

**WIN  
A \$1,500  
PRINTER PACKAGE  
(SEE PAGE 35)**

**WE TEST 9 PRINTERS AND MODEMS FOR THE ROAD!**

# COMPUTE

JUNE 1992

## ULTIMATE PCs!

**HOTTEST MACHINES  
FOR WRITING, PUBLISHING,  
AND ACCOUNTING**

### ULTIMATE UTILITIES!

• **NORTON vs. PC TOOLS**

### ULTIMATE GAMES!

• **SUPER SIMULATORS**

### PLUS

• **POWER PIMs**

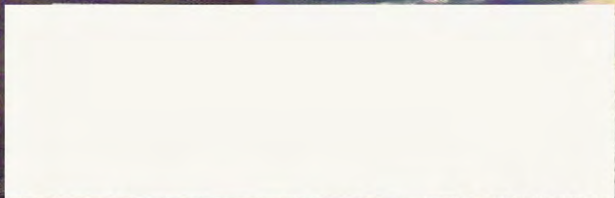
• **PC HEALTH**

• **MULTIMEDIA**

### SPECIAL

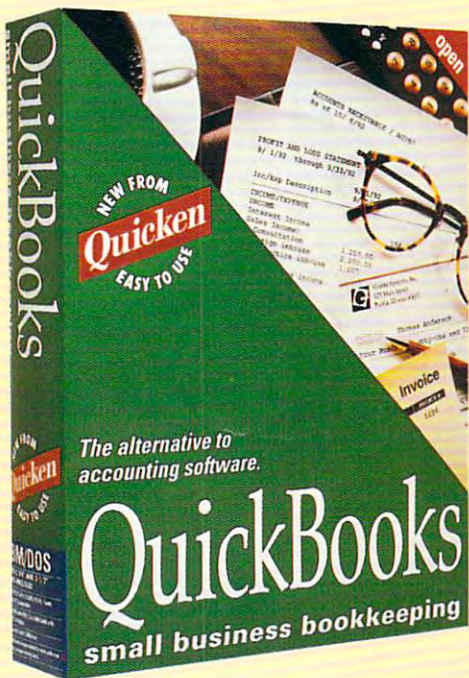
**PULL-OUT SECTION!**

• **DESKTOP GRAPHICS**



# Introducing the alternative to accounting software.

Introducing QuickBooks, from the makers of Quicken. The first software that does your books while you conduct your business. All you do is pay bills, invoice clients, and collect deposits. QuickBooks does all the work to provide you with management information and financial statements – any time you want.



Specifications: PC compatible computer with 640K RAM and DOS 2.1 or higher. Hard disk with 2 MB free.

**No accounting mumbo-jumbo.** With accounting software, you had to "post" "debits and credits" and "reverse entries" in "journals" and "ledgers." You practically needed to be a CPA.

But now you can computerize your books without any accounting mumbo-jumbo.

New QuickBooks uses just plain English. If you want to pay a bill, choose "Checkbook" from the Main Menu.

If you want to invoice a customer, choose "Invoicing." It's that simple.



## Stunningly simple to use.

Work with familiar forms.

Only enter information once. QuickBooks remembers your recurring payments.

Flexibly assign expenses.

F1-Help F2-File/Print F3-Find/Edit F4-Lists F5-Reports F6-Activities

The screenshot shows a "Pay to the" form for an "Office Supply Annex" bill. The amount is \$354.86. The form includes fields for "Address" (876 Belle Vista Way, Alexandria, VA 22307) and "Memo" (Office supplies/rentals). A table below lists the bill items: Stationery (Letterhead, envelopes), Bus. equipment (Lasewriters (2), Desk Lamps (3)), and Furniture. The total amount is \$354.86. At the bottom, it shows the "Checking" account balance and the "Ending Balance".

## Choose whom to pay and when.

Vendor	Invoice	Pay Date	Balance	Payment
Chicago Tools & Gadgets	856	11/11/92	682.32	588.99
Garden Supplies Inc.	12498	10/22/92	1,753.31	1,753.31
Garden Supplies Inc.	13546	11/ 4/92	3,825.52	3,825.52
New Leaf Landscaping	2456	10/25/92	1,865.62	1,865.62
New Leaf Landscaping	3578	11/ 8/92	158.88	158.88
New Leaf Landscaping	5685	11/ 9/92	236.35	236.35
Office Supply Annex	69699	12/16/92	856.36	8.00
Pine Lumber Yard	8976	11/16/92	745.32	8.00
Speedy Printing	5692	10/19/92	42.31	42.31
Checking Balance \$8,561.83			TOTAL	7,573.11

Just select the bills you want to pay from this list.

Payments to the same vendor can be combined.

Prints checks automatically for all bills selected.

Shows your bank balance.

Totals how much you owe.

## Invoice customers in minutes.

Practically no typing.

Pick here:

Customer	Balance
Bay Shore Properties	1,771.04
Bayshore Book Book	588.75
Bayshore National Bank	0.00
BaySoft, Inc.	0.00
Catering By Stephanie	0.00

It's entered here.

Sales tax is calculated for you.

The math is done for you.

F1-Help F2-File/Print F3-Find/Edit F4-Lists F5-Reports F6-Activities

The screenshot shows an "Invoice Number" form for "Bay Shore Properties". The invoice number is 8882345 and the date is 12/ 8/92. The form includes fields for "TO Num" (1225), "Terms" (Net 10), and "Project" (Bay Shore - 3). A table below lists the invoice items: Sr.Landsc Sr. Landscape Architect hours (48.00, 328.80), Project Mgmt Project Management hours (21.00, 261.60), Labor Manual labor hours (8.25, 346.50), Soil Amend Quality soil amendment/cubic yds (5.99, 778.78), and Sales Tax Sales tax (8.25, 64.24). The total amount is \$1,771.04. At the bottom, it shows the "BALANCE" and "ENDING BALANCE".

# Powerful bookkeeping, easier than you ever imagined possible.

## Collect money faster than ever.

All the information you need to call customers.

Quickly see who's behind.

**A/R Aging**

Customer	0-30	31-60	61-90	91-120	121-150	151-180	181-210	211-240	241-270	271-300	Total
Green Systems, Inc.	1,000.00	2,000.00	3,000.00	4,000.00	5,000.00	6,000.00	7,000.00	8,000.00	9,000.00	10,000.00	56,000.00
...	...	...	...	...	...	...	...	...	...	...	...
<b>Total</b>	<b>10,000.00</b>	<b>20,000.00</b>	<b>30,000.00</b>	<b>40,000.00</b>	<b>50,000.00</b>	<b>60,000.00</b>	<b>70,000.00</b>	<b>80,000.00</b>	<b>90,000.00</b>	<b>100,000.00</b>	<b>560,000.00</b>

**Collections Report**  
As of 12/31/92

Green Systems, Inc.

Customer	Invoice	Issued	Due	Balance Due
New Line Computers Mr. Ridge Evers (309) 676-9896 ext 124	1825	9/ 2/92	10/17/92	1,888.76
<b>Total New Line Computers</b>				<b>1,888.76</b>
Oak Management Mr. John Driscoll (309) 673-7897 ext 234	1886	10/ 5/92	12/ 4/92	810.92
2081	10/12/92	11/26/92	57.75	
<b>Total Oak Management</b>				<b>868.67</b>
Perris Cinema Mr. Garry Pasowitz (309) 673-9056 ext	1841	9/17/92	11/16/92	6,435.88

Green Systems, Inc.-Receivables  
Esc-Create Ctrl-N Home:iza FI-Help Ctrl-P Print

QuickBooks proven 12 times easier than leading products.

An independent research firm had small business bookkeepers perform 11 of the most common bookkeeping tasks using QuickBooks, DacEasy, and Pacioli. People using QuickBooks were able to complete all 11 tasks 12 times more often than people using DacEasy. No one using Pacioli was able to complete all of the tasks.

QuickBooks DacEasy Pacioli  
Source: Merrill Research & Associates

## Complete financial picture of your business.

Get control over your bottom line.

Evaluate your financial resources.

See emerging sales trends.

Predict your cash needs.

### Complete Financial Reports

- Profit and loss statement
- Sales report
- Accounts receivable aging
- Collections report
- Accounts payable aging
- Sales tax report
- 1099 report
- Cash flow forecast
- Payroll report
- Budget report
- Other reports
  - Summary report
  - Transaction report
  - Itemized income and expenses
  - Project or Job report

**Profit & Loss**  
1/1/92 - 12/31/92

**Balance Sheet**  
12/31/92

**Sales Report**  
1/1/92 - 12/31/92

**Cash Flow Forecast**  
1/1/92 - 4/30/93

Works with QuickPay for payroll.

With QuickPay, QuickBooks calculates all deductions, prints payroll checks and keeps complete records.



Special offers for Quicken users! QuickBooks reads your Quicken files during set-up. And if you act now, you'll get a **\$30.00 rebate** when you buy QuickBooks from your local retailer. (Rebate coupon and redemption instructions are in the package.) Or, buy QuickBooks direct from Intuit for \$54.95. **QuickPay users:** when ordering, tell us you use QuickPay or send in the QuickPay card in the QuickBooks package.

QuickBooks limited time offer

**\$99.95**

Save \$40.00  
\$139.95 Suggested Retail Price

Or buy QuickBooks & QuickPay for \$129.95  
\$169.95 Suggested Retail Price

Full 60 day money back guarantee. Rebate offer only valid through retail stores. All offers expire June 30, 1992.

To order, call toll-free

**1-800-624-8742**

24 hours a day, 7 days a week. U.S. and Canada

**Intuit**

P.O. Box 3014, Menlo Park, CA 94026

## Flexible invoice printing - 3 invoice formats.

Printing options:

- Your letterhead
- Plain paper
- Pre-printed form

Invoice formats:

- Product
- Professional
- Service



© Intuit 1992

Ad Code: CM6TB

www.commodore.ca

# COMPUTE

VOLUME 14, NO. 5, ISSUE 141

JUNE 1992

## FEATURES

6

### TOP PC UTILITIES

By Dan Gookin

The Norton Utilities and PC Tools go head to head.

18

### TEST LAB

Edited by Mike Hudnall  
Portable printers, modems, and faxes for the road.

62

### QUEST FOR PERFECTION

By Gregg Keizer

Design the perfect machine for your application.

76

### STRICTLY PERSONAL

By Rosalind Resnick  
How to hold your life together with PIMs.

94

### SIMEVERYTHING

By Gregg Keizer

The hottest PC games.

## COLUMNS

4

### EDITORIAL LICENSE

By Clifton Karnes  
COMPUTE's editors.

34

### NEWS & NOTES

By Jill Champion  
Top computer news.

40

### FEEDBACK

Answers to tough questions.

44

### TIPS & TOOLS

Edited by

Richard C. Leinecker  
Tips from our readers.

48

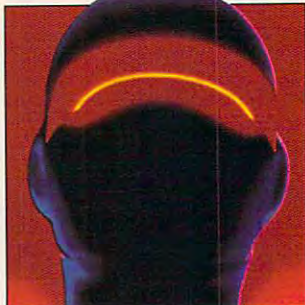
### COMPUTE/NET

By Richard C. Leinecker  
What's new online.

50

### INTRODOS

By Tony Roberts  
Make an emergency floppy.



Cover photo by Michel Tcherevkoff

52

### POINT & CLICK

By Clifton Karnes  
High-powered Ascend.

56

### HARDWARE CLINIC

By Mark Minasi

How exactly does XMODEM ensure your data arrives safely?

60

### PROGRAMMING POWER

By Tom Campbell

The PC's character ROM.

70

### SHAREPAK

By Bruce M. Bowden  
Shareware treasures.

136

### NEWS BITS

By Jill Champion  
Top stories at press time.

## DEPARTMENTS

72

### PRODUCTIVITY CHOICE

By Tony Roberts  
DR DOS 6.0.

74

### PERSONAL PRODUCTIVITY

By Daniel Janal  
Combating computer stress.

81

### ART WORKS

By Robert Bixby  
New illustration software.

82

### MULTIMEDIA PC

By David English  
Sound Blaster Pro.

84

### DISCOVERY CHOICE

By David Sears  
Super Solvers Spellbound!

86

### PATHWAYS

By Steven Anzovin  
Let your colors shine.

88

### ENTERTAINMENT CHOICE

By Peter Olafson  
Falcon 3.0.

92

### GAMEPLAY

By Orson Scott Card  
Copy protection.

## REVIEWS

98

Stacker AT/16,  
ProCalc 3D,  
JustWrite 1.0,  
AcerAnyWare 1120NX,  
Software Bridge,  
QuickAuthor,  
Avery Personal Label Printer,  
Conan the Cimmerian,  
Howtek Personal Color  
Scanner,  
PC-Write Standard Level 2.0,  
Relisys TEFAX RA-2125,  
SCAN:ALIGN,  
The Maximizer,  
Maximizer Lite,  
On the GoFAX,  
DiscXchange,  
The Secret Codes of  
C.Y.P.H.E.R.: Operation  
Wildlife,  
The Lost Admiral,  
Desktop Publishing by  
Design, and  
Monty Python's Flying  
Circus.

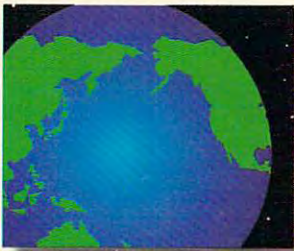
### SEARCHSTAKES

See page 35.

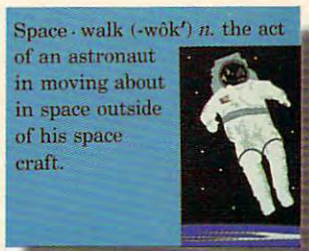
COMPUTE (ISSN 0194-357X) is published monthly in the United States and Canada by COMPUTE Publications International Ltd., 1965 Broadway, New York, NY 10023-5965. Volume 14, Number 5, Issue 141. Copyright © 1992 by COMPUTE Publications International Ltd. All rights reserved. COMPUTE is a registered trademark of COMPUTE Publications International Ltd. Printed in the USA by R. R. Donnelley & Sons Inc. and distributed worldwide (except Australia and the UK) by Curtis Circulation Company, P.O. Box 9102, Pennsauken, NJ 08109. Distributed in Australia by The Horwitz Group, P.O. Box 306, Cammeray NSW 2062 Australia and in the UK by Northern and Shell Plc., P.O. Box 381, Millharbour, London E14 9TW. 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) 275-9809.



*This isn't an ad for a National Geographic<sup>®</sup> Special, an action movie, the*



*Discovery Channel<sup>®</sup> or Nintendo<sup>®</sup>. It's an ad for the Sound Blaster Multimedia*

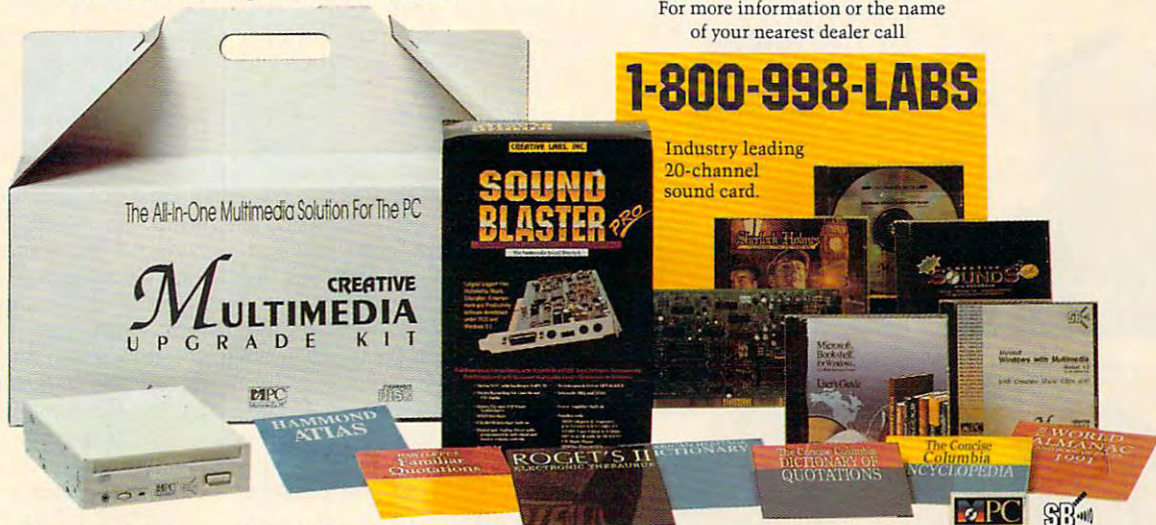


*Upgrade Kit. Which turns your home computer into all of them.*

Over \$2000 worth of goodies for less than \$850.

For more information or the name of your nearest dealer call

**1-800-998-LABS**



Easy-to-install internal CD-ROM drive.

5 leading CD software titles, including Microsoft Windows with Multimedia Extensions 1.0, Microsoft Bookshelf, Creative Sounds, the Selectware System and Sherlock Holmes, Consulting Detective.

**CREATIVE LABS**

Outside of North America, call 65-773-0233. fax: 65-773-0353. Sound Blaster is a registered trademark of Creative Labs, Inc. Windows and Bookshelf are registered trademarks of Microsoft Corporation. © 1992 Creative Labs, Inc. All rights reserved.

All trade names referenced are the service mark, trademark, or registered trademark of their respective manufacturer or owner.

Circle Reader Service Number 125

[www.commodore.ca](http://www.commodore.ca)

# EDITORIAL LICENSE

Clifton Karnes

This issue of COMPUTE is one of our best yet, and while looking through it, I was impressed again by what a group effort COMPUTE is. Each magazine is the work of writers, editors, contributing editors, copy editors, designers, and production people, as well as scores of administrative, sales, subscription, and circulation personnel.

This month, I'd like to introduce you to one team from this group that has a special influence on each issue—COMPUTE's four editors.

First on the list is David English, COMPUTE's managing editor. David has B.A. and M.A. degrees in English literature and an M.A. in cinema. David bought his first computer in 1981, an Apple II, and he started reading COMPUTE, programming in BASIC and dBASE, and creating synthesized music.

When the Mac came out in 1984, David bought one and

started working with MIDI and desktop publishing. Soon after he joined COMPUTE in 1988, he dived into the PC waters, buying a laptop and, shortly after, a 386.

At COMPUTE, David plans and assigns COMPUTE's Getting Started With sections and manages reviews. He also combines his interest in film, desktop publishing, and music by writing the "Multimedia PC" column.

Robert Bixby, COMPUTE's features editor, has an M.F.A. in writing, and he's one of those unusual people who can communicate both with people—via English—and with computers—via code. In fact, he bought his first computer, a Commodore 64, to make it easier to write. Soon, however, he was bewitched by the machine and writing programs in assembly language himself.

At COMPUTE, Robert writes "Art Works," a column that focuses on desktop publishing, word processing, graphics, and paint programs. In addition, he puts his technical background to good use by compiling our popular "Feedback" column, which answers readers' general and technical questions.

In addition to his many contributions to COMPUTE, Robert has published several articles in other magazines, including *Omni*, and he's written a dozen books. His latest project is a book on WordPerfect for Windows macros.

Mike Hudnall is COMPUTE's reviews editor. Mike has a Ph.D. in English, but like many of us, he became hooked on computers in the early days. While working on his Ph.D., he took his first computer course, which used a DEC PDP-11 minicomputer. That was in 1981. Soon after, he began using a CP/M machine owned by the universi-

ty. When it came time for him to buy his own PC, he opted for a Tandy EX, an early MS-DOS machine. Before long, he combined his interest in PCs and technical writing by freelancing.

Mike joined COMPUTE in 1990. His main responsibility is managing COMPUTE's Test Lab, the section of the magazine that offers comprehensive reviews and benchmarks of selected hardware and software. Managing Test Lab demands not only a solid grasp of the cutting edge of technology but also advanced language skills. Mike has both.

And then there's me. After completing a master's degree in music theory, I took a course in computer programming, mostly out of curiosity, and was hooked. After that, I took every computer course I could find. I've programmed mainframes, minicomputers, and micros in a variety of languages, including C, Pascal, assembly language, BASIC, COBOL, and Forth. In 1983, I bought my first computer, a Commodore 64, and started reading COMPUTE and Gazette. In 1986, I bought my first PC, and I began to write freelance articles.

I joined COMPUTE Publications in 1987 and am currently the magazine's editor, managing the magazine's editorial direction and content. In addition, I write "Editorial License" and "Point & Click," the latter column exploring Microsoft Windows.

My latest project is a book on Microsoft Windows, *101 Essential Windows Tips*, for COMPUTE Books.

So there we are. I hope you've enjoyed finding out a little about COMPUTE's editors. Next month, you'll have a chance to tell us something about yourself, by filling in our readership survey. □

**COMPUTE's editors are, from left to right, Clifton Karnes, David English, Robert Bixby, and Mike Hudnall.**



Introducing the New Grolier Multimedia Encyclopedia™ with exciting features for 1992

We are filled with awe as we explore the solar system. Each discovery comes alive with spectacular sights and sounds. It's getting late, but we're not ready to head back to Earth...



While exploring the final frontier, we met Copernicus, saw the Space Shuttle and listened as Neil Armstrong took a giant leap with one small step.



The Grolier *Electronic Encyclopedia* has long been recognized as the premier CD-ROM encyclopedia for serious, effective research. Now, Grolier introduces a remarkable resource that sets a whole new standard for multimedia encyclopedias—the *New Grolier Multimedia Encyclopedia*™.

**Serious research.  
Serious fun.**

Featuring all 21 volumes of the *Academic American Encyclopedia* on a single CD-ROM, the *New Grolier Multimedia Encyclopedia* provides a reference resource unparalleled in both quality and comprehensiveness.

Within seconds, you can locate articles on everything from covered wagons to lunar

landers. And a host of exciting new features makes the urge to explore virtually irresistible. You'll find more color photographs, illustrations, sounds and motion sequences. And timely coverage of such recent world events as the Persian Gulf War and dissolution of the Soviet Union.

But that's just the start. You can actually listen to famous speeches, music and more. And explore every corner of the world using over 250 high-quality maps.

The new edition also features a unique Timeline with over 5,000 entries that lets you journey from

prehistory to the present, linking you directly to articles. And our new Knowledge Tree takes the search out of research by letting

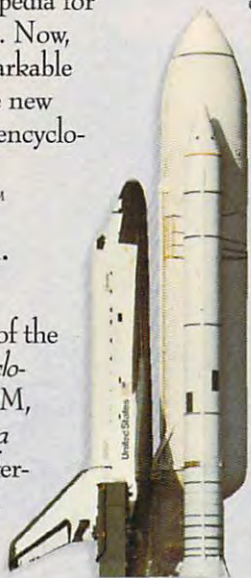


you explore broad topics, then quickly narrow your search to specific topics.

**Still just \$395.**

It's been selected Product of the Year by the Optical Publishing Association. And it's *still* just \$395. For more information on the *New Grolier Multimedia Encyclopedia*, call toll-free today.

**1-800-356-5590**



The New  
**GROLIER MULTIMEDIA  
ENCYCLOPEDIA**

The New Grolier Multimedia Encyclopedia runs on today's most popular platforms including MS-DOS, Macintosh and Windows/MPC.

Grolier Electronic Publishing, Inc., Sherman Tnpk., Danbury CT 06816 □ 203-797-3500

Circle Reader Service Number 133

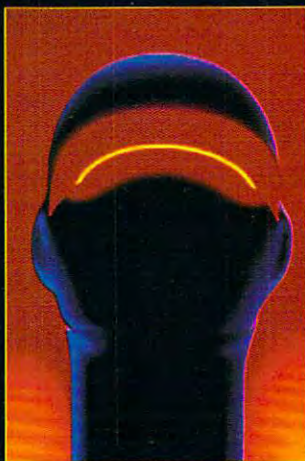
 [www.commodore.ca](http://www.commodore.ca)





# TOP PC UTILITIES

HERE'S AN IN-DEPTH  
LOOK AT TWO CONTENDERS  
FOR THE TITLE OF  
BEST UTILITY PACKAGE:  
THE NORTON  
UTILITIES AND PC TOOLS.



BY DAN GOOKIN

**T**ry to describe what utility software is, and eventually, you'll come up with a definition for what a computer does best: It makes life easier. So anything can be defined as a utility, since a computer's job is to make life easier. Everyone can use a few PC utilities for file recovery, protection, and security—and to ease the drudgery of using DOS. Yet PC utilities began their humble lives as programmer's tools, designed to simplify repetitive tasks of the PC elite.

Everything changed in 1982 when one PC entrepreneur came up with a utility that proved useful to both programmer and user: Peter Norton developed his hallowed UERASE.COM, the Unerase program. It could actually recover a deleted file—a file that IBM, Microsoft, and everyone else claimed was long dead. Norton packaged Unerase with six other utilities (which would all seem silly by today's standards) and sold them as The Norton Utilities. Unerase helped propel Peter Norton into an almost godlike status among PC users the world over, and it legitimized the utility as a new must-have type of PC software.

Today, there are dozens of utilities on the market. Nothing is sold piecemeal anymore; nearly all the utilities are packaged in fancy boxes and work in some type of colorful, integrated, mouseable environment. PC utilities have become a necessity, a vital category of software like word processors, spreadsheets, and databases. The scope of what a PC utility is

and does is much broader than that of the simple programmer's tools of yesterday, and the power they offer is hundreds of times beyond that of a simple speaker beeper or file sorter. Utilities are valuable programs yet easy enough for every level of PC user to handle.

Presently, there are two contenders for the PC-utility crown: The Norton Utilities, still going strong after ten years, and PC Tools, Central Point Software's powerhouse utility package. There's no top dog here, so this article won't attempt to give away king-of-the-mountain robes. Instead, my purpose is to examine what each package does, discuss the latest versions, and check on the status of PC utilities some ten years after their introduction.

## Basic Features

Ideally, a computer's operating system should give you everything you need to run your computer, productivity software aside. In that respect, DOS falls short. Using DOS is like playing baseball with only three people to a team. The job of the PC utility is to fill in the gaps and let you play a fair game. In this light, you can say that PC utilities have two major purposes: doing things DOS doesn't do and doing things DOS already does, but doing them better.

The comparison chart shows a list of the features DOS provides plus the enhancements offered by the two top PC-utility packages. In addition to the Overview, the table is divided into six areas: File Management, Direc-

tory Management, Disk Control, Security, Recovery, and Productivity. How PC Tools and The Norton Utilities deal with each of these areas is covered in the next few sections.

Of course, the most "missing" features belong to DOS. It's worth noting that earlier versions of DOS had even fewer utilities (which is why DOS 5.0 is such a valuable upgrade).

## Product Overview

Overall, Norton and PC Tools stack up fairly well, with PC Tools taking a giant lead only in the productivity area. Specifically, each program has both command line and integrated environments, allowing you to operate the utilities from everything from a batch file to a cozy, colorful graphic environment you can manipulate with a mouse. Both programs have online help, and both come with a handy recovery disk you can use right away if perilous conditions prevailed before you bought the utility.

Norton falls short right away by missing several Windows-specific programs that come bundled with PC Tools. Yet, PC Tools eats up 9.5 megabytes of disk space—almost four times what Norton uses. PC Tools didn't get called the kitchen sink of utility programs by shipping on one disk.

## File Management

File management is the ability to control and manipulate files beyond the simple commands DOS offers. There are two ways to approach this. The first is in an integrat-

ed environment where files are displayed along with commands that can control them. The second is the traditional way DOS lets you work with files, via the command line.

Both DOS and PC Tools come with shell programs that assist in file manipulation. Both shells let you copy, rename, delete, and move files singularly or in groups. The shells also come with their own customizable menus, allowing you to install your own programs into the shell and use it as your base of operations for the entire time you're in DOS. In addition to file manipulation, PC Tools' PC Shell also acts as control center for the other utilities in the PC Tools arsenal.

Norton lacks a file-management shell. It does, however, sport an integrated environment. From the environment you can select utilities, read about their options, and customize a command line that the environment can execute for you. This isn't the same thing, however, as a file-management shell.

In the area of file tools, The Norton Utilities lives up to its ten-year reputation. There are programs to change the date and time of files, size up files for copying to a floppy disk, and locate and modify files anywhere on disk.

One major disappointment with both utilities is the lack of a move command, an alternative to copying and deleting files. DOS and PC Tools offer this in their shells but not as a command line utility. Norton skips over a move command completely, which I find disappointing. Mace Utilities, which isn't covered in this comparison, has an excellent move command; see "And What of Mace?"

## Directory Management

Working with directories isn't as big an area as file management. Directory management includes the ability to change directories, perhaps using some type of graphic tree structure, plus the standard MD (Make Directory) and RD (Remove Directory) commands. Extra features include pruning and grafting, or the ability to cut an entire subdirectory branch and paste it elsewhere in your hard disk system.

NCD, Norton's version of the CD command, is a powerful way to change quickly from one directory to another without having to type in complex pathnames. But that's it! Norton offers no grafting or pruning commands, no utility for moving directories, and no unremove command for a subdirectory.

For its contribution to directory management, PC Tools has a separate program (DM, the Directory Manager), and it's very slick. DM shows you your subdirectory structure in the standard

tree format, but using only directory names—no files. To the left of the display is a histogram showing you the size of the directory as compared with the size of other directories on disk. Extremely large directories are shown in red. I find this a valuable feature when working with a subdirectory structure. But on the downside, to work with files again, you have to quit DM and return to PC Shell. Moving back and forth during major disk surgery can get tiresome.

Like Norton, DM lacks an unremove directory command. But when you think about it, unremoving a directory is trivial: You can't remove a directory in the first place unless all the files in that directory have been deleted. However, having a way to get back at those files once their directory has been deleted would be a boon to overzealous pruners and grafters.

## Disk Control

The most traditional disk-control utility is a sector editor, which has been around since Peter Norton's original Disk Editor program. This type of tool allows you to manipulate information anywhere on disk. It's a fun and scary thing to do, though the practical value of sector editing is limited when you consider the range of other disk utilities available. PC Tools also sports a Disk Edit tool from within the PC Shell environment.

More important than editing disk sectors is defragmentation, or the consolidation of fragmented files that tend to accumulate on hard drives. This is perhaps the most important utility that DOS doesn't offer. PC Tools has its Compress program, and Norton has Speed Disk. However, I feel the best defragmentation program can be found in Mace Utilities, where the idea was pioneered; see "And What of Mace?"

Both packages offer a safe formatting program, which was designed to replace the old DOS FORMAT command. However, since DOS 5.0's FORMAT also saves unformat information, these utilities aren't as vital as they were before DOS 5.0.

Other interesting disk-control programs are contained in both packages, including some low-level disk utilities prompted by Steve Gibson's original SpinRite disk optimizer. However, I consider this type of interleave reset and revitalization program to be more for show than for any practical purpose. The true value of low-level revitalization is in doubt by many PC experts, and it's also next to impossible on some of the newer hard drives with IDE and SCSI interfaces.

One bonus feature PC Tools has over Norton is a complete (and powerful) backup program: CP Backup, which is also sold as a separate package. Norton's backup program, The Norton Backup, stands toe-to-toe with CP Backup, but it's only sold as a separate package.

Norton comes back punching with NDOS.COM, a replacement shell for COMMAND.COM. Based on J.P. Software's 4DOS shell, NDOS offers similar yet more powerful features ideally suited to the command line DOS user.

## Security

This is a new category of PC disk utility, something nearly as important as the data-recovery programs. Security utilities offer protection from disaster before it strikes.

The main type of security program is similar to DOS's MIRROR; it makes an image of the boot sector, FATs, and root directory and saves it elsewhere on disk. This aids in recovery from accidental reformat and allows those vital parts of the disk to be rebuilt if something goes wrong. Norton's program is named Image; PC Tools' is called Mirror. Microsoft licenses the DOS command

### AND WHAT OF MACE?

Up until a short time ago, there was a third major contender for the PC-utility crown: Mace Utilities from Fifth Generation Systems. Mace is a powerful utility package and does some things much better than either of the two top dogs. But one thing it hasn't done is compete straight across, on a feature-for-feature basis, with PC Tools or The Norton Utilities.

Mace does have its strengths; the FRAGCHK, SQZDIR, SORTDIR, and UNFRAG utilities provide the best method of defragmenting a hard drive—far superior to PC Tools' Compress or Norton's Speed-Disk. Mace's other assorted utilities are strong and have merit, so if defragmenting is all you need, then Mace Utilities makes an excellent choice. Overall, however, Mace lacks the complete bag of tricks of the other two packages.

Presently, Mace Utilities is under review by Fifth Generation Systems, which hopefully means we'll see a bigger, better, and more powerful version of the program in the future. The current version continues to sell for \$149, with various pieces of the program sold individually for less. If future versions maintain Mace's flair for methodical and thorough utilities, then it will once again compete for the top spot.

Mace Utilities—\$149  
Fifth Generation Systems  
10049 N. Reiger Rd.  
Baton Rouge, LA 70809  
(800) 873-4384  
(504) 291-7221



Van B. Hooper  
President of Hooper International  
and Author of Hooper Software

# I'll Show You How To Increase Your Income and Manage Your Money Like a Financial Whiz!

I PERSONALLY GUARANTEE COMPLETE SUCCESS  
WITH MY FREE UNLIMITED TELEPHONE SUPPORT  
AND NINETY DAY REFUND OFFER.

**NOW, SAVE THOUSANDS OF DOLLARS  
A YEAR IN ACCOUNTING FEES AND  
AVOID I.R.S. AUDITS WITH THIS USER  
FRIENDLY CHECK WRITING AND  
ACCOUNTING SOFTWARE.**

Most Executives, Professionals and Business Owners simply don't have the time to learn the necessary accounting principals for effective management of their affairs. On top of it all, the I.R.S. makes endless demands for more comprehensive records.

With Hooper Accounting Packages, you are immediately more productive. All you have to do is follow the easy-to-understand instructions. You control your finances instead of allowing your finances to control you. This enables you to spend more time at what you do best — **Making Money!**

Hooper packages are inexpensive and are written in plain, simple, language. A friendly and helpful support staff is always available to courteously answer any and all of your questions, free of charge. Hooper takes the mystery and awe out of using accounting software!

Take advantage of the 90 day free trial offer today. You have all to gain and nothing to lose. Act now!

**"Hooper Software Does Much More Than Quicken,  
Is More Powerful Than Pacioli and is  
Immensely More Easy To Use Than Dac Easy."**

## 90 DAY FREE TRIAL.

**YOUR GUARANTEE OF SATISFACTION!**

Your absolute satisfaction is our number one priority. That's why we invite you to try Hooper Software for a full 90 days without risk or obligation. If you are not completely satisfied, you can return the software for a full and cheerful refund. No questions asked.

**WE SHIP  
ALL ORDERS BY**



Copyright 1992 by Excel American and Hooper International, Inc.  
Cheque-It-Out, Takin' Care Of Business! and Payroll-Master are trademarks of Hooper International, Inc.  
IBM, Quicken, Pacioli and Dac Easy are trademarks of their respective owners.  
All Hooper software operates with IBM PC-DOS or compatible computers.  
Specify 5-1/4" or 3-1/2" floppy disk.

Circle Reader Service Number 235

**"Americas No. 1  
Check Writing and  
Accounting Software  
For Non Accountants."**

**FREE 90 DAY TRIAL OFFER!**



## CHEQUE-IT-OUT™

The user friendly personal accounting software that helps you manage your affairs with complete accuracy. Ideal for executives, professionals and small business.



### Sample Listing of Hundreds of Cheque-It-Out Features:

- Works under Windows or DOS.
- Handles and feels like your checkbook.
- Know your account balances at all times.
- No accounting experience necessary.
- Full general ledger.
- Automated Double Entry System.
- Complete range of reports instantly available.
- Intuitive pop up windows.
- Mouse compatible.
- Over 3,000 screen color selections.
- Unlimited transactions.
- Context sensitive help screens.
- Tracks outstanding checks.
- Pop-up calculator.
- Operates in calendar or fiscal year mode.
- Unlimited free telephone support.

**Only \$69.95** Plus \$5 Shipping & Handling

## TAKIN' CARE OF BUSINESS!™

The simple-to-use software that will help you succeed in business. It will enable you to operate more efficiently and effectively, improving your bottom line.



### Includes All Features of Cheque-It-Out Above, Plus:

- Leading Edge Accounts Receivable Operating & Reporting Package.
- Advanced Accounts Payable Operating & Reporting Package.
- No accounting experience necessary.
- Unlimited free telephone support. And much more.

**Only \$149.95** Plus \$6 Shipping & Handling

## PAYROLL-MASTER™

Provides everything you need to professionally manage your payroll function.

### Sample Listing of Dozens of Payroll-Master Features:

- Designed to be fully compatible with all other Hooper software.
- Automatic Tax Collections.
- Prints W-2's and 1099's.
- No accounting experience necessary.
- Manages employee vacations, sick time, overtime and holidays.
- Supports up to 1,000 employees.
- Unlimited free telephone support.

**Only \$69.95** Plus \$5 Shipping & Handling

**ORDER TOLL-FREE  
1-800-525-9200**



or send check or money order to:  
**HOOPER INTERNATIONAL, INC.**

*"The Accounting People"*

P.O. Box 49711, Dept. 10  
Colorado Springs, CO 80949, USA

[www.commodore.ca](http://www.commodore.ca)

MIRROR from Central Point Software.

Another form of security is file encryption. Both Norton and PC Tools offer a way of taking the data in one or more files and secretly encoding it. The only way to decode the file is by using a password or code key. PC Tools takes this concept one step further and allows you to create encryption directories; all files placed in those directories are automatically encrypted, and access to the directories is only possible by password.

In the era of the computer virus, antivirus utilities are popular. Both Symantec and Central Point Software distribute their own antivirus programs. However, only PC Tools comes with a virus-scanning utility, Vdefend. While it will locate some viruses, it does little in the way of removing them (other than recommending you buy Central Point's other virus-specific software).

More important than direct virus detection, both utilities offer special disk-locking utilities that prevent unauthorized access to sensitive areas of the

disk. Norton's Disk Monitor and PC Tools' Data Monitor allow you to lock out all or some sectors of a hard drive, preventing access or just monitoring sensitive areas of the disk that shouldn't be touched. For most users, this type of protection from viruses (and other nasty programs) will be enough.

### Dr. Disaster

PC utilities were given birth by Peter Norton's Unerase program. Both utility packages—and now DOS—offer undelete and unformat commands. PC Tools has Undel, and Norton still retains Unerase after all these years (see "The Down-and-Dirty on Undeleting"). And thanks to the disk-imaging programs (Mirror and Image), recovery of a disk's boot sector, FAT, and root directory is also possible.

Both Norton and PC Tools also have unformatting utilities, which is no longer a big thing, since the UNFORMAT command is now a part of DOS's data-recovery repertoire. This is all traditional stuff—no new bugs under big rocks here. What is unique to both The Norton Utilities and PC Tools is their new array of file-recovery, deletion-prevention, disaster-prevention utilities. This is a special type of program that stores the files DOS deletes in special directories. Recovery is then 100-percent guaranteed by simply plucking the deleted file out of the special directory. The Norton Utilities uses the Erase Protect program to pull that trick; PC Tools has Disk Monitor.

Individual files can always go south, as anyone who's worked with too large a spreadsheet or database discovers. Both PC Tools and Norton offer programs to repair errant data files for 1-2-3, dBASE, and other popular formats. Both programs are called File Fix, and both will attempt to patch up the same types of files.

When bytes start fleeing from a troublesome disk, you can use PC Tools' DiskFix program to diagnose and repair the problem. The Norton Utilities uses The Norton Disk Doctor for diagnosis, as well as a wonderfully crafted (though technical) Troubleshooting Guide plus the Disk Tools utilities to eventually remedy the problem.

### Five All-Purpose Hard Disk Tools

In each package, you'll find several interesting, integrated utilities whose purposes seem to overlap. This appears to be the approach for disk utilities of the future: one piece of software that deals with several related areas of data protection, diagnosis, and recovery. Between PC Tools and The Norton Utilities, five individual programs handle those du-

ties: DiskFix, Data Monitor, Disk Monitor, Disk Doctor, and Disk Tools.

For example, PC Tools' DiskFix handles repair and disk-tuning options, while the Data Monitor program covers delete prevention, password-locking and encrypting of files in a directory, write-protecting sensitive parts of a disk, and other assorted duties.

The Norton Utilities' Disk Monitor will restrict access to sensitive areas of the disk, park your disk drive heads, and monitor other types of disk access. Disk Doctor is used to diagnose disk problems, and then Disk Tools will repair them, as well as perform other interesting duties.

I find this division of duties confusing—and not just from looking at five different programs that handle several dozen overlapping functions. A single integrated program for either PC Tools or The Norton Utilities would make more sense. Either that, or split up the duties into several dozen individual utilities. Given the bulk of PC Tools and The Norton Utilities, it would be easy to miss

### THE DOWN-AND-DIRTY ON UNDELETING

Just exactly what kind of mojo is involved with undeleting a file? What Frankenstein-like science is required to bring a dead file back to life? The secret to undeleting a file lies in DOS's laziness.

DOS deletes a file like you would remove someone's name from your address book: The person is still alive and probably lives at the same address, but your record of them is gone. DOS deletes files in a similar manner: It goes to the disk directory and replaces the first character of the filename with an I-am-deleted byte. Further, it marks the file's location on disk as available in the disk's map (or FAT). Again, only one byte is changed.

The reason why DOS deletes files this way is speed. Changing two bytes is quicker than going out to the disk and rubbing the file out. Yet the side effect of this method is that the file's contents on disk are still intact. A recovery utility needs only to change the I-am-deleted byte in the directory back to the first letter of the file's name and then change the I-am-available byte in the FAT to an I-am-occupied byte. Once that happens, the file is restored.

While the above discussion makes undeleting a file sound easy, the technomagic required is more complex. A lot of things can mess up file recovery. The most deadly event is when some other file overwrites all or part of the deleted file's data on disk. Smart recovery programs can detect this and will refuse to restore the file. However, as long as you undelete files before any other files are written to disk, you can safely recover anything.

### THE BLACK MAGIC OF UNFORMATTING A DISK

While undeleting files met with miraculous acclaim back in 1983, unformatting a disk met with stunned disbelief only a few years later. Like recovering a deleted file, restoring a freshly formatted disk seemed unbelievable. Yet with DOS's lazy FORMAT command accidentally erasing hard drives right and left, an unformat utility was sorely needed and a great success.

Unformatting a disk is possible because, as with deleting a file, DOS is rather lazy. Basically, when DOS sees a disk is already formatted, it only erases its first track and creates a new boot sector, root directory, and two disk maps (or FATs). The remainder of the disk—with its data still intact—is only verified. DOS 5.0's QuickFormat option even skips the verification stage.

An unformatting program looks for the earmarks of subdirectories on a reformatted disk. It then attempts to rebuild the root directory and FAT as it locates the files in those subdirectories. As long as the bulk of the reformatted disk's data was in subdirectories, full recovery is possible. However, any files in the root directory are generally lost.

To augment recovery, many unformatting utilities come with a disk-imaging program, such as DOS 5.0's MIRROR, PC Tools' Mirror, and Norton's Image. Those programs copy the boot sector, root directory, and FATs and place them in special image files near the end of the disk. Then, if you need to unformat a disk, the unformat utility will check for the image file hidden on the disk. If it's found, recovery is nearly instantaneous and complete.

# Keys To Success

*Take Control Of Your Future With A College Degree In Computer Science*

**Now** you can get the opportunity and earning power a college degree confers—without leaving home and without spending thousands of dollars.

