

Trivia Contest  
Winners Inside!

July 1985  
USA \$2.95/Canada \$3.95  
A CWC/I Publication

# Incider

The Apple II Journal

## VOICE RECOGNITION:

*The Ultimate Interface?*

### MORE APPLE CONNECTIONS:

■ Do-It-Yourself  
Analog to Digital  
Conversion

■ The //c's Serial  
Ports at Your  
Command

■ EDITORS'  
CHOICE:  
Mouse-Driven  
Word Processor

Get Car-Buying  
Advice from Your  
Computer!

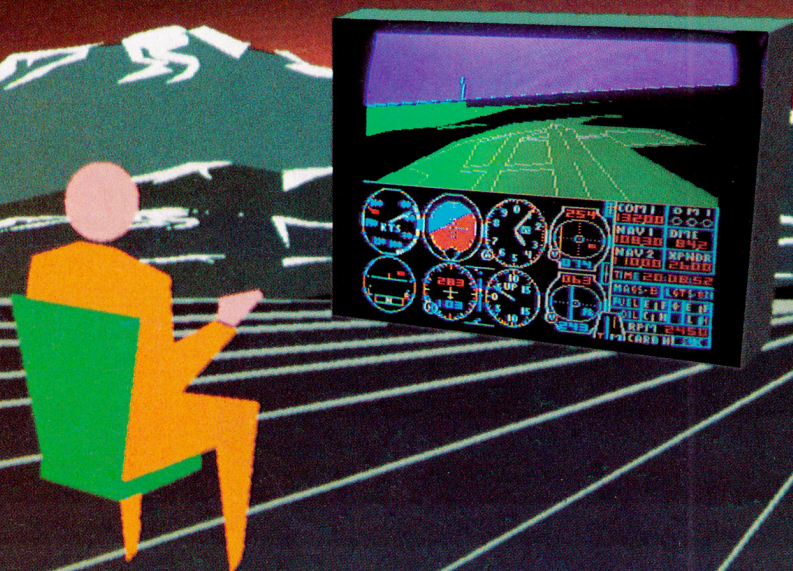
Could you  
run that by  
me again?





# Flight Simulator II

For Apple II+,  
Apple IIe, & Apple IIc



Put yourself in the pilot's seat of a Piper 181 Cherokee Archer for an awe-inspiring flight over realistic scenery from New York to Los Angeles. High speed color-filled 3D graphics will give you a beautiful panoramic view as you practice takeoffs, landings, and aerobatics. Complete documentation will get you airborne quickly even if you've never flown before. When you think you're ready, you can play the World War I Ace aerial battle game. Flight Simulator II features include ■ animated color 3D graphics ■ day, dusk, and night flying modes ■ over 80 airports in four scenery areas: New York, Chicago, Los Angeles, Seattle, with additional scenery areas available ■ user-variable weather, from clear blue skies to grey cloudy conditions ■ complete flight instrumentation ■ VOR, ILS, ADF, and DME radio equipped ■ navigation facilities and course plotting ■ World War I Ace aerial battle game ■ complete information manual and flight handbook.

**See your dealer . . .**

or write or call for more information. For direct orders enclose \$49.95 plus \$2.00 for shipping and specify UPS or first class mail delivery. American Express, Diner's Club, MasterCard, and Visa accepted.

**Order Line: 800 / 637-4983**

**subLOGIC**  
Corporation  
713 Edgebrook Drive  
Champaign IL 61820  
(217) 359-8482 Telex: 206995



# AST's into Apples!

**Printer  
Serial Port** →

**Terminal/  
Modem  
Serial Port** →

**Clock  
Calendar** →

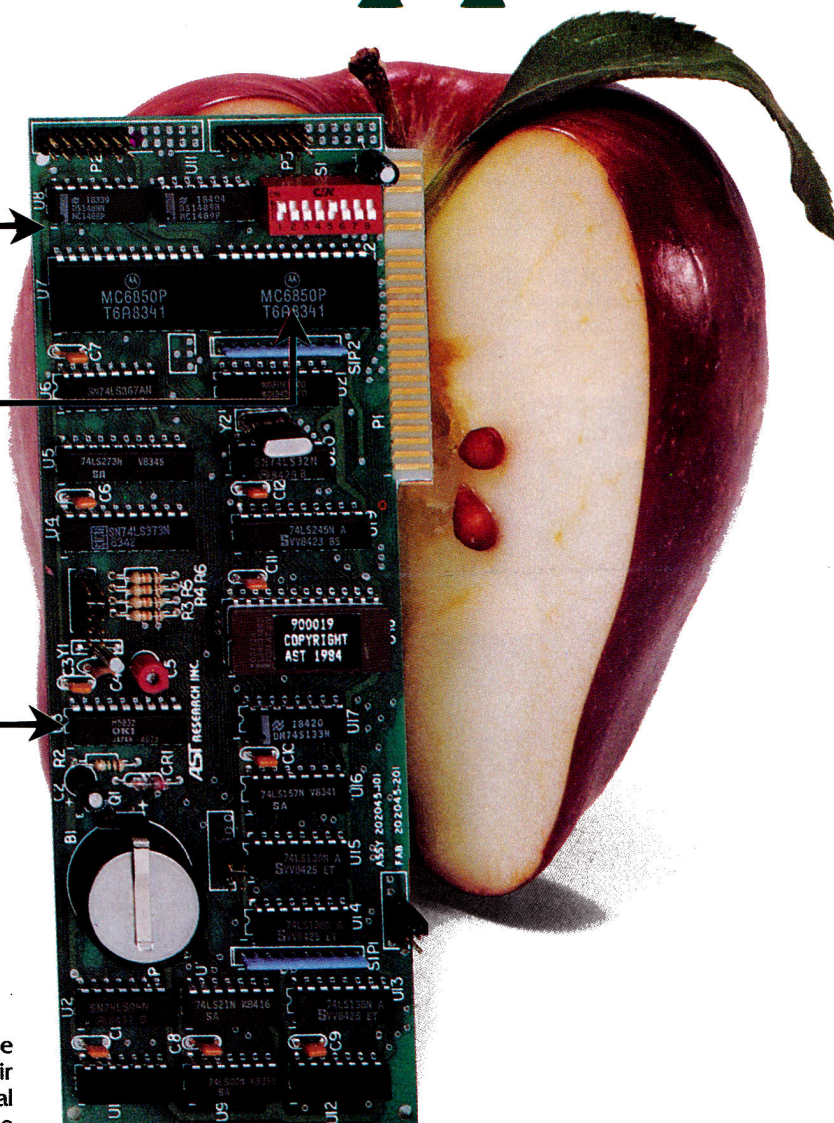
At AST, we are consistently thinking of ways to provide our dealers with the type of products they know their customers need to get the most out of their personal computer. We set the standard with SixPakPlus™ for the IBM PC and now we are striving to do the same thing for Apple computers.

Introducing Multi I/O™, the most comprehensive enhancement board available to fill the slots of an Apple IIe.™ Multi I/O provides a printer serial port, a terminal/modem serial port, and a ProDOS™-compatible clock/calendar with battery backup all on a single card!

The printer serial port provides the ability to access letter quality printers. Using the terminal/modem serial port your customers can communicate with each other via a telephone modem or hook up another terminal. And no matter how your customers use their Apple IIe, the clock/calendar is silently ticking away, providing them with the accurate date and time, even when the computer is turned off.

Interested? Wait, there's more. We'll help you sell our products by providing you with a complete marketing package to make your job easier and more effective. We'll support you with our advertising campaigns in all the popular consumer publications. ASTips™, our monthly newsletter will help to keep you up-to-date with current market news, technical tips, and other important AST happenings. We'll also provide you with point-of-purchase and promotional materials to supplement your merchandising programs. And if you decide you'd like some additional training, there's our in-house training center with seminars every week which we encourage our dealers to attend.

So there you have it, another innovative product from AST. We've set the standard once, and we'll do it again by providing you with the type of quality product your customers require. Then we'll go one step further to support your sales efforts by providing you with additional tools to help you sell successfully. Call your AST retail sales representative today.



**AST**  
RESEARCH INC.

2121 Alton Avenue, Irvine, California 92714  
Telephone (714) 863-1333 Telex 753699 ASTR UR



# Grappler<sup>®</sup> Graphics Relax! It's Easy

Whether you're looking for sunken treasure, or graphing your business sales, you must have effective graphics tools. And when it's time to print your results, you need to get what's on your screen off your screen. Enter the Grappler printer interface. Quick, easy and effective.

## THE GRAPPLER IS YOUR HIDDEN TREASURE

We all know that a picture tells a thousand words, so your graphics are your most important printouts. With the Grappler, graphics printing is a snap. A few quick and easy keystrokes, and your Hi-Res image is promptly reproduced on just about any printer you care to name. Depending on which keys you hit, your graphics can be

printed enlarged, enhanced, inverted, rotated, and ... well, the message here is flexibility.

## A GRAPPLER DESIGNED FOR YOU

To date Orange Micro has sold over 255,000 Grapplers, so you know you're in experienced hands. There are Grapplers available for many popular micros, including parallel and serial models for the Apple IIe, a new version for the Apple IIc and an advanced Commodore 64 interface. Most Grapplers offer buffering or other valuable options. All come with the "Seldom Used 1 Year Warranty." There's a Grappler for virtually every application, so remember to ask for it by name when you purchase your printer interface. You'll be glad you did. Graphics printing has never been so easy.

**Grappler<sup>®</sup>**  **Orange Micro<sup>®</sup>**  
Inc.

1400 N. Lakeview Ave., Anaheim, CA 92807 • (714) 779-2772 • TELEX: 5101001014



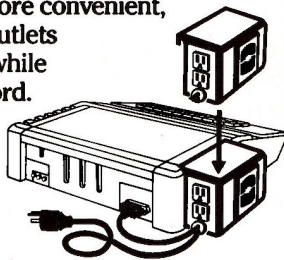


# CLOSE TO 1/4 MILLION APPLE II's SAVED

**SYSTEM SAVER®** from Kensington Microware quietly protects close to 1/4 million Apple® II's every day. Often referred to as "the piece Apple forgot," System Saver's unique combination of features have made it the most versatile, most convenient, best selling accessory ever made for the Apple.

## **System Saver organizes your power needs.**

To make your Apple system more convenient, System Saver provides extra outlets for your monitor and printer, while replacing the Apple's power cord. One front-mounted power switch controls your whole system.



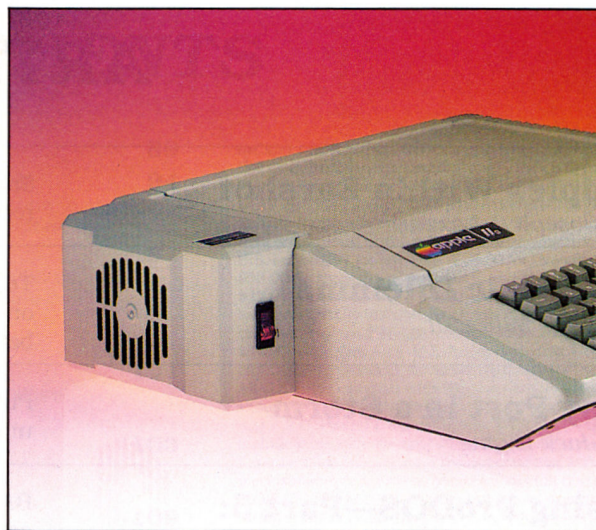
## **System Saver solves power line problems.**

Impurities in the power supply cause 70-90% of all microcomputer malfunctions. Line noise can be interpreted as data, confusing your Apple and causing annoying system errors. Power surges and spikes can do costly damage to your computer's delicate circuitry.

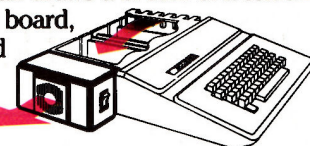
System Saver clips surges and spikes at a safe level and filters out line noise. It makes your Apple more accurate, more efficient and more reliable.

## **System Saver keeps your Apple cool.**

Peripheral cards added to your Apple not only generate heat, they block any natural air flow through the computer. The resulting high temperature conditions can potentially shorten the lives of both your Apple and your peripheral cards.



System Saver's quiet fan draws a breath of fresh air across the Apple's mother board, over the power supply and out the side ventilation slots at the rate of 17 cubic feet per minute.



Close to 1/4 million Apple owners think of System Saver as the piece Apple forgot. And 1/4 million well-protected Apples agree. Available at your local dealer. For more information, contact Kensington Microware, 251 Park Avenue South, NY, NY 10010, (212) 475-5200. Telex: 467383 KML NY.

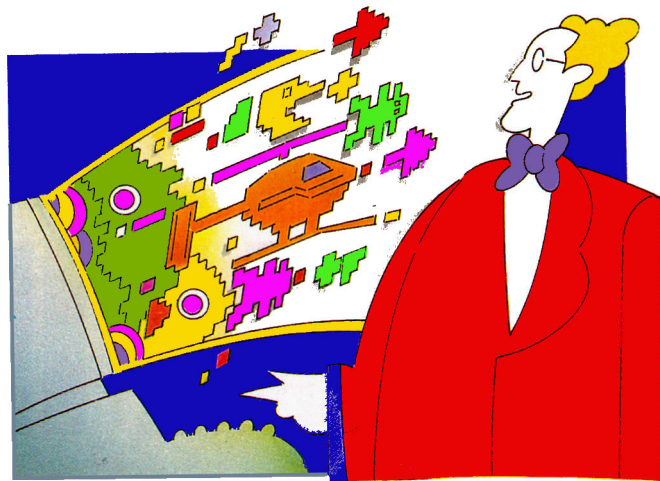




# inCider



13



97

## ARTICLES

---

### Apples Within Earshot

by Joseph J. Lazzaro

Speak up—your Apple's listening, thanks to voice-recognition technology.

14

---

### A Classic Dilemma

by W.M. Miller, Jr.

Torn between buying a new car and keeping the old one? Should I Trade? can help you sort out the facts before you head for the local car dealership.

20

---

### Any Port in a Storm

by Jack Higbie

Put your //c in the driver's seat with a simple technique that configures its serial ports.

28

---

### Using ProDOS—Part 5: The ProDOS-BASIC Connection

by Lee Swoboda

BASICally, convert your DOS 3.3 programs and discover the ProDOS advantage.

41

---

### Everything Is Under CONTROL

by Jerry Faughn

With an analog-to-digital converter, let your Apple master a variety of high-tech peripherals.

49

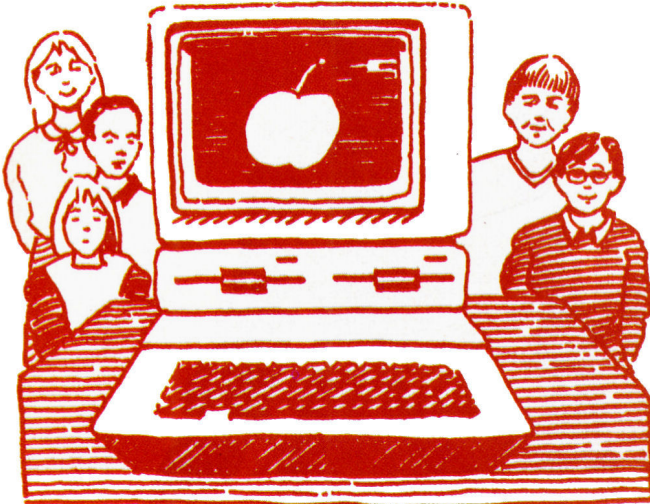
---

### Trivia Contest Winners Announced!

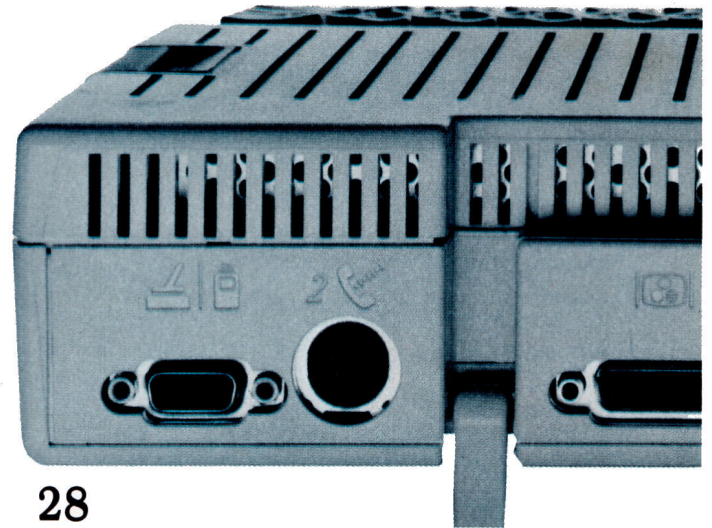
And now the news you've been waiting for—the winners of inCider's Great Apple Trivia Contest.

111





12



28

## DEPARTMENTS

### Editorial

### Letters

### The Cider Press

Transcontinental Banking; Computer Art in the Bronx; Apples for Teachers

### Corrections

### Apple Clinic

Answers to your hardware and firmware questions  
by Jim Sather

### The Applesoft Adviser

Reading and Writing: Learning the 'BASICS'  
by Dan Bishop

### Software Reviews

The Perfect Score; Mickey's Space Adventure; HomeFiler; Design Your Own Home; Landscape

### Hardware Reviews

A+ Mouse; MultiView 80/160; Rite-man F+; QC-10 Hard Disk

### New Software

6

8

12

43

64

68

71

77

83

### New Products

### Beginner's Cookbook

Step-by-step instructions on how to type in *inCider's* program listings

### The Game Reserve

Situation: Critical; H.E.R.O.; Ghostbusters; Felony!; Suspect; Fifth Eskadra; Battle of the Atlantic  
by Brian J. Murphy

### Ask inCider

Answers to your software and programming questions

### O'Brien's Journal

Sizing Up Spreadsheets  
by Bill O'Brien

### Data-Gram

Free on-line data bases and money-saving tips  
by Matthew Lesko

### Reader Services

### Editors' Choice

MouseWrite

89

94

97

101

103

109

110

112

*inCider* (ISSN #0740-0101) is published monthly by CW Communications/Peterborough, Inc., 80 Pine Street, Peterborough, NH 03458. Phone: (603) 924-9471. Second-class postage paid at Peterborough, NH, and additional mailing offices. (Canadian second class mail registration number 9590.) Subscription rates in U.S. are \$24.97 for one year, \$38.00 for two years and \$53.00 for three years. In Canada and Mexico, \$27.97—one year only, U.S. funds drawn on a U.S. bank. Nationally distributed by International Circulation Distributors. Foreign subscriptions (surface mail), \$44.97—one year only, U.S. funds drawn on a U.S. bank. Foreign subscriptions (air mail), please inquire. All U.S. and Canadian subscription correspondence should be addressed to *inCider*, Subscription Department, P.O. Box 911, Farmingdale, NY 11737. Please include your address label with any correspondence. For questions concerning your subscription and to place subscription orders, please call us toll free at 1-800-645-9559 between 9 a.m. and 5 p.m. or write to *inCider*, Subscription Department, P.O. Box 911, Farmingdale, NY 11737. Postmaster: Send address changes to *inCider*, Subscription Services, P.O. Box 911, Farmingdale, NY 11737. (Send Canadian changes of address to: *inCider*, P.O. Box 1051, Fort Erie, Ontario L2A 5N8.) Entire contents copyright 1985 by CW Communications/Peterborough, Inc.

MPA

Downloaded from [www.Apple2Online.com](http://www.Apple2Online.com)





# Editorial

## The Interface and I

**Q**uestion: In the following group, which element doesn't belong?

- A. Keyboard
- B. Mouse
- C. Joystick
- D. Graphics tablet
- E. Light pen
- F. Human voice

A trick question, of course. The answer is none, since, vis à vis your Apple these days, all of the above are potential "input devices."

A single, universal interface does not exist. As we're suggesting in this issue, there's more than one way to get your computer to do what you want it to do.

Ask different people how they perceive the computer interface, and, depending upon their applications, they may voice as many responses as the blind men of the fable did when describing an elephant. In the story, you may recall, the man who touched the tail claimed the elephant was most like a rope; the one who felt its side thought it most resembled a wall; the one who stroked its trunk was certain an elephant was like a snake, and so on.

So might one user claim that interacting with a computer is like Trans Am gear-shifting; another, like drawing on a "magic" pad (you know, the kind you had as a kid: lift the transparent overlay and your sketch disappears); a third, well, something like typing. As in the moral of the blind men and the elephant tale, not one of these paints a complete picture.

I'll admit I've been most comfort-

able with keyboards. So comfortable, in fact, I have to remind myself that not everyone shares that level of comfort with me—or may ever have to. My preference has as much to do with my 15 years of touch-typing experience as with the fact that word processing is my primary application. (Okay, I'll also admit to the worst hand-eye coordination in the office.)

We resist new technology the way we resist anything unfamiliar and threatening to our habits—anything that forces us, in fact, to conceive of ourselves differently. A recent scene at *inCider* comes to mind.

Late one afternoon, our technical editor, Bob Ryan, alone in his office, could be heard intoning monosyllables of a strangely menacing note: "Two. . .three. . .four," each followed by "Return." One by one, people got up from their desks to "see" what he was doing.

He was, in fact, training the computer to recognize his voice. Yet even those of us who were familiar with our cover feature ("Apples Within

Earshot," page 14), as well as with the sound of Bob's voice, were struck by the strangeness of hearing, then "seeing," Bob speaking to, or rather at, his //e.

Certainly, there was something weirdly anthropomorphic about this scene, even within the limits of the voice-recognition technology available today—enough to give us pause, and inspire self-conscious allusions to HAL in 2001. In this context, the phrase "giving a computer commands" steps out of the metaphorical into the literal.

As Sherry Turkle, MIT professor and author of *The Second Self: Computers and the Human Spirit*, and others have suggested, the incontrovertible presence of the personal computer in our lives, and the evolving nature of its applications are leading us to define not only what connects us to, but also what separates us from, our own machines.

And perhaps that's why I've taken a solemn vow never to use the word "interface" to describe any form of human interaction. ■



**by Susan Gubernat**

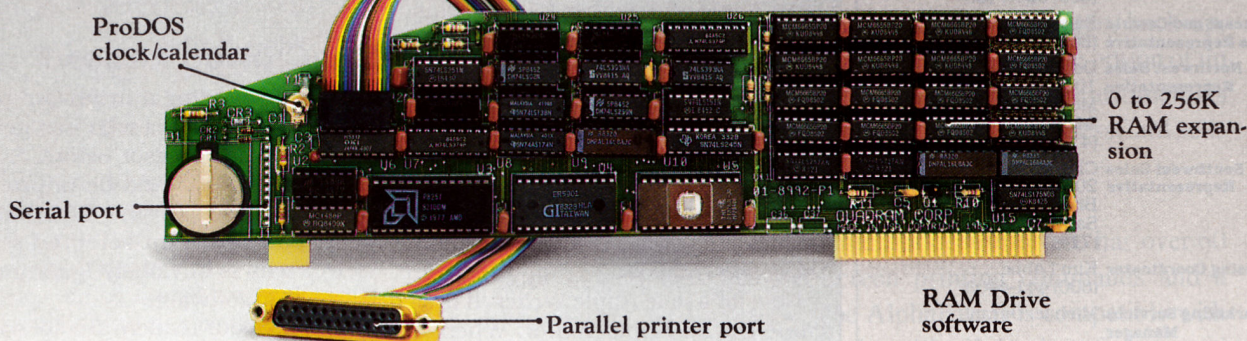


# Quadram Enhances Apples!

Quadram expands the power of the Apple II series personal computers. Quadram set the standard with the Quadboard. Now we offer you Multicore, the card that delivers RAM expansion to 256K, parallel and serial ports, a ProDOS clock/calendar, and RAM drive software. Plus, there's the new Extended Multifunction Card, Clock/Calendar Card, Serial Interface Adapter, and Buffered Serial Interface Adapter. All designed to bring out the best your Apple has to offer. For further details on these cards as well as our popular APIC parallel interface and eRAM 80 cards visit the dealer nearest you, or contact us at 4355 International Blvd., Norcross, Georgia 30093 (404) 923-6666.

## Multicore by Quadram

Easy menu-  
driven set up



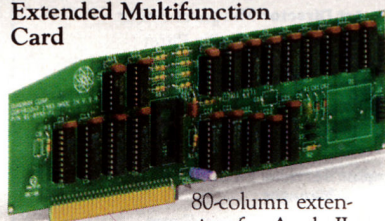
## Pro-DOS Clock/ calendar

Long-life Lithium battery • Easy to use date/time software.



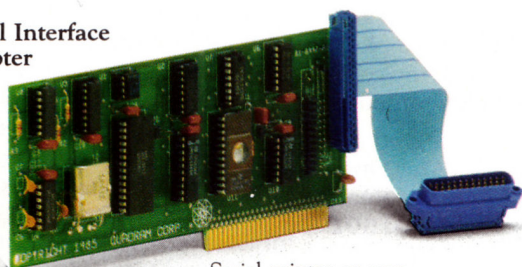
## Extended Multifunction Card

80-column extension for Apple IIe  
• 64K RAM expansion option • Color RGB interface • ProDOS clock/calendar.



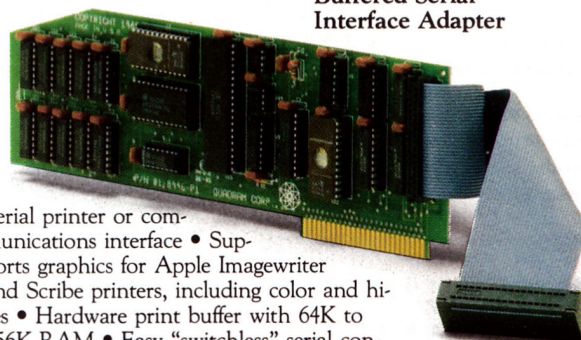
## Serial Interface Adapter

Serial printer or communications interface • Supports graphics for Apple Imagewriter and Scribe printers • Apple Super Serial Card compatibility • Easy "switchless" serial configuration.



## Buffered Serial Interface Adapter

Serial printer or communications interface • Supports graphics for Apple Imagewriter and Scribe printers, including color and hires • Hardware print buffer with 64K to 256K RAM • Easy "switchless" serial configuration.



Apple, Apple II, IIe, II+ are trademarks of Apple Computer Corp.

**QUADRAM**   
An Intelligent Systems Company

Circle 234 on Reader Service Card.



**Publisher** David B. Schissler  
**Editor in Chief** Susan Gubernat  
**Technical Editor** Robert M. Ryan  
**Senior Editor** Eileen Terrill  
**Review/New Products Editor** Paul Statt  
**News Editor** Cynthia K. Carr  
**Copy Editor** Robin Florence  
**Assistant Editor** Lefe Low  
**Proofreader** Peter Bjornsen  
**West Coast Editor** Wendy Lea McKibbin  
 (415) 328-3470

## Advertising

**Sales Manager/Northeast** Paul Boulé  
**Sales Representative** (800) 441-4403  
 (603) 924-7138  
**Southeast and Central Sales Representative** Barbara Alvarez  
 (800) 441-4403  
**Northwest Sales Representative** Donna Pomponi  
 1060 Marsh Road  
 Menlo Park, CA 94025  
 (415) 328-3470  
**Southwest Sales Representative** Charles Durham  
 2082 South East Bristol Street  
 Santa Ana, CA 92707  
 (714) 756-1984  
**Advertising Coordinator** Kim Labbe  
 (800) 441-4403  
**Marketing Services Manager** Michael Duran

## Design

**Art Director** Margaret Baker  
**Production Supervisor** Phyllis Pittet  
**Production Assistant** Cindy Boucher  
**Ad/Graphics Production** Fiona Davies

## Graphic Services

**Graphic Services Manager** Dennis Christensen  
**Manufacturing Manager** Susan Gross  
**Production Supervisor** Dawn Matthews  
**Film Preparation Supervisor** Robert M. Villeneuve  
**Typesetting Supervisor** Linda P. Canale

## CW Communications/Peterborough

**President** Debra Wetherbee  
**Vice President/Finance** Roger Murphy  
**Assistant General Manager** Matt Smith  
**Assistant to VP/Finance** Dominique Smith  
**Director of Circulation** William P. Howard  
**Circulation Manager** Frank S. Smith  
**Direct & Newsstand Sales Manager** Raino Wirein  
 (800) 343-0728  
**Director of Credit, Sales, and Collection** William M. Boyer  
**Executive Creative Director** Christine Destrempe  
**Director of Public Relations** Michele Christian  
**Founder** Wayne Green

# LETTERS

## WPL Information, Please

I'm looking for in-depth information on Apple Writer's WPL—more than the skimpy overview contained in my Apple Writer II documentation. Information, although included in the Apple Writer //e documentation, is unavailable to II Plus owners unless we purchase the //e version which doesn't run on the II Plus. Documentation alone isn't available from Apple and neither is any II Plus support.

Despite the rhetoric, Apple Computer doesn't support the entire Apple II family. The Apple II and II Plus have been eliminated from "family" consideration. Witness the fact that Apple Computer no longer distributes Apple software that will run on these two Apples.

Now let's take Apple Writer. It first came out as Apple Writer. When it was revised to include WPL, it became Apple Writer II. After it was revised to use the //e's special keys, the name changed to Apple Writer //e. Now I see Apple Computer has released a ProDOS version called Apple Writer II. Gee, I recognize that name—it's the version that runs on my II Plus! No way, Jose! It, like everything else Apple sells, runs on nothing less than a //e.

It was through the loyalty of the early Apple customers that Apple succeeded. Now that it's a "big boy," Apple behaves like any other impersonal entity. My answer to this attitude is simply, "Why buy Apple?" When I'm ready to upgrade my computer, you can guess which company I won't consider.

**Robert P. Alekshun**  
 77 Appleton Road  
 Auburn, MA 01501

*You must keep in mind that Apple Computer is a profit-making organization, not a club. People buy a computer for the machine—not the*

*company. Also, Apple stopped manufacturing the II Plus in December 1982. Although Apple included the II Plus in system upgrades, it didn't follow the same path for applications.*

*Concerning specific questions about Apple Writer or other Apple-related products, you'll probably get the most help from your local Apple dealer.*

—eds.

## Star-Crossed Review?

Imagine sending a new word processor to a reviewer who has never seen a word processor before. Such an assignment would be unprofessional to say the least, but that is what you did. You selected a reviewer who is obviously ignorant of astronomy software.

Some of your readers are not so ignorant; some of them will purchase astronomy software—including my chief competitor (TeleStar by Scharf Software Systems). They'll read your review of The Observatory (May 1985, p. 90) with interest. They can only be astonished by such remarks as Mr. Wright's complaint that calculations can take up to 2½ minutes "even though it's a machine-language program." With TeleStar they must wait more than 3½ minutes and in the end they get less for their patience.

They'll also recognize, as your reviewer clearly didn't, the pioneering accomplishments of The Observatory: the large number of celestial objects calculated in so short a time, scene magnification, the moons of Jupiter, and solar eclipses. Unfortunately, your readers will remain uninformed of the other achievements available only from The Observatory: transits of the sun, the phases of the moon, and extreme accuracy across centuries.

The comment that "Lightspeed has attempted a task that is too great" is particularly ridiculous.



Considering my comments about the competition, Lightspeed has done what has been done before, only better.

I'm surprised that a magazine of *inCider's* caliber is unable to find a reviewer who is knowledgeable and competent enough to criticize astronomical software. As it stands, the review is unfair. I believe it works to the detriment not only of me, but of *inCider* and the reviewer as well.

**Gary J. Lassiter**  
**Lightspeed Software**  
**2124 Kittredge Street**  
**Berkeley, CA 94704**

*inCider welcomes reader and manufacturer comments—both negative and positive—regarding its reviews. Totalitarian we're not. In this case, as in our other reviews, we stand behind our reviewer and his findings. Please note that Mr. Wright reviewed The Observatory and its merits. He didn't review the astronomy software market as you contend.*  
—eds.

## Family Feuds

While browsing in a software store, I listened to the store manager torpedo the Apple //c with a young couple that was determined to buy a computer for their daughter's education. They started out at a local Apple dealer because the public school system placed //c's in the elementary classrooms. The dealer advised them to look at software first, then select the computer.

The couple asked why many packages were for the Apple II, II Plus, and //e, but few mentioned the //c. The store manager told them that there is little software available for the //c, and that even though some say otherwise, software for other members of the Apple II family won't work on the //c.

The couple felt misled by the Apple

# Next-Generation Interfaces

Street Electronics introduces a new generation of Apple® interfaces that makes using printers, modems, clocks, and other peripherals easier than ever before. And, these new products are available at prices that will surprise you.

The **BusinessCard™** is an Apple II+ and IIe multifunction card with a printer and modem port, clock with battery back-up, built in graphic screen printing capabilities, and the option of up to 64k of print buffering. Purchasing the equivalent functions separately would cost well over \$500, yet the BusinessCard sells for less than \$200.

The **AlphaBits™ II** serial printer/modem interface has over 60 built in graphics and text screen printing commands and a 16-64k print buffer option. The AlphaBits II is compatible with a wide variety of printers, works with all Apple software, and sells for less than \$100.

The **LiveWire™** is an intelligent printer cable with a built in clock/calendar that connects a *parallel* printer to the *serial* port on your Apple IIc. The serial to parallel converter and clock are inside the LiveWire's unique connector—no additional hardware is needed. Also under \$100.

See your local Apple dealer.

Circle 355 on Reader Service Card.



Street Electronics Corporation  
1140 Mark Avenue  
Carpinteria, CA 93013  
Telephone (805) 684-4593

Apple is a registered trademark of Apple Computer.





# LETTERS

dealer (even though he sent them to look at software before making a purchase) and cried foul. The store manager added that the //c is being pushed by Apple dealers because it's a cheap, high-profit machine. He made Apple's integrated chip design sound like a dirty trick. Following his advice, the young family dropped the software and ran out to buy a Commodore.

As a new //c owner, I was upset. Perhaps you could set the record straight by addressing this software compatibility and availability issue. You might also comment on Apple's strategy and level of commitment to the //c.

**Randy Madsen**  
1715 Swannanoa Drive  
Greensboro, NC 27410

*It has been our experience that most software designed for the II Plus and //e will run on the //c. The biggest incompatibility problem is that many programs with inverse capital letters get mouse characters on the //c instead of the inverse capital letters.*

*In our opinion, Apple shows a greater commitment to the //c than other members of the II family. Of course, even the //c takes a back seat to the Macintosh family which has received much corporate and media attention within the last few months.*

—eds.

## //c Supremacy

As the premier Apple II magazine, *inCider* needs increased //c coverage. According to *InfoWorld*, the //c took 28 percent of the Christmas market, compared to the //e's 11 percent. The //c, in fact, sold more than the //e and the Mac combined.

My Apple dealer is selling three //c's for every //e, and the gap is widening. Software and hardware support for the //c are sure to increase, given its incredible sales record.

I believe that the //c and //e don't

## "I like the technical stuff in *inCider*!"

compete against each other. Each serves a distinct market. It's clear that the consumer has recognized the //c not as a "hacker's" computer, but as "the computer for the rest of us."

I hope your magazine is in the forefront of covering, promoting, and supporting the //c.

**Robert P. Lyle, Jr.**  
1873 Potwin Drive  
Baton Rouge, LA 70810

*inCider, as the cover emphasizes, is "The Apple II Journal." Despite Apple's continued Mac-hype policy, we remain devoted to the II family—which includes the //c. Ninety-nine percent of the time, if you can do it on a //e, you can apply the same procedure to a //c. Bob Ryan, inCider's technical editor, would be glad to answer specific questions.*

*You're right, Robert, as far as recognizing a buyer's personality for each computer. While the //c was designed for those who don't want to be bothered with "what's under the hood," keep in mind that it is supported by a wide software selection made available by the //e.*

—eds.

## Catalog Modifications

Thanks for the excellent program, Mini-Catalog ("The Incredible Shrinking Catalog," March 1985, p. 49), by John T. White. This utility has given me tremendous assistance in organizing and managing my disk files, and is a real time-saver when working with disks containing multiple, diverse files.

Since the program works only for Epson printers, and I have a C.Itoh 8510A dot-matrix, I had to make certain printer-code adjustments to use

my printer's compressed-type features—compressed character pitch, line spacing, and bold print—in the Mini-Catalog program mode. The program line modifications are as follows:

```
415 PRINT CHR$(27) + CHR$(81):  
      PRINT CHR$(27) + CHR$(66):  
      PRINT CHR$(27) + CHR$(33)
```

Delete line 420.

```
447 PRINT CHR$(27) + CHR$(78):  
      PRINT CHR$(27) + CHR$(65):  
      PRINT CHR$(27) + CHR$(34)
```

I thought these changes might interest your readers in adapting Mr. White's original Mini-Catalog program to their printers. Again, thank you for the article. I look forward to reading more of them in the future.

**Edward C. Martin**  
5184 Colonial Park Road  
Birmingham, AL 35243

## Technical Treasures

I like the technical stuff in *inCider*! It has been getting harder and harder to find. But how about publishing reviews on the PDQ 68000 Coprocessor, the Quantum Leap Megatask Plus, The Sider 10-megabyte hard disk, the Legend S Card (1-megabyte RAM), Roger Wagner Publishing products, and the Demco Graphics Card?

**Carl Stocker**  
9117 Briergate Court, F  
Indianapolis, IN 46229

Check the April 1985 issue, page 93, for *inCider*'s review of *The Sider*. Expect to find reviews of Roger Wagner Publishing products and the Demco Graphics Card in future issues.

—eds.

*inCider welcomes readers' comments regarding articles, letters, or other topics of interest. We reserve the right to edit letters for clarity, style, and space. Please address your correspondence to inCider, Letters, 80 Pine Street, Peterborough, NH 03458.*

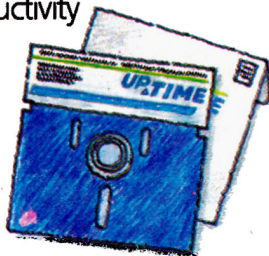


# Finally, the monthly magazine your computer can read.



**UP $\Delta$ TIME™, The Magazine on a Disk™**  
makes ordinary magazines  
seem pretty ordinary.

**Boot** UP TIME and you're ready to go. UP TIME is friendly, interactive and totally absorbing. With hard-working personal productivity and home finance programs to help you get the most out of your day, and more for your money. Exciting entertainment and educational programs make it fun to play and fun to learn.



**PLUS! Interactive "demos."** Now evaluate software before you buy. UP TIME brings you actual demonstrations and reviews of the hottest software. Plus you get inputs and advice from a worldwide network of UP TIME subscribers.

**For as little as \$4.50 an issue** ... not much more than the cost of a disk alone, you'll get over 12 friendly programs and a lot more, every month.

**Save 55%! Subscribe to UP TIME now and save more than half off the single-issue price of \$9.95. Call us now toll-free, 1-800-437-0033 and you won't miss another issue.**

**100% Satisfaction Guaranteed or Your Money Back in Full.**

## UP $\Delta$ TIME

THE MAGAZINE ON A DISK

**I'll BYTE!** Start my subscription to UP TIME immediately. I understand that my complete satisfaction is guaranteed. Please send me:

- |  |  |
|--|--|
| <input type="checkbox"/> 12 months for only \$54.00<br>(a \$65.40 savings) | <input type="checkbox"/> 3 months for only \$24.00<br>(a \$5.85 savings) |
| <input type="checkbox"/> 6 months for only \$36.00<br>(a \$23.20 savings)  | <input type="checkbox"/> 1 month trial for only \$9.95                   |

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_

For delivery outside the US (except Canada and A.P.O.) add \$1.50 per issue.

Send to: UP TIME • Dept. IN-07

P.O. Box 299 • Newport, RI 02840

For Apple II series computers. Apple is a registered trademark of Apple Computer Corp.  
© 1985 Viking Technologies, Inc., Formerly SOFTIME The Magazine on a Disk.

☐ Check/money order  
enclosed (payable to  
UP TIME please)

☐ Charge my: ☐ VISA  
☐ MasterCard

Account # \_\_\_\_\_

Exp. Date \_\_\_\_\_

Signature \_\_\_\_\_





## Camping Capers

Big Bird and Cookie Monster may not be among the campers, but children 8 to 12 years old can enroll in the Sesame Place Computer Camp, where they'll learn computer vocabulary and programming concepts.

Sesame Place, an action-oriented play park in Langhorne, Pennsylvania, offers the children's computer camp as part of its Computer Campus pro-

gram. A camper's day starts at 8:30 a.m. with scheduled classes, activities, and breaks running until 5 p.m. Sesame Place emphasizes individualized training—each child works at his or her own Apple //e during instruction times.

Sessions run weekly until August 9, 1985. Camp fee is \$175 per week, and it includes snacks, camp T-shirt, and class materials. If you're thinking of sending your child to computer camp, contact Sesame Place at (215) 752-4900.

## Get It Right

They're glad the phones are ringing off the hook at The Public Domain Exchange, but unfortunately it's for the wrong reasons. We didn't mean to lead you astray, but The Public Domain Exchange doesn't offer an Apple II public-do-

main software listing as reported in April's Cider Press ("Yours for the Asking," p. 13). The organization does publish a book, *The Best of Public Domain Software*, available for \$6.95 plus \$1.50 postage. We regret any inconvenience this might have created.

## Fruitful Semester

Teachers can have Apples on their desks every morning, thanks to an Apple Computer Inc. special purchase program. "An Apple for the Teacher" gives those in the educational field 25 percent or more off the retail price of an Apple personal computer system. Teachers can choose from a //e with 64K of memory, with Disk II drive, Monitor II display, and 80-column display interface card; a //e with 64K of memory, two Disk II drives, Monitor II display, and an interface card that provides 80-column display and an added 64K of

memory; a //c with monitor stand; or a Macintosh with 128K of memory.

To qualify for the program, you must be a certified, full-time professional employee at a K-12 non-profit public or private school, college, university, consortium, state board of education, vocational and technical school, public special education school, county educational computer center, Indian school, or Catholic diocesan education curriculum center.

If you'd like to apply for Apple's program, write for an order kit to: An Apple for the Teacher, P.O. Box 306, 125 Main Street, Half Moon Bay, CA 94019. The offer is available until September 30, 1985.

## INSIDE OUT

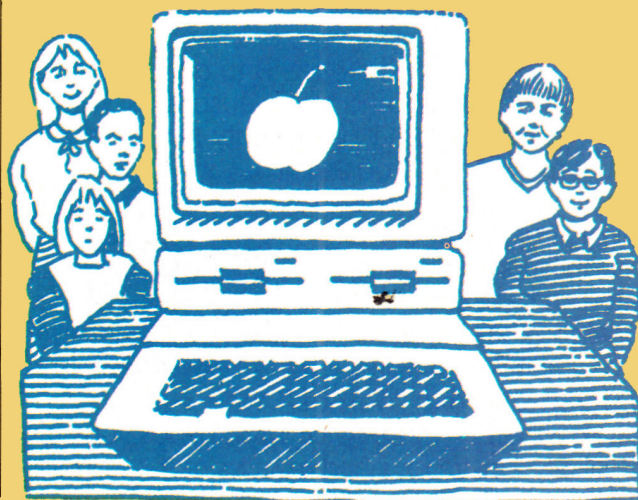
•**Card power.** . . Rumor has it that Apple may be producing a new RAM card that will increase the //e's random access memory to 1 megabyte.

•**Disk upgrade.** . . We hear that a 3½-inch drive may be on the way from Apple. The single- or double-sided high-capacity disk should support ProDOS and have a quad density that provides up to 800 kilobytes of storage per disk.

•**//c sales.** . . Apple has announced that more than 400,000 //c's have been purchased in the year following the computer's introduction. In comparison, it took 2½ years to sell the first 50,000 II's and 74 days for the first 50,000 Macs.

•**Software survey.** . . According to a Software Access International survey, almost half of those people who work for large companies rely on computer specialty stores as their primary source for software.

•**Advertising flair.** . . *Advertising Age* selected Apple Computer Inc.'s television commercial, "1984," as one of the best TV commercials of 1984.



Illustrations by Katherine Mahoney

by Cynthia K. Carr, inCider staff



## Artistic Endeavors

Talk about computers as state of the art. . . an exhibit called "Emerging Expressions: The Artist and the Computer," at the Bronx Museum of the Arts, features the work of 47 contemporary artists.

Last year, the museum started looking for artists who use computers as creative tools through an exhibition competition. No monetary prizes were awarded. "It's more for the public exposure," says Luis R. Cancel, museum director. He notes the museum is devoted to educating the public, and computer art is a new form worthy of attention.

Reaction to the computerized canvas has been mixed. Cancel says galleries have a harder time pre-

sending the computer artwork, but "museums are hanging back, looking at what type of work is being developed." The artists' reactions are different. "They're really excited. Artists are a different kind of hacker—a visual hacker—pushing the machine and manipulating light and sound."

Within a year, Cancel says the museum wants to set up a computer graphics workshop where artists without the financial means can experiment with computer equipment. If all goes according to plan, the museum could give artists residency for a period of time, such as six months.

The exhibit runs until September 22, 1985. For more information, contact the Bronx Museum of the Arts, 1040 Grand Concourse, Bronx, NY 10456, (212) 681-6000.



Laurence M. Gartel's "Logarithmic Folk Art"

## Cloning Around

Franklin computer owners needn't feel like lost waifs. The Franklin Users Group supports members

*We're always looking for news of the Apple world. If you're making news, send your press releases and photographs to The Cider Press, 80 Pine Street, Peterborough, NH 03458.*

with a newsletter, public-domain software library, and technical assistance. Membership is open to those with Franklins, Apple clones, or Apples. The group, however, emphasizes the Franklin and clones, group member Douglas M. Trueman says. For more information, send a self-addressed, stamped envelope to Trueman at East Wind Road, Apt. L, Tecumseh, MO 65760.



## Bankers' Hours

The last thing you need when conducting financial transactions is a bank hassle—especially if you work or travel overseas. CompuServe, an on-line information service, and the NCR Universal Credit Union offer transcontinental home banking by personal computer. Called Companion at-Home, the service is currently available only to NCR Universal Credit Union members. The Northwest Orient Airlines Employee Credit Union, Pacific IBM Employees Credit Union, and O.R.N.L. Credit Union will offer the service soon.

With Companion at-Home, members can access financial and information services 24 hours a day.

"The new international capability is an important enhancement to the system, because it frees our members from the restriction of geographic barriers and international time zones," says W.A. Smith, president of NCR Universal Credit Union.

Companion at-Home costs \$10 a month for NCR Universal Credit Union members, and the fee includes 90 minutes of connect time. Additional time costs 15 cents per minute. CompuServe members are charged 20 cents per minute during the day and 10 cents per minute at night.

## Calendar



**15-18**

**NATIONAL COMPUTER CONFERENCE '85**  
Chicago, IL  
contact:  
NCC Registration  
1970 Chain Bridge Road  
McLean, VA 22109  
(800) NCC-1985

**22-25**

**LOGO 85**  
Cambridge, MA  
contact:  
Special Events Office  
Massachusetts Institute of Technology  
Room 7-111  
Cambridge, MA 02139

**29-August 2**

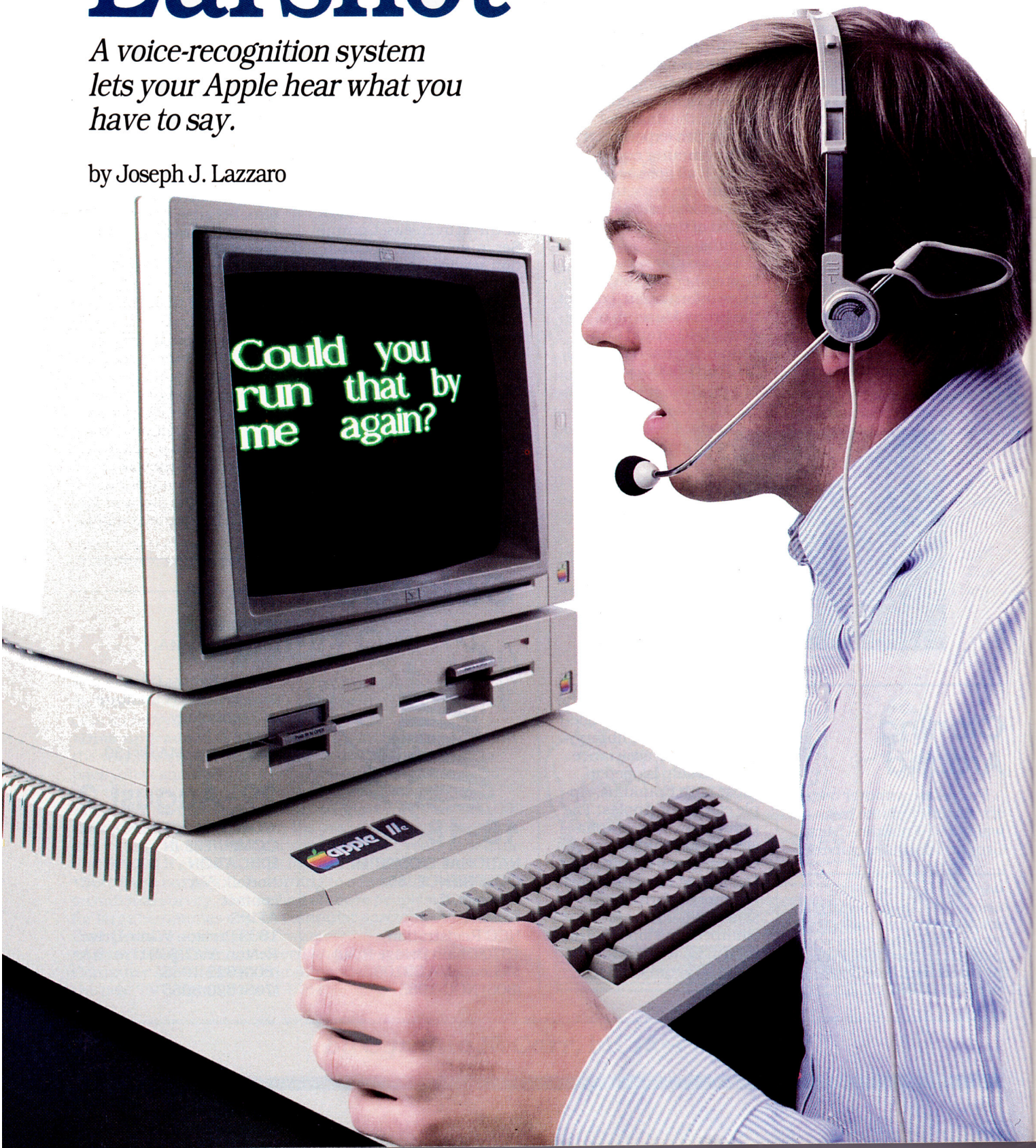
**WORLD CONFERENCE ON COMPUTERS IN EDUCATION**  
Norfolk, VA  
contact:  
AFIPS  
1899 Preston White Drive  
Reston, VA 22091  
(800) 622-1985  
(703) 620-8955



# Apples Within Earshot

*A voice-recognition system lets your Apple hear what you have to say.*

by Joseph J. Lazzaro





**Y**ou're on the road without your computer, and you have to retrieve a phone number—right now—from the data base in your office. You step into the nearest phone booth, drop a coin into the slot, and dial.

"Hello, Hal."

"Hello, Joe, what can I do for you?"

"Run the phone list, please."

"Running. . . Whose number do you want, Joe?"

"Bob's."

"I'm sorry, Joe, his number has been deleted from the directory. Shall I look up another name?"

It's not just science fiction anymore—computers with the power to recognize and respond to the spoken word are beginning to appear in our homes, offices, schools, and factories. If voice-recognition technology continues its rapid rate of development, we won't have to wait until 2001 to talk to our computers.

### **Phoning Home. . . and Other Applications**

How can computers even begin to mimic this most sophisticated of human abilities?

Sound gathering and sound-pattern matching form the basis of computerized voice recognition. The apparatus converts sound waves entering the system microphone to electronic signals the computer can understand, then compares them to a digital template (the computer's "audio memory") stored on disk and recalled into random access memory during the matching process. If the incoming signal resembles one of the template words, the computer "recognizes" the sound as a word in its vocabulary.

The voice-recognition equipment we have today is the result of research on the potential military applications of the technology. In the early 1970s, the Defense Advanced Research Projects Agency within the Department of Defense constructed a voice-recognition hardware/software system with a 1000-word vocabulary and an error index of less than 10 percent. The DARPA project was the first serious exercise in continuous-speech recognition, but private industry subsequently took over its development for commercial applications.

You may integrate a voice-recognition system into your computer's applications software environment with data bases, word processors, telecom-

munications packages, spreadsheets, and games. Any software package that can accept keyboard input can be modified to accept voice input. Saving the voice templates and the template-loader software to an applications disk is the procedure to follow with unprotected software and programs you've written yourself.

If you are interested in adapting software packages for voice recognition, look for programs written in standard Apple DOS 3.3 formats. If you can catalog the disks, load and list files, integrating the voice-recognition software shouldn't be difficult. Public-domain software is a good place to start. These programs are usually easy to work with, small enough to fit on a disk with the voice-recognition templates, and available for experimentation at no cost.

Handicapped and disabled users, particularly those with impaired manual dexterity, can find in voice-recognition systems the key to autonomy in their home and work lives. Speech difficulties are no hindrance to use of a speaker-dependent voice-recognition system—the ability to make distinct sounds is the only requirement. Voice recognition can be tied into household-maintenance software packages designed to perform such tasks as turning room lights on and off, activating appliances, dialing the telephone, controlling temperature, and so on, as well as the personal and business applications that can give disabled people full access to the "computer revolution." This new technology can mean the difference between independence and restrictive personal care.

Security encoding is another aspect of voice-recognition technology at work. The sci-fi scenario in which a character's voiceprint is matched against those on file is not far-fetched. You can prepare a program disk with a set of voice templates that restricts program access to particular users. A voice-recognition security scheme is more effective than a password, since templates cannot be easily falsified.

And as we noted at the beginning of this article, interfacing a voice-synthesis/recognition setup with a home or office telephone creates a non-computer-dependent link to your Apple while you're on the road, letting you access your home or office system from any standard telephone.

To set up this link yourself, you will have to hard-wire the recognition apparatus to your telephone—connect

the voice-recognition system speaker to the microphone input of your phone, then connect the speaker output of your phone to the microphone input of the voice-recognition system. You and your computer will then be able to both hear and speak to each other in a conventional manner. You can also give the touch-tone or rotary dial a more central role by adding passwords or other layers of operation. You will also have to integrate the voice-recognition driver software with your data base (or other applications program) as described earlier. Modifying your speech-recognition equipment to produce non-modem-based remote access is a fascinating, challenging project for the intermediate computer user.

### **Technologically Speaking. . .**

Let's take a look at the theory behind the product. Voice-recognition systems are classified according to the type of template they employ, and the type of speech to which they respond.

A *speaker-independent* unit contains factory-installed, fixed templates that allow the system to recognize only a limited vocabulary, although almost any speaker may deliver the words. Speaker-independent hardware is costly, and is usually custom-built for business applications, such as banking machines, in which its fixed repertoire is not a limitation.

A *speaker-dependent* system, on the other hand, has virtually unlimited vocabulary potential, but recognizes only the voice of the person who initializes the system—you must create your own templates on disk by speaking displayed words into the system through a microphone. Such units retail for less than \$500.

A *discrete-utterance* unit can recognize phrases and sentences only if short breaks (at least 200 milliseconds) fall between the words. Searching for short pauses of dead air, the momentary silences that form the gaps between words, it processes the sounds in between by comparing incoming signals to its templates. Discrete-utterance systems perform best with short, multiple-syllable command sequences, such as "catalog," "return," or "delete."

Discrete-utterance systems are derived from a simplified approach to voice recognition, but continuous-utterance units more closely resemble the science-fiction concept. They can identify larger blocks of data, streams of unbroken language that represent a

*Continued on p. 17.*

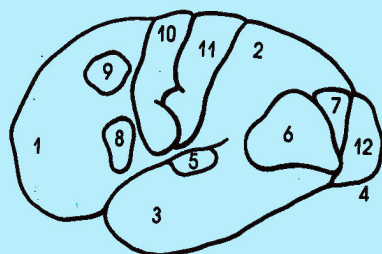


# Listening with the Brain: Human Speech Perception

It's more intelligent than any man-made machine, more capable than any multilingual speech processor. It's the most complex piece of voice-recognition software nature's ever come up with—the human brain.

Although our ears receive sound waves and convert them to electrical signals passed along the auditory nerves, it is the auditory center in the left temporal lobe of the cerebrum that gives us our sense of hearing. But distinguishing speech from other sounds is an even more specialized process. Toward the posterior part of the left temporal lobe, between the auditory and visual regions, lies the portion of the brain known as *Wernicke's area* (see the **Figure**). Since the last quarter of the 19th century, scientists have noted that patients with lesions in this part of the cerebral cortex cannot comprehend spoken language. They can still produce fluent speech sounds, although the meaning of their sentences is often quite jumbled. Wernicke's area appears to recognize words—that is, it stores memories of word sounds and pairs them with ideas.

**Figure.** Left cerebral cortex, with speech-related areas indicated.



As in the rest of the brain, the mechanisms in Wernicke's area do not operate in isolation. "Language"—speaking, listening, reading, and writing—is a multilayered ability involving motor skills, sensory reception, learning, and memory. Bundles of nerve fibers connect Wernicke's area to three other main language centers, all in the left hemisphere. Perception of written

language is centered in the *visual-association area*, adjacent to the part of the cortex that gives us our sense of sight. *Broca's area*, located in the frontal lobe near the area controlling lip, tongue, and jaw muscles, coordinates our physical ability to talk—it stores the memories of the muscle movements necessary to produce speech. *Exner's area*, near the part of the motor cortex associated with hand movement, regulates our ability to write language.

Damage to Wernicke's area often brings with it seemingly strange side-effects (in addition to major speech-comprehension difficulties)—writing and sometimes reading disabilities. Because the process of writing depends on our association of hand movements with auditory representations of words stored in Wernicke's area, patients tend to interchange letters that stand for similar sounds.

And reading appears to depend on the coding of letters into phonemes—the smallest units of speech that can be distinguished from each other. Deaf people, however, cannot rely on audition in learning to read and write—their memories of word/idea relationships are stored in the visual-association area. Deaf patients with Wernicke's lesions show no reading and writing impairment.

Normal perception of others' speech mediates the development of language production. Results of studies with infants as young as one month of age suggest that we are born with the ability to distinguish speech from other types of sounds. Long before we are capable of creating speech sounds, we can perceive different phonetic features—the acoustic characteristics arising from the way we articulate different sounds. Even before a young child can pronounce all the phonemes of his or her language, he or she can recognize them in the speech of others. Congenitally deaf children, however, never learn to speak normally. Even the experimental impairment of hearing through delayed auditory feedback—preventing a person's speech from reaching his or her ears for a few seconds—disrupts speech production.

Most models that attempt to explain speech cognition in the brain are variants of the *motor theory* of perception. When we speak, we hear our own words, and when we hear others' speech, we unconsciously anticipate our own reproduction of those words. As we listen, we recall the ideas we were expressing when we pronounced the same words, and thus know what the other person means. Some studies have even detected minute movements in the larynxes of people listening to others' speech.

The straight template design of computerized speech-recognition devices does not seem to serve as a theory for human speech perception. We routinely understand different acoustic stimuli—owing to wide variations in stress, accent, and intonation—as the same phoneme. There can be no direct matching of sound waves to cognitive representations.

A compromise theory is the mechanical *analysis-by-synthesis* model. When we hear speech, we store those original auditory signals and generate hypotheses about their characteristics according to our own internal rules. We speculate: What would this input be like if our hypotheses were true? We then compare our descriptions to the stored input until we achieve a match.

Cognitive theorists acknowledge the vagueness of our current analysis of human speech perception. Our models barely scratch the surface of the complex of abilities we call cognition. Within our constructions, we cannot yet account for even the comparatively minute amount of biochemical and physiological data we have gathered. How is Wernicke's area connected to the auditory cortex, and what mechanism filters out speech from other sound? How does a network of nerve-cell connections add up to something as complex as our conscious sense of understanding when we listen? Computers as tools may someday help us sort out the mystery of the human mind—but not even the most sophisticated machine can duplicate it. □

—Eileen T. Terrill  
inCider staff



# The Lis'ner 1000: Conversing with Your Apple

With the right equipment, you and your Apple can have a two-way conversation. Micromint's Lis'ner 1000 is a speaker-dependent Apple II voice-recognition expansion board based on a General Instruments SP-1000 chip; it also incorporates a speech synthesizer based on the SSI-263 voice chip. The Lis'ner comes bundled with two standard Apple-format floppy disks containing voice-to-text template builders, linkers, loaders, and editors, with an unlimited-vocabulary text-to-speech algorithm for the SSI-263.

Any communication usually mediated via keyboard and screen can be expressed through the Lis'ner 1000. You can adapt the factory-selected templates of DOS and Apple-soft commands to your own voice, or you can create your own templates, allowing you to use the Lis'ner simultaneously with other applications software, such as word processors, data bases, telecommunications packages, and games. The Lis'ner software includes listable Applesoft BASIC routines you can modify easily. Its assembly-language subroutines come complete with their respective source codes in fully documented, standard DOS 3.3 text-file format. Any commercially available assembler/editor can then re-assemble the source-code routines.

The Lis'ner 1000 comes in kit or factory-tested format. Just plug the board into any Apple expansion slot, except number 3. Plug the headphones and a standard 8-ohm speaker into the board, then boot up the supplied software.

The Voice Trainer is the first option on the Lis'ner main menu (see **Photo 1**). Before you try to use the Lis'ner 1000 the first time, you must select this option to let it "hear" your voice and store the recorded vocal patterns on disk as templates. The software then recalls templates into RAM when the system tries to make a voice match.

The Trainer presents you with highlighted words on the Apple screen (see **Photo 2**), which you must speak carefully into the microphone. The more precisely you

pronounce the words, the more accurate will be the recognition process. This dependency on voice templates means that the Lis'ner will recognize only the particular voices you've stored. The hardware and software are so configured that you will have to initialize the system—create a template disk—for each person who will use it.

In simple terms, an analog-to-digital converter transforms the micro-



**Photo 1.** The Lis'ner main menu.



**Photo 2.** The Lis'ner's Voice Trainer lets you initialize the system to your own voice.

phone input into discrete signals, which are then passed through filters to get rid of unwanted room noise and other frequencies confusing to the system. Special hardware splits your voice into several different frequency components, which the system compares to the current series of templates in memory. If a close match is achieved, the Lis'ner tells your computer to print your words on screen or act on your command. If the attempted match is off the mark, the Lis'ner will not "recognize" the word, or it may confuse it with a similar-sounding word in the template. You must be careful to pronounce each word the same way you did when you initialized the system.

So start talking—and listen closely when your Apple answers back. □

—J.J.L.

*Continued from p. 15.*

more natural way of speaking. But hardware and software design must be much more complex to process average human speech. The system must be intelligent enough to know where one word ends and another begins, and it must be fast enough to handle the input in real time.

Today's personal computers lack sufficient central-processing speed and random access memory to efficiently accomplish the task of real-time continuous-speech recognition. The CSR procedure involves some of the same sound-gathering and sound-matching techniques the human brain employs (see the sidebar on human speech perception), but is crude in comparison.

Through an ordinary microphone, sound enters the computer's voice-recognition circuitry as periodic sine waves, which are useless to the computer in their analog form. The voice-recognition hardware must convert them to a linear stream of digital signals—a series of ones and zeroes that stand for the on and off states of the computer's electronic circuits—before the computer can recognize or manipulate the data.

An analog-to-digital converter circuit transforms a wave into digital signals by assigning numeric values to the high and low energy points corresponding to an X/Y graph representation of the wave. The computer then evaluates incoming sound by statistically analyzing these equivalent digital data and comparing them to templates resident in RAM.

The voice-recognition device actually compares the sound between pauses. The system "listens" to you, and when it notes a break in your speech, it decides that it has "heard" a whole word, which it compares to its stored templates. The system assigns to each incoming word a probability value representing the closeness of its match to one of the stored templates. If the probability is above a certain value (fixed by the software designers), the system registers a match. Templates for independent systems are designed and installed at the software factory, while a dependent system comes with blank templates the user must initialize.

A discrete-utterance voice-recognition system is not practical for word processing or any other application in which speech must flow normally. Continuous-speech recognition must

*Continued on p. 19.*



# When Mind Meets Machine

High tech is invading our language, and there exists no better example than the word "interface." The problem with adopting technical words into the vernacular, however, is that their specialized meanings can become blurred. *Interface* suffers more than most from this phenomenon: The interface I'm talking about is not the verb that describes what you do with your friend or your "space," but the noun that describes how you get your computer to do what you want it to do.

Back when computers were young (and built out of vacuum tubes), you got your machine to perform a task by hard-wiring the flow of information through it—and you had to re-wire it every time you ran a new program. Luckily, John von Neumann came up with the stored-program concept and saved us all from a horrible fate.

Now that programs were to be stored in memory, you had to have a way to enter them into memory. This led to the first advance in user interfaces—the front panel. It wasn't much—just a row of switches and lights that let you enter programs and data, one bit at a time—but it sure beat re-wiring your computer.

It wasn't long, however, before the front panel was replaced by that darling of the mainframe, the card-punch machine.

We would probably still be punching our programs and data onto cards and running them through a card reader were it not for a (then) little company called Digital Equipment Corporation. In the early sixties, DEC began selling minicomputers. These machines had operating systems that allowed you to boss your computer around using a video-display terminal (VDT)—essentially a keyboard (for input) married to a video monitor (for output). System operators had used VDT's (or their hard-copy cousins, teletype terminals) for many years, but it was the minicomputer that relegated the card-punch machine to the dustbin of history.

The earliest microcomputers used a front panel as the primary input device (a technological example of ontogeny recapitulating phylogeny). It wasn't long, however, before the VDT became the standard microcomputer interface. (Luckily, card-readers were almost totally bypassed in the development of the desktop computer.) Although micros borrowed the VDT

concept from minicomputer design, manufacturers quickly realized they would sell millions of personal computers only if they made their machines extremely easy to use.

The current fashion in interfaces was designed and developed at the Xerox Palo Alto Research Center in Palo Alto, California. It consists of windows, pull-down menus, and icons, and is complemented by the use of a peculiar pointing device called a mouse. The first personal computer to popularize this interface was the Apple Lisa. Before long you could buy a number of software packages that emulated the Lisa interface to some degree; several computers (including, of course, the Macintosh) have such interfaces built in.

In a mouse/windows environment, it's pretty easy to get your computer to do what you want, but you still have to know how to use a keyboard and how to manipulate a mouse. What I look forward to is the day when I can tell my computer what to do simply by *telling* it what to do—and that's the promise of voice recognition. □

—Bob Ryan,  
inCider Technical Editor

## Voice-Recognition Glossary

**Algorithm.** A set of instructions to solve a particular problem, such as finding a square root, or recognizing speech.

**Artificial intelligence.** A computer containing large data bases, with the ability to make decisions based on its stored data. Some AI computers are called expert systems because they concentrate on a small area of knowledge.

**CSR.** Continuous-speech recognition, the identification of spoken words without unnaturally long pauses between them.

**DUSR.** Discrete-utterance speech recognition—single words with distinct pauses between them.

**Error index.** A measure of the number of errors a system makes. An error index of 5 equals a 5 percent error rate.

**Hal.** Heuristically programmed ALgorithmic computer, from the Arthur C. Clarke movie *2001: A Space Odyssey*. Heuristic means having the ability to gather additional knowledge—a non-static computer program.

**Lis'ner 1000.** A speaker-dependent, discrete-utterance voice-recognition expansion board for the Apple II series of computers. An optional voice synthesizer with unlimited vocabulary is also available as part of the Lis'ner package.

**LPC.** Linear predictive coding, a mathematical algorithm predicting the next most likely event based on previous data.

**SP-1000.** The speech-recognition chip in the Lis'ner 1000 expansion board.

**Speaker-dependent system.** A voice-recognition system that must

be initialized by the person who will use it.

**Speaker-independent system.** A voice-recognition system that can respond to any speaker and requires no initialization by the end user.

**SSI-263.** A Silicon Systems unlimited-vocabulary speech-synthesis chip in the Lis'ner 1000.

**Template.** A disk file containing words or phrases to be used as the basis for speech comparison in a voice-recognition system.

**Voice-to-text algorithm.** A computer program with a complex set of rules to translate speech into digital signals.

**Voice Writer.** A speech-activated word processor, currently under development, that can convert words to typed, formatted text.



Continued from p. 17.

rely on the context of words, however. The complexity of this task, so effortlessly accomplished by the human brain, significantly increases the amount of computer memory necessary to make the system fast enough to be practical.

A continuous-recognition program must include the rules of English grammar and syntax, because the system will have to predict the word most likely to come next. Understanding the context of natural language is a problem still debated by cognitive psychologists, and represents a formidable task for the computerist, given the huge number of word-combination possibilities to be cross-referenced.

In the technology of voice recognition, *linear predictive coding* is the science of assigning a probability value to the next event. For example, in the sentence, "Let's go to the . . .," only a limited number of possible answers can satisfy the blank. We might say "store" or "movies," but wouldn't be likely to use "doorknob." A linear predictive system assigns a probability value to each word in the context of the preceding phrase, and the machine waits for a member of a select group of words to complete the sentence.

To add to the difficulty, any voice-recognition system we build must function in the real world of confusing homonyms, bad grammar, loud noises, common colds, regional slang, and foreign accents. And an unlimited-vocabulary, continuous system will have to do all its processing in "real time"—one-tenth of a second per phrase—to be of any practical use in the real world.

### Looking to the Future

What do speech-recognition computerists see as the future of this technology?

A number of companies, including Thomas Watson Labs and Kurzweil Speech Systems, are currently engaged in serious competition to develop a voice-activated word processor, a speaker-independent, continuous-speech recognition system. The "voice writer" will translate spoken input directly into neatly typed text. Its vocabulary will be in the tens of thousands of words, and it will have sufficient computing power and speed to recognize a variety of speech patterns and accents. These corporate projects are aiming at a completion time of less than five years. The "voice writer" is

expected to have a serious impact on the business scene when it hits the open market. And clean copy will no longer belong solely to fast touch-typists.

In general, the cost of voice-recognition hardware will continue to go down, with the stepped-up mass production of chips such as the SP-1000 (see the sidebar on the Lis'ner system for Apple II computers). The natural course of increasing miniaturization and integration will hasten this trend.

These advancements are already apparent. A typical voice-recognition system built in 1982 with a 100-word vocabulary sold for about \$2000, while units with ten times the word capacity retailed for nearly \$10,000. Today you can have the same capability for less than \$300. In the next two to three years, we can look forward to faster, more reliable speech-recognition boards in the \$100 to \$200 price range. Many of these new systems will have the capacity to respond to a number of selected speakers. And it is reasonable to expect the development of a speaker-independent voice-recognition board with a nearly unlimited vocabulary in the next three to five years.

In the electronics labs of Silicon Valley, engineers are working on a board with a series of fast parallel microprocessors, a megabyte or two of RAM, and a programmable ROM to hold the templates—Hal's baby brother. A state-of-the-art voice-recognition board will incorporate principles of artificial intelligence to accomplish its tasks with sufficient speed and accuracy: The ideal system will have the ability to learn along the way. The user will "teach" it the basics at start-up, then the machine will take over, continually updating its PROM-based dictionary as it asks its owner to repeat unfamiliar words and phrases. The key to the real advancement of voice-recognition technology is just this: A speaker-independent, continuous-speech recognition system will have to "know" quickly that it has run across a new word or phrase and be able to notify the user that its PROM requires modification.

The skills of many professionals—the computer programmer, the electronics engineer, the linguist, the cognitive psychologist—will blend in the search for the most intelligent voice-recognition system we can create. Complete replication of our own innate capacity to understand the spoken word—language, a uniquely human ability—is *not* the primary

goal. But we can create a tool that will interact with us in a familiar way, help us work, help us learn, help us learn about the process of learning, perhaps. No, the real Hal hasn't arrived on the scene yet, but he's well on his way. ■

Write to Joseph J. Lazzaro at P.O. Box 524, Revere, MA 02151.

