKER KIT

Now you can create color, animated, graphic games for fun or profit - without programming! Easy to use menu driven PC game construction kit supports CGA, EGA, or VGA. Guaranteed. \$30 or free details.

GAME BUILDER

Box 312 • A Jackson, OH 45640
(614) 988-2331 Voice or (614) 988-2307 BBS

HARDWARE

SOFTWARE PLUS - Your Commodore, Amiga + IBM connection! 1000's of generic + orig. prgms, hardware + computer systems. For catalog, write: **SOFTWARE PLUS**, 64 W. Cutts, Biddeford, ME 04005 or call 207-284-9426.

MISCELLANEOUS

THE TEE SHIRT FOR PC LOVERS! In Ash or White! Choose: "PC Habit" or "Modem Habit" S-XL: Send \$13.98 + \$2.50 p&h (XXL+\$2) to: PC Habit, Inc. 13876 SW 56 St. Suite 125C, Miami FL 33175. Guaranteed! FL res add tax.

SILENCE YOUR PC!

Reduce or eliminate BEEPS & BUZZES from your computer. With a PC Silencer. Send \$12.95 (US) plus \$3.00 for postage and handling to: Advanced Solutions, 205 De Brullon, Boucherville, Que, J4B 2J6.

SOFTWARE

IBM - COMMODORE 64 & 128 - AMIGA. 1000's of PD/Shareware programs on 100's of disks. Free listing or \$1 for large descriptive catalog (specify computer). **DISKS O'PLENTY INC.**, 7958 Pines Blvd., Suite 270B, Pembroke Pines, FL 33024

PICK-3 & PICK-4 LOTTERY PLAYERS! LIP is the Lottery Inventory Program that gives you a fighting chance! IBM/Com. Only \$19.95 + \$2 s/h. OH add 6% tax. Specify 5/4 or 3/2 disk. OHIO res. ACT NOW and receive FREE 3-digit database (1980-1991 over 3700 entries) BL LIP Software P.O. Box 5044, Poland, Ohio 44514

IBM OR C64 USERS: 10 AWESOME DISKS jammed with 250+ virus-free programs! Only \$16 + \$3 s/h. Specify IBM or C64. Softcell dept-A Box 801 Tacoma, WA 98401

BUY/SELL used software! Lowest Prices! Free list. Specify 64/128, Amiga or IBM. Centsible Software, PO Box 930, St. Joseph, MI 49085. 616-982-0327

FREE! IBM PD & SHAREWARE DISK CATALOG Specify 5/4 or 3/2. Low prices since 1988! ASP APPROVED VENDOR, Finto Software, Dept M, Rt 2 Box 44, Rosebud, TX 76570

SOFTWARE



HAVE YOU WON THE LOTTERY? DO YOU OWN LOTTO PICKER? WELL, WHAT DID YOU EXPECT!

LOTTO PICKER is your ticket to the riches! **LOTTO PICKER** works by discovering the hidden biases in every lottery game worldwide. Using this info to your advantage **Lotto Picker** will tell you exactly which numbers to play - no guesswork involved. Your **Lotto Picker** card will be loaded with combinations and number patterns most likely to be selected! Plays all Pick 3,4,6,7,10,11. Also plays games based on playing cards (MS-DOS only). FREE telephone support with each purchase. For MS-DOS, Apple II, and C64/128. **NEW LOW PRICE \$29.95** (+\$4.55 s/h). NY add tax. **SATISFACTION GUARANTEED OR YOUR MONEY BACK!** **ORDER TODAY! 1-800-484-1062** s-code 0644 or 1-718-317-1961 **GE RIDGE SERVICES, INC.**, 170 Broadway, Suite 201-CP, New York, N.Y. 10038

FREE IBM SOFTWARE CATALOGS. \$1 mails your name to 12 dealers or 50 for \$4. DEALERS: your offer to this list \$10 a month. **DUDEK**, Box 58B, Poolesville, MD 20837.

Free VGA Picture Catalog: or 4 720K disk sampler set for \$10. **Linken Graphics**, Dept. 2, P O Box 98, Manville, NJ 08835. 908-253-0897.