#### **The AICS home study program:**

- B.S. and M.S. college degree programs
- In-depth courses in Programming Languages, Pascal, C, Artificial Intelligence, Software Engineering, Compiler Design, and much more.
- Approved Ada course available
- All courses through home study

#### **Proven acceptance in business, industry, and government.**

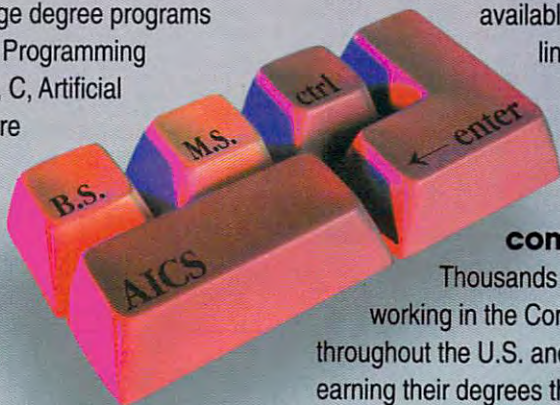
Many leading corporations have approved the AICS program for their employees. More than 75 employers have paid the tuition for their employees, including a number of Fortune 500 companies and government agencies.

#### **AICS lowers the cost of a college degree without lowering the standards.**

The academic program includes comprehensive courses using the same textbooks used in major universities. Qualified instructors are available on telephone help lines.

#### **Join students from leading computer companies.**

Thousands of men and women working in the Computer Science field throughout the U.S. and around the world are earning their degrees through the AICS non-traditional program. You can be one of them.



For a free catalogue call:  
**1-800-767-AICS**  
Outside U.S.:  
1-205-323-6191  
Fax 1-205-328-2229  
2101-CCF  
Magnolia Avenue  
Suite 200  
Birmingham, AL 35205

**AMERICAN  
INSTITUTE  
FOR  
COMPUTER  
SCIENCES**

*The leading edge of learning*

the valuable features offered in these handy little programs, so a new approach is bound to benefit all users.

## Productivity

Productivity utilities are almost totally the domain of PC Tools. Its PC Desktop program could stand by itself, right next to Borland's Sidekick. Yet Central Point Software has graciously included it with the PC Tools package.

PC Desktop features an appointment calendar, an autodialer, calculators, a database, notepads, and an outliner. A clipboard allows global cutting and pasting, and a general macro facility helps you customize PC Desktop.

Beyond the basic features of PC Desktop, you'll find extensive communications programs in various areas of the PC Tools program:

DeskConnect is a desktop-laptop communications program that is able to access files on one computer from another and exchange files between two computers (the second computer doesn't need to be a laptop).

Commute is a PC remote-control program, allowing you to access and use a computer at another location via modem. What you see on your screen is exactly what appears on the remote PC's screen. You can have password protection and host callback, and even monitor remote log-ins.

Modem communications and electronic mail are both features of the PC Desktop telecommunications module. Modem communications allows you to dial up any other PC connected to a modem. The electronic-mail module provides an easy link to MCI Mail, CompuServe, and EasyLink online services. You must have a compatible modem to make this possible.

PC Desktop is also capable of handling fax communications. To do this, your system must have a compatible internal fax card.

With The Norton Utilities, productivity enhancement is provided in two areas: the Batch Enhancer, which adds more power to your batch files, and The Norton Control Center, where you can monitor and adjust various hardware settings and control your DOS environment. PC Tools lacks both of these features.

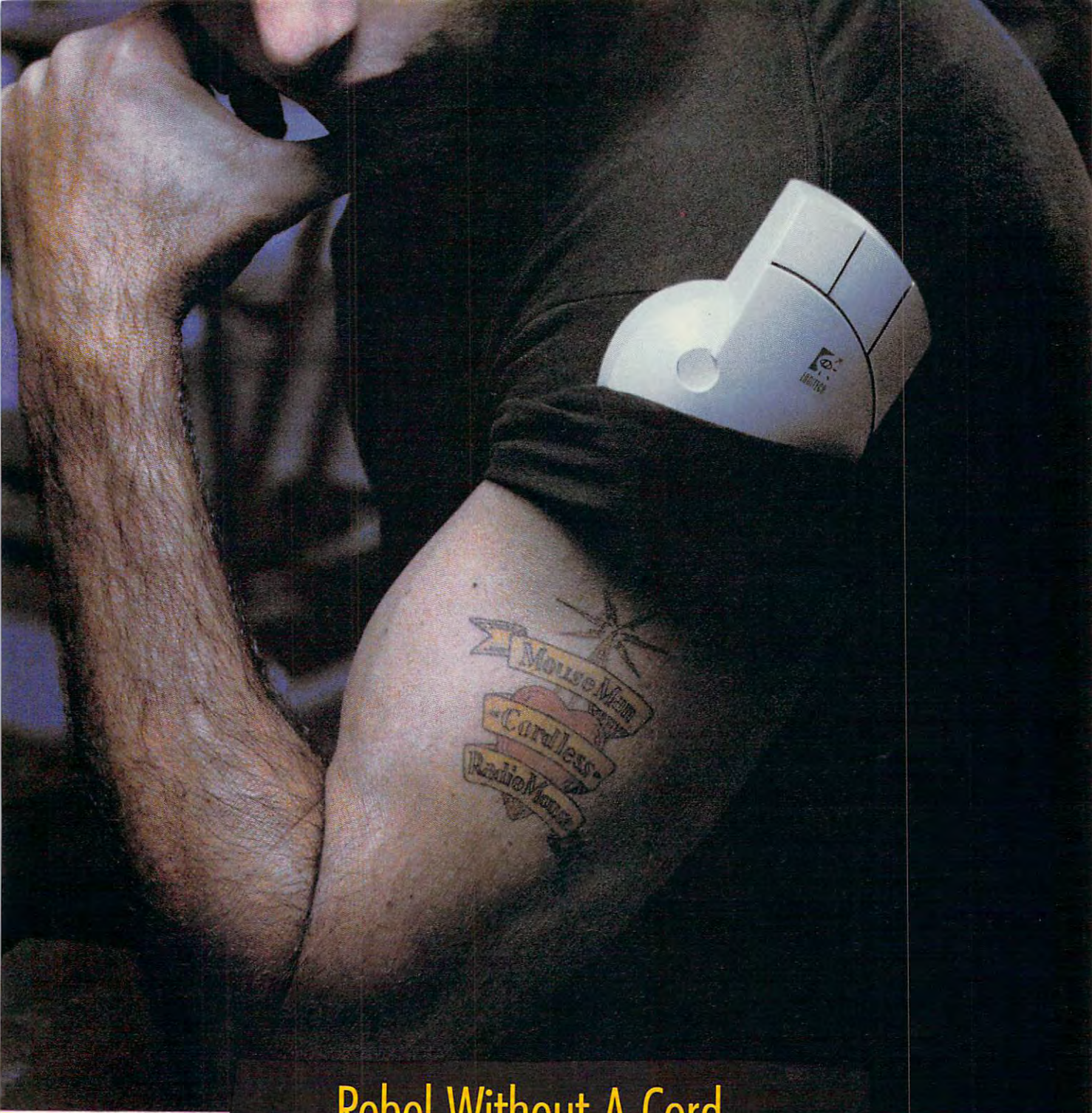
On the other hand, both packages have a system information utility. It displays a profile of your PC's hardware contents, plus it does benchmark testing and a wee bit of diagnosis. It's mostly for show.

## Which Utility Do You Need?

I find it hard to argue against having PC Tools. It's actually four programs in one: a general package of utilities, a file manager, a backup program, plus

## UTILITIES COMPARISON CHART

Feature	DOS 5.0	Norton	PC Tools
<b>Overview</b>			
Command line control	Yes	Yes	Yes
Integrated environment	No	Yes	Yes
Windows-specific programs	No	No <sup>1</sup>	Yes <sup>2</sup>
Online help	Yes	Yes	Yes
Mouse support	No	Yes	Yes
Graphic look	No	Yes	Yes
Recovery disk	No	Yes	Yes
Size on disk	1.5MB	2.5MB	9.5MB
<b>File Management</b>			
Shell program	DOS Shell	— <sup>3</sup>	PC Shell
Application menu	Yes <sup>4</sup>	—	Yes
Copy/Delete/Rename	Yes	—	Yes
Move command	Shell only	—	Shell only
Date stamping	—	File Date	Yes
File attributes	ATTRIB	File Attributes	Yes
File compression	— <sup>5</sup>	—	PC Secure <sup>6</sup>
File finder (with changes)	—	File Find	— <sup>7</sup>
File locator	DIR/S	File Locate	File Find
File printing	PRINT	Line Print	Yes
File sorting	—	Directory Sort	Shell only
File sizing	—	File Size	—
File viewing	TYPE	—	View
File wiping	—	WipeInfo	Wipe
<b>Directory Management</b>			
Shell program	—	— <sup>3</sup>	DM
Change directory	CD	NCD	Shell only
Create directory	MD	—	Shell only
Prune and graft directory	—	—	Shell only
Rename directory	Shell only	—	Shell only
Remove directory	RD	—	Shell only
<b>Disk Control</b>			
Backup and archiving	BACKUP	— <sup>8</sup>	CP Backup
Command interpreter	COMMAND	NDOS	—
Defragmentation	—	Speed Disk	Compress
Disk cache	SMARTDrive	Norton Cache	—
Low-level revitalization	—	Calibrate	DiskFix
Interleave reset	—	Calibrate	DiskFix
Park program	—	Disk Monitor	Park
Safe formatting	FORMAT <sup>9</sup>	Safe Format	PC Format
Sector editing	DEBUG <sup>10</sup>	Disk Editor	Shell only
<b>Security</b>			
Boot/FAT/Root protection	MIRROR	Image	Mirror
Directory password	—	—	Data Monitor
File encryption	—	Diskreet	PC Secure
Sector protection	—	Disk Monitor	Data Monitor
Virus detection	—	— <sup>11</sup>	Vdefend
Virus removal	—	—	—
<b>Recovery</b>			
1-2-3 repair	—	File Fix	File Fix
dBASE repair	—	File Fix	File Fix
General file repair	RECOVER <sup>12</sup>	—	—
Delete prevention	MIRROR	Erase Protect	Data Monitor
Diagnostic tools	—	Disk Doctor	DiskFix
Disk repair	—	Disk Tools	DiskFix
FAT recovery	MIRROR	Disk Tools	DiskFix
Undelete	UNDELETE	Unerase	Undel
Unformat	UNFORMAT	Unformat	Unformat
Unremove directory	—	—	—
<b>Productivity</b>			
Appointment calendar	—	—	in PC Desktop
Autodialer	—	—	in PC Desktop
Batch file enhancement	—	Batch Enhancer	—



## Rebel Without A Cord

**MouseMan® Cordless Radio Mouse**—nothing stands in its way, or ties it down. Unique radio technology controls your cursor from up to six feet away, no matter what's on your desktop. Battery lasts up to a year. Sure beats wimpy infrared mice—those signals get fouled up by any little thing and suck batteries dry in a few hours.

MouseMan Cordless also *feels* awesome: unique ergonomics; adjustable resolution; 100% compatibility; programmable Windows™-crunching buttons. All for about the same as most corded mice, complete with money-back satisfaction guarantee.

1-800-231-7717, ext. 437.



®/™—these trademarks are the property of their registered owners. GSA approved.

Circle Reader Service Number 244

[www.commodore.ca](http://www.commodore.ca)

## UTILITIES COMPARISON CHART (continued)

Feature	DOS 5.0	Norton	PC Tools
Calculator	—	—	in PC Desktop
Change hardware settings	—	Control Center	—
Clipboard	—	—	in PC Desktop
Communications	—	— <sup>13</sup>	in PC Desktop <sup>14</sup>
Database	—	—	in PC Desktop
Fax support	—	—	in PC Desktop
Macros	—	—	in PC Desktop
Notepad	—	—	in PC Desktop
Outliner	—	—	in PC Desktop
System information	—	System Information	System Information
Text locator	—	Text Search	Shell only

- <sup>1</sup>The Norton Utilities does come with icons for some programs.
- <sup>2</sup>Backup, Undelete, and a special control-menu program launcher.
- <sup>3</sup>A separate product, The Norton Commander, contains file and directory shells.
- <sup>4</sup>In DOS Shell.
- <sup>5</sup>DOS has a file-expansion program, EXPAND, but no companion COMPACT utility.
- <sup>6</sup>Only compresses files as they're encrypted.
- <sup>7</sup>Can be done in the shell after using File Find.
- <sup>8</sup>The Norton Backup is sold as a separate product.
- <sup>9</sup>FORMAT automatically saves unformat information on every disk reformatted.
- <sup>10</sup>DEBUG can load a sector into memory, allow you to edit that memory, and then write it back to disk. It's inelegant, but functional.
- <sup>11</sup>Disk Monitor will prevent a virus from writing to some parts of a disk, but it doesn't actively scan for infection.
- <sup>12</sup>RECOVER is a disaster. Though it's advertised as a file and disk repair program, I strongly advise against its use. In fact, Norton's Disk Tool will help you recover from using DOS's RECOVER command.
- <sup>13</sup>The Norton Commander comes with Command Mail, a link to MCI Mail.
- <sup>14</sup>PC Desktop offers extensive communications capabilities, including access to MCI Mail. Laptop/desktop and remote PC communications are also available through other PC Tools utilities.

the PC Desktop program with its productivity features.

On the downside, the program is overwhelming. I doubt if any one user will ever master the complete package, and books on PC Tools are fat and intimidating. You could make it a lifelong endeavor to say you've used everything in the package (which has often been the case with other major applications as well).

Comparatively speaking, you'd need to buy The Norton Utilities plus The Norton Backup and The Norton Commander even to start comparing the packages across the board. (This stems from Symantec's view of PC Tools as an end-user product and its outdated and stubborn insistence that end users don't buy programs.) For basic utility needs, however, Norton more than fills the bill. If you don't want the bulk of PC Tools and don't need CP Backup or the productivity utilities of PC Desktop, then The Norton Utilities is a slimmer choice.

Another basis for your decision is whether or not you feel comfortable working inside a file-management

shell. If so, then PC Tools will probably be your choice. If you prefer the DOS command line, then Norton is for you—especially given the inclusion of NDOS to replace COMMAND.COM. There's also a third option: As the scarecrow says to Dorothy in *The Wizard of Oz*, "Some people do go both ways." Personally, I use Norton on my desktop machine and PC Tools on my laptop.

Whichever utility you choose, PC utilities have grown in power and ability over the last ten years. And the bottom line is that there are plenty of options for any PC user looking to enhance DOS with some utility power. □

### PRODUCT LIST

PC Tools—\$179  
 Central Point Software  
 15220 NW Greenbrier Pkwy., Ste. 200  
 Beaverton, OR 97006  
 (503) 690-8090

The Norton Utilities—\$179  
 Symantec  
 10201 Torre Ave.  
 Cupertino, CA 95014  
 (408) 253-9600

## DOS 5.0'S UTILITIES

What makes DOS 5.0 such a remarkable upgrade is its arsenal of new features, including MIRROR, UNDELETE, and UNFORMAT—utilities formerly available only from third parties that are now commands under DOS. With those three programs, DOS can now be both the hero and the villain.

Along with its disaster-prevention and data-recovery utilities, DOS also sports other new commands that were formerly the exclusive domain of third-party utilities.

Help! Since day one, DOS help utilities have been available, giving users on-line access to the DOS manual, command syntax, and options. Now that's all a part of DOS with the HELP command plus the optional / ? switch on all other major DOS commands.

The DOS Shell program gives all DOS users a comfortable, graphic, and mouseable environment in which to manipulate files and directories, work with disks, run programs from a menu, and switch between several programs stored (but not running) in memory at once. This pits DOS head-to-head with such program swappers as Software Carousel and DESQview, as well as file/shell programs like XTree and PC Tools' Shell.

The HIMEM.SYS and EMM386.SYS configuration commands—plus DEVICEHIGH and LOADHIGH—are all now a part of DOS's memory-management skills. While not as advanced as some third-party packages, DOS's memory-management drivers and commands will give 386 owners more RAM in which to run DOS programs plus control for both extended and expanded memory.

Though DOS has always come with RAM-drive software, only with version 5.0 did Microsoft start tossing in a disk cache. The SMARTDRV.SYS software gives DOS users greater ability to speed up disk operations than the old FASTOPEN command.

Extensive command line editing, history, and macros are now possible, thanks to DOSKEY.

DOS 5.0 also upgraded the version of BASIC shipped with DOS. GW-BASIC is now just a REM in the history books and has been replaced by QBASIC, an interpreted version of Microsoft's QuickBASIC compiler.

Along with QBASIC comes DOS's new EDIT program. EDIT is much better than the old EDLIN, yet interestingly, it's an element of the QBASIC program. Third-party editors are more diverse and also more compact, since running EDIT requires the 250K QBASIC.EXE program.

If DOS continues to grow at this level, future versions may contain even more diverse utilities. On the must-have list are a defragmentation utility, better backup and restore, password protection and file security, and a disk doubler or file-compacting program. With those features—and possibly more—DOS may soon become a complete operating environment.





Illustration created with Micrografix Designer™, and printed by the Citizen GSX-140 PLUS printer with optional Color On Command.

## THE GSX-140 PLUS. NOT ALL DOT MATRIX PRINTERS ARE FOR THE BIRDS.

.....

*Creating color this brilliant will ruffle the feathers of most printers. It demands 360x360 dot-per-inch resolution. Plus the ability to control both color density and saturation.*

*Now you can have both. Affordably. Even when running Microsoft™ Windows™. All you need is Citizen's new 24-wire GSX-140 PLUS printer and its exclusive, user-installed option, Color on Command™. With vivid bursts of color, your spreadsheets can be easier to read, your graphics easier to understand, and your presentations all the more brilliant.*

*The GSX-140 PLUS is fully compatible with software applications run by MS-DOS®. Available at no extra cost, a special printer driver assures optimum performance with*

*Windows. Using the latest color saturation control technology, the GSX-140 PLUS prints true, bright, accurate WYSIWYG colors at high resolutions.*

*Whether printing in monochrome or color, the GSX-140 PLUS is easy to use, too, thanks to Citizen's Command-Vue™ control panel with plain English prompts. A quick menu offers instant access to the printer settings you change most often. And it even remembers your four favorite applications, setting them up the way you want whenever you use them.*

*So take a look at Citizen's GSX-140 PLUS today. For the name of your nearest dealer, call 1-800-4-PRINTERS.*



 **CITIZEN™**

© 1991 Citizen America Corporation. Citizen, Color on Command, Command-Vue and the Citizen Logo are trademarks of the Citizen Watch Co. Ltd. Microsoft and Windows are trademarks of Microsoft Corporation. Micrografix is a registered trademark, and Micrografix Designer is a trademark of Micrografix, Inc.

Circle Reader Service Number 166

 [www.commodore.ca](http://www.commodore.ca)



## It works for beginners as well as experts.

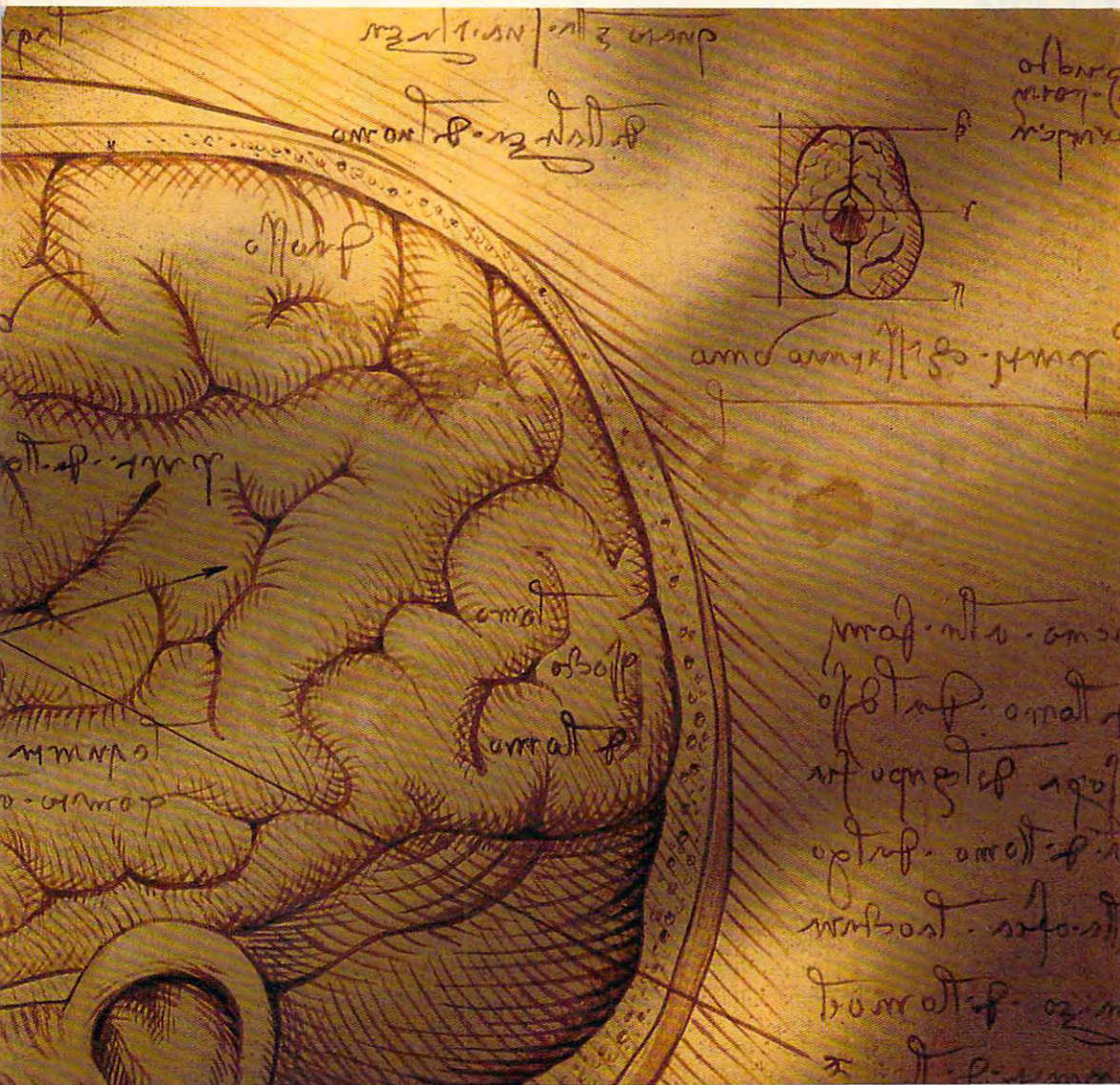
It helps manage complex systems with ease. And no matter how hard you try, you can't exhaust its potential.

In many ways, it's a lot like CompuServe.

If you're a beginner at interactive computer services, we've got what you're looking for.

Late-breaking news, stock quotes and financial data, travel information and reservations, entertainment and games, a complete encyclopedia, and more. And we make it simple, with on-screen menus, a handy index, and free time to sharpen your online skills.

For the experienced user and the computer professional, we feature hardware and software support, special-interest forums, lots of free software and shareware, a wealth of online computer



expertise, and sophisticated research tools. In fact, no computer service offers the number and quality of choices that CompuServe does.

Now, for just \$7.95 a month, and a one-time membership fee, you get all the basics as often as you like: news, sports, weather, shopping, a complete encyclopedia, and much more, plus up to 60 E-mail messages a month. And, there are lots of other valuable services available on a nominal pay-as-you-use basis.

Whether you're a beginner or an expert, to make the right choice in selecting an interactive service, just use your brain. Pick CompuServe. For more information or to order, see your computer dealer or call 1 800 848-8199. Outside the United States, call 614 457-0802.

**CompuServe®**

The information service you won't outgrow.

# TEST LAB

**I**ncreasing power, decreasing size—that's the direction of today's computer industry. And for today's computer enthusiast, the trend has proved a tremendous boon to productivity and convenience. Now you can write that winning proposal while sitting on your sofa, in a plane, or by the lake. Word processing, spreadsheets, and personal information management—even in Windows—are as close as your briefcase, thanks to the lower prices and higher technology of today's notebooks. It's no wonder that portable computing, one of the fastest-growing segments of the computer market, is also one of the most rapidly changing and closely watched segments.

It should come as no surprise, then, that hardware manufacturers have scrambled to provide a line of downsized peripherals for use with your notebook. This month, Test Lab focuses on two categories of portable peripherals—printers and communication devices.

Portable printers are great for producing hardcopy at remote locations, such as a construction site or summer cabin, as well as for making last-minute changes in a document when you're on the go and don't have access to a regular printer. The four printers we cover this month offer versatility; high quality; and, of course, tremendous convenience.

The five portable communication devices examined this month really let you unleash the power of your portable, whether you're uploading and downloading files, sending electronic mail, checking news and weather with your online service, or sending and receiving faxes.

This month's Test Lab provides the facts, figures, explanations, and analysis you'll need to increase your understanding of these new technologies and make a more informed buying decision. Ready to increase your portable productivity? Then read on.

MIKE HUDNALL



**BROTHER INTERNATIONAL**  
200 Cottontail Ln.  
Somerset, NJ 08875  
(908) 356-8880  
List price: \$499.95†

## BROTHER HJ-100i

What weighs four pounds, packs easily inside an average attaché case, operates almost silently, and can produce page after page of consistently high-quality text and graphics? If you answered the Brother HJ-100i Portable Inkjet Printer, you're absolutely right.

The putty-colored portable measures a scant 12¼ inches wide by 8½ inches deep by 2 inches thick, making it the perfect traveling companion for a notebook or laptop computer. A pivoting support stand, located at the rear of the printer's case, swivels out to hold the printer in an upright position when it's in use.

A solid performer, the Brother HJ-100i prints text in either LQ or NLQ modes at a steady 83-cps rate. The difference between these two modes is the density of the printed characters and amount of ink consumed. LQ mode generates black, well-defined characters and yields about 700,000 characters per cartridge. NLQ mode produces a less dense concentration of ink, giving you a gray (rather than black) image; however, it's much more economical, yielding approximately 1,400,000 characters per cartridge.

An optional ni-cad battery pack can power this printer if you choose to use it while traveling. In more stationary environments, the included AC adapter provides the power.

Controls for the HJ-100i—the soft-touch variety—are located at the front of the printer; embedded LED indicators keep you apprised of the printer's status. An internally mounted bank of 11 DIP switches lets you change the default values of the printer, such as paper size, normal or high-density characters, and mode selection.

Installing an ink cartridge in the Brother HJ-100i is a painless procedure best described as drop and click. You simply drop the replacement cartridge into the cartridge carrier and click the locking lever forward.

Three control modes on the HJ-100i allow you to vary graphic capabilities and emulations. In Mode 1 the HJ-100i emulates the IBM X24E series of printers, Mode 2 is the native HJ-100 mode, and Mode 3 provides Epson LQ emulations. A prioritized hierarchy for each mode gives you access to various mode subsets. For example, when the HJ-100i is in Mode 3 (Epson LQ), it will emulate the Epson LQ model 510, 850, 500, 2550, or 800 in that order of priority by sensing the control signals sent by the host PC. If no LQ driver appears in your application's printer-selection menu, the HJ-100i will use Epson FX or MX draft-quality print drivers instead. This prioritized emulation scheme provides a lot of flexibility in configuring the HJ-100i for virtually any application.

Print quality of the unit is excel-

†Street prices for hardware units appearing in Test Lab are usually significantly lower than list prices.

lent in the LQ mode and very good in the NLQ mode as well. Since the print mechanism uses jets of ink deposited by a cartridge that glides from side to side along a screw-type carriage, the unit is all but silent in operation.

It's a joy to set up and use the Brother HJ-100i, thanks to a super user's manual that details everything you need (or could possibly want) to know about the printer—in English, French, and German.

Everything about the HJ-100i is top-drawer—it's attractive, quiet, quick, small, and light. In short, it's a winner.

TOM BENFORD

Circle Reader Service Number 304

## CANON BJ-10EX

Canon caused a sensation a couple of years back when it introduced the BJ-10e, an easily transportable device capable of outputting high-quality text and graphics. This mighty mite made the dream of a truly portable office a reality. Not content to rest on their laurels, the Canon folks have endeavored to make a good thing even better. And they've succeeded—the new model is called the BJ-10ex.

Cosmetically, the BJ-10ex is a dead ringer for its predecessor, with the bulk of changes confined to extended firmware (for example, more DIP switches and emulation modes) and improved electronics (with, for example, one component replacing two or three). Aside from the x at the end of the name, the BJ-10e and BJ-10ex appear identical when viewed next to each other.

The BJ-10ex is the popular notebook size (12.2 inches x 8.5 inches x 0.9 inches), and at about four pounds, it's easy to pack along in a laptop's carrying case or in an attaché. A snap-on plastic cap keeps foreign matter out of the parallel interface port, found at the right side of the machine near the front.

Using a 64-nozzle bubble-jet

**CANON U.S.A.**  
1 Canon Plaza  
Lake Success, NY 11042  
(800) 848-4123  
List price: \$499

printhead, the BJ-10ex can output text at 83 characters per second in either high-quality mode or economy mode. The difference between these two modes is the amount of ink consumed and the quality of the output. Economy mode produces a semifilled character that appears gray rather than black, while high-quality mode generates well-defined solid black output. Economy mode yields about 1.4 million characters before the cartridge is spent; high-quality mode will deliver only about half as many before you need to replace the cartridge.

Three emulations come with the BJ-10ex to facilitate configuring it to work with all major software packages. Mode 1 is the IBM X24E emulation; Mode 2 provides Canon BJ-130e emulation; and Mode 3, also called LQ mode, provides Epson LQ-510 emulation. Setting the emulation mode involves changing the settings of switches 10 and 11 in a cluster of 11 DIP switches located under the front cover of the printer. (The original BJ-10e had only 10 switches.)

This bank of DIP switches also controls other configuration parameters, including page lengths of 11 or 12 inches, normal or high-density print modes, and readying the unit to work with the optional automatic sheet feeder.

Print quality in high-quality mode is quite good regardless of which emulation you use; when you use a font package like Bitstream's Facelift for Windows, it's almost as good as the output of a laser printer. The Epson LQ



emulation provides probably the greatest versatility of the three available modes, since practically every software package sold supports the Epson standard.

An optional ni-cad battery pack is available for users who want total freedom from AC power, and there's also an optional sheet feeder which automates the printing of multipage documents.

Canon has indeed succeeded in topping its own personal best with the BJ-10ex.

TOM BENFORD

Circle Reader Service Number 305

## CITIZEN PN48

Compact. Lightweight. Indisputably portable. Undeniably a performer. The 2½-pound Citizen PN48 makes good on the promise of the mobile office. Whether in a hotel room or in the air, this printer can make your documents look almost like they came off a laser printer—it's that good. And when you're packing for that extended road trip, you can squeeze the PN48 into your briefcase next to your notebook computer—it's that small.

If you're looking for the trade-offs, the good news is that there aren't many. You won't have a sheet feeder, but the PN48 offers two paper paths (from the rear or bottom) that work smoothly with almost any kind of paper and envelopes, in widths from 3.5 inches to 10.2 inches. If you're designing last-minute changes to your presentation at 27,000 feet, the

# TEST LAB

PN48 will also handle high-quality transparencies. Loading is simple, smooth, and flawless. Paper jams just weren't a problem for me.

Print quality is a trade-off, but it's a small one. Since Canon introduced its bubble-jet portable two years ago, several manufacturers have worked to improve the print quality of portable printers. Citizen achieves very clear and distinct type with the PN48, although you may experience some slight variation in tone. Overall, however, the quality of the print so far outdistances that usually associated with portable printers as to make these slight variations negligible. If you do experience problems, experiment with different kinds of paper, as paper quality will affect print quality.

The PN48 offers IBM and Epson emulations. A Windows driver is available from Citizen's online support bulletin board system. The drop-in ink cartridges come in two varieties: a single-strike cartridge (best-quality print) that you can use only once and a multistrike cartridge (lower-quality print) that can be turned over and used again. The multistrike cartridge should be good for 100,000 characters, or between 50 and 70 ASCII pages. The single-strike cartridge yields 35,000 characters, or about 20 to 25 ASCII pages.

A rechargeable ni-cad battery

## CITIZEN AMERICA

P.O. Box 4003

Santa Monica, CA 90411-4003

(800) 477-4683

List price: \$549 for Professional System with rechargeable battery, \$469 for Standard System without battery

provides true portability and adds little weight to the unit. Citizen claims that a full charge is enough to print about 20 to 25 double-spaced pages of text. Charging a completely empty battery takes about six hours.

The PN48 can't be considered a substitute for a desktop printer, except perhaps by executives who don't want to be seen printing documents they've prepared themselves. (In this case, Citizen's brick-size printer will easily fit into the top drawer of the desk, out of sight.) For the salesperson who needs to update and print orders and contracts while meeting with clients or for other specialized fieldworkers requiring access to a printer, the PN48 makes a lot of sense. The price, while not insubstantial, is well met by performance and reliability. When you're on the road, those are qualities that you shouldn't have to sacrifice.

PETER SCISCO

Circle Reader Service Number 306



## HAYES POCKET EDITION 2400 MODEM

A perfect addition to the portable computer user's ensemble, the Hayes Pocket Edition 2400 carries on the Hayes tradition of high-quality, industry-standard data-communications devices.

Measuring a demure  $3 \times 2 \times \frac{7}{8}$  inches, the Pocket Edition is a fully functional 2400-baud external device complete with built-in 9-pin serial cable, six-foot phone cord, and Smartcom EZ communications software. The Smartcom EZ software, a bare-bones terminal program, allows for such things as file transfers under the standard XMODEM protocol and is accessed through a friendly menu system; however, it lacks many of the features available in more sophisticated terminal packages—features like multiple-transfer protocol selections and mini-BBS functions. Because it's a genuine Hayes, however, the Pocket Edition 2400 will work with any software that supports the nearly universal Hayes AT command set.

Installing the Pocket Edition requires nothing more than plugging in the serial and phone cables and loading the Smartcom EZ software via an automated installation program. Hayes couldn't have made the installation and setup simpler than this.

The documentation supplied with the modem is clear and simple to follow. Hayes makes no assumptions about the user's knowledge or prior experience



## HAYES MICROCOMPUTER PRODUCTS

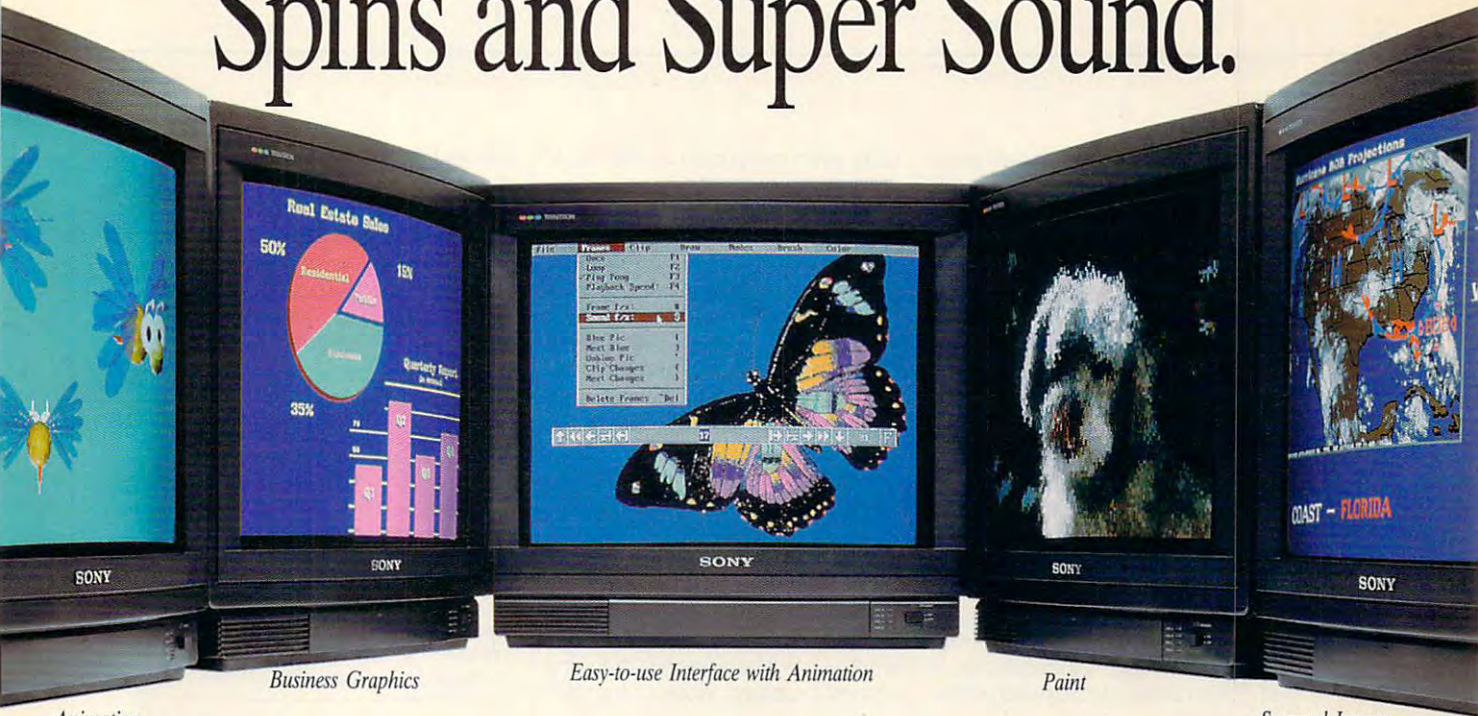
5835 Peachtree Corners E

Norcross, GA 30092-3405

(404) 441-1617

List price: \$179

# Power Moves. Hot Paint. Wild Spins and Super Sound.



Animation

Business Graphics

Easy-to-use Interface with Animation

Paint

Scanned Images

## PC Animate Plus™ for polished, professional presentations. Only \$199.95



### Put Your Project In Motion.

Get your act moving, fast. PC Animate Plus contains all the tools you need to create a knockout presentation – paint, 2D animation, graphics, special effects, and synchronized sound.

Paint beautiful pictures in any resolution. Animate your own cartoons or graphics from other sources. Title home videos, Create brilliant business presentations. Produce your own music videos. Explore the depths of your imagination. It's never been easier.

### Flexibility Matches Power.

PC Animate Plus was designed for simplicity. Simple to create, simple to change, and simple to use. The dropdown menus make it immediately usable. The manual was written

for quick reference. And the program's flexibility is unequalled in any resolution – forward or backward. PC Animate Plus supports the most popular sound card (Sound Blaster™ compatible), converts Autodesk .FLI files for compatibility, supports EGA, VGA, and VESA (super and ultra VGA), up to 1280 x 1024 with 256 colors, as well 32,000 color formats. And, it reads or writes GIF, PCX and TIFF picture formats.

### Power and Depth.

Special effects – color, pixel, palette, frame, and sound – turn your PC into a complete art and

animation department. Give 2D the look of 3D. Move images over easily defined paths. Change colors and apply textures as the image moves. Alter your image with effects like shatter, defocus, ripple and more.

There you have it. PC Animate Plus. It's practical and affordable. Plus, it's great fun.



*Brown Wagh*

160 Knowles Drive, Los Gatos, CA 95030  
 (800)451-0900 (outside CA)  
 (408)378-3838 (inside CA)  
 (408)378-3577 (fax)

# TEST LAB

with modems and terminal software, and the manual provides more than adequate handholding.

The Pocket Edition 2400 is unique in that it doesn't require a battery or AC power supply to operate like other pocket modems; it draws its operating voltage directly from the computer's +5-volt power-supply pin on the serial port. This eliminates the need to pack and carry an AC transformer or worry about whether your nine-volt battery is fresh.

The Pocket Edition 2400 is a natural traveling companion for use with portable computers, and it comes with a small zippered carrying bag for stowing it during travel. The black bag, with *Hayes Pocket Edition 2400* emblazoned on the

side, even has a loop on the back for belt attachment.

Such small size dictates eliminating some features regarded as standard on full-size modems—internal speakers and status-indicator lights, for example. Traditionally, speakers and indicators on modems allow ready access to the modem's status during transmission and provide an accurate means of error detection during problematic transfers.

A modem's speaker lets you know if a connection has been made, if a line is busy, or if you've dialed a wrong number. Without the speaker, you must rely on the terminal software. The bundled software, while it handles rudimentary communications, doesn't monitor

connection conditions as well as some third-party packages do.

Ideal for portable use and also quite serviceable for desktop users with limited space, the Hayes Pocket Edition 2400 delivers plenty of features and performance in a pint-size package.

TOM BENFORD

Circle Reader Service Number 307

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.

## THE MODEM AND FAX TESTS

To test this month's communications devices, we used a 20-MHz 386SL notebook computer and a 25-MHz 386DX desktop computer; each was running MS-DOS 5.0.

Additional equipment for the testing included a TLS-3 line simulator, an FTS-80 modem/fax test set, and a proprietary CPTS multilevel line-noise and signal-impairment generator. To confirm and calibrate all off-hook meter readings and test levels, we used a standard AT&T 2500 touch-tone telephone set.

A 2400-bps Hayes-compatible external modem connected via the serial port served as the host modem for all modem testing. We used Procomm Plus communications software (parameters: 2400,N,8,1) and the Super Kermit file-transfer protocol to send and receive the following test files: SPALOGO.IMG (bitmap graphics; 19,592 bytes), SOFTWARE.TEX (ASCII text file; 9,728 bytes), WATERFAL.PCX (PC Paintbrush file; 39,324 bytes), MEMCHK.COM (command program; 1,266 bytes), QT.COM (command program; 512 bytes), 4000AS.TXT (ASCII alignment text file; 4,224 bytes), BUSY.EXE (executable program; 12,539 bytes), CAN.TIF (TIF scanned image file; 12,018 bytes), PRINTER.DOC (ASCII extended characters; 4,224

bytes), SAY.EXE (executable sound program; 13,393 bytes), VOICE.V3S (digital sound file; 4,224 bytes), WIND-LOGO.GEM (GEM vector graphics file; 1,156 bytes).

We sent and received the test files using "clean" simulator conditions as well as various impairment levels. To test the integrity of transfers at the end of each test cycle, we ran executable and program files and compared file sizes; text and graphics files were displayed to confirm the integrity of those transfers visually.

For all fax testing, a desktop Okidata Okifax 650 fax machine served as the host test unit. We used the manufacturer's proprietary fax software with the following test files: SPALOGO.IMG (bitmap graphics; 19,592 bytes), SOFTWARE.TEX (ASCII text file; 9,728 bytes), WATERFAL.PCX (PC Paintbrush file; 39,324 bytes), 4000AS.TXT (ASCII alignment text file; 4,224 bytes), CAN.TIF (TIF scanned image file; 12,018 bytes), PRINTER.DOC (ASCII extended characters; 4,224 bytes).

File type-transmission compatibility varies greatly from one fax product to another; hence, some products can send all of the above file types as well as additional formats while others cannot even support all of the file types listed above. All can support ASCII files, and most can

transmit PCX and TIF types at a minimum, so we've based our test file types on the most popular formats supported by the majority of products.