## Product Information

### Lis'ner 1000

Micromint  
561 Willow Avenue  
Cedarhurst, NY 11516  
(800) 635-3355  
(800) 645-3479  
\$189 and up

Reader Service Number 447

## Additional VR Products

### Chatterbox

Voice Learning Systems  
29 Elle Ridge Lane  
Department B  
Boulder, CO 80302  
(800) 531-5314  
\$295 and up

Reader Service Number 448

### IntroVoice I and II

The Voice Connection  
17835 Sky Park Circle  
Suite C  
Irvine, CA 92714  
(714) 261-2366  
\$595-\$795 (I)  
\$795-\$995 (II)

Reader Service Number 449

### Voice Driver

Voice Recognition Systems  
550 Battery Street  
Suite 1716  
San Francisco, CA 94111  
(415) 788-2007  
\$995

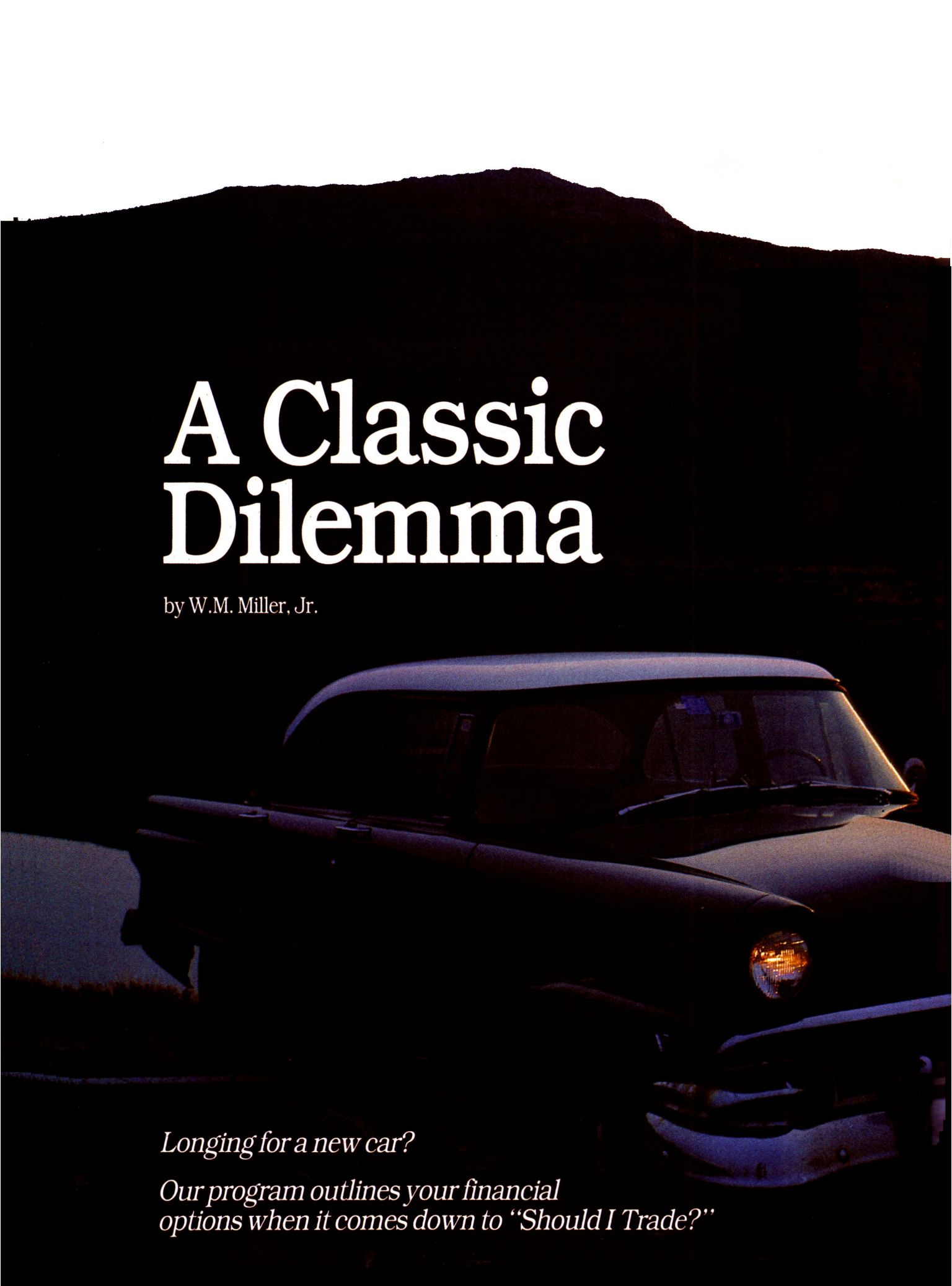
Reader Service Number 548

### Voice Master

Covox  
675-D Conger Street  
Eugene, OR 97401  
(503) 342-1271  
\$119.95

Reader Service Number 547





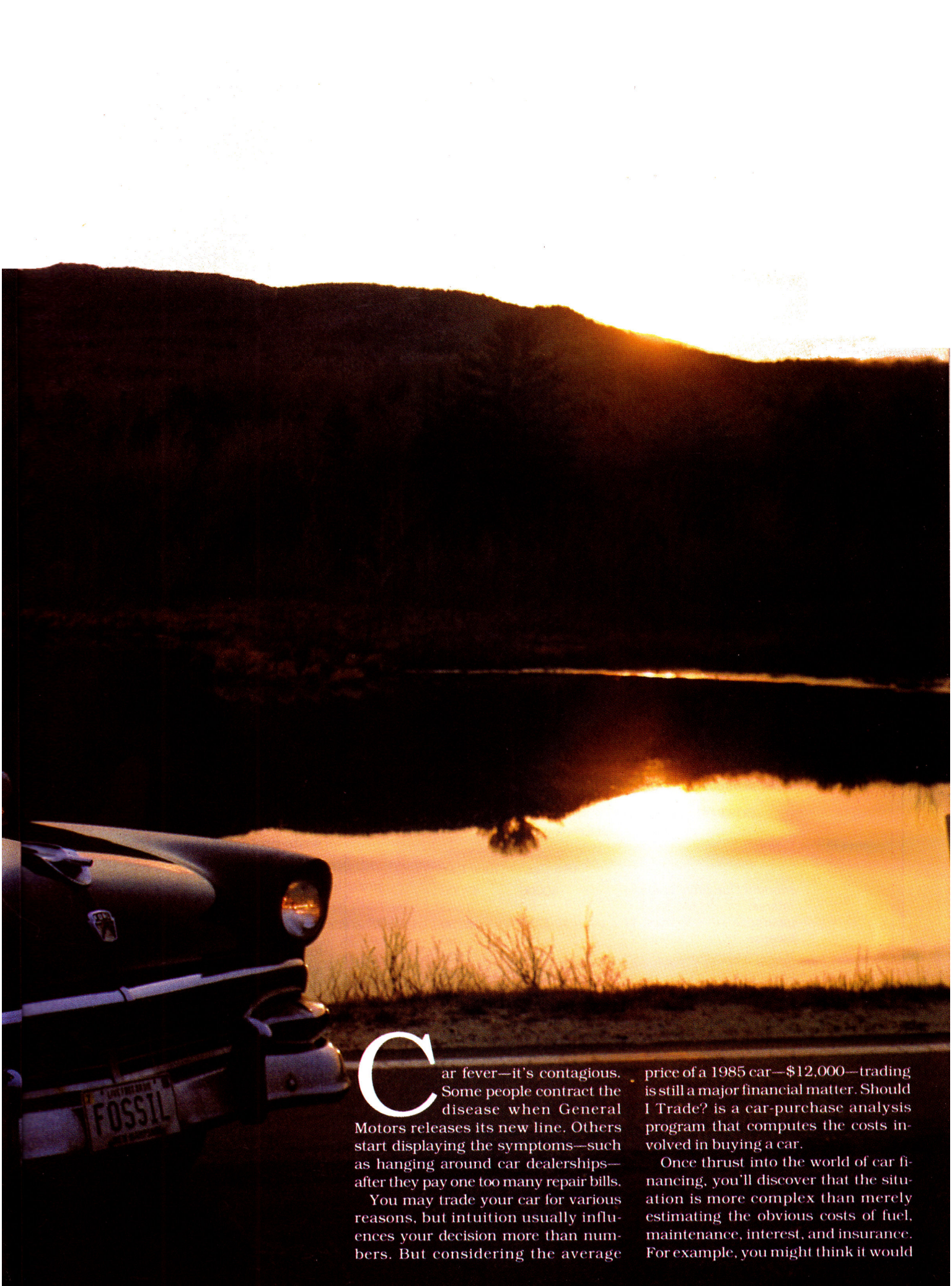
# A Classic Dilemma

by W.M. Miller, Jr.

*Longing for a new car?*

*Our program outlines your financial options when it comes down to "Should I Trade?"*





**C**ar fever—it's contagious. Some people contract the disease when General Motors releases its new line. Others start displaying the symptoms—such as hanging around car dealerships—after they pay one too many repair bills.

You may trade your car for various reasons, but intuition usually influences your decision more than numbers. But considering the average

price of a 1985 car—\$12,000—trading is still a major financial matter. Should I Trade? is a car-purchase analysis program that computes the costs involved in buying a car.

Once thrust into the world of car financing, you'll discover that the situation is more complex than merely estimating the obvious costs of fuel, maintenance, interest, and insurance. For example, you might think it would



**Table 1.** Sample printout for economics of trading a car.

Miller Associates  
6744 Ransome Drive  
Baltimore, MD 21207  
(301) 944-0708

1-18-85

**ECONOMICS OF TRADING CAR**

**Prepared for:**

W.M. Miller, Jr. 6744 Ransome Drive Baltimore, MD 21207

**Assumptions:**

1. Price—Regular Gas:	\$1.05
2. Price—Nolead Gas:	\$1.10
3. Inflation—Gas:	8%
4. Inflation—Maint.:	6%
5. Interest—Savings:	9%
6. Interest—Finance:	12%

**Present Car:**

Model Year and Make—Present Car: 80 Pontiac  
Mileage on Present Car: 64000  
Miles/Gallon—Present Car: 18  
Miles Driven per Year: 12000  
Expected Trade-in Value of Old Car: \$4000  
Gas Type: Nolead  
Insurance—Old Car: \$350  
License Tags—Old Car: \$20

**New Car:**

Price of New Car: \$12000  
Estimated Miles/Gallon—New Car: 22  
Miles Driven per Year: 12000  
Gas Type: Nolead  
Payment Method: Financing—36 Months  
Insurance—New Car: \$350  
License Tags—New Car: \$20

**FINANCING INFORMATION**

Monthly Payments	\$265.71
Total Principal	\$8000
Total Interest	\$1565
Total Paid	\$9565

**Table 2.** Sample printout comparing five-year costs of old car and new car.

**COST OF BUYING AND OWNING NEW CAR**  
(Compared With Cost of Keeping Old Car)

	Cost Over Next 5 Years	
	Old Car	New Car
Amount Due After Trade	\$0000	\$8000
Interest	0	1565
Insurance	1750	1750
License	100	100
Maintenance	2840	1223
Fuel	4300	3518
Interest Penalty on Purchase	0	3516
Interest Penalty on Other Costs	2168	1576
Total	\$11158	\$21248
Trade-in Value After 5 Years	\$2110	\$5066
Cost for 5 Years	\$9048	\$16182

Buying new car will cost \$7134 more than keeping old car over the next 5 years.  
This amounts to \$1426 per year.

**Note:**

This analysis is based in part on predictions of future costs. Since these predictions can't be made with absolute assurance of their accuracy, and because we can't possibly program in some of the peculiarities of costs unique to some situations, Miller Associates cannot be responsible for actions taken as a result of information furnished. However, extensive efforts have been made to provide you a sound economic basis for your decision on trading your car.

be more expensive to buy a new car than to stick with the old jalopy. Down the line, however, the new car will be worth more than the old one after the same length of time. But you also must keep in mind that if you paid cash for the new car, the money expended would have drawn interest in a savings account had you not bought the car. This is called an interest penalty, and it's a legitimate cost. The interest penalty applies to all car expenses, whether you trade or not, and should be calculated for a valid comparison.

Should I Trade? computes these costs and presents the results in a neat summary printout (see **Tables 1** and **2**). Should I Trade? can help you become an informed car consumer—and you can save thousands of dollars if you take the most economical route. The program runs on the Apple //e, //c, and II Plus with 48K of memory. It also requires one disk drive and a printer capable of printing in 80 columns.

**Test Drive**

You must supply the Should I Trade? program with information about your present car and the proposed new car. The program then computes the costs of each over the next five years. By subtracting the projected trade-in value of each car at the end of five years, the program gives you the bottom line, the net five-year cost, each way. **Tables 1** and **2** illustrate typical program printouts.

Type in the **Program listing** and save it to disk under TRADE. (Refer to Beginner's Cookbook on page 94 for directions on typing in inCider's programs.) To run the program, enter the command RUN TRADE. Don't use a write-protected disk, because you'll need to add data to it. The program creates text files as you run it, and modifies them when you change headers and customized parameters.

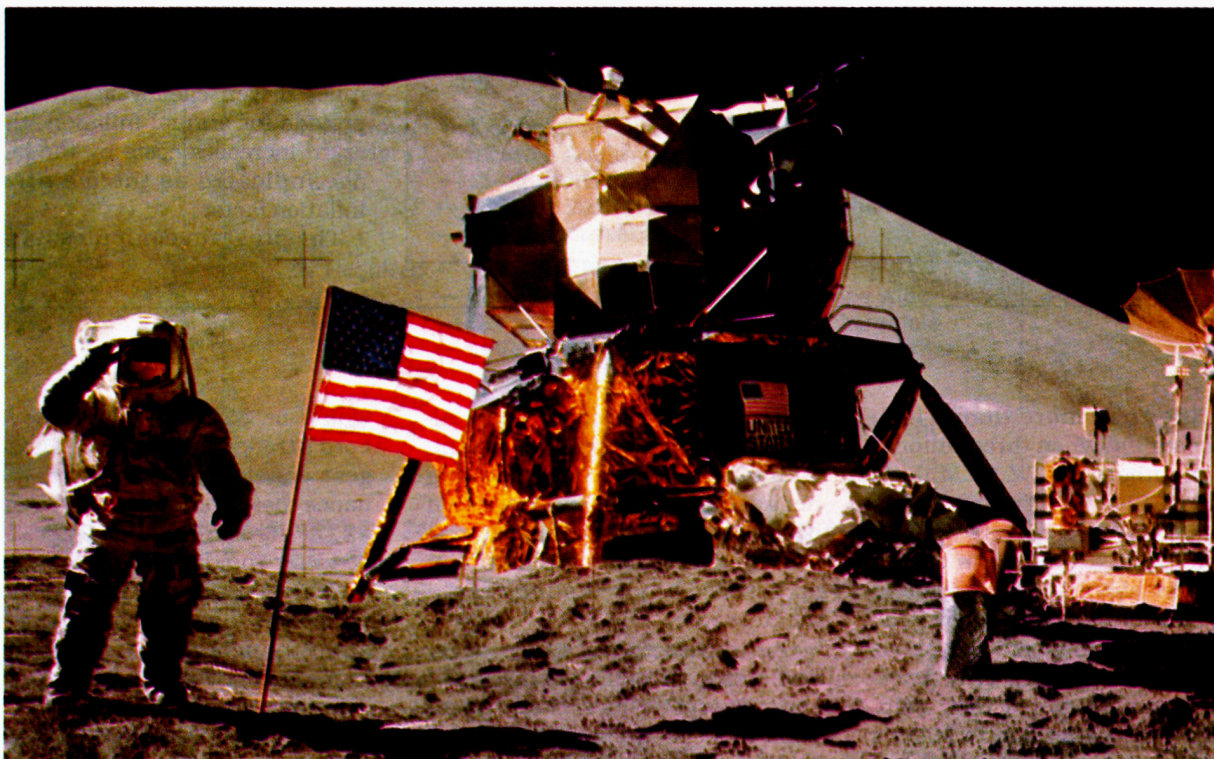
From the main menu (see **Table 3** for an explanation of the listed options), select option 1. The program prints out the values of its preprogrammed parameters (gas prices, gas and maintenance inflation rates, and savings and financing interest rates) in the paragraph labeled "Assumptions." Decide which factors you want to change for subsequent runs. (Parameters you create or change with option 3 are saved to disk for future runs.)

**Calculating the Worth of Your Car**

While some of the program's calculations are apparent, others involving maintenance, fuel, interest penalties,



# THE AMERICAN WAY TO THE TOP



This July 4th, we at Applied Engineering hope that all Americans will take time out to ponder who and what we are.

It is hoped that we can remind ourselves what it means to be an American.

We invented the telephone, the electric light, the phonograph, and the airplane. Americans invented the first vacuum tube, transistor and the integrated circuit, without which the personal computer would have been impossible. Over 95% of the world's new inventions are invented by Americans. We lead the world in all phases of technology; electronics, physics, chemistry, health science, space and robotics. We've sent men to the moon, landed a robot on Mars, and sent our probes out across the galaxy! Americans by their very nature are inventors, thinkers, winners and doers.

America is a country where two young men started a company in their garage and three years later Apple Computer is the industry leader. Applied Engineering started much the same way and we became the leading Apple peripheral manufacturer, with no outside sales force, no marketing strategy,

and no commissioned sales people.

Our business plan at Applied Engineering is simple. BE THE BEST. That means producing tomorrow's peripherals today, it means hard work, high quality, total dedication to Apple Computer and good service at competitive prices.

While some other guys are losing the ball game... we're adding to our roster. In the past few months, we've added 3 new products to our line up for a total of 21 and we're working on more. We've added more order lines and more knowledgeable people to serve you.

While others look to the Orient for solutions to their engineering and manufacturing problems, we at Applied Engineering feel differently because we know America's inventive past and her inventive future and we're excited.

To quote Dr. Robert Goddard in a letter to H. G. Wells, "There can be no thought of finishing, for 'aiming at the stars,' both literally and figuratively, is a problem to occupy generations, so that no matter how much progress one makes, there is always the thrill of just beginning."



**APPLIED ENGINEERING**  
"We Set the Standard"



**Table 3.** *Should I Trade?* menu options.

Option	Explanation
1) Run with Preprogrammed Parameters	Runs the program using built-in parameters such as gasoline costs and interest rates. Program contains default values for these parameters, to be used if you don't specify your own.
2) Run with Customized Parameters	Runs the program using your customized parameters.
3) View, Create, or Change Parameters	Lets you view the preprogrammed parameters, and create or change customized parameters.
4) Put Your Name on Printout	Replaces author's company address with your name and address.
5) Quit	Returns you to BASIC.

totals, trade-in values, and five-year costs aren't as clear-cut. Should I Trade? incorporates these figures into the program based on the elementary information you provide on price, mileage, and financing.

Maintenance costs are *all-inclusive*, covering preventive maintenance, corrective maintenance, and tires. A formula computes expenses that reflect growing maintenance costs as the odometer reading and the number of miles driven each year increase. To provide for annual inflation, the program increases costs by the percentage indicated as the maintenance inflation factor.

The program computes fuel costs  
*Continued on p. 56.*

## Keep It!

*inCider* had more than a tech check in mind when three editorial staff members ran W.M. Miller's program, *Should I Trade?* Purely inquisitive—and perhaps partly selfish—motives led them to find out if they should, in fact, trade in their cars for something new. One late afternoon (after reading about 8.8 percent financing), these hard-working souls devoted their valuable time and attention to Miller's program.

A little background first:

Lafe Low, Assistant Editor. Drives a 1956 Ford Mainline he inherited from his grandfather five years ago. The "FOSSIL," as its license plates read, has accompanied Lafe on numerous road trips and instilled immeasurable pride, but repair costs—a couple thousand dollars' worth—have made him think about buying a new car.

Cindy Carr, News Editor. Absolutely adores her 1983 Plymouth Turismo, her symbol of independence, her first car, her pride and joy. But after an anonymous encounter in Peterborough's infamous A&P parking lot and almost 30,000 miles racked up on the odometer, she's wondering if she'll get more by trading it now instead of waiting until next year.

Bob Ryan, Technical Editor. Often seen driving to Adams Field for a softball game in his copper-colored 1979 Chevy C-10 van. Emma, as she is affectionately known, has helped almost everyone in town, including half the *inCider* editorial

staff, move to new apartments. Although Emma has been a constant, faithful companion, she is showing her age. Bob admits he "done that poor van wrong," but imposing repair bills have drained his wallet and eroded any remaining sentimental value.

Our threesome visited a local car dealership to price their "new" cars. Everyone picked the latest 1985 models—no second-hand vehicles for this crew. Lafe chose a \$12,000, four-speed Jeep Cherokee that gets an estimated 20 miles per gallon. Cindy stepped up to a Chrysler Laser Turbo with sunroof and an estimated 21 miles per gallon for \$15,560. Bob selected a Plymouth Voyager SE, five-speed, with tinted glass and 23 miles per gallon—\$11,500. Each prospective buyer used Miller's car-purchase program to help decide whether to take a new four-wheeled friend home.

Should I Trade? required standard information about their respective cars, such as gas mileage, maintenance costs, yearly mileage, and insurance rates. The program uses this input to calculate comparison costs. All three editors followed the same parameters for inflation rate, gas prices, savings interest rate, and finance rate. While Lafe and Bob own their vehicles, Cindy still owes her firstborn to the bank, so she adjusted her program parameters accordingly.

The results? The program indicated Lafe's monthly payments

would be \$256.33, given his '56 Ford's trade-in value alone. His biggest consideration was maintenance costs over the next five years: \$2227 for the Ford, compared to \$640 for the Jeep. But Lafe won't trade the Fossil: "The program does not consider sentimental value. . . and, financially, I don't need to [trade the car]." A new used car is a definite possibility for Lafe, as he plans to restore the antique Fossil.

"I guess I'd better not get my heart set on that Laser," Cindy decided after reading her printout. The monthly payments, \$289.29, were too steep for her budget. She's still thinking about trading her car, but it will have to be for a lower-priced model.

"One thing this program shows you is that you'll never pay less," Bob notes. But his car analysis indicated he would pay only \$150 a month for a new Voyager. Of the three, Bob started out as the least likely to buy a new car. Should I Trade? has him leaning in the other direction. "The actual difference is less than five bucks a day. Big deal. So I don't go to Nonie's for lunch. So I don't drink beer. . . naa," he remarks. "Seriously, is five bucks a day such a sacrifice? That's the price you pay."

So if you happen to pass by *inCider*'s Elm Street offices and see a silver, 1985 Voyager with tinted glass parked out front, you'll know who has W.M. Miller to thank. □

—Cynthia K. Carr  
*inCider* staff



# AppleWorks Power!

//e Memory to 1.5 Megabytes

//c Memory to .5 Megabytes

## AppleWorks on the II+

- 1. Maximum Memory** — Expand the //e to 1.5 megabytes and get massive AppleWorks desktop space
  - 16-bit microprocessor CPU port
  - 256K or 512K add-on memory for the //c
  - User upgradeable at any time
- 2. Required Video** — See AppleWorks run on the II+
  - See spreadsheets up to 160 columns wide
  - On screen underlining and bold characters
  - Letter quality characters from the typewriter now on screen
- 3. Preferred Features** — Made in the U.S.A.
  - Superb quality backed by a 5 year warranty
  - Power saving designs

## MULTIVIEW™

### AppleWorks Now On The II+

The best selling program for the //e is now available for all Apples. MultiView is the first video card to offer AppleWorks versions 1.0, 1.1, and 1.2 for over one million Apple II, II+, and Apple compatible computers.

An AppleWorks configuration program is included at no charge with each MultiView to run AppleWorks on the II+ (or //e) using MultiView's 80×24 letter quality screen display.

MultiView does more than just run AppleWorks. MultiView displays razor sharp 80×24, 80×32, 80×48, 96×24, 132×24, 132×30, and 160×24 screen sizes on any standard monochrome monitor.

Super spreadsheets are possible as 132 or 160 character wide screens can show more than 12 months of financial figures on one screen without scrolling! Try a wide screen size with your favorite spreadsheet (VisiCalc, Multiplan, FlashCalc, MagiCalc, etc.) and you'll never want to go back to anything else.

Apple Writer and other word processors can also use MultiView's larger screen sizes to show on screen exactly what a printout will look like... no matter if elite or condensed type is printed. Even the newest ProDOS versions of Apple Writer // can work on the II+ and compatibles with our Apple Writer preboot — another first!

MultiView includes: function keys, an Applesoft line editor, screen dump, and optional light pen and international enhancements.

## MULTIRAM™

### Megabytes of Memory

MultiRam stops "Desktop Full" frustrations AppleWorks users experience using ordinary //e 64K fixed memory expansion cards.

MultiRam //e is expandable from 64K to ¾ megabytes using 64K and/or 256K RAM chips. Add a ¾ megabyte extension card that also offers RGB video and MultiRam //e expands to a full 1.5 megabytes. MultiRam C comes in 256K and 512K versions and is installed without messy soldering or jumpers in the Apple //c.

Each MultiRam card includes a desktop space expansion program allowing maximum memory use and ram fast speed for AppleWorks.

MultiRam //e doesn't stop with just more memory for today's programs. MultiRam is built for 16 bit processing power with an exclusive CPU port permitting direct linear memory addressing, up to 1.5 megabytes, by processors from the 8086, 68000I and 65816 processor families. A 16 bit coprocessor card will soon be available for MultiRam.

MultiRam's 64K minimum configuration retails at a pleasing \$159.95 with memory upgrades available.

## Now Available At Your Local Computer Dealer



### Checkmate Technology, Inc.

509 South Rockford Drive • Tempe, Arizona 85281-3021  
(602) 966-5802 U.S.A.

(800) 325-7347

Telex: 165-025 CEC PHX

ALL PRODUCTS MADE IN THE U.S.A. — EXCLUSIVE 5 YEAR WARRANTY

Copyright ©1985  
CHECKMATE TECHNOLOGY, INC.  
All rights reserved

Apple is the registered trademark of Apple Computer, Inc.  
Apple Writer, AppleWorks, Applesoft, and ProDOS are trademarks of Apple Computer, Inc.  
FlashCalc is the trademark of VisiCorp, Inc.  
MagiCalc is the trademark of Artsci, Inc.  
Multiplan is the trademark of Microsoft  
VisiCalc is the trademark of Software Arts, Inc.

Circle 227 on Reader Service Card.



# There's only one newsstand in the entire world offering you this selection of great computer publications.



## You're holding it.

That's right; you can get them all here. **And at discounts.** So browse. Whether you're new to computers, an experienced home/professional user or "in the business": order yours, today!

- ☐ **Computerworld.** If you manage information, you can't manage without your own subscription. \$39 gets you 51 issues, plus 10 Special Focus publications. Save \$5.
- ☐ **PC World.** The one publication that will grow with your growing PC needs. Helps you analyze financial/accounting data, manage complex projects, communicate results and plan. Now 12 issues for only \$17.97; you save \$5.78.
- ☐ **InfoWorld.** The only way to stay on top of what's happening is by getting the **only** personal computing newsweekly. Authoritative. Objective. Easy to read. \$29.58 for 51 issues . . . only 58¢ an issue.
- ☐ **inCider.** The Apple journal . . . and the **only** magazine devoted exclusively to the Apple family of computers. \$24.97 for 12 monthly issues. Save 30% off the cover price.
- ☐ **Macworld.** The world's most creative computer demands a journal that's just as simple, powerful and fun: *Macworld*. Now 12 issues of this attractive, easy-to-read publication can be yours for only \$24 (you save \$6).
- ☐ **HOT CoCo.** Keep the color in your life all year long with *HOT CoCo*, the magazine specifically created for the TRS-80 color computer and MC-10 user. \$24.97 for 12 months. Save 30% off the cover price.
- ☐ **80Micro.** Don't risk being an uninformed TRS-80 user. Get current, unbiased, system-specific information from the largest, most knowledgeable TRS-80 source. \$24.97 for 12. Save 48% off the cover price.
- ☐ **RUN.** The informative (and fun) Commodore 64/Vic-20 monthly. Comprehensive software/hardware reviews, action-packed games and timely tips to help you get the most out of your system. \$19.97 for one year: 43% off the cover price.
- ☐ **Micro Marketworld.** Selling? Twice a month, get in-depth reviews/forecasts to keep **ahead** of consumer trends/market needs. FREE if you qualify.

☐ **On Communications.** Bypass, teleconferencing, CATV: each month, explore the major developments shaping our communications world. FREE to qualified applicants.

### TO ORDER:

Check the publications you want above, then fill in below, and return this page to:

CW Communications/Inc.  
Circulation Department  
Box 880  
Framingham, MA 01701

Name \_\_\_\_\_  
(Please print or type.)

Title \_\_\_\_\_

Company \_\_\_\_\_

Nature of Business \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_

Telephone ( ) \_\_\_\_\_

Address shown is: ☐ Home ☐ Business

☐ Bill me.

☐ Payment enclosed (make check payable to "CW Communications/Inc.").

☐ Send information about foreign rates.

Please allow 6-to-8 weeks for your first issue.

### Your Money-Back Guarantee

If for any reason you're ever dissatisfied with your subscription, simply request a refund for all unmailed issues.



**CW COMMUNICATIONS/INC.**

375 Cochituate Road, Box 880  
Framingham, MA 01701  
(617) 879-0700

6C09-12-IC07



# INCREDIBLE DATABASE VALUE

*VersaForm is ideal for business because it's based on the way you do business now — your own forms and ledgers.*

## **Powerful, Flexible, Versatile — This is a FULL DATABASE at a Fantastically Low Price!**

Everyone knows how effective a database can be. But until now, they've either been powerful but hard to use, or just simple personal filing systems.

Now VersaForm has made the database both powerful AND easy to use. Because it's based on your own knowledge of business forms, you can tailor it to your own needs. And because it's a full-featured database, it can do the jobs that lightweights just can't handle.

### **Proven In Thousands of Offices**

For over 3 years, VersaForm has been used by manufacturers, bankers, doctors, farmers, and many others. It's THE program for serious business tasks such as invoicing, inventory, and purchasing — in fact, for whatever you've been doing using paper forms and ledgers.

### **VersaForm can:**

- Prevent errors by checking entries before accepting them, according to rules you set up. Saves on operator training!
- Save time by doing calculations automatically.
- Print on existing pre-printed forms — yours or the government's.
- Sort on any item, indexed or not.

- Store up to 4,000 characters in each record, up to 4,000,000 bytes per file.
- Produce the reports you need to manage your business.

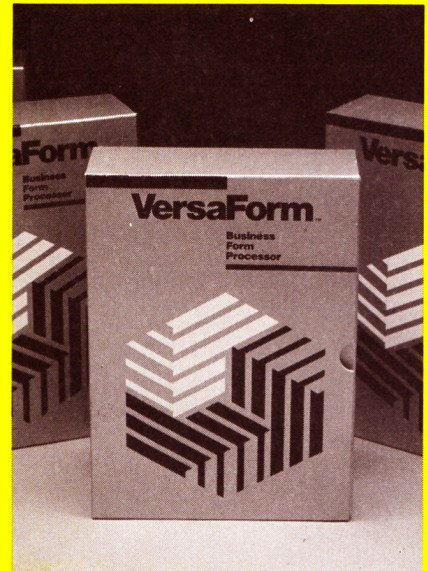
### **30 Day/1 Year Guarantee**

- If you're not fully satisfied with VersaForm, return it within 30 days and we'll refund your money.
- Upgrade to our multi-file system, VersaForm XL, within one year, and get Full Credit for the price!

We've SLASHED our prices so you can get to know VersaForm! But hurry — these low prices won't last forever!

### **BONUS OFFER**

Order now and receive your choice of Application Templates for only \$24.95 each (regularly up to \$49.95) — or two for just \$44.95! Choose from Invoicing, Purchase Orders, Mailing List, Check Writing, Cash Receipts, or Expense Journal.



Compare at over

**\$300.**

Now just

**\$69**

Multi-File version \$99  
(IBM PC Only)

Note: Prices subject to change after 60 days.



Credit card members can order by phone.

**Toll-Free: 1-800-824-8145**

In California, call:

**Toll-Free: 1-800-854-4448**

APPLIED SOFTWARE TECHNOLOGY  
1350 DELL AVE. STE. #206  
CAMPBELL, CA 95008  
(408) 370-2662

### **Applied Software Technology**

1350 Dell Ave., Ste. #206 Dept. IC, Campbell, CA 95008

Yes! RUSH me VersaForm for the IBM PC (\$69) \_\_\_\_\_

\* Apple II (+,e,c) (\$69) \_\_\_\_\_

VersaForm XL (MULTI-FILE) for the IBM PC (\$99) \_\_\_\_\_

Your application templates sound GREAT! I understand they cost just \$24.95 each, or \$44.95 for two. Send me the ones I've checked:

Invoicing \_\_\_\_\_ Purchase Orders \_\_\_\_\_ Expense Journal \_\_\_\_\_

Check Writer \_\_\_\_\_ Mailing List \_\_\_\_\_ Cash Receipts \_\_\_\_\_

Enclose check or money order with coupon. Include \$4.50 for U.S. postage and handling, \$7.00 for C.O.D. California residents add 6.5% tax.

\_\_\_\_ My check or money order is enclosed.

Charge my: \_\_\_\_\_ MasterCard \_\_\_\_\_ Visa \_\_\_\_\_ C.O.D.

Acct. No.: \_\_\_\_\_ Expires: \_\_\_\_\_

PLEASE PRINT CLEARLY

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone \_\_\_\_\_ Sign here \_\_\_\_\_

\* APPLE II — 64K, 2 DRIVES.

IBM — 2 DRIVES OR HARD DISK. 128K for VersaForm, 196K for XL.



# Any Port

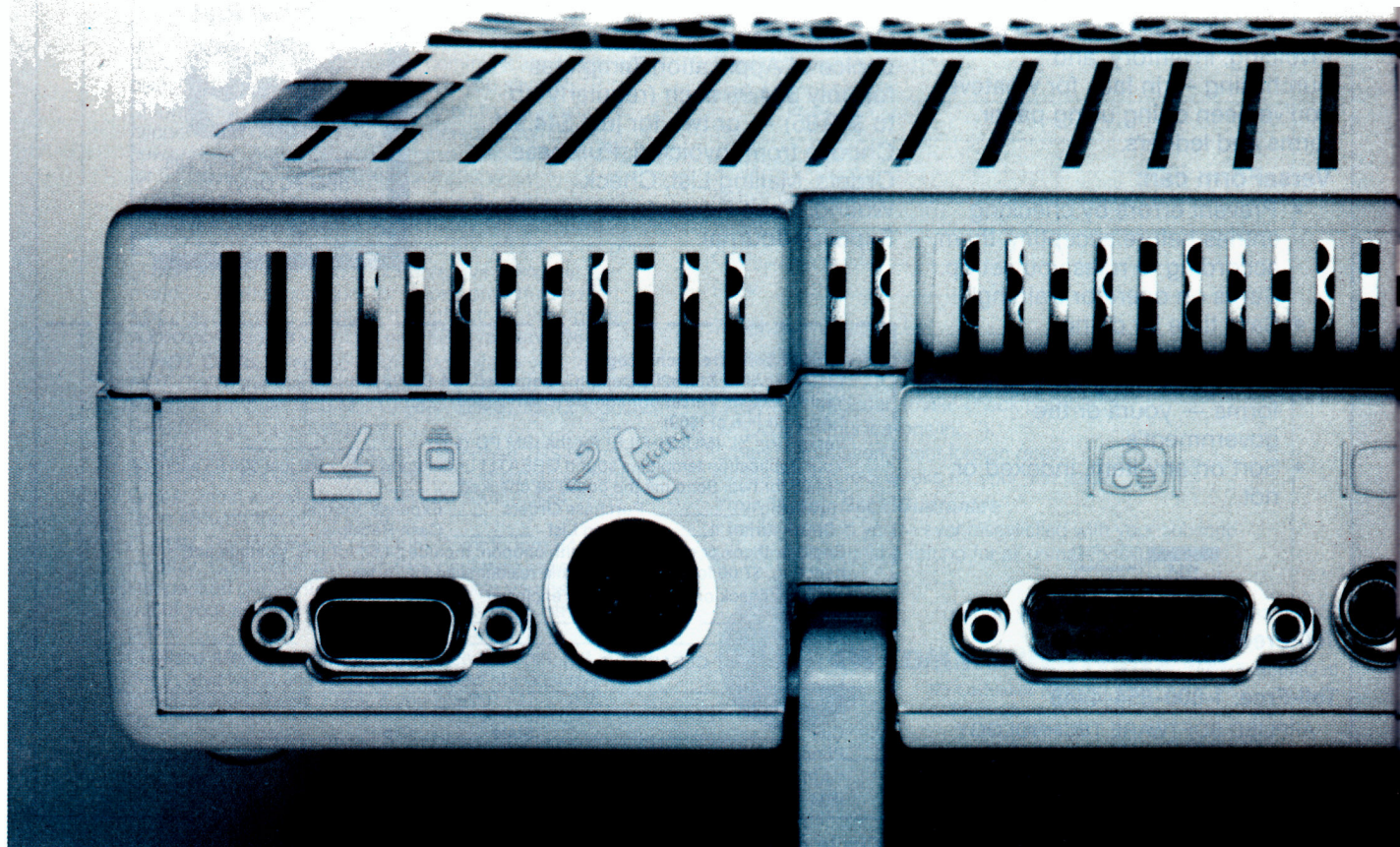
by Jack Higbie

*Learn how to configure*

**Y**our Apple //c's twin RS-232 ports are its link to the world outside—to a printer or plotter, to a remote computer via a modem, even to another computer hooked to it by cable. If you can set the appropriate parameters—the encoded values that describe the form of the data your computer is transmitting through its ports—your //c can drive any serial device.

Currently, there are three ways to configure your //c's serial ports. My purpose is to present a fourth. At the same time, I hope you will learn something about the inner workings of your computer.

The first way to configure your serial ports is simply to turn on your computer. The default configuration (discussed below) is loaded from ROM whenever you apply power to your computer. The second method is to use the System Utilities disk. It's a slow process, but the configuration will survive any type of reboot short of turning your computer off. The third method available to you is to configure the ports "on the fly," by sending them configuration codes after they have been activated with a PR#1 or a PR#2. It's fast, but you have to resend the configuration to the ports every time you activate them.





# in a Storm

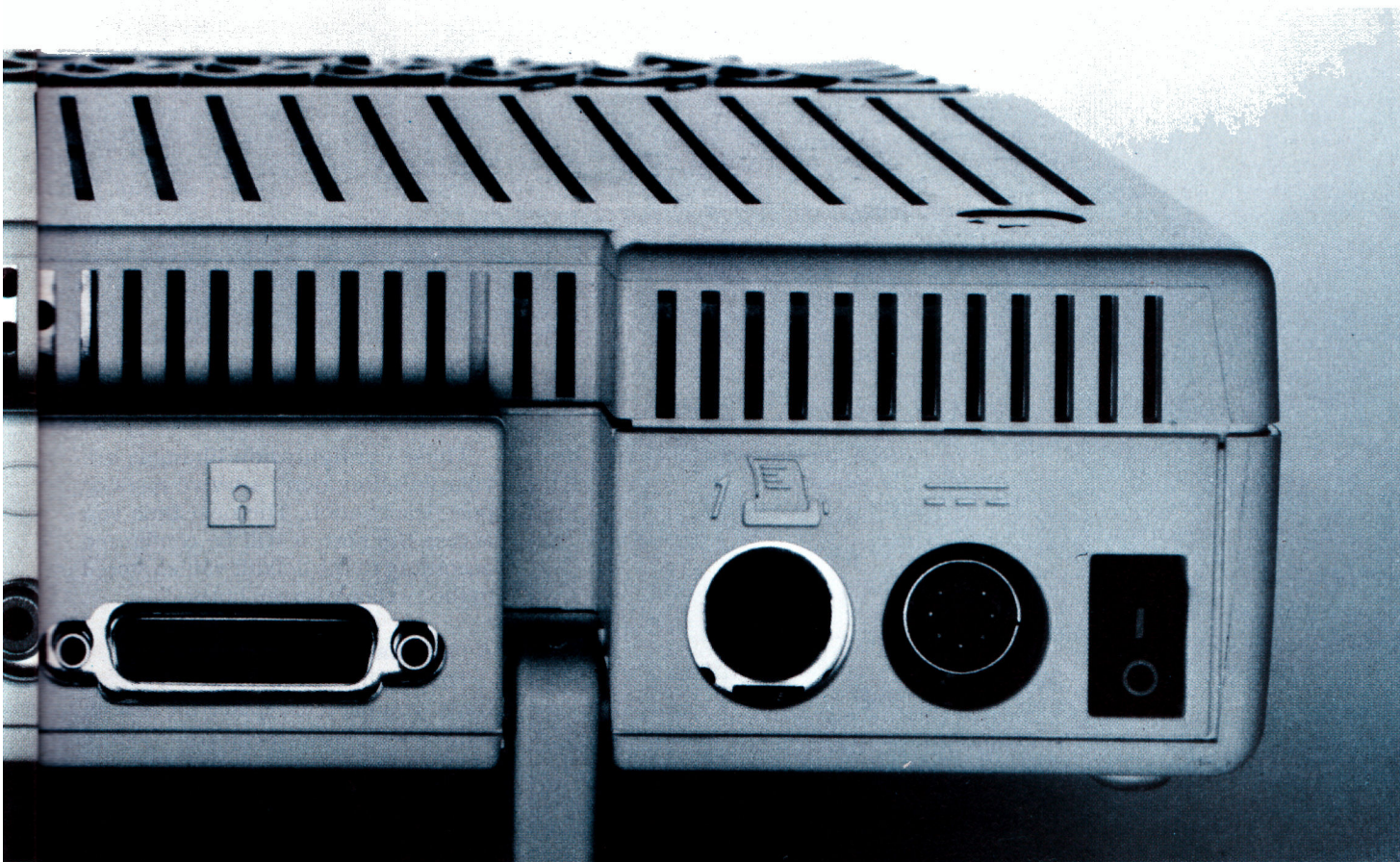
*your //c's serial ports for DOS 3.3.*

The method I present will permit you to configure the ports without resorting to the laborious System Utilities disk, yet the resulting configuration will survive all forms of reset except turning your computer off.

Let's look at your //c's default configurations. The upper 64K of RAM in your //c, the *auxiliary memory*, contains an area allocated for the text-screen display called text page 1X. Part of it is unused, however; this area is called the *screen-holes* region. When you turn your //c on, port configuration programs stored in ROM load the default parameters (values preset at the factory) into the screen holes in

the page 1X region. The default values are "permanent" in the sense that they are always loaded into RAM whenever you turn on the computer—they're protected from all forms of reset, including a forced "cold start" (pressing the open-apple/control/reset key combination).

Four bytes are allotted to each serial port for its collection of parameter values. When you activate a serial port by typing in PR#n, 2 bytes set the control and command registers of that port's ACIA chip (the asynchronous communication interface adapter, a 6551-type chip), and the other 2 bytes are transmitted to screen holes in





**Table 1.** Configuration commands for port 2. For port 1, change control-A to control-I.

Commands	Description
Control-A T	Enter terminal mode
Control-A I	Echo to screen
Control-A L	Issue line feed after carriage return
Control-A R	Reset port and exit
Control-A nnB*	Set baud rate
Control-A nP	Set parity
Control-A Z	Zap ignore further commands, do not format output (no carriage return)
Control-A Q	Quit terminal mode
Control-A N	No echo
Control-A K	Kill line feed after carriage return
Control-A S	Issue BREAK
Control-A nD	Set data format
Control-A nnnN	Line length, no echo

\*All n's are decimal values.

**Table 2.** Codes for baud rate, data format, and parity.

Baud Rate		Data Format (Data bits/stop bits)	Parity
nnB*		nD*	nP*
(1) 50	(9) 1800	(0) 8/1	(0,2,4,6) none
(2) 75	(10) 2400	(1) 7/1	(1) odd
(3) 109.92	(11) 3600	(2) 6/1	(3) even
(4) 134.58	(12) 4800	(3) 5/1	(5) mark(1)
(5) 150	(13) 7200	(4) 8/2	(7) space(0)
(6) 300	(14) 9600	(5) 7/2	
(7) 600	(15) 19200	(6) 6/2	
(8) 1200		(7) 5/2	

\*n's indicate the values in parentheses.

**Table 3.** Auxiliary-memory and main-memory screen-hole values.

#### Auxiliary-Memory Screen Holes (default values in parentheses)

##### Port 1

\$478 (\$9E) — \$C09B ACIA Control register	dddc bbbb	data, clock, baud
\$479 (\$0B) — \$C09A ACIA Command register	pppx xxxx	parity
\$47A (\$40) — \$0779	elxx xxxx	echo, line feed, communications
\$47B (\$50) — \$0579		line length

##### Port 2

\$47C (\$16) — \$C0AB ACIA Control register	dddc bbbb	data, clock, baud
\$47D (\$0B) — \$C0AA ACIA Command register	pppx xxxx	parity
\$47E (\$01) — \$077A	elxx xxxx	echo, line feed, communications
\$47F (\$00) — \$057A		line length

#### Main-Memory Screen Holes

Port 1	Port 2	Description
\$479	\$47A	Reserved
\$4F9	\$4FA	Reserved
\$579	\$57A	Line length
\$5F9	\$5FA	Temporary storage
\$679	\$67A	Bit 7 set while parsing command
\$6F9	\$6FA	Command control character (control-I, control-A)
\$779	\$77A	elxx xxxx echo, line feed, communications
\$7F9	\$7FA	Current column

main memory (the //c's lower 64K of RAM).

Examination reveals the following default configurations:

**Port 1:** 9600 baud, 8 data/2 stop bits, no parity, no echo, carriage return/line feed, control-I

**Port 2:** 300 baud, 8 data/1 stop bits, no parity, no echo, no carriage return, control-A

### A Temporary Fix

You can reconfigure the ports from within a program or from the keyboard by issuing a command control character—control-I for port 1 (the printer port) and control-A for port 2 (the communications port). The command control character serves to get the port's attention. The port responds by displaying a flashing question mark on screen, and interprets the next characters you type as configuration commands (see **Table 1**). You can change the command control character for a particular port by typing the new value immediately after the current one. For example, if you want to change control-A to control-V, enter control-A control-V.

If your //c is using a modem to talk to another computer, either modem can control your //c port, as well. Control-T from your modem puts your //c into terminal mode (indicated by a flashing underline cursor), and control-A Q means "quit" terminal mode. Control-R from the remote device also takes your //c out of terminal mode.

**Table 2** shows baud (data transmission) rate, data format (bit types: data and stop bits), and parity codes (for error detection). If you want to set your port for 300 baud, 7 data bits followed by 2 stop bits, and space parity, for example, you would type in control-A 6B (choice 6 under baud) control-A 5D (choice 5 under data format) control-A 7P (choice 7 under parity). From inside an Applesoft BASIC program, the command string would be:

```
10 PRINT CHR$(1) + "6B" + CHR$(1) +
    "5D" + CHR$(1) + "7P"
```

These configuration changes are volatile—they don't survive reset or port deactivation. The next time you access the port, it will be configured according to the default values stored in the auxiliary screen holes.

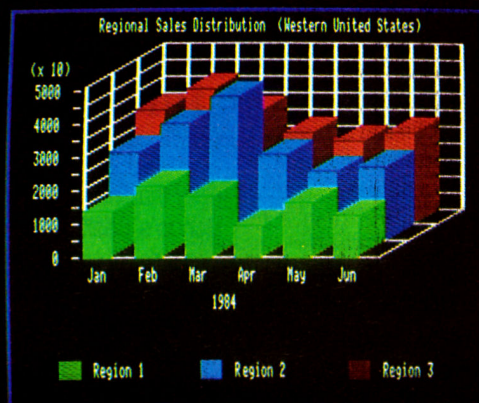
### A "Permanent" Patch

To reconfigure the ports on a lasting basis, you need to replace the default values with new ones. The System Utilities disk will accomplish this, but it is infernally slow. What you need is

*Continued on p. 34.*



# BEST COLOR TALENT IN THE SCREEN BUSINESS



*video7*

*video7*

## Critics' Choice

The favored nominee for "Best Color on any Apple™ II Screen": Professional Color™ from Video 7™!

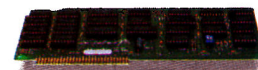
The name of the technology is "RGB," the highest standard in computer color.\*

**Professional Color, and the "Big Screen," too**

Playing the dual role of "RGB" and "80-column text," Professional Color gives screen performance that's especially vivid and alive.

## An Original Screenplay

Video 7 is the author of Apple's own RGB interface. So for Professional Color on your Apple II screen, get a V-Color™ card from Video 7. Call (800) 238-0101 (In California, (408) 943-0101) for the dealer nearest you.



\*"RGB" (red, green, blue) is also the color standard of the IBM PC. Apple is a registered trademark of Apple Computer, Inc. V-Color, Video 7 and Professional Color are trademarks of Video 7, Inc.

Circle 152 on Reader Service Card.

*video*  
**7**



Get  
3 Never-  
Before Published  
Bonus Programs FREE!

# Announcing hotCider

A ready-to-run, menu-driven disk loaded with the greatest Apple II\* software programs from inCider magazine.

## Best programs

hotCider was developed by inCider's technical editors Bob Ryan and Kerry Lanz. Together, they've assembled twelve of the very best programs ever submitted to inCider. There are programs for business, home management, education, entertainment, and graphics all on a high-quality floppy disk.

## Best offered

You get the best inCider has to offer. Standouts such as: **VisiData**—a unique list handler that works like a spreadsheet.

**Poster Printer**—say anything you would like to in a BIG way with your printer.

**Rembrandt**—discover your hidden talent as an artist with this drawing program.

**Wizfix**—a fun utility that gives you control of Wizardry game character development.

**Doing Windows**—create Macintosh-style windows on your Apple II.

**ProCAT**—a great ProDOS catalog utility.

## Unpublished programs

In addition to these and other outstanding inCider programs YOU'LL GET THREE PREVIOUSLY

UNPUBLISHED PROGRAMS. **Cider Zap**. A full featured utility that lets you examine and edit data right from the disk.

**Bongo's Bash**. Bongo the gorilla is trapped in a maze full of bananas. But watch out for the robot sentries! **Sector**

**Mapper**. Displays DOS 3.3 sector usage. A great companion to Cider Zap. That's three commercial quality programs that have never been seen before! And hotCider also includes its own documentation booklet.

## Available in May

hotCider Volume I will be available beginning in May at just \$21.47. That's just a fraction of what you would pay for one of these programs if they were commercially available elsewhere. And coming in October... look for hotCider Volume II!

To get your disk, simply fill out the coupon or attached order card with payment and drop it in the mail today. For faster service, call **TOLL FREE 1-800-258-5473** or in New Hampshire call 1-924-9471.

**YES!** I want the great taste of Apple II programming with hotCider. Send me hotCider Volume I on disk for \$21.47.

☐ Payment Enclosed ☐ MC ☐ Visa ☐ AE

Card No.

Exp. Date

Signature

Name

Address

City

State

Zip

7-85C

Prices include postage and handling. Foreign airmail please add \$1.50 per item. US funds drawn on US banks only.

**hotCider • 80 Pine St. • Peterborough, NH • 03458**



\*Apple and the Apple logo are registered trademarks of Apple Computer, Inc.



# \* SUMMER SALE \*

## APPLE\* MODEMS

by Prometheus

New 300/1200 Baud 212A Telephone Modem for your Apple II, II+ and IIe. Just plug in - Hayes compatible!

**PM1200A... \$299.95**

## MAC PAC for your Macintosh

Includes: ProModem 1200 external modem, cable and software.

**MAC PAC... \$369.95**

## OPTION SPECIAL!

Lowest Price!

Includes options processor, display and 64K buffer.

**PM-Special... \$169.95**

## Additional Apple Products

**Apple Cooling Fan** for Apple II, II+ and IIe

**APF-1... \$39.95**

## Switching Power Supply

for Apple II, II+ and IIe

**KHP4007... \$59.95**

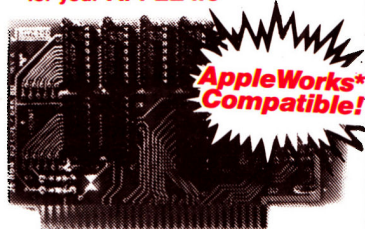
## SALE!

**12" Monochrome Green Monitor** for **APPLE II, II+, IIe & IIc**

- Excellent resolution
- 80 character x 24 line display format
- Complete with tilt/swivel monitor stand!

**MON-12G \$79.95**

## 80-Column plus 64K RAM for your APPLE IIe\*



**AppleWorks\* Compatible!**

Now you can double the memory capacity and get an 80-column display format for your APPLE IIe\* computer at an affordable price. Just plug the JE864 card into your APPLE\* and expand your display to 80 characters per line. Perfect for word processing. The JE864 also features 64K bytes of additional memory to allow programming not possible with standard APPLE IIe\* computers. Complete documentation included.

**Board:** High density board design squeezes 64K bytes of RAM onto a 2 1/2" x 4 1/2" board - Fully tested to assure proper operation.

**Uses:** Word processing - displays 1000 more characters per screen - Extra memory allows running of extremely large programs - Ultra High Resolution Graphics capability.

**JE864... \$79.95**

Mail Order Electronics - Worldwide  
**Jameco ELECTRONICS**

**Serving the Computer Enthusiast Since 1974**

# QUALITY COMPUTER PRODUCTS FOR APPLE II, II+, IIe, IIc and Macintosh\*

## APPLE\* Compatible CARDS



ASSC-P

Key:

a = Apple II or II+  
b = Apple IIe

## 16K RAM Card (Language Card)

The ARC-16K RAM Card allows the Apple\* II and II+ computers to expand from 48K to 64K. Complete with instructions. Key: (a)

**ARC-16K... \$39.95**

## Z-80 CP/M Card

The AZ80-1 is Soft-card compatible. Used with CP/M related programs. Key: (a,b)

**AZ80-1... \$49.95**

## EPROM Burner Card

The AEB-2 allows user to program and work with standard EPROMs (2716, 2732 & 2764). Easy to use, on-board firmware. Menu contains the following options: Write, Read, Copy, Compare, Blank-Check and Monitor. Complete with instructions. Key: (a,b)

**AEB-2... \$69.95**

## 80-Column Card w/Soft Switch

The A80-C is an 80-column card designed for the Apple\* II and II+ computers. The card is equipped with a soft switch which allows easy hookup for any monitor. The A80-C also features inverse video capabilities. This card is similar to the Videx\*\*\* 80 column card. Complete with instructions. Key: (a)

**A80-C... \$74.95**

## Super Serial Card

The ASSC-P is a serial card with a printer mode. It generates standard RS-232C signals and is similar to the Apple\* Super Serial Card. Complete with instructions. Key: (a,b)

**ASSC-P... \$99.95**

## APPLE™ Compatible 5 1/4" Disk Drive and Controller Card



- Uses Shugart SA390 mechanics
- 143K formatted storage
- Color matches Apple Computer
- Works with Apple Controller or other Apple-compatible controllers (ACC-1)
- Complete with connector - just plug into your disk controller card
- 35 tracks
- Size: 6" W x 3 1/2" H x 8-9/16" D
- Wt.: 4 1/2 lbs.

**ADD-514 (Disk Drive) \$149.95**

**ACC-1 (Controller Card) \$49.95**

## APPLE™ Compatible 5 1/4" Half-Ht. Disk Drive



- Uses Chinon Pinch-type mechanics
- 163K unformatted
- 35 tracks
- Super quiet
- Works with Apple Controllers or other compatibles (ACC-1) above
- Complete with connector - just plug into your controller
- Size: 5 1/4" W x 1 3/4" H x 8" D
- Wt.: 4 lbs.

**ADD-12... \$159.95**

## APPLE™ IIc Compatible 5 1/4" Half-Ht. Disk Drive

- Same specs as ADD-12 (above) except no controller necessary.

**ADD-IIc... \$169.95**

**NEW!**

## APPLE Keyboard and Case for Apple II and II+\*



Part No.	Description	Price
KB-EA1	Apple Keyboard and Case...	\$134.95
KB-A68	68-Key Apple Keyboard only...	\$ 79.95
EAEC-1	Expanded Apple Enclosure Case only...	\$ 59.95

### KEYBOARD (KB-A68):

- 68 Keys
- 15-Key Keypad
- Direct connection with 16-pin ribbon connector
- Special functions on number keys, including cursor controls, color demo, and one-touch disk catalog
- Metal baseplate for durability (with 6 mounting holes)
- Color (keys): white/grey
- Size: 14 1/2" L x 5 1/2" W x 1 1/2" H

### CASE (EAEC-1):

- Accommodates KB-A68
- Pop-up lid for easy access
- Fits power supply and motherboard too
- Size: 15 1/2" W x 16" D x 4 1/4" H

**Special Functions!**

## Numeric/Auxiliary Keypad for your APPLE IIe\* VisiCalc\*\* Users!



The JE614 is a newly introduced numeric/auxiliary keypad for the APPLE IIe.\* It offers the flexibility of a 10-key pad and the convenience of 23 directly accessible functions. Screen manipulating functions make word processing a snap and cursor controls make the keypad ideal for VisiCalc\*\* users. The JE614 Keypad is housed in a durable metal enclosure and is color-coordinated with your APPLE IIe computer. Operation of the keypad can begin within minutes from unpacking. Special functions include: Home, Clear, Clear to End of Screen, Scroll-Up, Scroll-Down, Tab, Delete, Left, Right, Up and Down. Each key has auto-repeat. Size: 5 1/2" L x 4-3/16" W x 1 1/4" x 2 1/4" D.

**JE614... \$49.95**

\$10.00 Min. Order - U.S. Funds Only  
Calif. Residents Add 6 1/2% Sales Tax  
Shipping - Add 5% plus \$1.50 Ins.  
Send S.A.S.E. for Monthly Sales Flyer!

Send \$1.00 Postage for your  
**FREE 1985 JAMECO CATALOG**  
Prices Subject to Change



Mail Order Electronics - Worldwide  
**Jameco ELECTRONICS**



**1355 SHOREWAY ROAD  
BELMONT, CALIFORNIA 94002**

**Phone Orders Welcome (415) 592-8097**

**Telex No. 176043**

7/85

\*APPLE, APPLE II, II+, IIe, IIc and Macintosh are registered trademarks of APPLE Computers  
\*\*VisiCalc is a registered trademark of Visi Corp. Inc.  
\*\*\*Videx is a registered trademark of Videx Inc.



a fast method of changing the values in the auxiliary screen holes.

**Table 3** contains the default-configuration values and auxiliary screen-hole addresses (given in hexadecimal notation). Other addresses of interest include the ACIA status register—\$C099/\$C0A9 (hard-wired); and the transmit/receive register—\$C098/\$C0A8 (port 1/port 2). The communications port uses page 8 (\$800–\$8FF) of the auxiliary memory as an input/output buffer, so information there will be overwritten.

The important thing in configuring the serial ports is to get the proper values into the auxiliary screen holes. That's where my program comes in.

If you put the short Applesoft routine I present (see the **Program listing**) at the beginning of a program that accesses the serial ports, or on a separate disk as a preboot, the routine will POKE new values into the auxiliary screen holes, thereby setting the new port "defaults" you specify. Here's how it works.

First, the routine accesses the auxiliary text page (page 1X) by POKEing

the 80STORE soft switch (location \$C001 hex, 49153 decimal), and the PAGE2 soft switch (location \$C055 hex, 49237 decimal). When finished, the program returns things to normal by POKEing the companion locations of these soft switches in line 100.

Lines 20–50 set port 1, and lines 60–90 set port 2. You can delete either set of lines if you wish to set only one port.

To demonstrate how you would configure a port, assume you want to set the default for port 2 to 1200 baud, 7 data/2 stop bits with space parity, automatic line feed after carriage returns, and a line length of 40 characters. You would first delete lines 20–50 from the routine and proceed as follows:

- Line 60 sets the data format and baud rate. Consulting **Table 2**, you find that the 7/2 data format is the fifth data-format entry. The number five, therefore, describes the data format you desire. Note that 1200 baud is the eighth entry under baud rate. Therefore, the number eight describes the baud rate you want.

From **Table 3**, you find that the data format/baud byte takes the form *dddc*

*bbbb*, where *ddd* describes the data format, *c* determines the clock bit (*c* is always 1 unless you are using an external clock), and *bbbb* describes the baud rate. Now you plug in the appropriate numbers. The number five (describing data format) is 101 in binary, so *ddd* equals 101. As mentioned, *c* equals 1. The number eight (describing baud rate) is 1000 binary, so *bbbb* equals 1000. Putting it all together, *dddc bbbb* equals 1011 1000. This bit pattern produces hex number \$B8, which is equivalent to 184 decimal. Consequently, to configure port 2 to the 7/2 data format and 1200 baud, line 60 should read:

```
60 POKE 1148,184 : REM port 2, data
    format, baud rate
```

- Space parity is the seventh entry in the parity section of **Table 2**, and thus *ppp* (from **Table 3**) equals 111 (the binary equivalent of 7). The rest of the bit pattern (*x xxxx*) is always 0 1011, so the total pattern for space parity is 1110 1011 (*pppx xxxx*). This equals \$EB hex, or 235 decimal. The value 235, therefore, is POKEd into location 1149 in line 70.

- For the echo/line-feed/communications byte, you indicate no echo by setting bit 7, the leftmost bit, to zero. You establish a line feed by setting bit 6 equal to one. Since you plan to use the port to drive a modem, set the communications bit (bit 0) to one. The remaining bits in the byte are zero—this yields the bit pattern 0100 0001—*clxx xxxx*—\$41 hex, 65 decimal; put 65 into line 80.

- To get an output line length of 40 characters, simply put 40 into line 90. The port will automatically produce a carriage-return character after every 40 characters. If you want unformatted output (no automatic carriage returns), this control byte should be zero (the default value for port 2, as **Table 3** shows). Incidentally, if you specify a zero line length using the control character command control-A ON, you actually get a line length of 255 characters. The only way to get a true zero line length is to POKE zero into \$47F (1151 decimal) or main-memory location \$57A (1402 decimal).

With the example above in mind, you should be able to determine the proper values to put into the program for any configuration you want.

### Applications

In most applications, you can insert the patch in the **Program listing** into the start-up program to configure the

## Binary/Hex/ Decimal Conversions

Notice that the default value for port 1 is \$9E; its composition is indicated by the string *dddc bbbb*. The first 3 high-order bits (*ddd*) contain the code for data format: For \$9E, that's 100 in binary (\$4 hexadecimal and 4 decimal). Looking at the data format in **Table 2**, note that the fourth entry is the format 8/2—8 data bits followed by 2 stop bits. The 4 low-order bits (*bbbb*) contain the baud designation—1110 binary, \$E hexadecimal, 14 decimal. Again from **Table 2**, the 14th entry under baud is 9600 baud.

Hexadecimal notation is convenient because memory addressing is organized on this basis. For those not familiar with this number system, hex numerals 0–9 represent their decimal equivalents, and the letters A through F the decimal numbers 10–15, respectively. Each hex position has a value 16 times that of the position immediately to the right of it (just as in decimal no-

tation the value of each position is ten times that of the one to the right). For example, the hex number \$C0A9 is 49,321 in decimal notation (a dollar sign preceding a number indicates hex):

$$\begin{aligned} \$C0A9 &= (12 \times 4096) + (0 \times 256) + \\ &\quad (10 \times 16) + (9 \times 1) = 49,321 \end{aligned}$$

In binary notation the value of each position in the number is two times greater than that of the position to its right—reading right to left, 1, 2, 4, 8. The binary number 1001 is \$9 in hex, or 9 in decimal:

$$\begin{aligned} 1001 &= (1 \times 8) + (0 \times 4) + (0 \times 2) + (1 \times 1) = \\ &= 9 = \$9 \end{aligned}$$

Likewise, the binary number 1110 is \$E hex, or 14 decimal:

$$\begin{aligned} 1110 &= (1 \times 8) + (1 \times 4) + (1 \times 2) + (0 \times 1) = \\ &= 14 = \$E \end{aligned}$$

Combining the numbers from the two previous examples produces the binary number 1001 1110. Note it is equal to \$9E hex (1001 1110 = \$9E). □

—J.H.

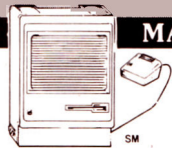


# CONROY-LA POINTE<sup>SM</sup> INC.

#NN21

All Rights Reserved © 1984 by Conroy-LaPointe, Inc.

TELEX 910 380 3980

ALL MAIL: Conroy-LaPointe, Inc.,  
12060 SW Garden Place, Portland, OR 97223ORDER NOW (800) 547-1289  
FOR YOUR APPLE

## MACINTOSH

## COMPUTERS

## BUSINESS SOFTWARE

## UTILITIES SOFTWARE

	LIST PRICE	CONROY PRICE
ASSIMILATION, Turbo Touch	\$ 129	\$ 89
BLUECHIP, Millionaire, Barron, Tycoon, ea.	\$ 60	\$ 37
CENTRAL POINT, Copy II Mac or MacTools, ea.	\$ 40	\$ 24
CONROY-LA POINTE, Diskettes, 10 pak, SS/DD, w/Flip-Pak	\$ 80	\$ 25
CONTINENTAL, Home Accountant	\$ 100	\$ 65
CREATIVE SOLUTIONS, MacForth Level I	\$ 149	\$ 95
CREIGHTON, Home Pak or Mac Office, ea.	\$ 39	\$ 26
Mac Spell+	\$ 99	\$ 60
CSD, MacLion	\$ 379	\$ 239
DOW JONES, Market Manager Plus	\$ 249	\$ 159
EXPERTTELLIGENCE, ExperLogo	\$ 150	\$ 95
FIRST BYTE, Smooth Talker	\$ 150	\$ 95
FORETHOUGHT, Fact Finder	\$ 150	\$ 95
HABA, DS/DD Ext. Disk Drive, 800K	\$ 550	\$ 479
HAYDEN, Sargon III	\$ 50	\$ 31
HUMAN EDGE, Mind Prober	\$ 50	\$ 29
INFOCOM, Hitchhiker's Guide	\$ 40	\$ 25
INNOVATIVE, Flip-n-File, 40	\$ 30	\$ 19
KOALA, Mac Vision	\$ 400	\$ 229
LIVING VIDEOTEXT, Think Tank	\$ 145	\$ 83
LOTUS, Jazz	\$ 595	\$ 395
MEGAHAUS, Megafiler	\$ 195	\$ 125
MegaMerge	\$ 125	\$ 80
MICROSOFT, Business Pak	\$ 595	\$ 395
Multiplan, Word, or File, each	\$ 195	\$ 125
MILES, Mac the Knife, v. 1	\$ 39	\$ 25
MONOGRAM, Dollars & Sense	\$ 150	\$ 89
NOVATION, Smartcat Plus Modem w/Software	\$ 499	\$ 349
ODESTA, Helix	\$ 395	\$ 259
PENGUIN, Graphics Magician	\$ 50	\$ 32
PROVUE, Overvue	\$ 295	\$ 185
SIMON & SCHUSTER, Typing Tutor III	\$ 60	\$ 37
SOFTW. PUBL., PFS: File & Report Combo	\$ 175	\$ 105
SOFTWARE ARTS, T/K Solver	\$ 249	\$ 159
STATE OF THE ART, Electronic Checkbook	\$ 80	\$ 50
STONEWARE, DB Master	\$ 195	\$ 125
TELOS, File Vision	\$ 195	\$ 115
WARNER, Desk Organizer	\$ 149	\$ 99

## FLOPPY DISK DRIVES

	LIST PRICE	CONROY PRICE
MICRO-SCI, A2 Disk Drive, 143K	\$ 345	\$ 169
A2 Controller Card	\$ 100	\$ 60
Half Height Drive for Ite	\$ 269	\$ 169
Half Height Drive for Ite	\$ 299	\$ 189
RANA, Elite I, 163K, 40 Track	\$ 299	\$ 189
Elite Controller	\$ 145	\$ 79
TEAC, T40 Half Ht, 163K, Direct	\$ 249	\$ 169
Controller Card for T40 by ComX	\$ 79	\$ 45

## HARD DISKS

QUARK, QC10 for Ite/IteII/MAC	\$1995	\$1595
-------------------------------	--------	--------

## OTHER HARDWARE

CCS, 7711 or 7710-A Interface, ea.	\$ 115	\$ 85
CPS/EASTSIDE, Wild Card II (copier, +/e)	\$ 140	\$ 79
COMX, 16K RAM Card (II +), 1 yr ltd wty	\$ 119	\$ 29
HAYES, Mach II, III Joysticks (II +/Ite)	\$ 90	\$ 65
KENNINGTON, System Saver Fan	\$ 90	\$ 65
KEY TRONIC, KB200 Keyboard (+)	\$ 298	\$ 179
KOALA, Muppet Keys	\$ 80	\$ 44
Touch Tablet w/Micro Illustrator (+/e)	\$ 130	\$ 75
KRAFT, Joystick (II/I +/Ite)	\$ 50	\$ 35
MICRO-SCI, 80 Col. Card + 64K RAM Card (Ite)	\$ 199	\$ 89
MICROSOFT, Premium Softcard (Ite)	\$ 395	\$ 275
ORANGE MICRO, Buffered Grappler Plus, 16K	\$ 209	\$ 159
16K Buffer Board for Grappler Plus	\$ 99	\$ 59
PCPI, Applicard, 6 MHz, 14 features	\$ 375	\$ 250
RH ELECT., Super Fan II w/surge protector	\$ 89	\$ 59
TITAN, Accelerator Ite	\$ 319	\$ 219
128K RAM Card (II +)	\$ 269	\$ 189
TRACKHOUSE, Numeric Key Pad (Ite)	\$ 100	\$ 50
TG, Select-a-Port	\$ 40	\$ 26
VIDEO 7, V Color 7 RGB Card	\$ 150	\$ 99
V Color Ite	\$ 200	\$ 139
V Color Ite	\$ 250	\$ 169
VIDEX, UltraTerm (II +/Ite)	\$ 379	\$ 229
VideoTerm 80 Col. Card (II +/Ite)	\$ 279	\$ 175
WICO, Smartcard (spec. II/I +/Ite)	\$ 199	\$ 159

	LIST PRICE	CONROY PRICE
ALS, Word or List Handler, ea.	\$ 80	\$ 36
Handler Pak (Word/List/Spell)	\$ 170	\$ 73
APPLE, Appleworks	\$ 250	\$ 215
ASHTON-TATE, dBase II (Req CP/M 80)	\$ 495	\$ 289
BPI, AR, AP, PR or INV, each	\$ 395	\$ 240
BRODERBUND, Print Shop	\$ 50	\$ 29
Print Shop Graphics Library	\$ 25	\$ 18
Bank St. Writer or Speller, ea	\$ 70	\$ 45
Bank St. Combo (Writer & Speller)	\$ 140	\$ 85
DOW JONES, Market Manager	\$ 249	\$ 159
Market Analyzer or Microscope, ea.	\$ 349	\$ 219
HOWARD SOFT, Tax Preparer '85	\$ 250	\$ 165
HUMAN EDGE, Sales or Mgmt Edge, ea.	\$ 250	\$ 165
LIVING VIDEOTEXT, Think Tank	\$ 145	\$ 89
MECA, Managing Your Money	\$ 199	\$ 125
MEGAHAUS, Megaworks	\$ 125	\$ 80
MICRO PRO, WordStar	\$ 350	\$ 189
WordStar w/ Starcard	\$ 495	\$ 265
WordStar Professional, 4 Pak	\$ 495	\$ 265
MailMerge, SpellStar, or StarIndex, ea	\$ 99	\$ 54
InfoStar and StarCard Combo	\$ 595	\$ 295
MICROSOFT, Multi-Plan (Ap DOS)	\$ 95	\$ 62
QUARK, Word Juggler & Lexicheck (Ite/Ite)	\$ 189	\$ 129
SENSIBLE, Sensible Speller	\$ 125	\$ 79
SIERRA/ON-LINE, Screen Writer II	\$ 130	\$ 79
SOFTWARE PUBL., PFS:File or Write, each	\$ 125	\$ 79
PFS:Graph or Report, each	\$ 125	\$ 79
SPRINGBOARD, Newsroom	\$ 50	\$ 32
STONEWARE, DB Master, v. 4 +	\$ 350	\$ 225

	LIST PRICE	CONROY PRICE
EPSON, Graphics Dump	\$ 15	\$ 7
FUNK, Sideways	\$ 60	\$ 37
HAYES, Terminal Pro for Smartmodem	\$ 99	\$ 65
MICROSOFT, Full Line IN STOCK		CALL
OMEGA, Locksmith	\$ 100	\$ 70
PENGUIN, Complete Graphics System II	\$ 80	\$ 49
Graphics Magician	\$ 60	\$ 40
QUALITY, Bag of Tricks	\$ 40	\$ 29
UNITED SWI, ASCII Express-The Pro	\$ 130	\$ 82
UTILICO, Essential Data Duplicator III	\$ 80	\$ 49

## HOME &amp; EDUCATIONAL

	LIST PRICE	CONROY PRICE
BEAGLE BROS., Full line IN STOCK		CALL
BRODERBUND, Print Shop	\$ 50	\$ 29
CONTINENTAL, Home Accountant	\$ 75	\$ 43
KOALA, Full line IN STOCK		CALL
MICROSOFT, Typing Tutor II	\$ 25	\$ 17
MONOGRAM, Dollars & Sense (Ite)	\$ 100	\$ 59
Dollars & Sense (Ite)	\$ 120	\$ 69
Forecast	\$ 60	\$ 38
SCARBOROUGH, Mastertyping	\$ 40	\$ 25
Build-A-Book	\$ 40	\$ 25
Your Personal Net Worth	\$ 80	\$ 50
SIERRA/ON-LINE, Homeworld	\$ 70	\$ 45
SIMON & SCHUSTER, Typing Tutor III	\$ 60	\$ 37
PLUS: BARRONS, CBS, DAVIDSON, EDU-WARE, HARCOURT, LEARNING CO., TERRAPIN		

## RECREATIONAL SOFTWARE

	LIST PRICE	CONROY PRICE
BLUECHIP, Millionaire or Barron, ea.	\$ 50	\$ 32
DATASET, Aztec or Zaxxon, ea.	\$ 40	\$ 27
ELECTRON. ARTS, Sky Fox & others, ea.	\$ 40	\$ 29
HAYDEN, Sargon III (Chess)	\$ 50	\$ 30
INFOCOM, Zork I, II, or III, ea.	\$ 40	\$ 25
ORIGIN, Ultima III	\$ 60	\$ 37
PENGUIN, Transylvania	\$ 35	\$ 24
SPECTRUM HOLOBYTE, Gato	\$ 40	\$ 25
SPINNAKER, FULL LINE IN STOCK		CALL
SUB LOGIC, Flight Simulator II	\$ 50	\$ 30
PLUS: BRODERBUND, DATAMOST, MUSE, SIR-TECH		

## UTILITIES SOFTWARE

	LIST PRICE	CONROY PRICE
BEAGLE, GPLE or Alpha Plot, ea.	\$ 50	\$ 27
Pronto DOS, Disk Quick, Ap. Mech. or I/O Silver, ea.	\$ 30	\$ 19
Full line IN STOCK		CALL
BORLAND, Turbo Pascal	\$ 55	\$ 33
3 Pak (Pasc, Turbo Tut, Toolbox) NEW	\$ 105	\$ 59
CENTRAL POINT Copy II Plus (dit copier)	\$ 40	\$ 23

## DISKETTES

## ★ CONROY-LAPOINTE™ DISKETTES ★

We guarantee these top quality products with our name.  
5 YEAR LIMITED WARRANTY.

10 ea. SS/SD, (Apple, etc) 35 Trk, W/FLIP BOX	\$ 12
100 ea. SS/SD, (Apple, etc) 35 Trk	\$ 99
1000 ea. SS/SD, (Apple, etc) 35 Trk	\$ 840
10 ea. SS/DD, 3 1/2" (MAC, H/P), W/FLIP BOX	\$ 25
50 ea. SS/DD, 3 1/2" (MAC, H/P)	\$ 115
100 ea. SS/DD, 3 1/2" (MAC, H/P)	\$ 229

## SINGLE-SIDED, DOUBLE DENSITY

	LIST PRICE	CONROY PRICE
CDC, 10 ea. SS/DD, 40 Trk (Apple, etc)	\$ 45	\$ 19
DYSAN, 10 ea. SS/DD, (Apple, etc)	\$ 40	\$ 27
MAXELL, 10 ea. SS/DD, MD1 (Apple)	\$ 47	\$ 19
VERBATIM, 10 ea. SS/DD, MD550i, (Apple)	\$ 49	\$ 19

## 3 1/2" MICRO DISKETTES

CONROY-LAPOINTE, 10 ea. DS/DD, w/Flip Box	\$ 29
MAXELL, 10 ea. SS/DD (MAC, H/P)	\$ 60
MEMOREX, 10 ea. SS/DD (MAC, H/P)	\$ 60
VERBATIM, 10 ea. SS/DD (MAC, H/P)	\$ 65

## ★ GENERIK DISKETTES ★

Top quality, w/jackets, no labels. Quantity discounts.  
90 day "No hassle, money back guarantee."