Get 6 terrific IBM shareware games for only \$1. each!

BLOCKOUT - 3D Tetris, Great
CFB40 - Best action Football
GOOSE - Futuristic tank game
CROSSBOW - Action adventure
PERE - Exciting Russian game
SEAHUNT - Funny Battleship

Send \$6(\$7 for 3.5" disks) + \$3 for S/H to Dept. A #1 FREEWARE, P.O. Box 131, Hatboro, Pa. 19040

USED SOFTWARE—Free Brochure. Specify Amiga or C64/128. We also buy used software. Send list. Bare Bones Software, 940 4th Ave., #222, Huntington, WV 25701 or 1-800-638-1123.

IBM-C64/128-APPLE PD & SHAREWARE - Free catalog or \$2 for sample & catalog (refundable). Specify computer. **CALOKE IND (B)**, Box 18477, Raytown, MO 64133

COMPUTE Classified is a low-cost way to tell over 355,000 micro-computer owners about your product or service.

Additional Information. Please read carefully.

Rates: \$38 per line, minimum of four lines. Any or all of the first line set in capital letters at no charge. Add \$15 per line for boldface words, or \$50 for the entire ad set in boldface (any number of lines.)

Terms: Prepayment is required. We accept checks, money orders, VISA, or MasterCard.

Form: Ads are subject to publisher's approval and must be either typed or legibly printed. One line equals 40 letters and spaces between words. Please underline words to be set in boldface.

General Information: Advertisers using post office box number in their ads must supply permanent address and telephone number.

Orders will not be acknowledged. Ad will appear in next available issue after receipt.

Closing: First of the second month preceding cover date (e.g. October issue closes August 1.)

CLASSIFIED DISPLAY RATES

Classified display ads measure 2 1/4" wide and are priced according to height. 1" = \$275; 1 1/2" = \$400; 2" = \$525. Preferred supplied material is Velox or PMT.

HOW TO ORDER

To place an ad, send order and payment to Sharon Steinkemper, Classified Manager, COMPUTE, 1965 Broadway, New York, NY 10023-5965, or call Sharon Steinkemper at 212-724-0911, FAX 212-724-0825.

Sharing is Caring
THE SALVATION ARMY

CONVERSATIONS

MIND EXPANSION

Timothy Leary is the former Harvard psychology professor whose philosophy, "Tune in, turn on, drop out," changed the face of America in the 1960s. Since then, his interests have turned to computers and virtual reality. Periodically, Dr. Leary appears on America Online for informal interaction with subscribers. Here is the transcript of one of his recent appearances.

Timothy Leary: Let me say a few words about what's going on in my life these days. We're working on a newsletter which has a tentative publication date of July 4th. The name is tentatively "Timothy Leary's Animations." The newsletter will be very interactive. We'll be soliciting articles from our readers for future editions.

Question: Dr. Leary, what prompted you to get into software? Also, any electronics-related stories you can relate to us from the 1960s?

Leary: What prompted me to get involved with software is the interaction between computers and the human mind. The language of computers gave me the metaphor I was searching for

20 years ago. As [for] the 1960s, that's a "whole nother lifetime." We're now in the 1990s. Why look back?

Q: Tell us about your software for mind expansion.

Leary: The reasoning behind the mind expansion software is the empowerment of the individual where everything that appears on the screen is what you have put there.

Q: What have you been doing in recent years, Dr. Leary?

Leary: I'm the head of two very influential software development companies. One is called FUTIQUE, and the other is TELELECTRONICS. We are developing 3-D electronic environments for the Mac, IBM, and the new 16-bit videogame appliances. Our company's aim is to load onto compact disc prefabricated fully furnished homes, gardens, landscapes, and any environment that the user would like to "boot up."

Q: What do you think about the Libertarian party?

Leary: I am an enthusiastic member of the Libertarian Party. I think that in politics the politicians of both parties, Democratic [and] Republican, pander to the lowest common denominator. Therefore, Newton's Law of Politics is true: "In politics the scum rises to the top." For this reason, I back the Libertarian Party. Our aim is to diminish, decrease, decimate the power of the state to interfere in the individual's life.