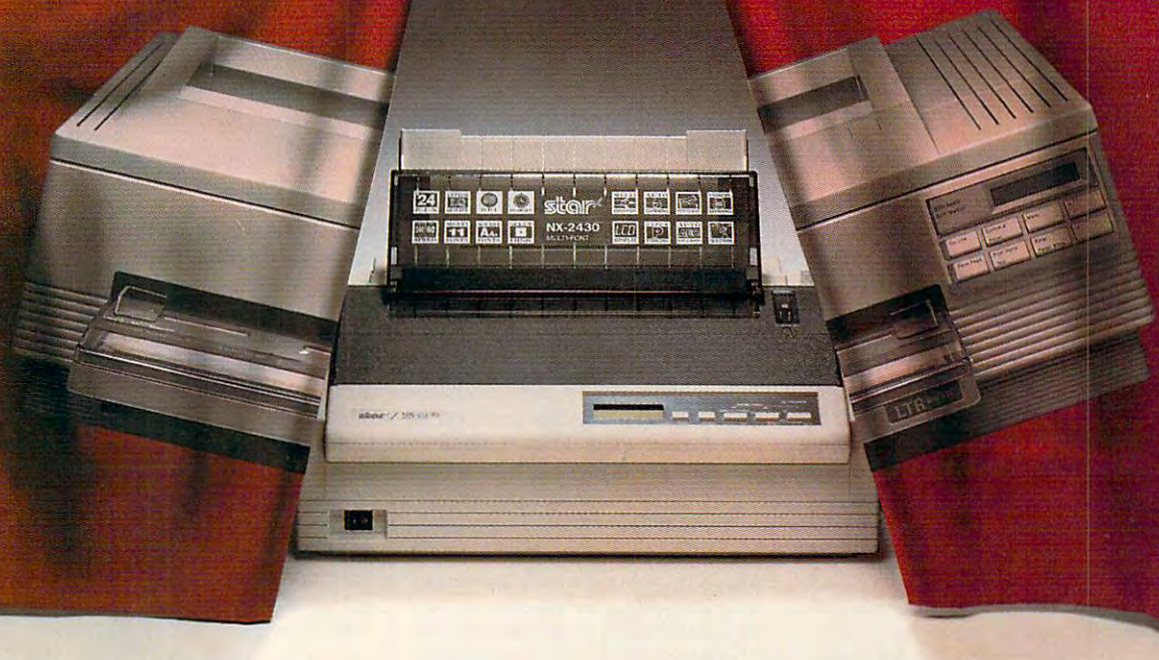
Test files were sent and received using "clean" simulator conditions as well as various impairment levels. We compared documents received at the Okifax 650 with laser-output samples of the original document files to judge the quality of the transmission and visually confirm the integrity of the file transfer. With each test device, we used the highest transfer rate available to send files to the Okifax 650, which supports 9600 bps in standard Group III mode. If the data-transfer rate had to be stepped down to 7200, 4800, or 2400 bps during the transfer process, we indicated it on our test-result data sheets.

For testing fax devices that can receive as well as send files, we used a nine-page set of laser-output samples with a cover sheet as the test medium, sending it from the Okifax 650 to the test device under clean and impaired line conditions. Received fax files were viewed on the video display between test cycles and printed using a 300-dpi HP-compatible laser printer driven by the fax software's file-printing utilities.

—TOM BENFORD, PRESIDENT  
COMPUTER PRODUCT TESTING SERVICES



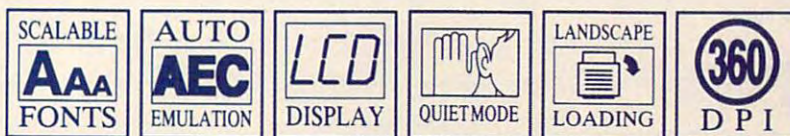
# DON'T LET THE LASER FEATURES FOOL YOU.



## Discover Star's new NX-2430 printer. Laser features at 1/3 the price.

Because its features and performance are so much like a laser, you'd think the new NX-2430 Multi-Font was actually a laser printer. It has 13 scalable fonts, which allow you the creative freedom to customize your documents. And it has the extra conveniences that make lasers so easy to use, like real-time LCD display and automatic emulation switching. What's more, its print quality is excellent for both text and graphics.

But don't be fooled—the NX-2430 Multi-Font is a very reliable, extremely affordable, 24-pin dot matrix. And it's backed by Star's exclusive 2-Year Parts and Labor Warranty. For more information, call 1-800-447-4700.



**star**

IT TAKES A LITTLE EXTRA TO BE A STAR.

Circle Reader Service Number 113

[www.commodore.ca](http://www.commodore.ca)

# TEST LAB

## MEGAHERTZ P224FMV POCKET LAPTOP FAX MODEM

Combine sophisticated modem, terminal, and fax software with highly functional communications hardware, and what have you got? The Megahertz P224FMV Pocket Laptop Fax Modem system, a high-powered package that should serve any user well.

The sleek, diminutive 3¼ × 2¼ inch unit comes with several accessories, including a six-foot telephone cord, a pair of alkaline batteries, an AC power adapter, and a zippered carrying pouch. A 9-inch serial cable connects with the host PC's 9-pin serial port. The Megahertz is equipped with a single phone jack, so it's not possible to have a telephone connected at the same time.

Packaged with the Megahertz is the MTEZ terminal program and ExpressFax software. MTEZ is a surprisingly good terminal program loaded with features, lacking only in the number of protocols available for data transfers. It's rich in functionality, including full scripting capabilities, DOS gate-

**MEGAHERTZ**  
4505 S. Wasatch Blvd.  
Salt Lake City, UT 84124  
(800) LAPTOPS  
List price: \$379

way, mini-BBS utilities, and much more. Likewise, ExpressFax is one of the most comprehensive and flexible fax software programs provided with any of the units reviewed here. The program supports full memory-resident (TSR) background fax reception, so it won't interfere with other computing functions. File conversions of ASCII text, PCX, DCX, EXP, and TIF formats are provided as well as a memory-resident printer utility for routing incoming faxes to on-line printers. ExpressFax doesn't support GEM IMG files, but unless you use Ventura Publisher or other GEM-based applications, this shouldn't pose much of a problem.

Installation proved to be more challenging than expected. Initially, the unit functioned perfectly as a modem but refused to send or receive any fax transmissions. A toll-free call to Megahertz technical support revealed that the internal registers had somehow

been changed and they required manual resetting. Once I reset these, the fax sent single-page documents without incident. However, transmission of multipage documents was interrupted, and a communications error was reported after each page was sent.

Another call to tech support disclosed that the version of ExpressFax shipped with the unit wasn't the most current and that this was the root of the problem. I promptly downloaded the newest version from the Megahertz BBS using the MTEZ software. Once the update was loaded, the fax functioned without a hitch.

Using the Megahertz unit is easy, thanks to the friendly yet sophisticated software provided. In just about every respect, I found the Megahertz to be a megahit.

TOM BENFORD

Circle Reader Service Number 308



### PORTABLE PRINTER TEST RESULTS

	BROTHER HJ-100i	CANON BJ-10EX	CITIZEN PN48	STAR MICRONICS STARJET SJ-48
<b>4-page text document</b>				
Elapsed time	2 min. 57 sec.	3 min. 6 sec.	4 min. 14 sec.	3 min. 20 sec.
Output appearance	good	good	good	excellent
<b>4-page GEM Artline graphics</b>				
Elapsed time	9 min. 55 sec.	9 min. 59 sec.	18 min. 24 sec.	10 min. 27 sec.
Output appearance	good	good	good	excellent
<b>2 PerForm ruled forms</b>				
Elapsed time	6 min. 12 sec.	6 min. 10 sec.	10 min. 39 sec.	6 min. 29 sec.
Output appearance	good	good	good	excellent
<b>C.P.T.S. printer test</b>				
Elapsed time	1 min. 47 sec.	1 min. 57 sec.	4 min. 27 sec.	1 min. 57 sec.
Output appearance	good	good	good	excellent
<b>Windows font test</b>				
Elapsed time	0 min. 36 sec.	0 min. 53 sec.	1 min. 5 sec.	1 min. 5 sec.
Output appearance	good	good	good	excellent
All tests were run using the Epson emulation.				

# Although We Carry A Variety Of Products, We Only Offer Quality.

## EXPANSION BOARDS

### Orchid Technology

Ramquest 16/32  
OK \$229 2MB \$329  
2-8MB for PS/2 50/55/60/70/80  
Ramquest 8/16 OK \$149 2MB \$245

### BOCA Research

Bocaram At Plus  
OK \$119 2MB \$199 2-8MB LIM 4.0 AT's  
Bocaram 2 for PS/2's OK \$159 2MB \$219  
Bocaram XT-PS/2 30 1MB \$159

### AST Research

Rampage Plus 286 OK \$189 2MB \$289  
up to 8MB for AT UM 4.0  
Fastram 286 1MB \$279  
Cupid 32 OK \$250

## VIDEO GRAPHICS CARDS

### ATI

8514 Ultra 1MB PS/2 or ISA BUS \$449  
Graphics Ultra 1MB & mouse \$549  
Graphics Vantage w/1MB \$389  
NEW!!! VGA Stereo XL w/1MB \$375  
VGA Wonder XL 1MB w/mouse \$239

### Orchid Technology

Fahrenheit 1280 w/1MB & Sierra \$379  
Prodesigner IIS 512K \$199 1MB \$219  
Prodesigner IIMC for PS/2 1MB \$399

### BOCA Research

BOCA Super VGA 512K \$139 1MB \$179

## PRINTER UPGRADES

### Hewlett Packard

Laserjet IIP, III, IIID, IIIP  
1MB \$69 2MB \$119 4MB \$199  
Laserjet II, IID  
1MB \$89 2MB \$119 4MB \$199

800/899-8518

**UNIVERSAL**  
MEMORY PRODUCTS

### Panasonic 4420 & 44501

1MB \$109 2MB \$129 4MB \$229  
4450 1MB \$179 4455 2MB \$269

### Epson EPL 6000 & EPL 7000

1MB \$129 2MB \$145 4MB \$235

### IBM 4019 & 4019E

4MB \$115 2MB \$139 3.5MB \$199

### OKI 400, 800, 820, 830, 840

1MB \$119 2MB \$169 4MB \$199

### Canon

LBP 4 2MB \$209 LBP 8 2MB \$119

## MEMORY CHIPS & MODULES

### DRAM

1X1-70NS \$4.95 256X4-80NS \$4.99  
1X1-80NS \$4.50 256X4-100NS \$4.95  
256X1-80NS \$1.99 256X1-120NS \$1.75  
256X1-100NS \$1.85 256X1-150NS \$1.50  
64X4-80NS \$3.00 64X1-100NS \$1.75  
64X4-100NS \$2.75 64X1-120NS \$1.60

### SIMM/SIPP Modules

4X9-70NS \$169 4X9-80NS \$159  
1X9-70NS \$42 1X9-80 \$41  
1X9-100NS \$40

## MATH CO-PROCESSORS

### IIT

US83C87-16, -25, -20 & -33 \$169  
US83C87-16SX \$115 -20SX \$129  
New US83C87-40 \$199

### Intel

80387-16, -20, -25 & -33 \$239  
80387-16SX \$139 -20SX \$189  
80287-10 \$75 80287XL \$99

UNIVERSAL MEMORY PRODUCTS 15451 Redhill, Suite E,  
Tustin, CA 92680 ☐ Phone: 714/258-2018 Fax: 714/258-2818  
Hours M - F 6:30 - 5:00 SAT 8:00 - 2:00 PST



**N**o matter what you buy from us, you won't have to worry. Because at Universal, we only stock the most reliable products in the industry.

That's why, we can offer a 5 year warranty with a 30 day, money back guarantee on every product.

Plus, everything you buy is guaranteed to be compatible with your computer. Because when you call to order, our sales service department will help you figure out exactly what you need. They're knowledgeable about every product. So they'll be there for you every step of the way.

And just to make sure nothing is overlooked, we also check every product for quality before it's shipped. After that, it's sent to you anyway you like.

So if you want to upgrade your computer, use Universal. Because everyone who orders a product from us, gets the same thing.



## IBM PS/2 UPGRADES

### IBM PS/2 Memory

6450604 2MB MOD 50Z, 55SX, 70 \$99  
6450608 2MB MOD 70A21 \$119  
34F2933 & 77 4MB PS/2 SIMM \$199  
6450129 8MB SIMM \$564  
30F5360 2MB for 30-286 \$99  
6450128 4MB MOD 90 & 95 \$219  
6450902 2MB MOD 90 & 95 \$129  
6450609 2-8MB MOD 50, 50Z, 60 \$298  
6450605 2-8MB MOD 70 & 80 \$350  
34F3077 2-14MB MOD 70 & 80  
w/2MB \$298  
34F3011 4-16MB MOD 70 & 80  
w/4MB \$429

### PS/2 Hard Drives

Zero Slot for 50, 50Z  
52MB \$395 80MB \$495 105MB \$599  
124MB for 55SX, 70 \$740 240MB \$999  
200MB \$1065  
124MB MDL 55SX, 70 \$740 200MB \$1065

### Processor Upgrades by Kingston

IBM PS/2 50, 60, 50Z, 30/286, 25/286,  
AT, XT/286, AST Premium/Bravo 286,  
Compaq Deskpro 286, Portable III, HP  
Vectra ES/12, ES/8, NEC PowerMate  
286+, Portable +, Epson 286: 20MHZ for  
\$341 25MHZ for \$419

## COMPAQ UPGRADES

### Compaq Deskpro

Deskpro 386/20, 25, 20E, 25E & 386S  
4MB Module \$229 4MB expboard \$327  
Deskpro 386/33 486/25 Systempro  
2MB Module \$149 6 socket exp. brd.  
w/2MB \$395

### 1/3 height floppy disk drives

1.44MB \$129 1.2MB \$139

### Portables

LTE 286 1MB \$99 2MB \$169 4MB \$449  
LTE 386S/20 1MB \$209 4MB \$399  
386/20 1MB Upgrade kit \$145  
4MB exp/ext brd \$375  
SLT 286 1MB \$119 4MB \$429  
SLT 386 1MB \$129 2MB \$255  
4MB \$435

## LAPTOP UPGRADES

### Toshiba

T1200XE/SE, T1600, T3100E, T3100SX,  
T3200SX, T5100, T5200, 2MB \$112  
T3200SXC 2MB \$159 4MB \$329  
T1000SE/XE/LE & T2000SX 1MB \$119  
2MB \$229  
T1000LE & T2000SX 4MB \$419  
T3100SX, T3200SX 4MB \$229  
T3200 3MB \$254

### Megahertz Laptop Modems

2400 BD internal \$149 w/MNP5 \$210  
2400/9600 FAX/Modem w/MNP5 \$319

## NEC UPGRADES

Powermate SX 2MB \$395 4MB \$575  
Powermate SX Plus 2MB \$299 4MB \$525  
Powermate SX/20  
2MB CPU \$189  
2MB EXP \$235  
Powermate 386/  
20/25 2MB \$325  
8MB \$799

## ZENITH UPGRADES

Z-386/20/25/33  
and 33E 1MB \$64  
4 MB \$219  
MastersPort SL,  
386SX 2MB \$199  
SlimsPort/  
SuperSport, SX,  
286E \$159  
TurboSport 386,  
386E 1MB \$149  
4MB \$495

Same day shipping by UPS, Federal Express or DHL. Order worldwide by PO, C.O.D., APO, FPO & credit card with no surcharge added. 20% restocking fee on all non-defective returns.



# TEST LAB

## FAX AND MODEM FEATURES

	HAYES POCKET EDITION 2400 MODEM	MEGAHERTZ P224FMV POCKET LAPTOP FAX MODEM	U.S. ROBOTICS WORLDPORT 2496 FAX/DATA MODEM	ZOLTRIX POCKET 96/24 FAX MODEM	ZOLTRIX 2400P DATA MODEM
List price	\$179	\$379	\$379	\$229	\$99
Product type	modem	fax/modem	fax/modem	fax/modem	fax/modem
Maximum fax speed (in bps)	n/a	9600	9600	9600	4800
Minimum fallback (in bps)	300	300	300	300	300
Data modem capability	■	■	■	■	■
Auto fax/modem select	n/a	■	■	■	■
Fax transmit capability	n/a	■	■	■	■
Fax receive capability	n/a	■	■	■	□
Maximum modem data speed (in bps)	2400	2400	2400	2400	2400
AT command set	■	■	■	■	■
Background/operation mode	n/a	■	■	■	■
Automatic answering	n/a	■	■	■	■
Automatic dialing	n/a	□	□	□	□
Performs polling	n/a	□	□	□	□
<b>Clean tests</b>					
Transmit	pass	pass	pass	pass	pass
Receive	pass	pass	pass	pass	†
<b>Impairment tests</b>					
Transmit	pass	pass‡	pass‡	pass	pass
Receive	pass	pass	pass	pass	†
Hardware installation	simple	average	average	average	simple
Software installation	simple	average	average	simple	simple
Documentation	good	good	excellent	good	good
Overall product assessment	good	good	good	good	good

† Send-only unit.

‡ Passed all tests; will not send IMG files.

■ —yes □ —no

n/a—not applicable or not available

Minimum fallback is the minimum speed to which a modem or fax will fall back—that is, slow down—to match speeds with another machine or to perform extra error correction in order to check and ensure data integrity.

Polling allows a fax unit, at a deferred time, to send out form letters to a predetermined set of fax numbers. It also allows you to leave documents in your transmit queue and have them transmitted in response to a faxed request.

# Shhh!

**Don't tell  
them  
they're  
learning.**

***If you haven't discovered  
it already, welcome to  
Learning Company software.***

We've put more into it, so you and your family will get the most out of it. Fabulous graphics, captivating characters, and intriguing music, sound effects and animation make Learning Company software so much fun that kids play it over and over. And, they're so excited about playing that they don't realize they're absorbing its rich educational content.

Our educational approach is a proven winner. All of our products are thoroughly tested by teachers, educational specialists, and kids—both in the classroom and at home.

This blend of solid education and engaging activities must be working. We have an amazingly high percentage of repeat customers. After you try one of our products, you'll come back for more too! So, add some excitement to your family's education.

***Choose from the following  
Learning Company titles:***

**Ages 10 & Up** *Operation Neptune \**  
*Ancient Empires*

**Ages 7 to 10** *Super Solvers  
Spellbound! \**  
*Super Solvers  
Midnight Rescue!*  
*Super Solvers  
OutNumbered!*

**Ages 5 to 8** *Reader Rabbit 2 \**  
*Super Solvers  
Treasure Mountain!*

**Ages 3 to 6** *Reader Rabbit's  
Ready for Letters \**  
*Reader Rabbit 1*  
*MetroGnomes' Music \**

**Productivity  
for All Ages** *The Writing Center \**  
*The Children's Writing  
& Publishing Center*

*\*New*

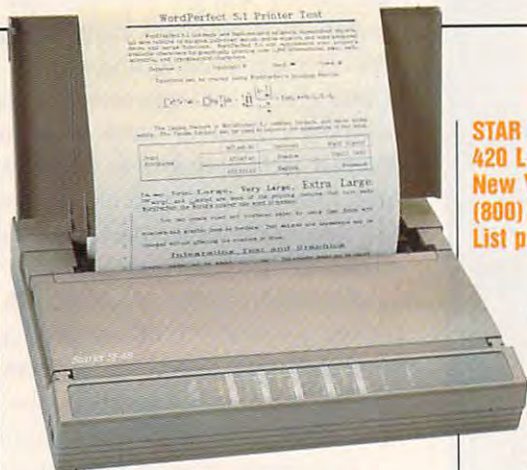
If you can't find our products at your local dealer, call us and ask about our limited time  
***25% discount offer!***

**The Learning Company®**

6493 Kaiser Drive ■ Fremont ■ CA ■ 94555

**Call 1-800-852-2255!**  
**www.commodore.ca**  
Circle Reader Service Number 104

# TEST LAB



## STAR MICRONICS STARJET SJ-48

With clear and well-defined output (up to 360 x 360 dpi resolution) rivaling that of laser printers, nearly silent operation, and minimal maintenance requirements, the four-pound SJ-48 is equally suited to the office, the home, and the college dorm. Best of all, it costs just a little more than a 24-pin dot-matrix printer (and several hundred dollars less than a personal laser printer).

Looking for type control? The SJ-48 comes with four resident bit-mapped fonts (Roman- and Helvetica-style faces with italic for both) and a version of Bitstream's Facelift, which gives access to 13 more scalable fonts. A Windows driver also comes with the printer.

The mechanical implementation of the SJ-48 is sound, from the paper feed to the front-panel controls. The printer accepts a variety of different paper stocks, from standard copier paper to envelopes and cards. Using the front panel, you can control the font and pitch, adjust the top of form, clean the printhead, pause printing, and flush the buffer (28K maximum, with no character download).

The clearly marked front-panel display provides only auditory feedback: Instead of visual indications of your selections, you must rely on a series of beeping signals, which are described in the printer's 120-page manual.

**STAR MICRONICS AMERICA**  
420 Lexington Ave., Ste. 2702  
New York, NY 10170  
(800) 447-4700  
List price: \$499

The documentation clearly lays out the order of font selection but doesn't explain how to rotate to the top of the pitch selection list. You should print a few test pages and record the results in your manual to ensure that you're setting the correct pitch for your documents.

Two paper paths (from the rear and from the top) handle rolling and straight feeds. You should feed heavier stock (envelopes and cards, for example) from the rear with the printer on its edge (using the printer's pull-out stand for stability). Regular paper can also be fed through the rear, from the top (with the printer flat on the table), or from an optional 30-page sheet feeder.

An optional rechargeable battery (an additional 0.6 pound) can provide power for printing about 40 pages of text. The added weight is a small trade-off for the flexibility of having a truly portable printer with this kind of print quality. Print cartridges install easily and are rated at 700,000 characters. Overall, the economics of the SJ-48 compare favorably to the economics of laser printers for home offices or other businesses with moderate printing requirements (about \$0.05 per page for the SJ-48 as compared with about \$0.03 for the typical laser printer).

Designed for small workspaces, mobile executives, and home office workers needing high-quality output, the SJ-48 is all the printer many computer users will need. Versatility, desktop publishing quality, high-resolution graphics, ease of use, portability, and reliability (a two-year warranty) make this one a Star.

PETER SCISCO  
Circle Reader Service Number 309

## U.S. ROBOTICS WORLDPORT 2496 FAX/DATA MODEM

The U.S. Robotics WorldPort 2496 portable fax and data modem is well designed and full of thoughtful features that, depending on your particular needs, could make it an excellent choice for your mobile telecommunications.

The WorldPort uses a 25-pin input connector and attaches to either 9- or 25-pin serial ports on the PC via an included Y-connector cable with dual ends. The unit itself comes with an internal speaker, data-display lights, and dual phone jacks—all highly useful and desirable features.

For troubleshooting problems that often occur during the connect phase of modem use, the internal speaker is a blessing. Without the speaker to alert you to potential problems, the software must be able to report accurately the current line status, which isn't always possible. For instance, if a bulletin board system is taken offline for one reason or another, a modem without a speaker will offer a simple NO CARRIER message in most cases when the number is tried, and that same message is reported for busy signals.

Without a speaker to alert you to the condition, multiple redial attempts will be made, incurring long-distance charges and causing the BBS operator headaches from the repeated calls. With the speaker on, you can hear that there's no longer a bulletin board online at that number and can cease connect attempts.

The WorldPort has four data lights that monitor data speed, fax/error correction, carrier detection, and battery power. Display lights are a welcome feature on any pocket fax/modem, since they provide a "window" on the unit's status and operations.

The dual phone jacks built into

# YOU WON'T RECOGNIZE THE FAMOUS COMPUTER IN THIS AD. OR THE VALUE.



You'd never know the amazing things this black box can do just by looking at it. Not only does CDTV® play your audio CDs but it can bring words, music and pictures to life on your television. CDTV simply connects to your TV and stereo and through its ingenious marriage of computer, audio and video technologies lets you play with a new generation of interactive CDs.

CDTV is based on the Amiga® and if you buy the CDTV/P system before June 30th it comes with AmigaDos®, a keyboard, floppy drive, mouse, Grolier's Electronic Encyclopedia™, Lemmings™, Appetizer pack and a savings of up to \$848.00\*.

Just pick up a CDTV Multimedia Player and you'll have a full 1Mb Amiga 500 with the potential to be a home video editing system, a home reference library, a children's learning tool, a music studio and a language learning lab. All within reach of your sofa.

For the name of the closest authorized Amiga dealer or for your free CDTV Welcome Tour video tape call 1-800-66-AMIGA, in Canada, call 1-800-661-AMIGA.

Look into CDTV Multimedia. You'll be amazed at what you see.



CDTV is a registered trademark of Commodore Electronics Ltd. Amiga and AmigaDos are registered trademarks of Commodore Amiga, Inc. Electronic Encyclopedia is a trademark of Grolier Electronic Publishing Inc. Lemmings is a trademark of Psygnosis. © 1992 Commodore Business Machines, Inc. \*Based on MSRP, actual dealer prices may vary.

Circle Reader Service Number 201

[www.commodore.ca](http://www.commodore.ca)

# TEST LAB

## PORTABLE PRINTER FEATURES

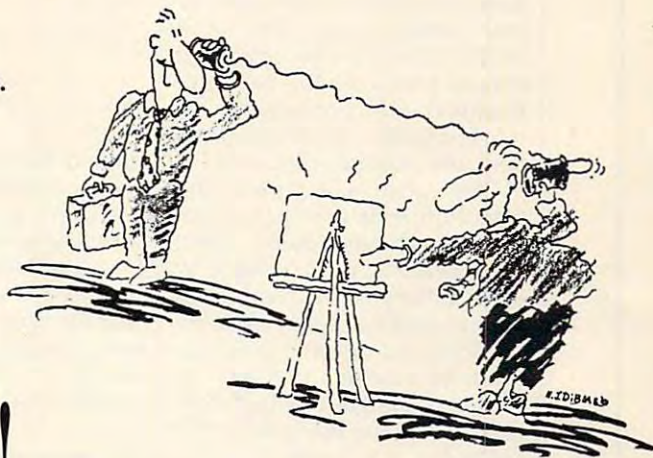
	BROTHER HJ-100i	CANON BJ-10EX	CITIZEN PN48	STAR MICRONICS STARJET SJ-48
List price	\$499.95	\$499.00	\$469.00††	\$499.00
<b>Dimensions</b>				
Height (in inches)	1.9	1.9	2.0	1.9
Width (in inches)	12.2	12.2	11.7	12.2
Depth (in inches)	8.5	8.5	3.5	8.5
Weight (in pounds)	4.0†	4.0†	2.5†	4.0
Print mechanism	ink-jet	bubble-jet	thermal	ink-jet
Print speed (in cps)				
Draft	83	83	53	83
Letter quality	83	83	53	83
<b>Interface</b>				
Parallel	s	s	s	s
Serial	n/a	n/a	n/a	n/a
SCSI	n/a	n/a	n/a	n/a
AppleTalk	n/a	n/a	n/a	n/a
<b>Emulations</b>				
IBM ProPrinter	■	■	■	■
Epson	■	■	■	■
HP-II	□	□	□	□
HP-Plotter	□	□	□	□
Standard RAM (in kilobytes)	37††	37‡	4	28
Expansion RAM (in kilobytes)	none	none	none	none
<b>Paper feed</b>				
Tractor	□	□	□	□
Friction sheets	■	■	■	■
Sheet feeder	□	□	□	□
Trays	□	□	□	□
Roll paper	□	□	□	□
Envelopes	■	■	■	□
Transparencies	■	■	■	□
Labels	■	■	■	□
Sheet feeder option	■	■	□	■
<b>Paper output</b>				
Face up	■	■	■	■
Face down	□	□	□	□
<b>Image position</b>				
Portrait	■	■	■	■
Landscape	■	■	■	□
† Weight with battery.		†† For Standard System without battery, \$549 for Professional System with rechargeable battery.		
†† In mode 1 or mode 2, 20K in mode 3.		■—yes □—no		
‡ In mode 1 or mode 2, 20K in letter quality mode.		s=standard n/a=not available		



# DELPHI – The \$1 per hour online solution!

**DELPHI's 20/20 Advantage Plan sets the standard for online value:  
20 hours for only \$20, for all the services you want!**

- Thousands of files to download.
- Chat lines with hundreds of participants.
- Worldwide e-mail.
- Hobby and computer support groups.
- Multi-player games.
- Local access numbers  
in over 600 cities and towns.



## Trial Offer: 5 hours for \$5!

Try DELPHI at \$1 per hour. Join today and get 5 hours of evening and weekend access for only \$5. If you're not satisfied, simply cancel your account before the end of the calendar month with no further obligation. Keep your account active and you'll automatically be enrolled in the 20/20 plan for the next month.

1. Via modem, dial 1-800-365-4636.
  2. When connected, press RETURN once or twice.
  3. At *Password*, enter **CP55**
- Questions? Call 1-800-695-4005.

Rates apply for evening and weekend access from within the mainland US. There is a one-time enrollment fee of \$19 when you join the 20/20 Advantage Plan. Further details are provided during the online registration.

DELPHI is a service of  
General Videotex Corporation  
1030 Massachusetts Avenue  
Cambridge, MA 02138-5302

800-695-4005 • 617-491-3393

Circle Reader Service Number 161

# TEST LAB

the WorldPort allow line signals to pass through the fax/modem to your phone, even when the WorldPort isn't in operation. This feature eliminates the hassle of plugging and unplugging required to switch from phone to modem use on single-jack units.

One valuable feature of the WorldPort is its third power option. As with other pocket units, the WorldPort can be powered by either battery (9-volt alkaline) or an included AC power adapter. An additional option allows voltage to be drawn from the computer itself via pin 9 of the DB-25 connector on some IBM-compatible computers. If +12 volts is present on pin 9, the internal battery (if any) is automatically disconnected, and the modem is turned on. If you have a PC that provides +12 volts to pin 9 of your 25-pin COM port (check your owner's manual), this is a very handy feature.

Whether the WorldPort meets your needs may well depend on its software. The communications software provided with the unit lacks many of the features now regarded by computer enthusiasts as standard. While this program conforms to the standard Hayes AT command set and supports XMODEM and ASCII file transfers, it lacks the faster, more efficient transfer protocols. Additionally, it doesn't support script and mini-BBS functions found on more sophisticated programs. If you want a fuller menu of features and data-transfer protocols, you'll have to purchase an additional communications software package.

The fax functions of the device are limited by the supplied software as well. The conversion process supports neither IMG nor TIF formats, which limits the software's usefulness if you have need of these types of image files. The fax-receive program, while fairly simple to use, doesn't operate in background mode. All system processing is halted while incoming fax transmissions are handled, unlike the back-

**U.S. ROBOTICS**  
8100 N. McCormick Blvd.  
Skokie, IL 60076  
(800) DIALUSR  
List price: \$379

ground TSR processing offered with comparable units.

If you're a traveling power user, you may need stronger software than the standard offerings supplied with this unit. If, however, your telecommunication needs are fairly straightforward, the modem and fax functions of the WorldPort should serve you nicely.

TOM BENFORD

Circle Reader Service Number 310

## ZOLTRIX POCKET 96/24 FAX MODEM

The combination of a 2400-baud modem and a full-function 9600-bps send/receive fax in a unit the size of a TV remote makes the Zoltrix Pocket 96/24 Fax Modem an ideal choice for laptop and notebook computer users with telecommunication needs. To go online, simply plug the included 9-pin serial cable into your computer's COM port, connect the phone cable to a jack, and load the software. This done, you have all the communication capabilities of a fully compliant Hayes-compatible modem and a PC fax board.

The Zoltrix has incorporated nearly every feature of a full-size modem into the tiny 5½ × 2¼ inch case. The internal speaker, an option lacking on many other pocket modems, provides auditory confirmation of both fax transmissions and modem functions. As with full-size modems, the speaker can be set to Off, On Until Connection, or On (at all times). An invaluable feature, the speaker is frequently the only way of knowing if the modem or communications package is functioning properly.

Another advantage the Zoltrix has over other pocket modems is



its two phone jacks built directly into the modem's casing. One jack is used for the incoming telephone line. The other jack is used to connect a standard telephone to the modem unit for voice communication. If the phone line to the Zoltrix is frequently used for both voice and data communications, the second jack will prove to be a most worthwhile feature, since it eliminates the need to disconnect and reconnect the modem each time you wish to use the telephone.

Another attractive feature of the Zoltrix is its series of status-indicator lights, commonly found on full-size modems but a rarity on pocket-size portables. The indicators provide a quick assessment of the fax/modem's status.

The fax/modem can draw its operational power two ways. For home or office use, the Zoltrix is supplied with a nine-volt AC transformer; on the go, the fax/modem can use a standard nine-volt alkaline battery.

The Zoltrix design facilitates communications on the go by providing a snap-on plastic casing that covers all the sensitive areas of the fax/modem. Acting as a sheath, the cover effectively isolates the unit from damage due to dust, bumps and scrapes, and general travel abuse.

The supplied BitCom and BitFax programs both provide excellent data communication. BitFax allows for the conversion and transmission of all major file types, including image and TIF formats. In addition, the software supports full memory-resident fax reception in the background, which allows other tasks to be per-

formed on the computer while you receive incoming fax transmissions. The BitCom terminal software is easy to learn and provides a full range of features that will prove useful even to the most demanding modem aficionado.

The Zoltrix Pocket 96/24 Fax Modem is a well-designed and complete telecommunication package. Any laptop or notebook user in the market for a topnotch fax/modem should consider this Zoltrix.

TOM BENFORD

Circle Reader Service Number 311

## ZOLTRIX 2400P DATA MODEM

While lots of notebook- and laptop-computer users need a modem and the ability to send a fax via the PC, not everyone needs (or wants) to receive a fax through a computer. Likewise, many budget-conscious users don't want to pay the price of sending faxes at 9600 bps; for these folks, a 4800-bps model at a lower price is fine. If you're one of these users, then the Zoltrix 2400P Data Modem is the device you're looking for.

The 2400P provides almost the same excellent software and hardware features found in the Zoltrix Pocket 96/24 Fax Modem, and it's a full-featured 2400-bps modem.



**ZOLTRIX**  
47517 Seabridge Dr.  
Fremont, CA 94538  
(510) 657-1188  
List price: \$99

The big difference between the two models is that the 2400P supports only 4800-bps fax transmissions and can't receive faxes at all.

The 2400P is certainly not lacking in features. A stylish dark gray case houses a trio of status-indicator lights, an internal speaker, dual phone jacks, and an external power jack. Viewing the status lights is no problem when the unit is connected to a laptop or notebook computer, but having the 5½-inch unit protruding from the back of a desktop computer makes reading the status lights a chore.

The 2400P comes equipped with its own internal speaker, which provides aural feedback of line conditions and transmission status. You'll want to consider this highly desirable feature when shopping for a fax/modem.

Because the Zoltrix 2400P comes with two phone jacks, you can use the phone without having to disconnect the modem. Leave your phone connected to the Zoltrix all the time if you like, since any phone signals can pass through the 2400P, even when the device is turned off.

Two power options are provided on the 2400P. A nine-volt alkaline battery can provide the power, or you can connect the included AC adapter for unlimited power draw. A status-indicator light alerts you to low-battery conditions. And, like the Pocket 96/24 model, the 2400P is outfitted with a protective cover that shields the

**ZOLTRIX**  
47517 Seabridge Dr.  
Fremont, CA 94538  
(510) 657-1188  
List price: \$229



unit's vulnerable areas.

A modified version of BitFax comes with the 2400P for fax transmissions at 4800 bps; this software has good features and provides excellent file support. TIF, PCX, IMG, ASCII, and several other formats are supported by the conversion software. You should pay attention to the version number, however. The review unit came with version 2.064 of BitFax. Some unresolved anomalies in this version caused problems with the review unit. (Zoltrix tech support was surprised that I'd received that software version, since it hadn't been tested yet.) The company supplied me with version 2.062, which ran without incident, and assured me it would remedy the problem with 2.064 in the very near future.

If 9600-bps send/receive pocket fax/modems seem a bit beyond your budget and you're truly wondering when you'd ever expect to receive a fax at your portable PC, perhaps the Zoltrix 2400P is the economical alternative you're looking for.

TOM BENFORD

Circle Reader Service Number 312

NEXT MONTH:  
WINDOWS  
WORD  
PROCESSORS

# NEWS & NOTES

Jill Champion

## Election-Year Prodigy

Prodigy's new voter-education service, Political Profile, is a welcome respite from network sound bites and political commercials that offer nothing new. Prodigy's Political Profile is a comprehensive database on federal and state politics designed to encourage public political awareness and involvement and to increase voter turnout. Through Political Profile, Prodigy subscribers can access a broad range of candidate information, from incumbents' biographies and key voting records to FEC (Federal Elections Commission) data

portable electronic dictionary that contains more than 300,000 definitions; 500,000 synonyms; spelling correction for more than 110,000 words; and an electronic grammar handbook. *SE* stands for *Special Edition*: The unit has full speech capability for people with special needs, such as those who are visually impaired, blind, learning disabled, or dyslexic.

Full speech capability allows every function on the 6000-SE to be spoken out loud, and the speech rate can be adjusted to suit the needs of the listener. Words can be fully pronounced, audibly spelled letter by letter, or audibly spelled phonetically, and letters can be spoken as they are typed in. A message key allows the 6000-SE to be used as a communication tool for the blind and as a teaching tool for the learning disabled. As many as 26 messages can be entered, stored,

lular, and other phones where jacks aren't removable and from foreign countries where phone jacks differ. The CCITT- and Bell-compatible Voyager weighs only six ounces and uses a nine-volt battery for extra convenience. The suggested retail price is \$390. If you have the Hewlett-Packard 95LX palmtop computer, Com 1 will provide a free adapter that allows you to use the Voyager with it. For more information, contact Com 1 Data Communications, 5120 Avenida Encinas, Suite C, Carlsbad, California 92008; (619) 431-5606.

## Mega Hard Drives

Are you looking for extra data storage? Try megastoring your data on one of Mega Drive System's new Millennium removable hard drives. These superstorage drives for PCs, Macs, and all networked workstations hold from 52 megabytes to one gigabyte with average access times of from 9 to 12 milliseconds. Linked multiple docking bays can increase storage up to seven gigabytes of active online storage.

The Millennium drives are priced from \$1,599 to \$6,599. Mega Drive Systems also has a new Mercury series of removable hard drives that hold up to one gigabyte of data in an internal half-height slot. Mercury prices range from \$1,129 to \$6,559. For more information, contact Mega Drive Systems, 489 South Robertson Boulevard, Beverly Hills, California 90211; (310) 247-0006.

## Parlez-vous... ?

As the world continues to move closer to the concept of a true global village, access to rapid, dependable language translators is now essential. If you're in need of a foreign language translator for any type of technical doc-

**The Language Master 6000-SE, Franklin Electronics' special-edition English-language resource, has full speech capabilities to help those with special needs.**



on presidential and congressional candidates' campaign contributions. Information is also available on the state level. For an extra \$2.50, subscribers can write directly to their congressional representatives through the service. Letters will be printed out and then delivered to Capitol Hill offices.

For more information on this service, contact Prodigy Services, 445 Hamilton Avenue, White Plains, New York 10601; (800) 776-3449.

## A Special Pocket Dictionary

Kudos to Franklin Electronics for helping meet the needs of the physically challenged with its recently introduced Language Master 6000-SE, a

and spoken at any time by pressing a key.

Because the 6000-SE will be used to meet a variety of different needs, features such as font sizes, speech modes, message speeds, and personal word lists can be completely customized.

The suggested retail price is \$495. For more information, contact Franklin Electronic Publishers, 122 Burrs Road, Mount Holly, New Jersey 08060; (609) 261-4800.

## Pocket Rocket

The MV214 Voyager pocket modem from Com 1 Data is packaged with an acoustic coupler, allowing Voyager users to link from pay, hotel, cel-

ADVERTISEMENT

# JOIN THE COMPUTE SEARCHSTAKES



## YOU MAY WIN BOTH OF THESE CITIZEN PRINTERS! DIAL 1-900-454-8681!

The Citizen GSX-145 color printer is the fast, easy solution to spreadsheets, multipart forms, and mailing labels. The Citizen Notebook Printer (PN48) fits in your briefcase and puts laser-quality printing on any paper, anytime. Now they can be yours.

### IT'S GRAND TO WIN

Every month, from now until November, you'll have the chance to win fabulous prizes by playing the Compute SearchStakes. And by solving a minimum of just two monthly SearchStakes, you'll be in the position to compete for the SearchStakes Grand Prize, to be featured in our upcoming December issue.

### IT'S FUN TO PLAY

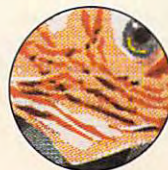
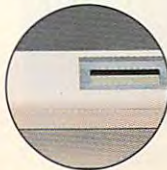
Each of the six picture disks displayed below is a portion of a photo or illustration taken from an ad in this issue. To solve the June SearchStakes, locate the ads from which

these disks were taken and note the page number for each. If the ad has no page number, simply count that page or cover as zero. Then add up all six page numbers. That is the solution to this month's SearchStakes.

### IT'S EASY TO ENTER

Once you find the solution, you may enter the June SearchStakes automatically on a touch-tone phone by calling 1-900-454-8681 (\$1.50 for the first minute, \$1.00 for each additional minute) or by mailing your answer on a 3" x 5" piece of paper, along with your name, address, and phone number to: "June Compute SearchStakes," 324 West Wendover Avenue, Suite 200, Greensboro, N.C. 27408 by 7/31/92. For more information on how you may win this month's prize, valued at \$1,500, turn to page 38.

Citizen printers. *Compute* magazine. Enter early... and enter often!



“We choose to go to the moon...”  
 —John F. Kennedy

“Likely to set a standard for multimedia entertainment products.”  
 —Computer Gaming World



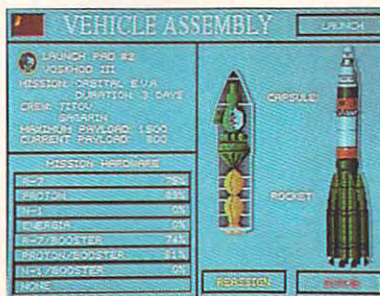
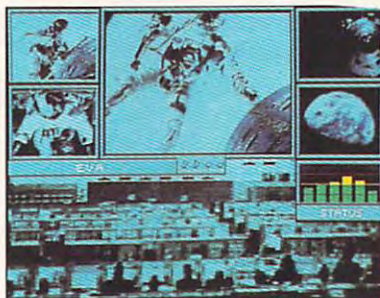
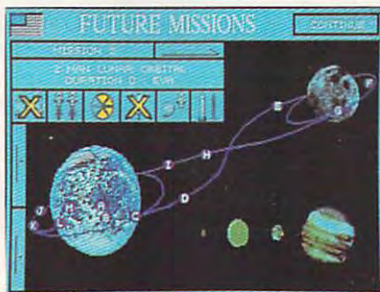
**BUZZ ALDRIN'S RACE INTO SPACE**  
 A U.S.-SOVIET SPACE RACE SIMULATION

Three... two... one... LIFT-OFF! The roar of the giant Saturn V engines becomes deafening as the gleaming rocket clears the launch tower. Within minutes it has enough velocity to reach orbit. America's space program is heading to the moon! But for two years the Russians have been working on a larger, more powerful rocket. Could they be secretly planning a mission this year to land men on the moon? Will they get there first?

Buzz Aldrin's Race Into Space™, is a computer simulation of man's greatest adventure, the race to the moon. It recreates all the excitement of every space mission using digitized footage from lift-offs, space walks, lunar landings and splashdowns.