100 ea. SS/DD, 35 Track (Apple, etc)	\$ 80
--------------------------------------	-------

## MODEMS

	LIST PRICE	CONROY PRICE
ANCHOR, Signalman Mark XII	\$ 399	\$ 259
HAYES, 2400B External Modem	\$ 899	\$ 699
Smartcom II Software (IBM/MAC)	\$ 149	\$ 107
Smartmodem 1200 (External)	\$ 599	\$ 419
Microcom II w/Smartcom (AP)	\$ 329	\$ 239
NOVATION, Apple Cat II 300 Baud (AP)	\$ 389	\$ 219
212 Apple Cat, 1200 Baud (AP)	\$ 595	\$ 419
SmartCat Plus w/Software (MAC)	\$ 499	\$ 349
PROMETHEUS, 1200 Standalone Modem	\$ 495	\$ 345
ProModem 1200 w/Software (MAC)	\$ 549	\$ 429
ProModem 1200A (AP)	\$ 449	\$ 349

## MONITORS

	LIST PRICE	CONROY PRICE
AMDEK, Color 300 - Comp/Audio	\$ 349	\$ 249
Color 500 - Comp/VCR/RGB/Audio	\$ 525	\$ 375
Color 600 - Hi Res/RGB/Audio	\$ 599	\$ 399
300A - 12" Amber	\$ 199	\$ 135
300G, 12" Green	\$ 179	\$ 119
PRINCETON, HX-12 - Hi Res/RGB	\$ 795	\$ 489
SR-12 - Hi Res/RGB	\$ 799	\$ 599
QUADRAM, Amherchrome, 12"	\$ 250	\$ 159
ZENITH, ZVM122 - 12" Amber	\$ 159	\$ 95
ZVM123 - 12" Green	\$ 149	\$ 89
ZVM124 & ZVM 135	\$ 240	\$ 30% OFF

## CABLES

	LIST PRICE	CONROY PRICE
ASTAR, RF Modulator for T.V. (Apple)	\$ 35	\$ 20
COMPUCABLE, Mac/Hayes Smartmodem Cable	\$ 32	\$ 25
RCA, Monitor Cable	\$ 15	\$ 9

## PRINTERS

## DOT MATRIX:

	LIST PRICE	CONROY PRICE
APPLE, Imagewriter Laserwriter	\$6995	\$6500
EPSON, RX / FX Series - In Stock		CALL
LX80 - 100 cps DQ/16 cps NLQ	\$ 299	CALL
JX80 - Color Printer, 160 cps	\$ 699	CALL
LQ1500 - 200 cps DQ/67 cps LQ	\$1295	CALL
OKIDATA, Okimate 20 - Color, Hi Res	\$ 268	\$ 208
182 - 120 cps/80 col	\$ 299	\$ 239
92 - 160 cps/80 col/para.	\$ 499	\$ 399
93 - 160 cps/136 col/para.	\$ 799	\$ 639
2410 Pacemark - 350 cps/para.	\$2995	\$1975
PANASONIC, P1090 - 80 cps/10"	\$ 349	\$ 249
P1092 - 180 cps/10"	\$ 599	\$ 459
QUADRAM, Quadjet - Inkjet Color	\$ 895	\$ 395
STAR MICRO, SG10 - 120 cps DQ/30 cps NLQ	\$ 299	\$ 249
SG15 - 120 cps DQ, 30 cps NLQ, 16K	\$ 499	\$ 419
SD10 - 160 cps DQ, 40 cps NLQ	\$ 449	\$ 379
SD15 - 160 cps DQ, 40 cps NLQ, 16K	\$ 599	\$ 509
SR10 - 200 cps DQ, 50 cps NLQ	\$ 649	\$ 549
SR15 - 200 cps DQ, 50 cps NLQ, 16K	\$ 799	\$ 679
TOSHIBA, 351 - 288 cps	\$1895	\$1369

## LETTER-QUALITY:

	LIST PRICE	CONROY PRICE
JUKI, 6300 - 40cps/para.	\$ 995	\$ 795
6100 - 18 cps/para/3 pitch	\$ 599	\$ 439
Sheet Feeder for 6300 (single)	\$ 275	\$ 225
PANASONIC, P3151 - 22 cps/15 1/2"	\$ 699	\$ 539
TOSHIBA, Prop. spacing & hi-res graphics:		
1351 - 192 cps DQ & 100 cps LQ	\$1895	\$1369
1340 - 144 cps DQ & 54 cps LQ	\$ 799	\$ 619
Bi-direction Tractor Feed	\$ 195	\$ 175

## PRINTER INTERFACES AND BUFFERS

	LIST PRICE	CONROY PRICE
ASSIMILATION, Mac to Epson Conn I/F	\$ 89	\$ 69
Daisywheel Connection	\$ 99	\$ 79
EPSON, Parallel Interface for LQ1500	\$ 100	\$ 79
Serial Interface Board	\$ 130	\$ 110
MPC, Apple II I/F & Cable for Epson & Gemini	\$ 90	\$ 49
OKIDATA, Plug n' Play, Tractors, Okigraph, ea.	\$ 40	CALL
ORANGE MICRO, Grappler Plus for Apple	\$ 145	\$ 99
Serial Grappler	\$ 119	\$ 79
Buffered Grappler Plus, 16K	\$ 209	\$ 159
QUADRAM, Microfazers, full line IN STOCK		CALL
Microfazers 8K, P-P, w/copy	\$ 189	\$ 139
STAR MICRO, Serial I/F & Cable	\$ 144	\$ 119
Mac/Star Interface	\$ 100	\$ 89

## ACCESSORIES

	LIST PRICE	CONROY PRICE
CURTIS, Diamond, 6 outlets, switched	\$ 50	\$ 29
Emerald, 6 outlets, 6' cord	\$ 60	\$ 35
Ruby, 6 outlets, 6' cord, filter	\$ 90	\$ 52
Sapphire, 3 outlets, w/filter	\$ 80	\$ 46
EPD, Lemon, 6 outlets/wall	\$ 45	\$ 29
Lime, 6 outlets/cord	\$ 70	\$ 45
Orange, 6 outlets/cord	\$ 100	\$ 60
Peach, 3 outlets/wall	\$ 60	\$ 39
INNOVATIVE, Flip-n-File 50 (disk holder)	\$ 22	\$ 15
KENNINGTON, Printer Stand	\$ 30	\$ 19
NETWORX, Wiretree, 4 outlet, w/fit & surge	\$ 70	\$ 39
Wiretree Plus	\$ 100	\$ 59

**ORDERING INFO & TERMS:** MAIL TO: 12060 SW Garden Place, Portland, OR 97223 - Include telephone number. Check your figures for Shipping, Insurance and Handling (SHI). All items usually in stock. NO C.O.D. Cashiers checks, money orders, Fortune 1000 checks and government checks honored immediately. Personal and other company checks - allow 20 days to clear. Prices reflect 3% cash & Conroy-LaPointe Credit Card discount. No ADD 3% to above prices for VISA/MasterCard/American Express. Your cards NOT charged if we ship. Add SHI CHARGES: U.S. Mainland, 3% (\$5 minimum) for standard UPS ground; UPS Blue, 6% (\$10 min); for U.S. Postal APO or FPO or Alaska, 6% (\$10 min); Canada, 12% (\$15 min). Foreign orders except Canada, 18% (\$25 min). Monitors by Postal or to foreign countries, 30% (\$50 min). Orders received with insufficient SHI will be refunded. All prices, availability and specifications subject to errors or change without notice, so call to verify. All goods are new, include warranty and are guaranteed to work. Due to our low prices and our assurance that you will get new, unused products - ALL SALES ARE FINAL. We do not guarantee compatibility. Call before returning goods for repair or replacement. ORDER DESK HOURS - 6AM to 6PM PST, Monday through Friday, Saturday 10 to 4, EconoRAM™, Fasttrak™, and Generik™ are trademarks of ComX Corporation.

## CASH-n-CARRY COMPUTER STORES, INC.

Retail Sales only. Store prices may vary.

**SAN FRANCISCO** - 550 Washington Street (at Montgomery, opposite the Pyramid), Interstate 80 to Highway 480; take Washington Street Exit, CALL (415) 982-6212.  
**PORTLAND, OREGON** - At Park 217, Tigard at intersection of Highways 217 and 99W, CALL (503) 620-5595.  
**SEATTLE, WASH.** - 3540 128th Ave. SE, Bellevue 98006. In Loehmann's Plaza near Factoria Square, SE of Highway 405 & 90 and at SE 36th and Richards, CALL (206) 641-4736.

Mail To: 12060 SW Garden Place, Portland, OR 97223

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

CONROY-LAPOINTE CREDIT CARD

Send me a Conroy-LaPointe credit application form, so I can get cash discount prices. A "no hassle" card. Minimum initial purchase \$400.



**Program listing. Port conversions.**

```

10 POKE 49153,0 : POKE 49237,0 : REM 80STORE, PAGE 2 on
20 POKE 1144,xxx : REM port 1, data format, baud rate
30 POKE 1145,xxx : REM port 1, parity
40 POKE 1146,xxx : REM port 1, echo, line feed, comm.
50 POKE 1147,xxx : REM port 1, line length
60 POKE 1148,xxx : REM port 2, data format, baud rate
70 POKE 1149,xxx : REM port 2, parity
80 POKE 1150,xxx : REM port 2, echo, line feed, comm.
90 POKE 1151,xxx : REM port 2, line length
100 POKE 49236,0 : POKE 49152,0 : REM PAGE2, 80STORE off

```

ports automatically when you turn the computer on.

In the telecommunications half-duplex mode, each computer must be in "local echo" mode (the echo bit set to one) to transmit input to its own screen. To begin, turn on the communications port by typing IN#2. Then put your //c into terminal mode (control-A T), make the phone call, and connect the computers. If you want a record of the transaction, type PR#1 to route input/output through the printer port.

To use full-duplex communication, you must designate one of the computers as the host, to echo input back to the source. If you'd like your //c to be the full-duplex host, type PR#2 and engage "local echo" to see your own input. Control-R from the remote computer takes your //c out of terminal mode, and makes the remote computer's keyboard and screen the input/output devices for your computer.

## APPLE // OWNERS YOU'VE WAITED LONG ENOUGH

...for a half-height Apple® compatible disk drive that fits any Apple // you own: //+, //e, and //c.



- Faster, more precise tracking and larger capacity than standard Apple® drives.
- 100% Apple® compatible for //+, //e, and //c external drives.
- Quieter and smoother running.

- Half-height, compact design... saves you space.
- One year warranty, 30 day money back guarantee.
- Suggested retail price: \$269.95

### //c POWER

#### New! Apple //c Disk Drive Adaptor Plug.

- Turns your Apple //+ or //e compatible disk drive into an Apple //c drive.
- Attaches in seconds—absolutely no soldering!
- 5-year warranty, 30-day money-back guarantee.

**FAST•SIMPLE•INEXPENSIVE  
ONLY \$19.95**

**PICO  
products**

Quality peripherals for IBM®, Apple®, and other leading microcomputers. Watch for more PICO Products at your local computer store—exceptional value and quality in computer accessories.

**For Dealer and Distributor information please call or write:**



**WGE International Ltd.**  
WGE Center, Rte. 202N  
Peterborough, NH 03458  
1 (800) 227-1560  
1 (603) 924-9261 in NH

IBM is a registered trademark of International Business Machines, Inc. Apple is a registered trademark of Apple Computer.

**Table 4. Pin assignments for wiring the port connectors.**

Pin 1	DTR	Data terminal ready (output)
Pin 2	TXD	Transmit data (output)
Pin 3	GND	Power and signal ground
Pin 4	RXD	Receive data (input)
Pin 5	DSR	Data set ready (input)

If the remote-computer user wants to run a DOS application, he or she simply types RUN PROGRAM (where PROGRAM is the name of the application). The program executes exactly as if you had typed the command yourself (providing you loaded DOS initially). To run protected software from the remote computer, you will have to break into the program to reestablish the output hooks—to get started, the remote computer needs to send PR#6, and in doing so, disrupts the conditions IN#2 and PR#3.

One last bit of information: If you want to wire the port connectors yourself, see Table 4 for the pin assignments on the 5-pin DIN connectors.

That's all you need to take control of your //c's serial ports. A solution at last! ■

*Write to Jack Higbie at the University of Queensland, Physics Department, Brisbane, Queensland 4067, Australia.*



# NORTHEASTERN SOFTWARE

88 Ryders Lane, Stratford, Connecticut 06497

- Up to 50% off/software purchases over \$300 an additional 2% off
- New larger facilities to serve you better
- School & corporate purchase orders accepted
- No additional charges for credit card orders

## Entertainment

Spy Hunter or Buck Rogers	27.00
Tapper or Star Trek	27.00
Congo Bongo or Up 'n' Down	27.00
Sorcerer	27.00
Cuthroats or Zork I	24.00
Zork II, III	27.00
Suspect	27.00
Deadline	29.00
Planetfall	24.00
Enchanter	24.00
Infidel	27.00
Hitchhiker's Guide	23.00
Ultima III	34.50
Lode Runner or Karateka	21.50
Choplifter	22.00
Reforged 88	36.00
50 Mission Crush	24.00
Objective Kursk	24.00
Subject Elect	30.00
Queston	24.00
Rails West	24.00
Battle for Normandy	24.00
Imperium Galactica	25.00
Pro Tour Golf	25.00
Ring Side Seat	25.00
Cosmic Balance II	25.00
Computer Baseball	24.00
Geopolitique 1990	21.00
Baltic 85	36.00
North Atlantic 86	36.00
Germany 1985 or Carrier Force	48.00
War in Russia	32.00
Flight Simulator II	32.00
Night Mission Pinball	30.00
Wizardry I	21.00
Wizardry II	21.00
Wizardry III	24.00
Wizardry IV	24.00
Wizardry V	16.00
Rendezvous with Rama	25.00
F15 Strike Eagle	22.00
Dragon World or Shadow Keep	20.00
Zaxxon	20.00
Fahrenheit 451 or Amazon	22.00
Expedition Amazon	21.50
The Quest	21.00
Coveted Mirror	21.50
Xyphus	21.50
Transylvania	22.00
Frogger	22.00
BCS Quest for Tires	21.00
Kings Quest	30.00
Wizard of Id Touch Type	19.00
Fax	19.00
Summer Games	23.00
Stellar 7	45.00
Ken Uston's Blackjack	19.00
Caverns of Frietag	20.00
Castle Wolfenstein	20.00
Beyond Castle Wolfenstein	20.00
Millionaire	30.00
Baron	30.00
Tycoon	37.00
Spitfire Simulator	26.00
Air Sim III	26.00
Bruce Lee	28.00
Sargon III	31.00
Miner 2049er	24.00
Death in the Caribbean	21.00
The Heist	24.00
How about a nice game of Chess	21.00
Mask of the Sun	27.00
Hard Hat Mack	24.00
Pinball Const. Set	28.50
Music Const. Set	28.50
The Standing Stone	28.50
One-on-One	28.50
Archeon	26.50
Skyfox	26.50
Seven Cities of Gold	26.50
Murder on the Zinderneuf	26.50
Sundog	31.00
Pitfall II	25.00
Gato	24.00
Fantasy	28.00

## Blank Media

Elephant SS/DD	12.50
Elephant DS/DD	21.00
Verbatim SS/DD	17.00
Verbatim OS/DD	24.00
Memorex SS/DD	18.00
Memorex (Mac 3 1/2")	34.00
BSF SS/DD	15.00
Maxell SS/DD	16.00

## Educational

APPLE Logo II	82.00
BARRONS Computer SAT	53.00
CBS	92.00
Mastering the SAT	21.90
Murder by the Dozen	41.00
DAVIDSON AND ASSOCIATES	29.50
Speed Reader II	29.50
Word Attack	29.50
Math Blaster	29.50
DESIGNWARE	18.00
Spellcorder	24.00
Crypto Cube	24.00
Spellkazam	18.00
DLW	20.50
Alien Addition	20.50
Medior Multiplication	20.50
Demolition Division	20.50
Alligator Mix	20.50
Dragon Mix	20.50
EDU-WARE (PEACHTREE)	17.00
Compu-Read	29.00
Compu-Math	29.00
SAT Word Attack Skills	28.00
RSAT Word Attack Skills	28.00
Spelling B w/ Reading Primer	23.00
Algebra 1 2 3 or 4	22.50
Algebra 5 & 6	27.50
Hands on Basic	31.90
Fractions	31.90
Decimals	31.90
HARCOURT BRACE JOVANOVIH	47.00
SAT	59.90
GRE Test	59.90
NAYDEN SOFTWARE	20.90
Micro Math (Add-Sub)	20.90
Micro Math (Multi-Div)	20.90
LEARNING COMPANY	30.00
Rocky's Boots	30.00
Number Stumper	25.00
Robot Odyssey	30.00
Reader Rabbit	24.00
Magic Spell	22.00
Juggle's Rainbow	18.00
Bumble Games	24.00
Bumble Plot	24.00
Gertrude's Puzzles	27.00
Gertrude's Secrets	27.00
MAGNUM	65.00
Super Speed Reading	65.00
MECA	49.00
Basic Building Blocks	49.00
MICROLAB SAT Programs	20.00
PROGRAM DESIGN	73.00
The New Step by Step	73.00
Step By Step II	73.00
Step By Step III	73.00
SCARBOROUGH SYSTEMS	24.00
Songwriter or Picturewriter	24.00
Phi Beta Philr	24.00
Master Type	24.00
SCHOLASTIC WIZWARE	24.00
Fact & Fiction Tool Kit IIC	24.00
Microzine (1-6)	24.00
Story Tree	24.00
Turtle Tracks	24.00
SPINNAKER SOFTWARE	19.00
Fraction Fever	19.00
Trains	21.90
Facemaker	27.25
Snooper Troops 1 & 2	21.90
Story Machine	19.00
Kindercomp	31.00
Delta Drawing	19.00
Kids on Keys	19.00
Alphabet Zoo	17.00
Hey Diddle Diddle	25.00
In Search of	27.00
Aerobics	19.00
Grandma's House	19.00
Kidwriter	19.00
SPRINGSBOARD	21.00
Early Games For Young Children	19.00
Matchmaker	19.00
Piece of Cake	19.00
Fraction Factory	19.00
SUNBURST	30.00
The Factory	30.00
Teasers by Tobbs	60.00
TERRAPIN Logo	60.00
XEROX	24.00
Sticky Bear ABC	24.00
Sticky Bear Numbers	24.00
Sticky Bear Pop	24.00
Sticky Bear Opposites	24.00
Sticky Bear Shapes	24.00

## Business

APPLE	Call
Appleworks	124.90
Apple Writer Ite	124.90
ARTSCI	184.50
Magic Office Systems	93.50
Magic Calc	93.50
Magic Window II	278.00
ASHTON-TATE DB II	235.00
BPI	234.00
General Accounting	42.00
GL, AR, AP, PR or INV	41.50
CONTINENTAL	60.50
Home Accountant	144.00
Tax Advantage	208.00
FCM/FL	148.00
G/L, A/R, A/P	34.00
BDW JONES SOFTWARE	93.00
The Market Analyzer	145.00
Market Manager	145.00
HAYDEN	91.50
The Writer	86.00
Pie Writer V2.2	98.00
HOWARD SOFTWARE SERVICES	38.00
Real Estate Analyzer II	Call
KENSINGTON	64.00
Format II Enhanced	217.00
LIVING VIDEO Think Tank II/Ite	48.50
MEGAHAUS	60.00
MegaFinder	115.00
MegaSpell	91.90
MegaWorks	118.00
MegaWriter	72.00
MICROPRO	72.00
Wordstar	36.50
Calstar	131.00
MICROSOFT Multiplan	43.00
MICROSTUFF Crosstalk	78.00
PEACHTREE Peach Calc	78.00
Lexicheck/Word Juggler Ite	46.90
SENSIBLE SOFTWARE	46.90
Sensible Speller	114.00
Bookends	155.00
Report Card	72.00
SIERRA ON-LINE	72.00
The General Manager II	72.00
Homework	72.00
ScreenWriter Ite	72.00
SILICON VALLEY	72.00
The Handlers Package	72.00
List Handler	72.00
The Word Handler II	72.00
SOFTWARE ARTS	72.00
Visicalc Package	72.00
SOFTWARE PUBLISHING	72.00
PFS: Best Sellers	72.00
PFS: Write	72.00
PFS: File	72.00
PFS: Graph	72.00
PFS: Report	72.00
STONEWARE	180.00
DB Master 4 Plus	70.00
PFS: File	70.00
PFS: Report	70.00
PFS: File/Report	110.00
Typing Tutor III	31.00
Millionaire	36.00
Transylvania	24.00
Coveted Mirror	24.00
The Quest	24.00
Main Street Filer	114.00
Helix	240.00
Sargon III	30.00
McPit	30.50
Click Art	30.00
Home Accountant	57.00
Microsoft Multiplan	115.00
Microsoft Basic	88.00
Microsoft Chart	74.00
Microsoft Word	115.00
Mac the Knife	23.00
Zork I or II	25.00
Zork III	28.00
Master Type	29.00
1st Base	108.00
DB Master (Mac)	115.00
DaVinci (series)	30.00
Habadox	60.00
TK Solver	145.00

We fully support the Macintosh — call toll free  
Apple Computers — call toll free

## Printers

APPLE	Call
Imagewriter (10 & 15")	Call
BROTHER	655.00
HR-25	830.00
HR-35	830.00
DAISY WRITER 2000	Call
DIABLO	850.00
620 (RS-232C)	1,785.00
630 (PC)	375.00
DYNAX DX-15	Call
EPSON	Call
FX-80	Call
FX-100	Call
RX-80F/T	Call
RX-100	Call
LQ-1500	Call
LX-80	230.00
JX-80	Call
Homewriter 10	Call
JUKI 6100	389.00
MANNESMANN TALLY	605.00
MT-160L	795.00
MT-180L	295.00
MT-Spirit	295.00
WEC INFO SYSTEMS	680.00
N2030	1,255.00
N3530	665.00
P2T	Call
OKIDATA	305.00
Microline 82A	535.00
Microline 83A	355.00
Microline 92P	595.00
Microline 93P	595.00
PANASONIC	208.00
KXP 1090	295.00
KXP 1091	388.00
KXP 1092	615.00
KXP 1093	615.00
PROMWRITER	295.00
8510AP	445.00
1550AP	395.00
8510SP	Call
QUIME Printers	Call
SILVER REED	240.00
EXP400P	275.00
EXP500P	395.00
EXP550P	700.00
EXP700P	700.00
STAR MICRONICS	234.00
SG 10	394.00
SG 15	495.00
SR 15	595.00
SD 10	345.00
SD 15	468.00
TOSHIBA Printers	Call
TRANSTAR	425.00
120P	550.00
130P	445.00
315	95.00
Pics Card	95.00

## Disk Drives

APPLE	295.00
Disk II Drive	Call
Duo Disk w/acc. kit	Call
Pro File Disk Drive	Call
IIC Add-On	Call
Mac Add-On	Call
INFAX	2,145.00
101 10 Meg	3,350.00
102 20 Meg	2,500.00
INDUS ST Slimline	188.00
A2 143K	188.00
Slimline Ite	188.00
Slimline IIC	57.00
Micro SCI Controller	198.00
QUENTIN	209.00
AP 100A Full Height	410.00
AP 105 Slimline	195.00
AP 110A Twin Pack	355.00
RANA	428.00
Elite I	195.00
Elite II	355.00
Elite III	428.00

## Monitors

AMDEK	235.00
Color 300	395.00
Color 500	415.00
Color 600	415.00
Video 300G Green	128.00
Video 300A Amber	130.00
DVM II or III	215.00
BMC	239.00
Color Plus Monitor	95.00
BM12 AOW Green	95.00
PANASONIC	145.00
TR 120 Green	150.00
TR 120 Amber	400.00
DTD 1300 RGB	400.00
PRINCETON	469.00
HX-12	155.00
RGB Interface	155.00
SAKATA	244.00
SC-100 Color	454.00
SC-200 RGB Color	94.00
SG-1000 Green	94.00
TAXAN	119.00
Green (Hi-Res)	125.00
Amber (Hi-Res)	263.00
210 13" Color (Lo-Res)	398.00
RGB Vision III	184.00
410-64 RGB-2 Interface	184.00

## Specials

EDO III	45.00
Locksmith 5.0	66.00
CIA Files	47.00
Back It Up III	52.00
Copy II-	21.00
Wildcard II	98.00
Dollars & Sense/Mac	67.00
Copy Master II	Call
Copy Mac	24.00
Megaworks	Call
Network Wiretree	46.00
Apple Joystick	Call
Apple Mouse	Call
Apple Super Serial Card	115.00

## Home/Accessories

Pixit	30.50
Take One	36.50
Apple Mechanic	17.00
Beagle Basic	20.00
Beagle Graphics	33.00
Disk Quick	14.00
Doss Boss	18.00
Double Take	20.00
D-Code	23.00
Fat Cat	20.00
Flex Type	17.00
Frame Up	17.00
GPLE	28.00
I/O Silver	17.00
Pilcon Doss	17.00
Silicon Salad	14.00
Triple Dump	23.00
Type Faces	11.00
Utility City	17.00
Zoom Graphics	31.00
Visible 6502	32.00
Crossword Magic	31.00
Turbo Pascal	33.00
Net Worth	49.00
Bank Street Writer	41.00
Bank Street Speller	41.00
Bank Street Filer	Call
Print Shop	28.00
Graphics Library	15.00
Digital Paint Brush	198.00
Forecast	38.00
Time Trax	1.50
DATA TRANSFORMS Fontrix 1.5	58.00
Font Paks 1-11	ea. 11.50
The Accountant	60.90
Cut & Paste	34.00
Financial Cookbook	34.00
FUNK Sideways	36.00
Orca/M	63.00
LAZERWARE Lisa V 2.6	54.00
Applesoft Compiler	110.00
Typing Tutor II	15.00
Typing Tutor III	31.00
Dollars & Sense	59.00
Dollars & Sense IIC	59.00
The Graphs Magician	37.00
New Complete Graphics System	48.00
Paper Graphics	31.00
Cat Graphics	22.00
QUALITY Bag of Tricks	25.00
Merlin	37.00
Merlin Pro	44.00
Merlin Combo	66.00
SOFTRONICS Solterm II	128.00
TURNING POINT Time is Money	51.50
ASCII Pro	78.00
Micro Cookbook II/Ite	23.00
Hayes Mach II	29.00
Hayes Mach III	34.00
Kraft Joystick	32.00
TG Joystick	Call
TG Select-A-Port	28.00
Micro Modem Ite/w SC I	130.00
1200 BAUD Modem	398.00
KENSINGTON System Saver	245.00
KEYTRONICS Keyboards	75.00
Koala Pad	44.00
Muppet Learning Keys	158.00
The Gibson Light Pen	218.00
MCT Speed Demon	68.00
Ram Card	285.00
SoftCard II	193.00
Apple Cat II	373.00
212 Apple Cat II	Call
ORANGE MICRO Grappler plus	Call
Buffered Grappler	Call
PICASSO w/interface	119.00
PROMETHIUS Pro Modem 1200	335.00
PROMETHIUS Internal Ite/II-	3



## BUY HARDWARE AND SOFTWARE AT WHOLESALE + 8%, AND GET 14-30 DAY SOFTWARE RENTALS†...

In just the last few months, *The NETWORK* has saved its members more than \$24,000,000 and processed over 100,000 orders.

### The nation's largest corporations depend on PC NETWORK!

On our corporate roster are some of the nation's largest financial industrial and professional concerns *including some of the most important names in the computer industry:*

<b>AT&amp;T</b>	General Motors
Barclays Bank	Gillette
Bell & Howell	<b>Hewlett Packard</b>
Citibank	Hughes Aircraft
Columbia University	<b>IBM</b>
<b>Data General</b>	<b>ITT</b>
Exxon	Kodak
Farm Bureau Insurance	<b>Multimate</b>
Frontier Airlines	United Nations
General Mills	Yale University
General Electric	Veteran's Administration

plus thousands of satisfied consulting firms, small businesses, user groups, municipalities, government agencies and value-wise individuals ACROSS THE NATION! Their buyers know that purchasing or renting from PC NETWORK saves them time, money and trouble. They also count on us for product evaluation, professional consultation and the broadest spectrum of products and brands around.

### CALL TOLL FREE 1-800-621-S-A-V-E

In Illinois call (312) 280-0002

Your Membership Validation Number: **1875**

You can validate your membership number and, if you wish, place your first money-saving order over the phone by using your VISA, MASTERCARD or AMERICAN EXPRESS. Our knowledgeable service consultants are on duty Mon-Fri 8 AM to 7 PM, SAT 9 AM to 5 PM CST.

**PERSONAL COMPUTER NETWORK**  
320 West Ohio  
Chicago, Illinois 60610

Call now... Join the PC NETWORK and start saving today!

### PC NETWORK • MEMBERSHIP APPLICATION

**YES!** Please enroll me as a member in the PC NETWORK™ and rush my catalog featuring thousands of computer products, all at just 8% above DEALER WHOLESALE PRICES. I will also periodically receive "THE PRINTOUT", a special up-date on merchandise at prices BELOW even those in my wholesale catalog, and all the other exclusive, money-saving services available to Members.

**875**

I am under no obligation to buy anything. My complete satisfaction is guaranteed. Please check (✓) all boxes that apply:

- |  |  |
|--|--|
| <b>Basic Membership</b><br>With 14 Days Rental   | <b>Special V.I.P. Membership*</b><br>With 30 Days Rental.  |
| <input type="checkbox"/> One-year membership for \$8   | <input type="checkbox"/> One-year membership for \$15  |
| <input type="checkbox"/> Two-year membership for \$15 (SAVE \$1)                                       | <input type="checkbox"/> Two-year membership for \$25 (SAVE \$5)   |
| <input type="checkbox"/> Business Software Rental Library for \$25 add'l. per year—with 14 day rentals | <input type="checkbox"/> BOTH Business and Game Software Rental Libraries for \$30 add'l. per year—with 30 day rentals |
| <input type="checkbox"/> Games Software Rental Library for \$10 add'l. per year                        | *VIP members receive advance notice on limited quantity merchandise specials   |

☐ Bill my credit card: ☐ VISA ☐ MasterCard ☐ American Express

Account Number:

Exp. Date  mo.  year

☐ Check or money order enclosed for \$

Name

Address  Apt. No.

City  State  Zip

Telephone (  )

**Please provide the following information to insure compatibility with your system (check all boxes that apply):**

- |                                    |                                    |                                    |                                 |
|------------------------------------|------------------------------------|------------------------------------|---------------------------------|
| <input type="checkbox"/> APPLE //e | <input type="checkbox"/> APPLE //c | <input type="checkbox"/> APPLE //+ | <input type="checkbox"/> IBM-AT |
| <input type="checkbox"/> MACINTOSH | <input type="checkbox"/> LISA      | <input type="checkbox"/> APPLE III | <input type="checkbox"/> IBM PC |

☐ Other:

Signature

(Signature required to validate membership)

Copyright © 1985 PC NETWORK INC.

## FEATURED PRODUCTS

### BRAND NAME SSDD DISKETTES FOR APPLE II and III

Box of 10 Guaranteed for Life..... \$ 9.00\*

CENTRAL POINT COPY II+ COPY II-MAC ..... 20.00\*

### EPSON PRINTERS Unbelievable Low Prices!!!

LX-80 80COL/100CPS ..... 217.00\*

FX-80 80COL/160CPS ..... 316.00\*

FX-100 132COL/160CPS ..... 449.00\*

### MONOGRAM DOLLARS & SENSE

for Apple II+ /E and Mac ..... 57.00\*

LIVING VIDEOTEXT Think-Tank + /E/MAC ..... 75.00\*

HAYES MICROMODEM IIe ..... 192.00\*

With Smartcom I

### AMDEK MONITORS

V300G Composite Green ..... 110.00\*

V300A Composite Amber ..... 120.00\*

IBM PC 256K HARD DISK SYSTEM ..... 1,906.62\*

1-320K Drive/1-10MB Hard Disk/256K CPU

COMPAQ PORTABLE HARD DISK SYSTEM ..... 2,511.50\*

10MB/1 Floppy/256K

HAYDEN ENSEMBLE ..... 155.00\*

1st integrated package for the MAC

BRAND NAME MACINTOSH DISKETTES ..... 24.95\*

Box of 10 Guaranteed for Life. Includes free Flip & File Case

\*NETWORK Members pay just 8% above these wholesale prices plus shipping.

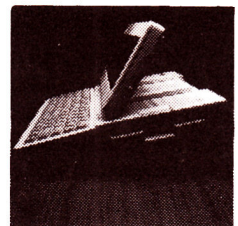
## Complete Apple Systems

The NETWORK offers fantastic discounts on these three complete Apple packages.

### ► APPLE //c

128K System  
Modem Port  
Serial Printer Port  
Mouse/Game Port  
Composite/RGB/TV  
40/80 Column  
Monitor Port  
QWERTY/DVORAK  
Keyboard  
Built in Drive  
Software

TOO LOW TO PRINT!



### ► APPLE //e PROFESSIONAL SYSTEM

128K //e CPU  
80 Column Card  
2 Disk Drives  
Software

TOO LOW TO PRINT!



### ► MACINTOSH BASE SYSTEM

192K Memory  
400K Diskette  
Keyboard  
Mouse  
Software

TOO LOW TO PRINT!



Wholesale Prices Change Rapidly... If you ever see a lower price advertised anywhere please call! You will find the Network's Price will always be the best!



# ...AS A PC NETWORK MEMBER ONLY!

Listed below are just a few of the over 20,000 products available at our EVERYDAY LOW PRICES!

## GAMES & EDUCATIONAL SOFTWARE

(Please add \$1 shipping and handling for each title ordered from below.)

	Wholesale		Wholesale
Bluechip Barton	\$ 28.25*	Penguin Graphics Magazine	\$ 32.50*
Broderbund Loadrunner	19.75*	Penguin Partywala	18.87*
Broderbund Chipdipper	19.00*	Screenplay Professional Blackbox	39.88*
Broderbund Print Shop	28.75*	Sierra On-Line Crossfire	18.00*
Broderbund Dazzle Draw	31.97*	Simon & Schuster Typing Tutor III - Mac Tool	28.25*
CBS Coren Bridge Made Easy	45.00*	Siir-Tech Wizard	26.97*
CBS Mastering the SAT	53.50*	Siir-Tech Knight of Diamonds	18.97*
CBS Mastering the GRE	53.50*	Siir-Tech Rescue Raiders	18.97*
CBS Murder By The Dozen	20.97*	Sublogic Night Mission Patrol	20.00*
Davidson & Associates Screen Reader II	26.97*	Spinnaker Alphabet Zoo	15.97*
Davidson & Associates Main Blaster	37.97*	Spinnaker Delta Drawing	24.97*
Davidson & Associates Word Attack	29.97*	Spinnaker Face Maker	15.97*
Hayden-Sonnet	28.47*	Spinnaker Hey Doodle Diddle	15.97*
Hayden-SAT Sample Test	11.97*	Spinnaker K-100 Comp	15.97*
Infocom Divination: Suspended	28.00*	Spinnaker Rhythms & Rhythms	15.97*
Infocom Enchanter: Planet Fall Seastaker Zork II	22.00*	Spinnaker Story Machine	15.97*
Infocom Sorcerer Zork II	25.00*	Spinnaker The Most Amazing Thing	20.77*
		Virtual Combinatorics Micro Lookbook	21.00*

## BUSINESS SOFTWARE

(Please add \$2.50 shipping and handling for each title ordered from below.)

Apple Approvals	\$179.97*	MECA The Running Program	\$ 42.50*
Borland International Turbo Pascal	30.00*	Microsoft Multiplan DOS 5.0 CPM	105.00*
BPI Ltd. Art. 29.00 N.Y. Each Only	211.50*	Microsoft Wordstar	105.00*
Broderbund Bank Street Writer	40.00*	Monogram Dollars & Sense	52.00*
Central Point Copy II Plus	20.00*	Sensible Software Sensible Speller IV	67.50*
Continental Software Home Accountant	40.97*	Sierra On-Line Homewright	41.97*
Continental Software COM-FU	53.50*	Sierra On-Line Screenwriter III Pro	68.25*
Dow Jones Software Market Analyzer	198.00*	Software Arts TK Solver	158.50*
Dow Jones Software Market Manager	171.00*	Softcraft Fancy Fonts	125.00*
Funk Software Software	35.00*	Software Publishing PPS-Fix	69.00*
Howardsoft Tax Reporter 1985	150.00*	Software Publishing PPS-Write	69.00*
Living Videotext Think Tank Mac Tool	75.00*	Software Publishing PPS-Graph	69.00*
Human Edge Mind Probe	26.50*	Stoneware DB Master Version 1	199.00*
Human Edge Management of Sales Edge	138.00*		
Human Edge Communication Edge	98.00*	T Maker Check Answer Machine Version Only	29.97*
MECA Managing your Money	105.00*	United Software Ind. Ass. Express Pro	71.50*

## HARDWARE

(Please add shipping and handling charges found in italics next to price.)

### COMPLETE SYSTEMS

Apple Macintosh Base System	CALL
Apple Apple II	CALL
Apple Apple IIc	CALL
Columbia Desktop & Portable Systems	CALL
Compaq 486	CALL
COMPAG 486 Hard Disk Available	\$2,511.50* (54.24*)
Compaq 486 Hard Disk 256K	1,999.00* (43.20)
DATA General DG ONE	1,999.00* (43.20)
128K 1 Drive: The Real Power	CALL
IBM PC, Portable System 256SD 100MHz 256K	1,495.02* (32.55)
IBM PC, Portable System 256SD 100MHz 512K	1,906.62* (42.89)
11 DSDSD 100MHz 1MB Hard Disk 256K	CALL
IBM PC AT 100MHz 256K	CALL
Sony M50, 100MHz 256K, 100MHz 512K, 100MHz 1MB	620.00 (13.93)
Sony M50, 100MHz 256K, 100MHz 512K, 100MHz 1MB	1,775.00 (39.93)
2 Drives: Core Computer 256K	CALL
Teva PC Complete IBM Compatible	1,200.00* (26.32)
Texas Instruments Professional	CALL



## Back Up Your Software

	Our Price
E.D.D. III (Best Nibble Copier)	45.00
CIA Files (Best of Utilities)	48.00
Copy II Plus - Central Point	21.00
Locksmith 5.0 - Omega	65.00
Nibbles Away III	49.00
Copy Master II 128K w/Gr. Dump	99.00
Wildcard II - Central Point	79.00
Replay II - MicroAnalyst	79.00

## Macintosh

	Our Price
Jazz	Call
Mac Turbo Touch	89.00
Back To Basics General Ledger	89.00
Copy II Mac	22.00
Facfinder	89.00
Ensemble	75.00
Hayden Speller	47.00
Mac Spell Right	64.00
Mac Spell +	81.00
Microsoft Chart	74.00
Microsoft File	115.00
Microsoft Multiplan	115.00
Microsoft Word	115.00
Microsoft Business Pack	349.00
ExperLogo	81.00
Dollars & Sense	85.00
Dock Organizer	62.00
Logic Solver	145.00
Think Tank 128	75.00
BASF 3 1/2" Disks (5)	16.50
Maxell 3 1/2" Disks (10)	28.00
Verbatim 3 1/2" Disks (10)	28.00

## Entertainment

	Our Price
Adventure Construction Set	34.00
7 Cities of Gold or Skyfox	27.00
Murder on the Zinderneuf	25.00
Archon II or One-On-One	27.00
Pinball Construction Set	25.00
Gato	29.00
Ghost Busters of Pitfall	27.00
Tractor Sanction or Shadow	27.00
Miner 2049 or The Heist	24.00
Wizardry	30.00
Knight of Diamonds	21.00
Legacy of Lylgarn	24.00
Return of Werda	27.00
Rescue Raiders	22.00
Wizpuz	16.00
Super Zaxxon or Frogger 3 Deep	25.00
The Quest or Ring Quest	21.00
Expedition Amazon, or Xyphus	21.00
Sword of Kadash	21.00
Below The Root	20.00
Swiss Family Robinson	20.00
Millionaire, Tycoon, or Barron	30.00
Solo Flight or NATO Commander	22.00
Amazon or Dragon World	25.00
Fahrenheit 451 or Shadow Keep	25.00
Flight Simulator II	32.00
Championship Lode Runner	22.00
Choplifter or Karateka	22.00
Pole Position or Zaxxon	20.00
Bruce Lee, Conan, or Mr. Do	24.00
Spy Hunter, Star Trek, or Tapper	27.00
Murder By The Dozen or Felony	25.00
Kings Quest	30.00
Beyond Castle Wolfenstein	30.00
Ultima III: Exodus	35.00
Sargon III	31.00
Cuthroths, or Seastalker	24.00
Hitchhiker's Guide to The Galaxy	24.00
Headline, or Starcross	30.00
Witness, Planetfall, or Enchanter	24.00
Infidel or Sorcerer	24.00
Zork I, Zork II, or Suspect	27.00
Operation Market Garden	35.00
Objective Kursk or Phantasia	24.00
War in Russia	48.00
50 Mission Crush or Broadside	24.00
Kampfgruppe or Reforger 88	36.00
Imperium Galactum	24.00
Germany 1985 or Carrier Force	36.00
Baltic 85 or Gemstone Warrior	21.00
Geopolitique 1990 or Rails West	24.00
North Atlantic 86	36.00
Battle For Normandy	36.00

## Hobby

	Our Price
Apple Mechanic	17.00
Beagle Basic	20.00
Beagle G.P.L.B.	20.00
Beagle Graphics	33.00
D-Code	23.00
Disk Quick	23.00
Dos Box	14.00
Double Take	20.00
Fat Cat	20.00
Flex Text	17.00
Frame Up	17.00
I.O. Silver	17.00
Pronto Dos	17.00
Silicon Salad	14.00
Triple Dump	23.00
Typefaces	11.00
Utility City	17.00
Bag of Tricks	25.00
Applesoft Compiler (Microsoft)	109.00
Einstein Compiler	85.00
Compiler Plus (Hayden)	37.00
Lisa V2.6	54.00
Merlin Pro	37.00
Merlin Assembler	37.00
Merlin Combo Pack	66.00
Visible Computer: 6502	32.00
The Graphics Magician	36.00
New Complete Graphics Sys.	48.00
Dazzle Draw	30.00
Pix-It	30.00
Take 1	36.00
Blazing Paddles	30.00
Zoom Graphics	31.00
Sideways	36.00
Fontrix	44.00
Font Paks 1-11 ea.	80.00
Printographer	24.00

## Blank Media

	Our Price
Elephant SS/DD (10)	12.50
Maxell SS/DD (10)	16.95
Verbatim SS/DD (10)	16.95
8ASF SS/DD (10)	14.95
Memorex SS/DD (10)	14.95
3M SS/DD (10)	17.95
Dysan SS/DD (10)	22.95

# PROGRAMS Plus

Visit Our New Showroom: Exit 32 off I-95

Stationhouse Square, 2505 Main Street • Stratford, Connecticut 06497

Corporate and School Purchase Orders Accepted

Mon.-Fri. 9 a.m. to 11 p.m. -- Sat. 10 a.m. to 11 p.m.

ORDERS ONLY  
TOLL FREE 1-800-832-3201

Inquiries & Conn. residents call (203) 378-3662 or 378-8293

Up to 50% off retail

MACINTOSH COMPUTERS ..... Call  
APPLE //c, //e COMPUTERS ..... Call  
LOWEST PRICES ON EPSON PRINTERS ..... Call

## Business

	Our Price
APPLE	
Access // (//e, //c)	59.00
Apple Works	199.00
Apple Writer // (//e, //c)	124.00
Quickfile // (//e, //c)	79.00
APPLIED SOFTWARE TECHNOLOGY	
Versaform	55.00
ARTSCI	
MagiCalc	94.00
Magi Office System	185.00
Magi Window II	94.00
ASHTON TATE	
dBase II w/Softcard	349.00
BPI SYSTEMS (//e or //c)	235.00
Investor's Workshop	22.00
CONTINENTAL SOFTWARE	
F.C.M./FL	61.00
G/L, A/R, A/P, Payroll ea.	144.00
Home Cataloger	31.00
CREATIVE PERIPHERALS	
Time Trax //e or //c	85.00
Time Trax //c Clock Only	55.00
DOW JONES SOFTWARE	
The Market Analyzer	208.00
The Market Microscope	208.00
HAYDEN SOFTWARE	
Pie Writer V2.2	95.00
The Writer	35.00
HUMAN EDGE SOFTWARE	
Communications Edge	119.00

Management Edge	149.00
Mind Probe	31.00
Sales Edge	149.00
KENSINGTON MICROWARE	
Format II Enhanced	90.00
LIVING VIDEOTECH	
Think Tank II+ or //e	85.00
MEGAHAUS	
MegaFinder	97.00
MegaSpell	37.00
MegaWorks	77.00
MegaWriter	64.00
MICROPRO	
Calcast	49.00
Infostar w/Z-Card	120.00
Wordstar w/Z-Card	169.00
Wordstar w/Z-Card	229.00
MICROSOFT	
Microsoft Softcard w/dBase II	328.00
Multiplan (Apple Dos Version)	59.00
ORGANIZATIONAL SOFTWARE	
Omnis 2	199.00
Omnis 3	339.00
PEACHTREE	
Back To Basics Accounting	125.00
PRACTICORP	
Practical II	35.00
QUARK	
Word Juggler & Lexichack	118.00
SENSIBLE SOFTWARE	
Bookends	72.00

Graphics Department	78.00
Report Card	37.00
The Sensible Speller	72.00
SERRA ON-LINE	
The General Manager II	131.00
The Screenwriter //e	78.00
SILICON VALLEY	
List Handler II+ //e, //c	47.00
The Handlers II+ //e, //c	103.00
Word Handler II+ //e, //c	47.00
SOFTWARE ARTS	
TKI Solver	179.00
The VisiCalc Package	114.00
SOFTWARE PUBLISHING	
PFS: File	72.00
PFS: Graph	72.00
PFS: Report	72.00
PFS: Write //e, //c	72.00
PFS: Proofs //e, //c	43.00
PFS: Access //e, //c	43.00
SORCIMI/US	
SuperCalc 3a	119.00
STATE OF THE ART	
Electric Checkbook	59.00
STONEWARE	
DB Master Business Team	219.00
DB Master Business Writer	98.00
DB Master Version Four Plus	185.00
DB Master (Corvus)	249.00
VISICORP	
VisiCalc II+ //e, //c	62.00
VisiSchedule	92.00

## Educational Software

	Our Price
APPLE	
Apple Logo II (//e, //c)	82.00
BARON'S	
Computer SAT	53.00
GMAT	53.00
CBS SOFTWARE	
Adventure Master	32.00
Forecast or T-Rex	35.00
Goren's Bridge	49.00
Mastering the SAT	92.00
Micro Speed Reading	78.00
Success w/Math (ea.)	15.50
DAVIDSON & ASSOCIATES	
Classmate	30.00
Math Blaster	30.00
Speed Reader II	41.00
Speed Reader Data A,B,C, or D	15.00
Spell-It	30.00
Word Attack	30.00
DESIGNWARE	
The Body Transparent	28.00
European Nations & Locations	28.00
Grammar Examiner	28.00
Mission Albebra	28.00
Remember	55.00
States & Traits	28.00
DLM	
Alligator Mix	20.50
Color-N-Shape Rodeo	19.00
Demolition Division	20.50
Freddie's Puzzles	19.00
Spelling Wiz	20.50

EDU-WARE/PEACHTREE	
Algebra 1, 2, 3, or 4	22.50
Algebra 5 or 6	27.50
Compu-Rad	17.00
Compu-Math Arithmetic Skills	25.00
Hands-on BASIC Programming	32.00
Introduction to Counting	25.00
Learning To Read 1, 2, 3, or 4	25.00
PSAT Word Attack Skills	18.00
PSAT Word Attack Skills	18.00
Spelling Bee w/Reading Primer	23.00
Writing Skills 1, 2, 3, or 4	25.00
EINSTEIN CORPORATION	
Einstein Memory Trainer	55.00
HARCOURT, BRACE	
Computer SAT	47.00
IMAGIC	
Crime & Punishment	25.00
KRELL	
Adventure in Flesh	39.00
Krell Logo	65.00
Krell SAT - Gold	225.00
EARNING COMPANY	
Addition Magician	21.00
Bumble Plot	24.00
Gertrude's Puzzles	27.00
Juggler's Rainbow	18.00
Magical Spell	21.00
Reader Rabbit	24.00
Robot Odyssey I	30.00
Rocky's Boots	30.00
Word Spinner	21.00
SCARBOROUGH SYSTEMS	
MasterType's Writing Wizard	49.00
Build A Book About You	26.00
Orig. Boston Computer Diet	52.00

SCHOLASTIC WIZWARE	
Agent U.S.A. or Turtle Tracks	24.00
Operation: Frog or Logic Bldrs.	24.00
Logo Robot or Kids at Work	19.00
SIMON & SCHUSTER	
Discover Your Baby-Birth to 2	49.00
JK Lasser Money Manager	82.00
SPINNAKER	
Adventure Creator or Trains	24.00
Aerobics	27.00
Counting Parade	21.00
Delta Drawing	31.00
File & Report or Spreadsheet	42.00
Fraction Fever or Sum Ducks	19.00
Grandma's House	19.00
In Search of	25.00
Kidwriter or Kindercomp	19.00
Snooper Troops 1 or 2	27.00
Treasure Island or Wizard of Oz	19.00
Word Processor	42.00
SPRINGBOARD	
Early Games or Music Maestro	21.00
Fraction Factory or Make a Match	19.00
Rainbow Painter or Puzzle Master	21.00
SUNBURST	
Challenge Math	30.00
Teasers by Tobbs	30.00
The Factory	30.00
The Incredible Laboratory	30.00
TERRAPIN	
Terrapin Logo	60.00
XEROX	
Chivalry	32.00
Explor'g Tables & Graphs 1 or 2	24.00
Pic Builder	24.00
Stickybear Series (ea.)	24.00

## Accessories

	Our Price
ALS Cards	Call
Applied Engineering Cards	Call
Kensington System Saver	64.00
Cool + Time	69.00
Hayes Micromodem //e	135.00
Hayes 300 Baud Smartmodem //c	159.00
Hayes 300 Baud Smartmodem	135.00
Hayes 1200 Baud Smartmodem	389.00
Novation Apple Cat II	192.00
Novation 212 Apple Cat II	369.00
Pro Modem 1200 (External)	Call
Pro Modem 1200A (Internal)	Call
Popcom X-100 (1200 Baud)	345.00
ERA 2 by Microcom	345.00
Zoom /Modem //e	129.00
Zoom /Modem //e Plus	159.00
Apricorn 16K Ramcard	68.00

ALS Z-Engine 2.2	149.00
Microsoft Premium Softcard //e	259.00
Microsoft Softcard II	239.00
Extend 80 (Carib. Computer)	115.00
MCT Speed Demon	199.00
Saturn 128K Ram	199.00
Neptune 80 Col. B&K Card	185.00
Accelerator //e	239.00
Videotext w/SS Inv.	175.00
Videotext Ultratrad	229.00
Corvus Hard Disks	Call
Mockingboard A Board	75.00
Mockingboard C Board	129.00
Mockingboard D Board //c	134.00
Echo II Plus	95.00
The Cricket //c	115.00
Hayes Mach II Joystick	29.00
Hayes Mach III Joystick	34.00
Kraft Joystick	32.00

TG Select-A-Port	26.00
Apple Mouse //e	125.00
Apple Mouse //c	85.00
Apple Super Serial Card	125.00
Serial Interface Card	115.00
Pasco/Interface	119.00
Grappler +	79.00
Buffered Grappler +	145.00
Nice Print (Spice Labs)	125.00
Finger Print Plus	99.00
Print-It	135.00
The Index +	109.00
Digital Paintbrush System	175.00
Muppet Learning Keys	44.00
Koala Pad	75.00
Key Tronic Keyboard	245.00
Trackhouse Key Pad	85.00

## Printers

<b>APPLE</b>	
ImageWriter	495.00
ImageWriter (Wide Carriage)	565.00
Scribe Printer	249.00
<b>BROTHER</b>	
HR-15XL	369.00
HR-35	819.00
<b>CITIZEN</b>	
MSP-10 (160 cps)	299.00
MSP-15 (160 cps)	449.00
MSP-20 (200 cps)	449.00
MSP-25 (200 cps)	589.00
<b>C. ITOH</b>	
ProWriter 8510 AP	295.00
ProWriter 1550 AP	445.00
ProWriter 8510 AP Plus	329.00
ProWriter 1550 AP Plus	469.00
ProWriter 8510 BC-2 (Mac, //c)	399.00
<b>EPSON</b>	
LX-80	Call
FX-80	Call
FX-80P	Call
FX-100 +	Call
JX 80	Call
LO-1500	Call
<b>NEC</b>	
SpinWriter 2050 (20cps)	669.00
SpinWriter 3530 (35cps)	1029.00
<b>OKIDATA</b>	
Microline 182P	219.00
Microline 192P	369.00
Microline 193P	499.00
Microline 192 Apple	389.00
Microline 92P	349.00
Microline 84P	659.00
<b>PANASONIC</b>	
KXP-1090	195.00
KXP-1091	279.00
KXP-1092	379.00
KXP-1093	539.00
<b>SILVER REED</b>	
EXP-400P	249.00
EXP-500P	289.00
EXP-550P	329.00
EXP-770P	759.00
<b>STAR MICRONICS</b>	
SG-10 (120 cps)	235.00
SG-15 (120 cps)	395.00
SD-10 (160 cps)	355.00
SD-15 (160 cps)	475.00
SR-10 (200 cps)	495.00
SR-15 (200 cps)	595.00
<b>TOSHIBA</b>	
P-1340	579.00
P-1351	1199.00
P-351	1249.00



---

# Using ProDOS **Part 5**

---

## The ProDOS—BASIC Connection

by **Lee Swoboda**

**N**ow that you're familiar with the commands ProDOS offers and what they do, I'll explain how ProDOS works in an Applesoft BASIC program. When you turn on your Apple, it automatically loads your operating system from the disk, stores it in memory, and connects it to other functions of the computer. If that operating system is DOS 3.3, the Applesoft prompt (!) appears when this process is complete. ProDOS, however, doesn't automatically connect to BASIC; you must provide the system file—BASIC.SYSTEM—to connect the two.

ProDOS also differs from DOS 3.3 in the way it's stored in memory. (**Figure 1** compares the two for a 48K Apple II Plus.) After loading DOS 3.3, the computer stores it in a fixed location at the top of available memory—just above memory location 38400. Whenever a BASIC program uses a DOS 3.3 command (signified by the control-D in a PRINT statement), the computer goes to this location and looks at the table

---

***You've learned the  
commands—now discover  
how ProDOS works in an  
Applesoft BASIC program.***

---

containing all DOS 3.3 commands. On the other hand, the only part of ProDOS that must be at a specific spot in memory is the table of parameters, the system global page (labeled ProDOS Table in **Figure 1**), which tells the computer where to find ProDOS.

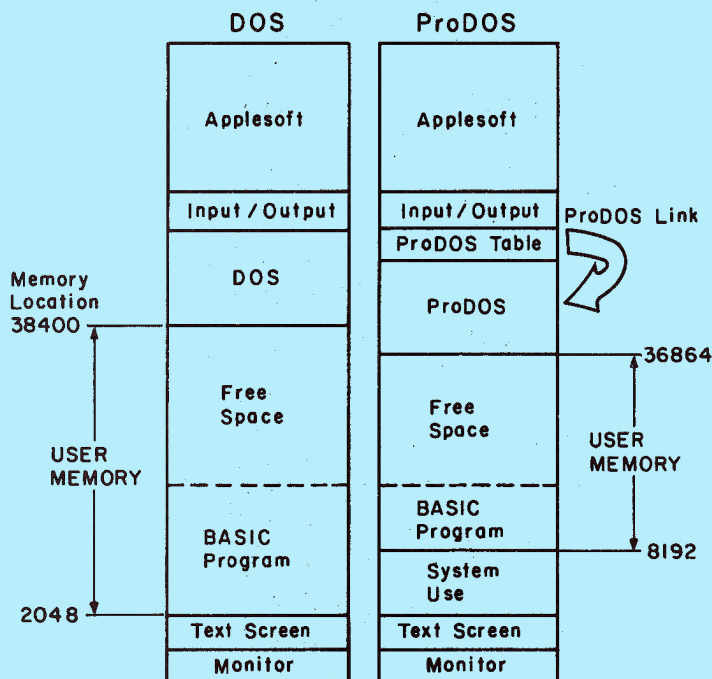
Apple recommends a 64K configuration for ProDOS since this operating system has 7.5K more overhead (memory devoted to the computer's use) than DOS 3.3. If you're using ProDOS

with a 48K Apple II Plus, ProDOS must reside just below the I/O buffers—the same place DOS 3.3 would reside. Since ProDOS is 1.5K bytes larger than DOS 3.3 and reserves the bottom 6K of memory for loading ProDOS or a system program, only 28K remains to hold BASIC programs (compared with 36K with DOS 3.3).

ProDOS automatically determines the type of computer you're using and how much memory is available. If you



**Figure 1. DOS and ProDOS memory maps of a 48K Apple II Plus.**



have a //e, a //c, or a II Plus, ProDOS locates itself in the 16K RAM card area of memory and updates its parameter table accordingly. **Figure 2** shows the memory configuration for a 64K Apple (48K Apple II Plus and 16K RAM card, //e, or //c). Because of the fixed location of DOS 3.3, however, even if you have an Apple //e, a //c, or a 64K Apple II Plus, DOS 3.3 can't easily take advantage of the additional 16K of available memory.

### Setting up a BASIC Disk

A ProDOS disk must have three characteristics: It must be formatted—magnetically on the disk; it must contain the file PRODOS (on which the ProDOS utilities are recorded); and it must contain a system file. (This file is BASIC.SYSTEM if you're using BASIC.)

To format a BASIC disk, follow the appropriate procedure in Beginner's Cookbook (p. 94). Format the blank disk using /PLAYING as the volume name. Your disk will boot (start up) in "ProDOS BASIC"—Applesoft BASIC with the enhancements discussed in Part 4 of this series. This formatting process is a more complicated version of the DOS 3.3 INIT command, but it's worth the effort to have the extra features ProDOS offers. To format additional disks, you merely need to use the Volume Copy Utility. I recommend you use your newly created disk as a master for future BASIC boot disks.

Now, put /PLAYING in drive 1, type PR#6, and press the return key. The disk boots your system and displays "ProDOS BASIC 1.0" on the screen. When you first start ProDOS, it looks for a program named STARTUP. Since /PLAYING doesn't have such a program, ProDOS displays the BASIC prompt (>). Normally, you'll want the computer to run a program automatically when you first start it, rather than dump you in BASIC. To create a simple start-up program, from the BASIC prompt, type:

```
10 PRINT CHR$(4); "CAT"
```

and press the return key. Type SAVE STARTUP and press the return key. Now, whenever you boot /PLAYING, the computer will automatically display a 40-column catalog before depositing you in BASIC.

From the BASIC prompt, type CAT and press the return key. The computer lists the three files on your disk: PRODOS, BASIC.SYSTEM, and STARTUP. These three files are fundamental to any disk that uses ProDOS from BASIC. If you write your

# DIAMOND BY CONSISTENT SOFTWARE

## Your Baseball/Softball Statistics Tracking & Scoring System

Now you can consistently ...

### track player stats

- players names, addresses
- offensive
- defensive
- pitching

### manage team info

- coaches names, addresses
- schedules
- equipment lists
- car pool assignments

### score a game

- create lineups
- assign positions
- score play by play
- automatically updates statistics

Best of all, it's easy to use ... forms fill in ... on-line help.

**For Apple\* IIc & IIe with 64K, 1 disk drive (printer optional)**

Take advantage of our league discounts:

1-5 copies

**\$49<sup>95</sup>**  
each

6-10 copies

**\$47<sup>95</sup>**  
each

11+ copies

**\$44<sup>95</sup>**  
each

Terms: U.S. dollars. All orders shipped UPS ground. Add \$1.50 shipping. \$3.00 for C.O.D. Air extra. California residents add 6% or 6½% sales tax. Cash or cashiers check only on C.O.D. Allow 10 days for personal check to clear.

**Order now! Toll free 1-800-221-9280 ext. 993**

**Send check or money order to:  
Include number of copies**

**For complete details, write or call  
(213) 374-2304**



Consistent Software  
2604 Graham Avenue  
Suite C, Department A  
Redondo Beach, CA 90278

**Dealer  
Inquiry  
Welcome**

\*Apple is a trademark of Apple Computers

**Circle 89 on Reader Service Card.**



# Corrections

We inadvertently failed to include four dot-matrix printers in the Buyer's Guide to Under-\$500 Printers (April 1985, p. 20). The printers listed below have parallel standard interface with optional serial interface. Each has variable line spacing; friction and tractor feeds; boldface, italics, underlining, and superscript and subscript features; graphics capabilities; square-dot technology; and print heads that are guaranteed for life.

## Legend 880 \$279

prints 100 characters per second  
prints 640 dots per line  
2K memory buffer

## Legend 1080 \$339

prints 140 characters per second  
1 line memory buffer  
alternate character sets

## Legend 1380 \$379

prints 160 characters per second  
2K memory buffer,  
upgradable to 4K  
DIP switches on top

## Legend 1385 \$449

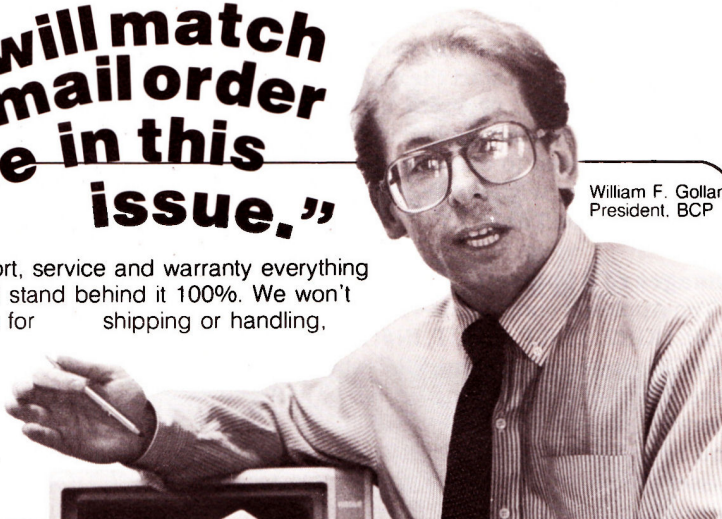
prints 160 characters per second  
2K memory buffer,  
upgradable to 4K  
DIP switches on top

For more information regarding these printers, contact Legend Peripheral Products, 6041 Varie Avenue, Woodland Hills, CA 91367, (818) 704-9100.

In the April New Products, the price of the W65FC02 chip from Western Design Center (p. 107) is misleading. For 1-99 units, the price is \$9.15; for 100-499 units, the price is \$6.55.

**"We will match any mail order price in this issue."**

We'll support, service and warranty everything we sell and stand behind it 100%. We won't charge you for shipping or handling, nor will we penalize you for using a credit card.



William F. Gollan  
President, BCP

COMPUTERS		SOFTWARE FOR Ile, IIC	
Apple Iles & Ilics		CALL	
MODEMS			
Hayes Smart 300 IIC	119.95	Prometheus Pro 1200	309.95
Hayes Smart 1200	389.95	Prometheus Pro 1200A	339.95
Hayes Micro Ile w/sc	169.95	Zoom Micro Ile + w/sc	169.95
PERIPHERAL CARDS & ACCESSORIES			
AST Multi-I/O	159.95	Koala Graphics Pad	79.95
Disks + Surge + Fans		Microsoft	
Verbatim SS/DD (11)	12.95	Z80 Soft 2 w/64k	274.95
Verbatim DS/DD (11)	16.95	Premium Pack Ile	264.95
Curtis		Premium Ile w/d/base	334.95
Diamond	34.95	Quadram	Call
Emerald	39.95	Titan	
Ruby	59.95	Accellorator I/Ile	234.95
Sapphire	49.95	64k Ram	149.95
Kensington Sys. Sav.	64.95	128k Ram	169.95
JoySticks		Neptune 64k + 80	189.95
CH Hayes Mach 3's	39.95	Neptune 128k + 80	209.95
Kraft	39.95	Neptune 192k + 80	229.95
GRAPHIC INTERFACES & BUFFERS			
Fingerprint +	99.95	Grappler w/16k	154.95
Grappler +	84.95	Grappler w/64k	174.95
Grappler + RS232	84.95	Quadram 64k Fazer pip	159.95
PRINTERS DOT MATRIX			
Apple Imagewriter	499.95	Epson FX 100 +	499.95
Apple Scribe	249.95	Gemini SG 10	239.95
Citizen MSP 10 160	309.95	Gemini Delta SD 10	369.95
Citizen MSP 15 160	459.95	Gemini Radix SR 10	509.95
Citizen MSP 20 200	459.95	Okidata 192	379.95
Citizen MSP 25 200	569.95	Okidata 192 Image	399.95
Epson LQ 1500	899.95	Okidata 193	519.95
Epson LX 80	239.95	Okidata 84	664.95
Epson LX 80 F/T	279.95	Toshiba P1340	589.95
Epson FX 80	359.95	Toshiba P351	1199.95
SOFTWARE FOR Ile, IIC			
Word Processing			
Bank Street Writer	44.95	Bag	20.95
Bank Street Speller	44.95	Catalyst	94.95
Format II Enh.	89.95	Computer Diet	54.95
Homeword	44.95	DB Master V 4.0 +	179.95
Homeword Speller	34.95	Dollars & Cents	64.95
Megaworks	79.95	Dollars & Cents IIC	74.95
PFS Write	74.95	DJ Market Anal +	209.95
Sensible Speller IV	74.95	DJ Investors Wk. + IIC	94.95
Screenwriter Pro	79.95	DJ Spreadsheet Lnk +	149.95
Think Tank	94.95	DJ Microscope +	209.95
Word Juggler	129.95	Figures & Forms	22.95
Business & Personal		Flashcalc	64.95
Appleworks	199.95	Forecast	39.95
Arrays GL, AR, AP, (ea)	154.95	General Mng.	139.95
ASCII Exp. Pro	84.95	Home Accountant	49.95
Baudville		Mng. Your \$	124.95
Actors & Action	20.95	Multiplan	69.95
Business	34.95	Net Worth	54.95
Heroes & Vill.	20.95	PFS Best Sellers	169.95
Pixit	34.95	PFS File	74.95
Take-1	37.95	PFS Report	74.95
Beagle		PFS Graph	74.95
DBI Take	25.95	Supercalc III	129.95
Flex Text	20.95	Turbo Pascal 3.0	47.95
Frame Up	20.95	Turbo Tool	39.95
Pronto DOS	20.95	Turbo Tutorial	24.95
Silicon Sal.	17.95	Home * Educational *	
Utility City	17.95	Entertainment	
D-Code	27.95	Air Rescue	24.95
Disk Quick	19.95	Alphabet Zoo	19.95
DOS Boss	17.95	Amazon	27.95
Basic	25.95	Aerobics	29.95
Mechanic	19.95	Apple Logo	89.95
GPLE	30.95	Arcade B Camp	19.95
Graphics	37.95	Aztec	29.95
I/O Silver	20.95	Barron	34.95
Triple Dump	27.95	Beyond Castle Wolf	24.95
Fat Cat	25.95	Bruce Lee	27.95
		Cat Graphics	24.95
Champ Lode Runner		24.95	
Classmate		34.95	
Choplift		24.95	
Computer SAT		54.95	
Conan		27.95	
Cutthroats		27.95	
Dallas Quest		24.95	
Dazzle Draw		35.95	
Deadline		34.95	
Delta Draw		34.95	
Dig Dug		19.95	
Dragon World		27.95	
Epyx Baseball		Call	
Exp. Amazon		24.95	
Exodus Ultima III		45.95	
F-15 Strike		24.95	
Facemaker		24.95	
Fahrenheit 451		27.95	
Felony		24.95	
Flight Simulator II		34.95	
GATO		27.95	
Gertrude's Secret		29.95	
Gertrude's Puz		29.95	
Ghostbusters		27.95	
Gold's Best		35.95	
Gorens Bridge		54.95	
Graphics Dept.		74.95	
Graphics Magician		34.95	
Hitchhikers Guide		27.95	
Kids on Keys		19.95	
Kindercomp		19.95	
Kings Quest		34.95	
Koala M Keys		49.95	
Lode Runner		24.95	
M Lge. Baseball		27.95	
Magic Paintbrush		24.95	
Master Type		27.95	
Math Blaster		34.95	
Mastering SAT		99.95	
Micro			
Cookbook		27.95	
Deserts		9.95	
Soups		9.95	
Appetizers		9.95	
Millionaire		34.95	
Mind Prober		34.95	
Mint Man		19.95	
Moptown Parade		27.95	
Muppet Learning		49.95	
Murder by Dozen		24.95	
NATO Comm.		24.95	
Night Pinball		24.95	
Paper Graphics 1.2 (ea)		34.95	
Pensate		24.95	
Pattern Maker		27.95	
Personal Net W.		54.95	
Planetfall		27.95	
Pole Position		20.95	
President's Choice		29.95	
Print Shop		34.95	
Print Shop GL		19.95	
Print Shop RE		10.95	
Robot Odyssey		34.95	
Rocky's Boot		34.95	
Rogue		20.95	
Run for \$		27.95	
Sargon III		34.95	
Seastalker		24.95	
Serpent's Star		27.95	
Sideways		39.95	
Simon Sch. T Tutor 3		34.95	
Solo Flight		24.95	
Songwriter		27.95	
Sorcerer		29.95	
Speed Reader II		44.95	
Spellcopter		24.95	
Spell It		34.95	
Squire		34.95	
SSI			
Baseball		27.95	
Gemstone W.		27.95	
Golf		49.95	
War Russia		27.95	
Reforged 88		39.95	
Tigers in Snow		27.95	
Objective Kurik		27.95	
Mission Crush		27.95	
Germany 85		39.95	
Battle Norm.		27.95	
Battle 85		24.95	
Phantase		27.95	
Story Machine		24.95	
Stellar 7		19.95	
Sticky Bear			
ABC		27.95	
Math		27.95	
Reading		27.95	
Pic Builder		27.95	
Spellgrabber		27.95	
Typing		27.95	
Run for It		27.95	
Success w/Math (ea)		18.95	
Supersport		20.95	
Suspect		29.95	
Sword Kadash		24.95	
Terrapin Logo		64.95	
The Quest		24.95	
Transylvania		24.95	
Trivia Fever		27.95	
Tycoon		34.95	
Welcome Aboard		27.95	
Where in World		27.95	
Word Attack		34.95	
Wizardry 1		34.95	
Wizardry 2		24.95	
Wizardry 3		27.95	
Xyphus		24.95	
Zaxxon		24.95	
Zork 1,2,3(ea)		29.95	
Books			
Apple Grap/Arc		18.95	
Bag of Tricks		29.95	
Beneath Apple DOS		18.95	
Understanding the Apple		19.95	
Invisclues		9.95	
Master PFS:		14.95	
6502 Assembly		19.95	
MACINTOSH SECTION			
Apple		Microsoft	
Mac 128k & 512k	Call	Basic 2.0	89.



own BASIC program, name it START-UP so the computer will run your program every time you start the disk.

Starting a BASIC program in ProDOS is similar to starting one in DOS 3.3. You will need to exercise special care, however, with some ProDOS commands. (See **Table 1.**)

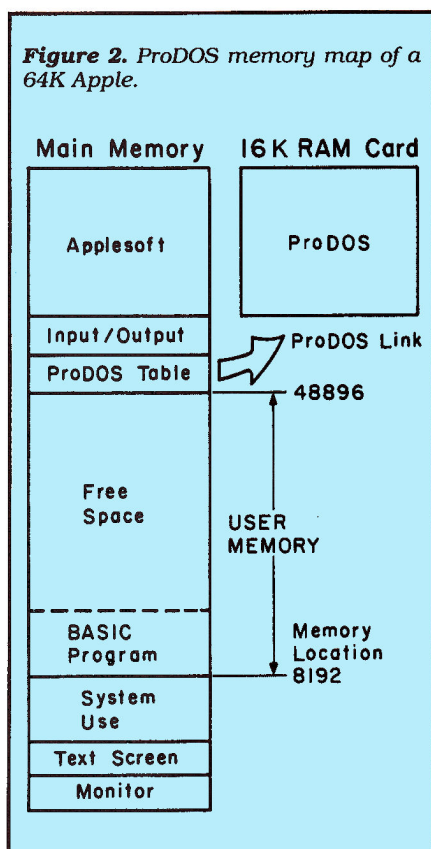
### Changes to Applesoft

Ten Applesoft commands—HIMEM, HGR, HGR2, TEXT, INPUT, IN#, PR#, TRACE, NOTRACE, and FRE—behave differently depending on which operating system (ProDOS or DOS 3.3) you're using. **Table 2** briefly discusses each command. For more information, refer to *BASIC Programming with ProDOS*.

### Converting Applesoft Programs to ProDOS

The primary reason to convert any program to ProDOS is to avoid switching between two operating systems. (Long-time Apple owners may remember switching between DOS 3.2 and 3.3.) A more significant reason is that for certain types of BASIC programs ProDOS offers advantages over DOS 3.3:

- Programs that use sequential text files. ProDOS reads, writes, and appends text files much more rapidly than DOS 3.3.



**Table 1.** Using selected ProDOS commands in a BASIC program.

Command	Use
RESTORE	If you've created variables in another BASIC program and saved them using ProDOS's STORE command, you should recall those variables early in the program with the RESTORE command.
HIMEM	ProDOS has a moving HIMEM (described in more detail in <b>Table 2</b> ). If you set HIMEM in your program, you must do so before you open any files and before you declare any strings. If you want to use HIMEM to protect a machine-language program from being overwritten by BASIC, see Appendix A of the <i>ProDOS Technical Reference Manual</i> .
PREFIX	In ProDOS, you have to use the full path name every time you access a file. If you're going to access only a few volumes or subdirectories, you should set the prefix to the volume and subdirectory containing the files you'll be using.
/RAM	If you have a 128K Apple (Apple //c or //e with an extended 80-column card), ProDOS lets you use the extra memory as a "RAM disk": The computer loads your data files into the extra memory and accesses the data from memory rather than from disk. Treat the RAM disk as you would any other disk drive. At the start of the program, you'll have to read text files from your floppy disk and write them to /RAM; but, once you've done this, access will be much faster. Before you end the program, you must write that data back to the floppy disk. Otherwise, you'll lose it.
CLOSE	ProDOS doesn't automatically close files at the end of a BASIC program as DOS 3.3 does, so you should insert a global close (PRINT D\$;"CLOSE") into your program before you end it.

**Table 2.** Applesoft commands that react differently under ProDOS and DOS 3.3.

Command(s)	Operation
HIMEM	The HIMEM command sets the upper limit on the memory BASIC has available for programs. In DOS 3.3, the location of HIMEM is permanent (unless you change MAXFILES). In ProDOS, the location is flexible to accommodate files as they are opened and closed. This may cause problems for machine-language programs written for DOS 3.3 but run in ProDOS. It won't cause problems for BASIC programs, though, because ProDOS moves variables around in memory to accommodate the moving HIMEM.
HGR, HGR2, and TEXT	ProDOS reserves the graphics-screen memory areas for graphics. HGR and HGR2 start this reservation, TEXT cancels it.
INPUT	Applesoft's INPUT statement doesn't allow commas or colons in the string you are entering. Complex data-entry routines using GET are required. ProDOS corrects this deficiency.
IN# and PR#	The IN# and PR# commands switch control of the input and output, respectively, for each of the eight peripheral slots (seven plus the keyboard/video screen) in an Apple II. The line: 999 PRINT D\$;"PR#1" activates the interface card (usually a printer interface card) located in slot 1.
TRACE and NOTRACE	The Applesoft TRACE command lets you watch a BASIC program execute step by step. In DOS 3.3, however, when TRACE is on, DOS 3.3 commands are not executed. With the ProDOS TRACE command, ProDOS commands are executed. NOTRACE still turns the TRACE function off.
FRE	ProDOS's FRE command is superior to Applesoft's. If you put the FRE command in a PRINT statement with a control-D, the computer will pass the command to ProDOS rather than to Applesoft: 10 PRINT CHR\$(4);"FRE"



# 12 Good Reasons Why RAMWORKS™ Is The Best Expansion Card For Your Iie

**1 APPLEWORKS MEMORY** Even though Ramworks enhances and expands a VAST ARRAY of other programs, Appleworks is our claim to fame. A 64K Ramworks will ADD 46K to your available desktop memory, a 128K Ramworks will ADD 91K, a 256K Ramworks will ADD 182K, and a 512K Ramworks will ADD 364K and a 1 meg Ramworks will give you nearly an 800K desktop. And it's all done automatically! When you plug in more memory chips into your Ramworks card, Appleworks will find them—automatically. Ramworks also increases the maximum number of records from 1350 to 4300.

**2 APPLEWORKS SPEED AND POWER** Ramworks does more than just increase the desktop memory (as if that weren't enough). With Ramworks, Appleworks will be able to run up to 20 times faster. If you buy a 256K or larger Ramworks card, Appleworks will automatically load itself in Ramworks. This greatly increases the speed at which Appleworks operates by eliminating all that nasty, time consuming disk access on Drive 1. These are but a few reasons why we say that Ramworks is Appleworks best friend.

**3 EXPANDABILITY** Ramworks was designed with the future in mind, as your needs increase, so can Ramworks. Clear instructions show you how to plug in more memory (up to 1 meg).

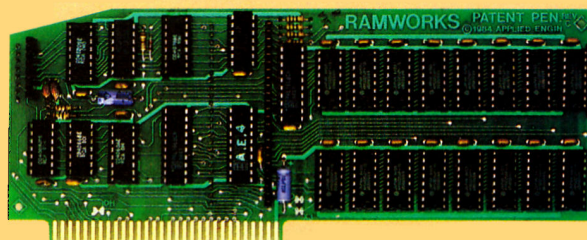
**4 SPEED** Today, as programs become more and more sophisticated, they inevitably become larger. And many of today's best selling programs (like Appleworks) won't fit in a 128K Apple, so many of these new larger programs continually go back to disk in search of more data. With Ramworks, you can have enough memory so that the entire program will be loaded into Ramworks' memory. This greatly increases the speed of software because your disk runs at 300 RPM, but Ramworks operates at the speed of light!