Q: Have you been doing any experiments with virtual reality?

Leary: Yes, I am involved with several groups developing TELEPRESENCE environments and electronic environments. I probably give more lectures and demonstrations about VR than anyone in the field.

Q: When will Mind Mirror be available for Macintosh?

Leary: We are trying to get

an update and revision of *Mind Mirror* for the Mac. With graphics, graphics, and more graphics! It is one of the two great sorrows of my life that *Mind Mirror*, my wonderful head program, was never translated for my Mac-using friends.

Q: Do you have software [currently available] for the Macintosh?

Leary: I do not have functioning Mac software. I can, however, strongly recommend four Mac products which convert the screen into a comfortable, livable, 3-D environment. These programs are 1) *Virtual Valerie*, 2) *Spaceship Warlock*, 3) *Manhole*, and 4) *Cosmic Osmo*.

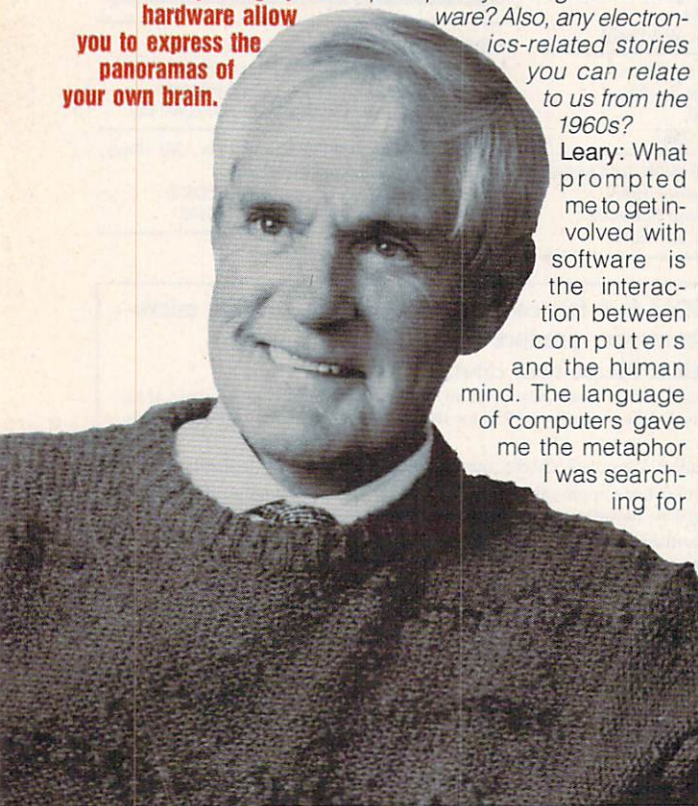
Q: What about the software you're currently working on?

Leary: We are working, as I mentioned before, on developing 3-D programs which will allow performers to select and move around in an electronic environment. Our programs are *interactor* theaters where a small group can assemble for purposes of education, entertainment, and enlightenment. The three E's of the electronic twenty-first century.

Q: Dr. Leary, could you comment on the advent of virtual reality? Someone pointed out that it couldn't compare to LSD. Do you see this new technology as a substitute for drugs?

Leary: No. Virtual reality isn't a substitute for organic psychedelic plants and drugs. Psychedelic drugs allow you to exit the repetitious word processes of your mind to boot up limitless programs, directories, and files in your brain. All of which, by the way, are technicolor, multimedia, and moving at the speed of light. On the other hand, electronic devices like the new computer-graphics hardware allow you to select electronic patterns and multimedia environments to express the panoramas of your own brain. □

Electronic devices like the new computer-graphics hardware allow you to express the panoramas of your own brain.



**USE THIS CARD TO REQUEST
FREE INFORMATION ABOUT
PRODUCTS ADVERTISED
IN THIS ISSUE.**

Clearly print or type your full name, address, and phone number. Circle numbers that correspond to the key numbers appearing on advertisements and in the Advertisers Index. Mail the postage-paid card today. Inquiries will be forwarded promptly to advertisers. Although every effort is made to ensure that only advertisers wishing to provide product information have reader service numbers, COMPUTE cannot be responsible if advertisers do not provide literature to readers.