As Space Director, you have at your disposal the entire space inventories of both the U.S.A. and U.S.S.R., and can plan and direct every conceivable space mission: sub-orbitals; orbital manned and unmanned; duration records; lunar flybys; lem tests; lunar passes; lunar orbits; lunar landings; and even emergency space rescues!

You get to recruit and train over 140 astronauts and cosmonauts and determine which ones have the “right stuff”. You determine which space hardware to research and develop and then you actually schedule and launch individual space missions.



Buzz Aldrin's Race Into Space™ offers twenty different approaches to the moon. Do you follow history or do you cut your own path to glory? Will the United States land on the moon first? Or will the Russians continue to dominate space and plant the red flag on lunar soil first?

**Do You Have The Right Stuff?**

- Buzz Aldrin's Race Into Space™ includes:
- Ability to select from over thirty types of space hardware
  - Hundreds of historical photos and digitized animations
  - Twenty varied approaches to land on the moon
  - Play the U.S. or Soviets
  - Recruit, train, and assign over 140 astronauts
  - Rescue stranded astronauts
  - Three levels of difficulty
  - Complete astronaut history
  - Full musical score and sound effects

To Order Buzz Aldrin's Race Into Space™, call 1-800-969-GAME, or see your local retailer. Coming soon on MS-DOS.

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

© 1992 Strategic Visions, Inc. All rights reserved. Buzz Aldrin's Race Into Space™ is a trademark of Interplay Productions, Inc. MS-DOS is a trademark of Microsoft Corporation.

MS-DOS Screens Pictured.  
 Circle Reader Service Number 105

**www.commodore.ca**

ument, scientific paper, financial report, employee notice, contract, marketing brochure, or just business correspondence, WORDNET offers a global network of language translators and editors. The Massachusetts-based company has connections with more than 700 foreign language translators worldwide, who are available around the clock to translate, write, edit, typeset, and otherwise prepare documents for your technical, legal, marketing, and general business needs.

The company prides itself on grammatically correct, culturally authentic translations from and into any written language, using linguists whose native tongue is that of the target audience. Furthermore, the translators are experts in their fields—for instance, computer manuals are translated by programmers, medical-related texts and documents by physicians, and legal documents by attorneys.

For more information, contact WORDNET, 30 Nagog Park, Acton, Massachusetts 01720; (508) 264-0600.

## More Babel-ophiles

For those who want to know what's out there that's multilingual for the PC, Knowledge Computing now offers a 254-page *Multilingual PC Directory* detailing around 300 multilingual products available in more than 70 countries from more than 1000 manufacturers, publishers, and affiliates.

Profiles describe each product's main features and noteworthy multilingual or foreign language capabilities, computer requirements, languages supported, and lists of software reviews that have been published. The suggested retail price for the directory is \$34.95. For more information, contact Knowledge Computing, P.O. Box 3068, Stamford, Connecticut 06905-0068.

## Getting Better

Pixel Perfect has released a bigger, better version of Schueler's Home Medical Advisor. Version 1.2 features a friendlier interface with hypertext, hot keys, and mouse support. It has also increased the value of the product by expanding the drug file to cover more than 800 medications, including information on use, side effects, and interactions. You can search for information

by common symptoms, diseases, injuries, poisons, drugs, and tests. Also, when you register the software, you'll receive a referral database including the names of board-certified specialists in your state, listed by county. The list price of Schueler's Home Medical Advisor is \$69.95. If you would like additional information, contact Pixel Perfect, 10460 South Tropical Trail, Merritt Island, Florida 32952; (407) 777-5353.

## Writing It Right

Editors, writers, and other word crafters who hesitate to trust their writing skills completely should check out WordStar International's recent upgrade of Correct Grammar for Macintosh, Windows, and DOS text-based applications. The product's grammar has been fine-tuned for higher accuracy—especially for examining subject-verb agreement, run-on sentences, and easily confused words. You can create and add your own rules to Correct Grammar's rule base. The software's preset style guides are subject based and include business, law, advertising, and more.

The good news for publishers and other companies that rely heavily on desktop publishing and word processing programs is that all versions of the new Correct Grammar can be networked. The main program is installed on a server, while personal dictionaries and style guides can still be created on individual PCs.

The suggested retail prices are \$99.00 for Mac and DOS versions, \$119.00 for the Windows version, \$99.00 plus \$36.95 for each network node for networked versions, and \$119.00 plus \$36.95 for each network node for the Windows networked version. For more information, contact WordStar International, 201 Alameda del Prado, P. O. Box 6113, Novato, California 94948; (415) 382-8000.

## The ROM Empire

From Trantor, new CD-ROM driver software (CD295) gives IBM PS/2 Model 95 computer users broad CD-ROM support by enabling the computer to connect to more than 45 different models of CD-ROM drives—and up to seven drives at a time.

The software runs in conjunction with IBM's BIOS (Advanced BIOS) in

# WordPerfect® Videos Teach It Fast

**Powerful Skills - 2 Hours or Less**

**Just Relax and Watch TV**

**S**EE it happen . . . Step-by-step. Later, at your computer, press the same keys you saw in the video (the keys are listed on a printed sheet); and powerful new computer skills will be at your command.

**It's Easy!**

Thousands of satisfied customers. Used in universities, businesses, and government agencies across the country.

**Clear Examples - Plain Language**

*Our video training has been recommended for purchase by The American Library Association's BOOKLIST magazine.*

**Five training VIDEOS now available:**

### WordPerfect Intermediate

**(Two Hours) \$69.95 + \$4 Shipping**

Most features are covered - from *margins* to *graphics*. Includes expanded section on **LABELS**. A single feature can save hundreds of hours of labor.

FOR 5.1 AND 5.0 (one video covers both)

### Introduction to WordPerfect

**(34 Minutes) \$49.95 + \$4 Shipping**

**For Beginners... The Basics In A Hurry** Concise. For people with *absolutely no computer experience* (and no time to study). Gets the first-time user up and running . . . immediately!

FOR 4.2, 5.0 AND 5.1 (one video covers all three)

## DOS®·Lotus®·Windows®

### Lotus® Intermediate

**(Two Hours) \$69.95 + \$4 Shipping** **NEW!**

Zero or limited Lotus experience? Learn skills in a hurry! **Includes Graphs, Macros, Linking, @ Functions, etc.**

FOR all versions 2.0 and later (one video covers all)

### DOS® Intermediate

**(60 Minutes) \$69.95 + \$4 Shipping** **NEW!**

New users and "old hands" will learn new tricks from this award-winning video.

FOR all versions of DOS (one video covers all)

### Windows 3.0®

**(60 Minutes) \$69.95 + \$4 Shipping** **NEW!**

Basic and Intermediate Skills, Icons, Menus, Dialog Boxes, Clipboard, Documents, and much more.

**Rush! - 3 Day Delivery - Add \$5 to Above Total**

**Send Check or Purchase Order to:**  
**Video Projects, Dept. W7**

**P.O. Box 191**

**Salt Lake City, UT 84110**

**VISA/MC Call 1-800- 272-6500**

Orders Only (24 Hours) • Questions? 801-595-1246

**30 Day Money Back Guarantee**

WordPerfect and Lotus 1-2-3 are registered trademarks of WordPerfect Corp. and Lotus Development Corp. respectively. © 1991 Video Projects Inc. 5500 Amelia Earhart Dr., #155, Salt Lake City, UT 84116

## COMPUTE SEARCHSTAKES!

**No purchase or phone call required.** For automatic entry, call 1-900-454-8681 on a touch-tone phone. To enter monthly SearchStakes drawings, call from 9 A.M. EDT on 4/26/92 through midnight EST 12/31/92 to give your name, address, telephone number, the *Compute* issue date (month), and the solution for the month you select. To enter the Grand Prize drawing, call from 9:00 A.M. EST 11/1/92 through midnight EST 1/31/93 to give your name, address, telephone number, the solution to the Grand Prize SearchStakes plus the solution to any two of the previous monthly SearchStakes. The cost for the call is \$1.50 for the first minute and \$1.00 per minute thereafter; average call is estimated to be 2-3 minutes. Charges for calls to the above number will appear on your phone bill. Callers must be 18 or older. All call-in entrants will receive a \$5.00 savings coupon toward caller's choice of: (1) Kathy Keeton's newest book, *Longevity*; or (2) a two-year subscription to *Compute*. Multiple coupons may not be combined on a single book or subscription purchase. Call as often as you wish; each call is a separate entry. Call-in entry option is void in GA, LA, MN, NJ, OR, and where prohibited.

**Alternate Entry Method:** Print your name, address, and phone number on a 3" x 5" piece of paper. (1) To enter the monthly drawings, print the *Compute* issue date (month) and solution for that month on your entry and address your envelope to include the issue date (month), for example: "June *Compute* SearchStakes." (2) To enter the Grand Prize drawing, print the words "Grand Prize," the Grand Prize solution, plus the solution to any two previous monthly SearchStakes on your entry. Address your envelope: "Compute SearchStakes Grand Prize." Mail all entries, addressed as directed above, to: 324 West Wendover Avenue, Suite 200, Greensboro, N.C. 27408. Enter as often as you wish; each entry must be mailed separately. All write-in entries must be postmarked by 1/30/93 and received by 2/15/93.

**For the solution(s), complete rules, and detailed description of prizes including prize values, send a self-addressed stamped envelope to Compute SearchStakes Solutions, Dept. RRS, 1965 Broadway, NY, N.Y. 10023-5965 by 12/31/92; no return postage required for residents of VT and WA. Solutions and prize information will be provided through the issue date in which the request is received.**

**Prizes/Values:** Grand Prize (1), minimum value \$15,000-maximum value \$40,000. Monthly prizes (6), one for each of the following *Compute* 1992 issue dates: June, July, August, September, October, and November, minimum value \$1,500-maximum value \$7,500. Maximum total prize value: \$85,000. A description of each prize, including its approximate value, will appear in *Compute* prior to the first entry date for that prize. Prizes are not transferable or redeemable for cash. No substitution of prizes except as necessary, due to availability. Licensing, transportation, registration, and dealer charges, if applicable, are winner's responsibility. Winners may be required to pick up some prizes from the nearest dealership. Travel prizes must be from a major airport nearest winner's home and must be used within 12 months of award date. Additional restrictions may apply. Taxes are the winner's responsibility.

Open only to U.S. residents 18 and older, except employees and their families of Compute Int'l Ltd., POWER GROUP, INC., their respective subsidiaries, affiliates, and advertising agencies. All federal, state, local laws and regulations apply. Void where prohibited. This program is sponsored by Compute International Ltd., 1965 Broadway, NY, N.Y. 10023, (212) 496-6100. Monthly winners will be selected at random from among all eligible entries received by the judges by the following drawing dates: June issue-7/31/92, July issue-8/31/92, August issue-9/30/92, September issue-10/30/92, October issue-11/30/92, November issue-12/31/92. Grand Prize winner will be selected from among all eligible entries received by 2/15/93. Winners will be selected by POWER GROUP, INC., an independent judging organization whose decisions are final. Odds determined by number of entries received. Winners will be notified by mail and required to execute and return an affidavit of eligibility and release within 21 days of date on notification letter or alternates will be selected. Limit one winner per household.

This sweepstakes is subject to the Official Rules and Regulations. For a list of winners, send a self-addressed stamped envelope to: Compute SearchStakes Winners, Dept. RRV, 1965 Broadway, NY, N.Y. 10023-5965 by 3/31/93. Requests will be fulfilled after the sweepstakes ends.

## NEWS & NOTES

the Model 95 and will operate with other systems incorporating BIOS. Among the numerous CD-ROM drives supported are Apple, Chinon, Hitachi, IBM, NEC, Panasonic, Sony, Texel, and Toshiba. The suggested retail price for the CD295 software is \$59. For more information, contact Trantor Systems, 5415 Randall Place, Fremont, California 94538; (510) 770-1400.

### Getting Intuit

Who wants to pull the plug on Intuit's highly profitable check-printing business? American Check Printers, that's who.

For years Intuit has sold its popular Quicken home accounting software at a narrow profit margin, knowing its users would return with lucrative check orders. Now American Check Printers has started a service that promises to shake things up in this small but highly profitable niche.

Its product will be displayed alongside Quicken at major retailers. For a single fee of around \$20, the purchaser can order checks at a 40-50-percent discount off the price offered by Intuit. And there is an offer in the package good for a \$20 discount on the first order, making the software essentially free of cost.

You use the data-entry component to enter the information that should appear on the checks (including decorative clip art) and return the floppy disk along with a voided check to American Check Printers with an order form and a payment. Within a couple of weeks, the printed checks will be returned.

American Check Printers software and service can be used to create checks for Quicken, Quick Pay, Microsoft Money, Managing Your Money, Money Counts, Money Matters, Pacilio, Dollars and Sense, MyCheckbook, and MyBusinessCheckbook. For more information, contact American Check Printers, 171 Jefferson Drive, Menlo Park, California 94025; (415) 617-8899.

### Making Money the Old-Fashioned Way

If you think you can get rich quick, get in touch with reality. But if you want to better manage the money you have, get in touch with Reality Technologies.

Reality, publishers of the Wealth Builder and Wealth Starter series of money- and investment-management software,

will soon introduce Smart Investor by Money Magazine, an online service and software package designed to serve the specific needs of individual investors.

The problem with existing online investment services is that the information is not well organized. Often you will compare apples and oranges when it comes time to determine which investment is superior. The information downloaded from Reality's Smart Investor will be preformatted to provide the maximum usefulness to the end user. It allows you to compare investment schemes, recommends mutual funds, cautions you about investments you have already made that might soon go sour, and allows you to buy and sell stocks through low-cost brokerage firms.

For more information about this online service, contact Reality Technologies, 3624 Market Street, Philadelphia, Pennsylvania 19104; (215) 387-6055.

### Help for Loyal IBM Users

IBM now offers a four-component system known collectively as HelpWare and touted as "the most comprehensive customer satisfaction offering in the personal computing industry." The components of the system include a telephone number where users can get information about PS/2s and OS/2, a 30-day satisfaction guarantee on all PS/2 products, a training program, and a series of 800 numbers for more specific PS/2 information. It appears that IBM is no longer portraying itself as the low-cost leader and is again styling itself as the solutions company, with the main change being that it is appealing to the individual instead of the corporate account, which was once the mainstay of IBM's profit margin. To find out more about HelpWare, contact IBM, 1133 Westchester Avenue, White Plains, New York 10604; (800) 772-2227.

*Companies with items of interest suitable for "News & Notes" should send information along with a color slide or color transparency to News & Notes, Attn: Jill Champion, COMPUTE, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408. Although space is limited, all items will be considered for publication.* □



# Let MicroProse fly you through the past and into the 21st century!

## B-17 Flying Fortress™

What did the courageous flyboys of the *Memphis Belle* really experience as they plowed through relentless anti-aircraft fire over Nazi-occupied Europe? Find out for yourself as you pilot the legendary B-17 Flying Fortress and lead a 10-man crew through 25 perilous daytime missions!

The most complete and accurate bomber simulation ever produced, the Flying Fortress will immerse you in breathtaking bombing runs! You'll destroy strategic targets...allocate crew members to their tasks...and fend off squadrons of deadly Nazi warplanes in explosive aerial combat!

The B-17 Flying Fortress. It's a flight simulation of legendary proportions!



Actual screens may vary.

A furious tide of drug cartels blankets the world in the year 2000. At the request of nations all over the world, the United States creates an elite paramilitary task force commanded by you!

Leading a squadron of fierce, high performance F-22 fighters, you'll unleash devastating aerial assaults on drug plantations and strategic targets! You'll break the tight grip drug bosses have on government and military establishments! And you'll lead 250 undercover agents against drug runners in the mountains, cities, and jungles of Colombia!

Plus, with ATAC's special options, you can fly your own fighter or play from a strategy perspective and command the whole ATAC force as you snuff out the scourge of drugs once and for all!

# ATAC

ADVANCED TACTICAL AIR COMMAND™



## MICRO PROSE™

ENTERTAINMENT • SOFTWARE

Coming soon for IBM PC compatibles!  
For more information about exciting MicroProse products,  
call 1-800-879-PLAY

© 1992 MicroProse Software, Inc. ALL RIGHTS RESERVED.

## Expert Advice

Oops! The review of Schueler's Home Medical Advisor in your April issue was of version 1.1. Version 1.2 was released in December 1991 and has addressed many of the shortcomings referred to by Mr. Anzovin's review of 1.1. We think you'll find 1.2 quite user-friendly. It brings the PC user comprehensive medical diagnostic/reference software not previously available.

PIXEL PERFECT  
MERRITT ISLAND, FL

*You're right. We mistakenly reviewed the earlier version of the program. To get the scoop on what's new in the latest version, see the article in this issue's "News & Notes."*

## A Friend Indeed

I have a friend who has an extreme vision loss due to multiple sclerosis but who loves to work with her computer. Is there a program out there to enlarge the characters on the monitor for use with WordPerfect, Lotus, and so on?

SUSAN DICK  
ROSEAU, MN

*It's worth mentioning that although many sighted people assume that visually impaired people are unable to see anything, the vast majority of legally blind people can see to some extent and only need to have enlarged type or a color adjustment to see a computer display clearly.*

*The first product that comes to mind is Eye Relief for Low-Vision Users (SkiSoft, 1644 Massachusetts Avenue, Suite 79, Lexington, Massachusetts 02173; 800-662-3622), a word processor designed for people with vision problems. It can expand the letters on the screen so that people with poor vision can see them easily. This magnification is limited to Eye Relief itself, however.*

*Telesensory (455 North Bernardo Avenue, Mountain View, California 94039; 800-227-8418) manufactures hardware and software screen enlargers that can enlarge the computer screen 2-15 times.*

*IBM has found many ways to ease computer use for the disabled. You can contact IBM's National Support Center for Persons with Disabilities at P.O. Box 2150, Atlanta, Georgia 30301-2150; (800) 426-2133. It has a TDD number as well: (800) 284-9482.*

## Prodigy Screen

In your April issue, in the article "Access and Security," Gregg Keizer made a statement that seemed to imply that Prodigy screens E-mail before it is posted. This would be a felony offense under the Electronic Communications Privacy Act of 1986. Prodigy does not screen E-mail.

STEVE HEIN  
PRODIGY SERVICES  
WHITE PLAINS, NY

*Mr. Keizer was referring in his statement to Prodigy's policy of screening public postings. He did not intend to imply that Prodigy screens E-mail, which would, as you say, be a crime. Neither Prodigy nor any other online service screens E-mail. We're sorry for any misunderstanding.*

## This Side of Paradise

I have a problem with Windows. I recently purchased an 8-bit VGA card and monitor from a friend. The VGA card didn't come with any software or instructions, yet installing it was a snap. When I try to install Windows, however, the screen goes blank after the second installation disk, and nothing happens from that point on. I tried installing Windows in CGA mode (recommended by Microsoft), and the installation was flawless. Yet when I tried

to switch to VGA mode within Windows, I wound up with a blank screen again. All my other software works fine. Any advice you can give me to solve my problem would be most appreciated. I am a new subscriber and find your magazine to be the most informative and objective on the market.

JERRY KOSSOWER  
EAST WINDSOR, NJ

*We called Paradise technical support at (800) 832-4778. Paradise is part of the same company that makes Western Digital hard disks and controllers. The technician we spoke with said that you should have no trouble as long as you're using the standard VGA driver in Windows. Specialized Windows drivers are available through the Paradise bulletin board at (714) 753-1234.*

*Next we called Microsoft technical support at (206) 637-7098. Microsoft suggested that you try reinstalling the system with the CGA driver (you can just use the setup program by typing SETUP while in the WINDOWS subdirectory to save the time and trouble of reinstalling Windows). Then start up Windows in real mode with the command WIN /R. Then make the switch to VGA within Windows. If that works, exit Windows and restart it in standard mode (assuming that you have at least an 80286 microprocessor) with WIN /S. If this runs all right, start up the system in 386-enhanced mode (assuming that you have at least an 80386 microprocessor) with WIN.*

*You might also have a conflict with your mouse driver. Try booting from a floppy without installing your mouse driver, and then install Windows. If these strategies don't work, call Microsoft. You'll need to know the make and model of your computer, how much memory you have, what other programs*

**Consulting the doctor,  
computing for  
the visually impaired,  
keeping mail  
private, looking for  
Paradise, multi-  
tasking on an older  
computer, and  
riding the magic bus**

**Free Lance Space Stud**  
needed to explore planet  
of gender-jumping females!  
Must be well-versed in  
pick-up lines and pottery.  
Call Colonel Stone at  
Androgena-8878!


Rex Nebular is on his way!

**MICRO PROSE™**  
ENTERTAINMENT • SOFTWARE

©1992 MicroProse Software, Inc. ALL RIGHTS RESERVED.

**1-800-879-PLAY**

Circle Reader Service Number 156

 [www.commodore.ca](http://www.commodore.ca)

*you're running, and what kind of processor you have before Microsoft can make any further recommendations.*

## Taking It to Task

I keep reading that you need a 386 to multitask. Is this because the 286 can't handle multitasking, or is it due to speed requirements? I also have a TVGA-8 video card. In the manual there's no address for the company. I'd like to get an 800 x 600 driver for my graphics card for Windows 3.0.

OLIVER W. HINKLEY JR.  
PAULDEN, AZ

*The capacity to multitask is built into both the 286 and the 386, though they work in slightly different ways. You can even multitask with an 8088 chip, if you're using GeoWorks Ensemble.*

*Windows 3.0 in standard mode (the most powerful mode available for a 286) can multitask Windows programs. A 386 or 386SX can operate as if it were several 8088 processors, so it can multitask DOS and Windows programs in Windows 386-enhanced mode.*

*The chip speed doesn't have anything to do with multitasking; it's all a product of the chip architecture and the code it's running. However, a slow chip running a number of programs may become unacceptably snaillike. The boosterism you see for the 386 chip is based more on its potential than its actual functionality. Even now, over ten years after its introduction, the standard 4.77-MHz 640K 8088 PC can run nearly the entire library of PC software (albeit slowly).*

*We were unable to turn up an address for the maker of TVGA. If anyone reading this can provide the address, please send it to us, and we'll forward it to Mr. Hinkley.*

## You Say EISA; I Say ISA

In searching for an i486 computer, I learned that there are two main types: EISA and ISA. What do these acronyms stand for? Which would be the most useful for general and CAD/CAE use? Additionally, the two main BIOS types seem to be Phoenix and AMI. Does it matter to the normal user which is used?

MATTHEW BOARDMAN  
CHESTER BASIN, NS, CANADA

*Actually, there are three bus choices: ISA (Industry Standard Architecture), EISA (Extended Industry Standard Architecture), and MCA (Micro Channel Architecture). ISA is the standard 16-bit bus you can find in any AT computer (XTs and PCs have an 8-bit ISA bus). The reason for the necessity of a change from ISA was that 386 and 486 computers needed a new standard bus to communicate with expansion cards 32 bits at a time. The 286 could only communicate 16 bits at a time.*

*IBM created the MCA bus to be used with its high-end PS/2 computers, hoping to establish a new standard. It also stood to make some money on the bus because it was demanding royalties from card and computer makers for using its technology. The MCA bus is also incompatible with old ISA technology. This didn't appeal to computer makers, and a coalition of manufacturers established a maverick standard called EISA, which is free for anyone to use and completely compatible with both 8- and 16-bit ISA cards.*

*Which is best? EISA is backward compatible with the ISA cards you already use and is ready to accommodate any 32-bit expansion cards that will come along in the future.*

*Phoenix and AMI (American Megatrends) BIOSs are completely mature and compatible. They're more widely used than the IBM BIOS they were built to emulate.*

*It doesn't matter to the user which BIOS is used, no matter how normal he or she is. But watch the copyright date on the BIOS chip. Some manufacturers might try to trim costs by using out-of-date BIOSs. If the copyright date is more than a couple of years old, consider another machine.*

*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** Clifton Karnes  
**Art Director** Robin C. Case  
**Managing Editor** David English  
**Features Editor** Robert Bixby  
**Reviews Editor** Mike Hudnall  
**Editor, Gazette** Tom Netsel  
**Editor, Amiga Resource** Denny Atkin  
**Copy Editors** Karen Huffman  
Susan Thompson  
Dana Stoll  
**Contributing Editors** Eddie Huffman, Gregg Keizer, Tony Roberts, Karen Siepak

## ART

**Assistant Art Director** Kenneth A. Hardy  
**Designer** Jo Boykin  
**Copy Production Manager** Terry Cash

## PRODUCTION

**Production Manager** De Potter  
**Traffic Manager** Barbara A. Williams

## PROGRAMMING

**Manager, Programming & Online Services** Troy Tucker  
**Programmers** Bruce M. Bowden  
Steve Draper  
Bradley M. Small

## ADMINISTRATION

**President, COO** Kathy Keeton  
**Executive Vice President, Operations** William Tynan  
**Editorial Director** Keith Ferrell  
**Operations Manager** David Hensley Jr.  
**Office Manager** Sybil Agee  
**Sr. Administrative Assistant, Customer Service** Julia Fleming  
**Receptionist** Polly Cillpam  
**Advertising**  
**Vice President,** Peter T. Johnsmeyer  
**Associate Publisher** (212) 496-6100  
**Vice President,** James B. Martise  
**Sales Development**

## 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. Southeast—Harriet Rogers, 503 A St., SE, Washington, D.C. 20003; (202) 546-5926. 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, 111 East Wacker Dr., Suite 508, Chicago, IL 60601; (312) 819-0900. (312) 819-0613 (FAX). Northwest—Jerry Thompson, Jules E. Thompson Co., 1290 Howard Ave., Suite 303, Burlingame, CA 94010; (415) 348-8222. Lucille Dennis, (707) 451-8209. Southwest—Ian Lingwood, 6728 Eton Ave., Canoga Park, CA 91303; (818) 992-4777. 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—Maria Manaseri, 1 Woods Ct., Huntington, NY 11743; (TEL/FAX) (516) 757-9562.

## THE CORPORATION

Bob Guccione (chairman and CEO)  
Kathy Keeton (vice-chairman)  
David J. Myerson (president and CEO)  
William F. Marlieb (president, marketing, sales and circulation)  
Patrick J. Gavin (senior vice president and CFO)  
Anthony J. Guccione (secretary and treasurer)  
John Evans (president, foreign editions and manufacturing)  
Jeri Winston (senior vice president, administrative services)

## 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: 111 East Wacker Dr., Suite 508, Chicago, IL 60601; (312) 819-0900, (312) 819-0813 (FAX). 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 J25469IGLTYO, Fax 434-5970. Korea: Kaya Advtng., Inc., Rm. 402 Kunshin Annex B/D 251-1, Donwa Dong, Mapo-Ku, Seoul, Korea (121), Tel. 719-6906, Telex K32144Kayaad.

## ADMINISTRATION

Sr. VP, CFO: Patrick J. Gavin; Sr. VP/Administrative Services: Jeri Winston; Sr. VP/Art & Graphics: Frank Devino; VP/Circulation: Marcia Orovitz; VP/Director of New Magazine Development: Fiona Cherry; VP/Director Sales Promotions: Beverly Grepper; VP Production: Hal Halpiner; Dir. Newsstand Circulation: Paul Rolnick; Dir., Newsstand Operations: Joe Gallo; 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; 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.

# TRIPLE THREAT

Get ready for 3 thrilling military simulations from MicroProse!

## F-15 STRIKE EAGLE III

Hold onto your joysticks! Because the spectacular F-15 Strike Eagle III is soon to take to the skies! And its revolutionary new visual system will immerse you in dogfighting so incredibly realistic you'll never want to leave your cockpit!

Combining the great elements of the original with fantastic new features, F-15 Strike Eagle III is a challenge to challenge the player.

## A-22

MicroProse was the first to let you fly the top-secret F-19 Stealth Fighter before anyone else knew about it. Now we're giving you the opportunity to fly and command a force of advanced fighter jets that the Air Force itself is still perfecting!

In the F-22, you'll have fingertip control of the world's most technologically-advanced fighter systems. You'll fly full campaigns in a variety of theaters! Plus, through

## TASK FORCE 1942

STRATEGIC NAVAL SIMULATION IN THE SOUTH PACIFIC

The first in a new series of spectacular WW II Pacific War Simulations, Task Force 1942 will have you commanding your own fleet of destroyers, cruisers, and battleships against enemy forces in the Pacific!

Command U.S. or Japanese forces! Target crippling blows upon enemy battleships! Take control of crucial battle positions like torpedo launcher and gun director! And pilot your ships through thrilling night battle action complete with burning explosions, torpedo wakes, and

**MICRO PROSE**  
ENTERTAINMENT • SOFTWARE

Coming soon for IBM PC Compatibles!

For more information about exciting MicroProse products, call 1-800-879-PLAY

© 1992 MicroProse Software, Inc. ALL RIGHTS RESERVED.

Circle Reader Service Number 212

[www.commodore.ca](http://www.commodore.ca)

# TIPS & TOOLS

Edited by Richard C. Leinecker

## More Little Gems

I've received an incredible number of letters from readers who want more of those handy debug programs. Here are four of the most requested ones.

Make sure the DOS program called DEBUG is in your path or the current directory. In these examples, the italic text is what the computer prints; the roman text is what you should type. One way to be sure you get these programs exactly right is to have someone read the numbers to you as you type them in. Another way suggested by one of our readers is to read the numbers into a tape recorder and then play them back as you enter the code.

To start off, I've written a special directory program that takes as many command line arguments as you want (limited, of course, by DOS's 128-byte command line maximum). It lets you see a directory of several given types. If you want to see all of the EXE and COM files in the current directory, just type DIRR \*.EXE \*.COM. To see the TXT, DOC, and ASC files, type DIRR \*.TXT \*.DOC \*.ASC.

### DEBUG DIRR.COM

*File not found*

```
-e 100 ba 68 01 b4 1a cd 21 be
-e 108 80 00 ac 0a c0 74 38 ac
-e 110 3c 0d 74 33 3c 20 74 f7
-e 118 8b d6 4a ac 3c 0d 74 04
-e 120 3c 20 75 ff 74 ff c6
-e 128 44 ff 00 2b c9 b4 4e cd
-e 130 21 72 0e e8 15 00 b4 4f
-e 138 cd 21 72 05 e8 0c 00 eb
-e 140 f5 8f 44 ff 4e eb c8 b4
-e 148 4c cd 21 bb 86 01 8b d3
-e 150 80 3f 00 74 03 43 eb f8
-e 158 c6 07 0d 43 c6 07 0a 43
-e 160 c6 07 24 b4 09 cd 21 c3
-RCX
CX 0000
:68
-W
Writing 0068 bytes
-Q
```

If you're anything like me, you hate typing MD NEWDIR and then CD NEWDIR. You should be able to create a directory and enter it with a single command. Now you can with MCD.COM. To use it, just type MCD NEWDIR to create and immediately enter a new directory.

### DEBUG MCD.COM

*File not found*

```
-e 100 be 80 00 ac 0a c0 74 1f
-e 108 ac 3c 0d 74 1a 3c 20 74
-e 110 f7 8b d6 4a ac 3c 0d 74
-e 118 04 3c 20 75 f7 c6 44 ff
-e 120 00 e8 07 00 e8 09 00 b4
-e 128 4c cd 21 b4 39 cd 21 c3
-e 130 b4 3b cd 21 c3
-RCX
CX 0000
:35
-W
Writing 0035 bytes
-Q
```

A lot of folks are using laptop and notebook computers these days. Since the cursor can be hard to see, it's sometimes convenient to have a large cursor. Here's a program called CSIZE.COM that'll make your cursor larger and keep it that way.

When you run CSIZE, it sets the new cursor size and stays resident in memory to make sure that your cursor size remains the way you set it. It'll occupy less than 1K of RAM once installed.

To use it, type CSIZE size. Size can be any single-digit number from 0 to 8.

### DEBUG CSIZE.COM

*File not found*

```
-e 100 be 80 00 ac 0a c0 74 6c
-e 108 ac 3c 0d 74 67 3c 20 74
-e 110 f7 4e ac 2c 30 3c 00 7c
-e 118 5b 3c 08 7f 57 0a c0 75
-e 120 05 b9 09 69 eb 07 fe c8
-e 128 b9 07 07 2a e8 89 0e 4d
-e 130 01 b8 1c 35 cd 21 89 1e
-e 138 4f 01 8c 06 51 01 ba 53
-e 140 01 b8 1c 25 cd 21 ba 20
-e 148 00 b4 31 cd 21 00 00 00
```

```
-e 150 00 00 00 1e 50 51 0e 1f
-e 158 8b 0e 4d 01 2b c0 8e d8
-e 160 39 0e 60 04 74 04 b4 01
-e 168 cd 10 59 58 1f 9c 2e ff
-e 170 1e 4f 01 cf b4 4c cd 21
-RCX
CX 0000
:78
-W
Writing 0078 bytes
-Q
```

One of the most annoying things that can happen is accidentally hitting the Caps Lock key. I never use this key, so I don't mind losing its functionality. The next program, called CAPOFF.COM, will remain memory resident and turn off the Caps Lock key if it's ever pressed. The program will occupy less than 1K of RAM.

### DEBUG CAPOFF.COM

*File not found*

```
-e 100 b8 1c 35 cd 21 89 1e 1c
-e 108 01 8c 06 1e 01 ba 20 01
-e 110 b8 1c 25 cd 21 ba 20 00
-e 118 b4 31 cd 21 00 00 00 00
-e 120 1e 50 2b c0 8e d8 80 26
-e 128 17 04 bf 58 1f 9c 2e ff
-e 130 1e 1c 01 cf
-RCX
CX 0000
:34
-W
Writing 0034 bytes
-Q
```

RICHARD C. LEINECKER  
MIAMI, FL

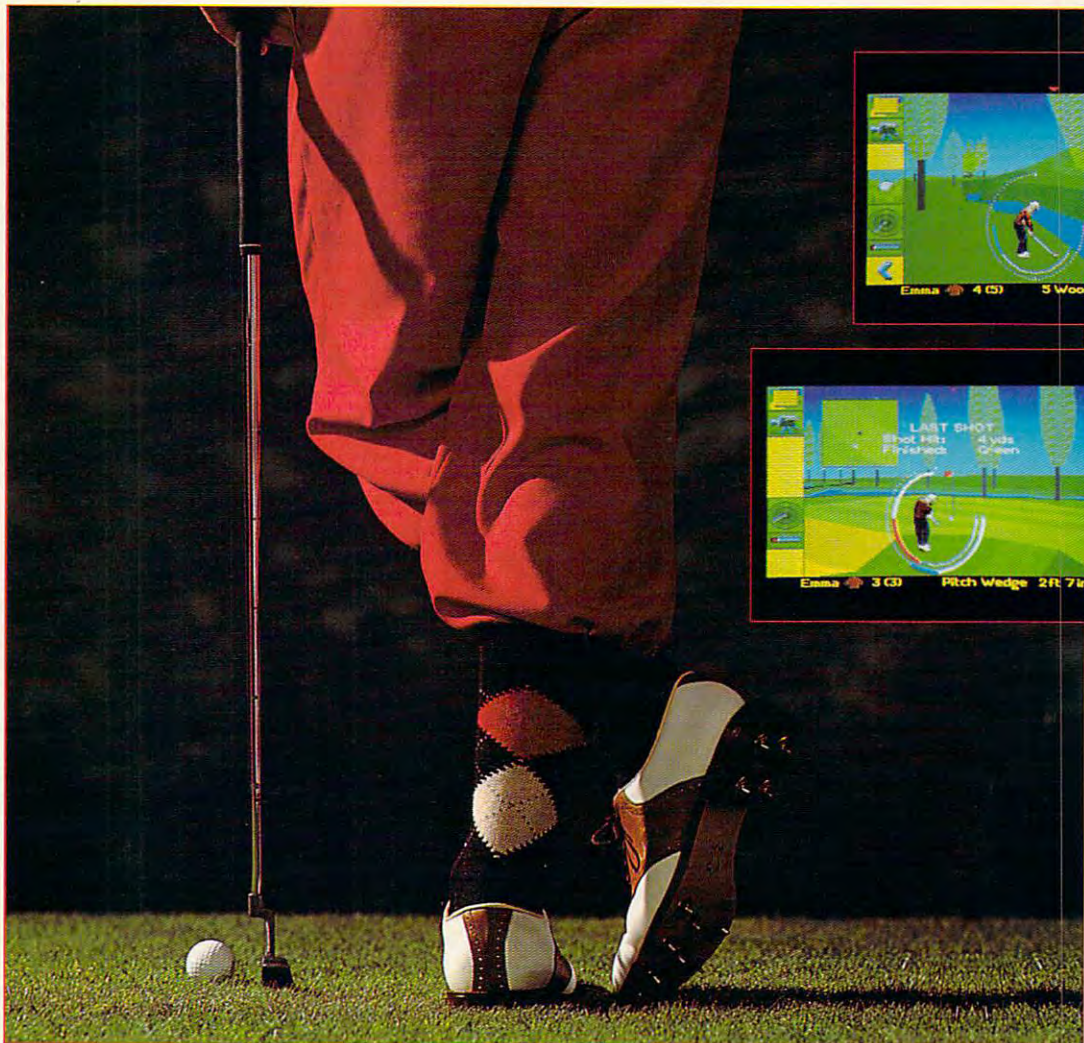
## Color Code

I often work with two documents at a time in DOS WordPerfect. When copying text from one document to another, I can make a mistake if I'm not paying close attention to which document is currently on the screen. To solve this problem, I set the second document to a different color. Then it's always obvious which document is which.

To change the color of a document from the default color, press Shift-F3 to make the

**A directory listing with multiple file specifications, an automatic CHDIR to a new directory, and more helpful little COM files**

# Bring The Challenge Of GREENS™ To Your Screen



Actual screens may vary.

Put the fuzzy head covers back on your clubs. It's dark out and it's raining. If you absolutely must play golf, boot up **GREENS**, the ultimate 3-D golf simulation.

No other golf game can match **GREENS** for realism, variety and pure entertainment. **GREENS** features three-dimensional, landscaped courses that show real contours and ground types. Accurately integrated ball mechanics make sure your shots behave like they would in real life. Six different courses, Singles or Tournament matches, and human or computerized opponents with varying strengths and weaknesses make the possibilities endless.

Power and precision. Critical decision-making. Unflinching authenticity and intelligent gameplay. State-of-the-art graphics. **GREENS** is as close as you can come to real golf — without worrying about lightning.

• Stunning 3-dimensional technology lets you travel anywhere around the course. Follow the ball as it flies through the air; watch your shots from numerous selectable camera angles.

- Change your stance, swing, tee and ball positions and see their effects on your shots before and after each stroke.
- Player profiles, which change over time, including a full handicap system.
- A dozen game types, including strokeplay, matchplay, best ball, skins and a full tournament option for 1 to 4 human players.
- Customizable computer opponents and replay facilities.

**MICRO PROSE™**  
ENTERTAINMENT • SOFTWARE

MicroProse Software, Inc.  
180 Lakefront Drive • Hunt Valley, Maryland • 21030-2245

For Amiga and IBM-PC/Tandy/compatibles. For the latest information on release dates and availabilities, call MicroProse Customer Service at 410-771-1151, 9 am to 5 pm EST, weekdays. © 1991 MicroProse Software, Inc.

Circle Reader Service Number 225

[www.commodore.ca](http://www.commodore.ca)

document active. Press Shift-F1 for Setup, and select item 2 for Display. On the Display menu, select item 1 for Colors/Fonts/Attributes, and on the last menu, choose item 1 for Screen Colors. Choose a foreground and background color, and press F7 to make the change permanent.

Now when you toggle between documents, the text color will change.

ROBERT JENKINS  
CENTERVILLE, GA

## Alternatives to Programs

In your December issue, the "On Disk" column contained a program called Delete Except. This program allows you to delete all files in a subdirectory except those specified on the command line. If you have MS-DOS 5.0, however, you can easily do this without a special program. This batch file shows you how.

```
@ECHO OFF
ATTRIB +H %1
DEL *.*
ATTRIB -H %1
```

Save this batch file as DELBUT.BAT somewhere in your path. To use it, just type DELBUT file mask.

In the same issue there was a program in "Tips & Tools" called DIRDIR.COM, which shows only the directories in the current directory. If you have MS-DOS 5.0, you can type DIR /AD and get the same results. The /A switch locates files with certain attributes. The D after /A tells it to include entries with the directory attribute.

VINCENT D. O'CONNOR  
BABBIT, MN

## Shelling from dBASE

If you're in dBASE and you decide to execute a DOS command, you can use the ! command at the dot prompt (such as ! DIR A:), and it works

fine. If you want to execute several DOS commands, however, this process becomes tedious. Here's a short Quick-BASIC program that lets you shell to DOS temporarily.

```
PRINT "Type EXIT to return"
PRINT "to dBASE III+."
SHELL CD\
SHELL
```

You should name this program SHELL.EXE and place it in your path. Next time you're in dBASE and want to execute several DOS commands, type ! SHELL at the dot prompt. The dBASE program will remain in memory, so you can't run programs that need a lot of memory. To return to dBASE from DOS, just type EXIT at the DOS prompt.

LEN WEAVER  
BRANTFORD, ON

## Knockout Color Separations

A goal for many desktop publishers is to save as much money as possible on preprinting costs. One way to avoid extra expense is to make sure your camera-ready art is truly camera ready by providing your printer with color separations.

But sometimes color separations alone are not enough. Depending on the colors you'll be using, your printer may require that certain colors be "knocked out."

Knockouts apply when you're printing one color over another. Often, depending on the colors involved, such as, say, black over a lighter color, you can just run one color over the other. But you can't, for example, print yellow over black, or all you'll get is a slightly yellowish shade of black. The area of black where the yellow will print over has to be knocked out—in other words, white space must be left in the black separation where the yellow ink will print.

Making color separations

with knockouts in paint and draw programs is usually relatively easy, because many programs automatically print knockouts. PageMaker allows you to print knockouts also, but not with all graphics formats. You cannot, for example, print one EPS file over another and get knockouts. You can print a PCX file over an EPS file and get knockouts, though. For knockouts in PageMaker 4.0, follow these steps.

In the Print dialog box, click on the Spot Color Overlays check box. Now select Knockouts. When you tell PageMaker to print, the program will give you separations with the colors knocked out. This will save you money on your printer's preprint set-up fees; your artwork will be truly camera ready.

WILLIAM HARREL  
VENTURA, CA

## Large Directories

In WordPerfect for DOS, F5 gives you a list of files, and you can go directly to a file by pressing N and then typing in the first few letters of the filename. When you have a long list of subdirectories, however, this won't work.

Instead, type N and then / or \ followed by the first few letters of the name of the file you want to see. It sure cuts down on scrolling time.

PHIL SHAPIRO  
SAN DIEGO, 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.* □

**Super power tips for WordPerfect, DOS 5.0, dBASE, and PageMaker users**



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

COMPUTE/NET on GENie had a terrific grand opening. The comments ranged from "I've never seen a RoundTable open up with so much information" to "This makes my modem and computer system worth their price."

This month we're sponsoring some contests. Do you know your computer trivia? Then try our computer trivia game. And that's only one of the games we have ready. There's a scavenger hunt and a logic game. And if you win, you can get free magazine subscriptions, disks, books, or connect time.

Above all, though, when you visit COMPUTE/NET, stop in at the COMPUTE Bulletin Board and participate in some of the most stimulating conversations online.

FIND US ON GENIE



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.



**GE Information Services**

# SIGN UP TODAY

\*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.