**5 COLOR** The same slot that's used for memory expansion is also the slot that's used for RGB color display, so all those lesser memory cards of yesterday make you decide in advance if you want RGB color. Only Ramworks lets you decide later to add RGB color. For only \$129, an RGB option can be added to Ramworks to give you double high resolution color graphics and 80 column text. All with a razor sharp, vivid brilliance that's unsurpassed in the industry. The RGB option does not waste another valuable slot, but rather plugs into the back of Ramworks and attaches to any Apple compatible monitor. Remember, you can order the RGB option with your Ramworks or add it on at a later date.

**6 COMPATIBILITY, OF THE SOFTWARE KIND** Programs like Appleworks, Magic Office System, Flashcalc, The Spread Sheet, Diverse-A-Dos, Supercalc, Magicalc and many others automatically recognize all or most of Ramworks memory (512K is average). The simple fact is that Ramworks is compatible with more off-the-shelf software than any other RAM card. Ramworks is 100% compatible with ALL software written for the Apple 80 column and extended 80 column card. Additionally, Ramworks can emulate other RAM cards so software written for other cards will run without modification. Software written for RAMWORKS will not work on other cards. We can emulate others, but others can't emulate us.

**7 COMPATIBILITY, OF THE HARDWARE KIND** Unlike others, Ramworks is fully compatible with hardware add on's from other companies, like the Sider and Profile hard disks. And Ramworks was designed in accordance with the official expansion rules defined by Apple so you don't have to worry about compatibility problems. As you continue to expand and make your Apple more powerful with other expansion products from Applied Engineering, you'll appreciate how each product has extra features designed to work with Ramworks and other products to give you a total performance package that is more powerful than the sum of its parts.

**8 IT SELLS THE MOST** Popularity translates into great software support because software companies can't support all RAM cards, they can only support the ones their customers are likely to own. And software companies appreciate the fact that when they write software for Ramworks in the Iie,



they're also writing software for our memory expansion card for the Iie, Z-RAM. And our customer list reads like the Who's Who of Apple computing with just about every software company in the land buying one, including Apple Computer (in the hundreds), Rupert Lissner, and Steve Wozniak (we didn't give one to Mr. Wozniak just to use his name, 2 one meg Ramworks were paid for at full price).

**9 IT'S FROM APPLIED ENGINEERING** Unlike most of the competition, we only make accessories for Apple, so we'll never spend your money on IBM product research. Applied Engineering's years of experience and wide product line really pays off, and because of our high sales levels we buy most of our I.C. chips factory direct. So don't let our low prices fool you, they're caused by high volume production. That's why we can offer the most memory for the least money. Guaranteed!

## 10 IT'S GOT IT ALL

- ☒ Sharp 80 Column Text
- ☒ Double high resolution graphics (with or without RGB option)
- ☒ User Expandable to 1 Megabyte
- ☒ Can Use 64K or 256K RAMS in any combination
- ☒ Adds Memory to Appleworks
- ☒ Accelerates Appleworks
- ☒ 100% Compatibility with All Iie software
- ☒ RAM Disk software available, compatible with Applesoft, PRO-DOS, DOS 3.3, and PASCAL (\$29)
- ☒ RAM Disk available for CP/M (\$29). (This program is included with our CP/M card)
- ☒ Visicalc preboot available (\$29)
- ☒ RGB option
- ☒ Takes only one slot
- ☒ 3 year no hassle warranty

**11 THE PATENT OFFICE HAS ONE** There are many advanced features on Ramworks, but two parts of the design are so advanced we applied for patents. One patent application deals with our ultra fast, ultra smooth 80 column screen display, and the other patent application deals with our ingenious way of dramatically reducing the power and heat of memory chips and improving reliability at the same time.

**12 HERE TODAY, HERE TOMORROW** In the seven years we've been making products for the Apple, we've seen a lot of companies come and go. Although nothing is forever, we're growing, expanding and we're profitable. And we are totally committed to Apple computing, which means you'll never run out of things to do with Ramworks. Or for that matter, reasons to buy one.

Ramworks™ with 64K .....	\$179
Ramworks™ with 128K .....	\$249
Ramworks™ with 256K .....	\$299
Ramworks™ with 512K .....	\$399
Ramworks™ with 1 MEG. ....	\$649
RGB Option (can be added later) .....	\$129

Call (214) 241-6060

9 a.m. to 11 p.m. 7 days a week or send check or money order to:  
Applied Engineering, P. O. Box 798, Carrollton, Texas 75006



MasterCard



Visa and

C.O.D. welcome. No extra charge for credit cards. Texas Residents add 5% sales tax. Add \$10.00 if outside U.S.A.



APPLIED ENGINEERING  
"We Set the Standard"



# Replace 19 floppies with 1 diskette?

## TeamMate does it!

Now your Apple IIe can have high capacity data storage like a Winchester while you still enjoy the convenience and familiarity of a standard floppy.

TeamMate's flexible disk drive from **Eastman Kodak** gives you 2.78 megabytes of data storage on one rugged diskette. You get unlimited expandable storage and access to Winchester capabilities... **at a very low cost.**

Installation takes only minutes, thanks to TeamMate's software transparency with ProDOS. No software drivers or modifications are needed.

Here are the TeamMate subsystems available now:

**TM 2203**...A single Kodak flexible disk drive giving you 2.78MB on one diskette.

**TM 2206**...Two Kodak drives for a total of 5.56MB of online, expandable storage.

**TM 2210**...10MB of Winchester storage, with the option of later adding a Kodak flexible drive.

**TM 2213**...A 10MB Winchester combined with the Kodak 2.78MB flexible drive for built-in backup.

**TM 2232**...32MB of Winchester storage—the ultimate in high performance mass storage.

TeamMate Model	Quantity 1-2	Quantity 3-9	Quantity 10+
TM 2203	\$ 895	\$ 761	\$ 716
TM 2206	\$1295	\$1101	\$1036
TM 2210	\$1295	\$1101	\$1036
TM 2213	\$1695	\$1441	\$1356
TM 2232	\$2195	\$1866	\$1756
Kodak Diskettes	\$ 15	\$ 14	\$ 12

All TeamMate subsystems include drive(s), controller, TeamMate chassis, power supply, necessary cabling, and manual. Kodak subsystems include a Kodak diskette.



Price includes UPS surface shipping.  
Allow 3-4 weeks delivery.

**Team-Mate**

**Yes, I want to expand data storage on my Apple IIe. Please send me the following:**

Quantity:

\_\_\_\_\_ TeamMate 2203 @ \_\_\_\_\_ ea.  
 \_\_\_\_\_ TeamMate 2206 @ \_\_\_\_\_ ea.  
 \_\_\_\_\_ TeamMate 2210 @ \_\_\_\_\_ ea.  
 \_\_\_\_\_ TeamMate 2213 @ \_\_\_\_\_ ea.  
 \_\_\_\_\_ TeamMate 2232 @ \_\_\_\_\_ ea.  
 \_\_\_\_\_ Kodak diskettes @ \_\_\_\_\_ ea.

Ship To:

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_

Daytime Phone \_\_\_\_\_

Subtotal \_\_\_\_\_

CA & MA residents,  
add sales tax \_\_\_\_\_

For optional UPS  
Blue Label delivery  
add \$10 per unit \_\_\_\_\_

Total Enclosed \$ \_\_\_\_\_

Payment Enclosed:  
☐ check ☐ money order  
☐ cashier's check

Make check payable to:  
Data Technology Corporation  
Dept. TM-1A  
2525 Walsh Avenue  
Santa Clara, CA 95051

For fastest delivery, call:  
In California, call collect:  
408-986-9545

**1-800-824-3724**

● Programs that use strings extensively. The ProDOS FRE command concatenates (cleans up) old string garbage much faster than the AppleSoft BASIC FRE command, which DOS 3.3 uses.

● Programs that use large text files or are constantly reading information from disk or writing it to disk. Not only do you benefit from ProDOS's faster disk access, but with ProDOS you can use a hard disk.

● Programs that can run on an Apple ///. ProDOS and SOS (the Apple ///'s operating system) have compatible text-file formats. (Although their text files are compatible, the BASIC programs are not.)

Conversely, you shouldn't try to convert other programs:

● Programs written in Integer BASIC. ProDOS doesn't support this language.

● Programs that use the INIT command to format disks from within the program. In ProDOS, you must format blank disks with the Format utility on the master disk.

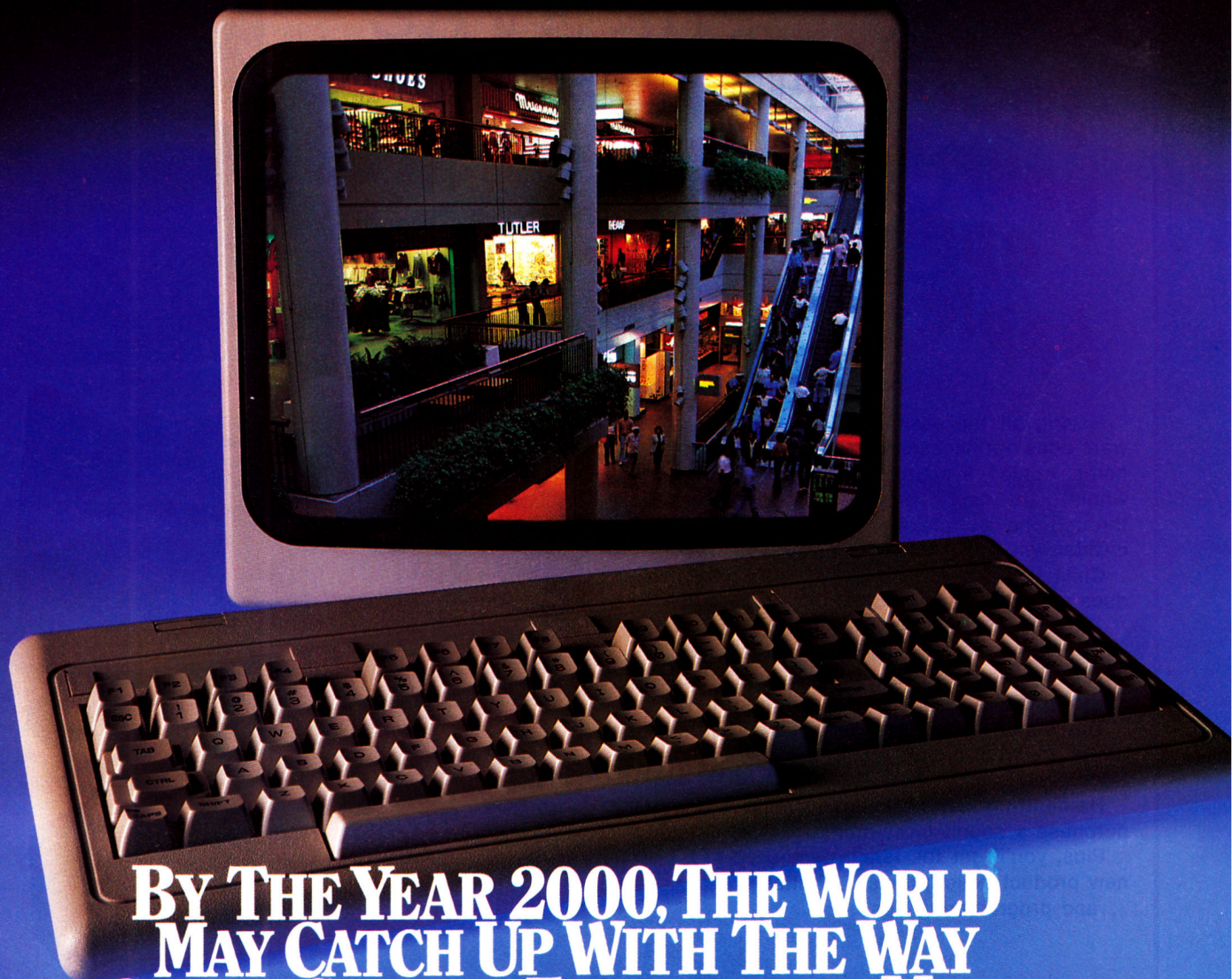
You can run simple Applesoft BASIC programs on ProDOS merely by converting them from DOS 3.3 to ProDOS. (See Part 2 of this series or pages 103-119 of the *ProDOS User's Manual*.) But ProDOS is different enough from DOS 3.3 that some programs present problems. You may have to change some of the commands in your Applesoft BASIC program to make it run in ProDOS. If programs are difficult to convert, you may want to leave them in DOS 3.3.

The easiest way to find out if an unmodified program will run in ProDOS is to try it. Run a few tests to make certain the program isn't producing garbage as output. If it doesn't run, you'll have to change all incompatible statements.

You should now have a good understanding of ProDOS commands and how to use ProDOS in BASIC. Next month, I'll wrap up this study of ProDOS with an examination of the differences between BASIC programs in DOS 3.3 and ProDOS, including a discussion of all the new errors ProDOS will let you make. ■

*Lee Swoboda can't answer all your questions individually. If the answer isn't lengthy and you include a stamped, self-addressed envelope, he'll do his best to respond. Answers to other questions will appear in future articles or in inCider's Letters column. You can write to Lee c/o Padapple Computer Consulting, 1451 NE Paulson Road, Poulsbo, WA 98370.*





# BY THE YEAR 2000, THE WORLD MAY CATCH UP WITH THE WAY COMPU SERVE'S ELECTRONIC MALL™ LETS YOU SHOP TODAY.

**Presenting the computer shopping service that delivers discount prices, name-brand merchandise, and in-depth product information.**

To make your computer even more useful, join CompuServe and shop in our Electronic Mall. Easy enough for beginners, it's open 24 hours a day, 7 days a week. And it offers a wide range of goods and services from nationally known stores and businesses including Bloomingdale's, Waldenbooks, American Express and Commodore.

**CompuServe's Electronic Mall™ lets you shop at your convenience in all these departments:**

The Auto Shop, Book Bazaar, Financial Mart, Leisure Center, Merchandise

Mart, Newsstand, On-line Connection, Personal Computer Store, Record Emporium, Specialty Boutique and Travel Agency.

## **Take the CompuServe Electronic Mall 15-Minute Comparison Test.**

*What you can do in 15 minutes shopping the Electronic Mall way.*

- Access descriptions of the latest in computer printers, for instance.
- Pick one and enter the order command.
- Check complete descriptions of places to stay on your next vacation.
- Pick several and request travel brochures.
- Access a department store catalog and pick out a wine rack, tools, toys...anything!
- Place your order.

*What you can do in 15 minutes shopping the old way.*

- Round up the family and get in the car.

**The Electronic Mall—A Valuable Addition to the Vast World of CompuServe.**

CompuServe Information Services bring you information, entertainment, personal communications and more.

You can access CompuServe with almost any computer and modem, terminal or communicating word processor.

To buy a CompuServe Subscription Kit, see your nearest computer dealer. To receive our informative brochure, or to order direct, call or write:

## **CompuServe**

Information Services, P.O. Box 20212,  
5000 Arlington Centre Blvd., Columbus, OH 43220

**800-848-8199**

In Ohio call 614-457-0802



# inCider... your integrated approach to Apple computing.

Having all the essential hardware and software does not necessarily add up to a complete home Apple\* system. To make your system whole, you need information to guide you through the complexities of home computing. inCider will pull it all together for you.

**Child's Play** gives you fun programs to introduce your children to computing.

**The Glau Report** is head to head software evaluations for your business applications.

**The Applesoft Adviser** guides you step-by-step through BASIC, so you'll program better.

**The Apple Clinic** saves you money with answers to your maintenance and repair questions.

**Hard-hitting reviews** help you make every purchase a sound investment.

Plus, you'll get the latest games...  
new product descriptions...utilities  
...and programming tips.

**Subscribe today  
and save 30% off  
the cover price.**

One year of inCider...twelve big issues...is only \$24.97. That's a savings of 30% off the newsstand price. Just fill out the coupon and return it today with payment enclosed.

To get your first issue faster, call toll free:

**1 (800) 258-5473**

(In New Hampshire, call 1-924-9471).

**Your money-back guarantee:** You can cancel your subscription at any time. We'll reimburse you for all undelivered issues—no questions asked.

Apple is a registered trademark of Apple Computer Inc.



**YES!** I want to accomplish more!

Send me 12 issues of inCider for \$24.97. I'll save 30% off the newsstand price.

☐ Payment Enclosed ☐ Bill me \$24.97

Name

Address

City  State  Zip

Canada and Mexico \$27.97, 1 year only, US funds drawn on US bank. Foreign surface \$44.97, 1 year only, US funds drawn on US bank. Please allow 6-8 weeks for delivery. Foreign airmail please inquire.

**inCider • PO Box 911 • Farmingdale, NY 11737 357B5**



# Everything Is Under CONTROL

*Need a burglar alarm? Want to tally items on a production line? The solution is simple: hook your Apple to an analog-to-digital converter.*

by Jerry Faughn

**F**or the ardent Apple fan, interfacing your computer with a variety of external devices lets you control many routine tasks and provides hours of rewarding experimentation. Previously, I've discussed a number of interface projects (October 1983, p. 122; June 1984, p. 72; and September 1984, p. 77). Of all the accessories you can connect to a computer, however, an analog-to-digital converter (ADC) is perhaps the most flexible.

A photoresistor connected to an ADC, for example, is useful in determining each day's output on an assembly line. Since a photoresistor changes resistance with light intensity (usually decreasing in resistance with increasing light intensity), a special program can keep count each time a product passes by and blocks off light

to the apparatus. This process could also be used as a burglar alarm—a break in the light beam would make the computer trigger a siren.

You can also connect an ADC to a thermistor, a device that changes resistance with temperature fluctuations. This setup can turn on an oven, for instance, when the temperature falls below a certain level, and shut it off when the temperature climbs too high.

After I explain how an analog-to-digital converter works, I'll show you how to connect these instruments to a typical ADC, National Semiconductor's 0809 ADC chip.

## **Volts to Binary Numbers**

Voltages, currents, and pressures are all examples of analog quantities: Their values can vary continuously.

For example, if a power supply has output ranging from zero to 20 volts, you can adjust it to produce 12 volts or any increment slightly higher or lower (12.1, 12.14, 11.981).

Computers, on the other hand, respond only to binary numbers—or, more specifically (in the case of the Apple II), only to decimal integers from zero to 255. To enable a computer to interpret or analyze data, you must convert analog values to digital numbers using an ADC.

National Semiconductor's 0809 chip is an 8-bit, 5-volt ADC: It converts an incoming analog signal (which must be between zero and 5 volts) to an 8-bit binary number. Using 3 volts as an example for the analog input, study the internal procedure the ADC performs to convert this signal to binary output:



●The ADC first compares the incoming signal to half its maximum range, 2.5 volts. Since the 3-volt signal is greater than this value, the ADC sets the most significant bit of its binary output, bit 7, high (1).  
●Next, the ADC compares the 3-volt

signal to the middle value of the new range ( $2.5 + 2.5/2 = 3.75$  volts). The 3-volt signal falls short, so the ADC sets bit 6 low (0).  
●Because the 3.75-volt comparison signal overshoot the 3-volt signal, the new comparison signal is reduced to

$2.5 + 2.5/2 - 2.5/4 = 3.125$  volts. This value is still higher than the incoming signal, so bit 5 is set low.  
●The next comparison signal is  $3.125 - 2.5/8 = 2.81$  volts. The incoming signal is higher than this, so the ADC sets bit 4 high.

These steps should now be evident. As you've probably determined, the next comparison signal is 2.97 volts, and bit 3 is set high.

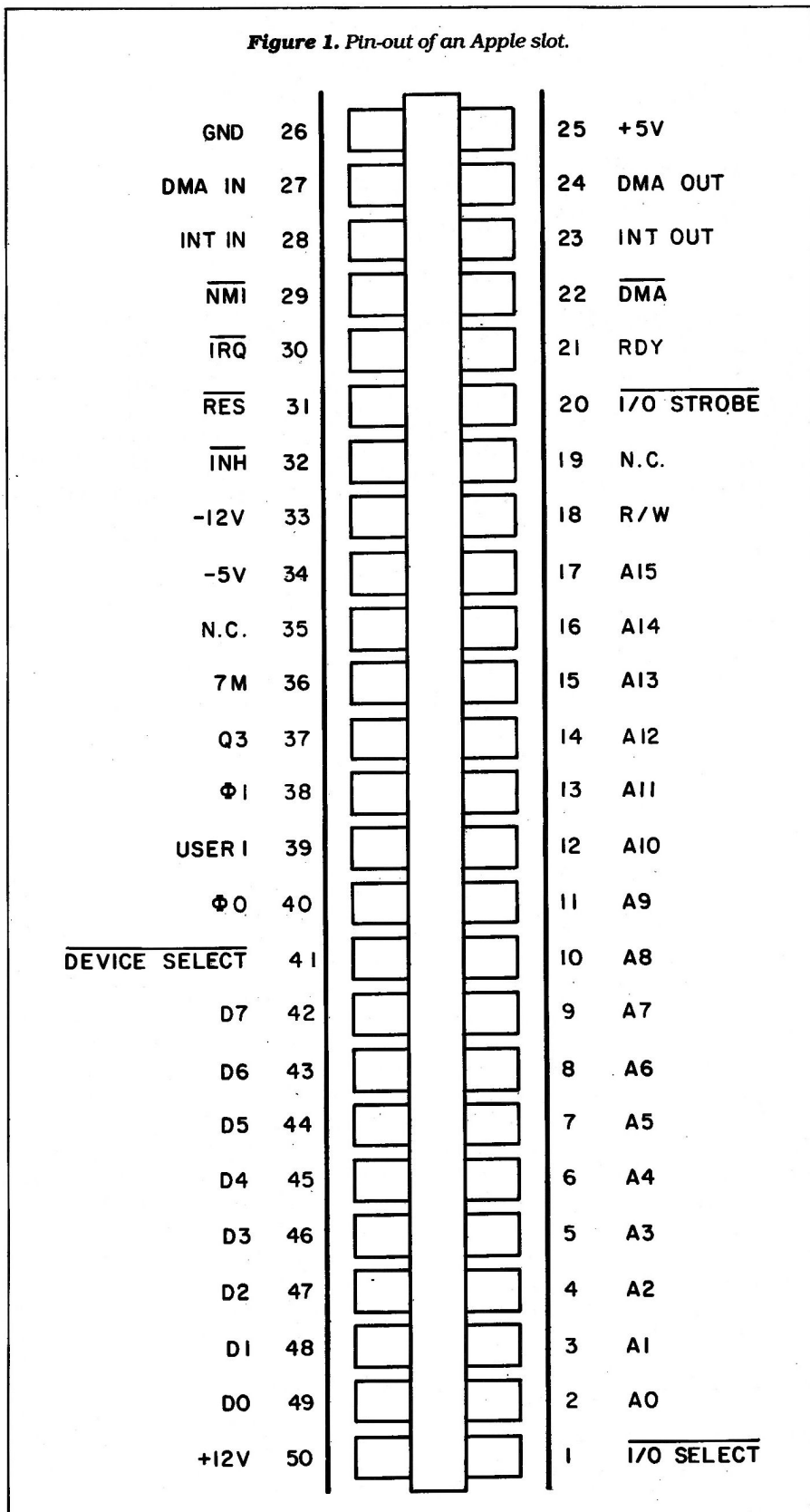
### The Apple Slots

To understand how to connect the 0809 ADC chip to the Apple, you must be familiar with a few of the signals your Apple's slots transmit—through pin 18, the read-write pin (R/W); pin 41, the device-select pin (DS); and pin 38, the clock signal. (A bar above the pin designation indicates that its function becomes active when the pin is set low, or grounded.) **Figure 1** designates a slot's pins (a "pin-out"), with the address lines (buses) to the computer labeled A0–A15 and the data lines labeled D0–D7.

Each slot is assigned certain memory addresses. (See **Table 1** for the memory addresses for slots 1–7.) Whenever one of the addresses within this range appears on the address bus, this slot opens—the DS pin goes low. The computer then needs to know whether to send information (write) to an external device connected to the slot or to read information from that device. The R/W line takes care of this function. For example, if you use a POKE statement to write something to the ADC, the computer sets the R/W line low. When you read something from the ADC with a PEEK statement, the computer sets the R/W line high.

The Apple clock signal is crystal-controlled and generates approximately one million square waves per second—that is, it goes from a high to a low a million times per second. This signal controls all internal operations of the Apple. Information can be sent to or from the computer only when the clock signal is low.

**Figure 1.** Pin-out of an Apple slot.



**Table 1.** Memory addresses opening slots 1–7.

Slot	Memory Locations
1	49296–49303
2	49312–49319
3	49328–49335
4	49344–49351
5	49360–49367
6	49376–49383
7	49392–49399



## ADC Connections

To see how you will use these signals to connect the ADC to the Apple, consider a few of the ADC pins—address latch enable (ALE), START, and output enable (OE).

**Figure 2** shows a circuit you can use to set up your ADC. One of the major steps in programming an ADC is to tell it through which of eight possible pins the analog signal will be transmitted. I'll focus on pin 26 of the ADC. Pins 23, 24, and 25 are connected to address lines A2, A1, and A0, respectively. (P4, P3, and P2 on **Figure 2** signify pins 4, 3, and 2 of the Apple slot shown in **Figure 1**.) When these lines are low, pin 26 becomes the analog input pin for the ADC.

If you convert address 49344 to binary, you'll see that the 3 lowest bits are all zeroes. Thus, a statement such as POKE 49344,0 sets pins 23, 24, and 25 all low, and simultaneously chooses pin 26 for analog input. Only the address POKEd matters—not the number POKEd. That is, POKE 49344, 63 would have worked equally well. Finally, you should note that the ADC recognizes the address and responds to it only when the ALE pin is set high.

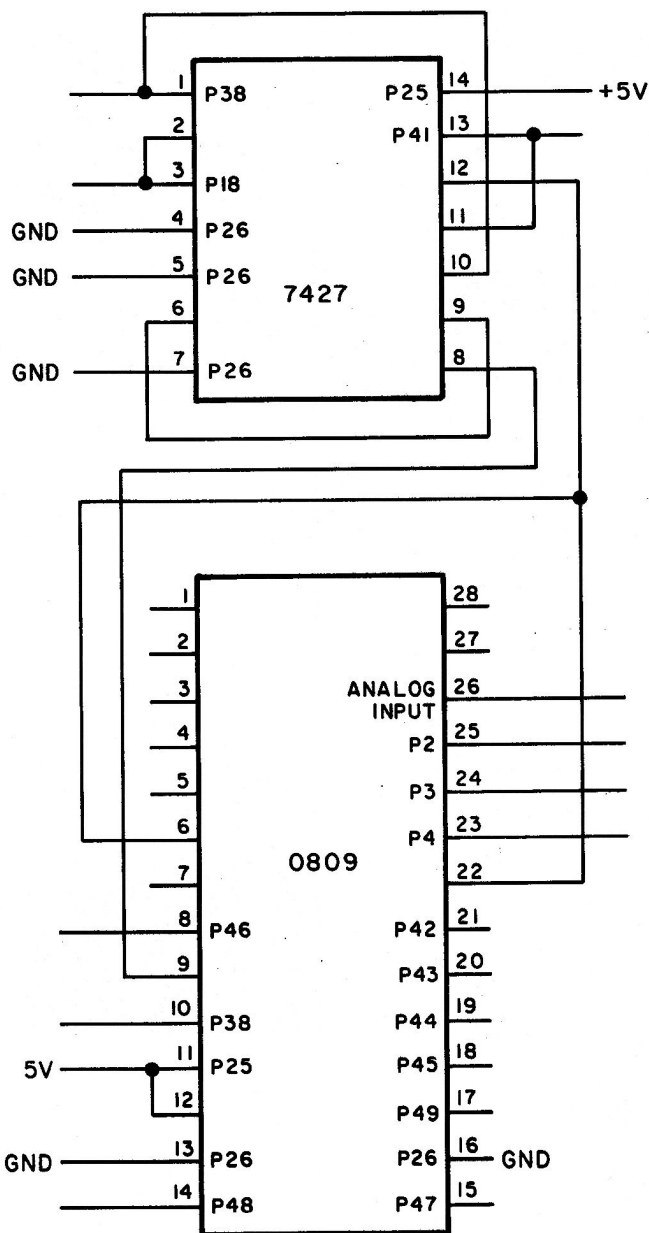
The START pin on the ADC does exactly what its name implies: It tells the ADC to get busy and convert an analog signal to a digital signal. The START pin is active when set high. **Figure 3** shows the ALE and START pins connected. The ALE pin indicates which analog input is being used; if START is simultaneously set high, this tells the ADC to look at the signal coming in at pin 26 and convert it to a digital value.

Set the OE pin low when the ADC is performing a conversion. Then, when the conversion is complete, set this pin high, so that the computer can read the resulting digital number.

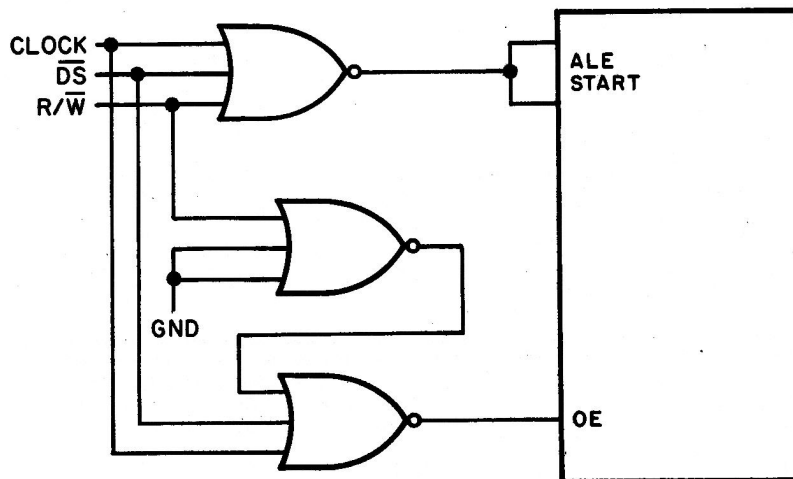
**Table 2** summarizes the steps you must take to get the ADC to start a conversion. The clock signal must be low; the R/W line must be low, so that you can write information from the computer; and the  $\overline{DS}$  signal must also be low, so that you can communicate with the instrument at this port (see **Figure 3**). The computer's clock,  $\overline{DS}$ , and R/W are all connected to the input pins of a triple-input NOR gate. When all inputs are low, the output of this device is high. Since it is connected to the ALE and START pins of the ADC, they also go high, and the ADC proceeds to convert an analog signal to a digital signal.

Once the analog-to-digital con-

**Figure 2.** Complete circuit to set up your ADC.



**Figure 3.** Circuit that sends digital values from the ADC to the computer. The second line of Table 2 shows the pin configuration.





# SCRG PRODUCTS FOR THE APPLE COMPUTER

## SWITCH-A-SLOT



\$179.50

The **SWITCH-A-SLOT** is an expansion chassis, which allows the user to plug in up to four peripheral cards at one time. One of these cards is selected for use, and only that card draws power.

This product is especially useful where the software requires the printer to be in a particular slot, and the user wishes to choose between two or more printers.

- Allows up to four peripheral cards to be plugged into one peripheral slot.
- User selects desired card by front panel rotary switch.
- Only selected card draws power.
- Plugs into any peripheral slot.
- Saves wear and tear on delicate connectors.
- 18" cable connects Switch-a-slot to computer.

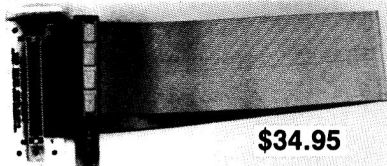
**New—resistive terminations for better response**



**SWITCH-A-SLOT** and **EXTEND-A-SLOT** work well with all slow to medium speed cards, such as Modems, Printers, Clock, 80 Column, Music, etc. They are not recommended for high speed data transfer devices such as disk drive controllers, alternate processor, and memory cards. These products may be incompatible with some alternate processor cards.



## EXTEND-A-SLOT



\$34.95

The **EXTEND-A-SLOT** brings a slot outside your APPLE<sup>®</sup>, allowing an easy change of cards. The 18" flex cable is long enough to allow placement of the card in a convenient location. The high quality connectors are gold plated for reliability.

The perfect accessory for:

Owners of large numbers of I/O expansion cards—keep your frequently used cards installed. Use the **EXTEND-A-SLOT** for the others.

Technicians—easy access to test points on accessory cards under actual operating conditions.

Experimenters—make easy changes to cards while card is installed.

**EASY TO USE**—just plug it in as you would any expansion card, then plug your card in. When you want to change cards, do it easily outside the computer, without the wear and tear on the computer expansion slot.

### OTHER PRODUCTS

**D Manual controller.** Gives complete control over the \$C000 through \$C0FF range in hardware. Can be switched while program is running. \$89.50.

**MAGIC KEYBOARD** (for ][ or ][+ only). Re-encodes the keyboard to give alternate keyboards, such as DVORAK, ASK, 10-KEY, HEXIDECIMAL KEYPAD, etc. \$49.50.

Available at your local dealer or direct from:

**So. Calif Research Group**

P.O. Box 593-R

Moorepark, CA 93021

(805) 529-2082

TELEX 658340 ATTN: SCRG

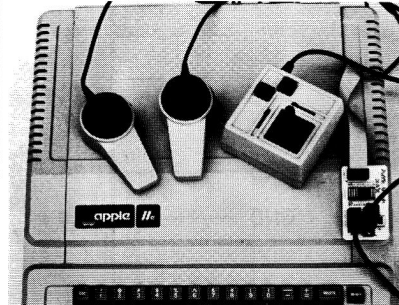
Answer Back INTERTEL SNC

VISA, MASTERCARD accepted

Add \$2.50 for shipping. Outside U.S. and Canada, \$5.00, for surface, \$10.00 Air; except Switch-A-Slot, \$25.00 Air.

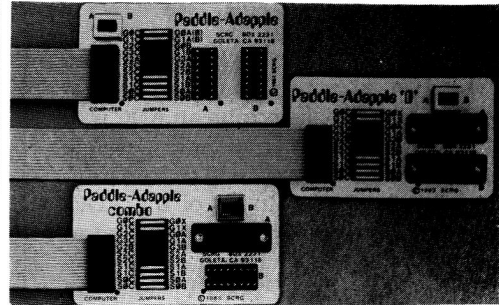
## Paddle-Adapple

### GAME I/O ADAPTER AND EXTENDER



- Works with all Apple compatible joysticks, paddles and other I/O devices.
- Select one of two devices or . . .
- Use 4 paddles simultaneously.
- Unique "Jumpers" socket allows you to configure to meet your needs.
- BPI<sup>™</sup> users can have BPI<sup>™</sup> device and paddles plugged in simultaneously. (**Paddle-Adapple** and **Paddle-Adapple Combo** only).
- Gives you four push-button inputs.
- Supports shift key modification.
- Exchange X & Y joystick axis.
- Small and compact — adheres to computer with supplied foam tape.
- All Strobes, annunciators and power available on all 16 pin connectors.
- Supplied with 18" cable.

\$29.95



The **Paddle-Adapple** has two 16 pin sockets. The **Paddle-Adapple "D"** works with the subminiature D connectors.

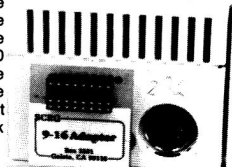
The **Paddle-Adapple Combo** has one 16 pin socket and one subminiature D connector.

## NEW 9-16 Adapter

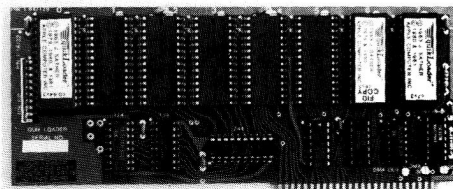
For Apple //e and //c

This product permits the use of most 16-pin I/O devices with the APPLE //c or //e. By plugging this adapter into the sub-miniature 'D' connector, you can plug in a 16-pin device, such as the **Paddle-Adapple**, paddles, joystick, **KOALA PAD<sup>™</sup>**, etc. The only limitations are those devices that use the annunciators or the C040 strobe, such as the **POWER PAD<sup>™</sup>**. Please note that the //c does not support four joystick inputs.

\$14.95



## quikLoader<sup>™</sup>



### FAST AND CONVENIENT

The **quikLoader** is the fastest way to load programs. **BAR NONE!** Programs can be loaded in fractions of a second. More importantly, DOS is instantly loaded every time the computer is turned on. Integer is even loaded in the language card. This process takes less than a second, saving valuable time. Frequently used programs are available instantly when you need them, without having to look for the disk, or hoping that the lengthy disk loading procedure goes smoothly.

To run a program from the **quikLoader**, bring up the **quikLoader** catalog (O-reset), and the names of the programs will be displayed, along with an index letter. Pressing the index letter will instantly load and run the program.

Up to 23 programs on the **quikLoader** can be displayed on the screen at one time. If you have more programs, you may scroll through the catalog in either direction.

The **quikLoader** is **ideal** for applications requiring a dedicated computer. Your program can be automatically loaded and run at "power-up".

### PROGRAMMING EPROMS

Putting your own programs on the **quikLoader** is easily done, using a separate EPROM programmer such as the **PROMGRAMMER**. For APPLESOFT, INTEGER, or single machine language files, no programming knowledge is necessary. You will need experience if you want to save copy-protected or complex programs. The amount of experience necessary depends on the complexity of the program.

### COMMERCIAL PROGRAMS

If you have a program that is valuable, it will become more valuable when it is instantly available to you. We are actively seeking licenses from software publishers to allow their popular programs to be made available for the **quikLoader**. Independent authors are encouraged to write programs suitable for the **quikLoader**. If the author wishes, we will market the program (with appropriate royalties), or the author can take care of all marketing. In either case, we will make known to our customers the availability of these programs.

We start your library of programs with the most popular utilities on the card, FID and COPYA. Now, if you have to copy a disk, you don't have to search for the master disk. You can start copying within 3 seconds after turning on the computer.

We are currently licensed to sell several very popular programs on EPROM. **DOUBLE-TAKE** by BEAGLE BROS., and **COPY ][ PLUS** by CENTRAL POINT SOFTWARE. The introductory price for **DOUBLE-TAKE** is \$45.00. This includes the program exactly the same as you would buy it at your dealer for \$34.95 (including disk and documentation), and a programmed 27128 EPROM (worth about \$25.00). **COPY ][ PLUS** cost \$65.00. This includes the original program (worth \$39.95) and two programmed 27128's.

Other programs available directly from us or the publishers are, **BARKOVITCH I/O TRACER** and **SINGLE STEP TRACE**, **MICRO/TYPOGRAPHER** from TIDBIT SOFTWARE, **ECHO** speech synthesizer software from STREET ELECTRONICS, and **MERLIN** assembler, from ROGER WAGNER PUBLISHING. More commercial programs are now in the works.

### MEMORY CAPACITY

The **quikLoader** has eight sockets for EPROMs. These sockets can accommodate standard EPROMs from 2716 to 27512. These types can be freely intermixed. The memory capacity of the **quikLoader** depends on the EPROMs used. For example, the 2716 can hold 2K of programs, and the 27512 can hold 64K. (Frankly, the current costs of the 27512 is prohibitive, but should come down drastically in the next year.) At this writing, the least cost-per-bit is provided by the 2764, which can hold an 8K program. Using these "chips", the **quikLoader** becomes a 64K ROM. Using larger capacity EPROMs allows it to become a 128K, 256K, or even a 512K card. If more memory capacity is needed, the **quikLoader** operating system supports multiple **quikLoaders**.

### INCREASED DISK CAPACITY

Since DOS is loaded from the **quikLoader** every time the computer is turned on, it is not necessary to take up valuable disk space with DOS. This will give you more than 5% additional space for programs and data on your disks.

### ABOUT THE DESIGNER

The **quikLoader** was designed by Jim Sather, author of **UNDERSTANDING THE APPLE ][** (forward by Steve Wozniak), published by QUALITY SOFTWARE (21601 Marilla Street, Chatsworth, CA 91311 (818) 708-1721).

### SYSTEM REQUIREMENTS

The **quikLoader** plugs into any slot of the APPLE ][+ or //e. If used in a ][+, a slightly modified 16K memory card is required in slot O. A disk drive is required to save data.

DOS, INTEGER BASIC, FID, and COPYA are copyrighted programs of APPLE COMPUTER, INC. licensed to Southern California Research Group to distribute for use only in combination with **quikLoader**.

\$179.50

### PROMGRAMMER<sup>™</sup>

The **PROMGRAMMER** will read or program any of the standard single-volt EPROMs from the 2708 to the 27512. Features include:

- Slot independent operation for the APPLE // family of computers.
- Zero insertion force sockets accepts 24 or 28 pin devices.
- Disk based software allows easy customization of software.
- Complete instructions for loading software into **quikLoader**.

\$149.50

### SIX MONTH WARRANTY TEN DAY RETURN PRIVILEGE TOLL-FREE ORDER LINES

in CA (800) 821-0774  
(800) 635-8310

all other states (Including AK, HI, VI & PR)  
Information & technical questions: (805) 529-2082



version has taken place in the 0809, you must obtain the digital values by changing some signals going to the ADC (see **Table 2**). Set the clock signal low; the R/W line of the computer must be high, since you want to read from an external device. The  $\overline{DS}$ , ALE, and START must all be low. (A low ALE and START ensure that another conversion won't begin until you've read the results of the first one.) Set OE high to read data from the ADC (refer to **Figure 3**). The 7427 chip in **Figure 2** contains three triple-input NOR gates to perform the decoding **Figure 3** demonstrates.

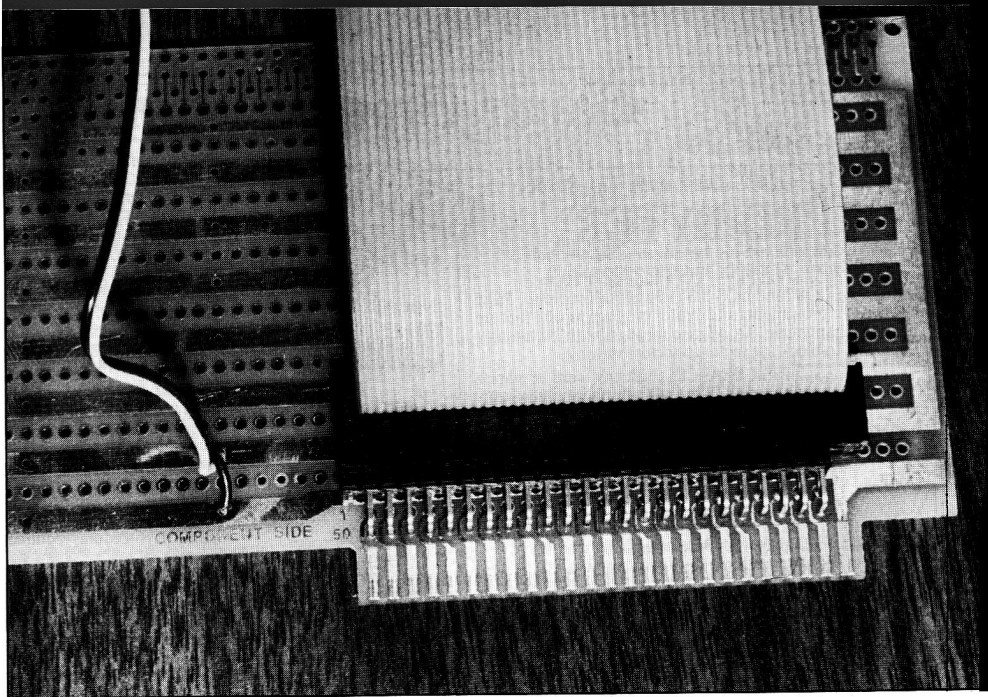
### Connecting the Circuit

A Douglas Electronics breadboard provides a simple way to make connections to the Apple slots. Attach a cable and headers (available from electronic supply houses such as Jameco and Jade) to it so that you can do all your wiring outside the Apple. The **Photo** shows this breadboard assembly.

Once you set up your circuit, you can test it to see if it's working properly by hooking up a potentiometer across zero and 5 volts with its center tap linked to pin 26 of the ADC (**Figure 4**). With the connections made to slot 4 of the Apple, enter and run the following program:

```
10 POKE 49344,0
20 PRINT PEEK(49344)
30 GOTO 10
```

As you rotate the knob of the potentiometer, the output on your monitor should vary from zero to 255.



**Photo.** Breadboard assembly.

### ADC Projects

**Figure 5** shows you how to attach a photoresistor to your ADC. A typical value for the fixed resistor in the circuit is about 30,000 ohms. With this circuit connected, run the program above and note how the signal to the monitor changes when you block off light to the photoresistor.

Replace the photoresistor described above with a thermistor and run the same program again. Warm the thermistor in your hand, and note the change in temperature on your display.

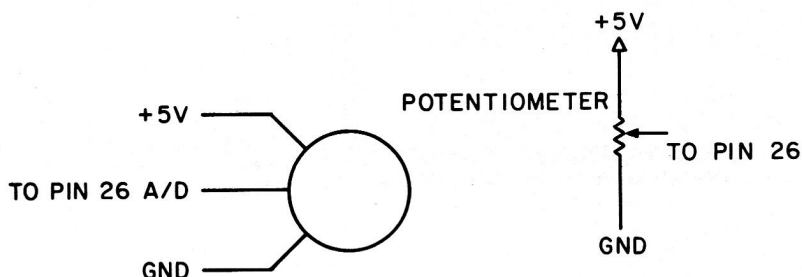
As an extra exercise, write a graphics program that reads the output from a photoresistor or a thermistor and plots the data in the colors of lo-res or hi-res mode—the results are guaranteed to wow your friends. ■

Address correspondence to Jerry Faughn, Physics Department, Eastern Kentucky University, Richmond, KY 40475.

**Table 2.** Configuration of ADC to start a conversion.

	Clock	R/W*	$\overline{DS}$ *	ALE START	OE
From computer to ADC	0	0	0	1	0
From ADC to computer	0	1	0	0	1

**Figure 4.** Potentiometer used as a voltage divider.

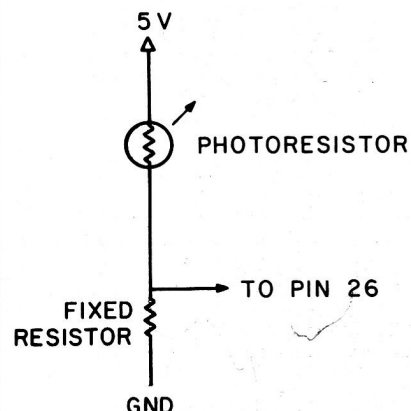


## Manufacturer Information

Douglas Electronics  
718 Marina Boulevard  
San Leandro, CA 94577  
(415) 483-8770

Reader Service Number 441

**Figure 5.** Photoresistor.





# Beagle Bros Apple® Software Report

Call 619-296-6400 or write for free Catalog

Ad Number 222—Page 1

"All the News That Fits"

Summer 1985

## NEW! ProDOS Disk with Tip Book! PRO-BYTER™

\$34.95 (Compatible with any Apple IIe, IIc or 64K II+/ProDOS™)

### ALL-NEW—BYTEZAP PRO

Inspect ProDOS™ and DOS 3.3 disks at the byte level. Make changes, improvements and disk or program repairs that are normally impossible. An *all-new* program with instantaneous block-to-block (or sector-to-sector) viewing.



**DISK SEARCH:** Find any word or phrase on a disk. Automatically trace or search any file. Repair "zapped" disk bytes that might cause malfunction. Instant disk maps show which sectors or blocks any file occupies.

**CUSTOMIZE DISKS:** Easy instructions show how to make changes to disks, other programmers' programs, and DOS itself—a changed byte here and there can produce amazing results. Hey, this stuff is FUN!

### NEW ProDOS UTILITIES

**MACHINE LANGUAGE SORT:** One CALL in your Applesoft program will alphabetize a list of words or numbers—*super-fast!* Works with normal string-arrays (A\$(1), A\$(2), etc.).

**CONVERTER:** Convert any Applesoft program line into machine code that can be CALLED by any Basic program.

**TEXT TYPER:** Read and print ProDOS text files (on your screen or printer) without having to boot another disk.

**MORE:** Put time and date of save in your disk catalogs. Print alphabetized lists of your ProDOS catalogs (including all hidden subdirectories). Make any Applesoft command work like any other. Scramble Basic so only you can read it...

### MACHINE LANGUAGE EDITOR

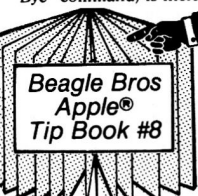
If you type in machine language programs from magazines, you'll love being able to make corrections by inserting and deleting code (no machine language knowledge required).

This easy-to-use editor also serves as a neat two-way-scrolling memory scanner. (Find out what's *really* going on inside your Apple's head.) The Pro-Byter manual shows you where in memory to look to find some very interesting stuff.

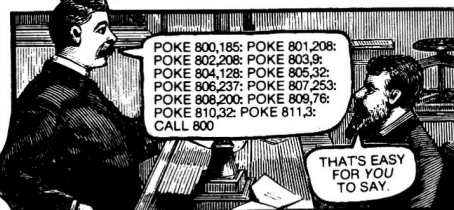
### PLUS ALL-NEW APPLE TIPS

From the authors of DOS BOSS (Bert Kersey and Jack Cassidy)—page-after-page of juicy tips, experiments and inside info about your Apple. Learn secrets about Apple's new ProDOS operating system and Apple disk structure.

The latest official version of ProDOS (V1.1.1 with the new "Bye" command) is included on the Pro-Byter disk.



You get a GOLD MINE of tips, including: How to use memory like an extra disk drive (ProDOS lets you load & save files in RAM), How to disable the LIST command so it says "File Locked", How to disable or swap ANY command, How to change "Startup" to any name, How to personalize ProDOS catalogs...



## UTILITY CITY™

\$29.50 (Compatible with any version of Apple II/DOS 3.3)

### A-Plus Magazine Readers' Choice 1985 Product of The Year

21 USEFUL UTILITIES: *List-formatter* puts each statement on a new line with indented loops and printer page breaks. *Multi-Cat* lets you create multi-column catalog printouts. *Filename Zap* allows invisible and trick file names, etc. Utility City is for beginning as well as advanced Applesoft programmers—very educational.

## SILICON SALAD™

\$24.95 (Compatible with any version of Apple II/DOS 3.3)

### OVER 100 PROGRAMS!

*Program Splitter* makes room for hi-res graphics in big programs. *Disk Scanner* finds bad sectors. *DOS-Killer* adds 2 disk tracks of disk space. *2-Track Cat* doubles the number of files. *Text Imprinter* converts text screen text to hi-res...

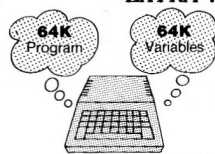
## NEW! 128K Extended Memory Utility! EXTRA K™

\$39.95 (Compatible with any Apple IIc or 128K IIe/DOS 3.3 and ProDOS™)

### PUT YOUR 128K TO WORK!

Even with 128K of memory, your Applesoft programs, pictures and variables only occupy and access the lower 48K. The EXTRA K disk contains several powerful programs that let you utilize all of that 128K capacity, speed and muscle.

### EXTRA VARIABLES



Your Applesoft programs can now function undisturbed in main memory while all variables, strings and other data reside in your Apple's massive extra 64K. Everything functions normally—no special commands or procedures required.

### EXTRA APPLE

EXTRA K lets you have two 64K Apples and programs in memory at once and switch between them at will. Plus, you can even have a ProDOS™ Apple and a DOS 3.3 Apple in memory simultaneously and swap files back and forth without subjecting yourself to Apple's *Convert* program.

### EXTRA-FAST COPIES

Make disk copies fast and "on-the-spot" without re-booting! EXTRA K's "nibble copier" duplicates and verifies unprotected disks in 35 SECONDS instead of 1½ minutes. Thanks to your Apple's 128K, only 3-4 passes per disk are necessary.

### EXTRA FEATURES

Compare any two disks, byte-for-byte. Create "dual personality" ProDOS/3.3 disks. Peek and poke auxiliary memory. Keep a live "logbook" of everything that has appeared on your text screen and review it when you want...

### EXTRA SCREENS

Store all kinds of images in memory and display any one (all or part) instantly. Up to 7 hi-res pictures or 62 text screens can be stored at once. Call several pictures to the screen per second, opening up new Apple animation possibilities.



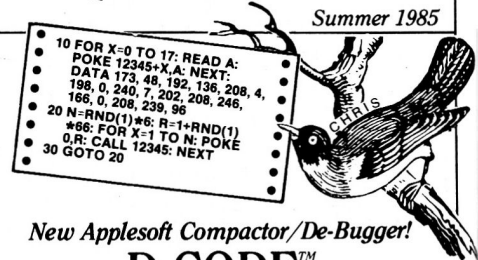
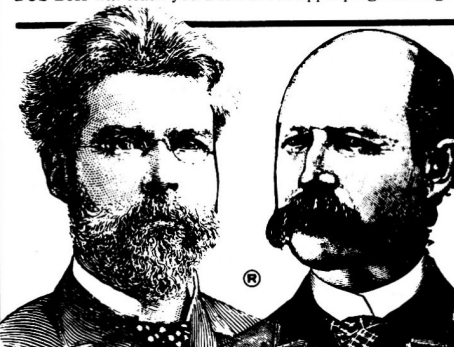
EXTRA K allows high-speed multi-screen switching.

## DOS BOSS™

\$24.00 (Compatible with any version of Apple II/DOS 3.3)

### CUSTOMIZE DOS 3.3

Change Catalog command to Cat, or "Syntax Error" to "Oops!", or anything you want. *Protect your programs:* An unauthorized Save-attempt can print "Not Copyable". List Prevention, other useful tips and fascinating experiments. DOS Boss will teach you a ton about Apple programming!



## New Applesoft Compactor/De-Bugger!

## D CODE™

\$39.95 (Compatible with any version of Apple II/DOS 3.3 and ProDOS™)

### PROGRAM PACKER

D CODE squeezes all of the wasted and unused bytes out of your Applesoft programs, saving valuable memory space and increasing your programs' speed and efficiency.

Automatically combine program lines, shorten variable names and/or remove REMarks. D CODE also uncovers wasted program lines that can't possibly be executed.

### AUTO-PROOFREADER

Keyboard errors are caught as you type. If you enter an illegal program line, you are told immediately—before you (or worse—someone else) runs your program. Or you may simply type "CHECK" to scan an *entire program* in a couple of seconds and uncover potential crashes. If no mistakes are found, you get an immediate "NO ERRORS" message.

### SUPER-TRACE

When a program stops or crashes, type "DUMP" to see the last 10-1000 statements and line numbers that were executed, in the order executed—an instant program *history*.

D CODE features sophisticated "live" tracing too, with each executing statement, line number and selected variable values appearing in a window at the bottom of the screen.

Your program runs up here.  
-----  
Lines & VARIABLES traced down here.

### BREAKPOINTS

D CODE lets you set up de-bugging "breakpoints" so your program stops when you want. For example, you can ask that your program be stopped the moment X gets set to 99, or the 3rd time a particular program statement is encountered.

### LIGHTNING-FAST FIND!

D CODE lets you find strings and variables *fast*—even large programs can be searched in about 2 seconds! All lines with a specified word are automatically listed with the word highlighted. This feature alone is worth the price of D CODE.

### GPLE COMPATIBLE

D CODE remains "transparent" to your programs and is fully-compatible with GPLE, Double-Take, ProntoDOS, etc.



1 HOME: HTAB 5: POKE 33,28: FOR C=1 TO 92: POKE 50,255-192\*(C-4 OR C-64)  
9 J=J+1-31\*(J=31): PRINT CHR\$(9+(J=1)): SPC(2+(J<10)): J: NEXT: PRINT  
85 POKE 33,1: PRINT "JULY..AUG..SEPT...."

## Beagle GAMES

## I. O. SILVER™

\$29.95 (Compatible with any version of Apple II)

### HI-RES STRATEGY!

I. O. SILVER is *both* a thinking person's strategy game and a fast-action arcade game. Your job is to create a hi-res "Super Computer" on the screen while avoiding a pesky gang of computer bugs. I. O. Silver's Strategy Workshop lets you plan your moves before each level. Excellent high-speed animation and hi-res action. Great for ages 12 & up.

**SOURCE CODE:** Programmers can get fully commented I. O. Silver Source Code on three 2-sided disks for \$30. Ordering info comes with the game.

## BEAGLE BAG™

\$29.50 (Compatible with any version of Apple II)

### 12 GREAT BASIC GAMES

Voted by Apple software buyers to *Softalk's* "Top-30 Most Popular" list, Beagle Bag is one of the best Apple game bargains on the market today. All games are LIST-able, so you can see what makes them work, or make changes.

# Beagle Bros

## MICRO SOFTWARE

The Apple Programmer's Best Friend

BEAGLE BROS, INC.

3990 OLD TOWN AVENUE, SUITE 102C  
SAN DIEGO, CA 92110 PHONE 619-296-6400



# Beagle Bros Apple® Software Retailer

Ad Number 222—Page 2

"All the News That Fits"

Print Pictures on Your Printer!

## TRIPLE-DUMP™

\$39.95 (Compatible with any version of Apple II/DOS 3.3 and ProDOS™)

PRINT ANY APPLE IMAGE

TRIPLE-DUMP lets your dot matrix graphics-capable printer print (1) Hi-Res and Double Hi-Res graphics. (2) Lo-Res and Double Lo-Res graphics. (3) Forty and 80-Column text screen text.

All kinds of images can be transferred to your printer with absolutely no programming knowledge. Or you can call Triple-Dump's routines from your own Applesoft Basic programs.

TRIPLE-DUMP gives you a full range of special effects—crop, rotate, magnify, compress, adjust density, etc.

GIANT BANNERS TOO

Print big signs and messages of all kinds (with 8½" high letters) on any kind of dot-matrix or letter-quality printer.

## GIANT BANNERS



## FATCAT™

\$34.95 (Compatible with any version of Apple II/DOS 3.3 and ProDOS™)

APPLE-DISK LIBRARIAN

Organize your disk library! FATCAT enters all of your ProDOS and 3.3 disk catalogs into one or more "Master Catalog" for fast searching, sorting and printing. Find the files you're looking for and eliminate space-wasting duplicates.

You can update your Master Catalog at any time by simply letting FATCAT read in your new or altered disks.

ALPHABETIZE FILE NAMES

FATCAT will sort your ProDOS and 3.3 disks so they catalog in alphabetical order. Or you can re-arrange file names in any order. Compare any two files too, and find the differences.

## DISKQUIK™

\$29.50 (Compatible with Apple IIc or 128K IIe/DOS 3.3)

DOS 3.3 IN-MEMORY DISK DRIVE!

DISKQUIK makes your Apple IIc or 128K IIe think it has an extra drive connected to Slot 3. It's just like using a super-fast (hard-disk speed), silent drive. Catalog with a "CATALOG.S3" command. Save and load all kinds of files to and from RAM with normal commands (holds about half the data of a floppy).

MANY USES: For example, load often-used programs into memory when you boot, so they are ready to use.

## PRONTO-DOS™

\$29.50 (Compatible with any version of Apple II/DOS 3.3)

TRIPLE-SPEED DOS 3.3!

ProntoDOS lets you load & save files at triple speed. Hi-res pix, for example, load in under 3 seconds.

MORE RAM & DISK SPACE

Create high-speed bootable disks with 15 extra sectors of space. Move DOS 3.3 to your Language Card (64K req'd.) for an extra 10K of usable memory. Also: Pronto's new TYPE command instantly displays DOS 3.3 text file contents.

## Hi-Res Shapes and Fancy Type! APPLE MECHANIC™

\$29.50 (Compatible with any version of Apple II/DOS 3.3)

HI-RES SHAPE ANIMATION

Your drawings are converted into hi-res "shape tables" so your programs can perform animation with Apple's built-in DRAW & XDRAW commands. List and Learn disk demos teach you how to create your own animated hi-res programs.

"Use Apple Mechanic routines & fonts in your programs without fear!"



"Just credit Beagle Bros on your disk and manual!"

FANCY DISPLAY TYPE

Six proportionally-spaced hi-res screen-display fonts (both large and small) are included on the Apple Mechanic disk—

WESTERN: KLMN  
apple: ABCDEFG  
STENCIL: ABCDE

26 more typefaces are available on our Apple Mechanic Typefaces™ disk (sold separately: \$20.00).

16-COLOR DOUBLE HI-RES GRAPHICS!

## BEAGLE GRAPHICS™

\$59.95 (Compatible with Apple IIc or 128K IIe/DOS 3.3 and ProDOS™)

DOUBLE HI-RES

Access 16 hi-res colors and 560 (horiz.) x 192 (vert.) pixels (twice normal resolution) on your Apple IIc or 128K IIe.

AS AN ARTIST, you can draw, fill and label double hi-res pictures using just the keyboard, or your AppleMouse™, joystick, Koala Pad™ or Graphics Tablet. Easy-to-use icon-assisted Cut & Paste features make graphic manipulations easy. Any image section may be altered or re-located.

OR, AS A PROGRAMMER, you get 33 new commands for drawing, filling and manipulating double-res images. You can convert normal programs and pictures to double-res, save and load any image section, compress picture data to 1/3 disk space, produce double-res "slide shows" and more. EXCELLENT REVIEWS—see Jan-85 A-Plus Magazine.

## BEAGLE BASIC™

\$34.95 (Compatible with unenhanced Apple IIe or 64K II+/DOS 3.3)

BETTER APPLE BASIC

Put Applesoft in RAM so you can change and improve it. Add new commands to Basic, like ELSE, SWAP, TONE...

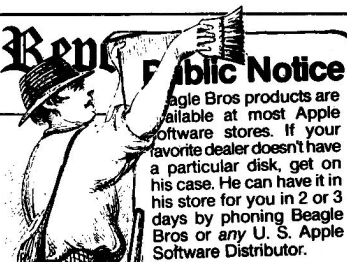


**Beagle Bros**  
MICRO SOFTWARE

The Apple Programmer's Best Friend

BEAGLE BROS, INC.

3990 OLD TOWN AVENUE, SUITE 102C  
SAN DIEGO, CA 92110 PHONE 619-296-6400



## GPLE™

\$49.95 (Compatible with any version of Apple II/DOS 3.3 and ProDOS™)

THE APPLE PROGRAM EDITOR

GPLE is Beagle Bros' "GLOBAL PROGRAM LINE EDITOR", the most popular, efficient way to edit Applesoft programs. GPLE works like a word processor for Basic program lines.

INSERT & DELETE

Now you can quickly make changes to your programs. No more awkward "escape-editing" to make changes. No more hassles with extra spaces in quote statements. No more slow "cursor-tracing" to the end of a line before pressing Return.

SEARCH & REPLACE

Find every occurrence of a string or variable in your programs. Or replace any word with any other. For example, change all X's to ABC's, or all "HORSE" strings to "COW".

FUNCTION KEYS

Define your own Apple "function keys". For example, ESC-1 can Catalog drive 1, ESC-N can clear the screen and type your name and address, etc. Customize your Apple with a set of ESC functions that perform any set of tasks that you want.

## DOUBLE-TAKE™

\$34.95 (Compatible with any version of Apple II/DOS 3.3 and ProDOS™)

2-WAY SCROLLING

Listings and disk Catalogs scroll both up and down, making file names and program lines easier and faster to find. You change scroll-direction with the Arrow keys. Machine language listings and Hex-Ascii dumps scroll two-ways too.

BETTER LIST FORMAT

Double-Take's easy-to-read listings have each Applesoft program statement on a new line for fast program reading.

BONUS FEATURES

A\$="ABC" ← VARIABLE-DISPLAY: Instantly prints all of your program's variables in the order used, with their current values.  
X=3,14159  
Y=255  
A\$: 5 10 150 ← CROSS-REFERENCE: Alphabetizes every variable your program uses, and displays them with their line numbers.  
X: 10 20 3000  
Y: 5 40 55 60

Plus AUTO-LINE-NUMBER, improved Re-Number, Hex-Dec Convert, Program Stats, eliminate/re-define the cursor...

Visa/MasterCard or COD, order Toll Free  
ALL 50 STATES/24 HOURS (orders only)  
**1-800-227-3800 ext.1607**

Beagle Bros products are on the shelves at your local Apple Software Store.

We also ship FAST via First Class Mail:

- |  |   |
|--|---|
| <input type="checkbox"/> Alpha Plot . . . . \$39.50  | <input type="checkbox"/> Fatcat . . . . \$34.95   |
| <input type="checkbox"/> Apple Mechanic . . . 29.50  | <input type="checkbox"/> Flex Type . . . 29.50    |
| <input type="checkbox"/> A.Mech.Typefaces. 20.00     | <input type="checkbox"/> Frame-Up . . . 29.50     |
| <input type="checkbox"/> Beagle Bag . . . . 29.50    | <input type="checkbox"/> GPLE . . . . 49.95       |
| <input type="checkbox"/> Beagle Basic . . . . 34.95  | <input type="checkbox"/> I. O. Silver . . . 29.95 |
| <input type="checkbox"/> Beagle Graphics . . . 59.95 | <input type="checkbox"/> Pro-Byter . . . 34.95    |
| <input type="checkbox"/> D Code . . . . 39.95        | <input type="checkbox"/> ProntoDOS . . . 29.50    |
| <input type="checkbox"/> DiskQuik . . . . 29.50      | <input type="checkbox"/> Silicon Salad. 24.95     |
| <input type="checkbox"/> DOS Boss . . . . 24.00      | <input type="checkbox"/> Tip Disk#1 . . . 20.00   |
| <input type="checkbox"/> Double-Take . . . . 34.95   | <input type="checkbox"/> Triple-Dump. 39.95       |
| <input type="checkbox"/> Extra K . . . . 39.95       | <input type="checkbox"/> Utility City . . 29.50   |

ADD \$1.50 FIRST CLASS SHIPPING (ANY SIZE ORDER).  
COD add \$3.00/California add 6%/Overseas add \$4.00

NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
ZIP \_\_\_\_\_  
VISA/MC/CARD# \_\_\_\_\_  
EXPIRATION DATE \_\_\_\_\_



MAIL DIRECTLY TO BEAGLE BROS.  
WE PROCESS ALL ORDERS IMMEDIATELY.

© 1985, Beagle Bros, Inc.



### Program listing. Should I Trade?

```

101 DIM D1$(17),QA$(17),QA(17),C(11,6,6),C$(11,6,6)
105 D$ = CHR$(4)
106 E1$(1) = "MILLER ASSOCIATES"
107 E1$(2) = "6744 RANSOME DRIVE"
108 E1$(3) = "BALTIMORE MD. 21207"
110 W$(1) = "1. PRICE-REGULAR GAS"
112 ONERR GOTO 117
113 GOSUB 683
114 GOTO 120
117 PRINT D$;"CLOSE HEAD": GOSUB 672
120 W$(2) = "2. PRICE-NOLEAD GAS "
130 W$(3) = "3. INFLATION-GAS "
140 D1$(1) = "TODAY'S DATE "
150 D1$(2) = "NAME "
1360 D1$(3) = "MODEL YEAR AND MAKE-PRESENT CAR "
170 D1$(4) = "MILEAGE ON PRESENT CAR "
180 D1$(5) = "MILES/GALLON-PRESENT CAR "
190 D1$(6) = "MILES DRIVEN PER YEAR "
200 D1$(7) = "PRICE OF NEW CAR "
210 D1$(8) = "ESTIMATED MILES/GALLON-NEW CAR "
220 D1$(9) = "EXPECTED TRADE-IN VALUE OF OLD CAR"
230 W$(4) = "4. INFLATION-MAINT. "
240 D1$(10) = "CASH OR FINANCE "
241 D1$(11) = "NO. OF MONTHS FINANCED "
242 D1$(12) = "TYPE GAS USED IN OLD CAR: "
243 D1$(13) = "TYPE GAS USED IN NEW CAR: "
244 D1$(14) = "INSURANCE - OLD CAR: "
245 D1$(15) = "LICENSE TAGS - OLD CAR: "
246 D1$(16) = "INSURANCE - NEW CAR: "
247 D1$(17) = "LICENSE TAGS - NEW CAR: "
250 W$(5) = "5. INTEREST-SAVINGS "
260 W$(6) = "6. INTEREST-FINANCE "
290 PP$(1) = "1.05"
300 PP$(2) = "1.10"
310 PP$(3) = "8"
320 PP$(4) = "6"
330 PP$(5) = "9"
340 PP$(6) = "12"
370 HOME
390 PRINT SPC(12);"SHOULD I TRADE?": PRINT " ": PRINT SPC(
11);"COPYRIGHT AUG. 1980": PRINT " ": PRINT SPC(11);"MI
LLER ASSOCIATES": PRINT " ": PRINT SPC(11);"6744 RANSOM
E DRIVE": PRINT " ": PRINT SPC(10);"BALTIMORE, MD. 2120
7"
400 PRINT " ": PRINT " ": PRINT " "
410 PRINT SPC(12);"SHOULD I TRADE?"
420 PRINT " ": PRINT " ": PRINT " "
430 PRINT "1. RUN WITH PREPROGRAMMED PARAMETERS"
440 PRINT "2. RUN WITH CUSTOMIZED PARAMETERS"
450 PRINT "3. VIEW, CREATE, OR CHANGE PARAMETERS"
455 PRINT "4. PUT YOUR NAME ON PRINTOUT"
460 PRINT "5. QUIT"
470 PRINT " ": PRINT " ": PRINT " "
480 INPUT " INDICATE YOUR CHOICE BY PRESSING APPROPRIAT
E NUMBER; THEN PRESS 'RETURN'.";A1
490 IF A1 > 0 AND A1 < 6 AND A1 = INT(A1) THEN HOME : GOTO
520
500 HOME : VTAB 10: INPUT " PLEASE JUST PRESS ONE OF THE
NUMBERS 1,2,3,4, OR 5 AND THEN PRESS 'RETURN'.
NOW PRESS 'RETURN' AND WE'LL TRY AGAIN.";A1$
510 HOME : GOTO 410
520 ON A1 GOTO 540,550,570,531,530
530 HOME : END
531 HOME : VTAB 7: PRINT " TYPE THE HEADING AS YOU WANT I
T TO APPEAR. YOU HAVE UP TO 3 LINES. PRESS 'RETURN' AFT
ER EACH LINE, EVEN IF YOU WANT NOTHING ON THE LINE. ":
PRINT " "
532 INPUT " ";E1$(1),E1$(2),E1$(3),E1$(4)
533 GOSUB 671
534 HOME : VTAB 10: INPUT " YOUR HEADING WILL NOW APPEAR
AT TOPOF PRINTOUT AND YOUR NAME WILL APPEAR IN DISCLAIM
ER. PRESS 'RETURN' TO GET BACK TO MAIN MENU. ";A1$
535 HOME : GOTO 390
540 FOR N = 1 TO 6:CR$(N) = PP$(N): NEXT N: GOTO 1150
550 ONERR GOTO 555
552 GOSUB 610
553 GOTO 560
555 PRINT D$;"CLOSE PARAMS"

```

Listing continued.

Continued from p. 24.

for the first year by multiplying the price of gasoline by the number of gallons used. The latter figure is determined by dividing miles driven per year by miles per gallon. Costs after the first year are increased by the percentage provided by the program as the annual fuel inflation factor.

If you buy a new car, you'll use money you would have saved otherwise, whether you pay cash or finance the car. The interest this money would have earned over the five-year period is called *Interest Penalty on Purchase*, and is calculated using *Interest-Savings*.

Money spent on maintenance, insurance, and the like would also accrue interest if left in the bank. Interest on costs other than the purchase price is called *Interest Penalty on Other Costs*. The program uses the *Interest-Savings* percentage to calculate this figure, too.

*Total Costs* over the five-year period compare the expense of keeping the old car as opposed to buying the new car. These costs aren't directly comparable, however, because after five years the new car will be worth more than the old one. To compensate for this factor, you must consider trade-in value and five-year cost.

The program calculates your old car's trade-in value after five years by depreciating the current trade-in value 12 percent per year. The new car's trade-in value after five years is determined by immediately depreciating the cost 20 percent, then depreciating the result 12 percent each year.

The cost of a car for five years is the total cost for five years minus the trade-in value after five years. These figures are directly comparable.

You'll need to manipulate parameters if you are still financing your current car, or if you intend to put money down on a new car in addition to the trade-in value of your old one.

### Before You Buy . . .

The lure of a brand-new car is hard to resist. But buying an automobile these days represents a major investment. Economic factors, such as high maintenance costs and poor gas mileage, can help you justify your decision to trade if you need to see firm figures—not just listen to your sixth sense—before you sign on the dotted line. ■

Write to W.M. Miller, Jr., at 6744 Ransome Drive, Baltimore, MD 21207.



Listing continued.

```

556 HOME : VTAB 10: INPUT "
YOU CAN'T RUN WITH CUSTOMIZED PARAMETERS UNTIL YOU H
AVE CREATED THEM. PRESS RETURN TO GO BACK TO THE MAI
NMENU. THEN SELECT OPTION 3 IF YOU WANT TO CREATE CUSTOM
IZED PARAMETERS.";A$
557 HOME : GOTO 390
560 FOR N = 1 TO 6:CR$(N) = CU$(N): NEXT N: GOTO 1150
570 PRINT SPC( 3);"VIEW, CREATE, OR CHANGE PARAMETERS"
580 PRINT " ": PRINT " ": PRINT " "
590 PRINT SPC( 21);"PROGRAM CUSTOM"
595 ONERR GOTO 598
596 GOSUB 610
598 PRINT D$;"CLOSE PARAMS"
600 GOTO 680
610 PRINT D$;"OPEN PARAMS,L10"
620 FOR N = 1 TO 6
630 PRINT D$;"READ PARAMS,R";N
640 INPUT " ";CU$(N)
650 NEXT N
660 PRINT D$;"CLOSE PARAMS"
670 RETURN
671 D$ = CHR$( 4)
672 PRINT D$"OPEN HEAD,L80"
673 FOR N = 1 TO 3
674 PRINT D$;"WRITE HEAD,R";N
675 PRINT E1$(N)
676 NEXT N
677 PRINT D$;"CLOSE HEAD"
678 RETURN
680 GOSUB 1110
681 GOTO 690
682 D$ = CHR$( 4)
683 PRINT D$"OPEN HEAD,L80"
684 FOR N = 1 TO 3
685 PRINT D$;"READ HEAD,R";N
686 INPUT E1$(N)
687 NEXT N
688 PRINT D$;"CLOSE HEAD"
689 RETURN
690 PRINT " ": PRINT " ": PRINT " "
700 PRINT "C - CREATE OR CHANGE CUSTOM PARAMETER"
710 PRINT "R - RETURN TO MAIN MENU"
720 PRINT " ": PRINT " ": PRINT " "
730 INPUT " INDICATE YOUR CHOICE BY PRESSING APPROPRIAT
E LETTER (C OR R); THEN PRESS 'RETURN'. ";A1$
740 IF A1$ = "R" THEN HOME : GOTO 390
750 IF A1$ = "C" THEN GOTO 770
760 IF A1$ < > "R" AND A1$ < > "C" THEN HOME : GOSUB 1100:
PRINT " ": PRINT " ": PRINT " "
762 INPUT " PLEASE JUST PRESS 'C' IF YOU WANT TO CREATE
OR CHANGE PARAMETERS, OR PRESS 'R' TO RETURN TO MAIN MENU.
";A1$: HOME : GOTO 740
770 HOME : PRINT SPC( 21);"PROGRAM CUSTOM"
780 PRINT " ": PRINT " "
790 GOSUB 1110
810 PRINT " ": PRINT " "
820 INPUT " PRESS THE NUMBER OF A PARAMETER TO BE CREATED
OR CHANGED;THEN PRESS RETURN.
AFTER ALL PARAMETERS ARE SET, JUST PRES
S RETURN.";A1$
830 IF A1$ = "" THEN GOSUB 1030: HOME : GOTO 390
840 A1 = VAL (A1$)
850 IF A1 = > 1 AND A1 = < 6 AND A1 = INT (A1) THEN GOTO
880
860 HOME : VTAB 10: INPUT " JUST PRESS A NUMBER FROM 1 TO
6 AND PRESS 'RETURN'. BUT FIRST PRESS 'RETURN' TO
TRY AGAIN.";A1$
870 GOTO 770
880 HOME : PRINT " ": PRINT " ": PRINT " ": PRINT " "
890 PRINT " TYPE THE VALUE YOU WANT TO USE FOR ";W$(A1)
910 INPUT " ";CU$(A1)
920 IF A1 = > 1 AND A1 = < 6 THEN GOTO 970
960 GOSUB 1100: GOTO 770
970 FOR N = 1 TO LEN (CU$(A1))
980 A2$ = MID$( CU$(A1),N,1)
990 IF A2$ = "." THEN NEXT N: GOSUB 1100: GOTO 810
1000 IF VAL (A2$) = > 0 AND VAL (A2$) = < 9 THEN NEXT N:
GOSUB 1100: GOTO 810
1010 N = LEN (CU$(A1)): NEXT N
1020 PRINT "PLEASE PRESS A NUMERICAL VALUE.": GOTO 890

```

Listing continued.