Cards valid only until expiration date.

This card is for product information only. Address editorial and customer service inquiries to COMPUTE, 324 W. Wendover Ave., Greensboro, NC 27408.

COMPUTE'S FREE PRODUCT INFORMATION SERVICE

Name _____

Address _____

City _____ State/Province _____ ZIP _____

Country _____ Phone _____

- A. What kind of computer(s) do you own? IBM PC/Compatible Tandy Amiga
 Macintosh Apple II Commodore 64/128
4 5 6 1 2 3
- B. Do you use your computer mostly for playing games
 working in your home office working in office outside home school work
7 8 9 10
- C. How many hours a week do you use your computer? 5 15 25 35+
11 12 13 14
- D. Which word processor do you use? WordPerfect Microsoft Word
 PC Write Wordstar DisplayWrite Other
15 16 17 18 19 20
- E. Which spreadsheet do you use? Lotus 1-2-3 Excel Quattro Pro
21 22 23
- F. Which online services do you use? CompuServe GEnie America Online
 Prodigy Q-Link
24 25 26 27 28
- G. What other computer magazines do you read? PC/Computing Computer Gaming World
 Home Office Computing Computer Shopper PC Sources PC Magazine PC World
29 30 31 32 33 34 35
- H. Do you influence the purchase of PCs where you work? Yes
36
- I. What is your total household income? >\$30,000 >\$40,000 >\$50,000 >\$75,000
37 38 39 40
- J. How many times per year do you purchase by mail order? 3-5 6-10 >10
41 42 43
- K. What is your age? _____ years

Circle 101 for a one-year new subscription to COMPUTE. You will be billed for \$12.97.

101	102	103	104	105	106	107	108
109	110	111	112	113	114	115	116
117	118	119	120	121	122	123	124
125	126	127	128	129	130	131	132
133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148
149	150	151	152	153	154	155	156
157	158	159	160	161	162	163	164
165	166	167	168	169	170	171	172
173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188
189	190	191	192	193	194	195	196
197	198	199	200	201	202	203	204
205	206	207	208	209	210	211	212
213	214	215	216	217	218	219	220
221	222	223	224	225	226	227	228
229	230	231	232	233	234	235	236
237	238	239	240	241	242	243	244
245	246	247	248	249	250	251	252
253	254	255	256	257	258	259	260
261	262	263	264	265	266	267	268
269	270	271	272	273	274	275	276
278	279	280	281	282	283	284	285
286	287	288	289	290	291	292	293
294	295	296	297	298	299	300	301
302	303	304	305	306	307	308	309
310	311	312	313	314	315	316	317
318	319	320	321	322	323	324	325
326	327	328	329	330	331	332	333
334	335	336	337	338	339	340	341
342	343	344	345	346	347	348	349
350	351	352	353	354	355	356	357
358	359	360	361	362	363	364	365
366	367	368	369	370	371	372	373
374	375	376	377	378	379	380	381
382	383	384	385	386	387	388	389
390	391	392	393	394	395	396	397
398	399	400	401	402	403	404	405



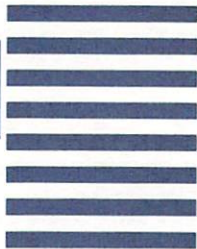
NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 853 PITTSFIELD, MA

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTE Magazine
Reader Service Management Department
P.O. Box 5145
Pittsfield, MA 01203-9654



**USE
THIS
CARD
FOR
FREE
PRODUCT
INFORMATION**

Call Our Number.

CompuServe, the world's largest and most comprehensive network of people with answers to your hardware and software questions, is waiting to hear from you.

For more information about CompuServe and our product support services, just mail this card or call 800 848-8199.