Richard C. Leinecker

## TUNE IN FOR FUTURE DEVELOPMENTS

For nine months COMPUTE/NET has grown in popularity and increased its offerings. The number of people using our area has increased beyond our expectations. On GENIE we now rank 32nd on the list of computing RoundTables. America Online doesn't rank its areas, but I'd expect a similar report there. A large part of the credit goes to our loyal readers and online following. Another round of applause goes out to our parent company, General Media. It made a corporate decision to support our efforts to make our online services a success.

Our corporate philosophy embraces new technology. It's influenced heavily by our sister magazine *Omni*, which now shares the same building with us. And our president, Kathy Keeton, never misses an opportunity to develop new ideas.

But the best is yet to come. I can't say in which direction we're headed, since things are currently under development and we don't want to give away any secrets. It's fair, though, to say that you'll be pleasantly surprised at how COMPUTE/NET evolves in the next year.

I won't be on staff here at COMPUTE anymore. I'm moving on to a new adventure but will remain as a cosysop on COMPUTE/NET. I've enjoyed getting COMPUTE/NET started and watching it grow. Online services are just beginning to realize their potential. In several years they'll take a dominant role in information transmission and family entertainment and enrichment. You can still send me E-mail, but your best bet is to address the

new online manager, Troy Tucker. His GENIE address is TROYGT, and his America Online screen name is TROY GT. (Note that *TROY* is spelled with a zero instead of an *O* for his America Online screen name.)

This month on COMPUTE/NET we're featuring several terrific programs that you'll find useful. There's a disk utility called DiskTool, a system analyzer called PC Doctor, and a great game called PuzzleMaster.

DiskTool will become your friend. If you've ever erased a file by accident, then you know the agony of delete. One of DiskTool's features is a file uneraser. Unerasing a file is never guaranteed to work, but DiskTool hasn't failed me yet. It also has a built-in file and sector editor that's the best I've ever seen. And if that's not enough, you can defragment your disk drive with the optimize function.

DiskTool is a professionally written program with a terrific interface. It has pull-down menus, mouse support, the ability to change colors, and windows with scroll bars. The filename is DT26.ZIP.

PC Doctor 4.0 is an enhanced version of the same program we talked about several months ago. It's a techie's toy. It lets you explore systems and peer into areas that are mysteries to most people. You can edit any portion of memory (conventional, expanded, or extended), view the memory-resident programs and information about them, get a look at the list of installed device drivers, and lots more. I've seen commercial programs for \$80 and more that don't do as much as PC Doctor.

The program has a nice interface and is easy to use. It has pull-down menus and full mouse support. It's stored

online as PCDOC40.ZIP.

The last of our featured programs is PuzzleMaster. It's a collection of six puzzle-type games. Included are a version of Master Mind, a takeoff on Simon, a word jumble game, a slide puzzle section, a peg puzzle, and a jigsaw game. Each of the games has several variations, so you can customize each one for different skill levels or increase the challenge when you've mastered them at the easy level.

The game is controlled with a set of easy-to-use menus. Full mouse support makes control even easier. Attractive screen effects will make you want to play just to see which effect you'll get next.

Each of the six games has its own high-score list, so you can get some competition going among family members or use the program at school for some classroom fun. The filename is PZMASTER.ZIP.

There's more for BASIC programmers. We've uploaded a selection of previously published BASIC programs. Included in the archive files are the source code, a compiled program, and a documentation file. If you're just learning BASIC, these are great examples. If you're already a BASIC programmer, you'll get lots of good ideas. If you're not a programmer at all, you'll probably enjoy most of these programs anyway.

Once again, I'd like to tell you how much I've enjoyed being involved with getting COMPUTE/NET started. Online services are an exciting part of the computer industry that's due for a growth explosion. I'll be watching, and I hope you will be, too.

You can still contact me with E-mail addressed to RLEINECKER on GENIE, ID 75300,2104 on CompuServe, or screen name RICK CL on America Online. □

**We've grown by leaps and bounds, but the best is yet to come.**

# SERIOUS ABOUT COMPUTING? TRY AMERICA'S MOST EXCITING ONLINE SERVICE—FOR FREE!

## GET THE LATEST FROM COMPUTE/NET ON AMERICA ONLINE.

If you have a computer and a modem, America Online is a great way to try COMPUTE/NET, the interactive magazine of the future! Use keyword COMPUTE to enjoy timely articles, reviews, and features found in COMPUTE. COMPUTE/NET is a great place to look for software, too—high-quality games, utilities, and more. There's something here for everyone. If you need technical help, or you want to drop a line to COMPUTE's editors, this is the place.

America Online has hundreds of other offerings that make it everything an online service was meant to be. Download from a selection of more than 40,000 programs—all carefully reviewed for quality and thoroughly tested. Get fast answers about software from the experts, and participate in live conferences and message boards specializing in games, graphics, educational programs, business and productivity applications, and much more.

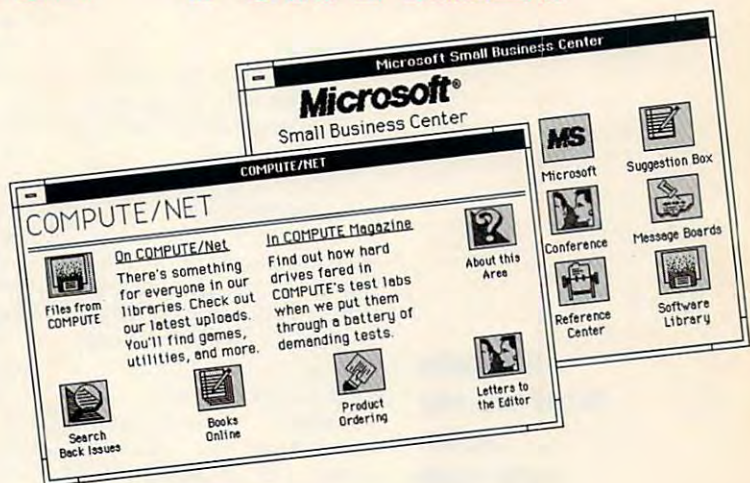
## EASY TO USE, YET POWERFUL.

Our unique graphical interface lets anyone—novice or pro—discover America Online's many services with just a point and a click. There are no puzzling prompts or commands to get in the way.

Get resume advice and career counseling. Manage your investments. Get the latest news and weather. Get homework help for the kids and use a searchable, up-to-date encyclopedia. Join special interest groups and clubs. Save time and money shopping. Find and book the lowest airfares. Entertain yourself with multi-player games, quizzes, movie and book reviews, horoscopes, soap opera news, and much more.

## WE'RE SERIOUS ABOUT THIS SPECIAL FREE OFFER!

We're so sure you'll love America Online, we'll even give you free software, a free trial membership and free connect time to try the service. Return this coupon (or call today) for a free trial membership!



See what's available,  
and get there, with just a point and a click.

## HURRY! RESPOND BY 7/31/92!

YES! Send me the free software and trial membership to try COMPUTE/NET and America Online. I understand there's no risk—if I'm not completely satisfied, I may cancel without further obligation.



NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_  
STATE \_\_\_\_\_ ZIP \_\_\_\_\_  
( ) \_\_\_\_\_  
HOME PHONE \_\_\_\_\_

### Computer Type and Disk Size:

DOS Compatible\*      Apple  
 5.25    3.5       Macintosh

\*The DOS-compatible version of America Online requires 512K RAM memory, a Hercules or EGA monitor or higher, a hard drive, and a mouse.

**1-800-827-6364, EXT. 5883**

Clip and mail to:  
America Online  
8619 Westwood Center Drive  
Vienna, VA 22182

America Online is a registered service mark of America Online, Inc. COMPUTE/NET is a registered service mark of COMPUTE Publications International Limited.

[www.commodore.ca](http://www.commodore.ca)

# INTRODOS

Tony Roberts

## AVOID THE BOOT-UP BLUES

What do you do if your hard drive refuses to boot?

- A. Scream.
- B. Take an early lunch.
- C. Take an early retirement.
- D. Pray for an early visit by a computer guru.
- E. Try rebooting with your backup system floppy.

If you answered E, you're on the right track. Occasionally, something goes wrong with the hard drive's crucial boot data, and the hard drive thinks it's a nonbootable device.

A system floppy is often all it takes to get you back in operation, but I'm willing to bet you'd have trouble laying your hands on a bootable floppy in a pinch. If you do have a bootable floppy, are you sure it holds the current DOS version?

If your bootable floppy is either non-existent or outdated, take a couple of minutes to create one now using the DOS FORMAT command. Insert a new floppy in drive A: and enter `FORMAT A: /S`. This operation formats the disk and copies `COMMAND.COM` and the hidden DOS system files to it.

With your new bootable floppy you're in good shape if trouble arises, but if you want to be even better prepared, copy `SYS.COM` and `CHKDSK.EXE` to the disk along with a small text editor and as many of your favorite disk tools as will fit.

If your hard disk ever fails to perform, boot from the floppy and see if you can access the files on the hard disk. If the hard disk is accessible, switch to the C: drive and run `CHKDSK` to verify that the data on the drive is intact. If `CHKDSK` runs clean, you can then run `AUTOEXEC.BAT` and go about your normal business.

Making repairs is usually relatively easy, but the approach depends on the reason for the failure. If `COMMAND.COM` on drive C: is missing or mangled, simply copy a fresh version from your floppy disk. Be certain that the DOS versions on your hard and floppy disks are the same; `COMMAND.COM` doesn't work very well in mix-and-match mode.

Similarly, DOS's hidden files, if damaged, could prevent boot-up. To copy new versions of these files to your hard disk, use the `SYS C:` command after booting with your floppy.

Another possible reason for failure is that something in your `CONFIG.SYS` file causes the system to hang before it ever gives you control. If you've added a new driver or recently edited `CONFIG.SYS`, consider this possibility.

One way to isolate such a problem is to rebuild `CONFIG.SYS` a line at a time until you see what causes the system to stumble. In one odd case I worked on, I finally discovered that the system hung up during the load of the `ANSI.SYS` device driver. I couldn't figure out why such a ubiquitous device driver would cause a problem until I noticed that the `ANSI.SYS` file was half its normal length. Once I replaced it with a whole copy from the DOS disks, the problem was solved.

A less easily explainable problem occurs when the hard disk's boot sector suddenly goes bad. Although rare, this problem has bothered me on a few occasions. Each time I thought that an entire hard disk reformat was in the offing, but I always found an easier solution using one of the disk-repair utilities, such as Norton's Disk Doctor or PC Tools Diskfix.

The important thing is to be prepared so you can recover from trouble and be back at work with as little

difficulty as possible.

An added benefit to a bootable disk loaded with all of your favorite utilities is that it comes in handy when you need to use someone else's computer temporarily. Working on an unfamiliar system can be much friendlier if you have access to at least a few of your usual tools. So format that bootable floppy and stash it where you can always find it.

Speaking of formatting disks, those of you with MS-DOS 5.0 installed should check out the new punch that this version of `FORMAT` carries.

The nicest addition to the program, by my way of thinking, is the ease with which you can tell DOS which size disk you're formatting. If you're trying to format a 720K disk in a 1.44MB drive, you can forget the cryptic `/T:80 /N:9` string you used to use to pass along information about tracks and sectors on the target disk.

`FORMAT` now takes a `/F` switch with which you simply specify the size of the disk you're formatting. `FORMAT B: /F:720`, for example, is all it takes to format that 720K floppy in a high-density drive.

Another nice feature is that `FORMAT` uses the `MIRROR` command to save a copy of the target floppy's file allocation table. This makes unformatting possible if you suddenly realize that you had the wrong disk in the drive when you pressed the Enter key.

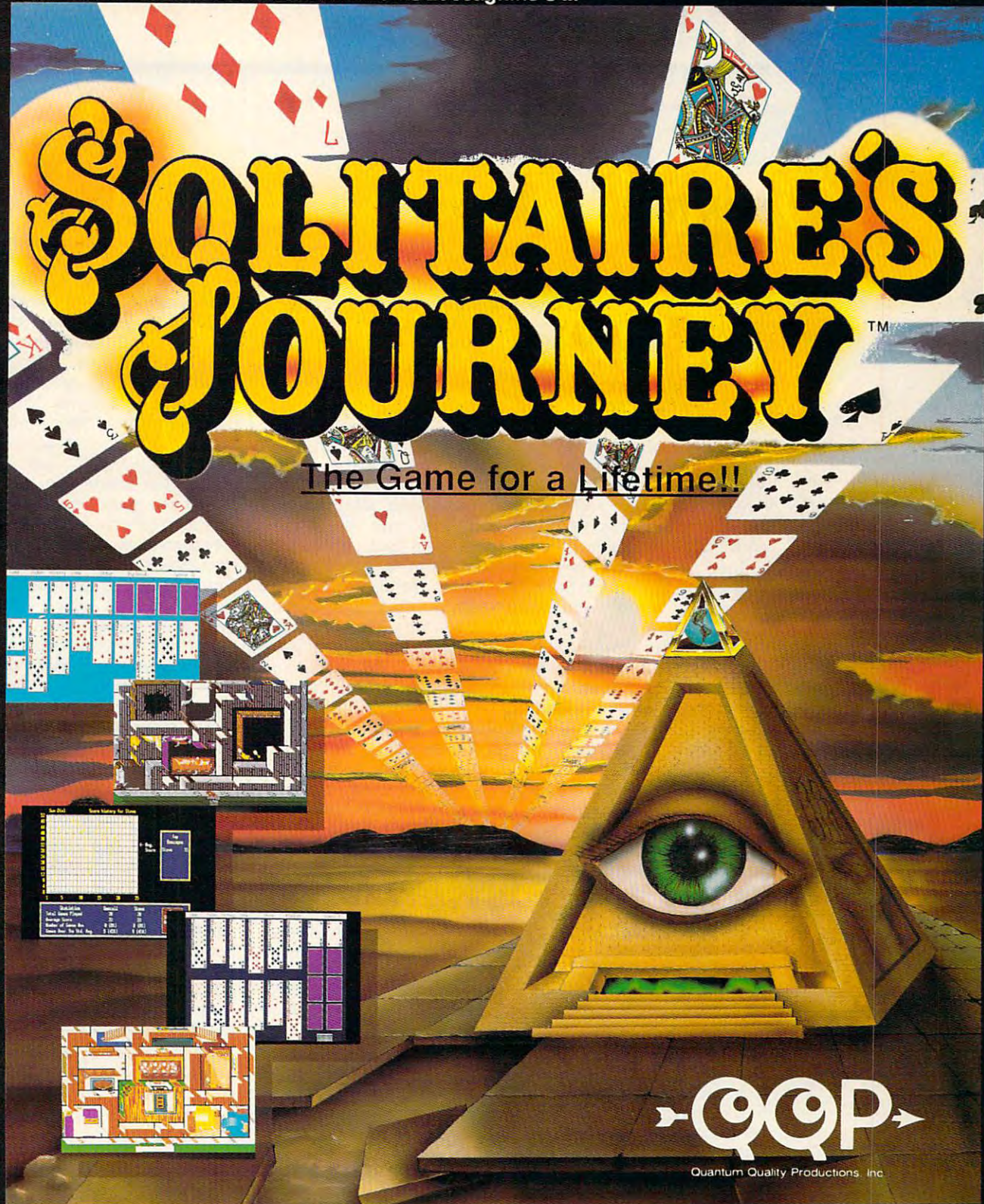
Also in the DOS 5.0 version of `FORMAT` is the quick format—the `/Q` switch. This option lets you reformat previously formatted media in seconds. Although this is a great timesaver, you should use this method only when working with disks that you know are good. The quick format is quick because all it does is create a new file allocation table and root directory; it doesn't scan for bad sectors. □

**A bootable floppy gets your system started when your hard disk is stalled.**

Andrew Visscher's and Bruce Williams Zaccagnino's ...

# SOLITAIRE'S JOURNEY™

The Game for a Lifetime!!



Quantum Quality Productions, Inc.

The greatest collection of solitaire games ever! In addition to the 105 individual games, there are tournaments, quests and cross country journeys for a lifetime of gaming entertainment. "Solitaire's Journey" ranges from the simple and easy all the way up to the strategic and challenging.

- **105 SOLITAIRE GAMES (Most of the world's best)**
- **TOURNAMENT PLAY (Set tournaments or create your own)**
- **4 INTRIGUING QUESTS.**
- **SEVERAL CROSS-COUNTRY TOURING COMPETITIONS.**
- **COMPLETE HISTORY AND OVERALL AVERAGES FOR EACH GAME**

The "Solitaire's Journey" computer game is IBM PC and soon to be Amiga compatible. It can be obtained through your favorite retailer or ordered direct by calling:  
**1-908-788-2799**

©1992 Q.Q.P. All rights reserved.  
IBM is a trademark of International Business Machines.  
Amiga is a trademark of Commodore.

Circle Reader Service Number 238

[www.commodore.ca](http://www.commodore.ca)

# POINT & CLICK

Clifton Karnes

## PLAN YOUR ASCENT

I've studied time management for years, and in my quest for organization, I've used or experimented with a number of computer tools, including SideKick, PC Tools Deluxe Desktop, Active Life, PackRat, and YourWay. All these programs have their strong points, but none of them really fit me like a glove. I had a strong feeling that I could be doing better at time control and that my tools could be more effective.

Then I found Ascent (NewQuest, 2550 South Decker Lake Boulevard, Salt Lake City, Utah 84119; 800-887-1814; \$299). It's a PIM (Personal Information Manager), but it's different from the ones mentioned above. Ascent was designed by a time-management company, not a software company. NewQuest is a division of the Franklin Institute, and Ascent is a computer program based on the Franklin system and the Franklin Day Planner. This has crucial implications for the way you use Ascent, and it accounts for the program's success as a tool.

First, some background: The Franklin Institute has been doing time-management consulting for years, with a client list any company would envy. Intel, Hewlett-Packard, Apple, Merrill Lynch, and CitiCorp are just a few noteworthy Franklin graduates. Franklin developed the Day Planner (a paper-based system) to help the company's clients control their time and their lives. The important point here is that the Franklin Institute has a proven track record in teaching time management and in producing time-management tools.

The computer has obvious advantages as a time-management tool (and some disadvantages, too), so Franklin, in con-

cert with NewQuest, developed Ascent, which is a Windows-based program.

You'll realize that this product is different as soon as you open the box. Included are the software; three manuals; a Franklin Day Planner, complete with a set of forms and a storage binder; a four-cassette training seminar with a workbook; a videocassette; and a Franklin catalog.

Although almost everyone will be tempted to install the software and start using it right away, you should take the time to listen to the four tapes and use the workbook. These tapes discuss in detail how to use the Franklin system and the Day Planner. If you don't listen to the tapes, you'll only scratch the surface of what Ascent can do for you.

The Franklin Institute's approach to time management requires discipline, but it's easy to describe. You begin by defining your most important values as a human being. From these values flow your long-range goals. From these long-range goals flow intermediate goals, and from these intermediate goals you construct your daily task list. This hierarchy of values, long-range goals, intermediate goals, and daily task list is called the Productivity Pyramid, and it's at the heart of the Franklin system. If you spend the time to develop your personal Productivity Pyramid, your daily tasks will be a significant part of your long-range goals and your human values. As a consequence, you'll feel a deep satisfaction with yourself.

After listening to the tapes and getting in the Franklin groove, you'll be ready to install the software. Instead of taking the usual 5MB-10MB of hard disk space, Ascent uses less than 1.5MB. But don't be fooled by this program's modest size.

Ascent boasts an MDI-compatible interface with a toolbar sporting buttons for each of the program's modules. Most of these modules mirror elements in the Franklin Day Planner. Included are Appointment Schedule, Prioritized Daily Task List (an energized to-do list), Daily Record of Events, Telephone Book, Red Tabs (important files), Productivity Pyramid, Master Task List, Focus (which blocks the clutter on your screen and gives you all the information on your highest-priority uncompleted task), Calendar (a week-at-a-glance view), TurboFile (a free-form index), Daily Journal (for your thoughts), Quotes (for your file of inspirational quotes), and Network (for viewing other Ascent users' schedules on a network).

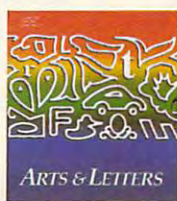
You can print the contents of these modules on letter-sized paper or on the special Day Planner paper provided.

The heart of the system is the Prioritized Daily Task List module, and most of the other modules are integrated with it or support it in one way or another. In the Daily Task List, you list each task you want to complete for the day. You then assign each a priority of A (vital tasks that must be done), B (important tasks that should be done), or C (trivial tasks that could be done).

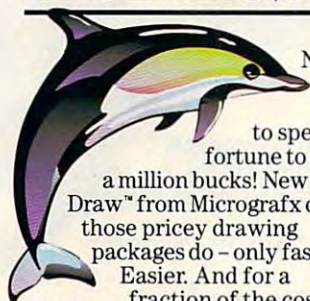
Next, you rank the tasks within each group with numbers and sort the entire list. Prioritizing, ranking, and sorting can be done by hand, or you can use special dialog boxes that make the process easy.

I've spent most of this page talking about the Franklin system rather than specifically about Ascent, but Ascent is more than just software. It's a powerful tool specifically designed to implement a thoughtful, flexible, and elegant time-management system. □

**Ascent is designed to implement a thoughtful, flexible, and elegant time-management system.**



# Do Everything Below For Less Than Any Of The Above.



Now you don't have to spend a fortune to look like a million bucks! New Windows Draw™ from Micrografx does what those pricey drawing packages do – only faster.

Create dazzling graphics with ease.

Graphics for the rest of us.

Already do your own graphics? Windows Draw will make it easier than ever. And if you don't, it's a great reason to start!

Windows Draw isn't for artists or computer wizards. It's for business people like you. People who want to add impact to a proposal.



Add impact to proposals, reports and newsletters.

Or flair to a flow chart. In fact, because it's compatible with your favorite PC programs, you can use Windows Draw to dress up just about everything you do.

Easy does it. With Windows Draw, easy-to-use drawing and

"A must-have accessory... a remarkable value."

PC Magazine  
12-31-91

"At \$149, this program is a real steal!"  
InfoWorld  
9-30-91

Dress up your charts and graphs.



	Arts & Letters	Free-Hand	Harvard Draw	Corel	Windows Draw
<b>Suggested retail price</b>	\$695	\$595	\$595	\$695	<b>\$149</b>
Gradients	Yes	Yes	Yes	Yes	Yes
Object blend	Yes	Yes	Yes	Yes	Yes
Bézier curve editing	Yes	Yes	Yes	Yes	Yes
Object rotation	Yes	Yes	Yes	Yes	Yes
Text on a curve	Yes	Yes	Yes	Yes	Yes
Outline fonts	Yes	Yes	Yes	Yes	Yes
Clip art	Yes	Yes	Yes	Yes	Yes
24-hr. tech support	No	No	No	No	Yes

color tools are right on the screen. Pull-down menus list an enticing selection of options available to you – including special effects like flip and blend. And "help" information is available at the touch of a button.

### A way with words.

You can make your text look as good as your pictures, using Windows Draw in combination with PageMaker 4.0 or your favorite word processing package.



Do your own logos and letterhead designs.

You can curve words, wrap them around pictures, shade them, color them, and much, much more!

### A mammoth clip art library – free!

If you don't want to do your own drawings, you can choose from more than 2,600 ready-made images that come with Windows Draw. And you can modify and manipulate them the same way you do drawings

made from scratch.

You'll never know how much you can do with Windows Draw until you try it. And with our money-back guarantee, what have you got to lose? Call to order today!

For technical illustration, ask about award-winning Micrografx Designer.™

**30-day money-back guarantee!**  
**1-800-347-3715**



M I C R O G R A F X®

Micrografx, Inc. 1303 Arapaho, Richardson, TX 75081 (214) 234-1769. Micrografx has offices in Toronto, Paris, London, Munich, Milan, Sydney, Madrid, Copenhagen and Tokyo. Copyright ©1992, Micrografx, Inc. All rights reserved. Micrografx is a registered trademark and Windows Draw and Micrografx Designer are trademarks of Micrografx, Inc. All other products are trademarks or registered trademarks of their respective owners. All Windows Draw packaging and documentation made from recycled paper.

# COMPUTER DIRECT

Presents... **SMITH CORONA**



# SMITH CORONA®

TOMORROW'S TECHNOLOGY  
AT YOUR TOUCH®

## 386SX-20 COMPUTER SYSTEMS



**ALL WITH 1 YEAR ON-SITE SERVICE, TOLL FREE SUPPORT AND LOADED WITH FREE SOFTWARE!** Simply Smart™

➤ **386SX-20 with 40MB HARD DRIVE** Only **\$999<sup>00</sup>**

Includes! 80386SX-20 MHz Personal Computer with 1MB RAM. RAM expandable to 8MB, 5.25" and 3.5" High Density Floppy Drives, 40MB - 17ms Hard Drive, 14" 0.39mm Dot Pitch VGA Color Monitor, Built-in VGA Graphics, 2 Button Mouse, 2 Serial and 1 Parallel Ports, 2 Expansion Slots and an Enhanced Keyboard

Mr. Suggested Retail \$1698.00

➤ **386SX-20 with 80MB HARD DRIVE** Only **\$1199<sup>00</sup>**

Includes! Same as above with 2MB RAM and 80MB Hard Drive! Mr. Suggested Retail \$2398.00

### ALL THIS SOFTWARE!

Installed on Your Hard Drive

- ✦ MS-DOS 5.0
- ✦ MS-DOS SHELL
- ✦ MS-QBASIC
- ✦ MS-Works 2.0
- ✦ Smith Corona Word Processing Program 6.0
- ✦ Desktop Reference Program
- ✦ Self Diagnostics
- ✦ Quick Learn Tutorial
- ✦ Start-up Menu - Built-in Demonstration

➤ **386SX-20 with 120MB HARD DRIVE AND FAX/MODEM BOARD**

Includes! 80386SX-20 MHz Personal Computer with 2MB RAM. RAM expandable to 8MB, 5.25" and 3.5" High Density Floppy Drives, 120MB - 17ms Hard Drive, Send-Receive FAX Board, 2400 Baud Internal Modem, 14" 0.39mm Dot Pitch VGA Color Monitor, Built-in VGA Graphics, 2 Button Mouse, 2 Serial and 1 Parallel Ports, 1 Expansion Slot and an Enhanced Keyboard. PLUS... FREE MICROSOFT WINDOWS 3.0!

Only **\$1399<sup>00</sup>** Mr. Suggested Retail \$2898.00

**30 DAY MONEY BACK GUARANTEE**

**CALL 1-800-BUY-WISE TODAY!**

Free Catalogs Free Catalogs Free Catalogs Free Catalogs Free Catalogs [www.commodore.ca](http://www.commodore.ca)



# SAVE UP TO 80%

All This and More for the Home or Office - 1000s of Items in Stock

## Build Your Own System with These Low Low Prices

### 286-12MHz Mini-Tower

- 12K RAM Memory • Expandable to 4 MEG
- 5.25" HD floppy Drive and IDE Hard/Floppy Drive Controller
- 101 Key Keyboard • 200 Watt Power Supply
- 1 Parallel and 2 Serial Ports • 2-5.25" and 3-3.5" Drive Bays
- Byte Size EZStart Productivity software Package including Word Processor, Home Inventory, Calendar, Mailing & Phone List, DR DOS 5.0 Startup Files and a DR DOS 6.0 special Offer!

**\$299<sup>95</sup>**  
Mr. Suggested Retail \$795

### 1MEG 386DX-33MHz Desktop

- 1 MEG RAM Memory • Expandable to 32 MEG • 64K RAM Cache
- Cache Expandable to 256K • 5.25" HD floppy Drive • IDE Hard/Floppy Drive Controller
- 101 Key Keyboard • 200 Watt Power Supply
- 1 Parallel and 2 Serial Ports • 3-5.25" and 2-3.5" Drive Bays
- 8 - 16 bit Expansion Slots

**\$799<sup>95</sup>**  
Mr. Suggested Retail \$2295

### 1MEG 386sx-16MHz Desktop

- 1 MEG RAM Memory • Expandable to 8 MEG
- 5.25" HD floppy Drive and IDE Hard/Floppy Drive Controller
- 101 Key Keyboard • 200 Watt Power Supply
- 1 Parallel and 2 Serial Ports • 3-5.25" and 2-3.5" Drive Bays
- Byte Size EZStart Productivity software Package including Word Processor, Home Inventory, Calendar, Mailing & Phone List, DR DOS 5.0 Startup Files and a DR DOS 6.0 special Offer!

**\$399<sup>95</sup>**  
Mr. Suggested Retail \$995

### 4MEG 486DX-33MHz Desktop

- 4 MEG RAM Memory • Expandable to 32 MEG • 64K RAM Cache
- Cache Expandable to 512K
- 5.25" HD floppy Drive and IDE Hard/Floppy Drive Controller
- 101 Key Keyboard • 200 Watt Power Supply • Weitek Scientific Math Coprocessor Socket
- 1 Parallel and 2 Serial Ports • 3-5.25" and 2-3.5" Drive Bays
- 2 - 8 bit and 6 - 16 bit Expansion Slots • Supports EMS 4.0

**\$1299<sup>95</sup>**  
Mr. Suggested Retail \$2495

## SUPERIOR QUALITY FLOPPY DISKS

All with a Lifetime Guarantee!

5.25" DSDD Floppy Disks from **19¢** ea

5.25" DSHD Floppy Disks from **37¢** ea

3.5" DSDD Diskettes **39¢** ea

3.5" DSHD Diskettes from **59¢** ea



ALL DISKS 100% CERTIFIED

## MODEMS

10 YEAR WARRANTY!

2400 bps Internal Modem Mr. Sugg. Retail \$129.95 **\$49<sup>95</sup>**

2400 bps External Modem Mr. Sugg. Retail \$159.95 **\$69<sup>95</sup>**

2400 bps Send/Rec FAX Int. Mr. Sugg. Retail \$299.95 **\$89<sup>95</sup>**

2400 bps Send/Rec FAX Ext. Mr. Sugg. Retail \$299.95 **\$99<sup>95</sup>**

9600 bps Send/Rec V.42bis Int. Mr. Sugg. Retail \$399.95 **\$99<sup>95</sup>**

9600 bps Send/Rec V.42bis Ext. Mr. Sugg. Retail \$399.95 **\$129<sup>95</sup>**

## CITIZEN 200GX 9 PIN PRINTER

PRINT LIKE A PRO!



Mr. Sugg. Retail \$299.95

- ★ 240 CPS HIGH SPEED DRAFT/40 CPS LK
- ★ BK PRINT BUFFER ★ FIVE RESIDENT FONTS
- ★ 16 COMMAND-VUE CONTROL PANEL
- ★ CONVENIENT PAPER PARKING FEATURE
- ★ TOP, REAR AND BOTTOM PAPER PATHS
- ★ OPTIONAL COLOR UPGRADE (SOLD SEPARATELY \$59.95)

**\$159<sup>95</sup>**

## MAGNAVOX EXTERNAL CD-ROM DRIVE

IN STOCK NOW!

CD-ROM disks put up to 600 MEG of data at your fingertips in seconds! Users can access complete encyclopedias, other reference books, catalogs, software and numerous databases. Includes PC Globe World & US Atlas, PC Sig Library Sharware, the Microsoft Bookshelf Reference Library and Grolier's Encyclopedia - A \$795 VALUE!

**\$399<sup>95</sup>**  
Mr. Sugg. Retail \$699.95

Plus... CD Software - the largest selection available from **\$19.95** each

## FULL PAGE FAX, SCANNER, COPIER & PRINTER

ETFax7 - The Ultimate Computer Peripheral!

- User Friendly Operation - Group III FAX and Copy Function
- 200 DPI Scanner with Fine Mode for Clear Reproduction
- Intel™ CAS Compatible
- Prints on Plain or Thermal Paper (Incoming Faxes)
- Automatic Document Feeder - Feeds Up To 5 Pages
- Send Windows Files Easily



Mr. Sugg. Retail \$799.95

**\$479<sup>95</sup>** Includes Windows 3.0 & a Serial Mouse!

## 14" COLOR VGA MONITOR

- 720 x 400 Resolution (text)
- 640 x 480 Resolution (graphics)
- 0.52mm dot pitch
- Tilt & swivel stand included

Mr. Sugg. Retail \$349.95

**\$219<sup>95</sup>**



1024 X 768 RESOLUTION VIDEO CARD WITH 1MB RAM

Mr. Sugg. Retail \$349.95

**\$99<sup>95</sup>**

## COMPUTER DIRECT, INC.

22292 N. Pepper Rd., Barrington, IL 60010

"We Love Our Customers"

PURCHASE PRICE DOES NOT INCLUDE SHIPPING CHARGES. ALL RETURNS MUST BE SHIPPED FREIGHT PREPAID AND PRODUCT MUST BE COMPLETE WITH NO MISSING ITEMS AND IN ORIGINAL PACKAGING. ALL PACKAGES ARE NORMALLY SHIPPED UPS GROUND, 2ND DAY AND OVERNIGHT DELIVERY ARE AVAILABLE AT EXTRA COST. WE SHIP TO ALL PORTS 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. PICTURES ARE FOR ILLUSTRATION PURPOSES ONLY, ACTUAL PRODUCT MAY DIFFER - SEE CATALOG.

Buy From the First Family of Computing!

#1 IN SERVICE, VALUE AND CUSTOMER SATISFACTION

**CALL 1-800-BUY-WISE ext. 51**

FAX ORDERING 708/382-7545 OUTSIDE SERVICE AREA, PLEASE CALL 708/382-5058

Circle Reader Service Number 184

[www.commodore.ca](http://www.commodore.ca)

# HARDWARE CLINIC

Mark Minasi

## HOW MODEMS WORK, PART 1

If you spend much time on computer data services such as CompuServe, GEnie, America Online, or, for that matter, any of the thousands of private bulletin board systems (BBSs), you've had to set up some kind of communications software. Are terms such as *MNP*, *XMODEM*, *YMODEM*, *V.32*, and the like confusing you? Then read on.

It may help to start the discussion with a statement of the overall purpose of communications. The point of communications is to get bytes of data from one point to another as quickly and reliably as possible, and that's where this whole mess started. So when you hear a new communications buzzword, ask, "How does this help me get data from point X to point Y?"

In the late seventies and the early eighties, the first BBSs appeared. Modems then typically transmitted at 300 bps, and the kind of data that was being transferred was usually text: either messages or text listings of BASIC programs.

In those early days, you'd transfer a file by setting your computer to capture mode, which meant that it would copy every incoming byte to a disk file. Then you'd tell the distant computer to list the file you wanted to receive, as if your only desire were to read the file as it scrolled by on the screen. The capture feature saved the file to disk as it appeared on your screen. When it was finished listing, you'd close the file, and you'd have your BASIC program transferred. There would be some extra trash above and below the file, but you'd just load the file into a text editor and trim that off.

Now and then, however, the transfer would become gar-

bled because of phone line noise. In that case, you'd see the garbled characters, and you'd tell the remote system to resend the file.

Hopefully, it would come through OK the second time. If not, you might conclude that you'd just happened to get a noisy line today, and you'd just hang up and dial again, hoping for a better connection. This was called phone line roulette.

In this case, there were error-detection and error-correction mechanisms. The detection mechanism was you, the human operator, noticing that the incoming data looked wrong. The correction mechanism was also you, requesting a resend. This crude system worked for two reasons.

First, you were transmitting at 300 bps. (Never say *baud*; no matter what you've been told, it doesn't stand for *bits per second*.) The lower the data rate, the lower the error rate. Bad bits appear on a normal phone line once in a blue moon at 300 bps; they can appear every minute or so at 9600 bps. Error correction was less necessary because errors just plain didn't occur.

Second, the kind of data that you were transmitting could stand up to an error or two—it was mainly English text. If you saw an incoming line of BASIC that read *PRONT 'Hello,'* you knew that *PRONT* was really *PRINT* garbled. The built-in predictability of English helped the error-correction process.

As time went on, 1200-bps modems became more popular. BASIC listings were replaced on bulletin boards by COM and EXE files, files that don't mean anything when viewed by the human eye.

So a BBS operator named Ward Christensen in the Chicago area invented a simple method for transferring data, a meth-

od that transfers data while simultaneously finding and correcting data garbled by transmission noise. He called the method *XMODEM*, and it looks something like this.

Say station S (the sender) is sending a 400-byte file to station R (the receiver). Both sides of the conversation must be running a program that manages a transfer according to the rules of the transfer. You do that whenever you tell your system to transfer with *XMODEM*. This insistence on both sides agreeing is the linchpin of communications protocols. Here's how the *XMODEM* technique works. (Because both sides are controlled by a computer, people don't have to worry about this stuff, except for issuing the commands to S and R to get going.)

First, the sender must ensure that the receiver is ready to receive the data. It does this by waiting for a particular one-byte signal from the receiver, an ASCII code 21, also known as *NAK* (negative acknowledgment).

There's no significance to this character—it was just picked at random. When R says *NAK* to S, R is saying to go ahead and start transferring. If you wanted to, you could generate a *NAK* from your keyboard by typing *Ctrl-U*.

S is going to send the data to R in 128-byte blocks. Before the 128 bytes of each block, however, it first sends an *SOH* (Start Of Header) signal, which is just an ASCII 1, something you could generate with a *Ctrl-A*. You've seen ASCII 1 before; it's the smiley face that shows up when you type a *COM* or *EXE* file to the screen.

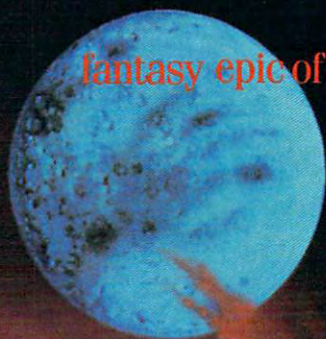
After the *SOH*, S sends another byte, a block number byte. The value of the byte is 1 for the 1st block, 2 for the 2nd, and so on. As bytes can only hold values up to 255, the value wraps around after 255.

**What exactly is XMODEM, and how does it make sure that your data arrives safely?**

# DUNE™

Translated to the computer screen for the first time, you can now experience  
the exotic world of the bestselling science fiction

fantasy epic of all time — DUNE™!



DUNE is a trademark of Dino De Laurentiis Corporation and licensed by MCA/Universal Merchandising, Inc.

©1984 Dino De Laurentiis Corporation. All rights reserved.

©1992 Virgin Games, Inc. All rights reserved.

Circle Reader Service Number 167

 [www.virgin.com/games](http://www.virgin.com/games)

# HARDWARE CLINIC

The 256th block would be numbered 0, the 257th would be numbered 1, and so on.

For the sake of redundancy, the third byte repeats the block number—but in another way. S subtracts the block number from 255! The second block number for our first block is, then, 255 minus 1, or 254. Then S sends the 128 bytes of data. The block's almost finished, but there's one more byte to go.

Recall that the whole purpose of this exercise is to be able to detect errors. S now adds something called a checksum that will allow R to detect errors. The sender S takes all 128 bytes of the data block and treats them as if they weren't ASCII characters or binary data, but just a string of 128 numbers. It then adds up the 128 numbers to get a sum. That sum is then divided by 256. The remainder, believe it or not, is the checksum. (This

makes better sense when you do it in machine language; Ward knew what he was doing.)

Here's an example. Suppose we had a block of not 128 characters, but, for ease of use, 11 characters. Let's use my name in uppercase letters: MARK MINASI. Remember that it's 11 characters, not 10, because of the space between the first and last names. The ASCII code for M is 77, A is 65, R is 82, K is 75, a space is 32, M is 77, I is 73, N is 78, A is 65, S is 83, and I is 73. Add them up, and you get a total of 780. Divide 780 by 256, and you get 3 with a remainder of 12. So 12 is the checksum.

S has now sent the first block. It was 132 bytes long—3 bytes in the header, 128 bytes of data, and 1 byte of checksum. Now let's see what R does with the block.

First, it looks at the block number to make sure that it makes sense—if block

27 arrives right after block 10, something's wrong. Assuming there's no trouble, it next examines the 128 bytes of data, ignoring the checksum for the moment. Using the 128 bytes of data, it computes its own checksum in the same way that the sender did. Now R examines the checksum that S sent to be sure it's identical to its own.

This is the error-detection part—the checksums must be the same. If they are, R signals S that all is well by sending a single byte, an ACK character. ACK (positive acknowledgment) is ASCII code 6, or Ctrl-F. If the checksums don't match, then the error-correction part comes in, and R sends a NAK code. When S receives the negative acknowledgment, it resends the data block. R checks the resent data block, and, hopefully, all is well. If not, S just keeps resending and R just keeps NAKing until they reach max NAKs, at which point the trans-

# LINKS 386 Pro Rival only

*This all new LINKS 386 Pro version of our popular, award-winning LINKS golf game offers many dramatic improvements that make playing LINKS 386 Pro more enjoyable – and gives you exciting new golfing possibilities!*

## **SUPER VGA Graphics and 386 Power.**

The new LINKS 386 Pro, featuring Harbour Town Golf Links, is the first golf game specifically designed for the graphic capabilities and computing power of your personal 386/486 computer system. SUPER VGA 256-color graphics at 640x400 resolution display breathtaking views of LINKS Championship Courses. Your friends won't believe that your computer looks so good!

## **Championship golf at your fingertips.**

A lot of listening went into the new LINKS 386 Pro. Many of the new features and improvements were added in response to direct requests from LINKS users like you! An exciting new feature is our Unique Computer Opponent. Play a round of golf and save your game. The new LINKS 386 Pro recorded every shot you made. Send your game off to your buddy and he can play against you right on the screen, shot for shot, as if you were right there next to him! We've also included pre-recorded games from worthy opponents, statistics, a variety of game play modes and much, much more.

## **Over 345 combinations of viewing windows.**

With the new LINKS 386 Pro you're not stuck with just one standard viewing window. With a few clicks of your mouse you can split the screen giving you a real-time reverse view of your shot to the green or add a scaleable top-view that displays the flight of your ball. Scorecard, club distance chart, terrain profile and other panels give you the flexibility to display what you want to view while playing and you can change your viewing setup at anytime!

Texturing of fairways, rough, sand, and other surfaces adds an extra level of realism.

Male and female golfers.

You can use any of the 7 existing LINKS courses or upgrade your favorite course to the Super VGA version.



fer is terminated. Assuming the first block has been received correctly, S then sends the next 128 bytes of our 400-byte file. Once that's been acknowledged, there's a third block, and finally there are only 16 bytes left. The 16 bytes are filled out with either end-of-file characters or null characters and then sent. Once that has been acknowledged by R, S says, "That's all, folks," by sending an EOT (End Of Transmission) character, which is ASCII 4, or Ctrl-D. A final ACK from R ends things.

A couple of things may be nagging at you about this protocol. First, why send the block number twice, and second, why subtract from 255? The first question is easier: The block number is sent twice simply for insurance. Remember that we don't trust the phone lines. This is a fairly common practice in communications and, for that matter, in real life. If you've ever heard an announce-

ment like "Mr. Jones, Mr. Jones, please pick up the white courtesy phone" in an airport, you might ask yourself why the announcer said Mr. Jones's name twice—was he supposed to pick up the phone twice? No, of course not. The announcer just wanted to be sure that Mr. Jones heard his name.