MAJOR  
CREDIT  
CARDS  
ACCEPTED



OUR  
AR  
NO.  
1016-7

NO SALES TAX COLLECTED (N.J. Add 6%)

**COMPLETE READY-TO-RUN  
SYSTEM NOW ONLY \$1,777**

### DELUXE APPLE IIe PACKAGE

- Apple IIe (128K)
- Two Disk II Drives by Apple
- Apple Drive Controller w/Pro Dos
- Extended 80 Column Card
- Grappler + Printer Card & Cable
- Epson LX-80 Printer (100 C.P.S.)
- Pkg. of Paper (500 Shts.)
- Zenith Green or Amber Monitor
- Extra Printer Ribbon
- System Dust Cover
- Deluxe Table Top Printer Stand
- Printer Dust Cover
- Box of 10 Diskettes



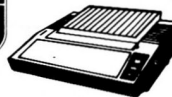
List \$2,389  
**CDA \$1,777**

- \* INCLUDES PRINTER
- \* TWO DISK DRIVES!
- \* YOUR CHOICE AMBER OR GREEN MONITOR
- \* 128K MEMORY

### EPSON SPECTRUM LX-80 PKG

#### Includes:

- LX-80 100 CPS Printer
- Printer Card & Cable
- Deluxe Printer Stand
- Extra Printer Ribbon
- Case of Computer Paper (1800 Sheets)
- Printer Dust Cover



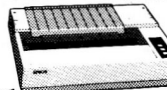
★ INCLUDES NEAR  
LETTER QUALITY MODE!  
LIST \$579  
(IIC Version \$329)

LX-80 FOR II/Ile  
DELUXE  
PRINTER PACKAGE  
**NOW ONLY \$349**

### EPSON FX-80 PRINTER

#### INCLUDES:

- FX-80 + 160 CPS Printer
- Buffered Grappler + (16K) Interface w/Cable
- Deluxe Printer Stand
- Extra Printer Ribbon
- Case of Computer Paper (1800 Sheets)
- \*Epson-Apple Connection a detailed book on how to use the Epson with the Apple.



FX-80 + FOR II/Ile  
DELUXE PACKAGE  
LIST \$889

**NOW ONLY \$569**  
(IIC Version \$549)

#### APPLE ACCESSORIES

ALS Smartterm II	\$179	\$129
ALS 2-Engine	199	149
Apple Mouse Iic	99	83
Apple Mouse Ile	149	132
Applied Eng. Z-80 Iic	159	119
Appl. Eng. RAM Works 128K	249	169
Appl. Eng. RAM Works 256K	399	279
Micro Sci Ext. 80 Col.	159	99
Microsoft Prem. Sftcd.	395	299
Microsoft Sftcard II	450	319
Titan Accelerator Ile	319	219
Video 7 Slot 7 RGB	159	109
Video 7 RGB Ext. 80 Col. Co	269	179
Video 7 RGB for Iic	219	159
<b>APPLE DRIVES</b>		
Apple Iic Add-On	329	279
Apple Disk II	329	269
Micro Sci A-2	299	199
Micro Sci 1/2 Hgt Iic	299	199
Micro Sci 1/2 Hgt	299	199
Rana Elite 1/2 Hgt	329	209
Rana Elite 1/2 Hgt Iic	339	219
Quark 10 Meg HrdDrv	1999	1495

#### PRINTERS

Apple Imagewriter	\$595	\$479
Brother HR-15	499	369
Brother HR-35	1245	829
Epson (All Models)	CALL	CALL
Juki 6000	299	239
Okidata (All Models)	CALL	CALL

IF YOU DON'T  
SEE IT.....

AMDEK		
Amdek Color 300	\$339	\$259
Amdek Color 600	599	399
Zenith Green Phosphor	149	89
Zenith Amber Phosphor	159	89

INQUIRE  
ABOUT IT!

#### MODEMS

Hayes Micromodem Ile	339	219
Hayes Micromodem Iic	339	239
Hayes 2400 Smrtmdm.	899	649
Novation Apple Cat II	319	219
Novation Apple Cat 212	595	429
Prometheus 1200 A	449	319
Prometheus External	449	339
Prometheus 1200		
Mac Pac	449	339

**BUY DIRECT BY MAIL OR PHONE  
ORDERS ONLY 800-526-5313**

Inquiries and in N.J. 201-728-8080

Information on your order 201-728-8082

ORDERING INFORMATION AND TERMS: Mail to  
**COMPUTER DISCOUNT OF AMERICA**

31 Marshall Hill Road, West Milford, N.J. 07480

Include address and phone number. Shipping, handling and insurance are additional add 2% UPS Ground (\$3.50 minimum), UPS Blue 6% (\$5.00 minimum). NO C.O.D. Cashiers checks, moneyorders, and credit cards ship immediately. Personal and company checks allow 15 days.  
ORDER 9 AM - 6 PM EST Monday - Friday • Saturday 10-4

Circle 185 on Reader Service Card.



# Diversi-DOS™

## Still The Best!

The top-rated DOS 3.3 enhancement program. Lots of extras! DOS Mover frees up 10K memory. Includes new insert/delete mode, improved BASIC listings, keyboard MACROS, wildcard filenames, text file printer, keyboard/print buffers, **fast garbage collection**, and MORE! Works on Apple //c, //e, or 64K II+.

### RAM Disk Emulator Now Included

Use the extra 64K in the //c or //e extended 80-column card as a high-speed pseudo-disk drive. Also works with most 128K cards in slot 1-7.

Time in Seconds	DOS 3.3 Floppy	Diversi-DOS Floppy	Diversi-DOS RAM-disk
BSAVE*	13.6	4.1	0.6
BLOAD*	9.5	2.6	0.5
WRITE**	44.6	14.9	7.7
READ**	42.2	12.4	5.5

\*Hi-res screen \*\*52-sector text file

## Back-up Your Floppy with Diversi-Copy™

The **FASTEST** way to copy (or format) unprotected DOS 3.3, ProDOS, Pascal or CP/M disks.

**Great for Apple //c!** Saves over 2 minutes per copy, and eliminates those annoying disk re-insertions.

**Verifies every byte**, so you know your copies are good.

**Shows motor speed** on each track, eliminating a major source of errors.

**Mass produces 1 copy** every 18-20 seconds (may require extra 128K).

Works on all Apple II compatibles.

	ProDOS Copy	Diversi- Copy*
1-Drive Copy	172 sec.	36 sec.
(50% Full Disk)	18 insertions	2 insertions
1-Drive Copy	172 sec.	44 sec.
(100% Full Disk)	18 insertions	4 insertions
2-Drive Copy	80 sec.	33 sec.

\*On 128K Apple //e or //c

### NEW: Diversi-DIAL™

Start your own CB-simulator on an Apple with 7-modems. New profit-making local stations starting all the time. Call 815/633-6533 (300-baud).

### 24-Hour Toll-Free Ordering

**800/835-2246** ext. 127 (orders only). For information call 313/553-9460.

Disk normally shipped within 24 hours. Price includes 1st class or foreign airmail. Return in 30 days for full refund if not totally satisfied

**FREE: Dogfight II** arcade game, by Bill Basham, included with each disk.

☐ Diversi-DOS - \$30

☐ Diversi-Copy - \$30

**dsr**

**DIVERSIFIED SOFTWARE RESEARCH, INC.**

34880 Bunker Hill

Farmington, MI 48018-2728

Visa/Mastercard/C.O.D./Personal Check accepted

Card No. \_\_\_\_\_ Exp. \_\_\_\_\_

### Listing continued.

```

1030 PRINT D$;"OPEN PARAMS,L10"
1040 FOR N = 1 TO 6
1050 PRINT D$;"WRITE PARAMS,R";N
1060 PRINT CU$(N)
1070 NEXT N
1080 PRINT D$;"CLOSE PARAMS"
1090 RETURN
1100 HOME
1110 FOR N = 1 TO 6
1120 PRINT W$(N); SPC( 7 - LEN (PP$(N)));PP$(N); SPC( 8 - LEN
(CU$(N)));CU$(N)
1130 NEXT N
1140 RETURN
1150 FOR N = 1 TO 6:CR(N) = VAL (CR$(N)): NEXT N
1155 VTAB 10: INPUT " PLEASE USE NO COMMAS, DOLLAR SIGNS,
PERCENT SIGNS, OR OTHER CHARACTERS NOT REQUESTED IN RESP
ONDING TO THE FOLLOWINGQUESTIONS.
PRESS 'RETURN' TO CONTINUE.";A$
1160 PRINT " ": PRINT " ": HOME : VTAB 10: INPUT "TYPE TODAY'
S DATE. " ;QA$(1)
1170 PRINT " "
1180 HOME : VTAB 10: INPUT "TYPE NAME.
";QA$(2)
1200 HOME : VTAB 10: INPUT "TYPE MODEL YEAR AND MAKE OF PRESE
NT CAR. " ;QA$(3)
1204 HOME : VTAB 10: INPUT "STATE MILEAGE ON PRESENT CAR NOW.
";QA$(4)
1208 HOME : VTAB 10: INPUT "INDICATE THE OVERALL GAS MILEAGE
THE PRESENT CAR GETS IN MILES PER GALLON. " ;QA$
(5)
1212 HOME : VTAB 10: INPUT "HOW MANY MILES DO YOU DRIVE IN A
YEAR? " ;QA$(6)
1215 HOME : VTAB 10: INPUT "TYPE AMOUNT PAID PER YEAR FOR INS
URANCE ON PRESENT CAR. " ;QA$
(14)
1217 HOME : VTAB 10: INPUT "TYPE AMOUNT PAID PER YEAR FOR LIC
ENSE TAGS ON PRESENT CAR. " ;QA$
(15)
1218 HOME : VTAB 10: INPUT "STATE PRICE OF PROPOSED NEW CAR.
";QA$(7)
1219 HOME : VTAB 10: INPUT "INDICATE ESTIMATED MILES PER GALL
ON FOR NEW CAR. " ;QA$
(8)
1220 HOME : VTAB 10: INPUT "INDICATE EXPECTED TRADE-IN VALUE
OF PRESENT CAR. " ;QA$
(9)
1222 HOME : VTAB 10: INPUT "TYPE ESTIMATED AMOUNT TO BE PAID
PER YEAR FOR INSURANCE ON NEW CAR. " ;QA$
(16)
1225 HOME : VTAB 10: INPUT "TYPE AMOUNT TO BE PAID PER YEAR F
OR LICENSE TAGS FOR NEW CAR. " ;QA$
(17)
1240 HOME : VTAB 10: INPUT " INDICATE WHETHER PAYING CASH OR
FINANCING. TYPE C FOR CASH OR F FOR FINANCING
";QA$(10)
1250 IF QA$(10) = "C" THEN GOTO 1270
1260 HOME : VTAB 10: INPUT "FOR HOW MANY MONTHS WILL THE CAR
BE FINANCED?. " ;QA$
(11)
1270 HOME
1272 HOME : VTAB 10: INPUT "TYPE GAS USED IN PRESENT CAR - RE
GULAR OR NOLEAD? TYPE AN R FOR REGULAR OR AN N FOR NOLE
AD. " ;QA$(12)
1274 HOME : VTAB 10: INPUT "TYPE OF GAS USED IN NEW CAR - REG
ULAR OR NOLEAD? TYPE AN R FOR REGULAR OR AN N FOR NOLE
AD. " ;QA$(13)
1280 HOME : PRINT "THIS IS A PARTIAL LIST OF THE DATA YOU JU
ST PROVIDED:"
1290 FOR N = 1 TO 13: PRINT N;". " ;D1$(N);QA$(N): NEXT N
1300 PRINT " ": INPUT "THERE SHOULD BE NO UNITS OR $ SIGNS IN
4,5,6,7,8,9 OR 11 - JUST NUMBERS. IF THIS DATA IS OK
, PRESS 'RETURN'. IF YOU WANT TO CHANGE ONE, PRESS THE NU
MBER OF THE ITEM TO BE CHANGED, AND THEN PRESS 'RETURN'.
";A1$
1310 IF A1$ < > "" THEN HOME :A1 = VAL (A1$): PRINT "
TYPE PROPER VALUE FOR " ;D1$(A1);" ": INPUT
";QA$(A1): HOME : GOTO 1280
1312 HOME : PRINT "THIS IS THE REMAINDER OF THE DATA YOU PR
OVIDED."
1313 FOR N = 14 TO 17: PRINT N;". " ;D1$(N);QA$(N): NEXT N
1314 PRINT " ": PRINT " "

```

Listing continued.



Listing continued.

```

1315 INPUT "IF THIS DATA IS OK, PRESS 'RETURN'. IF YOU WANT
      TO CHANGE AN ITEM, PRESS THE NUMBER OF THE ITEM TO BE C
      HANGED AND THEN PRESS 'RETURN'. ";A1$
1317 IF A1$ < > "" THEN HOME :A1 = VAL (A1$): PRINT "
      TYPE PROPER VALUE FOR                                ";D1$(A1): INPUT " ";QA
      $(A1): HOME : GOTO 1312
1318 ONERR GOTO 3470
1319 HOME : VTAB 11: HTAB 11: PRINT "WAIT! - CALCULATING"
1320 IF QA$(12) = "R" THEN G1 = VAL (CR$(1))
1330 IF QA$(12) = "N" THEN G1 = VAL (CR$(2))
1340 IF QA$(13) = "R" THEN G2 = VAL (CR$(1))
1350 IF QA$(13) = "N" THEN G2 = VAL (CR$(2))
1352 FOR N = 4 TO 9:QA(N) = VAL (QA$(N)): NEXT N
1354 QA(11) = VAL (QA$(11))
1355 FOR N = 14 TO 17:QA(N) = VAL (QA$(N)): NEXT N
1356 QA$(7) = "$" + QA$(7)
1358 QA$(9) = "$" + QA$(9)
1360 CR$(1) = "$" + CR$(1)
1361 CR$(2) = "$" + CR$(2)
1362 FOR N = 3 TO 6
1363 CR$(N) = CR$(N) + "g"
1364 NEXT N
1400 IF QA$(10) = "F" THEN GOTO 3200
1410 C(1,0,0) = QA(7) - QA(9)
1420 PU(0) = 1 * C(1,0,0)
1425 PV$(0) = "0"
1430 C(1,6,0) = QA(7) - QA(9)
1440 C(1,6,0) = INT (C(1,6,0))
1450 FOR Z = 0 TO 1
1460 FOR Y = 1 TO 5
1470 C(2,Y,0) = (((Y - 0) * QA(6) - QA(6) / 2) / 2678810.61) *
      QA(6)) * (CR(4) / 100 + 1) ^ (Y - 1) + .0064 * QA(6) * (C
      R(4) / 100 + 1) ^ (Y - 1)
1480 C(2,Y,1) = (((QA(4) + Y * QA(6) - QA(6) / 2) / 2678810.61
      ) * QA(6)) * (CR(4) / 100 + 1) ^ (Y - 1) + .0064 * QA(6) *
      (CR(4) / 100 + 1) ^ (Y - 1)
1490 C(2,Y,Z) = INT (C(2,Y,Z))
1500 C(2,6,Z) = C(2,6,Z) + C(2,Y,Z)
1510 C(3,Y,0) = (QA(6) / QA(8)) * (CR(3) / 100 + 1) ^ (Y - 1) *
      G2
1520 C(3,Y,1) = (QA(6) / QA(5)) * (CR(3) / 100 + 1) ^ (Y - 1) *
      G1
1530 C(3,Y,Z) = INT (C(3,Y,Z))
1540 C(3,6,Z) = C(3,6,Z) + C(3,Y,Z)
1550 NEXT Y
1560 NEXT Z
1570 C(4,6,0) = C(1,6,0) * (((1 + CR(5) / 1200) ^ 60) - 1)
1575 IF QA$(10) = "F" THEN C(4,6,0) = IZ
1600 FOR Z = 0 TO 1: FOR Y = 0 TO 6: FOR X = 1 TO 4
1610 C(4,Y,Z) = INT (C(4,Y,Z))
1620 C(5,Y,Z) = C(X,Y,Z) + C(5,Y,Z)
1630 NEXT X: NEXT Y: NEXT Z
1631 FOR Y = 1 TO 5
1632 C(7,Y,0) = QA(16)
1633 C(7,Y,1) = QA(14):C(7,6,0) = C(7,Y,0) + C(7,6,0):C(7,6,1)
      = C(7,Y,1) + C(7,6,1)
1635 C(8,Y,0) = QA(17)
1637 C(8,Y,1) = QA(15):C(8,6,0) = C(8,Y,0) + C(8,6,0):C(8,6,1)
      = C(8,Y,1) + C(8,6,1)
1638 NEXT Y
1640 C(6,6,0) = QA(7) * .8 * .88 ^ 5
1650 C(6,6,1) = QA(9) * .88 ^ 5
1660 C(6,6,0) = INT (C(6,6,0)):C(6,6,1) = INT (C(6,6,1))
1662 FOR Z = 0 TO 1: FOR Y = 0 TO 6
1664 C(9,Y,Z) = C(5,Y,Z) + C(7,Y,Z) + C(8,Y,Z)
1666 NEXT Y: NEXT Z
1670 FOR Z = 0 TO 1: FOR Y = 0 TO 6
1680 C(10,Y,Z) = C(9,Y,Z) - C(6,Y,Z)
1690 NEXT Y
1700 NEXT Z
1701 FOR Z = 0 TO 1: FOR Y = 1 TO 5
1702 C(11,Y,Z) = C(2,Y,Z) + C(3,Y,Z) + C(7,Y,Z) + C(8,Y,Z)
1703 C(11,Y,Z) = C(11,Y,Z) * ((1 + CR(5) / 1200) ^ (66 - 12 *
      Y) - 1)
1704 C(11,6,Z) = C(11,6,Z) + C(11,Y,Z)
1705 C(11,6,Z) = INT (C(11,6,Z)):C$(11,6,Z) = STR$(C(11,6,Z)
      )): NEXT Y: NEXT Z
1706 SN = C(4,6,0)
1709 C(9,6,0) = C(9,6,0) + C(11,6,0):C(9,6,1) = C(9,6,1) + C(1
      1,6,1)
1710 FOR Z = 0 TO 1
1720 FOR Y = 0 TO 6

```

Listing continued.

Circle 49 on Reader Service Card.

# The Master Handicapper™

Series by Professor Jones



EVALUATES FROM RACING FORM!

## PROGRAM



**GLD. Thoroughbred "Gold" Edition™**  
A "Full" featured thoroughbred analysis designed for the professional and serious novice. **\$159.95 complete**

**EGLD. Enhanced "Gold" Edition™**  
"Gold" Edition with complete Master Bettor™ system integrated onto the same disk. This powerful program will transfer all horses and scores to the bet analysis with a "single keystroke."  
(Master Bettor™ included) **\$199.95 complete**

**GLTD. Limited "Gold"™**  
Enables Professional Handicappers to assign specific values to the racing variables 'they' feel are important.

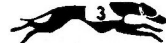
### PROFESSIONAL HANDICAPPING SYSTEMS

%	%	%
Age 5	Consistency 15	Speed 10
Class 15	Jockey 15	Workouts 0
Condition 10	Trainer 5	Time of Year 0
Earnings 5	Post 10	Consistency 5
100%	Is Everything OK (Y/N)	

Create program weight based on a particular track and fine tune it for maximum win percentage. This program is designed for "ease of use". The user needs no programming experience.

(contains integrated Bettor™) **\$299.95 complete**

### GD. Gold Dog Analysis™



The only professional dog handicapper on the market, includes:

- 1) Speed
- 2) Post Today
- 3) Kennel
- 4) Post Last
- 5) Distance
- 6) Condition
- 7) Running Style
- 8) Weight
- 9) All new internal weighting
- 10) NEW class indicator

If you are near a greyhound track, you can't afford not to use this program.

**\$149.95 complete**

(with integrated Master Bettor™) **\$199.95**

### Limited Dog™ \$299.95



### MHH. Master Harness Handicapper™

Professional software designed to provide a thorough analysis of all trotter and pacer races in North America and Canada. Features:

Class	Post Positions	Time Finish
Driver	Track Conditions	Time Last Quarter
Days Since Last	Trainer	Track Rating
Gender	Time ¼	Temp Allowance

**\$159.95 complete w/integrated Master Bettor™ \$199.95**

### PPX. Professor Jones' Football Predictor, Prof. Pix™

Complete Football Analysis with Data-Base.

- 1) Overlays
- 2) Point Spreads
- 3) "Super Plays"
- 4) "Over/Under" bets
- 5) Data Base Stats
- 6) Holds "100" teams

Highest percentage of winners 1983 **\$39.95 complete**

**\$99.95 with Data Base Management**

### NBA. Basketball™

This data base managed analysis will provide the user with "ALL" betting situations while storing relevant information on the disk.

**\$99.95 complete w/Manual \$129.95 NBA/College Version**

### LOT. LOTTERY ANALYSIS™

Statistical comparison program designed to detect subtle patterns in winning lottery numbers.

**\$79.95 complete w/Manual \$99.95 with Lotto**

## BROCHURE AVAILABLE

Send check / money order / VISA / Mastercharge (Include expiration date) to:



**TELEPHONE**  
**(208) 342-6939**

**Prof. Jones**  
**1940 W. State St.**  
**Boise, ID 83702**



TERMS: FREE SHIPPING ALL SOFTWARE. Add \$6.00 hardware / \$6.00 C.O.D. / UPS Blue \$6.00 / Out of Country \$9.00 / ID Residents 4% / 3 weeks personal checks / Cash price only, add 2% Visa, MC / Prices subject to change.

**IBM, APPLE, TRS-80, C-64 AND OTHERS**



# CLASSIFIEDS

## CLASSIFIED INFORMATION

Reach more than 110,000 Apple owners with an **inCider** classified ad.

Sections include:

- Publications
- Entertainment
- Education
- Home Productivity
- Business
- Utilities
- Games
- Hardware
- Software
- Services

Commercial ads, \$100 per issue (minimum 3 issues) **prepayment only**. Ad includes a bold headline, 10 lines of copy including company name, address, and phone number. \$15 for additional lines; \$75 additional for company logo.

Send typewritten copy with instruction to:

**inCider Classifieds**  
CWC/ Peterborough  
Rte. 101 and  
Elm Street  
Peterborough, NH  
03458

1-800-441-4403

# inCider

*Listing continued.*

```

1730 FOR X = 0 TO 10
1740 C(X,Y,Z) = INT (C(X,Y,Z))
1750 C$(X,Y,Z) = STR$(C(X,Y,Z))
1760 NEXT X: NEXT Y: NEXT Z
1765 HOME
1840 PRINT D$;"PR#1"
1845 PRINT CHR$(9)"80N"
1850 PRINT " 80N"
1855 PRINT " ": PRINT " ": PRINT " ": PRINT " ": PRINT " "
1860 GOSUB 683
1862 FOR N = 1 TO 3
1864 PRINT SPC(40 - LEN(E1$(N)) / 2);E1$(N)
1866 NEXT N
1890 PRINT SPC(62);QA$(1)
1900 PRINT " ": PRINT " ": PRINT " "
1910 PRINT SPC(28);"ECONOMICS OF TRADING CAR"
1920 PRINT " ": PRINT " "
1930 PRINT SPC(3);"PREPARED FOR:"
1940 PRINT SPC(7)QA$(2)
1950 PRINT " ": PRINT " "
1952 PRINT "ASSUMPTIONS: "
1954 FOR N = 1 TO 6: PRINT SPC(5);W$(N);": ";CR$(N): NEXT N
1956 PRINT " "
1957 PRINT "PRESENT CAR: "
1958 FOR N = 3 TO 6: PRINT SPC(5);D1$(N);": ";QA$(N): NEXT
N
1960 PRINT SPC(5);D1$(9);": ";QA$(9)
1961 PRINT SPC(5);"GAS TYPE: ";
1962 IF QA$(12) = "R" THEN PRINT "REGULAR"
1963 IF QA$(12) = "N" THEN PRINT "NOLEAD"
1964 FOR N = 14 TO 15: PRINT SPC(5);D1$(N);"$";QA$(N): NEXT
N: PRINT " "
1965 PRINT "NEW CAR"
1966 PRINT SPC(5);D1$(7);": ";QA$(7): PRINT SPC(5);D1$(8)
;": ";QA$(8)
1967 PRINT SPC(5);D1$(6);": ";QA$(6)
1968 PRINT SPC(5);"GAS TYPE: ";
1969 IF QA$(13) = "R" THEN PRINT "REGULAR"
1970 IF QA$(13) = "N" THEN PRINT "NOLEAD"
1972 PRINT SPC(5)"PAYMENT METHOD: ";
1973 IF QA$(10) = "C" THEN PRINT "CASH"
1974 IF QA$(10) = "F" THEN PRINT "FINANCING - ";QA$(11);" MO
NTHS"
1976 FOR N = 16 TO 17: PRINT SPC(5);D1$(N);"$";QA$(N): NEXT
N
1980 PQ = (PI - 1) * 100
1990 MQ = (MI - 1) * 100
2000 FQ = ((CR(3) / 100 + 1) - 1) * 100
2010 PR = (IP - 1) * 100
2771 FOR N = 1 TO 4: PRINT " ": NEXT N
2773 IF QA$(10) < > "F" THEN GOTO 2922
2780 PM(0) = 100 * PM(0)
2790 PM(0) = INT (PM(0))
2800 PM(0) = PM(0) / 100
2810 PM$(0) = STR$(PM(0))
2811 PM(2) = VAL (PM$(0)):PM(2) = INT (PM(2))
2812 PM(3) = PM(0) - PM(2):PM(3) = (INT (100 * PM(3))) / 100
2813 PM$(3) = STR$(PM(3))
2814 IF PM(3) = 0 THEN PM$(0) = PM$(0) + ".00"
2815 IF LEN (PM$(3)) = 2 THEN PM$(0) = PM$(0) + "0"
2820 PU(0) = INT (PU(0))
2830 PU$(0) = STR$(PU(0))
2832 PT = INT (PT):PT$ = STR$(PT)
2840 PV(0) = PT - PU(0):PV(0) = INT (PV(0))
2850 PV$(0) = STR$(PV(0))
2868 C(9,6,0) = C(9,6,0) + PV(0):C(9,6,0) = INT (C(9,6,0)):C$(
(9,6,0) = STR$(C(9,6,0))
2870 PRINT SPC(29);"FINANCING INFORMATION"
2880 PRINT SPC(29);"-----"
2890 PRINT SPC(27);"MONTHLY PAYMENTS"; SPC(8 - LEN (PM$(0
)));"$";PM$(0)
2900 PRINT SPC(27);"TOTAL PRINCIPAL "; SPC(8 - LEN (PU$(0
)));"$";PU$(0)
2910 PRINT SPC(27);"TOTAL INTEREST "; SPC(8 - LEN (PV$(0
)));"$";PV$(0)
2920 PRINT SPC(27);"TOTAL PAID "; SPC(8 - LEN (PT$))
; "$";PT$
2922 PRINT CHR$(12)
2924 GOSUB 4000
2950 PRINT SPC(6);"NOTE: "
2960 PRINT SPC(8);"THIS ANALYSIS IS BASED IN PART ON PREDIC
TIONS OF FUTURE COSTS. SINCE"

```

*Listing continued.*



## Listing continued.

```

2970 PRINT "THESE PREDICTIONS CAN'T BE MADE WITH ABSOLUTE ASS
URANCE OF THEIR ACCURACY, AND"
2980 PRINT "BECAUSE WE CAN'T POSSIBLY PROGRAM IN SOME OF THE
PECULIARITIES OF COSTS UNIQUE"
2990 PRINT "TO SOME SITUATIONS, ";E1$(1);" CAN NOT BE RESPONS
IBLE FOR ACTIONS TAKEN"
3000 PRINT "AS A RESULT OF INFORMATION FURNISHED. HOWEVER, E
XTENSIVE EFFORTS HAVE BEEN"
3010 PRINT "MADE TO PROVIDE YOU A SOUND ECONOMIC BASIS FOR YO
UR DECISION ON TRADING YOUR"
3020 PRINT "CAR."
3030 IF QA$(10) = "F" THEN FOR N = 1 TO 8: PRINT " ": NEXT
3040 IF QA$(10) < > "F" THEN FOR N = 1 TO 13: PRINT " ": NEXT
3045 PRINT CHR$(12)
3050 PRINT D$;"PR#0"
3060 END
3070 GOTO 1840
3200 IX = (CR(6) / 1200) / (1 - (1 / (1 + (CR(6) / 1200))) ^ QA
(11)))
3210 PU(0) = QA(7) - QA(9)
3220 PM(0) = IX * PU(0)
3240 PY(0) = PM(0) * 12
3250 PT = QA(11) * PM(0)
3260 P$ = "PAYMENTS"
3265 IZ = PM(0) * (((((1 + (CR(5) / 1200)) ^ QA(11)) - 1) / (
CR(5) / 1200)) * ((1 + (CR(5) / 1200)) ^ (60 - QA(11)))) -
QA(11))
3270 GOTO 1430
3470 HOME : INPUT "SOMETHING HAS NOT WORKED PROPERLY. IF YOU
PRESS 'RETURN' WE'LL GO BACK TO THE MAIN MENU AND YOU CAN
START OVER.";A1$
3480 HOME : GOTO 390
4000 FOR N = 1 TO 5: PRINT " ": NEXT N
4010 PRINT SPC(23);"COST OF BUYING AND OWNING NEW CAR"
4020 PRINT SPC(20);"(COMPARED WITH COST OF KEEPING OLD CAR"
4030 PRINT " ": PRINT " "
4040 PRINT SPC(42);"COST OVER NEXT 5 YEARS": PRINT SPC(42
);"-----"
4050 PRINT SPC(47);"OLD CAR"; SPC(3);"NEW CAR"
4055 PRINT SPC(47);"-----"; SPC(3);"-----"
4060 PRINT SPC(16);"AMOUNT DUE AFTER TRADE"; SPC(11);"$000
0"; SPC(9 - LEN(C$(1,6,0)));"$";C$(1,6,0)
4070 PRINT SPC(16);"INTEREST"; SPC(29);"0"; SPC(10 - LEN
(PV$(0)));PV$(0)
4080 PRINT SPC(16);"INSURANCE"; SPC(29 - LEN(C$(7,6,1)))
;C$(7,6,1); SPC(10 - LEN(C$(7,6,0)));C$(7,6,0)
4090 PRINT SPC(16);"LICENSE"; SPC(31 - LEN(C$(8,6,1)));C
$(8,6,1); SPC(10 - LEN(C$(8,6,0)));C$(8,6,0)
4100 PRINT SPC(16);"MAINTENANCE"; SPC(27 - LEN(C$(2,6,1)
));C$(2,6,1); SPC(10 - LEN(C$(2,6,0)));C$(2,6,0)
4110 PRINT SPC(16);"FUEL"; SPC(34 - LEN(C$(3,6,1)));C$(3
,6,1); SPC(10 - LEN(C$(3,6,0)));C$(3,6,0)
4120 PRINT SPC(16);"INTEREST PENALTY ON PURCHASE"; SPC(10 -
LEN(C$(4,6,1)));C$(4,6,1); SPC(10 - LEN(C$(4,6,0)));
C$(4,6,0)
4125 PRINT SPC(16);"INTEREST PENALTY ON OTHER COSTS"; SPC(
7 - LEN(C$(11,6,1)));C$(11,6,1); SPC(10 - LEN(C$(11,
6,0)));C$(11,6,0)
4130 PRINT SPC(49);"-----"; SPC(3);"-----"
4140 PRINT SPC(16);"TOTAL"; SPC(32 - LEN(C$(9,6,1)));"$"
;C$(9,6,1); SPC(9 - LEN(C$(9,6,0)));"$";C$(9,6,0)
4145 PRINT " "
4150 PRINT SPC(16);"TRADE-IN VALUE AFTER 5 YEARS"; SPC(9 -
LEN(C$(6,6,1)));"$";C$(6,6,1); SPC(9 - LEN(C$(6,6,0)
));"$";C$(6,6,0)
4152 R1 = C(9,6,1) - C(6,6,1):R1$ = STR$(R1):R2 = C(9,6,0) -
C(6,6,0):R2$ = STR$(R2)
4155 PRINT " "
4160 PRINT SPC(16);"COST FOR 5 YEARS"; SPC(21 - LEN(R1$)
);"$";R1$; SPC(9 - LEN(R2$));"$";R2$
4170 PRINT " ": PRINT " "
4171 IF R1 < R2 THEN P1$ = " MORE":AS$ = STR$(R2 - R1)
4172 IF R2 < R1 THEN P1$ = " LESS":AS$ = STR$(R1 - R2)
4173 AS = VAL(AS$):A5 = AS / 5:A5 = INT(A5):MO$ = " $" + STR$(
A5)
4180 PRINT SPC(10);"BUYING NEW CAR WILL COST ";"$";AS$;P1$;
" THAN KEEPING OLD CAR"
4181 PRINT SPC(5);"OVER THE NEXT 5 YEARS"
4183 PRINT " "
4190 PRINT SPC(10);"THIS AMOUNTS TO ";MO$;" PER YEAR."
4195 FOR N = 1 TO 6: PRINT " ": NEXT N
4200 RETURN

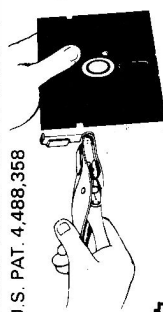
```

End of listing.

# INCREASE YOUR DISK CAPACITY 100%

**DOUBLES DISKETTES  
INSTANTLY!**

Now, the back of 5¼" diskettes can be used, even in a single-head disk drive. Double all your present diskettes safely... without disturbing the existing data!



**nibble  
notch**

cuts square notch for  
Apple, Franklin, and  
Commodore

**\$14.95\***  
only

**ALSO**

## DISK OPTIMIZER SYSTEM®

SOFTWARE FOR APPLE II, II+,  
Ile, III, AND FRANKLIN

**CERTIFIES YOUR NEW  
DISK 100% ERROR-FREE!**

• Locks out bad sectors • Adds  
36th track • Performs disk  
drive speed check • Adds DOS  
• And More!

### SPECIAL PACKAGE PRICE

Nibble Notch 1  
& Disk Optimizer **\$29.95\***  
Combo **FOR**  
(Optimizer alone **BOTH!**  
reg. \$24.95)\*

**INQUIRE ABOUT OUR ALL-NEW  
MULTILINGUAL DISK OPTIMIZER!**

\* On all orders add \$2 for postage & handling  
(\$5 Foreign). Florida res. add 5% Sales Tax.

**SATISFACTION GUARANTEED  
OR YOUR MONEY BACK!**



**ORDER  
TODAY**



**TOLL FREE 1-800-642-2536  
FLORIDA 305-493-8355**

or send check  
or money order to:  
**nibble notch®**  
computer products

4211 NW 75th Terrace • Dept. 211  
Lauderhill, FL 33319





# Announcing the only devoted entirely to

*Sponsored by MACWORLD,  
the Macintosh Magazine,  
August 21-23, 1985, Bayside  
Exposition Center, Boston*

The second standard in business computing has arrived, and it's called the Macintosh Office. The power, flexibility, and ease of use of the Macintosh offer you the alternative you've been waiting for. And the introduction of the Macintosh Office provides all levels of business with a choice.

The Macworld Exposition is your chance to see it all in one place—software, hardware, and peripherals developed for the Macintosh. See for yourself the products available now that will help you work faster, easier, and smarter.

**All of the elements of the Macintosh Office will be on display. The 512K Macintosh, the LaserWriter, and AppleTalk™, as well as Jazz™ from Lotus™, are just a few of the products you'll get to see.**

The Macworld Exposition has a targeted schedule designed to fit your busy schedule. As a dealer, a distributor, a retailer, a business user, or an educator, the three-day conference and exposition is designed for you.

Day one is for dealers, distributors, retailers, and other third-party vendors to talk to Apple and the 100+ exhibiting companies about their products.

Days two and three are specifically geared for people interested in the Macintosh as a tool for business and anyone else interested in the Mac.

## **Who should attend?**

**Industry:** Dealers, distributors, retailers, wholesalers, manufacturers, systems houses, consultants, technical programmers, all other ISOs

**Business:** CEOs, presidents, vice presidents, managers, comptrollers, owners/partners

**Professionals:** Doctors, nurses, bankers, lawyers, engineers, stockbrokers, real estate and insurance agents, CPAs, consultants

**Education:** Administrators, faculty, students

## **Here's a look at some of the conference sessions designed for you:**

- The Outlook for the Mac in the Office
- Developing Software for the Macintosh
- How to Start and Survive in Business with a Macintosh
- Maximizing MacPaint®
- The Mac Clinic
- A Guide to Better Business Graphics
- Maximizing MacWrite®
- Database Management on the Macintosh
- Getting the Most out of Spreadsheet Programs
- How to Get Your Programs Published
- What's Available in Mac Software
- File Management Tips and Techniques
- Maximizing Macintosh Disk Storage
- The Mac in the Classroom
- The Mac in Higher Education
- Developing University Courseware with a Macintosh



# computer show the Macintosh™

***Here are some of the companies who will be showing Macintosh products:***

Advanced Logic Systems  
Aegis Development  
Ann Arbor Softworks  
A+ /Ziff-Davis Publishing Co.  
Apple Computer, Inc.  
Applied Logic Systems  
Apropos Software, Inc.  
Artline Industries  
Assimilation, Inc.  
Blue Chip Software  
Boston Software  
Brain Power, Inc.  
Cadmus Computer Systems  
The Cobb Group  
Communications Packaging Corp.  
Computer Additions  
Computer Identities  
Computer Learning Systems  
Computer Shopper  
Computer Software Designs, Inc.  
The Computer Store  
Corvus Systems, Inc.  
Consulair Corporation  
T/Maker  
Creighton Development, Inc.  
Diablo Valley Design  
Diversions, Inc.  
EDP Supply North  
Enterset  
Esoft Enterprises  
Expertelligence  
Express Computer Supplies  
First Byte, Inc.  
Forethought, Inc.  
Frontrunner Computer Industries  
Future Design Software  
General Computer Company  
Haba Systems  
Hayden Book Company  
Hayden Software

Hayes Microcomputer Products  
Hippopotamus Software  
Icon Publishing  
ICON Review/Mindwork  
Infosphere, Inc.  
InfoWorld  
Innovative Technologies/Communications  
Intermatrix, Inc.  
Intersol  
Iomega Corp.  
The Kette Group  
I/O Video  
Kraft Systems  
Layered, Inc.  
Living Videotext, Inc.  
Loki Engineering, Inc.  
Lotus Development Corp.  
Mac Packs, Inc.  
MacTutor  
MACWORLD  
Micro Design  
Micro Marketworld  
Miles Computing, Inc.  
Microsoft  
MPH Computer Products  
Mycroft Labs, Inc.  
New Line 7  
Odesta Corporation  
Optimum Computer Luggage  
Organizational Software Corp.  
Palantir Software  
Paradise Systems, Inc.  
PBI, Inc.  
Peripheral Computers & Supplies  
Peripheral Systems  
Personal Computer Peripherals  
Prometheus Products, Inc.  
ProVUE Development Corp.  
Queue, Inc.  
Scott, Foresman & Co.  
Servidyne Micro Systems, Inc.



Sierra Information Systems  
Silicon Beach Software  
Small Business Computers of New England  
SoftTech Microsystems  
SoftIdea  
Software Arts, Inc.  
SoftWeave  
Softworks Limited  
Stoneware  
Sunol Systems  
Systems Control  
Tecmar, Inc.  
Telos Software Products  
Video 7  
Warner Software

The Macworld Exposition is produced by World Expo Company and managed by Mitch Hall Associates. For further information call Mitch Hall Associates at 617/329-7466 or 617/329-8091. Macworld Exposition is a registered trademark of World Expo Company, Inc. AppleTalk, MacPaint, and MacWrite are registered trademarks of Apple Computer, Inc. Macintosh is a trademark licensed to Apple Computer. Jazz and Lotus are trademarks of Lotus Development Corp.

**MACWORLD  
EXPOSITION**  
**BOSTON**



*The Apple Clinic is a forum for discussing Apple II hardware and related subjects. If you have questions or answers, or wish to make a statement, write to Jim Sather. His recent book, Understanding the Apple IIe, published by Quality Software, may also help you. Write to Jim c/o Apple Clinic, inCider, 80 Pine Street, Peterborough, NH 03458.*

## Franklin Drives

Can I hook up an Apple Disk II to a Franklin Ace 1000 with Franklin controller card? If not, can I hook up an Apple controller card/Apple disk drive combination to an Ace 1000? Is the alignment mechanism and tolerance—discussed several times in *inCider*—the same for Franklin and Apple disk drives? Thank you.

Bob Warren  
Kingsville, TX

*Apple II and Franklin drives and controllers are fully compatible and interchangeable. Track alignment on Apple and Franklin drives is identical. Comprehensive alignment procedures and tools (such as alignment disks) designed for Apple-compatible drives should work with Franklin drives.*

## The Cable Did It!

I'd like to pass on to your readers a small tale of woe about a printer, a computer, and a very large headache.

My brand-new Apple II-compatible Unitron 2200 and C. Itoh 8510 printer with standard mail-order printer interface card were not working at all. The printer kept dropping characters. It would print for several seconds, take itself off-line, then drop a character after I brought it back on-line. This made printing hex dumps messy and inexact. Letters were interesting, too. How would you like to "a;lkj-oidf"?

Connected to an Apple IIe at my local dealer's, the printer would not fail, no matter how many times we tried to force it. I took it home; it wouldn't print without dropping characters. Suspecting the interface card, I took it and the printer to the dealer. Same story! It wouldn't fail—page after page of perfect print. I took it home; it wouldn't work.

Next, I took my Unitron 2200, interface card, and printer to the dealer, where they worked perfectly. After taking them home, I finally discovered that the problem was something the dealer never suspected—the interface cable. At home, the printer cable went across both disk drive cables, two power cables, and a joystick cable—a situation that never occurred at the dealer's. By simply moving the printer to the other side of the computer and rerouting the cable so that it was near no other cables, the electromagnetic interference that was disrupting the printer vanished. Now it won't fail. Hallelujah!

The moral of this story may be never buy a cheap interface card that might have an equally cheap cable. It can also be said that nothing is ever as simple as it looks. But in the end, this problem took months to solve because of the dealer's lack of insight. I therefore warn you to select your dealer quite carefully.

Wallace Williams  
APO NY, NY

*Thanks for the interesting problem description, Wallace. I agree that choosing your dealer is important. Yet I see a different moral in your story. When you take a malfunctioning computer or peripheral in for servicing, take along all peripherals, cards, and cables that were connected when the symptoms were observed.*

*There's one thing that bothers me about the solution to your problem. The cables in the back of my Apples*

*are intertwined like spaghetti, but it has never caused any problems. Also, I usually buy the cheapest peripherals and interface cards I can find. I therefore suspect that you still have a bug somewhere, and that your printer will drop again the characters it needs so carefully to send.*

## Communicating with the Big Boys

I have a combination hardware/software question. After almost 30 years in the business, I broke down and bought an Apple IIe (two disk drives, printer, and so on). It's worked to my satisfaction in all areas except one—telecommunications. (The Applesoft BASIC editor is unbelievably primitive.) I have purchased several modems, including the fanciest (read most expensive), as well as several other software packages, but maybe what I want to do isn't possible.

I have access to several VAXes (UNIX) and several large CDC CYBERs (NOS and UNIX). I want to use Apple Writer to build some text files in either C, Pascal, or LISP; send them to the systems; compile, execute, and write to a file on the system; and send the file back to me. This will minimize my log-in time on systems that get bogged down during the university term. Could you recommend a system I could use on the Apple, as I now use it as a dumb terminal. At present I'm using a Multi-Tech modem and software, but Multi-Tech must have gone out of business as it's not answering mail.

Bernard W. Marschner  
Fort Collins, CO

*Welcome to the world of personal computing, Bernard. I hope your experiences with your own computer are as fulfilling as mine have been.*

*Your question is indeed a soft-*

**by Jim Sather**



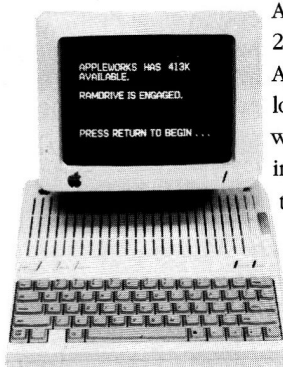
# Expanding Your IIC Is Easy With Z-RAM

Applied Engineering and Apple computer have teamed up to take your IIC to new heights.

Applied Engineering's Z-RAM card for the IIC is available with 256K or 512K of additional memory and a powerful Z-80 microprocessor for running CP/M software.

Z-RAM fits neatly inside the IIC. Installation is easy, clear instructions show you how. You'll need a screwdriver and about 10 minutes (if you can change a light bulb you can install Z-RAM).

## **Z-RAM and Appleworks will knock your socks off.**



A 256K Z-RAM will give you a 229K available desktop and Appleworks will be completely loaded into memory. Appleworks will now run about 10 times faster in your IIC with 1 disk drive than in other IIC's with 2 disk drives. A 512K Z-RAM will give you a 413K available desktop. A 256K Z-RAM can be upgraded to 512K by just plugging in more memory chips.

Z-RAM is also a high speed solid state disk drive. With Z-RAM, your programs will load and save over 20 times faster. Z-RAM's RAM disk is compatible with Applesoft, ProDOS, DOS 3.3, PASCAL and CP/M. And with Z-RAM, you can copy a disk in one pass. Just insert the original, remove the original, insert blank disk! That's it! Z-RAM is another disk drive, only 20 times faster, 4 times larger capacity, and no whirring, clicking or waiting!

But before you start panting over all that extra memory, don't forget that the Z-RAM card has a built-in high speed Z-80 processor chip that allows you to run CP/M programs like Wordstar, dBASE II, Turbo PASCAL, Microsoft BASIC, FORTRAN and COBOL and over 3,000 other CP/M programs. So Z-RAM not only makes Apple programs run better and faster, it lets you run MORE programs.

With the Z-RAM card installed, your IIC is still your IIC only now you'll have that extra memory that Appleworks

and other programs need. And you can run all that great CP/M software that others can only dream about.

Z-RAM is 100% compatible with all IIC software and hardware including the mouse, 2nd disk, modem and printer. Z-RAM is easily handled by the IIC power supply as power consumption is kept very low by using two custom integrated circuits and a patent pending power saving design. And Z-RAM is from Applied Engineering, the acknowledged leader and innovator of accessories for the Apple.

Z-RAM comes complete with manual, RAM disk software, Z-80 operating system, CP/M manual and a 3 year no hassle warranty.

So the next time somebody asks you why you didn't get an IBM P.C., tell him you bought a IIC because the IBM didn't have enough memory and was too slow and couldn't run CP/M software. And tell him you made it past the 8th grade.

**Z-RAM with 256K**

**\$449**

**Z-RAM with 512K**

**\$549**

If you want to run CP/M software, but don't need more memory, may we suggest our Z-80c card. The Z-80c offers the same CP/M performance as Z-RAM but has no memory expansion ports. And the Z-80c will not affect the running of Apple programs. The Z-80c is priced at only \$159.00 and should you ever want to upgrade to Z-RAM, we'll refund your full purchase price.

**Call (214) 241-6060**

9 a.m. to 11 p.m. 7 days a week or

Send check or money order to:

Applied Engineering

P. O. Box 798

Carrollton, Texas 75006



MasterCard



Visa and

C.O.D. welcome. No extra charge for credit cards.

Texas residents add 5% sales tax. Add \$10.00 if outside U.S.A.



**APPLIED ENGINEERING**  
"We Set the Standard"



ware/hardware question, as many are, and it serves to highlight the fact that most computer hardware is only as good as the program controlling it. In a nutshell, the solution to your problem is to find the right software and buy it. See *The Blue Book for the Apple Computer* (third edition, WIDL Video Publications, 1983) for a list of numerous communications programs available for the Apple II.

I don't have any experience making the Apple II communicate with the big boys, but I met a person at the Northeast Computer Show in Boston who does it regularly. He agreed to write a "guest answer" to your question. Thanks to Murphy A. Sewall for this highly informative letter. Judging from his response, the right software for your task may be *Softerm 2*.

## Guest Answer

Sadly, most mainframe communications software was written before there were microcomputer users wanting to transfer files. Mainframe-to-Apple is usually simple because most Apple communications programs provide for "capture" of text as it comes. Text files can be transferred to most host systems, but you need some knowledge of the mainframe's communications protocol.

Most mainframe communications software typically expects a terminal with a maximum line width of 130 characters, although a communications buffer of 256 characters is common (that is, your carriage return must be sent after every 255 characters, at least). Apple Writer and Screenwriter treat carriage returns as paragraph breaks, and consequently can overflow a mainframe's buffer. (Hayden's PIE Writer stores carriage returns with every line and avoids this problem.)

Text files containing C, Pascal, or LISP programs do have carriage returns frequently enough to satisfy most mainframe buffers. Difficulty in uploading probably is a failure to coordinate transmission of text lines with the mainframe's readiness to accept them.

After a line is transmitted, the Ap-

ple's software must wait for a "signal" that the mainframe is ready for the next line. In other words, the Apple's software needs to recognize that it has sent an end-of-line character and should wait for some specific "solicit" character (sometimes called a prompt) before sending the next line.

If the mainframe normally supplies the line feed after a terminal's carriage return, then the end-of-line character is a carriage return; otherwise, it usually is a line feed (control-J). Most mainframes transmit a printable solicit character (such as a > or .), often followed by X-ON (control-Q), which may or may not be "swallowed" by the Apple software (depending on the program) before the file transfer program can read it. Normally, a transfer works fine if the software is told to wait for the printable solicit character; if not, try waiting for a control-Q.

Most of the more sophisticated communications programs for the Apple (Apple Access II, ASCII Express: The Professional, *Softerm*, and *Transcend*, to name only a few) have the capacity to adapt to mainframes' requirements for file transfers. It's rather difficult with Apple Access II, because waiting for a solicit apparently can only be done from within a command file, and the documentation isn't very helpful.

*Softerm*, on the other hand, is well-documented and has options that cover nearly any contingency. *Softerm* also allows a "transparent" capture to disk (so the control codes the mainframe is sending can be displayed), which is a very useful diagnostic.

Murphy A. Sewall  
Storrs, CT

## Rotated Display

I've owned an Apple IIc since July. I have one problem: The lines on my monitor IIc are slanted a bit clockwise. What can be done about this?

Greg Kirk  
Lexington, TN

You should do nothing unless you're qualified to repair high-volt-

Downloaded from [www.Apple2Online.com](http://www.Apple2Online.com)

age assemblies. The insides of monitors and televisions are very dangerous, and amateurs should leave the repair of such devices to trained technicians. Take your monitor to your Apple dealer. The technician there can align the display by simply rotating the deflection yoke on the neck of the picture tube.

## Heads or Tails?

In reference to "Rub-a-Dub-Dub" in the March Apple Clinic, now that you've solved Soon Kim's problem on how to activate disk drive 2 in order to clean it, how about helping those of us who don't have a computer science degree and who rely on commercial programs to operate our Apples? I know a little about BASIC, but not the first thing about assembly-language routines.

In your reply, you stated, "I used to clean heads when I was in the navy." Does this imply that you now don't think it's necessary to clean heads?

D.C. Cox  
Sarasota, FL

Sorry if I threw you a couple of curves. The March program listing can be entered and run using monitor instructions given in all versions of Apple II reference manuals. Alternately, you can run the Applesoft BASIC Program listing accompanying this month's Apple Clinic. This program *POKEs* the assembly-language program into RAM and *CALLs* it.

The heads I cleaned in the navy had nothing to do with floppy disk drives. I no longer clean those heads although I do clean a lot of bottoms these days. (Other fathers of infants will understand.) As far as disk drive heads are concerned, I clean mine

**Program listing.** Applesoft BASIC program to activate drive 2.

```
10 REM
20 REM DRIVE 2 --- TRACK 0
30 REM
40 DATA 162, 96, 134, 43, 189, 142, 192, 189
50 DATA 140, 192, 189, 139, 192, 76, 56, 198
60 FOR A = 0 TO 15 : READ B : POKE 4096 + A,
  B : NEXT
70 CALL 4096
```



when I happen to have the cover off for any reason, which is about once a year.

Although that keeps them clean enough for me, I must admit that I'm not the type of person to lose sleep over dirty read/write heads. I'm sure that many users don't feel safe unless they clean their heads every three months or so. I don't disagree with them in any way because it's unlikely that anyone will clean their heads too often, and much of your disk data is simply too valuable to risk storing on unreliable disk drives.

## What's in a ROM Chip?

I purchased a slot 0 RAM card and upgraded my Apple II to an Apple II Plus by transferring the ROM chips from my firmware card to the motherboard. The motherboard had D0, E0, E8, F0, and F8 ROM chips. Can you tell me just what these chips are for? Is there some way I can make DOS work with an Integer firmware card in a slot

## Product Information

### Softterm 2

Softronic  
3639 New Getwell Road  
Suite 10  
Memphis, TN 38118  
(901) 683-6850  
\$195

Reader Service Number 440

other than slot 0, so I won't have to reload Integer all the time?

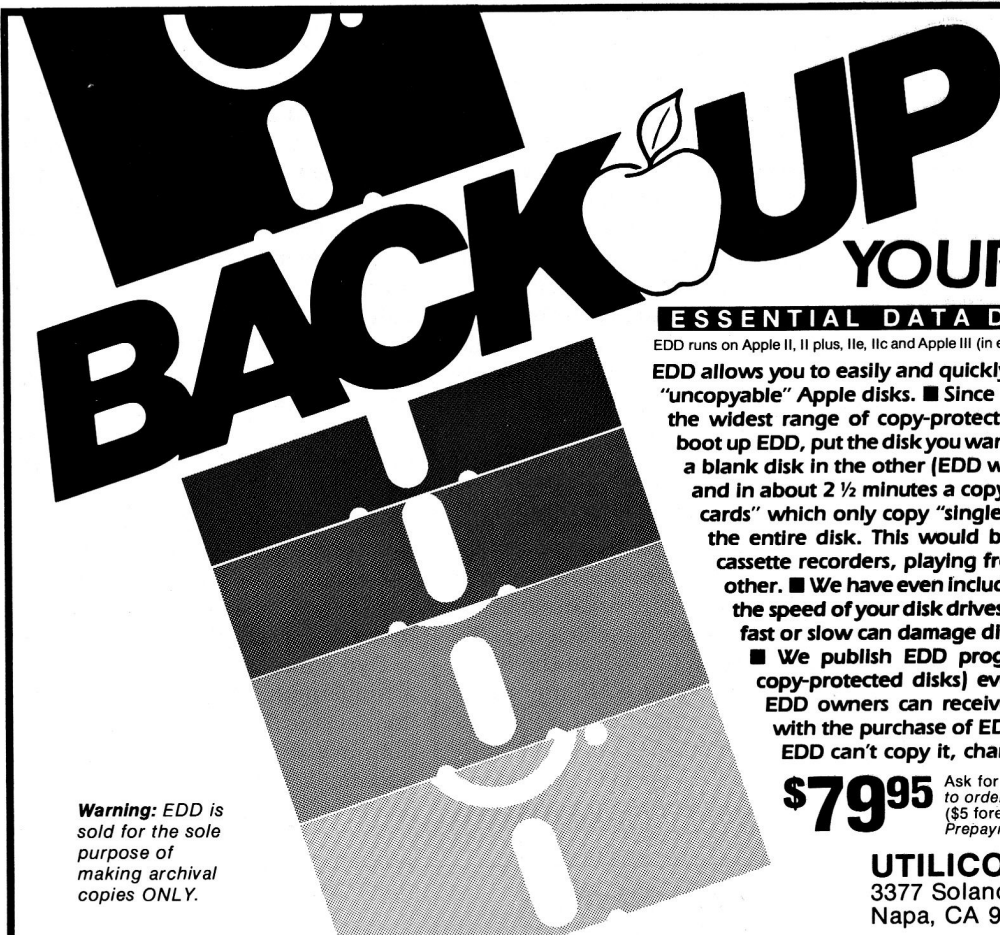
James J. Breslin  
Harrisburg, NC

In your motherboard's original Integer chip set, E0, E8, and F0 contain the Integer BASIC interpreter, some 6502 floating-point routines, a 6502 mini-assembler, and the Sweet16 16-bit pseudo machine interpreter. F8 contains either the original Apple system monitor or the newer Autostart monitor. D0 contains some other utility, probably the old D0 utility chip that Apple used to sell.

In the Applesoft chip set, D0, D8, E0, E8, and F0 contain the Applesoft BASIC interpreter, and F8 contains the Autostart monitor. The mini-assembler, floating-point utilities, and Sweet16 aren't present in the Applesoft chip set. Floating-point arithmetic is, of course, incorporated into Applesoft.

You can patch DOS 3.3 to locate Integer or Applesoft BASIC in a slot 1-7 firmware card by adding the firmware card slot number times \$10 to the values stored at \$A5B8 and \$A5C0 of the DOS. If the firmware card is in slot 5, change \$A5B8 from \$80 to \$D0 and change \$A5C0 from \$81 to \$D1. From BASIC, POKE - 23112, SLOT \* 16 + 128 and POKE - 23104, SLOT \* 16 + 129.

Another patch is to change \$BFD3-\$BFD5 from \$8D, \$00, \$E0 to \$EA, \$EA, \$EA. With this patch, booting DOS 3.3 will not clobber Integer BASIC in the 16K RAM card. To make the patch from BASIC, POKE - 16429, 234 : POKE - 16428, 234 : POKE - 16427, 234. ■



**BACK UP YOUR DISKS**

**ESSENTIAL DATA DUPLICATOR III™**

EDD runs on Apple II, II plus, IIe, IIc and Apple III (in emulation mode) using one or two disk drives. EDD allows you to easily and quickly make back up copies of your "uncopyable" Apple disks. ■ Since EDD has been preset to copy the widest range of copy-protections possible, you just simply boot up EDD, put the disk you want to copy in one disk drive and a blank disk in the other (EDD will work using one drive also) and in about 2 ½ minutes a copy is made. ■ Unlike the "copy-cards" which only copy "single load" programs, EDD copies the entire disk. This would be similar to hooking up two cassette recorders, playing from one, and recording to the other. ■ We have even included an option so you can check the speed of your disk drives because drive speeds running fast or slow can damage disks and cause other problems. ■ We publish EDD program lists (information about copy-protected disks) every couple of months, which EDD owners can receive. The current list is included with the purchase of EDD. ■ The bottom line is this; if EDD can't copy it, chances are nothing will.

**\$79.95** Ask for EDD at your local computer store, or, to order direct; send \$79.95 plus \$2 shipping (\$5 foreign). Mastercard/Visa accepted. Prepayment required.

**UTILICO MICROWARE**  
3377 Solano Ave., Suite #352  
Napa, CA 94558 (707) 257-2420

**Warning:** EDD is sold for the sole purpose of making archival copies ONLY.



## Reading and Writing: Learning the 'BASICS'

**M**ost people I know who get into computing start by buying a few games, and maybe a couple of application packages. When the urge to program overtakes you, however, one lesson you'll have to learn is how BASIC accesses data files on disk. The task is not as formidable as you might think, and once you have mastered it, a whole new world of BASIC is open to you. My column this month begins a short series on disk input/output (I/O) in applications programming.

Let's look at a few terms you'll encounter in any discussion of disk storage:

● **Byte.** A single character of alphanumeric data, such as a letter, digit, or punctuation mark.

● **Field.** A string of bytes that together represent a specific item of data—for example, a string of five digits denoting a ZIP code, or a two-character state abbreviation. Many commercial database management (DBM) programs refer to fields as "attributes."

● **Record.** A collection of related fields representing a unit of information about a specific topic—for example, data relating to an individual on a mailing list, including name, address, and phone number fields. DBM programs sometimes refer to records as "rows."

● **File.** The collection of records forming the entire body of stored information on a given topic—the complete mailing list, for example.

### Sequential or Random?

Applesoft gives you two ways to store data on floppy disks: sequential access and random access. Since commercial packages have built-in disk-access routines, you're hardly aware

**Learning to program means knowing the ins and outs of BASIC disk access.**

of the special programming required to save and retrieve data. The occasional blinking of the disk-drive light is the only indication that such processes are actually occurring. When you write your own programs, however, the differences between these two disk-storage techniques are a major concern.

Each field in a sequential file is only as long as the information it contains, plus 1 byte. For example, the name field SUE BROWN occupies 10 bytes, while HARVEY HAMILTON HARRISON takes up 25 bytes. The additional byte for each field is a special character the computer adds to indicate the end of that field. A sequential-access file consists of one large string of information with no wasted memory space, except for the special character separating one field from the next.

The unique field lengths and relatively simple structure of sequential access result in a few central drawbacks: slow retrieval, cumbersome editing, and overall I/O inefficiency. To search through a file to find the 82nd field, for instance, the computer must start at the beginning of the file and read through it one field at a time until it has counted 81 special characters. At that point, it "knows" it has arrived

at the beginning of field number 82.

Whenever you alter a field or record in a sequential file, the computer's disk I/O program must create an entirely new file to handle the updated information. For example, suppose Sue married Harvey. SUE BROWN HARRISON, requiring 19 bytes, will not fit into the same space as SUE BROWN with only 10. The disk I/O program must create a new file and fill it with the same data the old file contained, with the exception of this one updated name field. The program copies every record in the original file into the new one, then erases the old file from the disk and gives the new one the same name. When you delete a record, a vacancy remains until the program creates a new file and copies the old records into it.

Random-access files require a bit more planning than sequential files. You must first determine the maximum length of each field—then stick with it. For example, if you decide on a name field of 20 bytes, the I/O program will set aside 20 bytes for the name in every record in your file. For SUE BROWN, with 9 bytes, the computer will automatically add 11 blank spaces to fill the field. With HARVEY HAMILTON HARRISON, the computer will cut off characters beyond the 20th, leaving HARVEY HAMILTON HARR. When you enter data you must keep the field limits in mind—you might settle for HARVEY H. HARRISON, which consumes only 18 bytes and will fit the predefined field.

Two considerations arise from this arrangement. The first is that a random-access file may take up more disk memory than its corresponding sequential-access file, which doesn't pad fields with unused bytes. The second

**by Dan Bishop**



is that you must sometimes compromise the data you enter into a random-access file, to get them to fit into fields of predefined length. When you set up a random-access file, the trade-off is between a field long enough to encompass the majority of items entered and a field that wastes too much space.

The advantages of random-access disk I/O far outweigh these drawbacks. First, all records in the file are exactly the same length. Suppose your 20-byte name field is combined with six other fields to make up a record, the total length of which is 100 bytes. If you tell the computer to find record 82, it simply multiplies 81 times 100 and adds one. It jumps directly to byte 8101 in the file, "knowing" it will be the first byte in record 82. This procedure is considerably faster than the field-by-field searching sequential access requires.

The second advantage becomes apparent when you need to update the information in a given field. Since the length of the modified field will always be the same as that of the original, the I/O program can simply write the new data into the same area of disk storage the old field occupied. No adjustment of other fields or records is necessary. Adding and erasing records is just as easy, and if you design your program to keep track of deleted records, it can use that information to write new records into those vacancies.

The purpose of disk storage is greater efficiency in handling large data files; writing a new disk-based program that uses sequential files is normally not justified. Tape files, on the other hand, are necessarily sequential. If you want to convert a tape program to a disk system in a hurry, sequential disk access provides the "quick and dirty" approach you may need.

#### **Disk Commands: the Fundamentals**

A series of Applesoft commands lets you directly control the information stored on your disk.

The first disk command most beginning users learn is CATALOG, which lists the entire directory of stored files on your display, or passes it to your printer. The computer treats programs and data files the same way—in a sense, the stored information making up a program contains "records" of in-

## **"Mastering disk access opens up a new world of BASIC."**

structions for the computer to follow.

If your list of files is too long to be displayed on a single screen, the entire directory scrolls by, with the last 22 file names remaining on screen. Pressing control-S stops the scrolling; the same key combination restarts it, as well.

Each line in the directory display contains three pieces of information: I, A, B, or T, indicating integer BASIC program, Applesoft BASIC program, binary program, or text file; the number of disk sectors (256-byte chunks) the file takes up; and the name you gave the file.

A file name in Applesoft BASIC may contain up to 30 characters. The first character must be a letter, but remain-

ing ones may include spaces or any keyboard characters except the comma. You must assign each file a unique name, because the computer uses it in its search procedure.

You may also add password protection by making a control character part of the file name. Hold down the control key and press another key. The resulting character will not appear in the directory name displayed, but you must type it in to open that file.

To remove a file from a disk, type the word DELETE followed by the name of the file—for example, DELETE DAILY EXPENSE ACCOUNT. The disk space occupied by that file is now free for files you may wish to add later. To change the name of a file, type RENAME and the current name of the file, followed by a comma and the new name, as in RENAME THIS YEARS TAXES, LAST YEARS TAXES.

LOAD, RUN, and SAVE are three disk-operating system commands that work only with BASIC program files, not data files or binary program files. Keep in mind that your computer

## **ATTENTION subscribers!**

We occasionally make our mailing list available to other companies or organizations with products or services which we feel might be of interest to you. If you prefer that your name be deleted from such a list, please fill out the coupon below or affix a copy of your mailing label and mail it to:

**CW Communications/Peterborough  
inCider  
PO Box 911  
Farmingdale, NY 11737**

Please delete my name from mailing lists sent to other companies or organizations.

name \_\_\_\_\_  
address \_\_\_\_\_  
city \_\_\_\_\_ state \_\_\_\_\_ zip \_\_\_\_\_



can interpret commands and deal with data only if they are stored in RAM. Program instructions and data in permanent storage on disk must be copied from the disk into the computer's RAM before you can use them.

For example, if you type LOAD MASTER MAIL LIST, the computer searches the disk directory for a file by that name; when it finds the file, the disk routine copies the program instructions in that file into RAM. Those data continue to reside on disk, however. If you remove the disk and turn the computer off, you lose only the RAM copy of the program—the disk copy is unchanged.

To execute the program after loading it into RAM and viewing it, enter the command RUN. If you want to load and execute the program without checking it or making any changes, just type RUN and the program name.

Use the SAVE command followed by a valid file name to copy the BASIC program currently in RAM into a disk file. The program in RAM remains unchanged. If the computer doesn't find

the file name on the disk directory, the I/O routine creates a new file and copies the contents of the BASIC program into it. On the other hand, if a file of that name already exists on the disk directory, the computer uses the same disk space and records the RAM contents right over the old program. The earlier version is replaced by the new one you're saving.

### Programming Tips

When you write your own programs, get into the habit of using a different name for each successive version of your work. In case of power loss, you'd have to redo only the product of the latest session. And if you reach a dead end in your current version, you can always start again from an earlier one. A simple rule of thumb is to use the same alphabetic name for each version, but follow it with some indication of the date and time you saved the file to disk. A quick look at the disk directory (using the CATALOG command) reveals the order in which you saved the files, and relieves

you of having to remember version numbers or a list of names.

Remember to make frequent back-ups of your programs on a second disk. As soon as the drive stops running after a SAVE command, remove the working disk and insert the back-up. Give the computer another SAVE command, using the same file name, then put your working copy back into the disk drive.

Don't store your back-up and working disks in the same place. Your files are important. Think domestic disasters are too unlikely? Well, good luck. . . .

Next month I'll provide some specific program examples of random-access disk I/O in Applesoft BASIC. In the meantime, send in those user-defined functions (see June's Applesoft Adviser). If I receive some interesting responses, I'll devote an entire column this fall to your submissions. Keep 'em coming! ■

*Write to Dan Bishop at 4124 Beaver Creek Drive, Fort Collins, CO 80526.*

# Print-it!™

THE NEW APPLE® COMPATIBLE SERIAL AND PARALLEL PRINTER INTERFACE

## Go From Screen to Paper and Disk\* at the Touch of a Button.

**The ONLY way to get fast, easy printouts of ANY screen, at ANY time, with ANY program.**

Push the red button that comes with PRINT-IT! - Your program pauses instantly; touch RETURN and whatever is on your screen - text, graphics or both - is printed in color or black & white.

Whether your Apple II, II+, IIe<sup>®</sup> or "look-alike" is for business or pleasure, you'll want the ability to pause and take snapshots of your screen displays and then continue from exactly where you paused, all at the touch of a button - games, business data, menus, educational instructions, graphics - even CP/M<sup>®</sup>. PRINT-IT! will print your screen at any time no matter what program you're running, as well as perform every function you expect of an intelligent printer card.

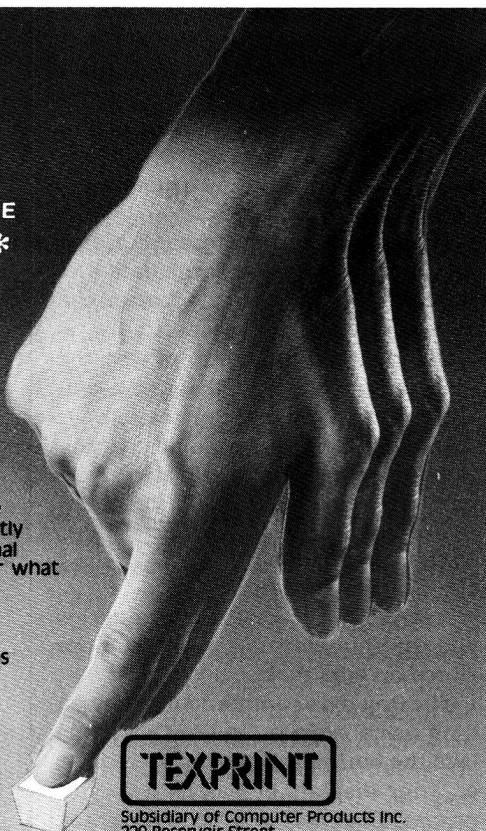
### PRINT-IT! supports:

- Graphics - Low, high, double low, and double high resolution • Text - 40 column as well as Apple IIe and Videx<sup>®</sup> 80 column cards including the new Apple 80 column RGB card
- Software - Prints from ALL software, even allows any printer to be used directly from Apple MousePaint
- Printers - All of the most popular printers,<sup>®</sup> including color, are easily selected with a dip switch.

PRINT-IT!, complete with cable (serial or parallel), is available at your local computer store now! If they don't have it in stock, ask them to get it for you.

Can't find a local dealer? PRINT-IT! is available for \$199 directly from Texprint.<sup>®</sup> Qualified educational and dealer discounts available.

① Visa, MC, AMX accepted. Add \$4 shipping and handling within USA. Mass. res. add 5% tax. \*Save It!™ Disk for only \$29.95.  
 ② Apple II, II+, IIe, and MousePaint are registered trademarks of Apple Computer, Inc.  
 ③ CP/M is a registered trademark of Digital Research.  
 ④ Videx is a registered trademark of Videx, Inc.  
 ⑤ Apple DMP/IMAGEWRITER/SCRIBE, BMC, C. Itoh, Canon, Epson, Dataproducts, IDS, Tally, NEC, Okidata, Quadram, Panasonic, Radio Shack, Star Gemini, Transstar, Diablo plus many others.



**TEXPRINT**

Subsidiary of Computer Products Inc.  
 220 Reservoir Street  
 Needham Heights Ma. 02194  
 Tel. (617) 449-5808

For Information call Toll Free

**1-800-255-1510**



# SOFTWARE REVIEWS



## inCider's Ratings

- ★★★★ Superlative
- ★★★ Above average
- ★★ Good
- ★ Not recommended
- Stay away

## The Perfect Score

### Mindscape

3444 Dundee Road  
Northbrook, IL 60026

SAT preparation  
Any Apple II, 48K  
\$69.95

★★★

At \$69.95, you have to wonder if Mindscape's *The Perfect Score: Computer Preparation for the SAT* can be any good at all. The answer is a qualified "yes."

The program consists of six double-sided disks covering the verbal and math sections of the Scholastic Aptitude Tests, with sample exams that "simulate a test-taking experience." Since post-test copies of the SAT's are now available, several publishing houses and software companies have been able to produce realistic sample tests and comprehensive reviews. It is usually the "how" and not the "what," however, that differentiates various programs, and that is the case here.

Little previous knowledge of computers is necessary to use Mindscape's SAT package. Simply follow the directions included in the manual and

printed on screen. Some of my students who had never taken a computer course and had some anxiety about computers had no problem running this program on Apple II machines.

The program is not strong in reviewing or introducing mathematical topics, relying instead on a brief example or two in the user's manual. A student who does not know the laws governing exponentiation, for instance, will probably not find enough examples or sufficiently detailed explanation to be able to solve such problems. The manual does a better job explaining verbal topics such as analogies and sentence completion.

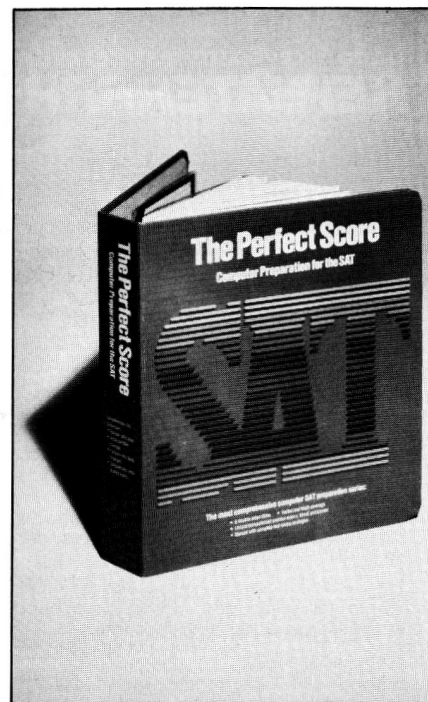
The program feature the manufacturer cites most proudly is a choice of operating mode. In the testing mode, you simply answer questions, with a chance to repeat items you miss a second and even a third time. At the end of a section test results are displayed.

My students, however, who vary widely in ability and background, found the learning mode more helpful. All agreed it would be beneficial in preparing for the SAT's. One of them commented, "This is much better than the book I've been using. I wish I had this instead." In learning mode, a question is explained even if the student answers it correctly. In the case of a wrong answer, the program provides hints after each subsequent incorrect guess until all of the choices are eliminated. One of my students termed these explanations and hints "very helpful and easy to follow."

One feature of the learning mode, however—the program's response to an incorrect answer—proved distract-

ing and even insulting to students. Included are such comments as "Are you really trying?", "Don't call us, we'll call you," and "You're kidding, aren't you?". Similar phrases pop up after correct answers: "Home Run," "Go to the head of the class," and so forth. At least one of my students found this, too, "annoying after a while."

During the actual running of the program the student has the choice of using a time clock that may be displayed continuously on screen or only as desired. In addition, optional sound effects can accompany the learning mode. Wrong answers are greeted with suitably sad, bassoon-like notes, while correct answers are rewarded with a flourish. All of my students







Mickey and Pluto look for the missing crystal in Mickey's Space Adventure.

opted for silence after a while, agreeing that the sound effects were "rather juvenile." Some also wondered if they would distract others in the vicinity. In case of a mistyped response, the screen with its clearly written instructions remains on hold until an acceptable response is entered.