Name _____

Address _____

City, State, Zip _____

Telephone (_____) _____ **CompuServe®**



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

Compute/Oct

BUSINESS REPLY MAIL

FIRST CLASS

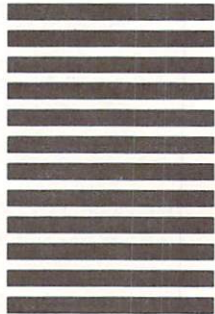
PERMIT NO. 407

COLUMBUS, OHIO

POSTAGE WILL BE PAID BY ADDRESSEE

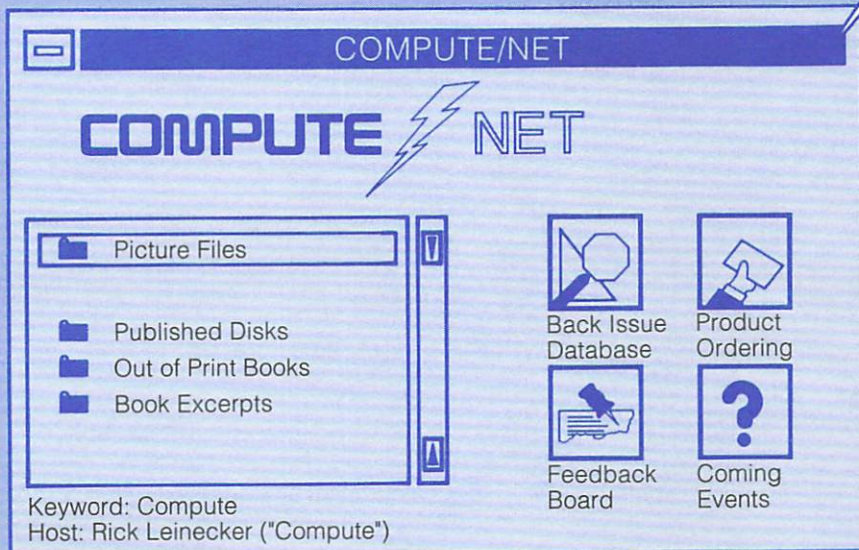
CompuServe®

ADVERTISING DEPARTMENT
PO BOX 20212
COLUMBUS OH 43220-9988



INTRODUCING

COMPUTE NET



Welcome to the grand opening of COMPUTE/NET. A wealth of information awaits you. Back issues of COMPUTE, hard-to-find computer books, super software, dazzling pictures, challenging games, prizes, a complete bulletin board, and much more are here. You can even talk to the editors and authors of the magazine. Lots of surprises are planned, so keep your eyes on us.



FIND US ON AMERICA ONLINE

Free Software. Free Time. Order Today!

Complete the coupon
& send it in, or
for faster service,

CALL TOLL-FREE

1-800-827-6364
Ext. 5560

to order
America Online
TODAY!

If you decide to continue your America Online membership, your \$5.95 monthly fee will include one free hour online each month. And for additional hours you spend enjoying the service, you'll pay just \$5 an hour for evening or weekend use of the service.



YES! Send me my FREE America Online software so I can try COMPUTE/NET, and credit me with free* time online to explore the service.

Name _____

Address (No P.O. Boxes) _____

City, State, ZIP
() _____

Home Phone Number _____

Computer type:

DOS®-COMPATIBLE

APPLE®

- 3.5" 5.25" Macintosh Apple II 3.5" Apple II 5.25"

The DOS-Compatible version of America Online requires 512K memory, an EGA monitor or higher, and a mouse.

Apple IIe computers must have 128K RAM, 80-column capability and a serial card to access America Online. 5560 / PC