But why subtract from 255? I thought I'd try asking the source himself, so I dropped a note on CompuServe to Ward Christensen. His answers were very helpful. "Why not?" he responded with a grin. "Actually, if a line glitch occurred that changed a particular block number to something else, there's a chance it might do two at a time." Thus, anything that affected, say, all the 1 bits would damage both copies of a block number, if both block numbers in XMODEM were equal. By subtracting from 255, there's a side effect of converting all the 1s to 0s and vice versa. Tak-

ing a binary number and converting its 1s to 0s and 0s to 1s is called taking its complement.

Ward observed that, in the case of the systematic error that always damages 0s or 1s, "the complement is not likely to get similarly zapped. Also, the block number isn't in the checksum, because I wanted it separately checkable." This provides an internal block check mechanism—but that's not the only reason for this method. Ward explained that one of the popular processors of the time was the 8080 (no, that's not the 8088; the 8080 predates the 8088 by about eight years). It had a built-in instruction that made using the complement for checking a simple matter.

That's XMODEM in some detail. We needed that detail to understand how you can speed up your file transfers without buying a new modem or new software. See you next month. □

# by the game itself.

**New!**  
Coming June 30, 1992



Real-time split screen views of your shot. Great for making your approach shot to the green.

Improved club selection features. Automatic club selection also available.

Wide, panoramic views giving you a better feel of the layout of the course.

Improved swing indicator for easier hitting.

Up to four viewing panels on the screen at one time!



Over 345 different combinations of Multiple Viewing Windows you can setup.

## Satisfaction Guaranteed

We offer free unlimited technical support by phone. And if you're not completely satisfied, you can return *LINKS 386 Pro* within 30 days for a full refund - no questions asked.

So you've got nothing to lose, but so much golfing enjoyment to gain. Try it out!

# 1-800-800-4880

24 hour FAX# (801)596-9128

Call toll-free 24 hours a day, 7 days a week, U.S. and Canada or visit your local software dealer.



**Yes!** As a registered owner of *LINKS 386 Pro* I want to pre-order my *LINKS 386 Pro* featuring Harbour Town for the introductory price of \$39.95 including shipping in US and Canada. (If you own *LINKS* and haven't registered, mail or FAX us a copy of the inside front cover of your *LINKS* manual along with your check or credit card information.) Offer expires 08/31/92.

UT & MN residents add sales tax. International shipping extra.

**Equipment required:** IBM or compatible 386/486 computer with minimum 2 meg of memory, SUPER VGA graphics, one or more floppy disks, mouse and a hard disk.

Guaranteed to work with your 386/486 system with Super VGA or your money back. Not copy protected. Free unlimited technical support.

**Yes!** Send me the new *LINKS 386 Pro* with Harbour Town for the IBM 386/486 computer for just \$69.95 when it's available. If I'm not completely satisfied, I can return it for a full refund. **FREE** air shipping within the U.S.

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
Day Phone \_\_\_\_\_

Check enclosed (no COD or purchase orders)  
 Visa  MasterCard  American Express

Card# \_\_\_\_\_  
Exp. Date \_\_\_\_\_  
Signature \_\_\_\_\_

Mail to: Access Software, Inc.  
4910 W. Amelia Earhart Dr.  
Salt Lake City, UT 84116  
[www.commodore.ca](http://www.commodore.ca)

# PROGRAMMING POWER

Tom Campbell

## PC CHARACTER ROM REVEALED

This month's program, BANNER.C, digs deep into the guts of your PC by using the character ROM to display letters eight times their normal size in text mode. It shows both an underused PC resource (the system font data) and some useful tricks of the C trade: bit-shifting operators, reading bit values, using array notation for pointers, and reading absolute addresses on the PC. (You can find the source code for BANNER.C on COMPUTE/NET on GENie or America Online.)

Banner asks you for a string of up to ten characters and a fill character. The fill character is what makes up the dots in the letter—for example, the asterisk character or one of the extended ASCII box characters. You can enter the extended ASCII characters by holding down the Alt key and pressing up to three digits, creating a number between 0 and 255. I suggest 177, 178, 219, 248, and 254. Then Banner displays the string on the center row of your screen.

Your PC video card has an 8 × 8 character set in its ROM, even though, in the case of EGAs and better, that's not the default system font. But it's there all the time to provide compatibility with earlier adapters. The dots that make up the 8 × 8 font are found at location F000:FA6E hex and are laid out in 256 sets of eight bytes each, with the first byte making up the top row of dots in each letter, the second byte making up the second row of dots, and so on. The example below shows the layout of the letter A.

The first byte, numbered 0, contains the hex value 3Eh. This makes little sense until

you view it as the binary value 01111100. Replace each of the 1s with an X, and you have the top line of the A. The next byte is hex C6h, or binary 11000110. You may notice that bit 0 is unoccupied for almost every character, as is byte 7. Bit 0 forms the space between letters—it's just an empty column formed by leaving bit 0 of each of the rows of bytes cleared to 0. An exception is the underline character, which, appropriately, goes all the way across the character matrix. And byte 7 is the space left for descenders—the tails for *g*, *j*, *p*, *q*, and *y*.

Bit		Byte
7		
6		
5		
4		
3		
2		
1		
0		
	XXXXX	0
	XX XX	1
	XX XX	2
	XXXXXXXX	3
	XX XX	4
	XX XX	5
	XX XX	6
		7

The chart above isn't quite accurate. The byte numbered 0 is actually byte 520. Remember that the uppercase A is ASCII 65. There are eight bytes of data per character. Multiply 65 by 8, and you get 520. Uppercase B is at 528, and C is 536. The formula, then, as it appears in the WriteChar() routine, is CharacterRom = CharacterRom + Letter \* 8.

CharacterRom was previously initialized and allocated at the same time—another handy C trick: char far \*CharacterRom = (void \*) 0xF000FA6E. This is identical to char far \*CharacterRom; ... CharacterRom = (void \*) 0xF000FA6E.

The previous example is clearer in this case, because we want to emphasize the nature of CharacterRom as an absolute address. The easy

part is explaining that 0xF000FA6E is hex notation for the absolute address whose *segment:offset* value is, as explained earlier, F000:FA6E. That's where the 1024 bytes of character ROM data appear. Let's dissect the rest of the line piece by piece, because much of it isn't what it seems. The char means that we will treat the address as a pointer to a character. Since a character is guaranteed by the ANSI standard to be the same size as a byte and since C lets us use array notation wherever we see a pointer, later we'll be able to calculate the location of each row of character data like this, even though CharacterRom wasn't declared as an array: Bitmap = CharacterRom[EachRow].

Let's use the top row of A, binary 01111100, as an example. The Binary numbers mirror the physical layout of bits in memory, so this loop starts at the left bit and moves right: for (EachCol=7; EachCol>=0; EachCol--).

The line "if (Bitmap & 1)" is another good example of C's terseness at work, taking advantage of C's treatment of an if expression as an integer result. In Pascal, you'd use this code: IF (Bitmap AND 1) = 1 THEN.

Using the bitwise AND operator of C to see whether a bit is set makes it easier to see what's going on. If the rightmost bit of Bitmap is indeed set to 1, the cursor is positioned appropriately, and the FillChar is written directly to screen memory. If bit 0 is clear (that is, with a value of 0 instead of 1), nothing happens. Finally, the byte is pushed one bit to the right, moving bit 1 into the 0 position, 2 into the 1 position, and so on, up to bit 7.

With only a little extra work, you could beef up WriteChar() to center the text both vertically and horizontally. □

You can find the source code for BANNER.C on COMPUTE/NET on GENie or America Online.



## HE'S LIVING PROOF THAT THE GODS HAVE A SENSE OF HUMOR

*Here's what the reviewers are saying:*

"Heimdall is constantly surprising and so huge it is going to be some time before you have exhausted the possibilities!"

"A delightful combination of action and animation."

"The graphical content is never less than good and in many places it's stunning."

Give the life of the viking warrior Heimdall in the ultimate quest adventure as you pit your brawn and brains against that evil dude Loke. Follow Heimdall through a series of misadventures on his action-packed crusade to save the world... and his reputation as one **BAD** Viking!

Circle Reader Service Number 183

### FEATURES:

- Choose from over 30 different characters with varying RPG attributes
- Explore the mysterious realms of the Norseland as you solve puzzles guaranteed to keep you challenged for hours on end
- Top-down scrolling isometric viewpoint
- Fluid animation and stunning graphics created by a team of world class animators



FOR PRICING AND ORDERS, PLEASE CALL 800-VRG-IN07.

VISA, MASTERCARD, AMERICAN EXPRESS AND CHECKS ACCEPTED.

AVAILABLE IN SPRING OF 92!

AMIGA SCREENSHOTS SHOWN.

DEVELOPED BY  
**CORE**  
DESIGN LIMITED





# QUEST FOR PER





# FECTION

ARTICLE BY  
GREGG KEIZER

STALKING THE PERFECT, AFFORDABLE  
PERSONAL PRODUCTIVITY PC

**W**orking at home is no picnic. The hours can be brutal, the alter-ego boss a demanding slave driver, and the work load sometimes erratic.

Still—and this goes for full-blown home-based businesses, moonlighters, and even anyone struggling to keep up by working extra hours at home—it's hard to beat. You can work when you work best—late at night, for instance. Office politics almost disappear. And the harder you work, the more you make (OK, maybe it doesn't always work out like that).

But any home office success is due as much to technology as to talent and perseverance. Without the gizmos and gadgets scattered around the house, you wouldn't be able to do the work you do, be as productive and profitable, or even keep tabs on your clients.

The linchpin of home office success is the personal computer. That one box provides almost all of the tools you'll need, from those that crank out correspondence or bills to the ones that manage numbers or volumes of data. It plays the role of assistant, secretary, co-worker, confidant, accountant, and half a dozen others, all without salary demands or time off.

### Begin with the Box

Because it provides so many options with so few drawbacks, it's crucial that you have the perfect personal productivity PC in front of you. Since so much depends on its ability to get jobs done, you need the best-fitting computer you can find.

But don't fall into the trap of thinking the best PC also has to be the most expensive. Far from it. You can equip your home office with an ideal PC for as little as \$1,600.

The perfect PC can begin with an almost empty box—a computer sans drives and monitor—or it can start with a basic system already configured with an adequate array of memory, disk drives, and video card. Though either opening gambit works, the trend today is for sellers to assemble a lineup of stock PCs and then let you pick. You can, of course, build the perfect PC from scratch, but the advantages are usually so inconsequential—the main one being an ability to name the brand of every component—that it's rarely worth your time.

Instead, start by buying a capable 386 IBM PC compatible, selected for low price and high power. It doesn't matter whether you buy your PC by mail order or in a retail store, a superstore, or even a discount warehouse or shopping club. Just match the computer's specifications with this list of features.

- 20-MHz 386 microprocessor
- 2MB RAM
- 100MB or larger hard drive
- 5¼- or 3½-inch high-density floppy drive
- VGA monochrome monitor and video card with 256K of video memory
- Keyboard
- MS-DOS 5.0 or DR DOS 6.0
- FCC Class B approval

Because PC prices continue to plummet—especially for machines centered on the 386—you can actually find this core computer for a little more than \$1,400. In fact, several mail-order firms break or nearly break this barrier, among them companies like In-

works just fine. More memory, a larger drive, and color VGA would be nice, especially for heavy Windows use, but what you get in this base machine can handle the bulk of your chores. Besides, you can slide past problems with some ingenious software.

A 100MB hard drive may seem on the small side, but with Stacker, an on-the-fly compression/decompression utility, you can effectively double the size of the drive (certain kinds of files compress more compactly than others). Stacker as software lists at \$149; a faster hardware/software version of Stacker (Stacker AT/16) lists for \$249.

More memory? You'll find that 2MB is enough for the basic DOS word proc-

### TEN LOW-COST PC ADD-ONS

Buying extra punch and power for the home office computer doesn't have to cost an arm and a leg. If you can stretch the budget just one more time, here's what you should consider.

1. Another megabyte of memory (maybe two). A 1MB SIMM runs in the \$50–\$60 range and is a snap—literally—to add to a system that is set up for them.

2. A mouse. Even if you don't use Windows, a mouse is a good bet. DOS software—graphics and desktop publishing, in particular—works with a mouse, too.

3. Another I/O card. Your PC probably came with two serial ports and a printer port. Another I/O board doubles the number of each—handy when you start adding devices like modems, label printers, and mice. Don't let the fact that you have four serial ports confuse you, though. Most PCs can only use two at a time. However, having four installed will allow you to leave your modem and your mouse attached all the time, even if you have to switch between them in software.

4. Another floppy drive. You'll spend less than \$70 for either a 5¼- or 3½-inch high-density drive.

5. A tower or minitower case. Most mail-order PC makers will substitute a minitower or tower case, as will shops that build

the PC to your specs. The larger case makes it easier to add drives and cards. And it can sit on the floor, out of the way.

6. A disk-compression utility. Adding something like Stacker, whether just the software or the hardware/software version, you effectively double the size of that 40MB hard drive to nearly 80MB.

7. A better keyboard. *Pathetic* is the word for the keyboards many low-cost PC manufacturers include. The OmniKey and Keytronic keyboards are among the best. The Omnikey/Ultra lists for \$129.

8. Monitor arm. For as little as \$75, you can get your monitor off the desk and onto a swinging, mobile arm. Doing so can cut neck pain (often the result of looking down at a too-low monitor) and open up more desk space for paperwork.

9. Power control center. Slip one of these between the computer and the monitor, and you've got four or five outlets, surge protection, phone line filtering, and one-stop power-up. Curtis and TrippLite both make excellent centers that are sold direct for \$80 or so.

10. Disk cache. Another software selection to beef up your PC is a program like the \$80 PC Kwik Powerpack, which speeds up hard drive data retrieval by storing frequently accessed data in RAM.

sight, HD Computer, and FastMicro. Closer to home, most cities sport a handful of entrepreneurs who will assemble a PC like the one above for about the same price.

To be on the safe side, budget \$1,500–\$2,000 for the foundation of your perfect home office PC. That should account for shipping charges (mail order) or sales tax (local), as well as for any slight price differences if you're set on a particular model.

### What About Windows?

Just how good is this inexpensive PC? Although we've cut corners in order to cut costs, the fact is that for most home office tasks this foundation

processor, database, spreadsheet, and telecommunications applications. Multitasking—running more than one program simultaneously—is possible with in that much RAM with DESQview or GeoWorks.

Or you could opt for a task switcher instead. Software Carousel can segregate that 2MB of RAM into two or three separate and smaller work areas and then flip between applications with the press of a couple of keys. If you're sold on Windows, you'll feel cramped in two megabytes—no doubt about it—and you'll probably have to forgo its multitasking capabilities. Making this machine Windows-ready, though, will only cost you around \$100–\$120.

Though color brightens up games and educational programs and is a prerequisite for multimedia presentations and some graphics work, you won't mind the monochrome VGA monitor if your home office work revolves around words, data, and numbers. Most desktop publishing can be done without color, as well.

Of course, you can always add to this perfect PC down the road when your budget allows and your needs demand it. Snap in more memory, upgrade the video board, or replace the monitor with a color model.

### Everything Else Is Gravy

Let's say you have the essentials on your desk, and some money burning a hole in your pocket (OK, so it's not really burning, maybe just smoldering).

Customizing this rock-bottom computer to fit your business won't bust your budget, either. Depending on the specifics, you can equip this machine with the extras for as little as \$500. You just need to know the kind of work you expect to do with the computer and the options you need for that work.

A typing service or accounting practice requires a PC different from the one required by a home desktop publishing business. And a full-time at-home worker's PC should be different from the one used to telecommute to the office part of the week.

### It's What's Inside That Counts

As you're building your prospective home office PC, use this short checklist to ask some smart questions about what's inside.

- Can you easily add system RAM to the motherboard by snapping in extra SIMM chips? That's the simplest way to beef up the PC's memory. You should be able to insert at least 8MB of RAM if you're using 1MB SIMMs.
- How many slots are still empty after the necessary boards—I/O, video, and disk controller—are in place? The more expansion slots still open, the more capability you can later add to the computer. Demand three empty slots, minimum.
- How many drive bays remain vacant? Later, you may want to add another floppy or hard drive, or a CD-ROM or tape backup device. Make sure the PC has at least two empty bays, with one of those large enough for a 5¼-inch half-height drive.
- Does the computer come equipped with a cache, and if so, how large is it? Cache RAM dramatically speeds up some computer actions by acting as a buffer between the fast processor and slow RAM.
- Are the components from depend-

## THE ULTIMATE PERSONAL PRODUCTIVITY MACHINE

You get what you pay for. Although a home office computer system ripe for work can run you as little as \$1,500, you must make sacrifices to bring the cost down that far.

The ultimate home office computer is a far cry from the most affordable. It is based on a state-of-the-art microprocessor, sports megabytes of memory, and comes complete with lots of extras. Here's the current contender for the ultimate home office PC.

- 33-MHz 486DX PC in a full tower case
- 8MB RAM, with a 256K RAM cache
- 200MB hard drive
- 5¼- and 3½-inch high-density floppy drives
- Super VGA video card with 1MB of memory
- OmniKey/Ultra keyboard
- 120MB tape backup drive
- 15-inch NEC 3FGx multisync monitor
- Four serial ports and two printer ports
- Seiko Smart Label Printer Plus
- Logitech or Microsoft Mouse
- 9600-bps modem
- MS-DOS 5.0
- Scanner with OCR software
- Software, including Stacker, Software Carousel, and 386MAX memory manager

The price for such a monster is almost as overwhelming as its abilities: within a couple of hundred dollars of \$4,700.

Still, this is the home office computer that can take you through the middle of the 1990s. And such a computer may rapidly pay for itself by handing you the tools to tackle jobs formerly out of reach or by quickening the pace of your work. And finally, remember that—depending on your tax bracket, your state and local income taxes, and the income from your home office efforts—the effective price for any home office computer system may really be only 45 to 70 percent of the purchase price. If you can deduct the entire cost of the above system, for instance, it actually represents an out-of-pocket expense of somewhere between \$2,115 and \$3,290.

able, reputable manufacturers? Although personal preference plays a part here, look for recognizable names on such things as the drives, video card, and motherboard chip set.

No matter what your business needs may be, your perfect PC should be designed and built to deliver on the promise of technology—to make your time more productive and your business more profitable. From here on, we'll look at several specific personal productivity applications and talk about the hardware and expenditures it will take to assemble the optimum machines to meet their requirements.

### The Perfect Telecommuter

Still on salary, but working at home with the help of your modem and the phone lines? Lucky you—you get the benefits of both worlds.

Build the perfect telecommuting PC by starting with the basic 386 system and adding the following.

- 9600- or 2400-bps modem. Telecommuting usually depends on intensive file transfers and remote connections with the office network. A 9600-bps modem dramatically cuts the time you'll spend online in a remote connection; a 2400-bps modem, though slower, is less expensive. The Practical Peripherals Practical Modem 9600SA external modem was just slashed to \$399 list; Everex's 2400-bps internal modem, the Evercom 24, lists at \$129. Also look for 19,200-bps modems to become more common—and more economical.
- Fax board or fax modem. You'll need a fax modem to supplement the computer-to-computer connection. Intel's SatisFAXtion board lets you receive faxes in the background. New low-cost SatisFAXtion boards will be released by the time you see this.

The bottom line. In the end, the total cost of the perfect telecommuting PC: \$1,900–\$2,400.

### The Perfect Publisher

Your spare bedroom can be the work site that churns out company newsletters, crisp presentations and proposals, fliers and brochures, and enough other documents to paper the neighborhood. Today's technology makes it possible for one talented person to write, design, and produce camera-ready copy in a single step on one machine.

Assemble the perfect desktop publishing PC by adding the following items to the stock 386.

- Additional memory. Font- and graphic-intensive documents cry out for more RAM, so spend \$100–\$120 for another 2MB of RAM in SIMMs and snap them in yourself. Remember that if your computer isn't equipped for SIMMs or you aren't technically minded, a technician can usually do the job in a few minutes for not much more than you pay for the chips.
- Better video card. You can often increase your monitor's resolution and number of colors by either adding memory to your existing video board (this strategy isn't always easy, or possible, beyond 512K) or buying a new 1MB video board. The Diamond SpeedSTAR Plus VGA is a better-than-average VGA card that lists at only \$269.
- Scanner. You'll need a scanner to incorporate real-world images into your publishing masterpieces. A quality hand scanner, such as Logitech's Scan-

Man 256, lists at \$449. If you're scanning large images or large quantities of images, though, a flatbed scanner like The Complete Page Scanner/GS (GS stands for Gray Scale) is a much better pick. It's also more expensive at \$1,099.00.

- Full-page monitor. Squeezing desktop publishing projects onto a 14-inch monitor is only inviting headaches. You need a screen that shows a complete page. Samsung's 15-inch Hercules-compatible full-page monitor may be hard to find, but the reward is an affordable \$849 (list price) cure for the video headaches in desktop publishing.

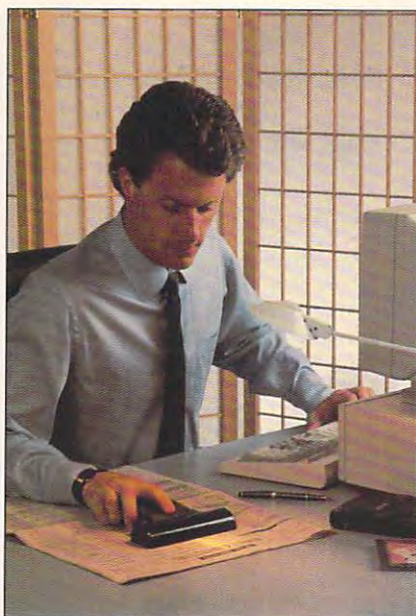
The bottom line. Total cost of the perfect publishing PC: \$2,400–\$2,900.

### The Perfect Marketer

When your business depends on selling, you need to beef up your PC's ability to take calls and punch out direct mail pieces.

Start with the standard 386SX system and add these components.

- Fax board or fax modem. You can't do business today without communicating by fax. Intel's \$499 SatisFAXtion board pulls in faxes while you work the phones. By the time this is printed, Intel will have released new versions of



*Typist makes data entry simple.*

the SatisFAXtion board with list prices starting at \$129 and specialty fax software for use from within Windows. The top-of-the-line model will support the new 14,400-bps fax standard.

- Label printer. Processing orders and printing labels—whether for shipments

or direct mail pieces—can try your printer's patience. Buy a label printer instead, like Seiko's Smart Label Printer Plus. This thermal printer uses one of your PC's serial ports and can even print from lists you create with your word processor or database. As of this writing, its list price is \$249.95, but discount houses may carry it for far less.

- Voice mail system. You may be able to get by with a two-line phone and an answering machine, but a voice mail system can direct messages and allow customers to leave requests in individual voice mailboxes. The Complete Answering Machine, a \$399 board, uses your PC's hard drive to store outgoing and incoming messages. If you don't want to spend money on a separate fax modem and voice mail system, take a look at The Complete Communicator, a package that brings these features together.

The bottom line. Total cost of the perfect marketing PC: \$2,300–\$2,400.

### The Perfect Writer

Wordsmiths need a customized PC, too. Whether you're pounding out the Great American Novel or bringing home the bacon with feature assignments for newspapers or magazines,

## PRODUCT INFORMATION

#### Typist Plus Graphics—\$595.00

Caere  
100 Cooper Ct.  
Los Gatos, CA 95030  
(800) 535-7226  
(408) 395-7000

#### Colorado Jumbo 120 DJ-10—\$250.00

Colorado Memory Systems  
800 S. Taft Ave.  
Loveland, CO 80537  
(800) 432-5858  
(303) 669-8000

#### The Complete Answering Machine—\$399.00

The Complete Page Scanner/GS—\$1,099.00  
The Complete PC  
1983 Concourse Dr.  
San Jose, CA 95131  
(800) 229-1753  
(408) 434-0145

#### Diamond SpeedSTAR Plus VGA—\$269.00

Diamond Computer Systems  
532 Mercury Dr.  
Sunnyvale, CA 94086  
(408) 736-2000

#### Evercom 24—\$129.00

Everex Systems  
48431 Milmont Dr.  
Fremont, CA 94538  
(800) 821-0806  
(510) 498-1111

#### SatisFAXtion—\$499.00

Intel  
5200 NE Elam Young Pkwy.  
Hillsboro, OR 97124  
(800) 538 3373

#### ScanMan 256—\$449.00

#### ScanMan 256 Micro Channel—\$549.00

#### ScanMan 256 with Perceive OCR—\$549.00

#### ScanMan 32—\$299.00

Logitech  
6505 Kaiser Dr.  
Fremont, CA 94555  
(800) 231-7717  
(510) 795-8500

#### OmniKey/Ultra—\$129.00

Northgate Computer Systems  
P.O. Box 59080  
Minneapolis, MN 55459-0080  
(800) 828-6131  
(612) 943-8181

#### Practical Modem 9600SA—\$399.00

Practical Peripherals  
31245 La Baya Dr.  
Westlake Village, CA 91362  
(800) 442-4774  
(818) 706-0333

#### PageMaster (15-inch Hercules-compatible monitor)—\$849.00

Samsung Information Systems America  
3655 N. First St.  
San Jose, CA 95134  
(800) 624-8999  
(408) 434-5400

#### Smart Label Printer Plus—\$249.95

Seiko Instruments USA  
PC Products Division  
1130 Ringwood Ct.  
San Jose, CA 95131  
(408) 922-5900

#### Software Carousel—\$89.95

SoftLogic Solutions  
1 Perimeter Rd.  
Manchester, NH 03103  
(800) 272-9900  
(603) 627-9900

#### Stacker 2.0—\$149.00

#### Stacker AT/16—\$249.00

Stac Electronics  
5993 Avenida Encinas  
Carlsbad, CA 92008  
(800) 522-7822  
(619) 431-7474

# OH NO! MORE **Leannings**™



## 100 Brand New **Leannings** Adventures!

Just when you thought they were finally safe those green haired numbskulls have blissfully blundered off towards new and greater perils.

# PSYGNOSIS



Available in IBM PC compatible; Amiga and Atari ST formats.

PSYGNOSIS, 29 Saint Mary's Court, Brookline, MA 02146 Telephone: (617) 731-3553 Fax: (617) 731-8379.

Circle Reader Service Number 163

 [www.commodore.ca](http://www.commodore.ca)

you can make use of some specialized tools inside the perfect PC.

Build up the PC's word-crafting prowess with these extras.

- **Topflight keyboard.** When your fingertips make money, they deserve the best. Subjective though this may be, you can't go wrong with Northgate's OmniKey/Ultra, a comfortable, responsive full-sized keyboard with function keys both at the top and on the left side. And it's less than \$130.

- **2400-bps modem.** Online research pays for itself in time saved and aggravation avoided. The most economical way to connect to services such as CompuServe and Dialog is with a 2400-bps modem. The Everex internal modem is a good choice.

- **OCR package and scanner.** Most writers live and die by clips. Ideas germinate from newspaper articles; files bulge with background pieces torn from magazines and photocopied from books. You can keep all this information digitally if you buy an optical character recognition (OCR) program and a hand scanner. Basic combination packages, such as Logitech's ScanMan 256 with Perceive OCR software, cost approximately \$550. Caere's Typist Plus Graphics, a \$595 scanner/OCR software pack, is near the top of the line. Either of these packages can be

purchased for roughly 50–60 percent of list price at discount outlets.

**The bottom line.** Total cost of the perfect writing PC: \$2,000–\$2,200.

### The Perfect Accountant

Every home office crunches numbers, even if they're only on the business's books. But for offices that specialize in accounting, figures are everything.

To construct the perfect accounting computer, include these peripherals along with the core home office PC.

- **More memory.** Most state-of-the-art spreadsheets, the number lover's best tools, operate under Windows. Spend \$100–\$120 on an additional 2MB of RAM for snappier performance.

- **Tape backup drive.** Though every hard drive should be backed up religiously, that advice goes double for critical financials. The easiest and most worry-free way to back up data is with a tape backup drive. The Colorado Jumbo 120 DJ-10, a 120MB drive, is simple to install, backs up even when you're not around, and only costs about \$250—less through mail order.

- **A math coprocessor.** You can significantly speed up really serious number crunching when you plug an 80387-20 math coprocessor chip into your PC's empty socket. The least expensive ones can be found for \$115–

\$120 in mail-order advertisements.

**The bottom line.** Total cost of the perfect accounting PC: \$2,000–\$2,100.

### Bringing It All Back Home

No matter what computer system you buy, two things will always be in short supply: RAM and hard disk space. If you have the funds to splurge in any area, buy a larger hard disk and more RAM. Some experts recommend that you estimate how much hard disk space you'll need and buy twice as much. But even if you do this, within a year, you'll probably wish you had more. Remember that a hard drive twice as big as the one you're considering probably costs far less than a second hard drive of the same capacity.

If you use software that accesses extended memory—Windows in particular—you'll know if you don't have enough memory. Your applications will fail for no apparent reason. If you have only 2MB of RAM, upgrading your machine to 4MB or more is a very small investment, and it can make a tremendous difference in performance.

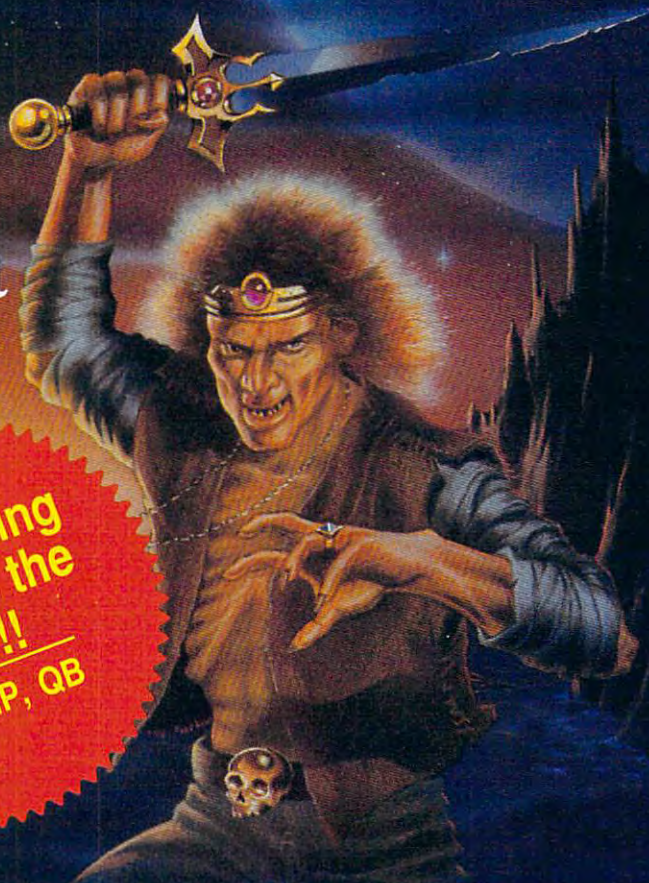
In every business, performance is the name of the game. It saves you time and makes you money. It only costs a little more to start out with the perfect PC, but it will pay off every day in personal productivity. □



# Might and Magic III

Marking 5 years  
of the  
Might & Magic series.  
Over  
500,000  
Might & Magic's  
Sold Worldwide

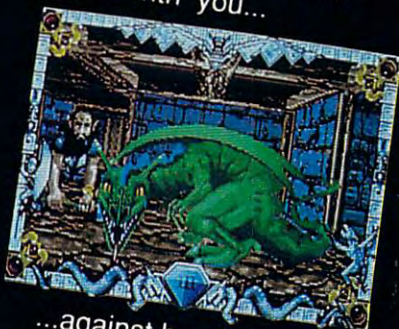
Isles  
of  
Terra



Role Playing  
Game of the  
Year!!  
CGR, GP, QB



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.

www.newworld.com Circle Reader Service Number 144

# SHAREPAK

Bruce M. Bowden

## A HOT COLLECTION OF SUMMER SOFTWARE

This month's SharePak disk greets the lazy days of summer with three programs that make computing easier for each member of the family. COMPUTECalc is a full-function calculator available at the press of a key. The offering

are downloaded and carefully scrutinized. From these, we choose the best. This saves you, as a SharePak subscriber, enormous time and expense!

Shareware is privately written software that has been released to online services in the hope that other online subscribers will download it, find it useful, and pay a registration fee. The author, by making the software available, is saying, "Try it, and if you like it,

please reward me for the effort I made to produce it." To encourage registration, many authors give phone support, provide free updates, and deliver other goodies to registrants.

hand calculator, you can use COMPUTECalc to add, subtract, multiply, divide, calculate percentages, and send figures to memory to be recalled later.

COMPUTECalc is compatible with any IBM PC, XT, AT, or clone with DOS version 2.0 or higher.

### CUMBERLAND TREE

CUMBERLAND TREE is a professional-quality genealogy program packed with special features. Enter individual names, along with dates and places of birth, christening, marriage, death, and burial, and you can tie the names together automatically as both a family and extended family structure. Print out pedigree charts, descendant charts, family group sheets, individual and marriage listings, birthday and anniversary lists, and many other reports. The pop-up menus are friendly and easy to use with extensive online help.

Ease of use is a hallmark of this database. When a child is added, the father's surname is automatically entered and vice versa. (If the surname isn't correct, then you can simply overwrite it.) When a place name is entered once, it can be selected from a pop-up window forever after.

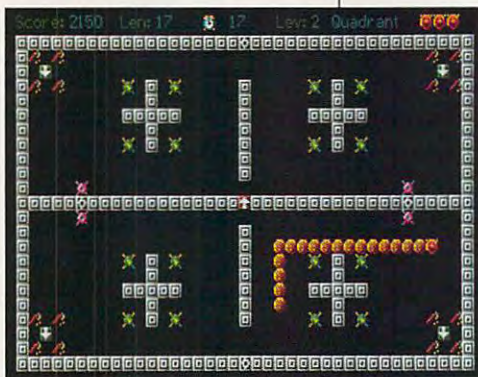
CUMBERLAND TREE runs on any IBM PC, XT, AT, PS/2, or compatible with 512K of memory.

### Squirmer 1.02C

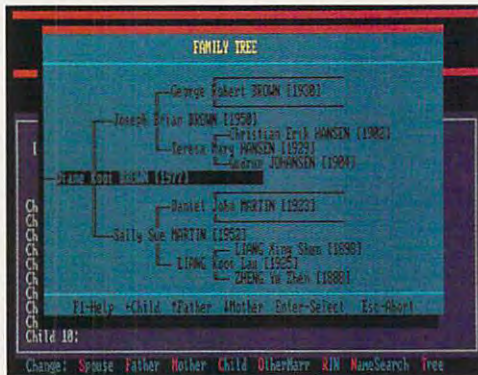
Squirmer has a voracious appetite for power pellets. He'll stop at nothing to consume everything in sight! The more he eats, the more he grows, and the more points you earn. But beware; the game is more difficult than it first appears.

Squirmer will run in CGA, EGA, or VGA on any IBM or compatible computer. □

June's  
SharePak offers  
cool relief  
from hot computer  
chores.



Squirmer tries to satisfy his munchies.



Do family histories with CUMBERLAND TREE.

CUMBERLAND TREE is a high-quality database that lets you trace your genealogy in style. And Squirmer challenges your reflexes and your quick thinking.

COMPUTE's monthly SharePak disk gives you the best of PC shareware and freeware. Each month, hundreds of titles

are downloaded and carefully scrutinized. From these, we choose the best. This saves you, as a SharePak subscriber, enormous time and expense!

Shareware is privately written software that has been released to online services in the hope that other online subscribers will download it, find it useful, and pay a registration fee. The author, by making the software available, is saying, "Try it, and if you like it,



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

June's  
SharePak  
disk  
\$1.99  
per program!

### Back Issues Available

**OCT 91:** NorthCAD-3D, computer-aided design; Conquest, a great Risk-type game; WAXMAN, a challenging TSR chess game; SPEAK, add speech to your computer. (#CDSK1091)

**NOV 91:** Popcorn, an arcade game with excellent graphics; Amortz, figure loan payments; CopyTree, easily backup large directories; Cunning Football, a great football simulation; Directory Enhancer, makes your directories much easier to read. (#CDSK1191)

**DEC 91:** EZ-Menu, access programs with a single keystroke; PuzzleMaster, an assortment of challenging brainteasers; PCBENCH, get a complete report on your system's performance. (#CDSK1291)

**JAN 92:** Hi-Lo Joker Poker, draw poker with a new twist; LINEWARS, an excellent modem space-combat game; ZipZap, view and modify files and disk sectors; FormGen, generate original business forms. (#CDSK0192)

**FEB 92:** CredCard, financial register for credit cards; EZ-Disklone Plus, make multiple, single-pass disk copies; PC VALET, easy shell for DOS commands; TSRMAKER, make pop-up TSR help and reminder screens. (#CDSK0292)

**APR 92:** AS-EASY-AS, full-featured professional spreadsheet program; GIFLITE, compress GIFs 40 percent; TSR Utilities, several great utilities to help you work with TSRs. (#CDSK0492)

**MAY 92:** Sharks, battle man-eating sharks to get valuables; CD Dot Challenge, the classic game computerized; RDIR, graphical charts of disk space usage; LZEXE, save disk space by compressing EXE files. (#CDSK0592)

**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

Please indicate how many disks of each format you would like:

	5¼-Inch at \$5.95	3½-Inch at \$6.95
This month's disk	_____	_____
#CDSK1091	_____	_____
#CDSK1191	_____	_____
#CDSK1291	_____	_____
#CDSK0192	_____	_____
#CDSK0292	_____	_____
#CDSK0492	_____	_____
#CDSK0592	_____	_____
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.

# PRODUCTIVITY CHOICE

*This feature-rich operating system is an attractive alternative to MS-DOS 5.0.*

Tony Roberts

## DR DOS 6.0

When it comes to choosing a DOS for their computers, most people simply take what comes bundled with their systems and look no further. Now, there's good reason to become an active participant in choosing which operating system is right for you.

DR DOS 6.0 from Digital Research is a brawny mixture of operating system and utilities that appears to stand just a shade taller than its market rival MS-DOS 5.0.

In addition to the standard menu of operating system features, DR DOS has enhancements to many commands, including options that let you customize and control your boot-up. Plus it has software for disk caching, disk optimization, and data compression.

To help those suffering from CONFIG.SYS confusion, Digital recently released an addendum to the documentation titled *Optimization and Configuration Tips*. It attempts to clarify some of the confusing points about using DR DOS and its options, especially its memory-management software. Along with the addendum, Digital sent a disk that includes updates and bug fixes for several of the system's modules.

One of my favorite DR DOS features is its bank of CONFIG.SYS commands; this makes it possible to keep several system configurations in one CONFIG.SYS file and to select the appropriate one at boot-up. The SWITCH command does this by waiting for an operator response and then branching to the selected subroutine. The TIMEOUT command makes this process even more powerful by allow-

ing the system to switch automatically to the first subroutine if no input is received within the timeout period.

Thus, you can set up a CONFIG.SYS that will boot up your defaults unattended, but if you want a special system setup, you can simply interrupt the process with a keystroke and make the appropriate selections. And if you put a question mark at the beginning of any statement in the CONFIG.SYS, DR DOS pauses and asks if you want that statement executed. TIMEOUT can be used here, too: If no response is given before the timeout period expires, the statement is ignored.

If your machine has at least a 286 processor and 1MB of memory, you can take advantage of DR DOS's extensive set of memory-management utilities. You also can load the operating system into high memory, freeing conventional memory for applications. A 386 or better machine lets you load device drivers, DOS data areas, and some of your own TSRs in-

to upper memory as well.

The controls for managing memory are somewhat complex and challenging to finetune. However, Digital seems committed to providing help in this area, having set up a download-only bulletin board and a "faxback" information facility to provide commonly requested guidance and the latest news about compatibility problems.

DR DOS also includes several disk-optimization tools. A version of the Super PC-Kwik disk cache—one of the most respected caching programs around—is part of the system.

SuperStor, a data-compression program, lets you nearly double the storage capacity of your hard disk drive. As you write data to the disk, a TSR compresses it, and then it decompresses the data as it's read back. This process consumes a bit of extra time during reading and writing, but the extra room on the hard disk may be well worth it.

The amount of space it can save depends on the type of



files your disk holds. Executable program files are the least compressible, while data files typically can be packed into smaller spaces.

Another bonus is DISKOPT, which defragments disks and sorts directories. While not as feature-laden as similar stand-alone programs, DISKOPT beats living with severe fragmentation for lack of appropriate defragging software.

DR DOS also provides the standard DOS commands; however, while they work as you'd expect, many of them also include options and switches that give you more power.

The extended directory (XDIR) and delete (XDEL) commands, for example, are likely to become two of your favorites. XDIR allows you to build directories the way you like to see them—sorted by date, extension, or attribute—much as the beefed-up MS-DOS 5.0 commands permit. However, the XDEL command extends the same powers to the delete function. With XDEL, you can delete every BAK file on your entire hard disk with the command XDEL \*.BAK /S. This utility prompts you for confirmation before it races through all of your subdirectories looking for files to erase.

DR DOS makes it easy not only to erase files but also to unerase them: An UNDELETE command and two additional levels of protection against accidental erasure are included. DISKMAP makes a copy of the current file allocation table, which can later provide valuable information to UNDELETE about where the file resided on the hard disk. As long as that space isn't occupied by another file, UNDELETE should be able to recover the deleted file.

DELWATCH provides a

greater level of protection by hiding, rather than erasing, deleted files. When DELWATCH, which runs as a TSR, is active, it keeps track of a certain number of files (200 is the default) which it labels *pending delete*. These are files that you've deleted that are no longer visible in your directory listings. However, DELWATCH keeps these files on disk and doesn't actually delete them until it reaches its 200-file limit or disk space runs out. When either of these occurs, DELWATCH begins actual deletion, beginning with the oldest file on its list.

One rap against DR DOS 6.0 is that floppy drive access is slow. Also, there's no version of BASIC packed with it. And although DR DOS 6.0 includes ViewMAX, an icon-based graphical user interface, as GUIs go, it's hardly worth mentioning.

But there's much to make up for these few deficiencies. DR DOS 6.0's other features include MOVE, used to easily relocate files or subdirectories; TOUCH, a quick and easy file date-stamping utility; FILELINK, which permits transfer of files between two computers via their serial ports; and PASSWORD, which provides password security for files or paths. It also includes a full-screen text editor.

Most potential DR DOS users will ask about compatibility. In the past, some software manufacturers were hesitant to lend support to DR DOS. When clashes between the operating system and the software occurred, DR DOS was often blamed.

But that's changing, according to officials at Digital Research. Several computer vendors, including CompuAdd, now pack DR DOS with the sys-

Digital Research.  
**DR DOS 6.0**  
Operating System for Personal Computers

Unleash the power of your PC with the most advanced, powerful and feature-rich DOS.

The graphic features a red and blue diagonal background with a large stylized '6' and '0' in the bottom right corner, set against a sky with clouds.

tems they sell. The growing acceptance of DR DOS 5.0, and now DR DOS 6.0, has awakened many other vendors to the importance of making certain their products interact with this operating system.

Users of Microsoft Windows 3.0 will find that DR DOS 6.0 and Windows get along fine, but early versions of Windows 3.1 and DR DOS 6.0 met in a head-on collision. Aware of the apparent incompatibility, Digital Research has affirmed its commitment to ensuring compatibility with Windows.