The questions themselves are well-conceived and well-written although not as numerous as they are in other programs. The lack of graphics can be distracting—you must turn to the user's manual whenever you have to solve a mathematics problem involving a diagram.

In sum, you do get what you pay for, and a bit more when you compare The Perfect Score to others available on the market. If you can ignore what are meant to be user-friendly responses to answers in the learning mode, this Mindscape program will be effective preparation for the SAT (and PSAT) exams. ■

**Art Johnson**  
Nashua, NH

## Mickey's Space Adventure

**Sierra On-Line**  
P.O. Box 485  
Coarsegold, CA 93614

Illustrated adventure for children  
Any Apple II, 48K  
\$34.95

★ ★

Looking back, we realize that 1984 was the year of the mouse. Not only were Mac and Lisa each equipped with one, but another version was available for the //e and //c. Not to be outdone, Sierra On-Line, in conjunction with an old-time mouse maker, Walt Disney, has just released one of its own. This mouse requires no desk space and is simple enough that an 8-year-old can use it. Mickey, as in Mouse, and his dog Pluto star in a new educational adventure game, Mickey's Space Adventure.

The game fills both sides of two disks. To begin, you must boot side A and follow the on-screen prompts through a short series of introductory displays. Once you have Mickey up and running, the plot is fairly simple. At one time, the inhabitants of a planet in the Alpha Centauri system kept their history on a crystal without a back-up copy. It was subsequently stolen and broken, the pieces cast adrift. Solar winds blew them to their resting places, one to each planet in our solar system. An unmanned space vehicle is launched; its destination is the planet where the first part of the crystal landed—Earth.

Mickey and Pluto come across the saucer and decide to help. They must locate the missing pieces in their correct order with the assistance of an on-

Circle 229 on Reader Service Card.

## UPGRADE get //e features on your apple II

up to 5 keyboard features with the  
**REPEATERRRR+™**

**Auto Repeat:** Invaluable. Repeats any keypress, including control characters for scrolling, rubout, etc. **Adjustable delay** to match your typing touch. **ON/OFF control.**

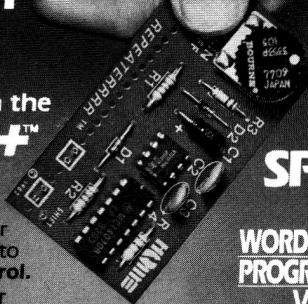
**High Speed Cursor:** Makes Apple's REPT key a speed control to double the repeat rate of any keypress. Zip through text or across a VisiCalc spreadsheet to get there fast. A must for 80 column displays.

New option for the REPEATERRRR:  
**SHIFT-key Modification:** SHIFT as you should. Get the "standardized" connection (SHIFT-key to Game I/O) while leaving the Game I/O open with our plug-in connector. Supported by most popular word processors (Apple Writer II, Word Handler, Screen Writer II, etc.) and many other programs. Works only with certain software and/or most 80 column boards.

Easy installation. Open top and plug onto 25-pin connector between keyboard and encoder board (fits Rev. 7 or later).

**REPEATERRRR**  
without SHIFT-key modification **\$27<sup>95</sup>**

**REPEATERRRR+**  
with SHIFT-key modification **\$37<sup>95</sup>**



**SPEED  
UP  
WORD PROCESSING  
PROGRAM EDITING  
VISICALC**

**TO ORDER:** Ask your local dealer or order direct.

Add \$2 per order shipping/handling (\$5 foreign). Ohio orders add 6.5% sales tax. Check, MasterCard VISA (incl. card no. & exp. date). 30 day trial — full refund if not satisfied. One year warranty.



**HIGH ORDER MICRO ELECTRONICS CORP.**

17 RIVER ST. CHAGRIN FALLS OHIO 44022  
PHONE 216-247-3110

Trademarks: Apple/Apple Computer, Inc., Screen Writer II/Sierra On-Line, Inc., Word Handler/Silicon Valley Systems Inc., VisiCalc/VisiCorp.



board computer. As with all adventures, your child is going to have to assist Mickey in gathering some needed and useful objects during the journey. For instance, if he didn't pick up a scarf while at home, Mickey's going to have a hard time finding one of the pieces. As a matter of fact, without it, he'll have to backtrack to get it when he least wants to. Your child, however, will never be told exactly which item is missing.

## Features

As in other adventure games, mapping becomes a very important skill. Players must keep maps of individual planet locations and certain areas within them.

Space Adventure relies on traditional two-word parsing. Available words are shown on two lines, verbs on the first line, objects below, at the bottom of the screen. This is the same format used in previous early-age-level adventure games. Players must form appropriate commands using the arrow and return keys. Generally, this is not difficult to do, but in situations where command lines are long or a command must be repeated a number of times to get the desired result, it can be cumbersome and frustratingly slow.

The educational values traditionally associated with this game genre are present here, too. Your child must learn and practice mapmaking skills, use logical problem-solving techniques and sequences, read for content and underlying hints, and deal with puzzles of varying complexity. In addition, Space Adventure presents a fairly complex body of astronomical data your child must learn well enough to use in the game. This includes, among other things, the names, relative sizes, composition, and order of the planets in our solar system.

One very appealing aspect of the program is its nonviolence. Players have to trade and negotiate with aliens, but never have to clobber one. And even after the computer repeatedly warns that Mickey's oxygen supply is dwindling, it never lets him die. Instead, the program tells your child that Mickey is too tired to continue, and to start again.

A save option also allows you to stop

in mid-game and continue from the same place at a later time. As this game could conceivably take an 8-year-old 20 hours to solve, this comes in very handy. Its only drawback is that you may save only one game per disk. When more than one child is using the program, this could be a disadvantage.

I've watched both an 8- and a 14-year-old play Space Adventure. My observation is that both of them are enjoying it and are continuing to make progress. Neither of them is bored with it, even though after six hours each they are not yet near to completing it. It has held their interest well.

Overall, Mickey's Space Adventure is a well-presented program. The graphics are beautifully executed and appropriate. A fair amount of educational value is offered in a format that is fun and challenging to the player. At \$34.95, it's not a bad buy for the beginning adventurer. ■

**Doug Landin-Young**  
Fresno, CA

## HomeFiler

### MicroLab

2699 Skokie Valley Road  
Highland Park, IL 60035

Home data base  
Apple II series, two disk drives, 48K  
\$50

★★

**B**lessed with a simple command structure and surprising storage capacity, HomeFiler is a no-frills database program offering home users a way to manage information quickly, easily, and inexpensively. As one might expect with \$50 data-base software, however, the program has some limitations—slow operation and a few poorly executed functions. Nevertheless, for those interested in computerizing their home recordkeeping, HomeFiler is worth a second look.

The program comes with a single floppy disk and a clearly written 12-page manual. It will work on all Apple



Circle 361 on Reader Service Card.

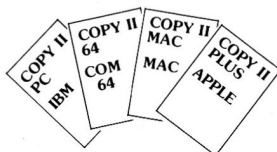
## BACKUP PROTECTED SOFTWARE with COPY II PLUS™ ver. 5

From the team who first brought you **COPY II PLUS** in 1981 comes a completely updated disk backup utility for your Apple // computer. New features include:

- **Fully automatic bit copy\*.** All parameters are stored on disk. Simply type in the name of the program you wish to backup, and **COPY II PLUS** does the rest!
- **New utilities** including Alphabetize Catalog, Fast 2-pass Disk Copy on a //c or //e, and an all-new Sector Editor.
- **Supplied on a standard DOS** diskette. Runs on the Apple //, Apple //+, Apple //e, Apple //c. Requires 64K and one or two disk drives.

Increase the power of your Apple //...  
Use **COPY II PLUS™ 5.0**

Call M-F 8-5:30 (W. Coast time) with your   : **503/244-5782.**  
Or send a check (add \$3 s/h, \$8 overseas) to



**\$39.95**

**CENTRAL POINT  
Software, Inc.**

9700 SW Capitol Hwy. #100  
Portland, OR 97219

\* We update Copy II Plus regularly to handle new protections; you as a registered owner may update at any time for 1/2 price! (To update, just send original disk and \$20.)

*This product is provided for the purpose of enabling you to make archival copies only.*





In less than 5 minutes, KITCHEN PLANNER will help you plan up to 14 days of balanced meals the way YOU want them and print the Menu and Shopping List.

- \* EASY TO USE \* SAVES TIME \*
- \* SAVES MONEY \*

- "Saves 5-6 hrs a month and keeps our meals varied." - Family Computing Magazine Cover Story, November 1984.
- "The concept of this program is great for my family... I have only owned the program for 3 weeks and our shopping expenses have been reduced by about \$25 a week... that's great!" - Mrs. S., Illinois
- "This has been without a doubt the most useful disk I have purchased for my home computer." - Mrs. T., Wisconsin

#### SATISFACTION GUARANTEED

Send Check or Money Order to:

SAV-SOFT PRODUCTS  
P.O. Box 24898  
San Jose, CA 95154

(add \$1.50 handling; in CA add 6%)

VISA, MC call: (408) 978-1048

48K Apple II, II+, IIe, IIC, I disk, printer  
Apple is a trademark of Apple Computer, Inc.

**\$29.95**

Circle 376 on Reader Service Card.

## Settle Your Bowling Scores "BOWL-KEEPER"

**\$29.95**

- Stores, Calculates and Prints
  - Individual games
  - Weekly series
  - Weekly average
  - Total pins
  - Cumulative average
  - Handicap (optional)
  - High series
  - High game
- Menu Driven
- Complete Individual Records
- Applesoft Basic
- Unprotected
- Apple II+/IIe, Single Disk

\_\_\_\_\_ Copies Bowlkeeper @ \$29.95 ea.

\_\_\_\_\_ Total

\_\_\_\_\_ 5% Sales Tax (FL residents only)

\_\_\_\_\_ \$2.00 Postage & Handling

\_\_\_\_\_ Total Order

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Send Check or Money Order

To

SOFTWARE UNLIMITED

P.O. Box 6361

Clearwater, FL 33518

(C.O.D. Orders ONLY 813/797-7815)

## SOFTWARE REVIEWS

II models; however, two disk drives are required. The flip side of the disk demonstrates how to create a file, but you may be better off learning by doing.

### Getting Started

Insert the program disk in drive 1, a blank disk in drive 2, and turn on your computer. Following the title screen, HomeFiler presents you with three options: Begin a Data Disk, Change a Data Disk, and Exit. Select the first and type I, to initialize the disk in drive 2 for use with HomeFiler. Next assign a name to your file, and begin entering the names and lengths of the fields (categories) in your prospective data base. For example, if you want to create a field for names 25 characters long, simply type NAME (press the return key) 25 (press the return key). HomeFiler allows up to 88 fields per data disk, and 1239 characters per field.

Once you have defined all the fields, press the 0 key to inform HomeFiler that you're finished. Be certain you have all the fields you need before pressing that key—once you do, adding a field means starting the program from the beginning.

After you've determined that the field information is correct, the program writes the file variables to your data disk and displays the HomeFiler main menu. From this point you can enter, inspect or change data, view your file's parameters, and sort, delete, and search through records. You can also generate reports of all or selected records, produce mailing labels (a handy feature), get help, select a new file, or exit the program.

### The Data

Data entry is simple. Just type information in the appropriate field and press the return key, or hit the return key alone to create a blank field. Pressing control-B backs up one field, control-E returns you to field 1, and control-A repeats data from the corresponding field of the previous record. This feature is especially useful if everyone on your address list lives in the same state, for example. When you are finished, press the Y key to confirm that all is correct, N to start over, or control-Q to quit and return to the main menu. When you press the Y key, the program writes the record to

disk, and you move to the next record.

Selecting the File Information option on HomeFiler's main menu enables you to examine the characteristics of a particular file in your data base. The program lists the name of the file; the number, length, and name of each field; the maximum number of records the file can contain; the number of records currently in use; whether the file will require one or two volumes (disks); and the number of records that will fit on Volume 1. When I created a sample file containing 11 fields, with a combined field length of 150 characters, I discovered that a file that size can hold 590 records, 559 of them on a single disk—that's pretty efficient.

### Complaints

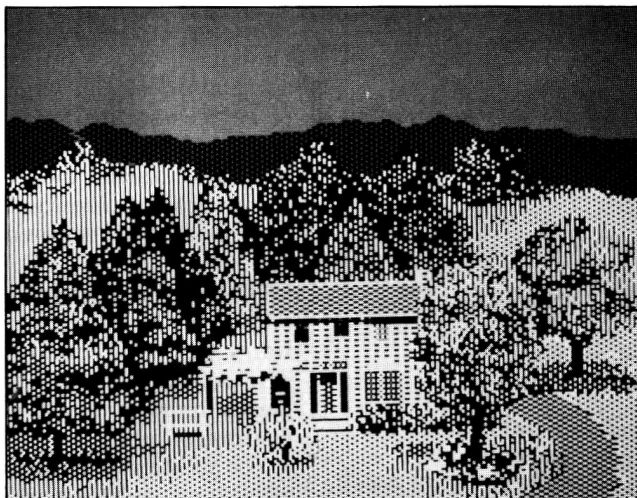
What isn't so efficient is HomeFiler's limited array of sort, search, and report capabilities. The major difficulty is that you can sort or search on only one field at a time. While you can search a file for customers living in a certain state or those who haven't paid you in six months, for example, you can't do both at the same time.

HomeFiler sorts in either ascending or descending order, letting you list items alphabetically, by invoice number, or by date, but little else. The program can conduct searches by word, number, or date. You must specify whether the program is to match search criteria exactly or with any portion of a field entry. The latter option is an attempt at a wildcard function, but it isn't nearly precise enough. Searching a field for all names beginning with "AB," for instance, would turn up Abraham, Ahab, and Rabinowitz. Searching a date field for "01" would yield not only the January records you're after, but all records dated the first of any month, as well—not very helpful.

With the Report option, HomeFiler displays all records on screen or prints them with all or selected fields, record numbers, and field names, as you desire. Printing selected records, however—a central function of any report generator—requires HomeFiler's Search option. That's just bad program design.

My other complaints involve the program's slow pace, poor visual formatting, and excessive keyboard op-





Create your dream house with Landscape Design.

eration. In addition, the manual neglects to warn you that the HomeFiler disk will not work correctly if it is write-protected, as it comes from the manufacturer. Disk access is frequent and lengthy. I grew to despise the LOADING MENU message that appeared every time I entered or exited a menu option. And, since HomeFiler doesn't use an 80-column format, you may not be able to view an entire record at once.

Selecting Help from the main menu takes you on an extensive one-way journey through all of HomeFiler's options. I'd prefer a system of contextual help screens—screens that offer information relevant to particular points in the program.

Another improvement would be to replace many of the INPUT statements, especially those asking "Correct? (Y/N)," with GET commands. An INPUT requires at least two keystrokes—in the example above, Y or N plus the return key—before the program can process a response; a GET command moves you along as soon as you press the Y or N key.

The most serious flaw, however, is that unless the write-protect tab is removed from the program disk, HomeFiler crashes when you attempt to delete a record. To avoid this problem, make a copy of the program, put the original in a safe place, and use the back-up without a tab. Then you'll be ready to get out that jumble of records and put HomeFiler to work. ■

**Wayne J. Sassano**  
Wethersfield, CT

## Design Your Own Home: Landscape

**Avant-Garde Publishing**

P.O. Box 30160  
Eugene, OR 97403

Graphics  
Any 48K Apple II,  
requires input device  
\$69.95

★★★

There's more to landscaping than planting shrubs and building fences—planning, selection, and placement are necessary considerations, as well. Avant-Garde's Landscape Design helps homeowners and professional designers tackle outdoor-improvement projects.

One of three programs in the Design Your Own Home series, Landscape Design lets you create useful landscaping layouts, but you'll find the program confusing at first. The information you need is in the manual, but a poorly organized format makes it hard to locate. The complex designs you can devise with the program, however, make it a remarkable package well worth the price.

With Landscape Design, you can view layouts from above, and horizontally from four directions. Since the program lets you vary the size, location, and types of plants and structures, it provides a good tool for experimenting with your ideas. A workbook helps you plan and execute designs.

Circle 16 on Reader Service Card.

## Software That Works For Generations

6 Types of Charts and Sheets  
Indices  
User Fields  
Notes, Footnotes and Sources  
No Limits  
Adapts to Your Hardware  
Comprehensive  
Easy to Use  
And Much, Much More

Send for brochure and sample printouts.

Family Roots includes detailed manual and 2 full diskettes of programs for your Apple II, IBM PC, Commodore 64 and CP/M.\*

Other genealogy software also available.

Price \$185. Satisfaction Guaranteed.

American Express, Visa & Mastercard Accepted

\*Trademarks for  
Apple Computer,  
Inc., International

Business Machines,  
CBM, Inc., & Digital  
Research.



**QUINSEPT, INC.**

P.O. Box 216, Lexington, MA 02173  
(617) 641-2930

Circle 41 on Reader Service Card.

## FREE?DISKETTES

SAVE MONEY! Apple II series users can use the diskette flip side, if another "write enable" notch is correctly made.

The **DISK-NOTCHER** by QUORUM quickly **SOLVES** that **PROBLEM**. It's like **FREE DISKETTES!**



- Stainless Steel Guide
- Easy Leverage Handle
- Clippings Catcher
- Square Notch Cut

Lifetime Warranty

**Certifix™**

NOW for ProDOS & DOS 3.3

BE SAFE! CERTIFIX by Quorum protects your ProDOS & DOS 3.3 data by "LOCKING OUT" flawed tracks & sectors. Your disk flip side is **CERTIFIED 100% ERROR FREE.**

- "LOCKS OUT" ProDOS & DOS 3.3 DISK FLAWS
- AUTOMATIC ProDOS or DOS 3.3 FORMATTING
- CAN MAKE 35 or 40 TRK ProDOS or DOS 3.3 DISKS
- APPLE II/c, e, & II+ • NOT COPYPROTECTED

**FREE CERTIFIX BONUS PROGRAMS**

- RESCUE™ RESTORES DELETED DOS 3.3 FILES
- SPEEDY™ WILL TEST YOUR DISK DRIVE'S SPEED

100% Money Back Satisfaction Guarantee!

**FREE!** "Write Protect" Tabs & Disk Labels, if you order the DISKETTE FLIP-KIT

**DISKETTE FLIP-KIT (tool, disk, etc.) \$34.95**

DISK NOTCHER is \$14.95 CERTIFIX is \$29.95

add \$2.00 s/h • CA add 6 1/2% tax

**SEE YOUR DEALER**

or order direct from Quorum

**800-227-3800 ext. 30**

VISA, M/C, or C.O.D. Dealers Invited.

**QUORUM INTERNATIONAL, Unltd.**  
INDUSTRIAL STATION P.O. BOX 2134-1C  
OAKLAND, CA 94614



**NEW**  
Improved Version

Replace that  
graphic "artist"  
with a complete



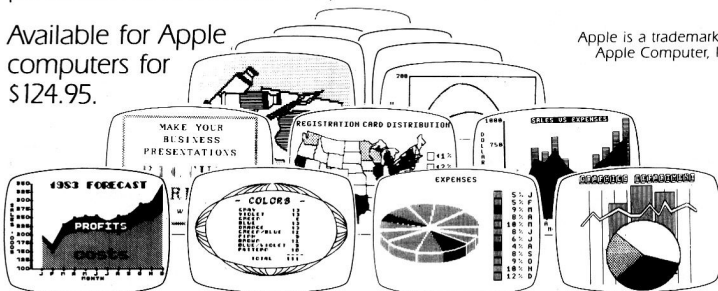
## Graphics Department™

Some software packages only do charts, others only do lettering, or only "slide" showing. The menu-driven Graphics Department program combines all of these and more into one package.

Build any type of graph; add titles and other lettering; draw ellipses, points, lines, rectangles; "paint" in 100 colors; present a "slide show"; and manage your library of picture data. This new updated version of the Graphics Department can even produce area charts and 3-D pie charts, has more fonts and prints on most printers. It does it all!

Available for Apple  
computers for  
\$124.95.

Apple is a trademark of  
Apple Computer, Inc.



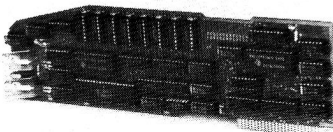
**Sensible Software, Inc.®**

210 S. Woodward, Suite 229, Birmingham, MI 48011  
(313) 258-5566

Circle 240 on Reader Service Card.

## HIGH-RES GRAPHICS SYSTEM FOR APPLE II COMPUTERS

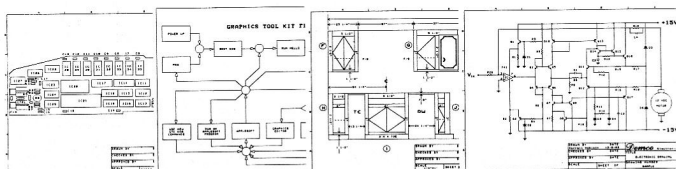
- The **HARDWARE** has two continuous pages of 640 pixels by 384 lines of bit mapped monochrome graphics.
- Completely compatible with Applesoft High-Res commands.
- Some **SOFTWARE** features are rubberband line draw, pattern fill, plot, block move/duplicate, cut and paste, shape and font positioning, and insert standard Apple pictures.
- The software also contains a vector shape table and font maker/editor programs.
- The software supports the Apple mouse and keyboard for cursor control.
- Print a full 8 1/2" by 11" page of graphics to a dot matrix printer capable of 80 dots per inch.
- Complete **HARDWARE** and **SOFTWARE** package including fonts and shape tables for only \$595.00.



The **GRAPHICS  
TOOL KIT**

APPLE II and APPLESOFT are registered Trade Marks of Apple Computer Inc.

**DEMCO Electronics**  
10516 Greville Ave.  
Inglewood, CA 90304  
(213) 677-0801



To begin, you must outline your property as viewed from above, including the house and structures such as a patio, deck, or swimming pool. To place trees, shrubs, flowers, and grass, simply move the cursor to the desired location and select the plant type from almost 100 varieties listed on the reference cards. Experimentation is the key.

Other features let you paint the layout (or the house and the sky, if you want) and add labels to your drawing. The program can also identify your plants, measure distances, and move plants around.

You may use a mouse, paddle, joystick, or graphics pad in your line drawings and plant placement. (A separate program for the mouse is provided.) The keyboard is reserved for selecting plants, sizing, and choosing colors. These devices aren't as easy to use as they should be. One annoying feature is the small, period-sized cursor that marks positions in the initial line-drawing mode. Also, the response to mouse movement is slow; it's easy to pass the point you intend to move before you realize it.

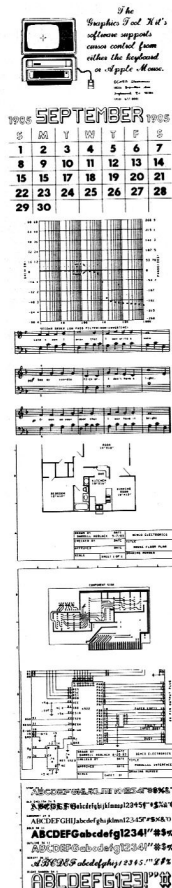
To compensate, it's fairly easy to erase or correct errors—once you know how. The documentation's tutorial fails to cover all of the program's capabilities, and the reference section is a hodgepodge of various types of information. Fortunately, the manual does have a fair technical appendix.

Two disk drives are a must with Landscape Design. Because you must access the program disk whenever you change menus, program and data disk swaps are frequent if you have only one drive.

Although the printer-installation utility appears straightforward, I was unable to get the Gemini 10X printer (one of 11 printers supported by the program) to produce drawings properly. (Some rather cryptic on-screen instructions seem to have slipped by alpha and beta tests.)

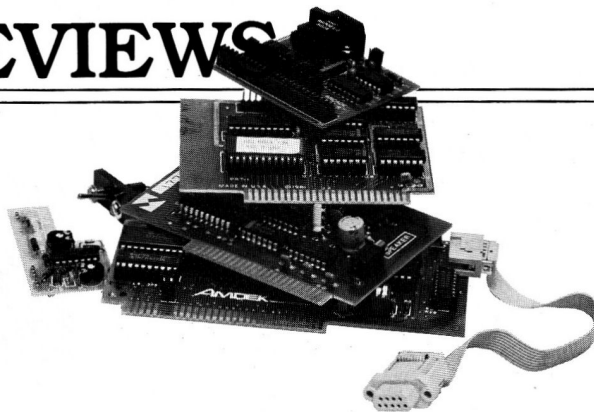
If your printer can function with the program, Landscape Design has everything homeowners and professionals should expect in a landscaping program. Its major drawbacks are a confusing manual and the amount of time required to learn the program. ■

**Michael A. Banks**  
Milford, OH





# HARDWARE REVIEWS



## inCider's Ratings

- ★★★★ Superlative
- ★★★ Above average
- ★★ Good
- ★ Not recommended
- Stay away

## A + Mouse

### Mouse Systems

2336 H Walsh Avenue  
Santa Clara, CA 95051

Optical mouse

Apple //c, and //e with Apple  
MouseCard

\$150

★★

When you place the sleek new A + optical mouse next to Apple's mechanical one for the //c and //e, or compare it to the older Macintosh version, the children's story of the city mouse and the country mouse comes to mind.

The A + Mouse is a model of urban chic: svelte, technologically sophisticated, and smooth to operate. The Apple peripheral is somewhat less worldly—chunky, slightly old-fashioned, and a bit slow on the draw. Yet, true to its literary counterpart, the A + Mouse is at a disadvantage. Threatening its survival are a high price tag and the possibility that dealers may not sell Apple //e users the MouseCard interface required to operate it.

For //c and Mac owners, the A + Mouse is well worth investigating. It uses infrared light, rather than a trackball, so there are no moving parts to

wear out or accumulate bits of debris. Noise and friction are also greatly reduced, for the A + Mouse glides on little felt feet over its metal MousePad, which has non-skid rubber strips to make it stay put.

The device's design—smooth lines and a low profile tapering down towards the button—make the A + Mouse fit neatly into the curve of your palm. In contrast, the Apple mouse seems awkward—sloping up to a ridge where the button is located, then down again.

Tested with MacPaint, A + Mouse drew details with greater precision than either of Apple's models. The latter, however, did appear to operate more smoothly when placed on the A + MousePad.

### Moving the Mouse

Since all software packages designed for the Macintosh use a common mouse interface, the ratio between mouse and cursor movement remains constant from program to program. My tests indicated that the A + Mouse can take you all over the Mac's screen without nearing the edge of its MousePad. For //e and //c packages, however, the mouse/cursor ratio can vary greatly.

In some programs, extensive mouse travel produces only small changes in cursor position. With a mechanical mouse, you simply trackball a longer distance. But since the optical mouse must remain on the MousePad, you may have to lift and reposition the A + several times.

Try out the mouse-compatible programs in which you're interested, to make sure the A + MousePad will be big enough to let you traverse the entire screen in a single pass. Even if it's

not, you may find that the A + Mouse's ease of operation offsets the annoyance of frequent repositioning.

### Do You Want One?

Is the A + Mouse really a good buy? While it's superior to the Macintosh mouse, you probably should resist the temptation to spend \$150 for a device you don't really need. If you're dissatisfied with the drawing capabilities of the Mac mouse, however, and you're willing to pay for greater precision and fast, noiseless, silky-smooth operation, I strongly recommend the A + Mouse.

If you own a //c, consider your options carefully. For \$100, you can buy the Apple //c Mouse. It includes a graphics program called MousePaint, a manual covering both the mouse and the software, and instructions for using the mouse in your own BASIC programs. For \$150, you get the A + Mouse, MousePad, a promotional brochure, and a brief fact sheet. You can also buy the A + with Bank Street Writer (a word processor from Broderbund Software) and Dollars and Sense (Monogram's money-management program) for \$239—not a bad deal.

Apple //e owners also have an easy choice. For \$150, there's the Apple //e Mouse; it's identical to the //c package, except that it includes a MouseCard, a circuit board that must be inserted into one of the //e's interface slots. No mouse works on a //e without it. The A + Mouse package costs the same, but doesn't include the MouseCard, so you'll have to shell out at least another \$50 for the interface, assuming you can buy one separately. Many dealers are reluctant to break up a //e Mouse package; check to see if yours would be willing to order a MouseCard from



Apple's service department.

Overall, the A+ Mouse earns high marks for performance, design, and ease of operation. Its optical technology brings out the best in graphics programs such as MacPaint, and the absence of moving parts should ensure years of trouble-free use. The price of the A+, however, is grossly inflated. Apple owners should seriously consider the Apple //c Mouse for \$50 less, or the //e version (with MouseCard) for the same price. And with MousePaint software to boot, the country cousin may just be the winner here. ■

**Wayne J. Sassano**  
Wethersfield, CT

## MultiView 80/160

### Checkmate Technology

509 South Rockford Drive  
Tempe, AZ 85281

80/160 column card

Apple II, II Plus, //e

Requires a monochrome monitor

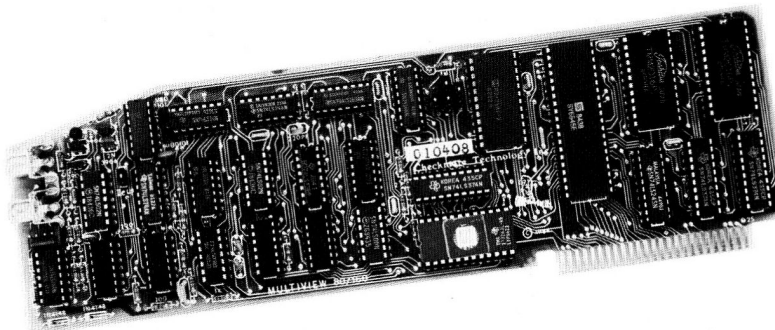
\$349.95

★★★

An investment in a high-quality, versatile video interface is no luxury for those of us who are writers, programmers, and business analysts spending extended periods of time at the computer. If you're a heavy computer user, you'd do well to purchase a MultiView 80/160. You'll exhaust neither its many features nor your eyes.

MultiView is an intelligent video-display card with a selection of seven screen sizes and a dozen combinations of background and text attributes, including inverse, bold, and underlined. For extended periods of computer use, you can modify your screen display to lessen eyestrain or other visual discomfort. Experimenting, I found that inverse backgrounds were hard on the eyes, but a normal background with an underline cursor and a bold intensity was delightful.

You can easily install MultiView in slot 3, even in the Apple //e whose auxiliary connector slot is reserved for ordinary 80-column display cards. If you have an extended memory (64K) 80-column card in the auxiliary connector, you can still use MultiView because its design lets it access that extra



*MultiView gives your Apple up to 160 columns.*

memory for spreadsheets, written documents, and BASIC programs.

MultiView requires a monochrome monitor with a video bandwidth of 12 MHz or better, a prerequisite most monitors meet. The Monitor Adjustment Aid program on the demonstration disk prompts you to scale the display (using vertical and horizontal controls) and to optimize clarity (using the brightness, contrast, and focus controls). If you can't initially capture the total width of the 96-by-24 or the 160-by-24 displays, external horizontal adjustment knobs will immediately correct fall-out (loss of characters at the left and right margins). The Apple Monitor II doesn't have these knobs, but a dealer can make the necessary internal adjustments.

Monitor II owners must confront another problem that's treatable but not curable. The Monitor II CRT is coated with a low-persistence green phosphor that causes a flickering display when you use the 80-by-32, 80-by-48, or 132-by-30 mode. Lowering the brightness and decreasing the contrast reduce this annoyance but don't eliminate it.

The manufacturer claims that a 132-column display is as clear to read as an 80-column display. Not only is this assertion true (the 8-by-9 matrix characters are near letter-quality), but a unique Eye Saver feature expands the space between characters, making the display extraordinarily clear.

Demonstration programs included with MultiView contain remark statements in the Applesoft BASIC and assembly-language source listings that help you exploit programming techniques MultiView uses. A special feature, reverse scrolling of up to 4096 characters, lets programmers retrieve

code that has scrolled off the screen without having to relist the program. Software developers will appreciate the availability of up to five prompt lines, freeing the rest of the screen for user workspace.

### Preboot Programs

If you're not a programmer, Checkmate Technology's packaged software will help you use MultiView with your spreadsheet, word-processing, and data-base programs. Because such programs don't expect to find a MultiView card in slot 3, you have to use a preboot program (ranging in price from \$25 to \$50) to turn on the card first.

Checkmate has released a Universal Spreadsheet Preboot, which was included in my review package. With MultiView installed, all you have to do is insert the preboot disk into the drive, turn on the computer, and follow the clear and uncomplicated instructions on the screen. You're prompted for the spreadsheet you'll be using (VisiCalc, Multiplan, MagiCalc, AceCalc, THE Spreadsheet, or IACalc), the display size you want from a large selection, and the attributes you'd like.

After the preboot disk is configured (automatically) the way you want, the screen prompts you to insert your spreadsheet program disk and press the return key. MultiView doesn't support VisiCalc Advanced yet, but technical support people at Checkmate assured me that a preboot for VisiCalc Advanced is slated for release in the spring.

Preboots are available for all ProDOS and DOS versions of Apple Writer II. MultiView supports other word-processing software (Magic Window and Format II, for example), but only in

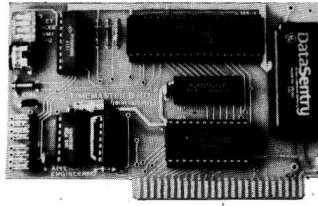


# APPLIED ENGINEERING

## To a World of Compromise, We Make No Contribution

### THE NEW TIMEMASTER II H.O.

- Absolutely, positively, totally PRO-DOS and DOS 3.3 compatible.
- Time in hours, minutes, seconds and milliseconds (the ONLY PRO-DOS compatible card with millisecond compatibility).
- 24 hour military format or 12 hour with AM/PM format.
- Date with year, month, day of week and leap year.
- Eight software controlled interrupts so you can run two programs at the same time (many examples are included).
- The only card recognized by both the



- DOS 3.3 and PRO-DOS versions of Apple Writer IIe.
- Appleworks will now time and date stamp all your data automatically.
- Compatible with ALL of Apple's languages. Many sample programs for machine code, Applesoft, CP/M and Pascal on 2 disks.
- On-board timer lets you time any interval up to 48 days long down to the nearest millisecond.
- Rechargeable nickel-cadmium battery will last over 20 years.
- Two BSR/serial ports for future expansion.

H.O.	PRO-DOS COMPATIBLE	INCLUDES DOS DATER	MILLISECOND TIME	YEAR DATA	LARGEST SAMPLE SOFTWARE	REMOTE SET PORT	BSR PORT	EMULATES ALL OTHER CLOCKS
BRAND A	YES	YES	YES	YES	YES	YES	YES	YES
BRAND C	NO	NO	NO	NO	NO	NO	NO	NO
BRAND M	NO	NO	NO	NO	NO	NO	NO	NO
BRAND P	YES	YES	YES	YES	YES	YES	YES	YES
BRAND S	NO	NO	NO	NO	NO	NO	NO	NO
BRAND T	YES	NO	NO	NO	NO	NO	YES	NO

Full emulation of all other clocks. Yes, we emulate Brand A, Brand T, Brand P, Brand C, Brand S and Brand M too. It's easy for the H.O. to emulate other clocks, we just drop off features. That's why the H.O. can emulate others, but none of the others emulate us. The Timemaster II H.O. will automatically emulate the correct clock card for the software you're using. You can also give the H.O. a simple command to tell it which clock to emulate. This is great for writing programs for those poor unfortunates who bought some other clock card.

#### REMOTE CONTROL

Our BSR X-10 interface option for the H.O. allows you to remotely control up to 16 lights and electrical appliances through your BSR X-10 home control system in your home or office. You're already wired because a BSR system sends its signals over regular 120 volt wiring. That means you can control any electrical device in your home or office without additional wiring.

**PRICE \$129.00 BSR Option (may be added later) \$49.00**

### VIEWMASTER 80

There used to be about a dozen 80 column cards for the Apple. Now there is only ONE.

- TOTALLY Videx Compatible.
- 80 characters by 24 lines, with a sharp 7x9 dot matrix.
- On-board 40/80 soft video switch with manual 40 column override.
- Fully compatible with ALL Apple languages and software—there are NO exceptions.
- Low power consumption through the use of CMOS devices.
- All connections are made with standard video connectors.
- Both upper and lower characters are standard.
- All new design (using a new Microprocessor based C.R.T. controller) for a beautiful razor sharp display.
- The VIEWMASTER incorporates all the features of all other 80 column cards, plus many new improvements.

PRICE	BUILT-IN SOFTWARE	SHIFT KEY SUPPORT	LOW POWER DESIGN	80 COLUMN HOME	7X9 DOT MATRIX	LIGHT PEN INPUTS	40 COLUMN OVERRIDE	INVERSE CHARACTERS
VIEWMASTER	139	YES	YES	YES	YES	YES	YES	YES
SUPERTERMINA	MORE	NO	YES	NO	NO	NO	YES	YES
WIZARD 80	MORE	NO	NO	NO	NO	YES	NO	YES
VISION 80	MORE	YES	YES	NO	NO	YES	NO	NO
OMNIVISION	MORE	NO	YES	NO	NO	NO	NO	YES
VIEWMAX 80	MORE	YES	YES	NO	NO	YES	NO	YES
SMARTTERM	MORE	YES	YES	NO	NO	NO	YES	YES
VIDEA	MORE	NO	YES	YES	NO	YES	NO	YES

The VIEWMASTER 80 works with all 80 column applications including CP/M, Pascal, WordStar, Format II, Easywriter, Apple Writer II, VisiCalc, and all others. The VIEWMASTER 80 is the MOST compatible 80 column card you can buy at ANY price!

**PRICE \$139.00**

### Z-80 PLUS

Now Includes New 4.0™ Software

Enter the CP/M world with the new Z-80 Plus card from Applied Engineering and introduce your Apple to thousands of new programs. Only the Z-80 Plus comes standard with the new 4.0 software, the most advanced system for running CP/M programs ever. Only CP/AM 4.0™ has advanced features like built-in disk emulation for popular memory expansion boards (those made by Apple and Applied Engineering and others) to give you a faster system with more storage. You also get menu driven utilities that are much easier to use than the older CP/M utilities so you can get down to all that great CP/M software faster. If you already own the Z-80 Plus, you can upgrade to the 4.0 software for only \$29. The Z-80 Plus runs older CP/M programs too, down to Version 1.6 (2.2 is the most popular). With the Z-80 Plus you can run the largest body of software in existence. Simply plug the Z-80 Plus into any slot in your Apple. You'll have two computers in one and the advantages of both, all at an unbelievably low price.

- TOTALLY compatible with ALL CP/M software.
- The only Z-80 card with a special 2K "CP/M detector" chip.
- Fully compatible with microsoft disks (no pre-boot required).
- Specifically designed for high speed operation in the Apple IIe (runs just as fast in the II+ and Franklin).
- Runs WORD STAR, dBASE II, TURBO PASCAL, FORTRAN-80, PEACHTREE and ALL other CP/M software with no pre-boot.
- A semi-custom I.C. and low parts count allows the Z-80 Plus to fly thru CP/M programs at a very low power level. (We use the Z-80A at a fast 4MHZ.)
- Does EVERYTHING the other Z-80 boards do, plus Z-80 interrupts.

**PRICE \$139.00**

### SUPER MUSIC SYNTHESIZER — END MOCKINGBOREDOM

- Complete 16 voice stereo music synthesizer on one card. Just plug it into your Apple, connect the audio cable (supplied) to your stereo, boot the disk supplied and you are ready to input and play songs.
- It's easy to program music with our compose software. You will start right away by inputting your favorite songs. The Hi-Res screen shows what you have entered in standard sheet music format.
- Now with new improved software for the easiest and the fastest music input system available anywhere.
- We gives you lots of software. In addition to Compose and Play

- programs, 2 disks are filled with over 30 songs ready to play.
- Easy to program in Basic to generate complex sound effects.
- Now your games can have explosions, phaser zaps, train whistles, death cries. You name it, this card can do it.
- Four white noise generators which are great for sound effects.
- Full control of attack, volume, decay, sustain and release.
- Our card will play notes from 30HZ to beyond human hearing.
- Automatic shutoff on power-up or if reset is pushed.
- Many many more features.
- Works in any slot of a IIe or II+ including slot 3 of a IIe.

**PRICE \$159.00**

Our boards are far superior to most of the consumer electronics made today. All I.C.'s are in high quality sockets with mil-spec. components used throughout. P.C. boards are glass-epoxy with gold contacts. Made in America to be the best in the world. All products work in Apple IIe, II, II+ and Franklin. Applied Engineering also manufactures a full line of data acquisition and control products for the Apple; A/D converters and digital I/O cards, etc. Please call for more information. All our products are fully tested with complete documentation and available for immediate delivery. All products are guaranteed with a no hassle **THREE YEAR WARRANTY.**



Call (214) 492-2027, 9 a.m. to 11 p.m. 7 days a week or send check or money order to P.O. Box 798, Carrollton, Texas 75006. MasterCard, Visa and C.O.D. welcome. No extra charge for credit cards. Texas residents add 5% sales tax. Add \$10.00 if outside U.S.A.



# HARDWARE REVIEWS

standard 80-column-by-24-line mode. Future preboot releases will include programs for PieWriter and Screen-Writer.

Filing and data-base systems currently supported include dBase II and Checkmate's InfoBank II. An AppleWorks preboot is available for integrated-software users and allows Apple II Pluses to run AppleWorks. Checkmate anticipates an updated version of ArtSci's Magic Office System will take full advantage of MultiView without the need for a preboot.

In addition to the customary 96 ASCII characters, MultiView offers 32 alternate characters: a checkmark, an apple, a degree sign, and a copyright symbol to name a few. Other enhancements include a light-pen port (under \$100) and a SuperWorks PROM (\$40), which offers a BASIC line editor, a user-programmable function key option, and a screen-dump command.

The documentation accompanying the MultiView card and preboot programs is well-organized and well-written. The paper quality of the user's man-

ual, however, is flimsy, and the pages are poorly bound and probably won't stand up to normal wear and tear.

MultiView 80/160 is warranted for five years, and diagnostic programs on the demo disk can help you determine if your card is malfunctioning. As a registered MultiView owner, you're sent a periodic newsletter and you can expect to receive strong technical support. ■

**Cynthia Field  
Wakefield, RI**

## Riteman F +

### Inforunner

431 North Oak Street  
Inglewood, CA 90302

Dot-matrix printer  
Parallel interface standard  
Serial interface available  
\$399

★★

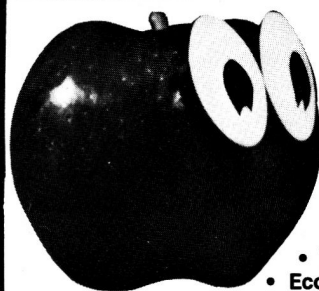
Perhaps the best feature of the Riteman F + dot-matrix printer

is its transportability—it's small enough to actually fit into an attache case. If that's important to you, and you also want a full complement of software-selectable features, consider the Riteman F +.

Despite its compact size, the F + is a full-feature printer with pica, elite, compressed, and proportional type fonts. The proportional font prints pica-sized characters in emphasized mode and avoids the smeared or "mushy" appearance some other printers produce. In addition to bold-face (double strike), double width, sub-superscripts, and underlining, the F + offers italics and several international character sets. (Subscript and superscript don't function in proportional font.) The F + prints graphics in single, double, or quadruple density.

The 96 standard ASCII characters are formed in a 9-by-9 matrix with full descenders in lowercase. This print quality, especially in proportional mode, is acceptable for most home or school applications, and puts the Riteman on a par with other dot-matrix

Circle 204 on Reader Service Card.



## LET YOUR APPLE SEE THE WORLD!

The DS-65 Digisector® opens up a whole new world for your Apple II. Your computer can now be a part of the action, taking pictures to amuse your friends, watching your house while you're away, taking computer portraits . . . the applications abound! The DS-65 is a random access video digitizer. It converts a TV camera's output into digital information your computer can process. The DS-65 features:

- **High Resolution** — a 256 × 256 picture element scan
- **Precision** — 64 levels of grey scale
- **Versatility** — Accepts either NTSC or industrial video input
- **Economy** — A professional tool priced for the hobbyist

The DS-65 is an intelligent peripheral card with on-board software in 2708 EPROM. Check these software features:

- Full screen scans directly to Apple Hi-Res screen
- Easy random access digitizing by Basic programs
- Line-scan digitizing for reading charts or tracking objects
- Utility functions for clearing and copying the Hi-Res screen

Use the DS-65 for precision security systems; computer portraiture; robotics; fast to slow scan conversion; moving target indicators; reading UPC codes, musical scores and paper tape and more! **GIVE YOUR APPLE THE GIFT OF SIGHT!** DS-65 Price: \$349.95  
RCA 1500 Series Camera w/6:1 zoom lens Price: \$399.90/Combination Price: \$729.95

### ADDITIONAL SOFTWARE FOR THE DS-65

— **Picture Scanner:** An applications tool for processing video images for display on the Hi-Res screen. A variety of dithering algorithms are provided, for compressing the digitized image into the Hi-Res screen and simulating grey scales. Price: \$39.95

— **Superscan:** Enables you to enhance the DS-65's Hi-Res pictures with colors! Choose from 21 different colors and assign them to grey scale values, modify pictures, zoom, enhance contrast, etc. Includes print routines for Anadex 9500 or 9501; Epson MX-80GFT and MX-100; and IDS 460 Paper Tiger\*. Written for The Micro Works by Magna Soft. Price: \$99.95

\*Paper Tiger is a trademark of Integral Data Systems, Inc.

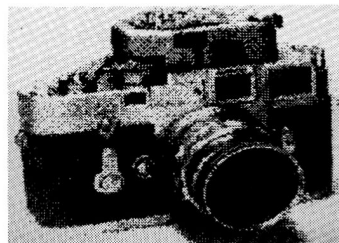
THE **MICRO  
WORKS**

Now for IBM PC!

California Residents add 6% Tax

Mastercard/Visa Accepted

P.O. BOX 1110 DEL MAR, CA 92014 619-942-2400



HI-RES PICTURE USING THE DS-65  
AND PICTURE SCANNER SOFTWARE



**30%**  
SAVINGS  
off cover price

**A one year subscription (12 monthly issues) at the low, rate of \$24.97! Save over \$10.00 off the newsstand rate.**

Apple is a registered trademark of Apple Computer, Inc.

**30%**  
SAVINGS

**YES! I want a one year subscription (12 issues) for only \$24.97.**

# inCider

☐ Send me 12 issues of **inCider** for \$24.97. I save 30% off the cover price.

☐ 24 issues for \$38.00. Save 46% off the cover price.

☐ Payment enclosed ☐ Bill me  
Please make checks payable to **inCider**

Name \_\_\_\_\_

Address \_\_\_\_\_

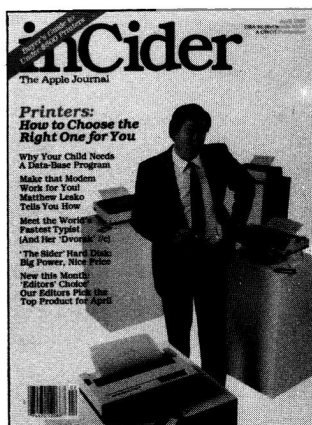
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Canada & Mexico \$27.97, 1 year only, US funds drawn on US banks.  
Foreign Surface \$44.97, 1 year only, US funds drawn on US banks.  
Foreign Airmail, please inquire. Please allow 6-8 weeks for delivery.

357B5F

**inCider—The Apple Journal—**  
the best in software and hardware reviews, entertainment, education and answers to your most pressing questions.

**30%**  
SAVINGS



## UNCONDITIONAL GUARANTEE

If **inCider** doesn't prove to be everything we say it is, just tell us. We'll refund your money for all undelivered issues — no questions.

**Add to your computing skills with monthly features like:**

- Off-the-shelf solutions to your computing needs.
- Reader interaction for more user-friendly information.
- An ongoing course on Applesoft Basic language.
- Special articles to increase your personal productivity.
- Ready to run program listings.

**30%**  
SAVINGS

**YES! I want a one year subscription (12 issues) for only \$24.97.**

# inCider

☐ Send me 12 issues of **inCider** for \$24.97. I save 30% off the cover price.

☐ 24 issues for \$38.00. Save 46% off the cover price.

☐ Payment enclosed ☐ Bill me  
Please make checks payable to **inCider**

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Canada & Mexico \$27.97, 1 year only, US funds drawn on US banks.  
Foreign Surface \$44.97, 1 year only, US funds drawn on US banks.  
Foreign Airmail, please inquire. Please allow 6-8 weeks for delivery.

357B5F

# inCider

☐ Send me 12 issues of **inCider** for \$24.97. I save 30% off the cover price.

☐ 24 issues for \$38.00. Save 46% off the cover price.

☐ Payment enclosed ☐ Bill me  
Please make checks payable to **inCider**

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Canada & Mexico \$27.97, 1 year only, US funds drawn on US banks.  
Foreign Surface \$44.97, 1 year only, US funds drawn on US banks.  
Foreign Airmail, please inquire. Please allow 6-8 weeks for delivery.

357B5F





## BUSINESS REPLY MAIL

First Class Permit No. 73 Peterborough, NH 03458

POSTAGE WILL BE PAID BY ADDRESSEE

CW Communications/Peterborough  
inCider  
PO Box 911  
Farmingdale, NY 11737

NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES



**30%**  
**SAVINGS**  
off cover price

**A one year subscrip-  
tion (12 monthly is-  
sues) at the low, rate  
of \$24.97! Save over  
\$10.00 off the news-  
stand rate.**



## BUSINESS REPLY MAIL

First Class Permit No. 73 Peterborough, NH 03458

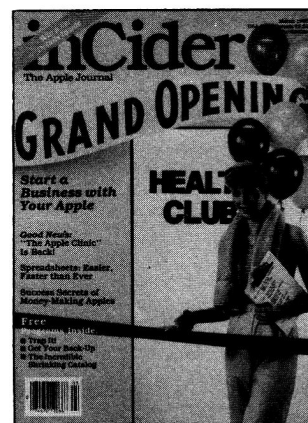
POSTAGE WILL BE PAID BY ADDRESSEE

CW Communications/Peterborough  
inCider  
PO Box 911  
Farmingdale, NY 11737

NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES



**inCider—The Apple Journal—**  
the best in software and hardware  
reviews, entertainment, education  
and answers to your most pressing  
questions.



## BUSINESS REPLY MAIL

First Class Permit No. 73 Peterborough, NH 03458

POSTAGE WILL BE PAID BY ADDRESSEE

CW Communications/Peterborough  
inCider  
PO Box 911  
Farmingdale, NY 11737

NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES



### UNCONDITIONAL GUARANTEE

If inCider doesn't prove to be  
everything we say it is, just tell us.  
We'll refund your money for all unde-  
livered issues — no questions.

### Add to your computing skills with monthly features like:

- Off-the-shelf solutions to your computing needs.
- Reader interaction for more user-friendly information.
- An ongoing course on Applesoft Basic language.
- Special articles to increase your personal productivity.
- Ready to run program listings.





# EASTCOAST SOFTWARE

ECS...inflation-fighting prices.

No hidden charges! No credit card fees!

# APPLE

CAT #	LIST	OUR PRICE
1298	ADVENTURE WRITER	39.95 30.75
2104	AGENT USA	39.95 27.05
0560	ALGEBRA 1	39.95 24.80
1142	ALLEN ADDITION	34.00 23.05
0013	ALPHA PLOT	39.50 26.35
2598	ALPHABET ZOO	29.95 20.30
0151	APPLE MECHANIC	29.50 19.70
0025	APPLE SOFTWARE 1985	19.95 15.45
0536	ASSEMBLY LINES (BOOK)	19.95 15.35
1448	BACK TO BASICS ACCT 2E/2C	195.00 121.00
1204	BANK ST. WRITER 2C/E-128K	69.95 47.35
1685	BANK STREET FILER	69.95 47.35
1405	BANK STREET STORYBOOK	39.95 25.55
0211	BARRON'S COMPUTER SAT	89.95 60.90
0278	BEAGLE BAG	29.50 19.70
0126	BEAGLE BASIC	34.95 23.30
1192	BEAGLE GRAPHICS	59.95 40.00
0658	BENEATH APPLE DOS	19.95 14.95
1385	BENEATH APPLE PRODOS	19.95 14.95
0111	BOOK OF APPLE SOFTWARE '85	24.95 16.00
1375	BPI GENERAL ACCOUNTING /E	395.00 263.35
2194	BUILD A BOOK	39.95 27.05
0448	BUMBLE GAMES	39.95 27.05
2880	C.H. PRODUCT MACH 3 (2E/C)	54.95 36.55
2816	C.H. PRODUCTS MACH 2	44.95 30.55
2817	C.H. PRODUCTS MACH 2E/2C	44.95 30.55
2883	C.H. PRODUCTS MACH 3	54.95 36.55
1417	CHARLIE BROWN'S ABC'S	39.95 27.05
1432	CODEWRITER	140.00 80.75
0416	COMPUSEVER STARTER KIT	39.95 24.35
1138	COMPUTER SAT (HARCOURT)	79.95 54.15
1731	COPY 2 PLUS 5.0	39.95 24.40
1468	CRICKET 2C	179.95 133.35
2097	CROSSWORD MAGIC	49.95 33.30
1900	D-CODE	39.95 26.65
1645	DAZZLE DRAW-2C/2E (128K)	59.95 40.60
1265	DB MASTER PLUS	295.00 208.05
0052	DEADLINE	49.95 33.80
0630	DELTA DRAWING	49.95 33.80
1143	DEMOLITION DIVISION	34.00 23.05
1539	DISK 3-RING VINYL PAGES-10	6.75 4.10
1166	DISK BANK (50)	19.95 11.00
1722	DISK BOXES (5 COLOR CODED)	25.00 12.50
2866	DISK DRIVE EXTENSION CABLE	19.75 16.70
2833	DISK QUIK	29.50 19.70
1205	DOLLARS & SENSE-2C	119.95 81.20
0409	DOLLARS & SENSE	100.00 67.65
0216	DOS BOSS	24.00 16.00
0983	DOUBLE TAKE	34.95 23.30
2205	DUST COVER - IMAGEWRITER	10.00 7.15
2285	DUST COVER EPSON RX 80	7.99 5.75
2028	DUST COVER MICROLINE 92	8.95 6.40
1760	DUSTCOVER-APP/KYBOARD-2 +/E	7.99 5.75
0360	EARLY GAMES YOUNG CHILDREN	34.95 23.65
1377	ECHO 2 + SPEECH SYNTH.	149.95 115.35
0092	ELEPHANT DISKS SS/DD (10)	37.00 14.75
1337	ELEPHANT DISKS SS/DD (10)	34.00 14.75
0107	EPSON MX-80 RIBBON	10.00 6.30
0029	ESSENTIAL DATA DUPLICATOR	79.95 49.95
0732	F15 STRIKE EAGLE	34.95 22.45
0280	FACEMAKER	29.95 20.30
1113	FAHRENHEIT 451	39.95 27.15
2986	FANTASY	39.95 28.20
1126	FIGURES AND FORMULAS	29.95 20.75
1520	FINGERPRINT INTERFACE	149.00 120.00
0850	FLASHCALC (PRO DOS)	99.00 67.05
0553	FLEX TYPE (FLEX TEXT)	29.50 19.70
2821	FLIGHT SIMULATOR II	49.95 36.65
1440	FLIP-N-FILE (50 DISKS)	19.95 11.30
2796	FLONTRIX	75.00 48.75
0009	FORECAST	59.95 40.60

CAT #	LIST	OUR PRICE
0554	FRAME-UP	29.50 19.70
1127	GAME SHOW	39.95 27.05
0733	GEMSTONE WARRIOR	34.95 25.55
0046	GENERAL MANAGER II	229.95 153.30
0573	GERTRUDE'S PUZZLES	44.95 30.45
2213	GHOST BUSTERS	39.95 27.05
2843	GLOBAL PLE/BEAGLE BROS.	49.95 33.30
1530	GRAMMAR EXAMINER	44.95 30.45
1100	GRANDMA'S HOUSE	29.55 20.30
0043	GRAPHICS MAGICIAN	59.95 40.00
0094	GRAPPLER +	145.00 87.30
0028	GUIDE TO THE APPLE /C	12.95 10.00
1346	HITCHHIKERS GUIDE GALAXY	39.95 26.90
1364	HOME ACCOUNTANT 2C/E-128K	74.95 48.05
0197	HOME ACCOUNTANT	74.95 48.05
2804	HOMEWORD	69.95 46.60
1901	I.O. SILVER	29.95 19.95
1589	IN SEARCH OF AMAZING THING	39.95 27.05
0442	JENNY OF THE PRAIRIE	39.95 27.15
0449	JUGGLES RAINBOW	29.95 20.30
2671	KAAMELEON 2C INTERFACE	99.95 65.75
1917	KARATEKA	34.95 23.65
1442	KINDERCOMP	29.95 20.30
1144	KING'S QUEST	49.95 33.30
0003	KNIGHT OF DIAMONDS	34.95 23.30
1693	KOALA GRAPH TABLET-2E/2C	124.95 83.50
0954	KRELL LOGO	89.95 76.95
2972	LABELS 1-IN WHITE (1000)	9.95 6.75
2890	LEARNING BRIDGE MADE EASY	79.95 54.15
1463	LEGACY OF LLYLGAMYN	39.95 26.65
0403	LISA 2.6	79.95 61.55
0806	LOCKSMITH 5.0	99.95 70.55
1708	LODE RUNNER CHAMPION-HINTS	9.95 6.80
0982	LODE RUNNER	34.95 23.65
0194	MAGIC WINDOW 2	149.95 103.85
0192	MASTER TYPE	39.95 27.05
0089	MAXELL SS/DD DISKS (10)	38.70 18.60
2357	MEGAWORKS (2E/2C)	125.00 84.65
2147	MICRO COOK-APPETIZERS-2E	12.00 8.00
2146	MICRO COOK-SOUPS/SALADS-2E	12.00 8.00
0227	MICRO COOKBOOK /C	40.00 26.70
2148	MICRO COOKBOOK /E	40.00 26.70
1294	MICRO-SCI 2C DISK DRIVE	299.00 248.75
1316	MICRO-SCI A2 DISK DRIVE	345.00 216.65
1509	MICROLINE RIBBON	3.20 2.20
2802	MICROMODEM 2E W/SMARTCOM I	199.00 153.85
1347	MILLIONAIRE	49.95 33.85
1135	MINUS MISSION	34.00 23.05
0774	MOCKINGBOARD C W/SPEECH	179.00 137.70
1400	MOPTOWN HOTEL	39.95 27.05
1709	MR. PRINTER STAND	29.95 20.30
0580	MULTIPLAN (APPLE DOS)	95.00 64.35
0191	NEWSROOM	49.95 33.85
2987	OPERATION MARKET GARDEN	49.95 35.25
0563	PODDLE-ADAPPLE COMBO	49.95 26.90
0568	PAPER GRAPHICS	49.95 33.95
2833	PARAL PRINTER EXT CABLE 6'	34.95 21.80
0695	PARALLEL INTERFACE W/CABLE	69.95 52.45
1418	PEANUTS PICTURE PUZZLES	39.95 27.05
0088	PFS ACCESS-2E/2C	70.00 47.40
1413	PFS FILE /E	125.00 84.60
1415	PFS GRAPH /E	125.00 84.60
1414	PFS REPORT /E	125.00 84.60
2809	PFS WRITE /E	125.00 84.60
0495	PIE WRITER 2.2 (40/80)	149.95 101.50
0584	PRESCHOOL IQ BUILDER 1	24.95 16.90
1196	PRINT SHOP	49.95 33.85
1793	PRINTSHOP GRAPHICS 1	24.95 16.90
0256	PRINTSHOP PAPER PACK	19.95 13.50
0349	PRO BLACKJACK - K. USTON	69.95 47.35
0461	PRONTO DOS	29.50 19.70
1279	PROWRITER NYLON RIBBON	10.00 6.65
0047	QUEST	34.95 23.75
2111	RAMCARD 16K-MPC	99.00 60.25
1386	RAMCARD 16K-WIZARD	95.00 62.85
2309	RAMWORKS/64K	179.00 149.15
0771	RF MODULATOR-INTERNAL	39.00 17.40
1450	RHYMES & RIDDLES	29.95 20.30
0574	ROCKY'S BOOTS	49.95 33.85
0133	SCREENWRITER II	129.95 86.65
0041	SENSIBLE SPELLER IV	125.00 83.35
1206	SENSIBLE SPELLER-PRO DOS	125.00 83.35
0447	SIDEWAYS	60.00 40.00
0400	SILICON SALAD	24.95 16.65
1340	SKY FOX	40.00 28.50
1373	SMARTMODEM 2C W/SMARTCOM I	239.00 180.80
0465	SNOOPER TROOPS 1	44.95 30.45
1338	SNOOPY'S READING MACHINE	39.95 27.05
0250	SPELLGRAPH	39.95 27.05
1291	SPELLICOPTER	39.95 27.05
0435	STEP-BY-STEP	99.95 67.65
0100	STICKY BEAR A B C	39.95 27.05
0099	STICKY BEAR NUMBERS	39.95 27.05
0292	STORY MACHINE	29.95 20.30
1326	SUNDOS	40.00 30.75
1445	SUPERTEXT PRO (40/80)	79.95 54.35
0524	SWITCH-A-SLOT	179.50 161.10
0001	SYSTEM SAVER	89.95 69.20
0236	TERRAPIN LOGO	99.95 67.65
1330	TG JOYSTICK W/Toggle /E	29.95 20.30
0136	TG JOYSTICK W/Toggle /E	29.95 20.30
1598	THE FACTORY (HOME)	44.95 31.70

CAT #	LIST	OUR PRICE
1602	THE POND (HOME)	44.95 31.70
0844	THINK TANK /E	150.00 101.55
2897	THUNDERCLOCK PLUS	150.00 121.80
1869	TIME IS MONEY	100.00 68.75
2899	TIME MASTER 2 H.O.	129.00 107.50
0462	TIP DISK #1	20.00 13.35
1193	TRIPLE DUMP	39.95 26.65
1823	TURBO PASCAL (CP/M)	69.95 47.35
0544	TYPEFACES	20.00 13.35
1237	Typing Tutor 3	49.95 33.85
2836	ULTIMA II (EXODUS)	59.95 40.00
2112	UNIVERSAL PRINTER STAND	29.95 19.95
2858	VERB VIPER	34.00 23.05
2900	VIEWMASTER 80	139.00 115.85
1864	VISICALC 2 + /2E	179.00 121.20
1296	WITNESS	39.95 26.65
1139	WIZARD OF WORDS	39.95 27.05
0144	WIZARDRY	49.95 33.30
2888	WORD ATTACK!	49.95 33.85
1402	WORD CHALLENGE	39.95 27.05
0249	Z-80 PLUS BOARD	139.00 112.95
0305	ZOOM/MODEM /E	179.00 134.65
0296	ZORK I	39.95 26.90

## SPECIALS

2909	BACK TO BASICS ACCT SYSTEM	375.00 232.70
0656	CHART (MAC)	125.00 84.65
2220	CHART WITS	50.00 35.85
1223	COPY 2 MAC VOL. 2	39.95 24.40
1514	DB MASTER	195.00 132.00
1151	DOLLARS & SENSE	149.95 100.00
2203	DUST COVER-MAC & KEYBOARD	20.00 14.30
3160	ELECTRIC CHECKBOOK	79.95 54.15
1219	EMBLEM	300.00 203.05
1362	FINANCIAL COOKBOOK	50.00 35.65
1324	FIRST BASE	195.00 132.00
3500	FLIP-N-FILE (60)	34.95 16.45
1926	FRONT DESK	149.95 101.50
1690	HAYDEN'SPELLER	79.95 54.15
1083	HOME ACCOUNTANT	150.00 101.54
0650	MASTER TYPE	49.95 33.95
1411	MAXELL 3.5-IN DISKS (10)	55.00 33.35
2787	MEMOREX 3.5-IN DISKS (10)	60.00 33.35
1073	MICROSOFT WORD (MAC)	195.00 132.00
0655	MULTIPLAN (MAC)	195.00 132.00
1946	MUSIC WORKS	79.95 54.10
0668	THINK TANK (512K)	245.00 163.35
2196	THUNDERSCAN	229.00 205.10
1239	Typing Tutor 3	49.95 33.30
0646	VERBATIM 3.5" DISKS	78.50 32.70

## MACINTOSH

2904	ARCHON	40.00 28.50
2819	CHART 'N' GRAPH TOOLBOX	39.95 25.85
0416	COMPUSEVER STARTER KIT	39.95 24.35
2910	CUT & PASTE (2E/2C)	50.00 35.65
2155	DATABASE TOOLBOX	39.95 25.65
1470	ELEPHANT DISKS SS/DD (10)	37.00 14.75
0092	ELEPHANT DISKS SS/DD (10)	37.00 14.75
0371	FINANCIAL COOKBOOK	50.00 35.65
2902	HARD HAT MACK	35.00 24.95
1654	MERLIN PRO	99.95 64.10
0597	MERLIN	64.95 41.65
1409	MERLIN/MUNCH/ASSEMBLY COMBO	109.95 70.50
0910	MUNCH A BUG	39.95 25.65
1341	MURDER ON THE ZINDERNEUF	40.00 28.50
2903	MUSIC CONSTRUCTION SET	40.00 28.50
2908	ONE ON ONE	40.00 28.50
2907	PINBALL CONSTRUCT SET	40.00 28.50
0599	PRINTOGRAPHER	39.95 25.65
1382	SEVEN CITIES OF GOLD	40.00 28.50
1340	SKY FOX	40.00 28.50
2906	STANDING STONES	40.00 28.50
0093	VERBATIM SS/DD SOFTPACK	34.50 16.40
0912	VIDEO TOOLBOX	39.95 25.65
1453	WIZARD'S TOOLBOX	39.95 25.65
1131	WRITE CHOICE	44.95 28.85

CHECK ONE: ☐ VISA ☐ MASTERCARD

Card # \_\_\_\_\_ Exp. \_\_\_\_\_

Telephone \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_

Please enter my order for: \_\_\_\_\_

Please specify machine: \_\_\_\_\_

☐ Please send free catalog.

## EASTCOAST SOFTWARE

49 Derrytown Mall  
Hershey, PA 17033

MAIL YOUR ORDER OR CALL

(717) 533-8125

800-233-3237

We Ship UPS—Shipping 1% (\$2.50 min.)

C.O.D. Add An Additional \$2.50

Hardware (Printers/Monitors)

Shipping is \$2.50 + 4% (U.P.S.)

For Air Mail, Canadian, APO/FPO Orders,

Shipping \$2.50 + 4% of Total Order (US Funds)

PA Residents Add 6% Tax

No Minimum Order

Visa-Mastercard-C.O.D.-Check

Prices Subject To Change

Sorry, No Foreign Orders

This Ad Prepared MAY 1985



printers in its price range. The manufacturer claims the speed is 105 characters per second in draft mode and 52 cps in expanded mode, but those figures don't include time lost in carriage returns.

The F+ printer can handle cut-sheet or continuous-form paper in a range of widths from 4 inches to letter size. An unusual front-loading mechanism makes the printer easy to use and doesn't waste the first sheet of paper. On the other hand, this design makes aligning the perforation to establish the top-of-form difficult.

The manufacturer calls the ribbon an "exclusive cassette design"—no other printer or typewriter uses one like it. Make sure your dealer is prepared to stock the cassettes for you, and check the cost.

Formatting options include top, bottom, left, and right margins and horizontal and vertical tabs. A unique software command generates a reverse line feed in increments of your choice, although the machine cannot produce reverse form feed. You can print out hexadecimal code instead of the standard ASCII characters by holding down the form-feed and line-feed buttons when you turn the printer on.

A clone of Epson's assortment of printer commands has been programmed into the Riteman's ROM chip, giving you nearly universal compatibility with software and printer interface cards. A Centronics-compatible parallel interface port is standard, and an RS-232C serial port and an 8K buffer are available as options.

Installing the printer consists mostly of taking it out of the box, removing the packing material, and plugging in the power cord and interface cable. You may have to remove one screw to uncover the DIP switches if you want to examine the factory settings, or if you are using an unusual interface card in your computer.

The F+ manual is barely adequate compared to those from other printer manufacturers. The documentation's dry tone reflects its electrical-engineering orientation, and it also appears to have been translated into English without benefit of a good dictionary. The sections on user-defined fonts, font downloading, and bit-image graphics are especially difficult to comprehend.

For those of you who need the convenience of a portable printer, however, the Riteman F+ may provide the versatility and efficiency you're looking for. ■

**James B. Munro**  
Youngstown, NY

## QC-10 Hard Disk

**Quark**  
2525 West Evans  
Suite 220  
Denver, CO 80219

Hard disk  
Apple //e and //c  
\$1995

★★

Quark's QC-10 hard disk adds 10 megabytes of on-line storage to your Apple //e, //c, ///, or Macintosh—but in trying to be a jack of all trades, it's quite possibly a master of none.

The Quark QC-10 comes with two disks, one for Macintosh and one for SOS/ProDOS applications. It also includes cables for the Macintosh, //e, and //c. I ordered an Apple /// cable with my hard disk, as well. Two switches on the back of the unit let you specify the computer you're using.

At \$1995, the QC-10 costs almost three times more than the Sider 10-megabyte unit, but the Sider only connects to the Apple //e and its clones. Even Apple's own 10-megabyte Profile is only //e-compatible. Quark's drive looks like the appropriate choice for the Apple user with a variety of equipment.

With the QC-10's software, you can divide the 10-megabyte area into smaller segments and use it as several disks, or as one contiguous volume. The review unit I received was already divided into separate sections for the Apple ///, II series, and Macintosh. Each portion was about 2 megabytes in size, leaving 4 megabytes for my own volumes.

You'll get the first hint that something's wrong when you try to exit the Filer routines. Apple-coded BASIC.SYSTEM is the default file you'd run on the standard utilities disk. But there is no BASIC.SYSTEM on the Quark disk; you have to run QC.QUARK. The

Quark designers, however, didn't bother to re-code the Filer to indicate that.

You rename QC.QUARK. to BASIC.SYSTEM on the original disk and the copy. Since you can exit the Filer correctly and all other functions appear to be working, you'll probably feel confident you can now reboot the system with your new copy. But you're wrong—you'll get the message "Interpreter Not Found." The disk looks for QC.QUARK. as the first file loaded after ProDOS and will accept no substitute. You must go back and copy BASIC.SYSTEM (formerly QC.QUARK.) to another file and call it QC.QUARK. (Rename your copy, too.) Finally, you feel everything should work correctly—but you're wrong again.

Apple's ProDOS utilities, like most ProDOS software, accept the volume name of the boot disk as the default path name for your disk activity; you can call the disk any name you want. But Quark hard-codes the volume name /QC.SOFTWARE into its utilities. If you name your disk anything else, you'll get a "Volume Not Found" error—before you can even do any real work on the hard disk.

Quark's product works well on the Macintosh, but with multi-machine capability built in, the designers need to take its development a few steps further: make the software more logical, and give the QC-10 a common, compatible area where Apple II's, ///s, and Macintoshes can swap files. As the QC-10 stands now, it's rather disappointing. I don't have time to wait—it's back to the Profile for me. ■

**Bill O'Brien**  
Fort Lee, NJ

*Editor's note: In February Quark released a new version of the ProDOS/SOS software disk. According to project manager Perry Moss, "when you exit the program, it now returns you to our utilities program. The problems Bill O'Brien encountered no longer exist." Each portion of the software—for the Apple ///, II series, and Mac—has been reduced to 1 megabyte, and Moss reminds users that unless they plan to operate all three computers they may erase the programs for the two unused machines.*



# NEW SOFTWARE

## Very Important Professional

The **VIP Professional** is a tough-but-tender integrated spreadsheet. It takes the memory of the //c or the enhanced //e—128K—and provides a mouse and pull-down menus to the Macless. The VIP also takes advantage of the double high resolution of the II series. The powerful spreadsheet combined with data base and business graphics compares favorably with Lotus 1-2-3. But the VIP is easier to use. The price is only \$199, from VIP Technologies, 132 Aero Camino, Goleta, CA 93117, (805) 968-4045. For more information circle number 486 on the Reader Service card.

## Science Fair

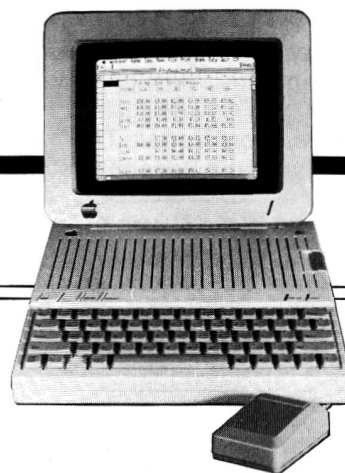
The **Temperature Lab** is the first in a series of science laboratory offerings from Hayden Software. The programs will enable students to conduct experiments illustrating scientific phenomena. Temperature Lab features a temperature sensor that

*Product descriptions contained in this section are based on information supplied to us by the respective manufacturers. These announcements are provided solely as a service to our readers and do not constitute endorsement by inCider of any given product.*

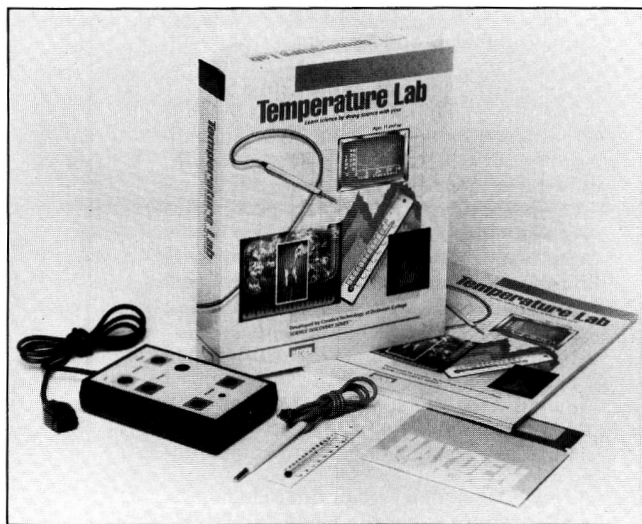
plugs into an Apple II through the game port. Recorded temperatures are also displayed immediately on the monitor. An alcohol bulb thermometer is included to check directly measured readings against the computer. The Temperature Lab and Experimenter's Guide retails for \$99.95, from Hayden Software, 600 Suffolk Street, Lowell, MA 01854, (617) 937-0200. For more information circle number 470 on the Reader Service card.

## Super Apple

**SuperCalc 3a** is the only spreadsheet with integrated graphics and data management for the Apple //c and enhanced Apple //e. Features like file conversion, send and receive utilities, ProDOS file support, full use of the 65C02 processor, and 50 more built-in functions mark the speed and sophistication of SuperCalc 3a. You can convert AppleWorks and VisiCalc files to SuperCalc formats, and even transfer files between Apples and IBM PCs. The Sideways utility is provided, which ends cutting and pasting by printing wide reports horizontally. All this for \$195 from Sorcim/IUS Micro Software, 2195 Fortune Drive, San Jose, CA 95131, (408) 942-1727. For more information circle number 471 on the Reader Service card.



*The Professional offers Mac graphics on a //c.*



*Temperature Lab measures and interprets.*



*Build a spreadsheet in ten minutes with SuperCalc.*

**edited by Paul Statt**

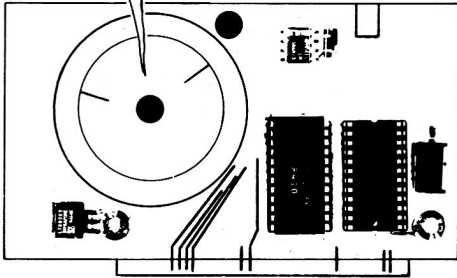


Votrax Announces

## VOTALKER IB & AP

New Industry Standards For Talking Personal Computers. Exclusively for IBM PC and XT, Apple II, and Compatibles. From Votrax, The Pioneer in Synthetic Speech Systems.