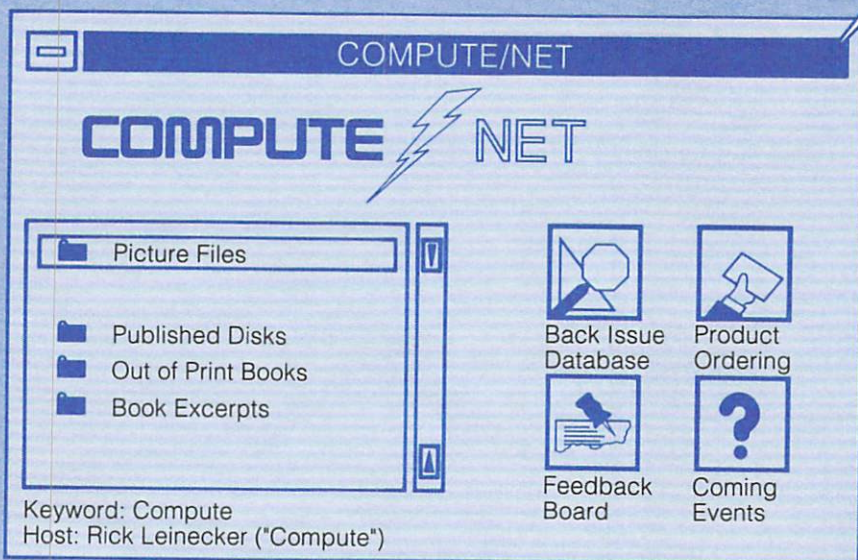
* Telecommunications surcharges apply weekdays from 6 a.m. to 6 p.m. and outside the continental United States.

Copyright © 1991 Quantum Computer Services, Inc. America Online and People Connection are registered service marks of Quantum Computer Services, Inc. Apple and Macintosh are registered trademarks of Apple Computer, Inc. DOS is a registered trademark of Microsoft Corporation.


America Online requires a VISA, MasterCard, or checking account. Allow two weeks for delivery.

INTRODUCING

COMPUTE NET



COMPUTE/NET

COMPUTE  NET

- Picture Files
- Published Disks
- Out of Print Books
- Book Excerpts

Keyword: Compute
Host: Rick Leinecker ("Compute")

- Back Issue Database
- Product Ordering
- Feedback Board
- Coming Events



Welcome to the grand opening of COMPUTE/NET. A wealth of information awaits you. Back issues of COMPUTE, hard-to-find computer books, super software, dazzling pictures, challenging games, prizes, a complete bulletin board, and much more are here. You can even talk to the editors and authors of the magazine. Lots of surprises are planned, so keep your eyes on us.

FIND US ON AMERICA ONLINE



Free Software. Free Time. Order Today!

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT 9096 VIENNA, VA

POSTAGE WILL BE PAID BY ADDRESSEE

A M E R I C A ®



8619 Westwood Center Drive
Vienna, VA 22182-9806

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

Complete the coupon
& send it in, or
for faster service,

CALL TOLL-FREE

1-800-827-6364

Ext. 5560

to order
America Online
TODAY!

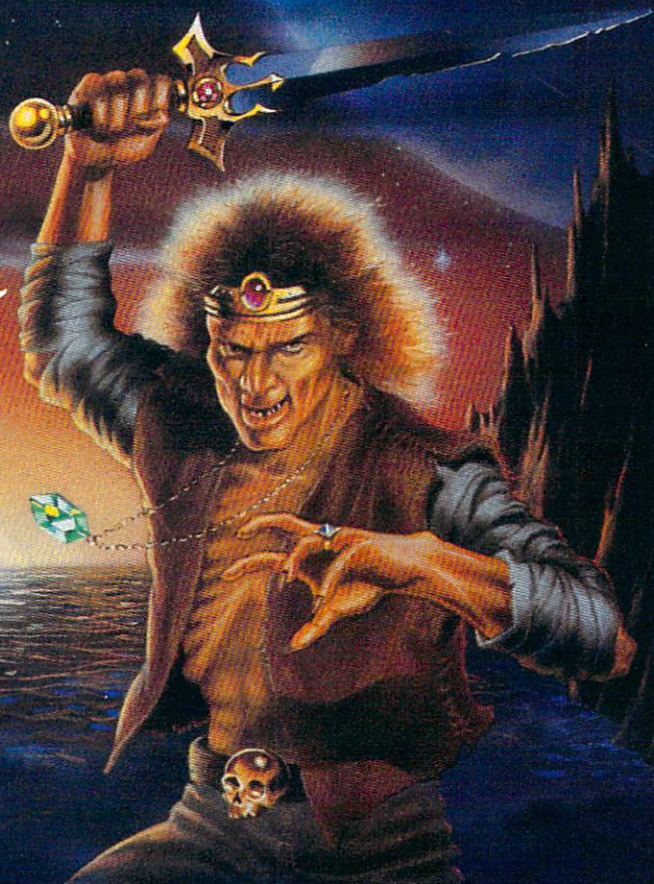
If you decide to continue your America Online membership, your \$5.95 monthly fee will include one free hour online each month. And for additional hours you spend enjoying the service, you'll pay just \$5 an hour for evening or weekend use of the service.