All of this combines to make DR DOS an excellent alternative to MS-DOS, formerly the only game in town. So if you're in the market for a new operating system, you should definitely consider DR DOS 6.0. It performs well and offers many options that will enhance your work every time you sit down at your computer. □

Circle Reader Service Number 303

**IBM PC and compatibles, 512K RAM (1MB recommended), two floppy drives or one floppy drive and one hard drive—\$99**

**DIGITAL RESEARCH  
70 Garden Ct.  
Monterey, CA  
93940  
(800) 274-4DRI**

# PERSONAL PRODUCTIVITY

Daniel Janal

## PROFESSIONAL VICTIMS

My wrists hurt. My eyes throb. No, I haven't been mugged. I am a victim of my computer.

Too much Solitaire. Too much Tetris. Enough repetitive motions to cause pain. You know the kind of pain I'm talking about if you play addictive games. Those are the ones you start playing as you wait for the last calls of the day to come. Then you keep playing for another hour figuring you'll only sit in traffic if you leave. Suddenly it's 8:00. Your eyes are tearing up from continual stress and focus, but you play anyway. That's addiction.

After days, weeks, and months of repetitive activity—not just playing games but engaging in business activities as well—you could feel severe pain in your wrists, jarring strain in your eyes, or an aching soreness in your back, shoulders, or neck.

Constant work at the computer can lead to serious and permanent damage. Julia S. La-

cey spent three years studying the effects of computers and stress in the workplace, and the findings are distressing. One of the most debilitating diseases, carpal tunnel syndrome, which causes severe pain in the hands, wrists and arms, now accounts for 50 percent of all workplace illnesses, according to the Occupational Safety and Health Administration (OSHA). Five years ago the figure was only 2 percent.

Lacey's CRT Computer Wellness Survey shows 67 percent of full-time computer users have headaches, 48 percent have neck aches, and 29 percent have both backache and shoulder ache. "That's not an easy way to get work done," she says.

She advises workers to get good equipment and set it at proper heights: Monitors should be at eye level; keyboards should be placed so that your elbow forms a 90-degree angle between your shoulder and hand.

You should also take breaks every 30 minutes. "You will be healthy and pain-free only if you move about at your workstation and get away routinely for work-productivity breaks," says Lacey, who consults on ergonomics for companies and has coauthored with two doctors a book called *How to Survive Your Computer Workstation: 15 Easy Steps to Workstation Comfort*. "Every study on the human body reinforces this concept." Stretching every five or ten minutes for a few seconds will also help your body, which was not designed to sit in a chair for long periods. Taking frequent productivity breaks, such as going for mail, can help reduce stress, Lacey asserts.

Other surprising suggestions based on research make Lacey's book a must-read for designing offices in

the home or large businesses. For instance, to reduce eye-strain, she suggests that you

- Move the monitor four feet from the eye.

- Turn down the monitor light to the lowest you can see; then raise it a tad to reduce eye fatigue and stress.

- Blink, if you have strained or dry eyes. To remember this, place a note on your monitor that says, "Blink."

To reduce stress, Lacey suggests several exercises and tips, including the following:

- Glance away from the monitor often to refresh your eyes.

- Breathe deeply to lower blood pressure and provide a feeling of tranquility.

- Get away from the monitor.

"Some suggestions are contrary to long-accepted company practices," says coauthor Howard Levenson, O.D., of the Marin Optometric Group in San Rafael, California. "However, when frequently refreshed, workers feel better and are more productive. Attendance records improve, and medical claims decrease."

Proper computer use need not be expensive. Many people have reduced a wrist ache by using a foam pad that fits in front of the keyboard. You can find wrist supports in computer stores.

Lacey also cautions that problems you experience might *not* be computer related. For instance, optometrists report that 30 percent of people have visual problems that are undetected, uncorrected, or undercorrected. It's no wonder if these people blame their monitors. People who are overweight have frequent backaches. They may blame their chairs, although in reality their weight causes the pain.

Once I have done my exercises and rested my eyes, I can return from my break to play Tetris with a relaxed mind and clear eyes. □

**Relaxation, exercise, and timely breaks are key to more productive work, less discomfort, and higher scores.**



You'll find many of these exciting new features on our updated classics:

**NEW MAC FEATURES!**

All MAC versions are System 7 compatible and available in color and black/white.

- Programmed by Apple specialists
- Magnate high score of best players
- Numerous player options
- Realistic digitized sound
- Multiple levels of skill

# BACK & Better Than Ever!



**NEW WINDOWS™ FEATURES!**

- Easier "point and click" interface
- Dazzling animations
- Incredible sound effects with **SOUNDBLASTER™** sound
- Easy Windows installation
- Super VGA support and hi-resolution graphics



Windows is a trademark of Microsoft Corporation.

FEATURES LISTED FOR BOTH FORMATS MAY NOT BE AVAILABLE IN ALL VERSIONS OF EVERY GAME.

Monopoly® is a registered trademark of Tonka Corporation. ©1992 Parker Brothers, a division of Tonka Corporation. Risk® is a registered trademark of Tonka Corporation. ©1992 Parker Brothers, a division of Tonka Corporation. Rich Uncle® is a registered trademark of Tonka Corporation. © 1998 Parker Brothers, a division of Tonka Corporation



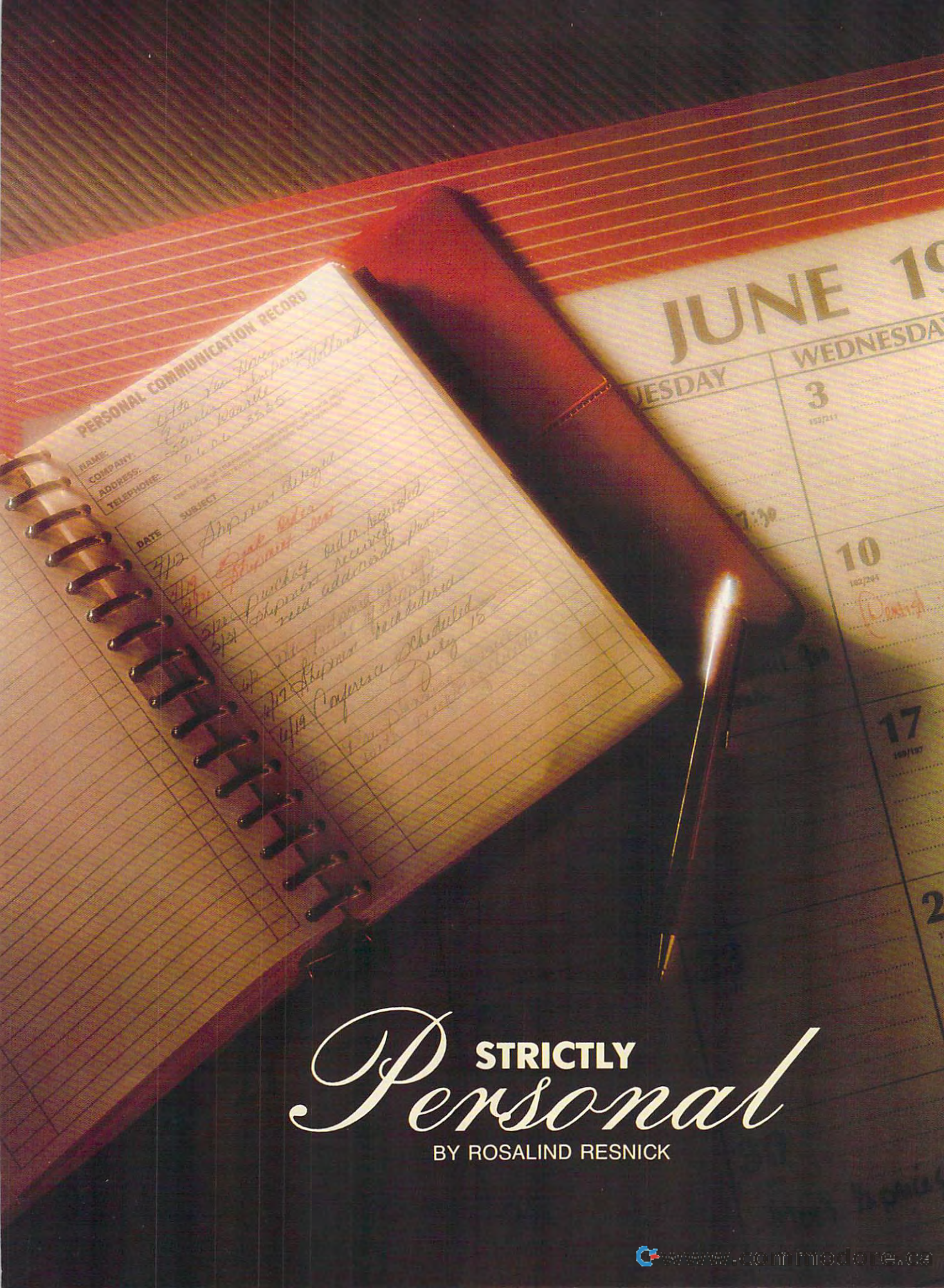
Virgin is a registered trademark of Virgin Enterprises Ltd.

For pricing and orders, please call 800-VRG-IN07. Visa, Mastercard, American Express and checks accepted.

Circle Reader Service Number 122

©1936 Parker Brothers

[www.commodore.ca](http://www.commodore.ca)



**PERSONAL COMMUNICATION RECORD**

NAME  
COMPANY  
ADDRESS  
TELEPHONE

DATE

SUBJECT

4/16 to the Home  
 4/17 to the Home  
 4/18 to the Home  
 4/19 to the Home  
 4/20 to the Home  
 4/21 to the Home  
 4/22 to the Home  
 4/23 to the Home  
 4/24 to the Home  
 4/25 to the Home  
 4/26 to the Home  
 4/27 to the Home  
 4/28 to the Home  
 4/29 to the Home  
 4/30 to the Home

**JUNE 1991**

TUESDAY

WEDNESDAY

3

1991/211

10

1991/241

17

1991/187

**STRICTLY**  
*Personal*

BY ROSALIND RESNICK

92

THU

4

156/219

conference 11:45

11

163/205

18

176/196

Leah & Charlotte

25

177/169

no lunch with  
Mindy  
PRESENTED 8:30

FRIDAY

5

187/209

12

164/202

John 9:00

19

171/195

SATURDAY

6

158/208

13

165/201

20

172/194

writing workshop →

INDEX REFERENCE

A-Z U-V-W

NUMBERS O-P-Q

NAME: *Leah & Anne*

TELEPHONE NO.: *(305) 752-3635*

ADDRESS: *4671 Biscayne Blvd*  
*Forest City - Miami*

DATE: \_\_\_\_\_

FILE NO. (OPTIONAL): \_\_\_\_\_

**Y**ou bought a computer because you thought it would help you organize your life. But now you're so busy that you scribble notes on scraps of paper and then forget where you put them. When a client calls to respond to the letter you sent him last month, you can't remember who he is or what you told him. You miss deadlines because you can't squeeze everything onto your calendar.

If these experiences sound familiar, you're not alone. Information anxiety is the scourge of the 1990s, but it's nothing that a trip to the software doctor can't cure. The prescription isn't pills; it's PIMs—Personal Information Managers.

Steve Garfein, an Irvine, California, consultant who works at home and uses a Windows-based PIM from Polaris Software, got hooked on PIMs three years ago.

"For years, I had an office manager to perform many of the functions that PackRat does," Garfein says. "I no longer have an office manager. I wouldn't know what to do with one."

Software that tracks appointments, files away addresses, and organizes the clutter that tends to pile up on every desk has come a long way since Borland International introduced Sidekick in 1984. Today, there are some 40 PIMs on the market, ranging from relatively simple programs that track birthdays and Boy Scout troop meetings to sophisticated project managers capable of handling million-dollar projects. Fully featured programs with capabilities for note taking, schedule tracking, contact management, and planning now start at under \$100.

"Word processing was the application for the 1980s," says Michael Jimmeron, a Tucson lawyer who uses PackRat. "I think that PIMs are going to be the software for the 1990s."

Here's why PIMs are so popular:

1. A PIM means never missing an appointment. PIMs can be programmed to sound an alarm or flash a message to alert you to a meeting you have to attend or a phone call you're scheduled to make. Karri Riedel, a secretarial temp in Perrysburg, Ohio, says she uses Chronologic's Instant Recall on her home computer to keep tabs on birthdays, doctors' appointments, and even her daughter's Brownie meetings.

2. A PIM means never losing a phone number. PIMs let you create an electronic database that stores a person's name, address, phone number, fax number, nickname, birthday, favorite restaurant, and other helpful tidbits. If you have a modem, you can even command the PIM to dial the phone number for you at the touch of a key.

3. A PIM means never letting a dead-

line sneak up on you. PIMs that double as project managers not only tell you when a project is due but generate detailed graphs and charts that show what you (and your colleagues) should be doing every day in order to get the job done on time. SureTrak Project Scheduler helps you see how a project is going, pinpoint trouble, and get yourself back on track. For novice project managers, On Target has a scheduling assistant that guides you through the planning process.

4. A PIM means never losing an important file, or even an unimportant one. PIMs excel at sifting through electronic data to find the item you're looking for. Most word processors lack such powerful search features, forcing you to hack your way through a thicket of DOS filenames. Info Select, for example, lets you retrieve files by simply typing the letter *G* (for *get*) plus the first two or three letters of the topic you're searching for. PIMs can also keep tabs on papers stashed in your filing cabinet. Garfein says he logs all his paper files by keyword so he won't have to search for them manually.

5. A PIM means never retyping anything. Most PIMs let you export data to word processors, spreadsheets, and other programs. PackRat, for example, offers a dynamic data exchange (DDE) macro that lets you effortlessly plug information into Microsoft Word for Windows, Excel, and Ami Pro. Garfein says he uses PackRat before meeting with a client to ferret out pertinent information. Then he dumps the data into his word processor, prints it out, and files it in his Day-Timer. "PackRat helps me focus on that client as if he were my only client," Garfein says.

6. A PIM means never looking like an amateur. PIMs not only help you get your own affairs in order, but many of them also have powerful report-generating features that show the world you're organized, too. That's important if you need to make business presentations or print out data in a form your colleagues can understand. Symantec's GrandView, for example, lets you turn rough outlines into well-organized plans, proposals, reports, and even Harvard Graphics slides.

7. A PIM means never having to read between the lines. Unlike paper calendars and schedulers, PIMs give you lots of space to enter information about important events. Info Select, for example, can accommodate as many as 10 million characters per database. Instant Recall lets you type up to 30 pages per entry. "I can't see myself going back to a manual calendar," says Riedel, who uses Instant Recall.

8. A PIM means never having to

make a list. Because PIMs let you build your own database of people, events, and topics, they're useful for market research and customer mailings. Lotus Agenda even has an information-sifting feature that lets you gather information from external sources such as CD-ROM, electronic mail, and online databases and sort it by company, topic, or publication.

9. A PIM means never having to throw anything away. Because PIMs store information electronically, there's never a need to clean out the file cabinet only to find out two days later that you threw out the one piece of information you really needed. Charles Olsen, a Dickinson, Texas, mainframe computer operator, says he's using Agenda to store notes for a science fiction novel he's working on. He uses one Agenda view (or category) to store several detailed items about helicopter specs.

10. A PIM means never losing those little pieces of paper. When PIMs like Instant Recall, Info Select, and Sidekick are run memory resident, you can pop up an electronic notepad, write a note, and retrieve the information later. PackRat offers the same convenience for Windows users. "I'd write things down on a little piece of paper; then, six months later, I'd find the piece of paper and have to call and apologize," Olsen says. "With Instant Recall, I can keep the promises I've made."

There's only one good reason not to get a PIM: if you find the idea of becoming efficient terrifying.

## Organization Tools

Unlike software that helps you write letters and crunch numbers, personal information management software doesn't fall into one neat category.

Some programs, such as Micro Logic's Info Select 2.0 and Chronologic's Instant Recall 1.2, track everything from the names of contacts to birthdays. Others, like Symantec's On Target and Time Line 5.0 and Primavera Systems' SureTrak 2.0, are actually specialized project managers capable of managing not only your own information and appointments but also those of your entire department or company.

General-purpose PIMs are ideal for lawyers, accountants, and other people who sell their time and bill by the hour. Some PIMs can time client phone calls to the nearest second. PIMs are also good for people who sell products or information and need fast facts at their fingertips. Project-management software, by contrast, is better suited to event planners, advertising executives, software developers, and other people who manage projects that take more than a couple of

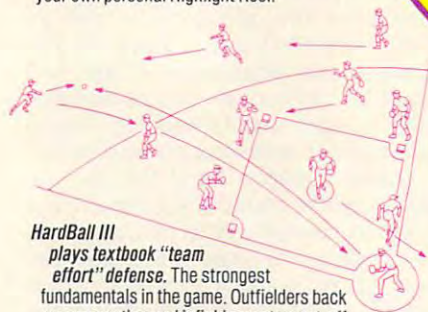




▲ *HardBall III* takes a full cut at major league realism. A power line-up that includes printable stats, standings and box scores; the ability to import data from *HardBall II*™, *Earl Weaver II*™ and *Tony LaRussa*™; plus a Team & Player Editor that allows you to alter everything from team logos to a player's ability.



▲ *HardBall III* zooms in on the bang-bang plays. Five camera angles cover the entire ballpark. Watch instant replays and save the best for your own personal Highlight Reel.



*HardBall III* plays textbook "team effort" defense. The strongest fundamentals in the game. Outfielders back up one another and infielders act as cut-off men, coming out to take the throw.



▲ *HardBall III* has the best play-by-play man in the business. Network broadcast great Al Michaels joins the *HardBall III* Team up in the booth, with a digitized description of all the action.

LET 'EM PLAY  
BASEBALL.  
WE PLAY  
HARDBALL™

PRESENTING THE ALL-NEW HARDBALL III™



▲ *HardBall III* leads off with digitized players and 256 color VGA graphics. Nobody beats this double play combo. Visuals as eye opening as a line drive up the middle. Animation as smooth as a Gold Glove shortstop. From fresh mowed grass to ivy covered walls, details that capture The Show.



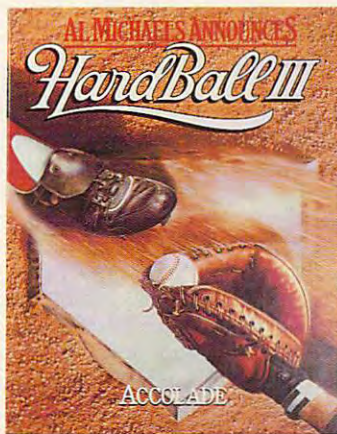
*HardBall III* tests each hitter's power with eight real ballparks. Famous fields from both major leagues. Your catcher may have just enough pop to put it out of Chicago's "friendly confines," but can he go deep in Toronto?



▲ *HardBall III* thrusts you into the heat of a pennant race. It's a 162 game, major league season—complete with road trips and an all-star game. Compile good numbers along the way and maybe you'll make the roster.

The only computer game with Hall of Fame credentials. You don't outsell every baseball title in history by standing pat in the off-season. New *HardBall III* redefines computer baseball once more with real play-by-play announcing; unprecedented graphics, realism and playability; plus more of the authentic baseball nuances that serious fans want in a simulation. More runs. More hits. No errors.

To order, visit your favorite software retailer or call 1-800-246-7744.



ACCOLADE™  
The best in entertainment software.™

Play-by-play announcing requires 2MB of RAM. Actual game screens from IBM PC VGA version of the game. Other versions may vary. *HardBall III*, *HardBall II* and *HardBall* are trademarks of Accolade, Inc. *Earl Weaver II* is a trademark of Electronic Arts. *Tony LaRussa* is a trademark of Strategic Simulations, Inc. All other product and corporate names are trademarks and registered trademarks of their respective owners. © 1992 Accolade, Inc. All rights reserved.

## PRODUCT LIST

Sidekick—\$99.95  
Borland International  
1800 Green Hills Rd.  
P.O. Box 660001  
Scotts Valley, CA 95067  
(800) 331-0877  
Requires IBM PC or compatible and 512K.

Instant Recall—\$99.95  
Chronologic  
5151 N. Oracle, Ste. 210  
Tucson, AZ 85704  
(800) 848-4970  
Requires IBM PC or compatible and 512K.

Who-What-When—\$295.00  
Chronos Software  
555 Deharo St., Ste. 240  
San Francisco, CA 94107  
(415) 206-0580  
Requires IBM PC or compatible and 512K.

Agenda—\$395.00  
Lotus Development  
55 Cambridge Pkwy.  
Cambridge, MA 02142  
(800) 343-5414  
Requires IBM PC or compatible and 640K.

Info Select—\$149.00  
Micro Logic  
P.O. Box 70  
Hackensack, NJ 07602  
(800) 342-5930  
Requires IBM PC or compatible and 256K.

Microsoft Project—\$695.00  
Microsoft  
One Microsoft Way  
Redmond, WA 98052-6399  
(800) 426-9400  
Requires IBM PC or compatible, 2MB  
(80386 CPU and 3MB recommended),  
and Windows (DOS version also available).

Ascend—\$299.00  
NewQuest  
2550 South Decker Lake Blvd.  
Salt Lake City, UT 84119  
(800) 887-1814  
Requires IBM PC or compatible, 1MB, and  
Windows.

PackRat—\$395.00  
Polaris Software  
17150 Via Del Campo, Ste. 307  
San Diego, CA 92127  
(800) 338-5943  
Requires IBM PC or compatible, 1MB, and  
Windows.

SureTrak Project Scheduler—\$795.00  
Primavera Systems  
SureTrak Division  
1574 W 1700 S  
Salt Lake City, UT 84104  
(801) 973-9610  
Requires IBM PC or compatible and 640K.

Maximizer Lite—\$79.95  
Richmond Software  
6400 Roberts St., Ste. 420  
Burnaby, BC  
Canada V5G 4C9  
(800) 663-2030  
Requires IBM PC or compatible and 512K  
(advanced and LAN versions also avail-  
able).

GrandView—\$295.00  
On Target—\$399.00  
Time Line—\$699.00  
Symantec  
10201 Torre Ave.  
Cupertino, CA 95014  
(800) 441-7234  
Requires IBM PC or compatible;  
GrandView requires 320K; On Target re-  
quires 1MB and Windows (2MB and  
mouse recommended); Time Line requires  
640K.

Texim Project—\$1,295.00  
Texim  
833 Portland Ave.  
St. Paul, MN 55104  
(612) 290-9627  
Requires IBM PC or compatible, 640K,  
and 3MB hard disk space; mouse  
recommended.

who thought it would be too complex to learn," Davison says. "Now general business people are recognizing this as a valuable tool, not just the professionals with calculators on their belts."

### Workalikes

It's important to find a PIM that works the way you do.

If your organization or business is small and you don't have many appointments or names to keep track of, you'll probably be able to get by just fine with a paper calendar, a Rolodex, a spiral notebook, and Post-it notes.

But as your company gets bigger and more complex, you ought to consider an electronic organizer to manage your data and your time. Marketers, journalists, public relations people, event coordinators, and scout troop leaders can all benefit from PIMs. Lawyers can use PIMs to track filing dates; doctors can use PIMs to schedule patients.

Once you've decided to buy a PIM, figure out which aspect of your business is disorganized and buy a program to solve your specific problem. The PIM should let you take notes, manage customer contacts, track your schedule, and plan activities. Look for a program that can perform quick searches to isolate individual notes.

At the same time, it's a good idea to stay away from any program with so many bells and whistles that it will only confuse your organization efforts. And don't buy a program that takes more time to learn and to keep up than it now takes to paw through your clutter.

If you spend a lot of time on the phone and need rapid access to large stacks of notes and other text-based data, consider Info Select 2.0, Instant Recall 1.2, or Sidekick 2.0, all of which are TSRs that pop up at the touch of a key. For Windows users, PackRat 4.0 is a PIM created to take advantage of Windows' powerful linking features.

Agenda 2.0 is a powerful tool for people who need to organize and cross-reference large amounts of text-based data. Who-What-When 2.2 is ideal for tracking appointments. GrandView 2.0 is best if you prefer to manage your information by outlining. Also take a look at Ascend, a PIM created by the Franklin Institute (covered in the "Point & Click" column in this issue).

It's also important to remember that whichever PIM you buy, it's only as useful as the data you put into it.

"I think there's this voodoo that's supposed to occur when you get organized electronically," Tarter says. "A disorganized person isn't going to get organized just by installing a PIM on his computer." But a little organizational effort goes a lot further when a PIM is involved. □

days and involve a team of people. Some examples of project-management software are Microsoft Project, Time Line, and Texim Project. They help a manager—or a team of managers—keep track of a project.

"A PIM tracks your time hour by hour: Meet Bill, paper due—that kind of stuff," says Scott Davison, marketing manager for Symantec's project-management group. "Project-management software lets you build a fairly complex model to track your projects. Instead of just getting a snapshot of what's going on, you see that Task A can't start until Task B is finished."

If this makes project-management software sound a little daunting, in

some respects it is. Time Line, a corporate favorite, has helped major defense contractors keep tabs on multimillion-dollar projects. Time Line also helps managers keep track of things like tasks split between two employees when one of them goes on vacation.

Even so, project-management software isn't just for Fortune 500 companies, Davison says. To target smaller businesses, Symantec recently introduced On Target, a simplified project-management program that runs in Microsoft's Windows environment.

"What we realized was that there was a large audience of middle managers and small-business people who could benefit from this technology but

# ART WORKS

Robert Bixby

## THE NEW VECTOR

It wasn't so long ago that the only option for vector drawing on the PC was Micrografx PC Draw. Then it was big news when Adobe created the PC illustration and design niche by porting Illustrator from the Macintosh to the PC. The big news was followed by a small thud, unfortunately. So much had to be left behind that Illustrator's giant leap turned out to be a baby step for mankind. Adobe Illustrator, though still available, was soon buried by the currently reigning big three—CorelDRAW!, Micrografx Designer, and Computer Support's Arts & Letters.

The competition has been fierce in this arena, with the ante being raised first by one's hotshot programmers and then by another's, with massive clip art files, followed by massive typeface libraries, followed by ever more bizarre means of manipulating the drawing (perspective, warping, and extruding routines), followed finally by charting. Watching them slug it out makes me marvel that all three are still standing. But what's really amazing is that new kids keep appearing, ready to join the fray.

The first newcomer to appear on my desk was Harvard Draw from Software Publishing. It features layers, which are like acetate sheets laid over the drawing surface. Layers allow you to construct a multiple-level drawing, and they keep distinct systems separate in mechanical drawings. It could generate multiple copies of an object in a circular pattern or in perfectly placed columns and rows.

An onscreen help line provides the options available as each icon in the toolbox is selected. This will be appreciated by beginners, and it's easy to turn it off so veteran

Harvard Draw artists won't have to look at it anymore.

Harvard Draw features auto-trace and many of the drawing features familiar in illustration/design software, but it also has some innovations that will force the past masters to run to catch up. One of the innovations in this product is its scripting language, which allows you to write and edit drawings with a text editor. Simply copy the text file into the Windows Clipboard from a text editor while Harvard Draw is running, and the commands you've specified (with commands like `opendraw`; `set fillnone`; `set-outlinecmyk`

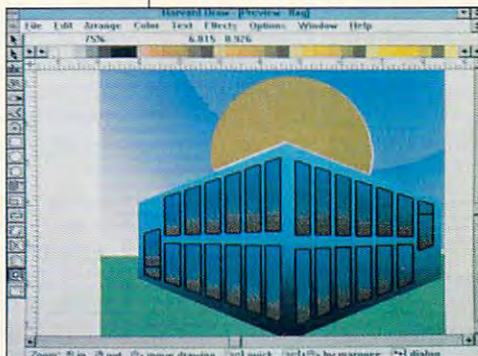
`0,0,0,100`) will be carried out. Harvard Draw also allows you to fit text to more than one curve, group and combine objects, cut holes in objects, paste copies of an object to a path, blend shapes and colors, perform unusual gradient fills (the motifs include such exotica as a 12-pointed star), mix color on a CMYK or an RGB model, fill an open path, automatically generate regular polygons, choose from a 16-level undo, get context-sensitive help, and more.

Soon after my encounter with Harvard Draw, I received a telephone call from a publicist about a product called Professional Draw (from Gold Disk, the preeminent professional software developer for the Amiga).

As of this writing, Professional Draw is still in beta, with some functions unimplemented, so I can't comment on its trace engine, for example. However, Professional Draw is not arriving without a

track record. It's the prime choice for vector drawing and illustration/design software on the Amiga. Its arrival is a little like that of Adobe Illustrator—we wait with bated breath to see to what degree we can make a PC with Windows perform like an Amiga. Making it behave like a Macintosh proved beyond the powers of Adobe's best programmers.

Gold Disk has the benefit of arriving on the scene with many of the problems already solved. I am pleased to report that Professional Draw is very intuitive, jackrabbit fast, and not bug-ridden, which is high



**Harvard Draw and Professional Draw could teach the established illustration leaders a few lessons in speed and convenience.**

praise indeed for beta software. Whether Gold Disk can pack in enough features to make it stand out from the crowd remains to be seen.

Suddenly a new area of competition has opened up at the affordable end of the spectrum. I received Picture Wizard and Arts & Letters Apprentice the other day from Computer Support, both scaled-down versions of Arts & Letters Graphic Editor, loaded with clip art and designed to make it easy to construct art projects. The name and the package of Picture Wizard suggest that it's aimed at young people. Meanwhile, Micrografx has introduced a new graphics package called Micrografx Windows Draw. I hope to compare these new packages in an upcoming column. □

David English

## SOUND BLASTER TURNS PRO

When the Multimedia PC (MPC) specifications were announced back in November 1990, Microsoft recommended that developers use the Sound Blaster, the only existing sound card that came close to matching the MPC specs.

In fact, it seemed at the time that Microsoft had simply taken the Sound Blaster specs and added an audio mixer so that software could adjust the various audio levels—FM music, microphone input, line-in, CD-audio, and digital sampled sound.

A year later, Creative Labs and its distributor, Brown-Wagh Publishing, started shipping an upgraded version of the Sound Blaster: Sound Blaster Pro (Brown-Wagh Publishing, 160 Knowles Drive, Los Gatos, California 95030; 408-378-3838; \$299.95). It adds the audio mixer necessary to meet the MPC standard fully, as well as a second Sound Blaster on the same card and a CD-ROM interface.

The Sound Blaster Pro has

two FM chips that provide as many as 22 simultaneous synthesizer-type voices (the Sound Blaster has only one FM chip for 11 simultaneous voices). It also has two ADCs (Analog-to-Digital Converters) and two DACs (Digital-to-Analog Converters) that let you record and play back realistic-sounding voice and sound effects in stereo. (The Sound Blaster has only one ADC and one DAC for mono recording and playback.)

The CD-ROM interface isn't a SCSI interface, so you're limited in the number of CD-ROM drives you can use with the Pro. It currently works with the Creative Labs SCD-521, Matsushita CR-521, and Panasonic LK-MC-521 series drives. All three are available as either internal or external drives. I tried the Creative Labs SCD-521B internal drive with the Pro, and it appears to be both fast and reliable.

Like the original Sound Blaster, the Pro includes a volume control, MIDI interface/joystick port, microphone input, line-in, and line-out on the back of the card. Although the MIDI kit is optional with the Sound Blaster, it's included in the Sound Blaster Pro package.

The Pro also comes with a full array of software. Voice Editor II supports stereo recording and file compression, as well as audio input from a microphone, CD audio, or a file. The graphics-based waveform display lets you cut and paste, zoom, and loop your sound segments. You can also add echo and reverb digitally.

The CD Player program turns your CD-ROM drive into a software-controlled audio-CD player. The program's control screen uses the familiar cassette recorder layout, making it easy to play, pause, stop, rewind, fast forward, change track, and change volume.

SBTalker takes any ASCII text file and converts it to spoken words. (Like most algorithmic text-to-speech converters, though, it sometimes mispronounces the words.)

The FM Intelligent Organ program turns your computer into a stereo organ. It features a learning mode and offers automatic accompaniments and rhythms. It can also work with a MIDI keyboard through the Pro's MIDI interface.

With MMplay, you can synchronize Sound Blaster audio files with Autodesk Animator animation files to create simple multimedia presentations on your PC.

And two Windows programs, Jukebox and SBMixer, let you play MIDI files and adjust the various levels of the Pro's audio sources from within Windows.

If you're interested in turning your PC into an MPC, you can also buy the Sound Blaster Pro as part of an official MPC upgrade kit. The kit consists of the Pro sound card, a compatible internal CD-ROM drive, and five CD-ROM titles, including Microsoft Bookshelf and Windows With Multimedia—all for just \$849.95.

So how does the Sound Blaster Pro sound? The sound quality of any 8-bit sound card, including the Sound Blaster Pro, is roughly equivalent to that of an FM radio—orders of magnitude better than the PC's usual beeps and boops.

If you want true CD-audio quality sound from your PC, you'll have to spring for one of the upcoming 16-bit stereo sound cards, such as the \$995 MultiSound card from Turtle Beach Systems.

For most of us, an 8-bit card is all we really need. Hook your Sound Blaster Pro to a decent pair of speakers or headphones, and you'll be ready to experience the many sounds of multimedia. □

**With the Sound Blaster Pro, you can turn your PC into a multimedia workstation.**





# THUNDER BOARD. PC GAMES LIKE YOU'VE NEVER HEARD THEM BEFORE.

Lend us your ear. And we'll stuff it with a calibre of sound that's ears ahead of the competition.

Introducing Thunder Board™ from Media Vision. No other sound card out there today can soar to such incredible heights. Or plunge to such awesome lows. And Thunder Board's dynamic filtering means dynamite sound. Higher fidelity. Bigger ka-booms. And more bang for the buck.

Our guarantee is that we put the quality where your ears are. And the money where our mouth is. In fact, we'll refund your money if you don't agree Thunder Board is the best sound board for your PC games.

In addition, with Thunder Board you get three free PC action game samplers: Nova 9™, Lemmings™ and Lexi-Cross™. Plus, free Thunder Master™ software that lets you record and edit sound files with a Wave Form Editor.

And Thunder Board is fully compatible with all the



newest PC games. Plus 100% compatible with AdLib™ and Sound Blaster™ applications—to support the largest library of games possible. What's more, Thunder Board has breakthrough features to let you break all the sound

barriers. Like twice the Digitized Audio Playback and Recording Capability at an explosive 22 kHz—compared to the competition's puny 11 kHz.

Also, you get a squadron of powerful extras. Like a Joystick Port. Headphone Jack. An 11 Voice FM Music Synthesizer that lets you score music as well as score points. And a Power Amplifier with built-in Volume Control, so you can have yourself a real blast—without blasting the neighbors.

So take off—for a dealer near you. And go from static to ecstatic.

Because, with Thunder Board, hearing is believing.

**MEDIA VISION**

**Thunder Board™ The Sound of Adventure.**

For the name of a Thunder Board dealer or simply some good sound advice, call Media Vision. 1-800-845-5870.

Media Vision, 47221 Fremont Boulevard, Fremont, CA 94538. 510-770-8600, FAX: 510-770-9592

Media Vision, Thunder Board and Thunder Master are trademarks of Media Vision, Inc. All other trademarks and registered trademarks are owned by their respective companies.

Circle Reader Service Number 214

[www.commodore.ca](http://www.commodore.ca)

# DISCOVERY CHOICE

*This fun-filled game will get you ready to teach the local word bully a thing or two.*

David Sears

## SUPER SOLVERS SPELLBOUND!

For those of us born without a knack for spelling, weekly grammar-school spelling bees always inspired a certain degree of terror. Misspelling a word in the first round happened more often than anyone would like to admit. Or worse, poor spellers would somehow survive the initial barrage of common words only to face a word like *sobriquet*. Meanwhile, the class word bully, who could spell *peripatetic* while performing handsprings, claimed the gold star by correctly spelling *nutmeg*. Where was justice?

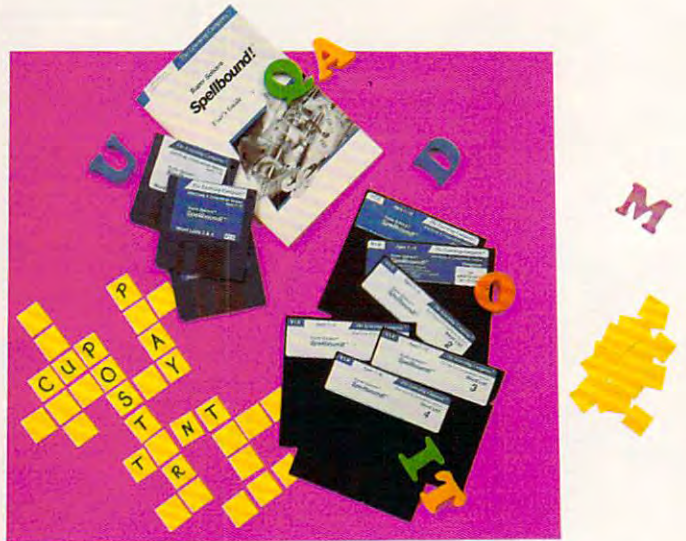
Must our children endure the horror and embarrassment we fell victim to? Not now: Super Solvers Spellbound! makes it fun to learn how to spell.

The Learning Company brings in the familiar, whimsical characters of Super Solvers to put even the most reluctant young students on the path to better spelling.

The story begins with a challenge: Morty Maxwell wants to prove that he's not only the Master of Mischief but the world's best speller as well. No self-respecting Super Solver will stand idly by and allow this to happen, despite the fact that not every Super Solver is a terrific speller.

Thanks to the Spellbinder (a notebook-sized computer), beating Morty at this game will take only a few fun-filled hours of playing with words. To win, you must triumph not only at local spelling competitions but at statewide bees as well. The final test takes place in Washington, D.C.—an auspicious location for Morty's downfall.

Even players at the young end of Spellbound!'s 7- to 12-



year-old target audience will have little trouble getting started. A short command at the DOS prompt invokes the program. With a mouse driver in place, you can initiate most actions within the game via simple pointing and clicking. Parents might wish to encourage heavier reliance on the keyboard, however, where the arrow and Enter keys, along with the space bar, serve just as well as the mouse.

Spellbound! increases typing efficiency, and while the emphasis remains on spelling, this adventure can't help but familiarize keyboard neophytes with the rudiments of text entry.

In the Spellbinder is a trio of spelling exercises disguised as puzzles. Word Search resembles the popular diversion of the same name often found in newspapers. You must find a number of words hidden in a grid filled with random letters. The difference between other word finds and Word Search is, of course, the ulterior motive. Super Solvers search for words that later will appear in the spelling bee.

And in preparation for this upcoming test, you must not only find the word but also select its constituent letters in the proper order. The Spellbinder doesn't permit you to select letters indiscriminately; *elves* must be culled from the grid sequentially, beginning with *e*. Starting with *s* or *v*, even if all the other required letters are eventually selected, doesn't merit a correct answer.

Word Search can put together challenging puzzles. With the user-selected word lists as its database, it will scatter words upside down, diagonally, backward, and in a delightful serpentine manner. Kids will love to follow the word *microprocessor*, to name one, as it snakes down and across the grid. Sound a bit tricky for your seven-year-old? Don't worry; the advanced puzzles appear only late in the game, just before the final spelling bee. By then your Super Solver will gamely tackle any puzzle.

The next activity, Flash Card, brings you face to face with Morty. Each flash card boldly displays Morty's mug—

further incentive for a Super Solver to spell each word correctly. Press the space bar or click on Flash to display a word briefly; then attempt to spell it. The Spellbinder doesn't give up on kids who can't spell the word the first time; it gives them three chances before moving on to the next word.

Already the most demanding of the three preparatory activities offered by the Spellbinder, Flash Card increases in difficulty as you approach your goal of competing in the Washington, D.C., spelling bee. Not only do you have to spell flashed words correctly, but you also have to unscramble these same words in order to earn further point bonuses.

If you don't recall the flashed words from the beginning of the activity, unscrambling them can prove frustrating. The Spellbinder helps out here by allowing several attempts at unscrambling each word; the Flash Card screen displays any letters that are placed correctly, leaving gaps where incorrect letters are chosen. All in all, it's not a bad compromise, and kids will probably feel the most pride for successfully completing this activity.

Criss Cross brings to mind crossword puzzles, but instead of presenting clues, this activity supplies all the words needed. The task is to fit words of varying lengths into a framework of boxes, one letter per box. Through the process of elimination, you can quickly bring this activity to an end.

As with the other puzzles, later levels can bring greater complexity in Criss Cross. However, when words of the same length appear on the list, trial and error will yield the unique

solution in just a few minutes.

After participating in all three activities and earning sufficient points to qualify for the next spelling bee, Super Solvers head for the real competition. There, Spellbound! shines brightest. Besides the rich 256-color VGA graphics that give you plenty to look at, clear digitized speech on the PC makes the program truly remarkable. The warm, feminine voice of the officiator welcomes the contestants, utters words of praise, and most strikingly, regularly speaks aloud many of the words that Super Solvers have studied.

While many PC owners, all too familiar with the raspy static that often passes for digitized speech in otherwise respectable games, would just as soon ignore optional vocals, this aspect of Spellbound! deserves attention. Any fear of missing a word simply because it's unintelligible to the human ear fades quickly; this digitized vocabulary ranks among the best.

PC speaker quality may vary, but a sound card promises consistent and superb results for digitized speech playback. If you don't have a sound card, you might want to consider The Learning Company's Family Sound Value Pack, which consists of an Ad Lib card and a copy of Spellbound! and sells for only \$119.95. Spoken words are interspersed among the majority of flashed words, often to good effect.

What if, despite all your preparation for the spelling bee, you don't take first place? Then head back to the activities of the Spellbinder, of course, for more practice. Spellbound! never penalizes players for trying, and this no-lose at-

mosphere will do timid kids far more good than the public humiliation of a real spelling bee.

Preset lists cover general topics as well as troublesome word types such as homonyms and palindromes. In addition, you may fill up to 100 special lists with words of your own choosing, thereby customizing the program to focus on problem words or this week's spelling list.

So with a minimum of effort and a good deal of fun, Spellbound! can turn every Super Solver into a spelling heavyweight. And who wouldn't like to teach the local word bully a lesson or two? Spellbound!'s remarkable union of updated learning activities with outstanding sound makes this software a great equalizer where words are concerned. □

**IBM PC and compatibles; 512K RAM (Tandy 1000 series requires 640K RAM); CGA, EGA, VGA, or Tandy 16-color; supports Ad Lib, Roland, and Sound Blaster—\$49.95**

**THE LEARNING COMPANY  
6493 Kaiser Dr.  
Fremont, CA 94555  
(800) 852-2255**

Circle Reader Service Number 301

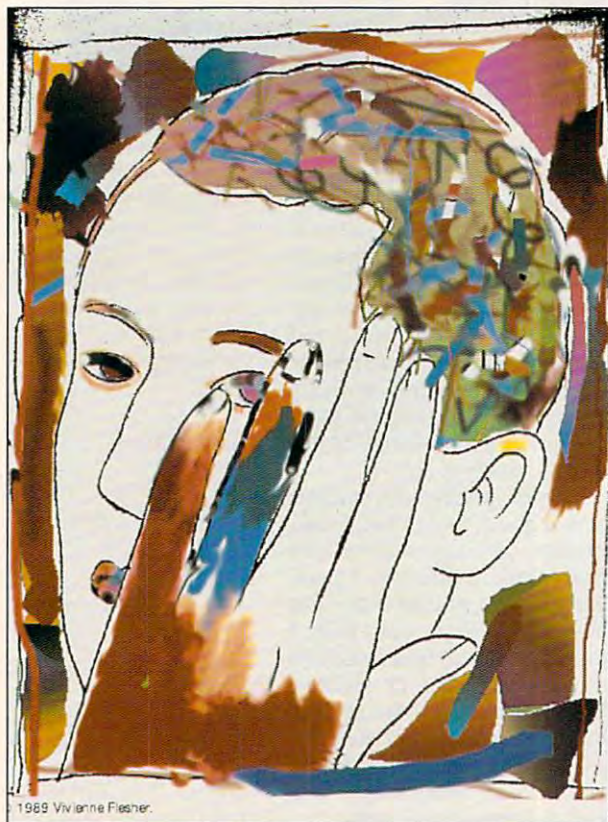
Steven Anzovin

## STATE OF THE ART

The rapprochement between IBM and Apple made big news a while back, and many observers believed that Apple got the best of that deal. But PC users, and especially PC artists, may be the biggest winners in this new world order.