Give your IBM PC and XT and Apple II the Power of Speech



Until Votalker IB and AP, synthetic speech systems for personal computers were like a piano with 50 keys, an eagle with a broken wing, and a singer with a two-octave range. When Votrax developed the SCO2 speech synthesis chip, it was the classic case of advanced technology in need of support systems to unlock its dormant powers. Now, Votalker introduces a revolutionary family of text-to-speech translators — the key to the lock. First members of the family are the Votalker IB for IBM PC and XT and the Votalker AP for Apple II, Apple IIe, and Apple Plus. With Votalker these units play the piano with all 88 keys. Soar through unlimited vocabulary, using 32 inflections and 4,100 pitch settings. Sing in five octaves, and generate sound effects in 16 amplitudes.

### A Newly Designed Circuit Board includes:

- SCO2 chip • speaker • audio amplifier
  - volume control • external speaker jack.
- The board operates in the host computer slot, eliminating the need for serial ports and cable hookups. Internal editing and smoothing ensure clarity and integrity of speech.

**The Text-To-Speech Translator** sets Votalker above all other synthetic voice products. Text is generated through programs or keyboard and translated directly into spoken language. The sophisticated software on a diskette offers:

- unlimited vocabulary
- little use of system memory • exception table that stores and accurately pronounces difficult words.

**Other Votrax Products** — the stand-alone Personal Speech System and Type 'N Talk — are currently used in thousands of applications.

Votalker Prices Begin at \$179

Call Votrax at (800) 521-1350\*

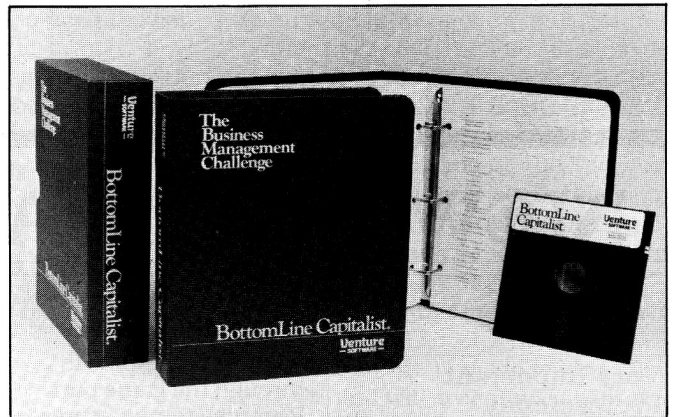


VOTRAX, INC.  
1394 Rankin  
Troy, Michigan 48063  
(313) 588-2050

\*In Michigan, Call Collect  
(313) 588-0341

Circle 7 on Reader Service Card.

## NEW SOFTWARE



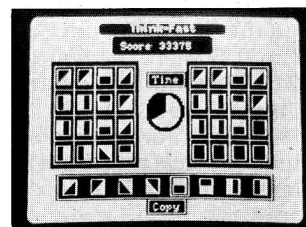
The Bottom Line—can you manage?

### Venture Adventure

Executives and entrepreneurs will relish the challenge of **Bottomline Capitalist**, where fun-loving financiers sharpen business-management skills. Participants—pretending to be entrepreneurs—compete with each other for a dwindling market share and elusive success. The champion capitalist will make a profit in 40 quarters of budgeting, raising capital, developing a staff, and expanding production. The Bottomline Capitalist is the greatest money-maker; \$129.95, from Venture Software, 16200 Ventura Boulevard, Encino, CA 91436, (818) 986-4110. For more information circle number 484 on the Reader Service card.

### Both Sides Now

**Think Fast** for the Apple II measures and improves short- and long-term memory in both hemispheres of the brain.



Pit your right brain against your left with Think Fast.

Challenging exercises work your left brain—verbal and numeric recall—and right—abstract graphics or visual information. You will better appreciate the workings of your brain's two halves and determine if your left or right brain dominates—and improve your memory, too. The Think Fast brain trainer sells for \$39.95 from Brainpower, 24009 Ventura Boulevard, Calabasas, CA 91302, (818) 884-6911. For more information circle number 485 on the Reader Service card.

### Taking Stock

When to sell? **Stocks and Profits** answers the market's crucial question with a disciplined selling strategy based on seven simple principles seldom applied by investors. You develop decisive selling as a reflex habit. Buying, selling, commissions, daily and weekly price action, graphics displays, and portfolio reports are used in the training simulation. Neophytes as well as savvy investors gain the profit edge with **Stocks and Profits**, \$49.50, from Micro Program Designs, 5440 Crestline Road, Wilmington, DE 19808, (302) 738-3798. For more information circle number 487 on the Reader Service card.





Keep youngsters safe, at home and away.

### Personal Safety

**Keeping Safe** teaches children as young as five how to handle potentially dangerous situations. A wide variety of encounters are projected—ranging from “Strangers in Cars” to dealing with “People You Know”—giving the youngsters a chance to experience potential problems in a non-threatening way. The computer adds reinforcing or correcting feedback and delightful graphics—a wise way to handle a delicate subject, for \$49.95, from Marshware, P.O. Box 8082, Shawnee Mission, KS 66208, (800) 821-3303. For more information circle number 487 on the Reader Service card.

### Supercharged Turbo

**Turbo Pascal 3.0** offers a twofold increase in compile and execution speeds over Version 2.0, while adding graphics, optional binary-coded decimal support, I/O redirection, and a memory-mapped editor to its list of new features. The Turbo Pascal language-development environment includes a high-speed single-pass native code compiler, full-screen editor, runtime error checking, commented source code, and a

MicroCalc spreadsheet. Turbo 3.0 requires 35K bytes of memory. Version 3.0 sells for \$69.95 (owners of Turbo 2.0 can trade in that version for a credit of \$39.95), from Borland International, 4113 Scotts Valley Drive, Scotts Valley, CA 95066, (408) 742-1133. For more information circle number 474 on the Reader Service card.

### When You Wish...

**Wishbringer** brings adventure into your life, even if you shy away from excitement, like the dreamy postal clerk whose imagination leads him into Infocom's latest fantasy. Written by Brian Moriarty for the introductory-level player, it is highly interactive—the story is open-ended and many of the puzzles have more than one solution. You need imagination, skill, daring, and maybe just a bit of luck, to find the cat The Evil One has captured from the ancient crone at The Olde Magick Shoppe. Wishbringer for the Apple II, //e, and //c retails for \$39.95 from Infocom, 55 Wheeler Street, Cambridge, MA 02138, (617) 492-1031. For more information circle number 472 on the Reader Service card.

# One Third Off.

**The keypad for the Apple II\* now costs one-third less.**

If you do spreadsheets, ledgers, tax prep—any program on your Apple II that uses numbers—you need a IIe Tender Keypad. And now it costs one third less than it's ever cost before.

**Only \$99.**

With the IIe Tender, you get complete cursor control in all directions, the four mathematical functions, a decimal point, comma, space bar and delete key. For a few dollars more, you can have the IIe Tender Programmable, which also gives you four keys that can be permanently defined to any frequently-used key.

**A little extra.**

Either way, you get a well built, color-coordinated keypad that installs in minutes without taking up an expansion slot; one that's human engineered to provide you with a sure touch and less user fatigue. Not to mention the free Coupler-Calc software you get to turn your keypad into a fixed or floating-point calculator.

**Try one.**

There's never been a better time to try a IIe Tender. At your local Apple\* dealer or software store now.

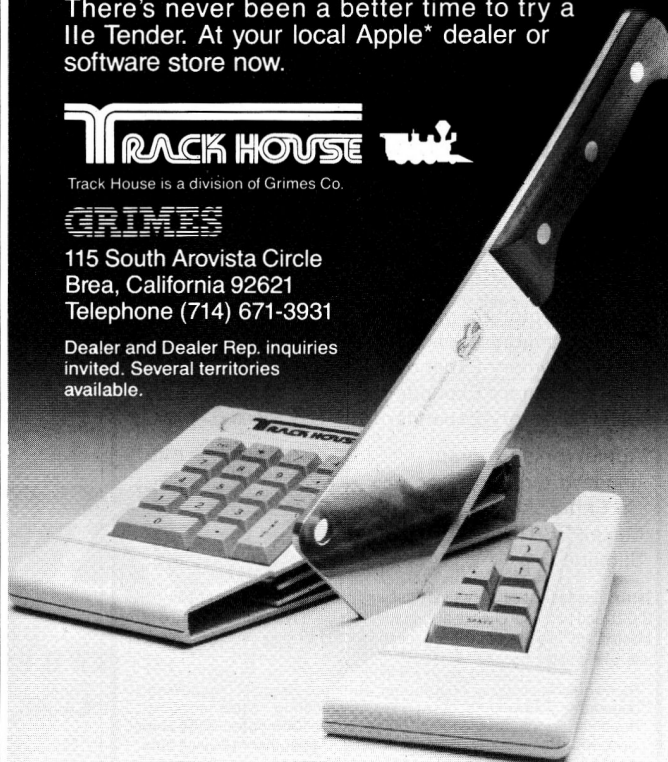
**TRACK HOUSE**

Track House is a division of Grimes Co.

**GRIMES**

115 South Arovista Circle  
Brea, California 92621  
Telephone (714) 671-3931

Dealer and Dealer Rep. inquiries invited. Several territories available.



Standard model keypads are also available for the Apple II+\*. Ask your dealer for details.

\*Apple, Apple IIe and Apple II+ are registered trademarks of Apple Computer, Inc.

Circle 158 on Reader Service Card.



# kyan

## PASCAL

### For the Apple

**kyan pascal** is the most complete package available for learning and using the Pascal language. And now, it's available for the Apple II family of computers.

**kyan pascal** is easy to use, lightning fast, and loaded with features. It's a full Pascal implementation. It compiles and runs many times faster than other Pascal compilers.

#### kyan pascal features:

- Optimized Machine Code Compiler;
- Built-In Full Screen Text Editor;
- String-Handling, Chaining, Include File, and Other Powerful Extensions;
- Random Access Files and Full Graphics Support;
- Built-In Assembler (Allows Full Hardware Control);
- 13-Digit Arithmetic Precision; and,
- Tutorial Manual with Sample Programs.

**kyan pascal** requires 64K of memory and a single disk drive. No additional hardware is necessary. And, it comes with kyan's **MONEY BACK GUARANTEE**. . . If not completely satisfied, return it within 15 days for a full refund.

**kyan pascal for the Apple** . . . . . **\$69.95**

(Add \$4.50/copy for handling, \$12.00 outside North America. California residents add \$4.55/copy for sales tax)

Send Check/Money Order to:

Call: (415) 775-2923

MC/Visa Accepted



**kyan software**, Dept. H

1850 Union St., Ste. 183

San Francisco, CA 94123

Circle 78 on Reader Service Card.

## MORE MEMORY

Let our RAM chips expand your Ramworks card up to 1024k! We can expand your Z-RAM, Titan, Microfazer, Microbuffer, Buffered Grappler, and other cards also. FAST (150 NS), economical chips. **GUARANTEED 1 year.**

### UP TO 55% OFF!

	LIST	OUR PRICE
64k Memory Expander Kit	70.	35.
128k Memory Expander Kit	140.	62.
256k Memory Expander Kit	250.	124.
512k Memory Expander Kit	500.	227.
1024k Memory Expander Kit	1000.	424.
AppleWorks Program	250.	210.
Imagewriter (wide)	749.	626.
//e Enhancement Kit	70.	61.
Maxell SS/DD Disks (10)	30.	19.
Slimline Drive //e or //+	259.	178.

**Terms:** For fastest delivery send Cashier's or Certified check, or Money Order. C.O.D. and personal checks accepted (allow 14 days to clear). Add 3% for MasterCard/Visa (include # and expiration). Add \$3 shipping. Texas residents add 6% sales tax.

Ramworks/Microfazer, Microbuffer, Buffered Grappler, AppleWorks respective trademarks of Applied Engineering, Quadram Corp., Practical Peripherals, Orange Micro, Apple Computer. 256k chips work with Ramworks.Z-Ram cards only. Dealer inquiries welcome.

**COIT VALLEY COMPUTERS**

14055 Waterfall Way

**(214) 234-5047**

Dallas, Texas 75240



Is Carmen San Diego in Constantinople?

### Where in the World. . .

**. . . is Carmen San Diego?** You'll crack that case as you learn about geography and world affairs in the intrigue of an intercontinental chase. You unearth clues, solve puzzles, and track a thief from land to land with the aid of *The World Almanac and Book of Facts*, included at no charge with *Where in the World is Carmen San Diego?*, another exciting exploration from Broderbund Software, 17 Paul Drive, San Rafael, CA 94903-2101, (415) 479-1170. For more information circle number 483 on the Reader Service card.

### The Apple Path

**Pathwords** is a game of word knowledge, speed, and strategy. Up to four players race against the clock to join letters and make words. You begin with a grid of 109 random letters. Your challenge: connect the letters in all directions to form words. The longer the word, the more points you score. You set the speed of play. If you challenge your opponent's word successfully you'll score extra points. *Pathwords* is available for \$34.95 from CBS Software, One Fawcett Place, Greenwich, CT 06836, (203) 622-2500. For more information circle number 478 on the Reader Service card.

### Small Bites

Lots of cookbook programs count calories and analyze dietary composition of foods. But **Nutri-Byte** collects a wealth of information to help you control and modify your eating behavior: Do you eat when angry or tense, or binge just to avoid leftovers? *Nutri-Byte* can be used by anyone who can type—no computer expertise is needed. Learn healthy eating habits through self-awareness, for \$149.95, from ISC Consultants, 14 East 4th Street, New York, NY 10003, (212) 477-8800. For more information circle number 479 on the Reader Service card.

### Little Apple that Could

**Engine** lets you operate a powerful diesel locomotive over actual railroad routes. You specify the size of your train and choose a route. Throttle and brakes must be controlled to avoid speeding, stalling, jackknifing, and other realistic problems. Two volumes of tracks are available, one for the Appalachians and the other for the western United States, for \$40 each, from Bryan Consulting Services, 2303 West Reading Street, Tulsa, OK 74127. For more information circle number 480 on the Reader Service card.



# CLASSIFIEDS

## Hardware

### DATA ACQUISITION SYSTEM

The ISSAC 41-A and 91A data acquisition and control systems turn your Apple II+ and IIe into a scientific or industrial workstation. Systems offer modular expansion: 4 to 512 channels of A/D, 4 to 16 channels of D/A 16 to 128 binary I/O lines. ISAAC LabSoft makes programming easy with real time data acquisition and graphics extensions to Applesoft.

# ISAAC™

**CYBORG CORPORATION**  
DEPT. 1-4  
55 Chapel Street  
Newton, MA 02158  
(617) 964-9020

### ADVANCE

Improve writing skills with your Apple. GRAMMAR AND USAGE, a six-sided package, is perfect for high school, college students and adults. Interactive lessons and exercises. Send check or money order for \$49.95 to

**DISK-ED**  
P.O. Box 441  
East Haven, CT 06512  
(203) 457-1846

Connecticut residents, please add 8% sales tax.

### MOUSETRACER

Use your Mac, IIe, or IIc mouse and draw like the pros! Put cartoons, pictures, logos, etc. on the drawing board. Strap your mouse to the Mousetracer and use your favorite graphics program to trace the picture of your choice. The possibilities are limitless! Send \$34.95 + \$2 postage & handling (CA residents add \$2.10 sales tax) to:

**BRIMARK INNOVATIONS**  
9821 Yolanda Ave.  
Northridge, CA 91324

### BUY DIRECT AND SAVE FULLY APPLE COMPATIBLE

80 Col w/64K Apple //e ..... \$78.  
80 Col w/Inverse (Videx comp) .. \$68.  
Z-80 CP/M Card ..... \$48.  
Graphic Printer Card w/cable ... \$54.  
(Grappler + compatible)  
Disk Controller for 2 Drives ..... \$39.  
FREE CATALOG  
S & H UNDER \$100 10%—OVER \$100 5%

**COMPUTER SUPPLY**  
P.O. Box 164 D  
Valley Stream, NY 11582  
(516) 239-1855 Hours: M-F 9-6 EST

### RGB BOARD FOR APPLE IIS

This interface card is for APPLE II, II+, IIe & COMPATIBLES. It works with any IBM compatible TTL RGB color MONITOR; is compatible with 80-COLUMN card; supports all text & graphic modes & double high resolution colors. 15 FOREGROUND COLORS are SELECTABLE. Plugs easily into SLOT 7. \$149.99. DEALER enquiries WELCOME.

**KSI, KAWA SYSTEMS INT'L.**  
450 San Antonio Rd. # 31  
Palo Alto, CA 94306  
(415) 856-0926.

## Entertainment

### WIZARDRY!

RESCUE apparently DOOMED characters!... "clone" your best characters! Acquire huge stocks of gold, weapons, and magic items—all WITHOUT cheating! No additional software required! Send \$5 for easy, step-by-step instructions to:

**THE WIZARD**  
POB 337  
Gales Ferry, CT 06335

## Utilities

### CONVERT PFS FILES TO APPLEWORKS

Utility converts most PFS (TM Software Publishing) files for use on AppleWorks (TM Apple Computer). Requires Apple IIe or c with 2 drives, AppleWorks, and PFS FILE. Send \$22 and \$2 S&H (PA add \$1.44 Tax):

**SAYRE SUPER SOFTWARE**  
P.O. Box 267  
Sayre, PA 18840-0267

## Publications

### NOTES FOR APPLEWORKS

The information serious users need. Review, 4 tutorials, 12 applications templates, 100 tips for efficient use, annotated bibliography, 2 keyboard templates. Information on multi-column text, custom printers, extended memory, mailmerge, graphics, VisiCalc and DIF files, database design, undocumented problems, ProDOS utilities, and more. 2nd edition, \$10 postpaid.

**ROBERT ERICSON, AICP**  
P.O. Box 16064  
Rumford, RI 02916

**NEW! MINUTE MANUALS** for  
The Dot Matrix Printer \$12.95  
PFS: File/Report/Graph/Write \$12.95  
Apple Writer (all versions) \$ 9.95  
Learn quickly and easily basic and advanced procedures for your printer and software. Step by step instructions, Many helpful hints Send check, MO, Visa/MC + \$2 shipping to:

**MINUTEWARE**  
P.O. Box 2392  
Columbia, MD. 21045  
(301) 995-1166

## Software

### \$\$\$ MONEY MAKER \$\$\$

Increase your income by hundreds and most likely thousands of dollars. Money back guarantee! (Apple, Macintosh, IBM). Call toll free: 1-800-223-5838. In Florida, call: 305-771-6498.

**THE PROFESSOR CORP.**  
959 N.W. 53rd St.  
Ft. Lauderdale, FL 33309  
FREE CATALOG

### EASY PRINTER SET-UP

PRINTS CHARMING(tm) makes printer set-up so easy. Select your FONTS, SCRIPTS, MARGINS, LINE SPACING, etc. by Menu Guided Keyboard action. Save set-ups on disk. ONLY \$24.95 ppd. (IN res. add 5% tax). MC/VISA/CK/MO. For APPLE II, II+, IIe, IIc w/disk drive. For EPSON & PANASONIC. Specify make & model of printer & DOS 3.3 or ProDOS. PRINTS CHARMING makes EASY PRINTER SET-UP!!

**CARDINAL POINT INCORPORATED**  
P.O. Box 596  
Ellettsville, IN 47429  
(812) 876-7811

### SOFTWARE GALORE!

Four Big Reasons to buy from Soft Source-R

1. Top selling Apple programs
2. Up to 40% off
3. Recreational, educational, sm. business
4. FREE shipping!

FREE brochure. Specify computer.

**THE SOFT SOURCE-R INC.**  
Dept. B Box 2931  
Joliet, IL 60434

## Games

### DOLLAR GAMES

10 games for \$10. Disk 1 has Break Thru, Maze Demons, Shootout, Attack, etc. No. 2 has music, graphics, hires draw, disk organizer and others. For description send \$1. To order include Disk No., address, and check to:

**BRIAN LINK**  
5855 Newhouse Road  
East Amherst, NY 14051  
(716) 741-3297

Circle 281 on Reader Service Card.

# TERMEXEC

*"TermExec does a lot for the money." InCider*

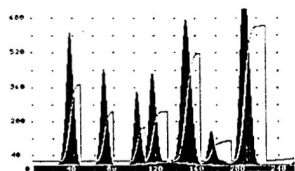
A total communications resource, Term-Exec lets you talk with any other phone-accessible computer...mainframes, information services, or micro-based Bulletin Board systems.

A lot for \$95.00 with our money-back guarantee. American Express, Visa & Mastercard accepted. Write or call today for more information and our free brochure.

**Quinsept, Inc.**  
P.O. Box 216, Dept. IC  
Lexington, MA 02173 / (617) 641-2930  
Bulletin Board (617) 863-0282



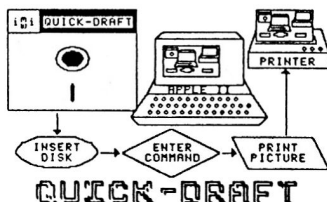
## Scientific & Graphic Software For Your Apple\* II Computer



**VIDICHART II**—Enhanced data acquisition, processing and display of spectra, chromatograms, rate curves, etc. Fast plots, scrolling and zoom scaling on 4 data sets. Includes analog, digital and timer I/O (using ADALAB), fast math package, integrate, differentiate, auto commands. . . . . \$100

**VARICALC** — Powerful equation solver for numerical modeling of complex physical, chemical and math processes. Solves for any variable in an equation with up to 19 variables, LOG, EXP and TRIG functions. Also evaluates 3 dependent equations and plots graphs. Interactively change variables via a joystick, arrow keys or loops. Supports IMI's ADALAB data acquisition card . . . . . \$100

**QUICK-DRAFT**—Design slides, diagrams, flowcharts, etc. Easily draw lines, arrows, arcs, ellipses, rectangles, polygons. Also features 19 text fonts, 22 colors, object macros, multi-screen scroll and print feature. . . . \$ 50



**QUICK-SHAPE**—Create shape tables from any hi-res picture, edit enlarged images. Includes 18 shape tables for large text, different fonts, math, music and electronic symbols . . . . . \$ 25

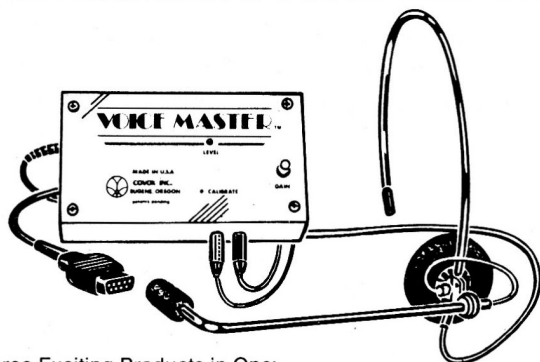
Add \$2.50 shipping on all U.S. orders. VISA or MASTERCARD accepted.

**CALL OR WRITE FOR FREE BROCHURE** about these products and other IMI software and hardware for laboratories and businesses.

\*Trademark of Apple Computer, Inc.

**IMI INTERACTIVE MICROWARE, INC.**  
P.O. Box 139, Dept. 52  
State College, PA 16804  
Phone: (814) 238-8294 • Telex: 705250

## THE AMAZING VOICE MASTER



Three Exciting Products in One:

- **Speech Synthesizer** — Your Computer can talk to you in your own voice.
- **Word Recognition** — Make your computer respond to your spoken commands.
- **Voice Harp** — A totally new musical instrument that you play and compose by humming.

Based upon new technologies invented by COVOX. Performance is equal to other systems costing thousands of dollars more. One low price buys the entire system.

**ONLY \$89.95** (suggested retail)

Available from your dealer or by mail. When ordering by mail, please include \$4.00 shipping and handling (\$10.00 for foreign orders).

Call (503) 342-1271 for a telephone demonstration and ordering information. VISA or MC accepted. FREE brochure available.



**COVOX INC.**

675-D Conger Street, Eugene, OR 97402  
Telex 706017 (AV ALARM UD)

Circle 207 on Reader Service Card.

## Games

### KNIGHT'S OF WIZARDRY!!

Frustrated? Rookies and skilled players alike win with our system. Fully detailed maps containing all notes and information needed. \$6 each scenario. Master Manual has secret tricks and step by step guide to conquer all three scenarios, only \$15. all for only \$25.00 PH #1-704-866-0579.

### MASTER MAZE SYSTEMS

P.O. Box 12867 dept I  
Gastonia, N.C. 28053-6867

### \$2.65 ADVENTURE HINTS

Clues, solutions, maps, trivia: Zork I, Zork II, Zork III, Deadline, Starcross, Witness, Mystery House, Death Caribbean, Adventure or Colossal Cave, Mask of Sun, Serpent Star, Wizard & Princess, Ulysses, Dark Crystal, Expedition Amazon, Quest, Coveted Mirror, Transylvania, Map sets: Wizardry, Knight Diamonds, Legacy Llylgamyn, Solution-Ultima III.

### ASPEN SOFTWARE

1357 Diamond Dr.  
Prescott, AZ 86301

## Education

### DIET WISE

*Diet Wise Software* puts you in control of your nutrition in ways impossible before. Now everything is at your fingertips to make it easy to follow diets, control weight, or simply live better. Nutrient data base has 800+ foods and 15 nutrients including calories, sodium, cholesterol, sugar. Apple 64K(80 col) IBM, CP/M (\$40-\$120). Professional version, Nutripak available. Visa/Master Card.

### NUTRITIONAL DATA RESOURCES

P.O. Box 540-1  
Willoughby, OH 44094  
(216) 951-6593

### EDUCATIONAL SOFTWARE

"I thought home educational software would be dull. . .but I wanted to help my child. Then I discovered your wonderful catalog with top educational software that was really fun for both of us. We really enjoy working together on our computer now. Thanks for being so knowledgeable and caring in your selections." Write or call for your own free catalog.

### MY CHILD'S DESTINY

70 Grant Avenue, Dept. 1450  
San Francisco, CA 94120  
(415) 861-3157

## This Publication is available in Microform.

### University Microfilms International

Please send additional information

for \_\_\_\_\_  
(name of publication)

Name \_\_\_\_\_

Institution \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_

300 North Zeeb Road  
Dept. P.R.  
Ann Arbor, Mi. 48106





# NEW PRODUCTS

## Tell Your Modem

The Code-A-Phone **Tel-A-Modem** is an intelligent modem device integrated into a two-line desktop telephone. It is compatible with 212A command-type modems such as the Hayes Smartmodem, communications software such as Smartcom, and all RS-232C terminals and computers. The Tel-A-Modem combines a fully featured key telephone with a command modem to provide simultaneous voice and data communication. The voice phone offers automatic pulse or tone dialing, uninterruptible power, memory, and more advanced functions. The modem is full duplex and operates at 300 or 1200 baud. The unit sells for \$595 from Code-A-Phone, 16261 S.E. 130th Avenue, Clackamas, OR 97015, (503) 655-8940. For more information circle number 460 on the Reader Service card.

## Double Disks

The **Turbo II** is an affordable disk duplicator for medium- to large-volume production of 5¼-inch disks. It copies all soft-sector 5¼-inch formats: single-sided, double-sided, floppy, single density, double density, or quad density. It copies the difficult group-encoded Apple format at a rate of 2500 copies per eight-hour day. The \$5600 price tag includes a complete Apple II/e. If you

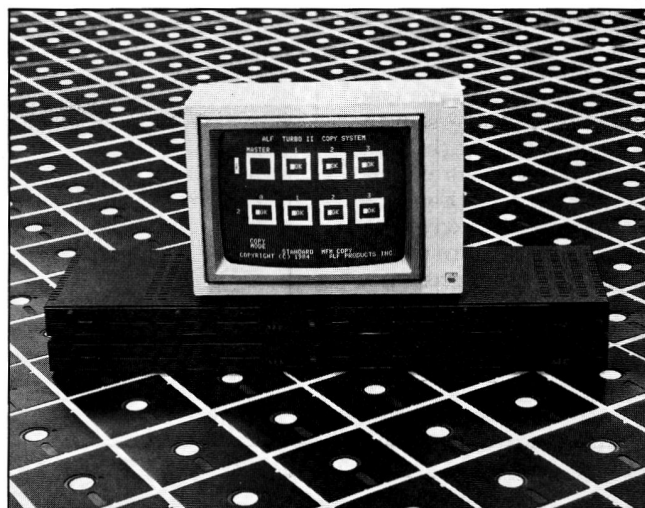
already own a machine, the price comes down to an easy \$1500, from ALF Products, 1315F Nelson Street, Denver, CO 80215, (303) 234-0871. For more information circle number 461 on the Reader Service card.

## Troubleshooting Guide

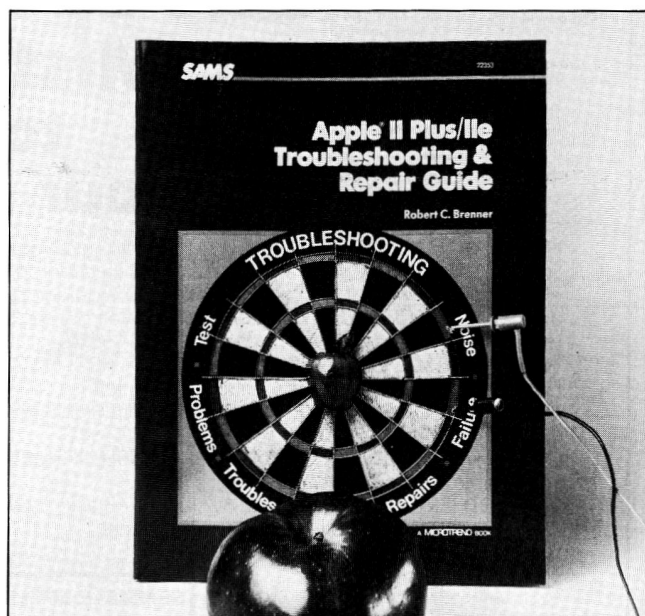
The **Apple II Plus//e Troubleshooting and Repair Guide** takes users through proper II Plus and //e diagnostic techniques and lists specific malfunctions. The author of the 256-page guide, Robert C. Brenner, wants the book in the hands of the user in those "95 percent of all circumstances where knowledge and a good reference are enough to... find and repair a failure." Development of custom hardware and software diagnostic tools is covered, as well. The abundantly illustrated volume is available for \$19.95 from Howard W. Sams, 4300 West 62nd Street, Indianapolis, IN 46268, (317) 298-5400. For more information circle number 458 on the Reader Service card.

*Product descriptions contained in this section are based on information supplied to us by the respective manufacturers. These announcements are provided solely as a service to our readers and do not constitute endorsement by inCider of any given product.*

*Tel-A-Modem provides simultaneous voice and data communication.*



*The Turbo II, for large-volume floppy-disk duplication.*

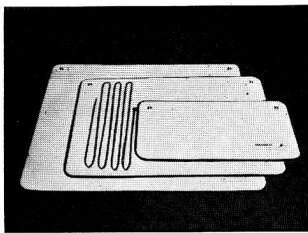


*Diagnostic techniques for II Plus and //e users.*

**edited by Paul Statt**



# NEW PRODUCTS



Cut the static with Wilson Jones Desk Mats.

## Snug as a Bug. . .

Wilson Jones **Static Dissipative Desk Mats** help eliminate static-electric charges that can damage your Apple. The mats are made of two outer conductive vinyl layers and a middle layer of carbon—they collect and drain off static electricity. Each mat includes a ground cord with a 1-megohm resistor and a snap connector, which you attach to a suitable ground. The color is neutral; sizes are 10 by 18

inches, 18 by 24 inches, and 28 by 24 inches. From Wilson Jones, 6150 Touhy Avenue, Chicago, IL 60648, (312) 774-7700. For more information circle number 464 on the Reader Service card.

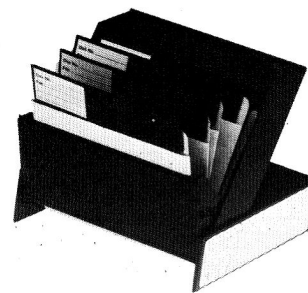
## Switch Twist

Belkin **Data Switches** redirect data between multiple compatible peripherals, without plugging and unplugging cables. Your Apple makes maximum use of printer, modem, terminal, and

plotter. A turn of the dial switches data between connectors, and either component can act as input or output. For details contact Belkin Components, 4718 Rosencrans Avenue, Hawthorn, CA 90250, (213) 644-3184. For more information circle number 452 on the Reader Service card.

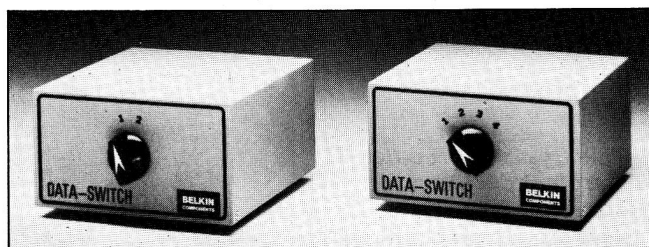
## Serve and Protect

The **Diskplay** provides portable storage for as many as 15 5¼-inch floppy disks. The unit locks open



Diskplay—your data's home away from home.

to display disks for work, but locks closed to protect them at night. A mechanical hinge lasts longer than thin flexible plastic. Each Diskplay has a pre-printed label for an index of contents, and is available in a wide selection of colors, from Ring King Visibles, 2210 Second Avenue, P.O. Box 599, Muscatine, IA 52761, (319) 263-8144. For more information circle number 453 on the Reader Service card.



Belkin Data Switches send output where it's needed.

# It takes only One Spelling Mistake to blow your image

No matter how much work you've put into that report, no matter how accurate your references and sound your conclusions, a single spelling mistake can destroy its credibility.

**HOW CAN YOU GUARD AGAINST THIS?** Simply check your paper with Sensible Speller™, the software program that is a virtual electronic dictionary. With tireless, efficient detachment, it will catch mistakes you would not notice. It will in fact display misspelled words in context, suggest the correct spelling, and allow immediate replacement of misspelled words with correct ones.

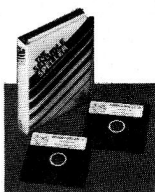
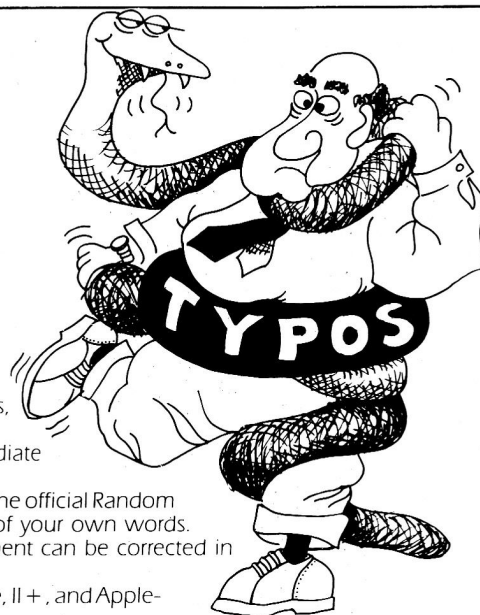
**WHAT IS THE SIZE OF SENSIBLE SPELLER'S VOCABULARY?** All 80,000 words of the official Random House Dictionary. And there's enough room left on disk to add thousands of your own words.

**HOW LONG DOES IT TAKE TO USE SENSIBLE SPELLER?** A ten-page document can be corrected in one or two minutes.

**ON WHAT COMPUTERS CAN YOU RUN SENSIBLE SPELLER?** On all Apple IIc, IIe, II+, and Apple-compatible computers.

**WHAT OTHER DICTIONARIES ARE AVAILABLE?** Black's Law Dictionary™, Sensible Technical Dictionary™, and Stedman's Medical Dictionary™ are available separately on diskette.

**WHERE MAY SENSIBLE SPELLER BE PURCHASED?** It is available at your dealer for \$125 in either the "IV"™ or ProDOS version.\*



**SENSIBLE SPELLER ProDOS IS APPLEWORKS COMPATIBLE**



**Sensible Software, Inc.**

210 S. Woodward, Suite 229, Birmingham, MI 48011  
(313) 258-5566

\*Sensible Speller ProDOS works with the following word processors: AppleWriter ProDOS version, AppleWorks (Apple Computer, Inc.), Format II Enhanced-ProDOS (Kensington Microware), and others. Sensible Speller IV works with DOS 3.2 and DOS 3.3: AppleWriter (Apple Computers, Inc.), Bank Street Writer (Brodebund), Format II (Kensington Microware), HomeWord & ScreenWriter (Sierra On-Line Inc.), PFS:WRITE (Software Publishing, Inc.), Word Handler (Silicon Valley Systems), CP/M-Wordstar (Digital Research Corp.-Micropro International), and others. All features are not available with CP/M, PFS:WRITE & Word Handler. Owners of trademarks indicated in parentheses.

Circle 353 on Reader Service Card.



## Apple Wristwatch?

The Seiko **PC Data-graph RC-1000** is a multifunction quartz wrist terminal. It connects to an Apple at home and stores 2K of data on the arm. The user selects information on the computer, connects the Datagraph, and loads. Data are ready for instant recall—anywhere, any time—on the scrolling 2-line, 24-character, dot-ma-



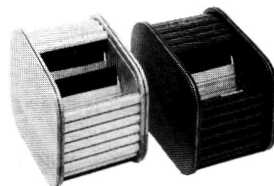
The Seiko RC-1000, for Dick Tracy types.

trix LCD readout. This is a Seiko—time of day, year, month, date, day of the week, hour, minute, and second are hard-wired. Numbers, schedules, addresses, stocks, and other facts can be stored in 12 files. With cable and Apple software, the PC Data-graph retails for \$150, from the Consumer Electronics Division of Hattori America, 1330 West Walnut Parkway, Compton, CA 90220. For more information circle number 454 on the Reader Service card.

## Solid Storage

A roll-top desk for your disks—this **Solid Oak Diskette Storage Chest** from Smith & Bellows is crafted of solid oak. Its slanting lines allow you to quickly sort and locate 70 5¼-inch disks. The entire construction, from the

spacious interior to the hand-polished surface, shows a commitment to quality workmanship. And oak protects magnetic media from static charges. The chest retails for \$59.95, from Smith & Bellows, P.O. Box 668, Amherst, NH 03301, (603) 673-8482. For more information circle number 465 on the Reader Service card.



Keep your disks in a Smith & Bellows Solid Oak Storage Chest.

## Light of the World

The Magellan **Light Pen System II**—unlike toy graphics systems and joysticks—interacts directly with your monitor or TV screen. With the Light Pen single-dot accuracy is achieved on the Apple graphics display—that's high resolution. The Light Pen is controlled by the hand and a button on the pen itself—the user never touches the keyboard or joystick. An interface card for any of the II, II Plus, or //e expansion slots is included, as are Quick-Draw and Amper-Pen software. The complete package for Apple artists retails for \$189.95, from Magellan Computer, 4371 East 82nd Street, Suite D, Indianapolis, IN 46250, (317) 842-9138. For more information circle number 456 on the Reader Service card.

## Now you can monitor and control the world (or at least your part of it) with a little help from APPLIED ENGINEERING

### 12 BIT, 16 CHANNEL, PROGRAMMABLE GAIN A/D

- All new 1984 design incorporates the latest in state-of-art I.C. technologies.
- Complete 12 bit A/D converter, with an accuracy of 0.02%
- 16 single ended channels (single ended means that your signals are measured against the Apple's GND.) or 8 differential channels. Most all the signals you will measure are single ended.
- 9 software programmable full scale ranges, any of the 16 channels can have any range at any time. Under program control, you can select any of the following ranges:  $\pm 10$  volts,  $\pm 5$ V,  $\pm 2.5$ V,  $\pm 1.0$ V,  $\pm 500$ MV,  $\pm 250$ MV,  $\pm 100$ MV,  $\pm 50$ MV, or  $\pm 25$ MV.
- Very fast conversion (25 micro seconds).
- Analog input resistance greater than 1,000,000 ohms.
- Laser-trimmed scaling resistors.
- Low power consumption through the use of CMOS devices.
- The user connector has +12 and -12 volts on it so you can power your sensors.
- Only elementary programming is required to use the A/D.
- The entire system is on one standard size plug in card that fits neatly inside the Apple.
- System includes sample programs on disk.

**PRICE \$319**

A few applications may include the monitoring of ● flow ● temperature ● humidity ● wind speed ● wind direction ● light intensity ● pressure ● RPM ● soil moisture and many more.

### A/D & D/A

#### A/D & D/A Features:

- Single PC card
- 8 channels A/D
- 8 channels D/A
- Superfast conversion time
- Very easy programming
- Many analog ranges
- Manual contains sample applications

#### A/D SPECIFICATIONS

- 0.3% accuracy
- On-board memory
- Fast conversion (0.078 MS per channel)
- A/D process totally transparent to Apple (looks like memory)
- User programmable input ranges are 0 to 10 volts, 0 to 5, -5 to +5, -2.5 to +2.5, -5 to 0, -10 to 0.

The A/D process takes place on a continuous, channel sequencing basis. Data is automatically transferred to its proper location in the on-board RAM. No A/D converter could be easier to use.

#### D/A SPECIFICATIONS

- 0.3% accuracy
- On-board memory
- On-board output buffer amps can drive 5 MA
- D/A process is totally transparent to the Apple (just poke the data)
- Fast conversion (0.003 MS per channel)
- User programmable output ranges are 0 to 5 volts and 0 to 10 volts

The D/A section contains 8 digital to analog converters, with output buffer amplifiers and all interface logic on a single card. On-card latches are provided for each of the eight D/A converters. No D/A converter could be easier to use. The on-board amplifiers are laser-trimmed during manufacture, thereby eliminating any requirement for off-set nulling.

**PRICE \$199**

### SIGNAL CONDITIONER

Our 8 channel signal conditioner is designed for use with both our A/D converters. This board incorporates 8 F.E.T. op-amps, which allow almost any gain or offset. For example, an input signal that varies from 2.00 to 2.15 volts or a signal that varies from 0 to 50 mV can easily be converted to 0-10V output for the A/D.

The signal conditioner's outputs are on a high quality 16 pin gold I.C. socket that matches the one on the A/D's so a simple ribbon cable connects the two. The signal conditioner can be powered by your Apple or from an external supply.

#### FEATURES

- 4.5" square for standard card cage and 4 mounting holes for standard mounting. The signal conditioner does not plug into the Apple, it can be located up to ½ mile away from the A/D.
- 22 pin, 156 spacing edge card input connector (extra connectors are easily available i.e. Radio Shack).
- Large bread board area.
- Full detailed schematic included.

**PRICE \$79**

### I/O 32



- Provides 4, 8-Bit programmable I/O Ports
- Any of the 4 ports can be programmed as an input or an output port
- All I/O lines are TTL (0-5 volt) compatible

#### Some applications include:

Burglar alarm, direction sensing, use with relays to turn on lights, sound buzzers, start motors, control tape recorders and printers, use with digital joystick.

- Your inputs can be anything from high speed logic to simple switches
- Programming is made very easy by powerful on-board firmware
- The I/O 32 is your best choice for any control application

The I/O manual includes many programs for inputs and outputs.

**PRICE \$89**

Please see our other full page ad in this magazine for information on Applied Engineering's Timemaster Clock Card and other products for the Apple. Our boards are far superior to most of the consumer electronics made today. All I.C.'s are in high quality sockets with mil-spec. components used throughout. P.C. boards are glass-epoxy with gold contacts. Made in America to be the best in the world. All products compatible with Apple II and //e.

Applied Engineering's products are fully tested with complete documentation and available for immediate delivery. All products are guaranteed with a no hassle three year warranty.

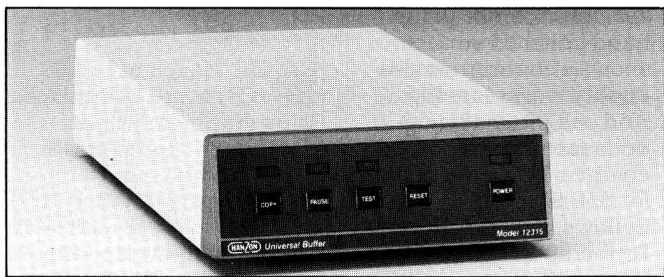
Texas Residents Add 5% Sales Tax  
Add \$10.00 If Outside U.S.A.

Send Check or Money Order to:

**APPLIED ENGINEERING**  
P.O. Box 798  
Carrollton, TX 75006

Call (214) 492-2027  
7 a.m. to 11 p.m. 7 days a week  
MasterCard, Visa & C.O.D. Welcome  
No extra charge for credit cards





Make the switch with HanZon's Universal Data Buffer.

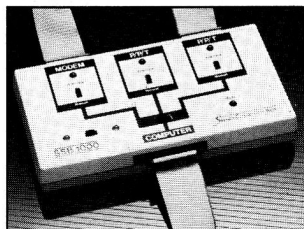
## Trouble-Free Interfacing

The **Universal Data Buffer** is an intelligent device that connects any computer with serial or parallel output to any printer. The buffer's microprocessor automatically checks the computer and reconfigures the interface to match. The test feature varies baud rates and word sizes to determine switch settings. Standard baud rates from 300 through 19,200 are supported. The Universal Data Buffer is available for \$385 from HanZon Data, 18732 142nd Avenue N.E., Woodinville, WA 98072, (206) 487-1717. For more information circle number 450 on the Reader Service card.

## Intelligent Connection

The **Smart Switch Box** is an easy way to connect a modem and two peripherals to a single computer. It has one computer port and three peripheral ports—one dedicated to a modem and two for printers, plotters, or terminals. The Smart Switch uses 25-wire ribbon cables, and employs logic circuitry to make the correct RS-232C connection between any computer and peripheral. The Smart Box will indicate which piece of equipment is disabling data transfer in the event of trouble, and includes two six-foot-long cables with male and female DB25

connectors to accommodate any port. Available for \$159.95 from IQ Technologies, 11811 NE First Street, Suite 308, Bellevue, WA 98005, (206) 451-0232. For more information circle number 459 on the Reader Service card.



*IQ's Smart Switch Box connects your Apple to any serial peripheral.*

## Cheap Letters

The **Juki 6000** is a compact, efficient, economical letter-quality printer. The new printer weighs only 13 pounds, and measures just 15¼ inches wide, 9 inches deep, and 5½ inches high. Its maximum print speed is 10 cps. The bidirectional, logic-seeking printing system combines a 9-inch wide printing area (12-inch platen) with a smooth friction paper feed. The Juki 6000 uses single-strike or fabric ribbons, and is available with Centronics or RS-232C interface, for \$295. That's right—less than \$300—from Juki Industries of America, 299 Market Street, Saddle Brook, NJ 07662, (201) 796-3666. For more information circle number 457 on the Reader Service card.

## Print It Yourself

The **U-Print Universal Printer AP64** for the Apple //c offers 64K of internal memory for buffering output data. A copy button allows for as many as 255 multiple manuscripts, and a reset button clears the buffer memory. U-Print has a standard Centronics parallel interface. The AP64 sells for \$199.95, and the **AP16**—with 16K of internal memory—for \$139.95. Both from Digital Devices, 430 Tenth Street, Suite N205, Atlanta, GA 30318, (404) 872-4430. For more information circle number 451 on the Reader Service card.

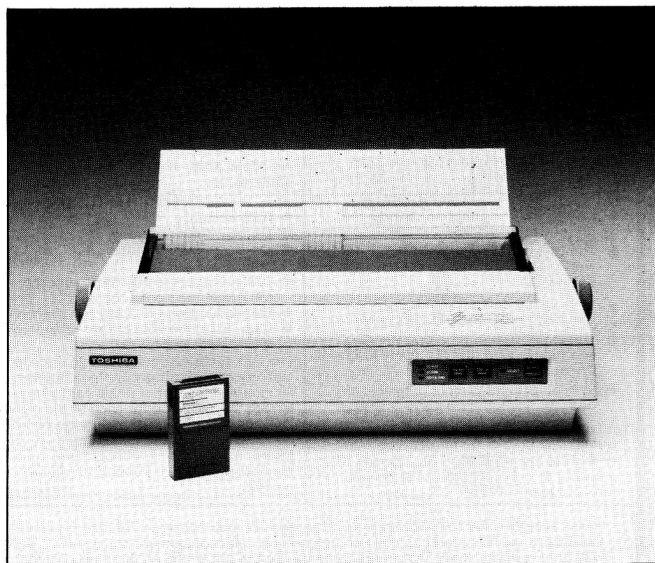
## Office Peace and Quiet

The Toshiba **P351** is an enhanced version of the 24-pin, 3-in-1 dot-matrix printer. Plug-in font cartridges make changing type a snap, and the high-speed draft printing rate of 288 characters per second is among the fastest in the business. The cabinet has been acoustically redesigned to reduce the noise level by four decibels. The P351 also offers Qume

Sprint 11 letter-quality emulation, a forward-stacking sheetfeeder, and the ability to print in bold-face without slowing down. The suggested retail price is the same as that of the P1351, \$1895, from Toshiba America Information Systems, 2441 Michelle Drive, Tustin, CA 92680, (714) 730-5000. For more information circle number 455 on the Reader Service card.

## Only Connect

The **ApriCord //c** is one of a family of parallel printer interfaces that allows you to print with any of the popular Centronics-compatible machines and your //c. The ApriCord //c requires no external power supply. It contains fewer, but more advanced, electronic components than standard interfaces. The electronics are encased in an injection-molded shell—no expansion module is required. The ApriCord //c sells for \$79.95 from Apricorn, 7050 Convoy Court, San Diego, CA 92111, (619) 569-9483. For more information circle number 466 on the Reader Service card.



*The P351 printer, Toshiba's acoustic wonder.*



# People are talking about **Hardcore COMPUTIST**®

"I have been subscribing to your magazine for over a year now and let me say, there is not a more informative publication for the Apple computer in existence."

M.W., Keene, NH

"Your application goes beyond backing up software and into the realm of a truly fine educational publication...the best on my shelves."

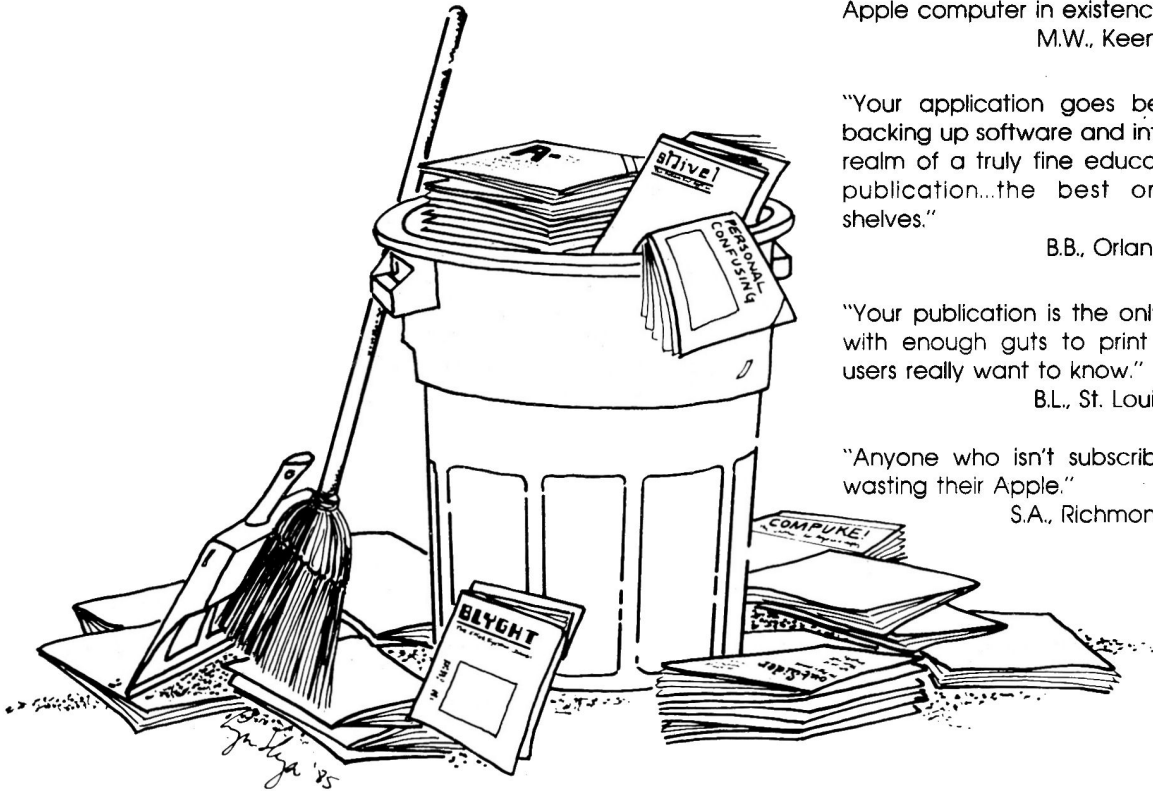
B.B., Orlando, FL

"Your publication is the only one with enough guts to print what users really want to know."

B.L., St. Louis, MO

"Anyone who isn't subscribing is wasting their Apple."

S.A., Richmond, VA



**Hardcore COMPUTIST is a monthly publication which details the removal of copy-protection from commercial software, and features complete listings of original, top-quality Applesoft and Assembly language programs for use on the Apple II series of computers.**

Apple is a registered trademark of Apple Computer, Inc.

**A  
REAL  
Apple  
magazine.  
Hardcore  
COMPUTIST  
...the last word in copy  
deprotection.**

Yes! Please send me a subscription to Hardcore COMPUTIST.

Name

Address

City  St  Zip

Phone

VISA/MC  Exp

Signature

Send check or money order (US funds drawn on US bank) to: Hardcore COMPUTIST, PO Box 110846-J, Tacoma, WA 98411. **Subscription Rates (for 6 issues):** US \$20, US 1st Class \$24, Canada \$34, Mexico \$39, Foreign \$60. **SAMPLE:** US \$4.75, **SAMPLE:** Foreign \$5.75



# inCider's Index to Advertisers

Reader Service	Page	Reader Service	Page
168 Addmaster .....	110	86 Kensington Microware .....	3
* Applied Engineering .....	23, 45, 65, 79, 91	91 Kyan Software .....	86
87 Applied Software Tech. ....	27	* MacWorld Exposition .....	62, 63
216 AST Research .....	1	208 Micro City .....	107
179 Beagle Bros .....	54, 55	204 Micro Works .....	80
69 Blue Chip Software .....	69	380 Nibble Notch .....	61
* Business Computers of Peterborough .....	43	310 Northeastern Software .....	37
361 Central Point Software .....	73	416 Orange Micro .....	2
227 Checkmate Technology .....	25	31 Pacific Exchanges .....	110
Classified Ads .....	87, 88	* PC Network .....	38, 39
78 Coit Valley Computers .....	86	49 Prof. Jones .....	59
124 CompuServe .....	47	521 Programs Plus .....	40
56 Computer Accents .....	100	268 Prometheus Products ....	CIV
185 Computer Discount of America .....	57	234 Quadram .....	7
17 Conroy-LaPointe .....	35	16 Quinsept .....	75
89 Consistent Software .....	42	281 Quinsept .....	88
163 Core Concepts .....	104	41 Quorum .....	75
101 Data Technology .....	46	223 Sav-Soft Products .....	74
240 Demco Electronics .....	76	353 Sensible Software .....	90
108 Diversified Software .....	58	354 Sensible Software .....	76
362 Eastcoast Software .....	81	143 Silicon Express .....	111
404 Elek-Tek .....	108	375 Software Unlimited .....	102
146 Golem Computers .....	60	376 Software Unlimited .....	74
66 H & E Computronics ....	CIII	* Southern California Research Group .....	52
427 Hardcore COMPUTIST ....	93	67 Stellation Two .....	110
229 High Order Micro .....	72	355 Street Electronics .....	9
* Human Systems Dynamics .....	106	156 Sublogic .....	CII
inCider Magazine hotCider Sub .....	48	25 Texprint .....	70
Subscription Ad .....	32	158 Trackhouse .....	85
157 International Apple Core .....	105	* Uptime .....	11
536 Jameco Electronics .....	33	264 Utilico Microware .....	67
		152 Video 7 .....	31
		7 Votrax .....	84
		350 Wayne Green Int'l Ltd. ....	36

For further information from our advertisers, please use the Reader Service card.

\*This advertiser prefers to be contacted directly.

Advertising Sales: (603) 924-7138, (800) 441-4403

Paul Boule, Sales Manager; Barbara Alvarez

# READER SERVICE

This card valid until August 31, 1985

A. My favorite article in this issue begins on page \_\_\_\_\_

B. Where did you get this copy of *inCider*?

- ☐ 1. Personal subscription  
☐ 2. Computer store  
☐ 3. Newsstand  
☐ 4. Bookstore  
☐ 5. At work  
☐ 6. Library  
☐ 7. Friend/Colleague  
☐ 8. Other \_\_\_\_\_

C. How many of each issue's program listings do you actually type in?

- ☐ 1. Zero  
☐ 2. One  
☐ 3. Two  
☐ 4. Three  
☐ 5. Four  
☐ 6. Five or more

D. Which of the following microcomputers do you plan to purchase during the next 6 months?

- ☐ 1. Apple IIe  
☐ 2. Apple IIc  
☐ 3. Macintosh  
☐ 4. Apple compatible  
☐ 5. Other  
☐ 6. No plans to purchase

E. Have you influenced computer purchasers among friends and colleagues in the last 6 months?

- ☐ 1. Yes, friends.  
☐ 2. Yes, colleagues.  
☐ 3. No.

F. Which of the following microcomputers do you own?

- ☐ 1. Apple II or II+  
☐ 2. Apple IIc  
☐ 3. Apple IIe  
☐ 4. Apple III  
☐ 5. Macintosh  
☐ 6. Apple compatible  
☐ 7. Other \_\_\_\_\_

G. What is the primary application you use your computer for? Check only one.

- ☐ 1. Word Processing  
☐ 2. Accounting (home)  
☐ 3. Spread sheet  
☐ 4. Games  
☐ 5. Programming  
☐ 6. Education  
☐ 7. Data Base Management  
☐ 8. Communications  
☐ 9. Other \_\_\_\_\_

H. What is your level of computing expertise?

- ☐ 1. Beginner  
☐ 2. Intermediate  
☐ 3. Advanced

I. How long have you subscribed to *inCider*?

- ☐ 1. Less than 3 months  
☐ 2. 3-6 months  
☐ 3. 6 months to 1 year  
☐ 4. 1-2 years  
☐ 5. More than 2 years

J. On a scale of 1 (no interest) to 5 (great interest), please rate your interest in the following *inCider* columns:

- \_\_\_\_ 1. Fermentations  
\_\_\_\_ 2. The Game Reserve  
\_\_\_\_ 3. O'Brien's Journal  
\_\_\_\_ 4. Product Reviews  
\_\_\_\_ 5. Data-Gram  
\_\_\_\_ 6. Editors' Choice  
\_\_\_\_ 7. New Product Listings  
\_\_\_\_ 8. The Applesoft Adviser  
\_\_\_\_ 9. The Cider Press  
\_\_\_\_ 10. Ask *inCider*  
\_\_\_\_ 11. Fudge It!  
\_\_\_\_ 12. Apple Clinic

K. If you are not a subscriber, please circle 500.

M. If you would like a one year subscription to *inCider*, please circle 501 on the Reader Service Card. Each subscription costs \$24.97. (Canada & Mexico \$27.97, Foreign Surface \$44.97, one year only). Please allow 10-12 weeks for delivery.

**Reader Service:** To receive more information from any of the advertisers in this issue, circle the number on the Reader Service Card that corresponds with the Reader Service number on the ad in which you are interested. You will find numbers near the logo of each advertiser. Complete the entire card, stamp and drop into a mailbox. In 4-6 weeks you will hear from the advertiser directly.

1 6 11 16 21 2 7 12 17 22 3 8 13 18 23 4 9 14 19 24 5 10 15 20 25	151 156 161 166 171 152 157 162 167 172 153 158 163 168 173 154 159 164 169 174 155 160 165 170 175	301 306 311 316 321 302 307 312 317 322 303 308 313 318 323 304 309 314 319 324 305 310 315 320 325	451 456 461 466 471 452 457 462 467 472 453 458 463 468 473 454 459 464 469 474 455 460 465 470 475
26 31 36 41 46 27 32 37 42 47 28 33 38 43 48 29 34 39 44 49 30 35 40 45 50	176 181 186 191 196 177 182 187 192 197 178 183 188 193 198 179 184 189 194 199 180 185 190 195 200	326 331 336 341 346 327 332 337 342 347 328 333 338 343 348 329 334 339 344 349 330 335 340 345 350	476 481 486 491 496 477 482 487 492 497 478 483 488 493 498 479 484 489 494 499 480 485 490 495 500
51 56 61 66 71 52 57 62 67 72 53 58 63 68 73 54 59 64 69 74 55 60 65 70 75	201 206 211 216 221 202 207 212 217 222 203 208 213 218 223 204 209 214 219 224 205 210 215 220 225	351 356 361 366 371 352 357 362 367 372 353 358 363 368 373 354 359 364 369 374 355 360 365 370 375	501 506 511 516 521 502 507 512 517 522 503 508 513 518 523 504 509 514 519 524 505 510 515 520 525
76 81 86 91 96 77 82 87 92 97 78 83 88 93 98 79 84 89 94 99 80 85 90 95 100	226 231 236 241 246 227 232 237 242 247 228 233 238 243 248 229 234 239 244 249 230 235 240 245 250	376 381 386 391 396 377 382 387 392 397 378 383 388 393 398 379 384 389 394 399 380 385 390 395 400	526 531 536 541 546 527 532 537 542 547 528 533 538 543 548 529 534 539 544 549 530 535 540 545 550
101 106 111 116 121 102 107 112 117 122 103 108 113 118 123 104 109 114 119 124 105 110 115 120 125	251 256 261 266 271 252 257 262 267 272 253 258 263 268 273 254 259 264 269 274 255 260 265 270 275	401 406 411 416 421 402 407 412 417 422 403 408 413 418 423 404 409 414 419 424 405 410 415 420 425	551 556 561 566 571 552 557 562 567 572 553 558 563 568 573 554 559 564 569 574 555 560 565 570 575
126 131 136 141 146 127 132 137 142 147 128 133 138 143 148 129 134 139 144 149 130 135 140 145 150	276 281 286 291 296 277 282 287 292 297 278 283 288 293 298 279 284 289 294 299 280 285 290 295 300	426 431 436 441 446 427 432 437 442 447 428 433 438 443 448 429 434 439 444 449 430 435 440 445 450	576 581 586 591 596 577 582 587 592 597 578 583 588 593 598 579 584 589 594 599 580 585 590 595 600

Name \_\_\_\_\_ Title \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Telephone ( ) \_\_\_\_\_

**inCider** • July 1985 2

**Reader Service:** To receive more information from any of the advertisers in this issue, circle the number on the Reader Service Card that corresponds with the Reader Service number on the ad in which you are interested. You will find numbers near the logo of each advertiser. Complete the entire card, stamp and drop into a mailbox. In 4-6 weeks you will hear from the advertiser directly.

1 6 11 16 21 2 7 12 17 22 3 8 13 18 23 4 9 14 19 24 5 10 15 20 25	151 156 161 166 171 152 157 162 167 172 153 158 163 168 173 154 159 164 169 174 155 160 165 170 175	301 306 311 316 321 302 307 312 317 322 303 308 313 318 323 304 309 314 319 324 305 310 315 320 325	451 456 461 466 471 452 457 462 467 472 453 458 463 468 473 454 459 464 469 474 455 460 465 470 475
26 31 36 41 46 27 32 37 42 47 28 33 38 43 48 29 34 39 44 49 30 35 40 45 50	176 181 186 191 196 177 182 187 192 197 178 183 188 193 198 179 184 189 194 199 180 185 190 195 200	326 331 336 341 346 327 332 337 342 347 328 333 338 343 348 329 334 339 344 349 330 335 340 345 350	476 481 486 491 496 477 482 487 492 497 478 483 488 493 498 479 484 489 494 499 480 485 490 495 500
51 56 61 66 71 52 57 62 67 72 53 58 63 68 73 54 59 64 69 74 55 60 65 70 75	201 206 211 216 221 202 207 212 217 222 203 208 213 218 223 204 209 214 219 224 205 210 215 220 225	351 356 361 366 371 352 357 362 367 372 353 358 363 368 373 354 359 364 369 374 355 360 365 370 375	501 506 511 516 521 502 507 512 517 522 503 508 513 518 523 504 509 514 519 524 505 510 515 520 525
76 81 86 91 96 77 82 87 92 97 78 83 88 93 98 79 84 89 94 99 80 85 90 95 100	226 231 236 241 246 227 232 237 242 247 228 233 238 243 248 229 234 239 244 249 230 235 240 245 250	376 381 386 391 396 377 382 387 392 397 378 383 388 393 398 379 384 389 394 399 380 385 390 395 400	526 531 536 541 546 527 532 537 542 547 528 533 538 543 548 529 534 539 544 549 530 535 540 545 550
101 106 111 116 121 102 107 112 117 122 103 108 113 118 123 104 109 114 119 124 105 110 115 120 125	251 256 261 266 271 252 257 262 267 272 253 258 263 268 273 254 259 264 269 274 255 260 265 270 275	401 406 411 416 421 402 407 412 417 422 403 408 413 418 423 404 409 414 419 424 405 410 415 420 425	551 556 561 566 571 552 557 562 567 572 553 558 563 568 573 554 559 564 569 574 555 560 565 570 575
126 131 136 141 146 127 132 137 142 147 128 133 138 143 148 129 134 139 144 149 130 135 140 145 150	276 281 286 291 296 277 282 287 292 297 278 283 288 293 298 279 284 289 294 299 280 285 290 295 300	426 431 436 441 446 427 432 437 442 447 428 433 438 443 448 429 434 439 444 449 430 435 440 445 450	576 581 586 591 596 577 582 587 592 597 578 583 588 593 598 579 584 589 594 599 580 585 590 595 600

Name \_\_\_\_\_ Title \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Telephone ( ) \_\_\_\_\_

**inCider** • July 1985 2

# READER SERVICE

This card valid until August 31, 1985

A. My favorite article in this issue begins on page \_\_\_\_\_

B. Where did you get this copy of *inCider*?

- ☐ 1. Personal subscription  
☐ 2. Computer store  
☐ 3. Newsstand  
☐ 4. Bookstore  
☐ 5. At work  
☐ 6. Library  
☐ 7. Friend/Colleague  
☐ 8. Other \_\_\_\_\_

C. How many of each issue's program listings do you actually type in?

- ☐ 1. Zero  
☐ 2. One  
☐ 3. Two  
☐ 4. Three  
☐ 5. Four  
☐ 6. Five or more

D. Which of the following microcomputers do you plan to purchase during the next 6 months?

- ☐ 1. Apple IIe  
☐ 2. Apple IIc  
☐ 3. Macintosh  
☐ 4. Apple compatible  
☐ 5. Other  
☐ 6. No plans to purchase

E. Have you influenced computer purchasers among friends and colleagues in the last 6 months?

- ☐ 1. Yes, friends.  
☐ 2. Yes, colleagues.  
☐ 3. No.

F. Which of the following microcomputers do you own?

- ☐ 1. Apple II or II+  
☐ 2. Apple IIc  
☐ 3. Apple IIe  
☐ 4. Apple III  
☐ 5. Macintosh  
☐ 6. Apple compatible  
☐ 7. Other \_\_\_\_\_

G. What is the primary application you use your computer for? Check only one.

- ☐ 1. Word Processing  
☐ 2. Accounting (home)  
☐ 3. Spread sheet  
☐ 4. Games  
☐ 5. Programming  
☐ 6. Education  
☐ 7. Data Base Management  
☐ 8. Communications  
☐ 9. Other \_\_\_\_\_

H. What is your level of computing expertise?

- ☐ 1. Beginner  
☐ 2. Intermediate  
☐ 3. Advanced

I. How long have you subscribed to *inCider*?

- ☐ 1. Less than 3 months  
☐ 2. 3-6 months  
☐ 3. 6 months to 1 year  
☐ 4. 1-2 years  
☐ 5. More than 2 years

J. On a scale of 1 (no interest) to 5 (great interest), please rate your interest in the following *inCider* columns:

- \_\_\_\_ 1. Fermentations  
\_\_\_\_ 2. The Game Reserve  
\_\_\_\_ 3. O'Brien's Journal  
\_\_\_\_ 4. Product Reviews  
\_\_\_\_ 5. Data-Gram  
\_\_\_\_ 6. Editors' Choice  
\_\_\_\_ 7. New Product Listings  
\_\_\_\_ 8. The Applesoft Adviser  
\_\_\_\_ 9. The Cider Press  
\_\_\_\_ 10. Ask *inCider*  
\_\_\_\_ 11. Fudge It!  
\_\_\_\_ 12. Apple Clinic

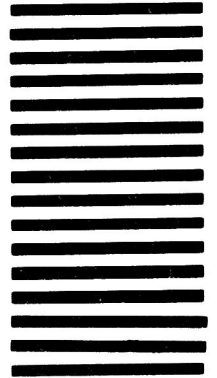
K. If you are not a subscriber, please circle 500.

M. If you would like a one year subscription to *inCider*, please circle 501 on the Reader Service Card. Each subscription costs \$24.97. (Canada & Mexico \$27.97, Foreign Surface \$44.97, one year only). Please allow 10-12 weeks for delivery.





NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES



---

**BUSINESS REPLY MAIL**

First Class Permit No. 27 Dalton, MA 01226

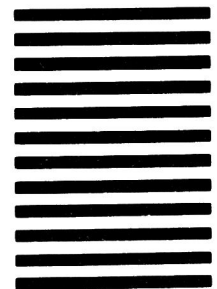
---

POSTAGE WILL BE PAID BY ADDRESSEE

**inCider**  
**P.O. Box 336**  
**Dalton, MA 01227**



NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES



---

**BUSINESS REPLY MAIL**

First Class Permit No. 27 Dalton, MA 01226

---

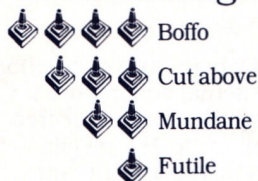
POSTAGE WILL BE PAID BY ADDRESSEE

**inCider**  
**P.O. Box 336**  
**Dalton, MA 01227**

# The GAME RESERVE

In *The Game Reserve*, Brian Murphy reviews six to eight of the most recent Apple games to hit the market. Look here for inCider's scoop on the latest fun.

## Game Ratings



### Situation: Critical



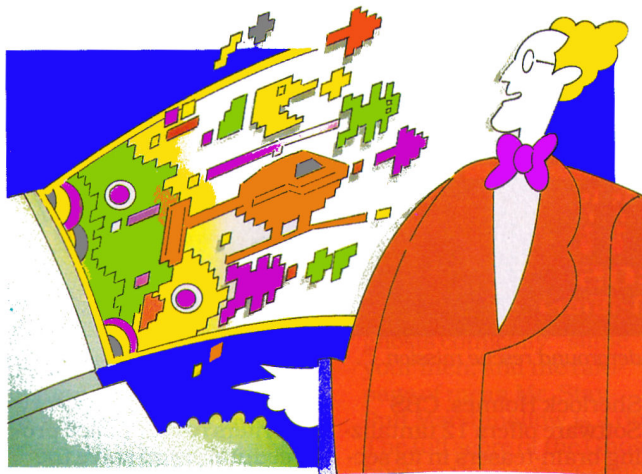
Prism Software  
26600 Southfield Road  
Lathrup Village, MI 48076  
\$29.95  
Any Apple II, 48K  
Joystick optional

The future of computer games looks promising. I've found two exciting ones this month, among a number of other entertaining offerings.

**Situation: Critical** packs a lot of bang for the buck (**Photo 1**), requiring you to complete three



**Photo 1.** *Situation Critical—lost in space. . .*



challenging arcade games. It might become a lifetime quest.

First you must steal the components of a doomsday bomb from the alien Xarlons, who look like No-



**Photo 2.** . . .you need a steady throttle hand. . .

lan Bushnell robots with a mean streak. You race from room to room, zapping Xarlons and grabbing parts of the nuke. If your armor hasn't been blown away, you hop into a jet that speeds you to the next scenario.

Once in your plane, you must negotiate the heavily defended subterranean grottoes under the surface of Xarlon. You must dodge anti-aircraft guns, laser guns, and laser force screens, or destroy them

with your guns and bombs. Watch the rocky, twisting passages—you have only one plane (**Photo 2**). Winning takes more than one try—more than 20, come to think of it.

Finally you fly over the plains of Xarlon, bombing docks, roads, ships, bridges, and refineries (**Photo 3**). The Xarlons send up fighters and anti-aircraft missiles, but this is the easiest mission of the game. If you can conserve your fuel and evade enemy missiles, you can bomb Xarlon all night.

**Situation: Critical**—all three games—is fun, fun, fun. Each game was programmed by a different author, and each is beauti-



**Photo 3.** . . .but color graphics make bombing easier.

fully designed. The animation in the grottoes of Xarlon is very good, reminiscent of *Star Blazer*. The color, action, 3-D, and simulated scrolling in the bombing scenario are out of this world. Check out **Situation: Critical!**

### H.E.R.O.



Activision  
P.O. Box 7287  
Mountain View, CA 94039  
\$39.95  
Any Apple II, 48K

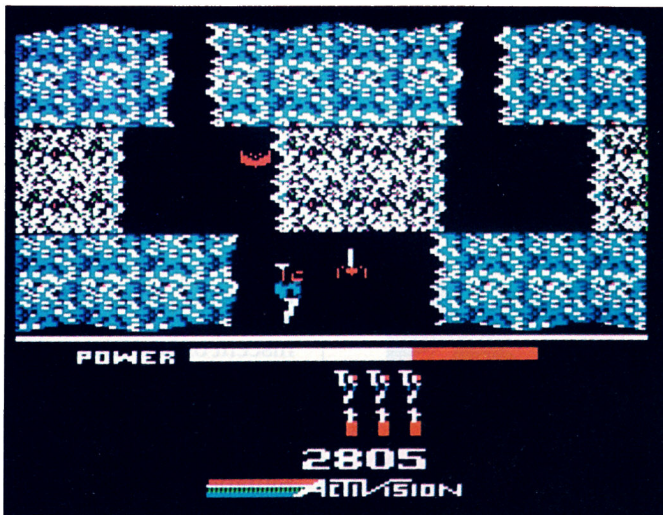
The second good arcade game of the month is **H.E.R.O.**—Helicopter Emergency Rescue Operation. In this fantasy, you guide a rescuer with a mini-helicopter strapped to his back through subterranean labyrinths to seek trapped miners (**Photo 4**).

Using a joystick to move this little superguy, you plant explosives, fire bursts at the nasty creatures who inhabit the tunnels, and thread your way through the shafts when the lights inexplicably go out (**Photo 5**).

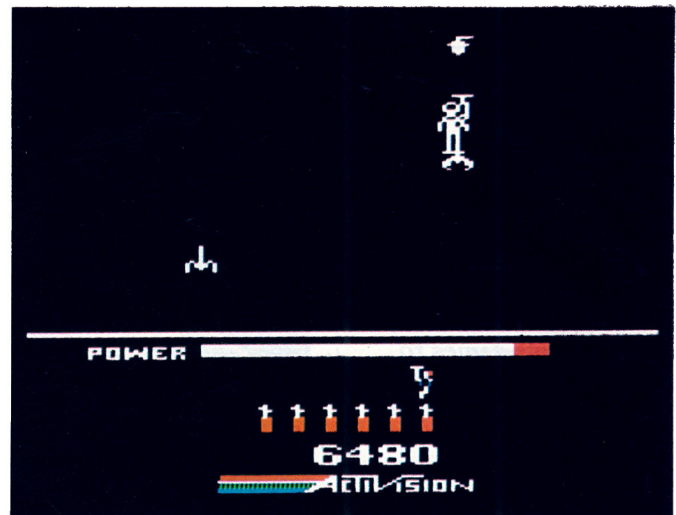
This "lights out" feature is one of the most inventive and effective in the game. As you proceed through the advanced levels, you will enter scenes that remain on screen only a split second, to be replaced by blackness. You can still see the creatures lurking in the caverns, but the passages remain dark. The game is difficult to

by Brian J. Murphy





**Photo 4.** Your H.E.R.O. is on an underground rescue mission. . .



**Photo 5.** . . .when suddenly the lights go out.

master. After an hour's practice you can work your way down to level 4 or 5, but it will be many hours before your four miners (plus any extra you pick—one per 20,000 points) dig as deep as the 20th level and below. You need to learn how to use dynamite safely, how to flee the lava flows, and how to snake through complex mazes.