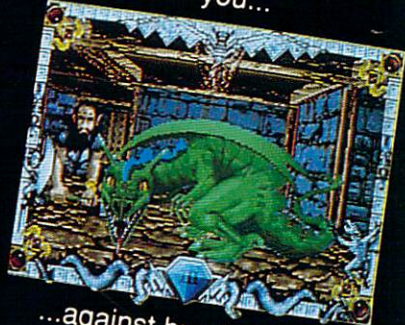
Might and Magic III

Marking 5 years
Over
500,000
Might & Magic's
Sold Worldwide
of the
Might & Magic
series

Isles
of
Terra



Extraordinary personalities
will join with you...



...against hundreds of
imaginative creatures



...as you discover the
wonder of magic



...in this world of fantasy
sights & sounds!

Feel the Power. Experience the Magic.

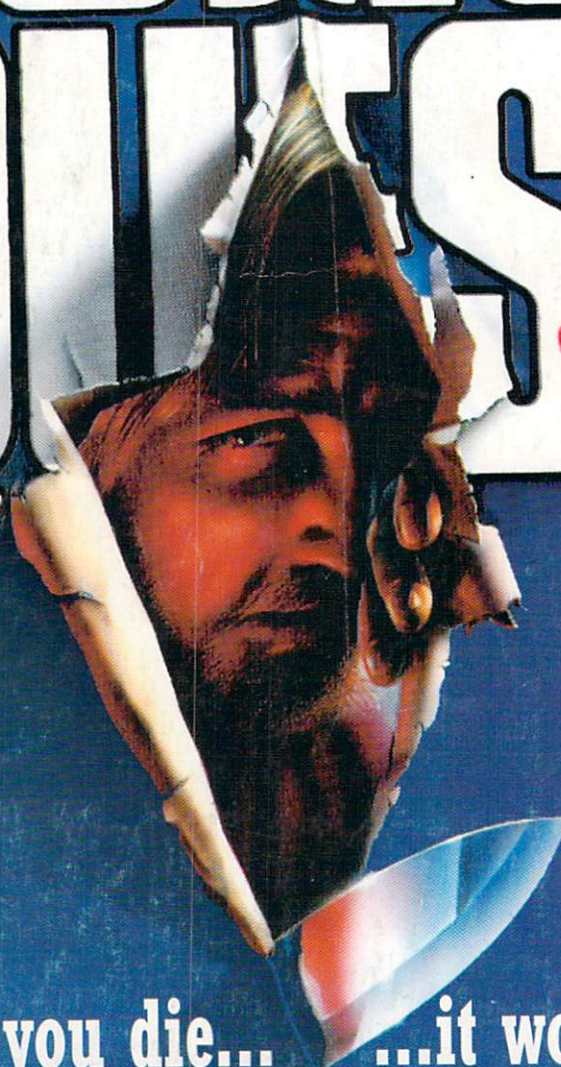
- ★ A swashbuckling adventure that will keep you riveted for hours!
- ★ Mesmerizing graphics created by the industry's top animators.
- ★ Stunning music, sound fx and speech adding a "3rd dimension" of play!
- ★ Easy to start playing, instantly absorbing, addictively challenging.
- ★ NOTE: Former experience with previous Might & Magic's *is not required.*

**NEW
WORLD
COMPUTING™**

Available at your local software retailer or direct from New World at **1-800-325-8898**
(or, **1-818-999-0607** outside U.S.) • P.O. Box 4302 Hollywood, CA 90078-4302

copyright © 1991 Might & Magic is a registered trademark of New World Computing, Inc. • IBM screens shown. Actual screens may vary.
Distributed in the U.S. by Electronic Arts Distribution.

POLICE QUIZ



3

If you die... ...it won't be from boredom



Suggested price \$59.95. Visit your retailer or call 1-800-326-6654.