One of the things that Macs have had for years now, and even Amigas are getting, is what's known as true color (also referred to by the number of bits it takes to describe the color of a pixel on the screen—for instance, 24-bit color). That's the ability to work with 16.7 million colors on the screen at the same time to create lifelike graphics and photorealistic images. True color makes standard 256-color VGA look like a cheap cartoon. Can you get true color out of a stock 386? Not with-

**Let your true colors come shining through. New PC graphics programs make the most of an almost infinite palette.**



© 1989 Vivianne Fleisher.

out spending \$1,000–\$2,000 on an adapter. How many PC programs can take advantage of true color? A handful, most in poky Windows versions.

But the least expensive color Macintosh, the Mac LC, is capable of putting 32,000 colors onscreen without any additional hardware (this is called high color by marketing types). A few high-color boards are appearing for the PC. And there are about 300 Mac programs that can handle true color with ease. Take painting programs, for example. King of the hill is Adobe PhotoShop (Adobe Systems, 1585 Charleston Road, P.O. Box 7900, Mountain View, California 94039; 415-961-4400; \$899.95), eventually to be available for suitably equipped PCs. PhotoShop, the program that wins the most popularity contests among Mac artists, can do prodigious feats of true-color photo retouching.

PhotoShop is not an inexpensive program. But if you think all Mac software is just as exorbitantly priced—and it often is—check out Expert Color Paint (available from TigerSoftware, 800 SW 37th Avenue, Coral Gables, Florida 33134; 800-666-2562, \$35). This true-color paint program has maybe 60 percent of Adobe PhotoShop's functionality for one-sixteenth the street price. Combine Expert Color Paint with a Mac LC, and you have a graphics workstation capable of high color that costs less than any equivalent 386 solution.

Lots of artists trained in paints, watercolors, and other traditional art media—it's probably accurate now to say old-fashioned art media—won't use computers for graphics work because paint program tools are too different from the brush and canvas they're used to. And who can blame them? Graphics programs are universally unable to take ad-

vantage of the fluid arm-hand-eye skills of a trained painter or draftsman. Now, a new Mac program called Painter from Fractal Designs (510 Lighthouse, Suite 5, Pacific Grove, California 93950; 408-655-8800; \$299) offers a pretty good simulation of traditional tools. You can choose a "paper" or "canvas" background for your paintings and then select from a variety of "brushes," "pastels," "crayons," and so on. As you paint, the brush actually gives the effect of being a real brush painting on real paper of a particular roughness and color. When you use a pressure-sensitive graphics tablet, Painter's brushes and chalks can even respond to delicate changes in pressure. A version of Painter has just been released for Windows.

The Mac even makes room for oddball efforts. A case in point is TextureSynth (from Pantechon, P.O. Box 738, Santa Cruz, California 95061; 408-427-1687; \$149), the most addictive graphics program I've ever seen for any machine. You guessed it—TextureSynth is a synthesizer for rolling your own custom textures for desktop publishing backgrounds, 3-D texture maps, and startup-screen wallpaper. It works much like a sound synthesizer—just change the settings on the control panel to make new visual textures, which appear in an image window. In true color, TextureSynth can generate thousands of different textures. Part of the pleasure of this program is getting completely lost in jungles of bizarre texture effects—waves of blue fur, maniacally busy vermilion stucco, or the pattern of sunlight glinting off lime Jell-O. I found using TextureSynth to be like a flashback to the Age of Aquarius. Maybe the IBM-Apple alliance will result in a new Summer of Love for PC artists. □

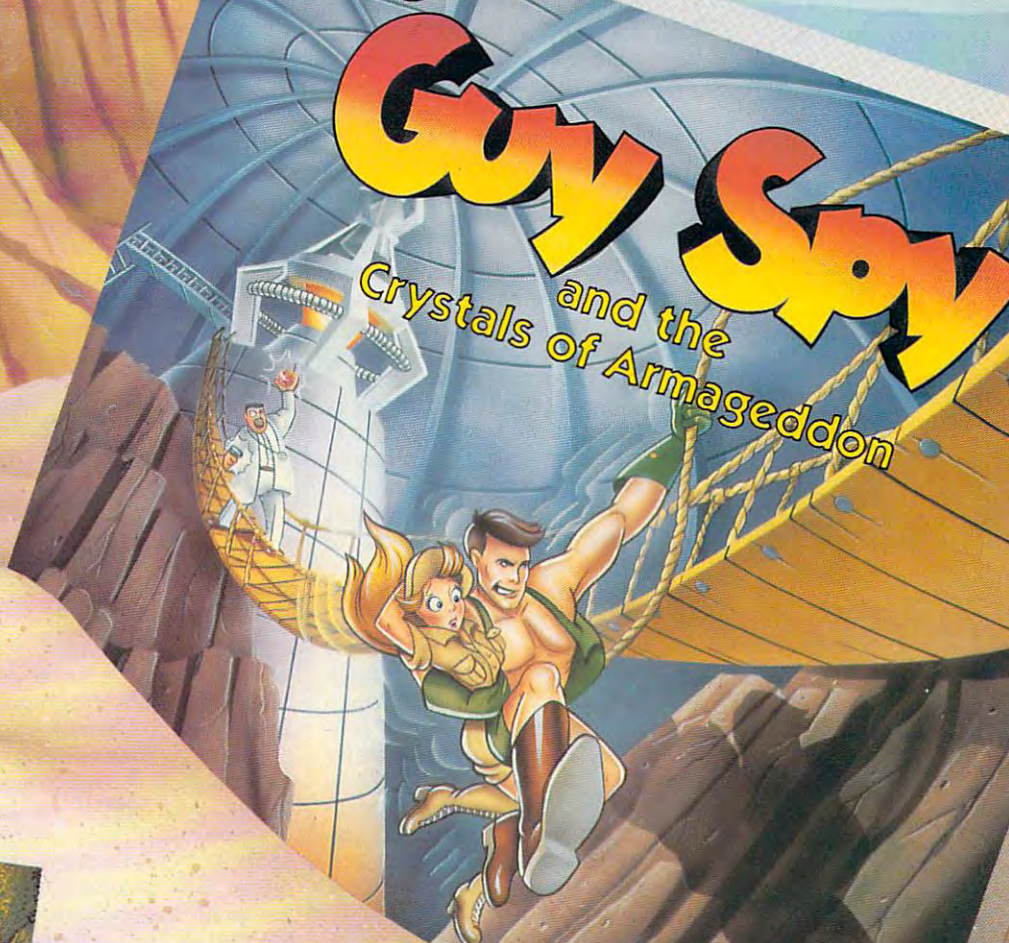


# Guy Spy™

## and the Crystals of Armageddon

# Guy Spy

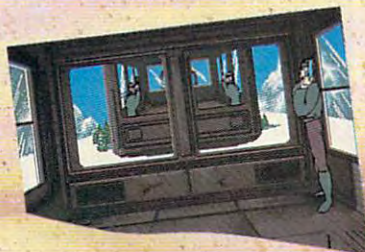
## and the Crystals of Armageddon



Guy Spy is a break-through in adventure gaming featuring full-screen animated characters that are completely under your control! With over 1,500 frames of animation, five megabytes of graphic data and original music and sound effects, Guy Spy sets a new standard in adventure gaming excellence.

As Guy Spy you are the government's most trusted and daring counter-espionage agent. Intelligence reports confirm the evil Baron Von Max has located the legendary Crystals of Armageddon. With the power of the crystals in the hands of this madman, Von Max will have everything he needs to fuel his ultimate weapon of mass-destruction... the doomsday machine.

You must chase Von Max and his henchmen around the globe in a desperate bid to save the world from his evil plans. If you fail, there is no telling what kind of destruction Von Max will unleash on the world. Your orders are simple: stop Von Max at any cost... before it's too late!



ReadySoft Incorporated  
30 Wertheim Court, Suite 2  
Richmond Hill, Ontario, Canada L4B 1B9  
Tel: (416) 731-4175 Fax: (416) 764-8867

Circle Reader Service Number 251

"Guy Spy" is a trademark of ReadySoft Inc. © 1995 ReadySoft Inc. ALL RIGHTS RESERVED. [www.commodore.ca](http://www.commodore.ca)

# ENTERTAINMENT CHOICE

*Fly the skies like never before with this powerful simulator.*

Peter Olafson

## FALCON 3.0

Consider, if you will, the hills of Falcon 3.0: gentle rises and falls, soft curves, slopes. From close up, you get the impression of a mild haze at the point where hill and sky collide, and from a height, you see the shadows that hills cast. Never before has there been a flight simulator that gives the ground such texture. It's of a piece—a fabric—and you can almost touch it.

Even the least experienced computer pilot knows that traditionally the hills and mountains in flight simulators barely have been hills at all. They've been pyramids, more or less, and despite the advances made in recent years, they're still pyramids. But Falcon 3.0 has changed that; in it there's not a pyramid in sight.

And the ground is simply one of a host of never-befores in Falcon 3.0, Spectrum HoloByte's next-generation, feature-packed flight simulator for the IBM and compatibles. If you aren't in the armed services (and perhaps even if you are), this is as close as you can come to flying the Falcon. And it's close.

This high-end, vastly expanded version of the simulator Spectrum released for the IBM and the Macintosh in late 1987 places you in control of a little more than your trusty F-16. You have a whole squadron of 18 fighters; a pool of pilots to fly them; three vast, detailed environments to fly them in; and an array of stunning enhancements.

Flying Falcon 3.0 on a fast machine is an utterly beguiling experience. Each outing begins with a near-full-motion video sequence (which can be toggled off) before a free-fall plummet into the cockpit (a de-



vised nod to F/A-Interceptor and its cousin Jetfighter series). Take off from a base in Saudi Arabia, Central America, or Israel. Then switch to an external view, flick on the autopilot, and watch as your wing men—at first pale blue shadows in the background—move into position. Watch them radio their reports (or listen to their digitized voices if your sound card has the right stuff), and issue as many as 12 different commands back to them. Once the fight is joined, you'll almost be able to smell their panic in a jam, their satisfaction with a victory.

It's a strange kind of role-playing—with a very personal edge—but I could get used to it in a hurry. On a heavily cached 33-MHz 486, Falcon 3.0 is smoother than smooth; it has an almost liquid flow. And when I hooked up the high-fidelity flight model for machines supplied with a math

coprocessor, well, the game just about took off.

Combat is a vivid, almost shocking experience. We're always reminded that this is war. Shot-down planes erupt in flames and leave little bits of themselves behind. Demolished tanks give up columns of smoke. Impacts on the surface give off circular shock waves that bring back memories of smart-bomb attacks in Iraq during Operation Desert Storm. And when you watch your plane go in, there's a tangible impression of impact.

On an escort mission over Central America, my wing leader was hit by a missile. I had little warning and no second chance. With the jet on fire and out of control, I switched to one of the external views and sat back to watch it go in. But I wasn't expecting what happened. POW! All I could see was fire and more fire. It felt as if someone had given

me a little psychic shove. But it didn't last: I wanted to watch my remaining wing man try to complete the mission—and see how the air strike went.

One of the real delights in Falcon 3.0 is the campaign game, in which your success or failure has a distinct impact on how the battle proceeds. (If the mission doesn't come off, the tank unit you attack will survive to fight another day.)

Flying is the heart and soul of Falcon 3.0, but there's a lot more, all easily reached via mouse from the War Room screen. It's definitely one of the most agreeable option screens around, too. Catch the looping video of combat footage in the tiny black-and-white screen in the corner. The War Room screen will transport you to elegant, simple screens for setting the realism level and system options. These are the Red Flag module, which is a combination trainer and mission-design utility; a replay mode with a VCR-style interface; and a communications screen for setting up same-side or opposing play via direct link, modem, or Novell-compatible local area network.

Suppose you don't want to bother with all this and just want to fly? You can. Remember that tiny black-and-white video screen? Click on it, and you bounce straight into the cockpit and fly almost arcadelike with an infinite supply of ammunition and some nice fat targets close by. There's even a high-score table to boost egos.

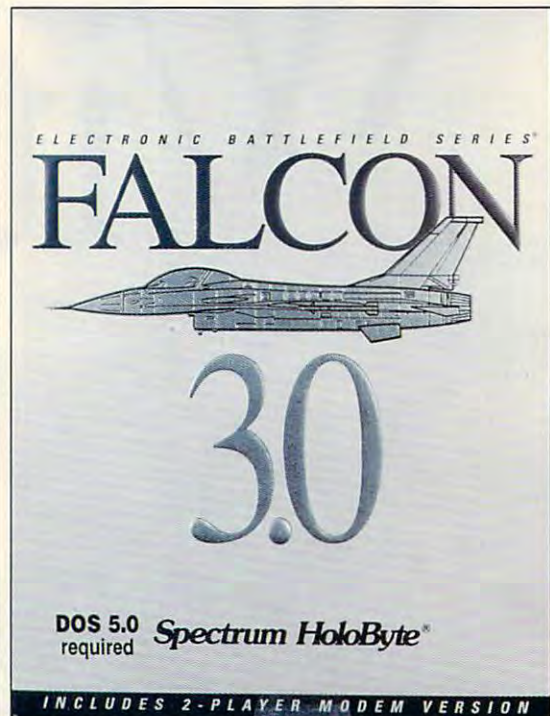
The manual is a book—342 clear and comprehensive pages. (Thank goodness for the index!) Anything I didn't understand initially about Falcon 3.0, I understood after a turn with this little doorstop.

Bear in mind that you'll need a lot of oomph in the specs department to accommodate all this good stuff. Falcon 3.0 is of a new breed of high-end games, and it's bound to leave some unhappy people coughing in its smoke.

For starters, it requires 614,400 bytes of free memory (and hence DOS 5.0 loaded in high memory) and 11MB on your hard disk. (If you can't cough up the former, the program comes with five batch files that will help you create the appropriate boot disk.) While it will run under that operating system on 12-MHz or faster 286 machines with 1MB of RAM and VGA, a 20-MHz 386 with 2MB is recommended. The program is designed for optimal performance on a 25-MHz or faster 386.

Now, Falcon 3.0 isn't without its problems. I've seen a good many complaints about bugs in the original December release. (I've been using upgrades almost since day one, so I haven't experienced any bugs firsthand.) But Spectrum HoloByte fairly flew into action to repair the problems. Within days of the program's release, patches began to appear on electronic bulletin boards. The most current version at this writing (late January) is 3.0A. It fixes keyboard-response problems that occurred on some machines; improves joystick calibration, the communications mode, and enemy artificial intelligence; fixes sound and Red Flag problems; and addresses a host of lesser snafus.

If I have complaints about Falcon 3.0A, they're about the little things that keep a great program from being perfect. Three theaters of conflict seem a mite small for a flight



sim of this size—especially since two of these scenarios (Panama and Israel) are strictly fictional. (The planned Operation: Flying Tiger Campaign disk adds Korea, Japan, and the Philippine theaters.) There's a handy quick-reference card, but a keyboard overlay with the 100-plus commands would've been even nicer. I'd also have liked an *Are you sure?* requester on the War Room screen to prevent accidental drops to DOS when brushing the Esc key. (And yet, when I want to quit, Falcon 3.0 drops to DOS more slowly than any other program I've ever seen.) But these are all minor when you consider the things Falcon 3.0 brings us.

Like those hills. Ah, yes—those beautiful hills. There's gold in those hills. □

Circle Reader Service Number 302

**IBM PC and compatibles (80286 or faster), 1MB RAM (2MB recommended with extended memory), DOS 5.0 or DR DOS 6.0, VGA, one floppy drive and one hard drive; supports Ad Lib, Sound Blaster, Roland MT-32, and LAPC/1—\$79.95**

**SPECTRUM HOLOBYTE  
2061 Challenger Dr.  
Alameda, CA 94501  
(800) 695-4263**

# Finally. A C With No



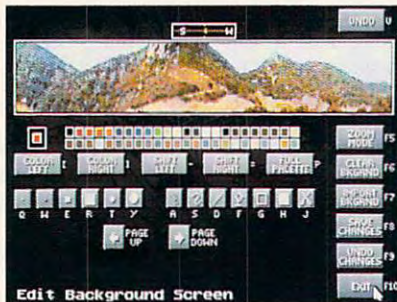
**Classic swing characteristics.**

The ideal swing for every club in the bag. Woods are hit with a full turn and the short irons with a smooth, three quarter backswing. From drives to chips to putts, every shot is textbook Nicklaus.

**Created by Jack Nicklaus.**

Voted Golfer of the Century. The preeminent course architect of our time. Signature™ is Nicklaus' third golf game and his crowning achievement on the computer. "It's the newest, most comprehensive game on the market."

**The only 256 Color VGA Course Designer on the market.** Another first from Nicklaus. The powerful 256 Color VGA Course Designer is the "magic wand of golf!" Create an unlimited number of golf courses in breathtaking color.



**Refine each hole with "Plot & Play."** Are the bunkers in unfair positions? Don't wait until your course design is completed to find out — play the hole instantly, while design is in progress, and feel out its playability.



**True-to-life ball flight.** Like real golf, club length and loft will determine trajectory and distance. A 2 iron will hit long and roll hot, a PW will fly high and land soft. And don't ignore Mother Nature. Wind and terrain can alter ball flight and bounce.



# Golf Game Handicap.

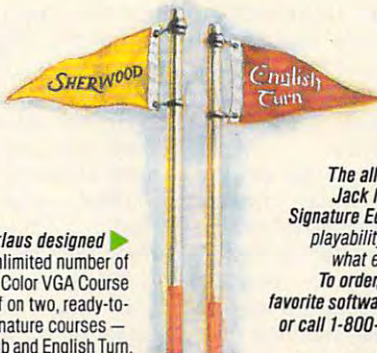


Jack Nicklaus' 256 color masterpiece. Feature rich, with five digitized golfer animations (including the Golden Bear himself); authentic tour statistics and up to five rounds of tournament play. Tee off with friends — or computerized opponents, whose abilities can be altered with the Player Editor.



**The fastest screen redraws.** Slow play is the bane of golf. Signature Edition™ solves that problem with fastest screen drawing speeds of any comparable golf game.

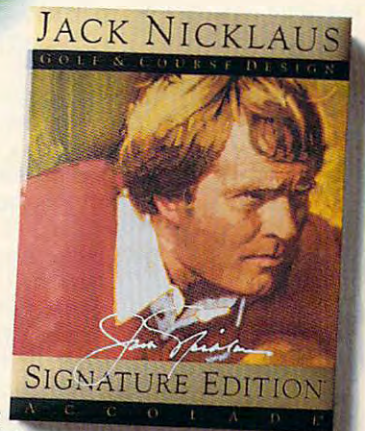
**Includes two Nicklaus designed courses.** Create an unlimited number of layouts with the 256 Color VGA Course Designer or tee off on two, ready-to-play Nicklaus signature courses — Sherwood Country Club and English Turn.



Compatible with Jack Nicklaus Unlimited Golf™. Existing courses created with Unlimited™ can be imported to the Signature Edition™.



Hear golf's greatest hits. Digitized sound effects add to the total wealth of realism. The unmistakable sound of a forged blade cutting the air. The perfect "click" of a club catching the sweet spot. It just doesn't get any better than this.



The all-new Jack Nicklaus Signature Edition™. Unprecedented realism combined with unmatched playability. Or in the language of the links, "dead solid perfect." But what else would you expect from Jack Nicklaus and Accolade? To order, visit your favorite software retailer or call 1-800-245-7744.

**ACCOLADE™**  
The best in entertainment software.™

Coming this fall for the Apple® Macintosh®

Circle Reader Service Number 146

# GAMEPLAY

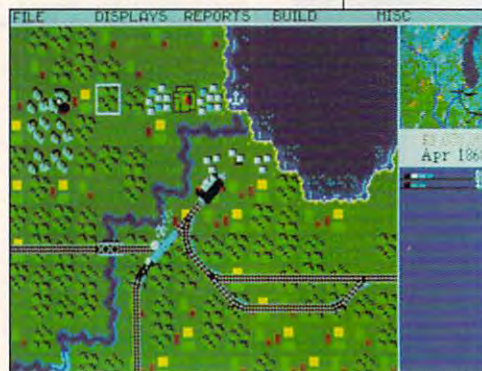
Orson Scott Card

## THE GRIPES OF WRATH

Every now and then, instead of dealing with one of the Grand Themes of the Art of Computer Game Design, I like to devote a column to gripes.

**Copy protection.** Copy protection is both annoying and necessary. Game theft really is a problem, especially when a game is new. And yet the schemes used to keep us from pirating are sometimes truly awful. Fortunately, the key-disk scheme seems to have van-

**Railroad Tycoon teaches you more than railroading. Even its copy-protection scheme is educational.**



ished, though in some games its vestiges linger.

I don't know whether Sierra On-Line has stopped having its games check for a change in location on the hard disk. (If there is a change, the game will assume it has been illegally copied and won't run.) The reason I don't know is that after I had a hard disk crash and couldn't reinstall any of my Sierra games without sending for new disks, I decided to forget it. I haven't installed a Sierra game since.

The schemes that depend on reading complex codes in black ink on purplish brown paper are both ineffective and annoying. My Xerox copies of the code sheets are actually more readable than the originals, which proves that the scheme is useless. Photocopy-

ing code sheets is as easy as copying a game program.

Code wheels make me crazy. I can never find them, since I always put them away in a place where I'll be sure to find them next time, but it's never the same place twice.

The best copy-protection scheme is low price, of course. That's why people don't photocopy my novels—the copy costs would be greater than the cost of a new book off the shelf. But the next best scheme is the one that Railroad Tycoon uses. The game makes you identify a picture of

a locomotive and pick its name from a list. At first this requires you to have the thick manual with you whenever you play. But the more you play it, the more familiar you become with all the locomotives so that, eventual-

ly, you can get past the copy-protection test without the manual. What a great idea! When you become really familiar with the game, you can *earn* the right to get rid of the code sheet because the code is real information that you learn by playing the game.

**Startup screens.** OK, when you first play a game, it's nice to get that logo identification and enhance the name recognition of the publisher. But the 50th time you play the game, waiting to get rid of the publisher's logo can be so maddening that you begin to associate that publisher's name with deep feelings of loathing. And no title screen is so pretty that you want to see it again and again (and again).

Of course, the worst offender in this regard is Microsoft

with its infuriating Windows startup logo display. Good thing the company didn't do that with MS-DOS in the first place, or we'd all be using Macs by now.

This applies also to repetitive messages that display for a fixed length of time. When you know what the message is going to be, why must it stay on the screen for seconds? Going from level to level in Rattler Race, for instance, always involves an annoying wait.

And please! Enough with requiring us to respond with meaningless clicks in Windows games. Why is it that at the beginning of every Tetris for Windows game I must click on OK to prove I've read the title screen? Having to do this is as bad as getting the endless Prodigy messages that require me to press Esc in order to get on with whatever I'm trying to do.

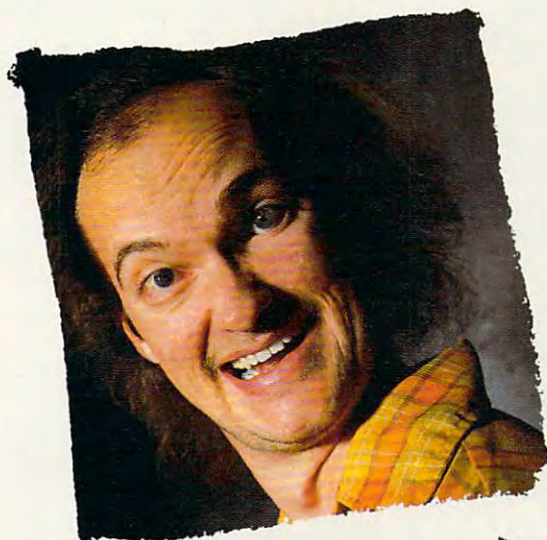
**Option shortages.** Is it laziness, or is there a Philosophy of Limited Choices that I haven't heard about? I can't understand why Tetris for Windows, for instance, doesn't allow you to clear the vanity board without reinstalling the game. (The secret: When you first install the game, copy the file TETRIS.HST to a file named something like TETORIG.HST. Then when you want to clear the vanity board, copy TETORIG.HST back on top of TETRIS.HST, and you'll have the original clean board again.) Fortunately, Super Tetris solved this problem.

Why is it that some games still don't give you the option of loading a saved game from inside the program, instead of making you go back and start the whole game over again?

Let me just point out that I never get this annoyed with games that I'm not playing over and over again. I only gripe about games I love. I want to like them better! □



THIS OPPONENT IS PROGRAMMED  
TO BE CHALLENGING.



this one wants to rip your  
lungs out.

If you think you're good at games, then let's have some real fun. When you're online with GENie® Multi-Player Games, you're playing real people, in real time. Some of the best players around the world. □ Splash a bandit in Air Warrior®, and you've just taken out eight other guys, who'll be back gunning for you. Blast a MechWarrior® in MultiPlayer BattleTech™, and who knows? Could be that jerk from the coast. Could be a mercenary who's looking for a few good friends. □ With GENie, the possibilities are endless, the

people are terrific, and even the prices are competitive. So put some new life into your joystick, and sign on. We'll see just how good you are. □ Sign up now: 1. Set your modem for half duplex (local echo) at 300, 1200 or 2400 baud. 2. Dial toll free — 1-800-638-8369. Upon connection, enter HHH 3. At the U # = prompt, enter XTX99315, Kesmai92 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.



AIR WARRIOR®



MULTIPLAYER BATTLETECH™



STELLAR EMPEROR™

GENie®  
multi-player games

100% ORGANIC OPPONENTS



Air Warrior is a registered trademark and Stellar Emperor is a trademark of Kesmai Corporation. MultiPlayer BattleTech is a trademark and MechWarrior and BattleTech are registered trademarks of FASA Corporation.

Circle Reader Service Number 157

[www.commodore.ca](http://www.commodore.ca)





THE WHOLE WORLD IN A PC: SIMULATION SOFTWARE PUSHES THE COMPUTER TO ITS LIMITS—AND THEN REMOVES THE LIMITS.

# SIMEVERYTHING

BY GREGG KEIZER

**D**ecaying cities or humanity's march through time. Click. Crowded ant tunnels or the emptiness of the solar system. Click, click. Military machines or billion-dollar space-ships. Click, click, click.

Your computer's keyboard is the ultimate remote control. It lets you change the channels on your PC as you mesmerize yourself with a seemingly unlimited number of opportunities for learning and fun. Personal computers model an amazing number of situations and scenarios, mimicking the real world while keeping it safely at arm's length. The dirt, danger, violence, and complexity that make the world so untidy can be distilled into an onscreen representation that—if all goes right—*seems* like reality.

Simulations have been around a lot longer than the computer on your desktop, of course. They didn't just spring up like Athena from the brow of Zeus. Over a hundred years ago, German generals worked through *kriegsspiels*, or war games, to plan campaigns and fine-tune strategies. In this century, universities modeled businesses with pencil and paper, while fledgling pilots tested their wings in crude flight trainers that were pitched and rolled by men standing outside the simulated cockpit.

However, simulations and games based on simulations have proved to be one of the most explosive areas of growth in PC software, seemingly independent of recession or boom and bust in the rest of the computer and software market. The PC's high power and low price have made mimicry on such a scale possible.

In the real world, simulations do everything from predicting hurricanes to helping physicists puzzle out the earliest moments of the universe. Simulations are no less diverse in the world of electronic entertainment.

Sid Meier's *Civilization* walks you through the history of a world you've never known. Starting with a band of nomads searching for a place to settle down, you guide your people in a race for knowledge, power, technology, and territory. *Civilization* has all the trappings of a simulation—decisions, realistic environment, and interlocking complexity—but it's as much a game as anything. That doesn't matter, because in PC simulations the end almost always justifies the means. And *Civilization* ends right, leaving you with the feeling that you've just witnessed the development of a people in the process of forming a dynamic (and sometimes extremely dangerous) culture.

SimAnt is a simulation on a microscopic scale. With a fairly firm foot in science, SimAnt sends you back in time—to about 1955—when every boy had a plastic ant farm.

Tunnels fill with ants and ant eggs. Enemies battle it out for turf on a *Honey, I Shrunk the Kids*-sized stage, and a house awaits the inevitable invasion of the black ants you control. SimAnt is a truer simulation, in that it lets you run things you have no real business running. Real ants may do little more than carom off each other, or worse, curl up into tiny commas and die, but the electronic ants in SimAnt do your bidding every time.

Falcon 3.0, a mechanical simulation, is even more traditional in its approach. Where Civilization compresses centuries and SimAnt expands tiny insects, Falcon 3.0 condenses intricate machinery worth millions of dollars into something civilians can play with. Packed with a mind-boggling array of simulated controls, Falcon 3.0 lets you fly an F-16 jet fighter against enemy aircraft in a missile-launching, radar-tracking, electronic-warfare feeding frenzy. Easily one of the most comprehensive and complicated simulations around, Falcon 3.0 also taxes the hardware like few others: If you don't have at least a 20-MHz 386 with a couple of megabytes of RAM, don't bother showing up.

A home PC brute of two years ago—a 12-MHz 286 computer with VGA, maybe a 40MB hard disk—simply can't cut it with today's top simulations. To run at full speed, simulations demand a fast PC, preferably a 486 or a 386 with a math coprocessor chip. Simulations test the PC like few other packages—databases, spreadsheets, Windows, and CAD software included.

Future simulations will undoubtedly demand more than today's PC can provide. "It's hard to see how you could simulate the earth in a much more realistic model [than SimEarth] and still stay on the PC," says Tom Ligon, president of ARC Software and the creator of Dance of the Planets, a majestic solar-system simulator. "In a way, its gameness reflects the fact that the technology is limited."

In two years, 486-equipped computers will be as common in the house as 386SX machines are now. The power hungry will run chips like Intel's 80586, or perhaps a superfast RISC chip.

### Sim It All

"You can simulate anything," says SimCity and SimEarth creator Will Wright. "[It's] a matter of semantics. But as we come to understand a system, we're beginning to understand the processes of a system."

### MAN THE RAMPARTS! THE BARBARIANS ARE HERE!

Is the personal computer the only place to play with these imitations of reality? Can the PC lay sole claim to simulations? Hardly.

Though PCs have long cornered the simulation market, threats from the barbarians of electronic entertainment—videogame machines—may soon break that stranglehold. SimCity, one of the most highly acclaimed simulations of the last five years, is now available on the Super Nintendo Entertainment System (SNES), Nintendo's 16-bit game machine. Falcon, a video derivative of Falcon 3.0, is also available on the SNES. Railroad Tycoon, the railroad empire-building simulation, will be soon. And Koei, a maker of Japanese, Chinese, and European political and military simulations, has long produced versions for the cruder 8-bit Nintendo game deck.

The appeal of videogame systems lies in their low cost and ease of use. For a tenth of the price of a personal computer and with virtually no installation or compatibility headaches, videogame machines let you play from the comfort of the den couch or the living room carpet.

With such advanced (and faster) videogame systems as the Sega Genesis and the SNES, and with larger-capacity game cartridges—some that sport several megabits of chip memory—simulations can now be played on the television, not just the computer screen.

"It's actually a combination of marketing and technology," says Will Wright. "A lot of the higher-end systems are being sold to 20-year-olds," a population typically more interested in simulations, while younger players have been the traditional market for videogame machines.

PCs have the sim market pretty much to themselves—today. In the not-so-distant future, though, they'll be forced to share the simulation spotlight.

Near-future desktop PC simulations will take on the task of simulating a larger number of such systems—whether natural or manmade—as well as explore their hidden processes in a deeper, richer way.

At the Winter Consumer Electronics Show in Las Vegas, where designers strutted their latest stuff, several simulations stood out as ones to watch in 1992. Dynamix, the Oregon arm of Sierra and creator of Red Baron, a World War I air-combat simulator, has taken its flight-modeling and graphics techniques to the Second World War in Aces of the Pacific. Flying any of over two dozen Japanese and American aircraft, you battle from carriers and land-based airfields, re-creating historical missions—including the dramatic assassination raid that downed Admiral Yamamoto—and try to survive through brutal aerial campaigns.

Electronic Arts' as-yet-tentatively-titled Michael Jordan's Flight Simulator takes a page from simulations as it reproduces the grace of professional basketball with a three-dimensional perspective that will leave you awe-struck. Some may call it a sports game, but many will see it as the simulator it really is.

Interplay's Buzz Aldrin's Race into Space lets you guide the American or Russian space program in a two-decade dash to the moon. Using more than a hint of multimedia, Race into Space asks you to make decisions on rocket development, astronaut selection, and mission control. For those of us who grew up watching rockets rise into the Florida sky, this simulation promises a nostalgic look at the past and an intriguing what-if construction kit.

### Two on the Edge

"I'd really like to see software like Dance of the Planets that goes outside, something that's not self-contained, that doesn't go away when you turn off the PC," says Tom Ligon.

What Ligon dreams of—a simulation that continues to intrigue its users long after the screen goes dark—is but one example of how designers look at their craft and where they'd like to take desktop simulations.

"Two areas that appeal to me a lot are simulating space missions and neural networks," Ligon muses. "You'd learn a lot about neural networks and train them, but it wouldn't be a game. And I'd like to deal with the earth, even down to earth science or life science. It would take a lot of creativity to make something that has merit yet can run on the PC, but I think it's worth doing."

Will Wright wants to delve even deeper into evolutionary and biological simulations, past the premise of SimEarth. "I find myself repeatedly attracted to evolution. Number one, because of the result and number two, because of the application to other tasks. The techniques could be harnessed to make your software evolve, for example, and I find myself pushing toward education—getting people excited about things, experimenting and exploring on their own."

And what of the charms of multimedia and videogames being applied to simulations? Wright thinks that videogame simulations are an attractive possibility, now that "the hardware is finally in place." Multimedia, says Ligon, may be a different story. "I don't think that's going to be competitive in the next five years because of the initial [development] expense."

Maybe neither is necessary to shift simulations into high gear. When you can simulate nearly everything now, why wait for the future? □

# 64/128 VIEW

*Gazette needs 64 and 128 programs every month. If you are a programmer, here are some tips that can help you make a sale.*

Tom Netsel

**G**azette wants to buy your 64 and 128 programs. Sell just one program, and you can easily recoup the cost of your entire computer system.

We rely on our readers for the programs we need each month to fill Gazette and Gazette Disk. Here are some tips on what we want and ways to make it easier for you to make a sale.

Send your program and documentation on a disk. Save each twice, in case one gets damaged. Send a printout of your documentation and a short cover letter explaining what your program does and how to run it. Enclose a daytime telephone number. Don't send a printout of your program listing. Send postage if you want your material returned.

To increase your chances of making a sale, do all you can to make it easy for us to use and understand your program. I've rejected programs because authors have made my job tougher.

Here's what we like to see in a submission. First of all, use the correct address. Don't delay things by writing to a post office box number we haven't used in years. Send programs to Gazette Submissions Reviewer, COMPUTE, 324 West Wendover Avenue, Suite 200, Greensboro, North Carolina 27408.

Deadlines, interruptions, and weak coffee can put me in a bad mood at submission meetings. Imagine that I've a stack of programs to get through, and I've just opened yours. You've got 60 seconds to impress me.

You'll be off to a good start with that note that explains what your program

does and how to run it. If there are numerous files, backups, and demos on your disk, I can get very annoyed deciphering cryptic filenames, trying to decide which file to load first.

If we've had your package open for more than a minute and we still don't know what it's supposed to do, we'll do one of two things. We'll either reject the program outright or toss it back in the pile until next month. In the latter case, we don't totally reject it, but we're not jumping to buy it either. This bumping process can go on for months.

With your letter, send a printout of your documentation. Here's where you can really boost your chances for a sale. Write in the style we use in the magazine! Explain what your program does, why it might be useful or entertaining, and whether it's in BASIC or machine language. Then explain how to use the program. Many authors fail to do this.

It's very important that you send documentation on disk as well as paper. Save it as a PETSCII, ASCII, or SpeedScript-compatible file. DO NOT USE GEOS! I load your documentation into my 128, edit it, convert it to ASCII, and upload it to an IBM for additional editing and typesetting. Retyping your documentation wastes time. If I have a program whose instructions need minor editing and one that requires hours of work, guess which one I'll buy?

Finally, tell us about yourself: your occupation, age, hobbies, and so on. We like to publish a little information about our authors. □

## GAZETTE

### 64/128 VIEW

G-1

If you send a game or utility to Gazette, follow these tips to boost your chances for a sale.  
By Tom Netsel.

### FEEDBACK

G-2

Questions and comments from our readers.

### RELATIVELY SIMPLE

G-6

Many programmers shy away from using relative files, but let's take another look at these black sheep of the file family.  
By Jayson Johnson.

### REVIEWS

G-12

Tie Break, Calc II, and Bad Blood.

### BEGINNER BASIC

G-18

Turn keyboard characters into movable sprites.  
By Larry Cotton.

### MACHINE LANGUAGE

G-20

Use a rotating buffer to determine a program's starting address and more.  
By Jim Butterfield.

### WORLD VIEW

G-21

Czechoslovakia loves its Commies, but politics has nothing to do with it.  
By Emil Heyrovsky.

### GEOS

G-22

GEOS graphics require a good management system.  
By Steve Vander Ark.

### PROGRAMMER'S PAGE

G-24

Here's a handy list of POKEs, WAITs, and SYS calls.  
By Randy Thompson.

### PROGRAMS

File Logger	G-25
Demo Maker	G-26
F/X Plot 128	G-30
Sprint III	G-33
Pad Design	G-38

## Address Correction

In "Commodore Clips" (February/March 1992) we listed the wrong post office box number for Clip Art Cupboard. The correct address is P.O. Box 317774, Cincinnati, Ohio 45231. We regret the error.

## Amortization Table

I have been trying in vain to get hold of a program that will list amortization tables with an option of payments every two weeks. Can anyone help me?

MARGIT DES LAURIERS  
SANDSPIT, BC  
CANADA

In the May issue, Larry Cotton presented an amortization program in his "Beginner BASIC" column that displays payments on a monthly or yearly basis. For payments other than monthly, however, you might try the following program. It asks for the amount borrowed and the number of payments per year. If you wish to make payments every two weeks, enter 26 at the second prompt. It will then request the annual interest rate and the duration of the loan in years.

The program will calculate the payment you must make for each period and then print a table showing the breakdown of interest and principal on each payment and the remaining balance. At the end of a year, it will print a total of the principal and interest paid. The program will pause and wait for you to press any key before printing the next year's schedule of payments.

```
RM 50 K$="PRESS ANY KEY
      {SPACE}TO CONTINUE
      "
GR 100 PRINT"{CLR}
SE 110 DEF FNA(X)=INT(X*
      100+.5)/100
BJ 120 INPUT"AMOUNT BORR
      OWED";E
MB 130 INPUT"NUMBER OF P
```

```
      AYPMENTS PER YEAR"
      ;N
AM 140 INPUT"ANNUAL INTE
      REST RATE";I:I=I/
      100
AB 150 INPUT"DURATION IN
      YEARS";D
CQ 160 R=(I*E/N)/(1-1/(I
      /N+1)↑(N*D))
AC 170 PRINT
JX 180 PRINT"YOUR PERIOD
      IC PAYMENT WILL B
      E $";FNA(R)
BE 190 PRINTK$
QX 195 GET W$:IF W$=""TH
      EN 195
HD 200 PRINT
AF 210 AT=0:A2=0:EN=E:RT
      =0:IT=0:B=0:D1=N
KJ 220 IF INT(D)>=1THEN2
      40
AJ 230 B=B+1
JD 240 FORB=1TO INT(D)
RK 250 PRINT CHR$(147)"
      {DOWN}AMORTIZATIO
      N SCHEDULE";TAB(2
      5);" YEAR #";B
PF 260 PRINT:PRINT" # "TA
      B(5)" INTEREST "TAB
      (17)" PRINCIPAL";
JK 270 PRINT TAB(31)"BAL
      ANCE":PRINT
PM 280 FORB=1TOD1
JA 290 IV=FNA(EN)*I/N
CJ 300 RT=RT+1:A=R-IV:AT
      =AT+A:EN=E-AT
FS 310 IFRT<N*DTHEN330
DX 320 R=R+EN:A=A+EN:AT=
      AT+EN:EN=0
HE 330 I2=I2+IV:IT=IT+IV
      :A2=A2+A
AJ 340 A2=INT(A2*100+.5)
      /100
MX 350 PRINTB1;TAB(4);FN
      A(IV);TAB(16);FNA
      (A);
XQ 360 PRINT TAB(30);FNA
      (EN)
KK 370 NEXT
FD 380 IF RT<>N*DTHEN400
SF 390 PRINT:PRINT"LAST
      {SPACE}PAYMENT";F
      NA(R):PRINT
RP 400 PRINT:PRINT"FOR T
      HE CURRENT YEAR Y
      OU PAID"
DB 410 PRINT"$";FNA(IT);
      "IN INTEREST "
HH 420 PRINT"AND $";FNA(
      A2);"IN PRINCIPAL
      "
FP 430 IF B=D OR B>D THE
      N 540
CM 440 PRINT:PRINTK$
SF 450 GET W$:IF W$=""TH
      EN 450
SP 460 PRINTCHR$(147)
KG 470 IT=0:A2=0
PA 480 NEXT
BM 490 B=B-1
FP 500 IF D=BTHEN540
HR 510 D1=((D-INT(D))*12*
      N)/12*N
CM 520 B=B+1
RF 530 GOTO 250
GP 540 PRINTK$
ER 550 GET W$:IF W$=""TH
      EN 550
EK 560 END
```

## Genealogy Programs

I am looking for a family tree program for my 64. Can you help?

FREDERICK J. CARLETON  
METAIRIE, LA

We published "Climbing Your Family Tree" in the February 1991 issue of COMPUTE in which the author described several programs available for the 64 that let users enter family data. You might want to contact the following companies about their genealogy programs. Here's a list of the ones mentioned in the article.

Family—\$34.95

PFA  
8600 Old Spanish Tr., Ste. 79  
Tucson, AZ 85710  
(800) 366-1372

PED C and FGS—\$39.95  
BYTEWARE  
906 West 6th Ave.  
Monmouth, IL 61462  
(309) 734-7096

Arbor-Aide—\$34.95  
SOFTWARE SOLUTIONS  
7378 Zurawski Ct.  
Custer, WI 54423  
(715) 592-3594

Family Roots—\$225.00  
QUINSEPT  
P.O. Box 216  
Lexington, MA 02173  
(800) 637-7668

## Keyboard Wanted

The time has come for me to locate a new detached keyboard for my 128D. Perhaps one of your readers may have one for sale.

STEPHEN VAN EGMOND  
360 FRONT RD.  
LASALLE, ON  
CANADA N9J 1Z5

Questions  
and answers about  
amortization  
tables, genealogy  
programs  
for the 64/128,  
and more