Is this an original idea? It's original enough to prevent Activision from being taken to court for copyright infringement. The concept of the game should be familiar enough to omnivorous arcade addicts, but I heartily recommend H.E.R.O. for its challenge, smooth action, and unpredictability.

### Felony!



CBS Software  
One Fawcett Place  
Greenwich, CT 06836  
\$34.95  
Any Apple II Plus, //e, or  
//c, 48K

**L**ike mysteries? Silly question—most people adore a good detective story, with twists and turns that would defy even

Sherlock Holmes. CBS Software offers 12 tantalizing brain-teasers in its second mystery game.

**Felony!**—it's got a winner here.

If you can recall a delightful collection of mayhem from CBS called *Murder by the Dozen*, you'll have an idea of how *Felony!* works.

The game presents you, or several of your friends, with a crime to crack—it could be the theft of a precious jewel, a kidnapping, or a murder. Your job is to figure out whodunit and supply a plausible motive for the wrongdoing, plus physical evidence for your suspicions.

Begin by selecting one of 12 crimes. The game shows you a case history of the misdeed. You may go to the scene of the crime, or the homes of suspects and witnesses. Wherever you proceed, you select people to interview and the next place to search for physical evidence.

For each selection you make, a series of numbers appears on screen corresponding to hints in the clue book—the statement of a witness, a piece of physical evidence, or the simple message "No clue."

Each scenario of *Felony!*

is actually what mystery writers call a "police procedural": you solve the case not by flights of intuition (although they can be very helpful), but by the careful collection and thoughtful analysis of the evidence, including witnesses' statements. Make sure you write down all the salient points, especially the names of witnesses and locations to be visited. If you forget to take notes, you may wind up interviewing the same witness twice—and that lowers your score.

Be sure to question every witness who can help you, but try to differentiate between those who have something to say and those who don't—every useless lead you follow lowers your final score. Start with the "hot" leads mentioned in the case summary, especially the ones that arouse your suspicion during interviews.

Look for inconsistencies in the stories witnesses tell. If two witnesses contradict each other, chances are one of them is your suspect.

This is a handsome game, well-supported by the clue book and other documentation materials. It doesn't take long to learn, and its entertainment value is exception-

ally high. As a simulation of actual police work it's right on target in recreating the feel of the job. *Felony!* (the game, not the actual crime, that is) offers excitement, intellectual challenge, and lots of fun. Now get out there and book 'em, Danno.

### Suspect



Infocom  
55 Wheeler Street  
Cambridge, MA 01238  
\$44.95  
Any Apple II, 48K

**R**eporters are seldom asked to nice parties. That's why you, a working journalist, have accepted an invitation to a Halloween masked ball at Ashcroft Farm from your old friend Veronica Wellman.

You find yourself attending a costume party at a mansion belonging to one of the first families of Maryland's "horsey" set. You are dressed as a cowboy. You look rather dowdy beside some of the extravagant outfits at the soiree.

No matter. You decide to play it safe, hanging around the bar and danc-



ing in the main ballroom. Early in the evening you see Veronica spill a drink on her costume, staining it. She rushes out, and you don't see her for the rest of the night. You witness an argument—apparently regarding the price of horses—and watch the wealthy come and go—nothing special.

Late in the evening someone comes and announces that Veronica has been murdered. She has been strangled to death, and her body lies in the office of the estate. It's shocking news, but not nearly as astounding as what happens later: The local police arrive, snap the handcuffs on you, and arrest you for the murder of the lady of the house! You protest that you've been in the ballroom all night and have plenty of witnesses to prove it. No good—you must stand trial and await an uncertain destiny.

That's the story of Infocom's new text adventure, **Suspect**. Don't try to play it safe by avoiding such messy things as murder scenes, skullduggery among the upper classes, and repartorial snooping. To save your skin, you must actively seek out clues to the riddle of who is framing you and why.

I have not yet solved the mystery, but I do have some hints to offer to get you started. First, look for telling facts. The game describes Veronica as heavily veiled, and her voice as indistinct. Could it be that the Veronica in the ballroom was a phony, and the real Veronica has already been murdered as the game begins?

One character furtively threw an object into the ballroom fireplace. Is it something worth singed fingers to save? What are the contents of the ten missing pages of the mystery novel in the mansion library? Who has a motive

to kill Veronica? Her cowering husband? Her catty, jealous friends? You can raise the odds of your survival by snooping around the house and the party, asking about Veronica and finding out who likes her and who doesn't.

Infocom rates this game "advanced"—it's a super-toughie. Time is limited—the police will arrive to arrest you at a predetermined hour. You have only a few minutes to figure out a very tricky puzzle. To add to the atmosphere of genteel violence, the game includes the usual Infocom goodies: an invitation from Lady Veronica, the invoice for your costume, and a magazine story about Maryland's horsey scene in general and your hosts in particular. Read the articles carefully—you may detect a motive. Ask yourself one important question: Who would profit from Veronica's death?

You might come up with a list of suspects early, but producing the evidence to satisfy the police will take all your adventuring skills. Suspect is another great mystery from Infocom, a company that seems unable to write a bad game.

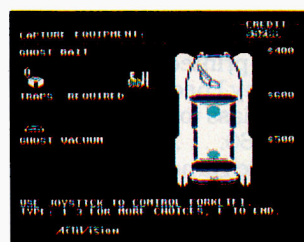
## Ghostbusters



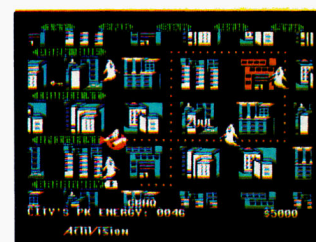
Activision  
P.O. Box 7287  
Mountain View, CA 94039  
\$39.95  
Any Apple II, 48K

If there's something strange in your neighborhood, call the Ghostbusters. If you need a good laugh, catch the movie *Ghostbusters*. If you want to hear a good rocking song, Ray Parker, Jr.'s "Ghostbusters" is better than most.

Then there's the **Ghostbusters** arcade game. It has some nice touches,



**Photo 6.** You'll need a vacuum cleaner for ghostbusting.



**Photo 7.** The city streets swarm with spirits.

but on the whole is disappointing. You build your Ghostbusters franchise with a cute forklift that loads ghost vacuums into your ectomobile. The ghosts comically "slime" your men, and the rampage of mean Mr. Stay-Puft Marshmallow is a riot. The full score of the Ghostbusters theme song—with sing-along lyrics—is included.

Nice details, but Ghostbusters isn't a very good game.

You drive along the city streets, visiting haunted buildings and vacuuming up ghosts along the way (**Photos 6 and 7**). At each haunting your two operatives set out a portable trap, turn on the particle-accelerator beams, and maneuver the spook over the trap. The more ghosts you trap, the more money you make. If you're in the black, you penetrate the Temple of Zuul (**Photo 8**)

once the Keymaster and the Gatekeeper—little lock and key symbols wandering the streets—have met. If you trap no ghosts, the city's PK energies will rise and Mr. Stay-Puft Marshmallow will be released.

Somewhat a fine scenario turns out to be boring and frustrating. The flaw in the design is that once the ghostbusters turn on their particle streams, they can't chase ghosts with them. You can't shorten, lengthen, or separate the streams. And if your timing is a bit off and the ghost isn't below the point of convergence, you lose him and get slimed.

Frankly, learning the basics just takes too long. I'm not talking about success, just the skill to get into the fray—simple timing. It takes no special talent to vacuum up a ghost on the street. You get a dull game.



**Photo 8.** What's behind that creaking door?



### Fifth Eskadra



Simulations Canada  
P.O. Box 452  
Bridgewater, N.S., Canada  
B4V 2X6  
\$60  
Any Apple II, 48K

I like Simulations Canada because it writes war games on off-beat topics. **Fifth Eskadra** is based on a hypothetical war between American and Soviet naval forces in the Mediterranean. It might begin the day after tomorrow—or never—depending on the wisdom of politicians and the flow of the currents of luck in the Middle East. **Fifth Eskadra** has immediacy going for it.

It does not, however, have graphics going for it. This is a "hybrid" game,

with a map sheet and die-cut cardboard counters with printed information so tiny I needed a magnifying glass to read it. All this for \$60. . . .

The game itself is good. It's a less complex, Middle Eastern version of Strategic Simulations' North Atlantic '86. You organize task forces, search for enemy battle groups, and intercept them with ship-to-ship missiles and air strikes. During each turn you can form new task forces, split them, give them new orders, and raise the level of conflict—from rising tensions (no combat), through conventional warfare, tactical nuclear war, and operational nuclear war, to global nuclear war. The side that escalates from one level to the next loses victory points. And if the game moves to that last level, everyone loses.

Until then, keep your powder dry and shadow the enemy task forces. It's a game of cat-and-mouse that calls for some fancy footwork. Would it be to your advantage after all to fire the first shot? No, unless you have overwhelming strength against a cornered enemy.

When combat begins, you automatically hit the other guy with everything you've got. You may choose which enemy force to bombard with air strikes, but combat-ready ships within range of each other will attack without orders. During combat keep your eyes glued to the screen. The action reports come in fast during a battle, and you don't want to miss any important developments.

This game gets high marks for excitement and ease of play, but only a passing grade in graphics and convenience.

Come on, Simulations Canada—even a low-resolution map would be better than pushing counters on a sheet of paper. It's what consumers expect and what other complex games deliver. If you want to be competitive, you have to bite the bullet and go graphics!

### Battle of the Atlantic

No rating

Simulations Canada  
P.O. Box 452  
Bridgewater, N.S., Canada  
B4V 2X6  
\$60  
Any Apple II, 48K

**W**e have little to say about **Battle of the Atlantic**. Bob Ryan (*inCider's* technical editor) and I found that it has an unhealthy tendency to hang up at unpredictable points in play, with no way to recover.

The game itself is supposed to be a strategic

simulation of the war the Axis waged against Britain's sea lifeline in World War II—good idea, but a poor game.

You make up task forces, convoys, wolf-packs, and battle groups, and send them on patrol or escort duty. Once the ships are out, you have no further tactical control over them, except to send a task force on an interception if an enemy fleet is sighted. The action's only a step away from the computer playing itself—forget it.

### Trivia News

A few months ago, while still in the guise of Warden Shiftky, I posed three trivia questions:

1. Who invented Pong?
2. Who invented the Analytical Engine?
3. What was the first application of data punch cards?

I promised to print the answers and the names of those who got all three right. Here we go:

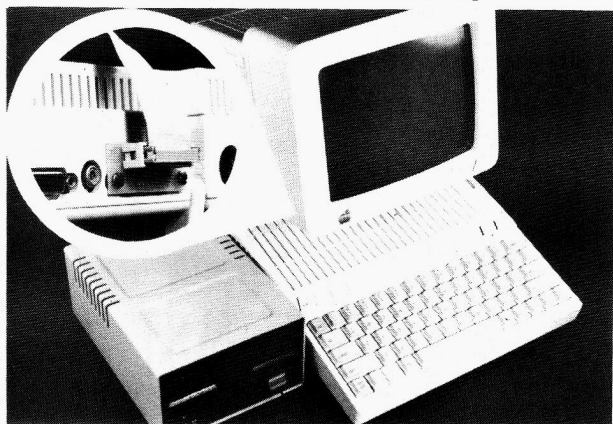
1. Nolan Bushnell, founder of Atari
2. Charles Babbage
3. The programming of the Jacquard loom in early 19th-century France

I've received correct responses from Franklin D. Egolf, Jr., of Elizabethtown, NC; Steve Frank of Dickinson, ND; Vincent Lim of Vancouver, BC; Flavian Stellerine of Trenton, NJ; Bill Dieter of Rochester, MI; and Mark Fung of Tenafly, NJ.

Thanks for responding and for reading the column. I'll print any correct responses that arrived before April 30, 1985. Until next time, aloha. ■

*Brian Murphy is anxious to learn what you think of the present state of computer games. Write to him at inCider magazine, 80 Pine Street, Peterborough, NH 03458.*

### CREATE A SECOND DISK DRIVE FOR YOUR APPLE IIc



Use any disk drive compatible with Apple II+ or IIe to make your IIc more enjoyable, more productive with

### ADAPT-A-DISC

The coupler that attaches in minutes with only a screwdriver. No wires to solder, no hassle with modifying your disk drive.

- **QUICK • EASY** **\$29.95**
- **AFFORDABLE** Texas Residents add sales tax

Apple and the Apple Logo are trademarks of Apple Computer, Inc.

### COMPUTER ACCENTS, Inc.

Mastercard P.O. Box 5307 AC 713  
& Visa Kingwood, Texas 77325 664-9727

If you have a question, our technical editor has the answer. Send your queries about Apple computing to Bob Ryan, Ask inCider, 80 Pine Street, Peterborough, NH 03458.

## Rodentmania

Dear inCider:

I am interested in buying a mouse, and I would like information about products (other than MousePaint) that take advantage of the AppleMouse. I have heard that a mouse, in conjunction with the open-apple and closed-apple keys, is the equivalent of a joystick. Is there any truth to this?

Keith Namoit  
25 Lewis Avenue  
Great Barrington, MA 01230

Dear Keith:

In the October 1984 issue of inCider (p. 76), we published a list of available Apple II programs that use the AppleMouse. Since then, a number of other mouse-driven programs have been released. Check the New Software sections of back issues for details about individual products.

The problem with most of these programs is that they use the mouse in a very cursory (no pun intended) fashion. They do not attempt to replicate the Macintosh/Lisa interface on the Apple II—they merely use the mouse as a substitute for the cursor keys or a joystick.

The reason these programs do not do more with the mouse is that support for the device is not built into most Apple II computers. The only machines that directly support it are the //c and the new enhanced //e. As more //c's are sold, and as more //e owners upgrade to the 65C02 and the new monitor and character-generator ROM's, you will see many more programs that make full use of the Macintosh/Lisa interface.

Using a mouse in conjunction with the open-apple and closed-apple

keys does not take the place of a joystick. While pressing the apple keys produces the same result as pressing the buttons on a joystick, the computer does not handle mouse input the same way it does joystick input—a program that requires a joystick will not necessarily work with a mouse. Most manufacturers, however, are including routines to handle mouse input as an alternative to joysticks.

If you are interested in writing routines to incorporate the mouse into your programs, refer to "The Mouse That Roars," by Bill O'Brien, in the October 1984 issue of inCider (p. 72).

## Right of Assembly

Dear inCider:

I have just begun to learn machine language on my Apple //e, and in a number of books I have come across references to Apple's assembler. When I tried to find out about this assembler in my manuals, I could only find reference to the mini-assembler. Is an assembler built into the //e? If so, how do I call it up, from the monitor or from Applesoft BASIC? If not, are there any assemblers on the market that I could purchase?

I read in your April issue that a chip upgrade is available for the //e. Will software written for the 6502 still work on the 65C02?

Beno Rubin  
3845 Sedwick Avenue  
Bronx, NY 10463

Dear Beno:

Apple supplies three assemblers for the //e. Two of these—the DOS 3.3-based Tool Kit Assembler and the ProDOS Assembler—come on disk. The third, the mini-assembler, comes in two forms: in the new monitor ROM chips that are part of the //e upgrade, and in the Integer BASIC that comes with the DOS 3.3 System Master disk. There are also a number

of third-party assemblers on the market. The most widely used are the S-C Macro Assembler (S-C Software, 2331 Gus Thomasson, Suite 125, Dallas, TX 75228, 214-324-2050), the Lisa Assembler (Lazerware, 925 Lorna Street, Corona, CA 91720, 714-735-1341), Merlin and Merlin Pro (Roger Wagner Publishing, 10761 Woodside Avenue, Suite E, Santee, CA 92071, 619-562-3670), the Microsparc Assembler (Microsparc, 45 Winthrop Street, Concord, MA 01742, 617-371-1660), and ORCA/M (Hayden Software, 600 Suffolk Street, Lowell, MA 01853, 617-937-0200).

With regard to your second question, all software for the 6502 will work on the 65C02. The reason that some software for the //e will not work on the //c is related to other differences in the machines, not to their microprocessor function.

## Pop Go the Keycaps

Dear inCider:

I have an Apple //c and want to make use of the alternate keyboard configuration (Dvorak) that Apple decided to implement on the //c. The Apple //c owner's guide tells you to just flip the keyboard switch and presto! I'd like to know how to remove the keycaps and replace them in a Dvorak layout.

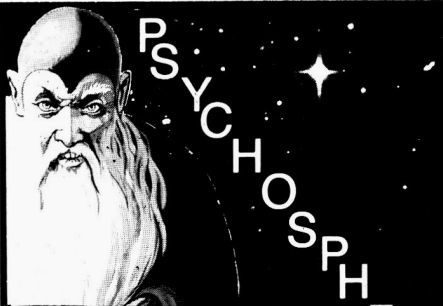
Jeff Gonzalez  
2557 North 62nd Street  
Wauwatosa, WI 53213

Dear Jeff:

Switching keycaps on the //c is easy. First, get a flat-head screwdriver and gently pry the keycaps from the keyboard—they should come off very easily. Next, consult page 17 of the //c owner's guide for a diagram of the Dvorak layout. Finally, replace the keycaps as shown—they simply snap into place. You now have a full-fledged Dvorak keyboard.

**by Bob Ryan, inCider Technical Editor**





INTERACTIVE SPACE  
ADVENTURE FOR THE  
SERIOUS ADVENTURER

THE MIND IS ESSENTIAL  
THINK LIKE AN ALIEN  
CHALLENGE THE ANCIENT EVIL  
SURVIVE A DEADLY WORLD

64K APPLE II+, IIe, IIc  
SINGLE DISK  
\$39.95 plus \$2.00 Handling  
(FL add 5% Sales Tax)

Send Check or Money Order To

SOFTWARE UNLIMITED  
P.O. Box 6361 • Clearwater, FL 33518  
COD 813/797-7815  
Dealer Inquiries Invited

\* APPLE is a trademark of  
Apple Computer, Inc.

### Foreign Computer Stores/ Magazine Dealers

You have a large technical audience that speaks English and is in need of the kind of microcomputer information that CW/Peterborough provides.

Provide your audience with the magazine they need and make money at the same time. For details on selling **80 MICRO**, **inCider**, **HOT CoCo**, **RUN** contact:

**SANDRA JOSEPH**  
**WORLD WIDE MEDIA**  
**386 PARK AVE., SOUTH**  
**NEW YORK, NY 10016**  
**PHONE (212) 686-1520**  
**TELEX—620430**

## Developing Dilemma

Dear *inCider*:

I am a computer professional, and I have been engaged in writing IBM PC software products for the insurance industry. I recently purchased an Apple //c for the development of a new insurance application to which the //c is perfectly matched. However, I am distraught over the lack of information to be found regarding the //c.

My specific questions are:

- 1) Why am I unable to get a copy of the //c BIOS?
- 2) Where can I get some serious information about ProDOS?
- 3) Is there a BASIC compiler that is compatible with ProDOS?
- 4) Because of the product I have developed, Apple has requested that I join its Certified Developer Program. Do you know anything about this program? Would it help relieve some of the problems I am having in obtaining technical information? Apple has sent me literature about this program, but I am just trying to avoid a wild goose chase.

Bob Santoro  
46 Powder Hill Road  
Middlefield, CT 06455

Dear Bob:

I understand your frustration in trying to obtain technical information about the //c. Apple has been very tardy in releasing this material. You can, however, obtain most of the information you need about the basic input-output system of the //c from the reference manual available from Apple.

You can get serious information about ProDOS from a number of sources. Check out Apple's ProDOS Technical Reference Manual and BASIC Programming With ProDOS. You should also take a look at *Beneath Apple ProDOS from Quality Software* (21610 Marilla Street, Chatsworth, CA 91311), and *Inside Apple's ProDOS* from Reston Publishing Company, Reston, VA.

I don't know of any ProDOS-compatible compiler. Perhaps one of our readers out there can help.

The Certified Developer Program is a very good way to obtain the technical assistance you need. Apple has

a good reputation for encouraging third-party developers, and the Certified Developer Program is the centerpiece of this support system.

## Getting a Handle on 128K

Dear *inCider*:

I own an Apple //c with a mouse and an Imagewriter printer. How can I print a hi-res picture with my Imagewriter? Also, can you tell me how I can access the upper 64K of memory in my //c and where I can find a memory map for the //c? Finally, where can I find the book *Beneath Apple DOS*?

Han Pak

Dear Han:

You need a graphics-dump program to print high-resolution pictures. There are a number of such programs available—check with your dealer for details.

You can access auxiliary memory in the //c (and an extended //e) by writing to certain memory addresses on page \$C000. To write to auxiliary memory, you must first POKE any value into \$C005 (49157). To write to main memory, POKE any value into \$C004 (49156). To read from auxiliary memory, POKE location \$C003 (49155). To select main memory for reading, POKE location \$C002 (49154).

You can see where your program is reading and writing by checking two other locations. If the value in \$C013 (49171) is greater than 127, you are reading auxiliary memory. If it is not, you are reading from main memory. The RAM-write status location is \$C014 (49172). If the value there is greater than 127, you are writing to auxiliary memory; if it isn't, you're writing to main memory. Note that these switches affect only the lower 48K of memory in each bank. Check your technical reference manual (//c or //e) for more details and for information about switching the upper 16K of memory. You will find a memory map of the //c in the Apple //c Technical Reference Manual.

You can obtain a copy of *Beneath Apple DOS* from Quality Software (see address above). ■



## Sizing Up Spreadsheets

**S**preadsheets aren't impossible to understand—they just seem difficult at first. Most of the initial problems you might have with spreadsheets arise from their underlying three-dimensional structure; breaking down this conceptual barrier can make learning to use a "calc" program much easier.

### The Manual Approach

"Manual" spreadsheets have existed for some time, and even today most stationery stores still supply them. First used in accounting, spreadsheets have now found their way into a number of other applications because of their simple construction—horizontal and vertical lines dissecting a sheet of paper to create a multitude of small boxes, or cells.

You address each cell by referencing its column and row location, denoted by a pair of Cartesian coordinates—either "row,column" or "column,row." (There is no standard notation.) The first cell position is always the upper left-hand corner of the sheet at "address" 1,1 (or A,A or A,1).

Although they make organizing numeric work easier, manual sheets suffer from a lack of clarity. You can't tell if the entry in any particular cell is a

number or a value derived from a formula. And even if you know that the result you're looking at is derived from a formula, there's no obvious way to discover what formula was used.

You could annotate all of the entries on the sheet, clearly delineating their meaning and origin. But even in a small sheet of 15 columns by 20 rows, that would mean 300 additional entries—and a spreadsheet should make your life easier, not create extra work.

Using a pencil and paper to play with numbers is not simple. If you're lucky, you might have to erase the contents of only one cell. If the value in a cell is part of a formula that affects other cells, however, you might have to erase an entire column or row—or even half the sheet.

**When paper accounting gets out of hand, let your Apple crunch those numbers.**

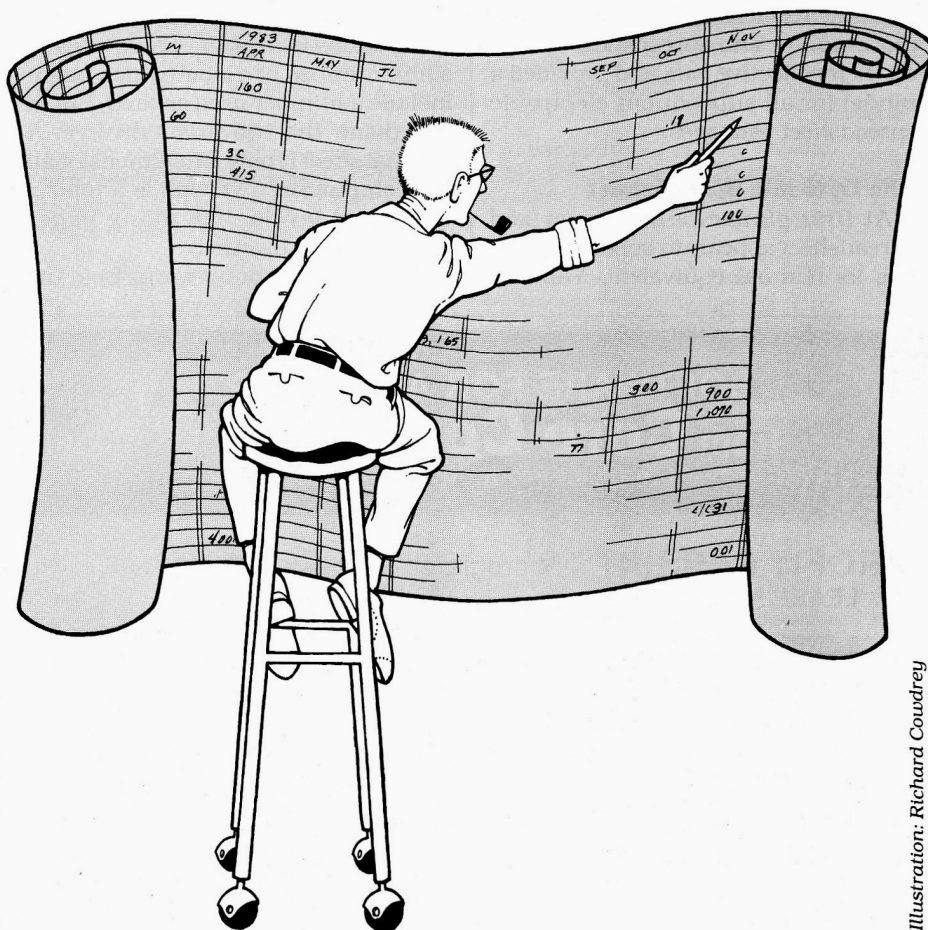


Illustration: Richard Coudrey

**by Bill O'Brien**



You might expect that the introduction of microcomputers would make this process easier. It didn't at first—not until Daniel Bricklin and Robert Frankston created a program called VisiCalc. Its elegant design set the microcomputer and spreadsheet worlds on their collective ears and provided a model for all subsequent electronic spreadsheet packages.

### The Dynamic Spreadsheet

At first glance, a computerized spreadsheet appears to be surprisingly like its manual equivalent. You can

use it for the same variety of purposes, and it's composed of cells addressed in the same row, column or column, row manner. Just as in the manual version, the image you see in a computerized spreadsheet's cell can be any designator—the result of a formula, a single number, or a label (which might include a number used as text). But at this point, the two forms diverge. A manual sheet is only two-dimensional; the computerized version is a matrix of several levels, like many paper sheets stapled together.

Because a computer works from the

instructions you give it, you essentially annotate the sheet as you fill it out. The lowest level, an empty cell, contains the cell's coordinates. A literal copy of the data you enter fills the next layer. The computer then adds a layer describing the type of entry you've made—numeric, text, or formula. On top of that is another layer containing the value of your entry. If the entry is a number, the cell repeats it; if it's a formula, the cell contains its computed value. A text entry is generally given the value of zero.

Most spreadsheets also contain a layer for formatting the entry. Text may be flush left or right, or centered in the cell area. Numbers can appear in as many different formats as the programming allows—for example, standard, decimal (with a user-defined number of decimal places), dollar (with or without commas), or accountant (parentheses used for negative numbers).

The final layer displays the actual image of your entry with all formatting, positional enhancements, and calculations performed. If you enter the formula  $120 * .10$ , for example, and tell the program to display it in dollar format, you'll see \$1.20 as the final result in that cell.

Sometimes, if the spreadsheet has a large number of cells, a minute or more may elapse as the computer calculates formulas, then checks each cell and changes values where appropriate. You may now realize that the "typical" computerized spreadsheet is a fairly complex construction.

### The Material World

If there were only one spreadsheet program on the market, deciding which one to buy would be easy. But advertisements everywhere proclaim each spreadsheet larger than the next: 200 rows by 64 columns, 300 rows by 300 columns. It sounds great, but consider this: A 300-by-300 matrix occupies 90,000 (90K) bytes. If you enter integers only (which have a minimum storage requirement of 2 bytes), 180K of memory is required—in addition to the spreadsheet program's own memory-overhead requirements. Real numbers (with decimals) can be squeezed into 4 bytes, but that's still 360K. The amount is astronomical when you deal with text. And you can't put even

## SOFTWARE FOR ALL OF US from Core Concepts™ Financial-Productivity Series

FREE  
SHIPPING!

NEW!

### PROFIT PURSUIT™ 4 programs on 1 disk. ONLY \$34.95

- 1. LEASE MASTER™:** Find lease payment amounts, pre-tax monthly and yearly yield, total yield. Compute with multiple advance payments and residual value. Print or display lease amortizations starting or stopping at any period.
- 2. PRICING MASTER™:** Find the cost, selling price, mark-up, and margin. Recalculate by changing any entry. Print item name and data. A must for retailers & wholesalers!
- 3. DEPRECIATION + :** Print or display Straight-Line, Declining Balance, Sum-of-the-Years-Digits depreciations. Plus, 3, 5, and 10 year ACRS for personal property, 15 & 18 year ACRS for real estate.
- 4. APR!:** Find the Actual Percentage Rate of loans with prepaid points and fees. APR! will compute the monthly payment amount.

### WORK FORCE II™ 6 programs on 1 disk. ONLY \$34.95.

- 1. THE LOAN ANALYZER:** Compute loan and mortgage amortizations, balloon payments, total interest paid, daily percentage rates, present value of capital leases, and periodic payment amounts. Find an unknown term or the amount which can be financed. Print or display amortizations starting or stopping at any period.
- 2. THE LINE WRITER™:** A line-at-a-time correctable typewriter. Great for addressing envelopes and other small word processing jobs.
- 3. THE BALANCING ACT™:** Checkbook balancing is made easy with this once a month checkbook balancing program. Menus allow entries to be added or changed. Group totals, amount of error, and all entries can be printed or displayed.
- 4. THE CALCULATOR:** Turns your Apple into a four function printing calculator with memory and percent.
- 5. THE SAVINGS ANALYZER:** Compute the future value of savings, IRA's, and investments in moments with The Savings Analyzer.
- 6. THE WAGE ANALYZER:** Analyze your income by the hour, time & 1/2, weekly, bi-weekly, semi-monthly and annually. Calculate increases or decreases by amount or percent. Printout provides a great way to present pay raises to employees.

Greg Glau of InCider says: "Borrowing money is no problem with the loan analysis section to guide you. Work Force II is easy to understand and operate. It's an honest value..." June 1984

Compatible with the Apple IIc, IIe, II+, & II

Call Toll Free

ORDERS ONLY / 24 HOURS

1-800-221-9280

Ext. 979

ALL ORDERS  
SHIPPED  
IMMEDIATELY!

Apple is the trademark of  
Apple Computers Inc.

Since 1983

- ☐ Please send me PROFIT PURSUIT at \$34.95  
☐ Please send me WORK FORCE II at \$34.95  
☐ check or money order ☐ VISA ☐ MC ☐ AE ☐ COD (add \$4.00 for COD)  
 Arizona residents add 6% Sales Tax. Overseas add \$5.00

Card # \_\_\_\_\_  
 Signature \_\_\_\_\_ Valid From \_\_\_\_\_ to \_\_\_\_\_  
 Name \_\_\_\_\_ Phone \_\_\_\_\_  
 Address \_\_\_\_\_  
 City/State/Zip \_\_\_\_\_

Core Concepts

P.O. Box 24157 Tempe, AZ 85282

Product Information (602) 968-3756

DEALER INQUIRIES INVITED



# What you should know about the International Apple Core.

If you're like most Apple users, you don't realize the many benefits of an IAC membership. Or what it can do for you and your computer.

## So what's an IAC?

*International Apple Core*™ is a non-profit organization of Apple users and user groups. We are dedicated to providing education, information and support to users of Apple and Apple-compatible products.

We aren't just for clubs. An individual can enjoy all the special benefits we have been providing user groups since 1979. You may share information on new applications. Or learn the latest on products. Or keep up on Apple events. Even receive specialized training.

If you'd like to join a local user group or contact other Apple enthusiasts, we can help you find them.

A membership  
That pays you.

As a member of IAC you nearly get paid with what you will save. By joining you will save nearly \$20 on our electronic spreadsheet, *IACcalc*™. Not to mention all the other benefits only available to you as a member.

## Information, please.

IAC provides many sources of information. Your \$30 yearly membership fee brings a 12-issue subscription to *Nibble* magazine devoted to Apple systems and compatibles. *Nibble* features more than \$50 worth of ready-to-run Apple programs in each issue. The programs focus on home, business, education and entertainment. *Nibble* also features new products, reviews, tips and techniques for learning more about your Apple and having fun doing it!

You will be eligible to receive the IAC *Disk of the Month*, a subscription to user contributed software. Each disk presents themes like games, education, or a potpourri.

## Get an education.

You'll receive many educational benefits from our software programs. Our 3Pak™ series of theme packaged programs includes Educational, Financial, Games and the popular Logo. We have an Applesoft Tutorial and Education disk which is great for children.

## Support for your Apple and you.

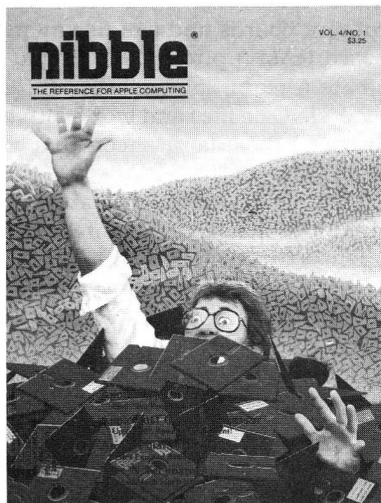
For as little as \$50 annually and no deductible, you can protect your hardware, software and disks for up to \$15,000.

*Attach-Bios* and *CP/M→SOS Converter* are ideal disks for Apple II Pascal and Apple III CP/M® application writers, vendors and users. All documentation is on the disks and no softcard is required to run Converter.

## Invite your friends and save.

IAC offers user groups a special package. For \$90 your group receives a full year IAC membership and a subscription to *Nibble*. Included are the Disks of the Month and a listing of other IAC affiliated user groups world wide.

Individually or as a group you can't lose. So fill out the membership coupon below. And don't forget to ask for our product catalog.



Apple, Apple II, Apple III and SOS are registered trademarks of Apple Computer, Inc.

International Apple Core is Licensed by Apple Computer, Inc. to use certain of the latter's trademarks.

IACcalc and 3Pak are trademarks of International Apple Core. CP/M is a registered trademark of Digital Research.

Nibble is a registered trademark of microSPARC, Inc.

## The companies we keep.

Here is a list of the corporations that support and sponsor the International Apple Core.

Apple Computer Inc., Cupertino, CA  
Brock Software Products, Crystal Lake, IL  
Burtronix, Orange, CA  
Digital Research, Pacific Grove, CA  
East Side Software Co., New York, NY  
Educational Software Products, Glencoe, IL  
Electronic Arts, San Mateo, CA  
General Microcomputer, Inc., Michigan City, IN  
Hayes Microcomputer, Norcross, GA  
Houston Instrument Division, Austin, TX  
Howard D Sams Co. Inc., Indianapolis, IN  
M&R Enterprises, Santa Clara, CA  
Macworld, San Francisco, CA  
MultiTech Systems, Inc., New Brighton, MN  
Nestar Systems, Inc., Palo Alto, CA  
Nibble/microSPARC, Inc., Lincoln, MA  
Source Telecomputing, McLean, VA  
Sundex Software Corporation, Boulder, CO  
Turning Point Software, Watertown, MA  
Vagabondo Enterprises, Aptos, CA  
Verbatim Corporation, Sunnyvale, CA

Circle 157 on Reader Service Card.

## Membership Application

- ☐ \$30 U.S. Individual  
☐ \$40 Canada & Mexico Individual

- ☐ \$72 International Individual  
☐ \$90 U.S. User Group Package  
☐ \$152 International User Group Package

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State/Zip \_\_\_\_\_ Country \_\_\_\_\_

All Memberships Include  
a 12-Month Subscription to *Nibble*.  
Please allow 6 to 8 weeks for the  
delivery of your first *Nibble*.



INTERNATIONAL  
APPLE CORE™

Membership Dept 1-04  
467 Saratoga Ave. Ste. 228  
San Jose, CA 95127  
Membership orders: 408-988-4484  
General information: 408-727-7652

- ☐ Payment enclosed (U.S. funds only)  
☐ VISA ☐ MasterCard  
☐ Please send your product catalog.

Charge Card No.

□□□□□□□□□□□□□□□□

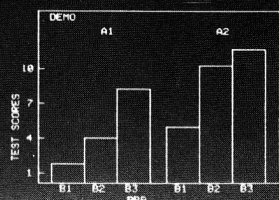
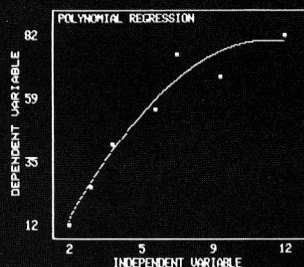
Interbank No. Expiration Date

□□□□ □□ □□ □□  
MO DAY YEAR

Signature \_\_\_\_\_



# THE STATISTICS SERIES



**Statistics Made Simple  
Run Analysis Immediately  
With The Statistics Series**

**STATS PLUS \$200**

Complete General Statistics Package  
Research Data Base Management  
Parametrics and Nonparametrics  
Correlation, Regression

**REGRESS II \$150**

Complete Multiple Regression Package  
Stepwise, Simultaneous Solutions  
Power Polynomial Solutions

**ANOVA II \$150**

Complete Analysis of Variance Package  
Analysis of Covariance, Randomized Designs

Apple II 48K, 1 or 2 Disk Drives,  
DOS 3.3, ROM Applesoft



**HUMAN SYSTEMS DYNAMICS**

To Order—Call (800) 451-3030  
(818) 993-8536 in CA

or Write

HUMAN SYSTEMS DYNAMICS  
9010 Reseda Blvd., Suite 222  
Northridge, CA 91324



180K of data on a 140K Apple floppy.

Variety of arithmetic features is another consideration in your purchase. Most programs support all the low-level math functions—addition, subtraction, multiplication, and division. Some offer higher functions (such as sine, cosine, and absolute value) and accounting functions (net present value, mean, and standard deviation). The larger the number of features, the higher the price—save some money and buy a spreadsheet that includes only the features you want.

If you're looking for a program for personal use—to help with the monthly budget—IACalc from the International Apple Core may be just what the doctor ordered. It works with most 80-column boards and can use memory-board RAM (up to 512K), so you can create a giant spreadsheet. It'll even read VisiCalc files and work with hard disks, for those large sheets that won't fit on your floppy.

VisiCalc is still around, and there's also Multiplan. One advantage of Multiplan is that it prints the lines forming the cells. If you're sending your spreadsheet to the IRS as part of your tax statement, ruled (lined) paper is required.

SuperCalc 3a from Sorcim/IUS (for the //c or the //e with an 80-column card and Apple's upgrade kit) uses the new ROM's and 65C02 (CMOS) processor available from Apple. The program also supports business graphics to help emphasize your statistical data. SuperCalc 3a requires a minimum of 128K of RAM.

So take the plunge. Once you've learned how to use them, electronic spreadsheets offer convenience, organization, and precision. They're ideal tools for the management of your home and business finances.

## IN THE NEWS

Almost one year behind schedule, Apple released its LCD screen for the //c. It hit the market with a whimper and a pop, greeted by all as old technology and no great improvement in readability over past offerings from other vendors. It does make the //c more transportable, but other than that, there's little justification to spend your money on it.

You'll probably hear that the LCD has a problem. It does and it doesn't. If you're using it in single high resolu-

tion and in mixed text and graphics mode, the leftmost row of dots on the screen is distorted. Apple has tested more than 100 programs on the screen, however, and found that none of them uses that particular combination of modes. At first I thought it was a cover-up—single high resolution in mixed text and graphics modes just had to be common. Except for some games, though, I couldn't think of any. So if you hear anyone giving Apple a bad time about the screen, you might tell them the facts.

Also noteworthy is a recent IBM development. After a solid week of chiding Apple on its closing of three production facilities for a week to let inventory levels drop, journalists finally got a chance to take a shot at IBM. Big Blue has ceased production of the PCjr owing to lack of interest. This follows four months of media praise after the company "turned around declining Junior sales by redesigning the computer to better address its market."

Has anyone forecasted a downward trend in IBM stock or expressed concern about its fate? No. Has anyone mentioned IBM's financial loss almost since the day the Junior was released? No. Why would any journalist want to engage in speculative reporting about IBM when no one at the company will talk about the issues long enough to even lay the groundwork for a misconception? I guess the moral of the story is that if you want a company no one will criticize no matter what it does, name it IBM.

## COPY PROTECTION

Copy-protected software has always been a sore point with me. It's frustrating and promotes the growth of a cottage industry—as soon as a new system materializes, hackers immediately see who can break the protection first.

That's why I was pleased to receive a press release from the folks at StoneWare—the company has dropped the copy protection on DBMaster. I can't resist saying it was overdue—the copy-protection scheme was causing problems with disk reliability. I also can't resist applauding the firm for its decision to market a copyable version.

For companies to continue to offer non-protected software, users must refrain from distributing bogus copies.



Overall software prices will drop if program sales remain healthy.

### NEXT MONTH

Whatever you do, don't miss my August column. It's a little different, and I'll have some startling news for *in-Cider* fans. See you next month. ■

Contact Bill O'Brien at P.O. Box 1010A, Fort Lee, NJ 07024 or through Compu-Serve at user ID 74216,1215.

## Product Information

### DOS 4.0

Rune Software  
Suite 214  
80 Eureka Square  
Pacifica, CA 94044  
(415) 355-4851  
\$95

Reader Service Number 442

### IACcalc

International Apple Core  
908 George Street  
Santa Clara, CA 95050  
(408) 727-7713  
\$49.95

Reader Service Number 443

### Multiplan

Microsoft  
10700 Northup Way  
Bellevue, WA 98004  
(800) 426-9400  
(206) 828-8088  
\$95

Reader Service Number 444

### SuperCalc 3a

Sorcim/IUS  
2195 Fortune Drive  
San Jose, CA 95131  
(408) 942-1727  
\$195

Reader Service Number 445

### VisiCalc

VisiCorp  
2895 Zanker Road  
San Jose, CA 95134  
(408) 946-9000  
\$400

Reader Service Number 446

# A computer store's service at mail-order prices.

**Because we're both.**

Our commitment to service is why so many private individuals, schools and Fortune 1000 companies choose Micro City. If in the Chicago area, please visit us at 24W500 Maple Ave., Naperville.



#### HARDWARE FOR APPLE

##### DISK DRIVES FOR APPLE

Super 5 Direct Slim Drive  
II+, //e ..... \$169  
Super 5 Dir. Slim Drive //e ..... 175  
PACE AP-50 Full Height. II+,  
//e ..... 159  
PACE AP-50 Full Hgt. //e ..... 165  
Remington Rand Floppy Drive,  
Mac ..... 299

##### GENERIC HARDWARE

16K Ram, II+ ..... 42  
Z-80 Card, II+, //e ..... 42  
Cooling Fan, 2 outlets, Surge  
Protect, II+, //e ..... 35  
Joystick, fire button, (Spec. II+  
//e) ..... 29  
Computer Case, II+ ..... 59  
Replacement Keyboard, II+ ..... 69  
Case w/built-in Numeric  
Keypad ..... 119  
RF Modulator ..... 19

Power Strip, Surge Protect,  
6 Outlets ..... 19  
ADVANCED LOGIC SYSTEMS  
CPM Card, II+, //e ..... 269  
Business Card T-Maker,  
w/II+, //e ..... 299  
Z Engine II+, //e ..... 139  
Smarterm II, II+, //e ..... 129  
Dispatcher II+, //e ..... 109  
Printer Mate, II+, //e ..... 69

ALPENLITE  
Mac Pro Carrying Case ..... 59  
//e Pro Carrying Case ..... 59

APPLIED ENGINEERING  
CALL

CH PRODUCTS  
Mach II Joystick (Spec. II+,  
//e, //c) ..... 38  
Mach III w/fire button (Spec. II+,  
//e, //c) ..... 45  
Paddletick Spec. II+, //e, //c ..... 38

CALIFORNIA COMP. SYS.  
Clock Calendar ..... 95  
7711 Async Ser. Interface ..... 99

DISC WASH  
Printer Port Adaptor, //e ..... 99

KENSINGTON MICROWARE  
System Saver Fan, II+, //e ..... 65  
Accessories: Surge protect ..... 45  
Accessories: Starter Pack ..... 79

KOALA TECHNOLOGIES  
Koala Pad w/SFT, //e, //c ..... 69  
Muppet Learning Keys w/SFT,  
//e, //c ..... 55  
Gibson Light Pen ..... 149  
MacVision Digitizer ..... 219

MICRO SCI  
80 Col w/64K, //e ..... 109

#### MICROSOFT

SoftCard II ..... \$249  
Premium SoftCard //e ..... 269

#### MICROTEK

Dumpling-GX ..... 79  
Dumpling Interface w/16K ..... 159  
64K Ram Card, II+, //e ..... 159  
128K Ram Card II+, //e ..... 219  
Magnum 80me 80 Col w/64K,  
//e ..... 119

#### MITSUBA

80 Col w/64K, //e ..... 99

#### MOUSE SYSTEMS

A+ Mouse, //e, Mac ..... 89

#### ORANGE MICRO

Grappler +, II+, //e ..... 89  
Buffered Grappler +, II+,  
//e ..... 159  
Bufferboard II+, //e (Spec. your  
Interface) ..... 89

#### PERSONAL COMP. PROD.

Appli-Card 6 MHz/64K  
memory II+, //e ..... 249  
Appli-Card 6 MHz/64K RAM  
Extender II+, //e ..... 359

#### PRACTICAL PERIPHERALS

GraphiCard (Graphics int.) ..... 79  
SerIAL (RS 232) ..... 109  
Switchport for //e ..... 89  
Pro Clock ..... 109

Microbuffer II, spec. printer  
16K spec. par/ser ..... 109  
32K spec. par/ser ..... 119  
Microbuffer II+ (both par & ser)  
16K ..... 139  
32K ..... 149  
64K ..... 169

Microbuffer In-Line External  
32K (spec. par/ser) ..... 189  
64K (spec. par/ser) ..... 219  
Microbuffer/E Internal for Epson  
Printers

16K Parallel ..... 119  
32K Parallel ..... 139  
64K Parallel ..... 179  
8K Serial ..... 119  
16K Serial ..... 129  
32K Serial ..... 149

QUADRAM  
eRam 80 (80 Col, 64K, //e) ..... 109

SWEET MICRO SYSTEMS  
Mockingboard A (Music) ..... 89  
Mockingboard B (Speech) ..... 79  
Mockingboard C (A+B) ..... 139  
Mockingboard D, //e ..... 159

TG PRODUCTS  
Paddles (spec. II+, //e) ..... 32  
Select-a-Port ..... 39  
Track Ball ..... 49

#### TITAN SYSTEMS

64K Ram Card ..... \$159  
128K Ram Card ..... 199  
64K + 80 Col, //e ..... 199  
128K + 80 Col, //e ..... 289  
192K + 80 Col, //e ..... 349  
Accelerator //e, II+, //e ..... 229

#### TRACK HOUSE

Programmable 10-Key Numeric  
Keypad for //e ..... 139

#### VIDEX

Ultraterm (132 Col) ..... 249  
Videoterm VT600 (80 Col) ..... 189  
VT601 (80 Col + SS) ..... 209  
VT602 (80 Col SS + Inv) ..... 219

Lower Case Chip ..... 25  
Visicalc Preboot ..... 45  
Apple Writer II Preboot ..... 22  
Ult. Visicalc Preboot ..... 54  
Ult. Applewriter Preboot ..... 24

#### PRINTERS

ABATI  
LQ Parallel ..... 329

BROTHER  
HR-15XL, LQ spec. par/ser ..... 369  
HR-35P, Letter Quality ..... 759

COMREX (Div. of Epson)

CR-IIe, LQ parallel ..... 369  
CR-IIe LQ serial ..... 379  
Keyboard ..... 169  
Tractor ..... 99

EPSON  
CALL

NEC SPINWRITER

NEC 3510, Serial ..... 1199  
NEC 3530, Parallel ..... 1199  
Bi-Dir. Tractor, 3500 Series ..... 179  
Cut Sheet Feed, 3500 Series ..... 729

OKIDATA  
CALL

PANASONIC  
KX-P1090, Parallel ..... 219  
KX-P1091, Parallel ..... 299  
KX-P1092, Parallel ..... 389  
KX-P1093 Par/Ser ..... 539

SILVER REED

EXP-400 LQ (spec. Par/Ser) ..... 259  
EXP-500 LQ (spec. Par/Ser) ..... 309  
EXP-550 LQ (spec. Par/Ser) ..... 409  
EXP-770 LQ (spec. Par/Ser) ..... 689

TOSHIBA

P1340 LQ (spec. Par/Ser) ..... 589  
P1351 LQ (spec. Par/Ser) ..... 1249  
P351 LQ, Par. .... 1269  
P1351 Bi-Direct Tractor ..... 159  
P1351 Auto Sheet Feeder ..... 699

#### MONITORS

AMDEK  
V300 Green ..... 139  
V300A Amber ..... 149  
Color 300 (Comp) ..... 249  
Color 500 (RGB Comp) ..... 329  
Color 600 Hi Res RGB ..... 419  
Color 710 Super Hi, RGB ..... 539

#### COMREX (Div. of Epson)

CR-5650, Green or Amber ..... 109  
CR-6700 Hi Res RGB ..... 399

#### SAMSUNG

MD1251D, Hi Res, Green ..... 115  
MD1251D Hi Res, Amber ..... 119  
CD1451D Color Comp ..... 229

#### TAXAN

12" Hi Res Amber ..... 139  
12" Hi Res Green ..... 129  
210 Color (RGB/Comp) ..... 259  
410-864 RGB Int. II+ ..... 79  
410-864 RGB Int. //e ..... 189

#### MODEMS

HAYES  
Smartmodem 300 ..... 159  
Smartmodem 1200 ..... 389  
Smartmodem 2400 ..... 619  
Micromodem //e w/SFT ..... 159  
Smartmodem 300 w/SFT,  
//e ..... 179

KENSINGTON MICROWARE  
Accessories: Portable Modem  
for Mac, //e ..... 109

NOVATION

Smart Cat Plus 300/1200 Baud  
w/Software for Mac ..... 299  
J-CAT ..... 89  
Apple CAT II ..... 189  
212 Apple Cat Upgrade ..... 219  
212 Apple Cat System ..... 349  
Expansion Module ..... 29.95  
Touch Tone Receiver ..... 79.95  
Firmware ROM ..... 25.95

PROMETHEUS

Promodem 1200 Ext. .... 309  
Promodem 1200A w/Software for  
II+, //e ..... 309  
Promodem 1200 w/Mac Pac. .... 399  
Promodem 1200 w/SFT, //e ..... 359

ZOOM TELEPHONICS  
Zoom Modem //e Apple ..... 139

#### DISKETTES

BASF  
SS DD Box of 10 ..... 17.95  
SS DD 3.5" Box of 5 ..... 17.95

BONUS

SS DD Box of 10 ..... 17.95

MAXELL

SS DD Box of 10 ..... 19.00

VERBATIM

SS DD Box of 10 ..... 19.95

DS DD Box of 10 ..... 26.95

SS DD 3.5" Box of 10 ..... 34.95

Disk Drive Analyzer ..... 29.95

Disk Drive Head Clean. Kit ..... 8.95

Cleaning Diskettes - 10 ..... 12.00

XIDEX

SS DD Box of 10 ..... 15.95

DS DD Box of 10 ..... 16.95

#### SOFTWARE

PLEASE CALL!

Please call for FREE catalog  
and CURRENT LOW PRICES!

1-800-548-8244 (Order Line)

312-810-0037 (Customer Service, Product  
Information & Illinois Orders)

Hours: Mon - Fri 8:30 - 5:30, Saturday 10 - 4

Check, money order, Visa, MasterCard or American Express (include # & exp. date). \$2.50 shipping & handling in Continental U.S. (Alaska, Hawaii & foreign add 5%, min. \$5.00). Personal/company checks allow 2 weeks. Please add 2% for credit card use. Illinois residents add 6.25% sales tax. School & corporate P.O.'s welcome. Dealer inquiries invited. Prices subject to change.

Micro City →





Here are 130 reasons to buy at Elek-Tek, not to mention the fastest delivery anywhere.

#### PRINTER ACCESSORIES

1. **FR 192**  
Epson 80 col. ribbon . . . \$ 3.50
2. **FR 193**  
Epson 132 col. ribbon . . . 5.00
3. **FR 153A**  
OKI & Gemini Ribbon . . . 2.50
4. **FF 7353**  
80 col. printer stand (metal) . . . 15.00
5. **FF 7354**  
132 col. printer stand (metal) . . . 18.00
6. **CB 5609**  
IBM PC to Epson cable, 8 ft. . . 20.00

#### PRINTER BUFFERS

7. **DDP-16**  
16K Par/Par. (exp. to 64K) . . . 70
- QUADRAM**
8. **QRMP8**  
8K Parallel/Parallel . . . 125
  9. **QRMP8S**  
8K Parallel/Serail . . . 139
  10. **QRMP8P**  
8K Serial/Parallel . . . 139
  11. **QRMP8S**  
8K Serial/Serail . . . 139

#### POWER PROTECTORS

12. **PowerMite PG600-S9**  
6 outlet Surge Suppressor . . . 30
13. **ISOBAR 8**  
8 outlet Surge Suppressor . . . 50

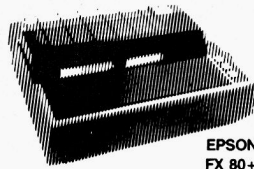


#### Standby Power Systems

Protects your computer hardware and data when the power goes out.

14. **400VA (3.3A)** . . . 475
  - Transfertime—4-6 Mil. Sec.
  - Waveform—rectangular
  - Runtime—up to 24 min.
15. **1000VA** . . . 875
  - Switches to battery powered back-up in 1/2 mil. sec.
  - Clean sine wave output
  - AC line synchronized
  - Regulated output voltage
  - Surge Suppression
  - EMI/RFI filter

**Save 30% to 43%**  
off Manufacturer Suggested Retail prices on  
**EPSON • Okidata • Star**  
**• TOSHIBA • COMREX • OLYMPIA**



**EPSON®**

EPSON  
FX 80+

16. **LX 80/** . . . \$ 240
17. **Homewriter (Inc. Int)** . . . 260
18. **FX 80+** . . . 345
19. **FX 100+** . . . 490
20. **FX 85/FX 185** . . . CALL
21. **LQ 1500 parallel** . . . CALL
22. **Comrex II Comriter** . . . 309

**Star**

42. **SG 10** . . . 235
43. **SD 10/15** . . . CALL
44. **SR 10/15** . . . CALL

**OKIDATA**

45. **Oki 182** . . . CALL
46. **Oki 192/193** . . . CALL
47. **Oki 84** . . . CALL

#### OTHER PRINTERS

48. **Olympia Compact 2** . . . \$ 399
49. **Olympia Compact RO** . . . CALL
50. **Toshiba P351** . . . 1250
51. **Toshiba P1340** . . . 575

#### HEWLETT-PACKARD

71. **HP-71B Computer** . . . \$ 399
72. **HP-82400A**  
Series 70 card reader . . . 125
73. **HP-82401A**  
HP-IL interface . . . 95
74. **HP-82402A**  
4K memory module . . . 60
75. **HP-82700A**  
8K memory module . . . 150
76. **HP-82441A**  
Assembly/Forth . . . 120
77. **HP-82480A**  
HP-71 math pac . . . 75
78. **HP-82482A**  
HP-71 finance pac . . . 60
79. **HP-82483A**  
Surveying Pac . . . 120
80. **HP-82484A**  
Curve Fitting . . . 75
81. **HP-82485A**  
Text Editor . . . 60
82. **HP-82488A**  
Data Com. Pac . . . 120

#### SPECIAL PURCHASE



**HP-41C**  
**\$105**

While Limited Quantities Last

84. **HP-41CV** . . . \$168
85. **HP-41CX** . . . 245
86. **Optical Wand** . . . 95
87. **Card Reader** . . . 145
88. **Printer** . . . 283
89. **Quad R A M. (for HP41C)** . . . 60
90. **Ext. Memory Module** . . . 60
91. **Ext. Function Module** . . . 60
92. **Time Module** . . . 60
93. **HP-IL Loop Module** . . . 95
94. **Digital Cassette Drive** . . . 400
95. **Printer/Plotter (HP-IL)** . . . 335
96. **HP-2225B**  
ThinkJet Printer . . . 375
97. **HP-9114A**  
Disk Drive . . . 600

#### SLIMLINE Shirt-pocket Styled Power Packed Programmable LCD PROBLEM SOLVERS

98. **HP-11C**  
Scientific . . . 58
99. **HP-15C**  
Scientific . . . 90
100. **HP-12C**  
Financial . . . 90
101. **HP-16C**  
Programmer . . . 90



## HUGE SAVINGS ON DISKETTES

#### DISKETTE ACCESSORIES

128. **F 320 3 1/2" Head Cleaning Kit (20 cleanings)** . . . 22.00
129. **MM 5 Media Mate Holds 50 5 1/4" disks** . . . 10.00
130. **MM 3 Media Mate-Holds 30 3 1/2"** . . . 9.00

**DISKETTES**  
Call for  
**Quantity pricing**  
for 10 boxes  
or more

**Dysan**

**maxell**

**3M**

**SONY**

**wabash**

**MEMOREX**

	Dysan	maxell	3M	SONY	wabash	MEMOREX
3 1/2" SSDD	29.00	27.00	34.00	27.00	26.00	—
DSDD	—	37.00	44.00	37.00	—	—
5 1/4" SSDD	19.00	15.50	15.50	15.00	12.00	13.00
DSDD	24.00	20.00	19.00	18.00	13.00	16.00
SSDD96TPI	29.00	28.00	—	—	—	—
DSDD96TPI	40.00	35.00	29.00	—	—	—
5 1/4" DSDDHD (For IBM AT)	50.00	44.00	—	—	—	—
8" SSDD**	27.00	32.00	25.00	—	—	—
8" DSDD**	32.00	37.00	20.00	—	—	—

\*\*Unformatted

CALL TOLL FREE 800-621-1269 EXCEPT Illinois, Alaska

**ELEK-TEK, inc.**

6557 N. Lincoln Ave. Chicago, IL 60645  
(312) 631 7800 (312) 677 7660

Corp. Accts. Invited. Min. Ord. \$15.00. Visa or MasterCard by Mail or Phone. Mail Cashier's Check, Mon. Ord., Personal Check (2 wks. to clear) Add \$4.00 1st item. (AK, HI, PR, Canada add \$10.00 first item) \$1.00 ea. add'l ship. & handl. Shipments to IL address add 7% tax. Prices subj. to change. WRITE for free catalog. RETURN POLICY: Defective Only. Most products replaced within 30 days of purchase with identical merchandise only. Computer and large peripherals replaced only when defective on arrival (within 3 work days of delivery). Other problems covered by mfr. warranty. ALL ELEK-TEK MERCHANDISE IS BRAND NEW, FIRST QUALITY AND COMPLETE. Delivery subject to availability. DUNS #09-718-0517

# DATA-GRAM

**A COLLECTION OF FREE OR INEXPENSIVE  
DATA BASES AND MONEY-SAVING TIPS FOR  
GOING ON-LINE.**

by Matthew Lesko

## On-line Extravagance?

Tired of paying a premium for on-line information you can usually obtain elsewhere? FAPRS, a Control Data Corporation (CDC) data base, identifies approximately 1000 federal government programs that give money to individuals and organizations. CDC charges \$16 per hour plus 26 cents per central processing unit. In most instances, the federal government will run the same data base for you off-line and send you a free printout. To locate an access point near you, contact General Services Administration, Federal Programs Branch, 1825 Connecticut Avenue NW, Washington, DC 20009, (202) 673-5302.

## For Adults Only

Turn to XNET, a computerized classified-personal ads section with topics concerning romance, relationships, and entertainment. XNET charges \$5 per month, and on-line fees range from \$7 to \$16.50 per hour depending on the time of day. For more information, use your modem to call (516) 549-0845. You can also contact XNET Computer Services at P.O. Box 2365, Halesite, NY 11743, (516) 549-0811.

## Catchy Names

Investigate the name appeal behind personal and professional bulletin boards like Critical Mass, Dial Your Match, The Doctor's Office, Modem Magazine, On Broadway, and Children's Apple Tree. With your modem, call (415) 674-0660 for a listing of 185 Bay area bulletin boards.

## Life's Finer Things Are On-line

Antiques, art, exotic real estate, and purebred pets are as close as your telephone. The Collectors' Data Service provides buyers and sellers of the world's finest collectibles with a comprehensive, affordable communications link. Listings cover rare, exceptional merchandise in more than 20 categories. A monthly newsletter is included. There are no initiation fees or monthly minimums. Connect charges are \$16.80 per hour between 7 a.m. and 6 p.m. Monday through Friday, but only \$8.40 during other times with the local phone numbers provided. The Collectors' Data Service is located at 420 West Mercer, Seattle, WA 98119. Call (800) 435-0100, and in Washington, (206) 281-7273.

## Download Transformation

Take a downloaded file from Dialog—or practically any other information utility—and transform it into a readable report with Biblio-Link and The Professional Bibliographic System. Biblio-Link is a utility that takes a downloaded file from an information service and makes it readable for a data-base management package called the Professional Bibliographic System. This system lets you shape data and produce reports just as other data-base management systems do. Biblio-Link costs \$195 per utility used. The Professional Bibliographic System costs \$395. Contact Personal Bibliographic Software, P.O. Box 4250, Ann Arbor, MI 48106, (313) 996-1580.

## Campus Capers

For those who can't make it to campus, the New York Institute of Technology provides on-line courses for credit toward bachelor's degrees in business administration, behavioral science, and general studies. Tap into a free on-line catalog: call your local Telenet number (call 800-336-0437 if you don't know it), type in C 51630 after the @ prompt, then type "College" after the welcome message. The Center for Adult and Professional Education has more information at the New York Institute of Technology, Old Westbury, NY 11568, (516) 686-7924.

*Editor's note: If you can't connect with one of these data bases, it may be temporarily—or permanently—off the air. Many data bases are non-commercial ventures and can encounter financial difficulties. Feel free to contact Matthew Lesko if you continue to run into obstacles. ■*

---

Matthew Lesko is the founder and president of Information USA, Inc., a computer data-base consulting and publishing company. He is the author of seven information books—two of which made the New York Times best-seller list. For a free copy of his newsletter on computer data bases, write to Information USA, Inc., 4701 Willard Avenue, #1707, Chevy Chase, MD 20815, or call (301) 657-1200.



# inCider

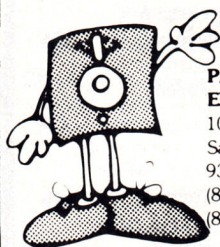
## Reader Service

To receive more information on the products and services advertised in this issue, please turn to reader service card.

Circle 31 on Reader Service Card.

### MEMOREX FLEXIBLE DISCS

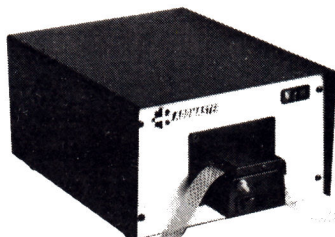
**WE WILL NOT BE UNDER-SOLD!!** Call Free (800)235-4137 for prices and information. Dealer inquiries invited and C.O.D.'s accepted.



**PACIFIC EXCHANGES**  
100 Foothill Blvd.  
San Luis Obispo, CA  
93401 In Cal. call  
(800)592-5935 or  
(805)543-1037



Circle 168 on Reader Service Card.



**RS232C Computer compatible  
Paper Tape Transmitter/Model 612**

Stops and starts on character at all speeds, uses manual control or X-on, X-off 90-260 volt, 50-60 Hz power. 50-9600 baud, up to 150 char/sec synchronous or asynchronous; gated internal or external clock, RS 232C, current loop or parallel output, reads 5-8 level tape, 7-11 frames per character, even or odd parity. Desk top or rack mount.

Addmaster Corporation, 415 Junipero Serra Drive,  
San Gabriel, CA 91776, (818) 285-1121, Telex 674770  
Addmaster SGAB.

## Coming Attractions

- **Apple languages: Which one is best for you?**
- **Pascal Primer: Tom Swan begins his Pascal tutorial column in August. Don't miss it!**
- **SuperCalc 3a—will it make Apple owners forget about Lotus 1-2-3?**
- **Take your Apple //c for a ride**
- **Simplify your correspondence with our small—but powerful—envelope addresser**
- **Do you have what it takes to explore the Pyramids of Egypt?**
- **Hints and Techniques: Text-Screen Tricks and Superfriendly Menus**



# inCider

*inCider* magazine is published monthly by CW Communications/Peterborough, Inc. Entire contents copyright 1985 CW Communications/Peterborough, Inc. No part of this publication may be reprinted, or reproduced by any means, without prior written permission from the publisher. All programs are published for personal use only. All rights reserved.

*inCider* is a member of the CW Communications/Inc. group, the world's largest publisher of computer-related information. The group publishes 53 computer publications in 24 major countries. Nine million people read one or more of the group's publications each month. Members of the group include: Argentina's *Computerworld/Argentina*; Asia's *The Asian Computerworld*; Australia's *Computerworld Australia*, *Australian Micro Computerworld*, *Australian PC World*, and *Directories*; Brazil's *DataNews* and *MicroMundo*; China's *China Computerworld*; Denmark's *Computerworld/Danmark* and *MicroVerden*; Finland's *Mikro*; France's *Le Monde Informatique*, *Golden (Apple)*, and *OPC (IBM)*; Germany's *Computerwoche*, *Microcomputerwelt*, *PC Welt*, *Software Markt*, *CW Edition/Seminar*, *Computer Business*, and *Commodore Magazine*; Italy's *Computerworld Italia*; Japan's *Computerworld Japan* and *Perso ComWorld*; Mexico's *Computerworld/Mexico* and *CompuMundo*; Netherlands' *CW Benelux* and *Micro/Info*; Norway's *Computerworld Norge* and *MikroData*; Saudi Arabia's *Saudi Computerworld*; Spain's *Computerworld/Espana* and *MicroSistemas*; Sweden's *ComputerSweden*, *MikroDatorn*, *Min Hemdator*, and *Svenska PC World*; the UK's *Computer Management* and *Computer Business Europe*; the U.S.' *Computerworld*, *HOT CoCo*, *inCider*, *InfoWorld*, *MacWorld*, *Micro Marketworld*, *PC World*, *RUN*, *73 Magazine*, and *80 Micro*.

**Problems with Advertisers:** Send a description of the problem and your current address to *inCider*, Route 101 and Elm Street, Peterborough, NH 03458, attn. Rita Rivard, Customer Service Manager. If urgent, call (800) 441-4403.

**Problems with Subscriptions:** Send a description of the problem and your current and/or most recent address to: *inCider*, Subscription Department, P.O. Box 911, Farmingdale, NY 11737. Or call (800) 645-9559, (800) 732-9119 in New York, between 9 a.m. and 5 p.m. E.S.T., Monday through Friday. If you have a problem with payment, please have your mailing label and your cancelled check or credit card statement in front of you.

**Change of Address:** Send an old label or a copy of your old address and new address to: *inCider*, P.O. Box 911, Farmingdale, NY 11737. Please give eight weeks' advance notice.

**Microfilm:** This publication is available in microform from University Microfilms International, United States address: 300 North Zeeb Road, Dept. P.R., Ann Arbor, MI 48106. Foreign address: 18 Bedford Row, Dept. P.R., London, WC1R4EJ, England.

**Dealers:** Contact Raino Wirein, Direct and Newsstand Sales Manager, *inCider*, Route 101 and Elm Street, Peterborough, NH 03458. Call (800) 343-0728.

**Back Issues:** Send \$3.50, plus \$1.00 postage for each copy to *inCider*, Back Issues Dept., Route 101 and Elm Street, Peterborough, NH 03458. For ten or more copies postage is a blanket \$7.50. To order by telephone using VISA, MasterCard or American Express call (800) 258-5473 from outside New Hampshire, or 924-9471, ext. 136, within New Hampshire.

**Submissions:** We're always looking for first-class manuscripts at *inCider*. We'll consider publication of any material for the Apple. Guidelines for budding authors are available—just address an envelope to yourself and include it with your request. Mail manuscripts, queries, or requests for writers' guides to: *inCider* Editorial Offices, 80 Pine Street, Peterborough, NH 03458.



# Trivia Contest Winners Announced!



The drum roll, please. And now the news you've been anxiously waiting for—the winners of *inCider's* Great Apple Trivia Contest!

We had a hunch you'd like the contest (we're all trivia buffs down deep) and who could pass up the chance to win an Apple //e Professional System (//e with extended 80-column card, DuoDisk drive, and monitor)? Twelve multiple-choice questions couldn't be that difficult, could they?

Well, only 25 percent of the 1325 entrants answered every question correctly. The number seems low, but as Editor in Chief Susan Gubernat explains, "Trivia questions are deceptively simple, and we designed a contest to ferret out those people who know the Apple culture."

On March 27, 1985, we drew the name of the first-prize winner: Dean Ouchida, a 21-year-old junior at Oregon State University who's majoring in, conveniently, computer science.

Three second-prize winners received Hayes 300-baud modems from Hayes Microcomputer Products, Inc., and five third-prize winners were awarded Mach III joysticks, courtesy of C.H. Products. Refer to the **Winners' Box** for the names of the prize recipients.

All of us at *inCider* (except for our proofreader, Peter Bjornsen, who had to wade through the en-

tries every day) were pleased with the number of people who participated. Look for more contests in *inCider* during the coming months.

To settle your curiosity, here are the answers to *inCider's* Great Apple Trivia Contest, which appeared in the March issue, page 128:

1. A, 2. C, 3. A, 4. A, 5. C, 6. A, 7. C, 8. B, 9. B, 10. A, 11. C, 12. B

## Winners' Box

### First Prize:

Apple //e Professional System  
Apple Computer  
Dean Ouchida  
Corvallis, OR

### Second Prize:

Hayes 300-baud Modem  
Hayes Microcomputer Products  
Andrew Baldrige  
Carrollton, TX  
Gene Harjamaki  
Mankato, MN  
Craig Ketover  
Harrison, NY

### Third Prize:

Mach III Joystick  
C.H. Products  
Keith Brenneman  
Van Buren, OH  
Steven R. Bryant  
Hamden, CT  
Gary Kueber  
New Orleans, LA  
Art Sellers  
Keokuk, IA  
Elliot Sprecher  
Norwalk, CT

Circle 143 on Reader Service Card.

**ELEPHANT DISKS**  
SS/DD 12.19  
SS/DD 12.49  
DS/DD 16.99

**VERBATIM**  
SS/DD 16.45  
DS/DD 22.45  
Head Cleaning Kit 5.79

**Data Case**  
8.99

## SILICON EXPRESS

**CALL** We have hundreds of other programs in stock at fantastic savings!

Add'l Fonts & Chars	13.95	Paper Graphics	30.89
Alpha Plot	24.89	Pensate	20.95
Amazon	27.49	PFS: Access	41.99
Apple Mechanic	17.99	PFS: Write	71.99
Arcade Boot Camp	20.95	PFS: File	71.99
Archon	23.99	PFS: Report	71.99
ASC II Pro	77.99	PFS: Graph	71.99
Axis Assassin	14.89	Pinball Construction	23.99
Bag of Tricks	25.89	Pixit	31.89
Bank Street Writer	42.89	Planetfall	23.99
Bank Street Speller	42.89	Practicalc II	48.95
Baron	32.89	Printographer	23.99
Beagle Bag	18.49	Print Shop	29.89
Beagle Basic	20.99	Print Shop Gr.#1	17.49
Beagle Graphics	34.99	Pronto DOS	18.49
Beneath Apple DOS	13.95	Quest	21.89
Beneath Apple PRO DOS	13.95	Rendezvous w/Rama	27.49
Beyond Cast. Wolf.	24.89	Report Card	36.89
Blazing paddles	34.95	Rescue Raiders	24.95
Bruce Lee	24.95	Sargon III	30.99
Bookends	71.99	Seastalker	71.99
Castle Wolfenstein	19.89	Sensible Speller	21.99
Cat Graphics	20.95	7 Cities of Gold	26.99
Chpshp Load Runner	23.95	Shadowkeep	27.49
Complete Graphics Sys	47.89	Sideways	35.99
Computer Baseball	25.89	Silicon Salad	14.99
Computer Quarterback	27.95	Skyfox	26.99
Copy II+	20.99	Snooper Trps 1 or 2	26.99
Coveted Mirror	20.89	Solo Flight	24.95
Crossword Magic	30.89	Sorcerer	26.99
Crypt of Medea	21.95	Speed Reader II	40.99
Cut & Paste	23.99	Spitfire Simulator	24.89
Cuthroats	23.99	Spy vs. spy	24.95
Dazzle Draw	41.95	Squire	34.95
D-Code	24.89	Standing Stones	13.99
Deadline	29.89	Starcross	29.95
Disk Arranger	20.95	Sticky Bear ABC	23.99
Disk Drive Analyzer	21.95	BOP	23.99
DiskQuick	17.99	Math	23.99
Disk Repair Kit	20.95	Reading	23.99
Dollars & Sense	58.99	Suspect	26.89
Dollars & Sense IIC	69.89	Take 1	38.89
DOS Boss	13.99	Terrapin Logo	59.99
Double-Take	20.99	Think Tank	88.89
Enchanter	23.99	Time is Money	60.99
Essential Data Dup	44.99	Tip Disk #1	13.89
Expedition Amazon	21.89	Transylvania	21.89
Fahrenheit 451	27.49	Triple-Dump	23.99
Fat Cat	20.99	Tycoon	32.99
Financial Cookbook	33.99	Typefaces	11.99
Flex Type	17.99	Typing Tutor III	30.89
Flight Sim II	33.89	Ultima III	34.99
Fontrix 1.5	56.89	Utility City	18.89
Fontpaks 1 thru 11 ea	14.99	Versaform	54.99
Frame-Up	18.89	Visable 6502	31.89
GATO	27.95	Witness	23.95
Graphics Magician	36.89	Wizardry	29.99
GPLE	29.89	Word Attack	29.89
Hard Hat Mack	13.99	Xyphus	21.89
Hitchhiker's Guide	22.99	Zork I	23.89
Home Accountant	47.95	Zork II or III	26.95
Infidel	26.99	80 Col. 64K Card	94.89
I.O. Silver	19.89	Apple Cat II	192.99
Karateka	24.95	Crocket	124.89
King's Quest	34.95	Disk Notcher	8.95
Knight of Diamonds	20.99	Echo +	107.95
Last Gladiator	13.99	Grappler +	84.99
Lazerware Lisa 2.6	53.99	Buffered Grappler +	147.89
Legacy of Lyligamyn	24.99	Koala Pad	74.89
Locksmith 5.0	64.95	Mach III	33.99
Magic Paint Brush	24.95	Micromodem IIE	221.89
Magic Window II	93.89	Microsci A2 Drive	184.89
Map Pack	13.95	Microsci IIC Drive	204.99
Master Type	24.89	Mockingboards	CALL
Math Blaster	29.89	Networker	99.95
Maxell Disks	LOW	Orange Interface	59.99
Merlin	36.99	Prometheus 1200A	304.99
Merlin Pro	59.99	16K Ram Card	64.85
Merlin Combo	65.99	System Saver Fan	63.89
Mico Cookbook	22.99	Wildcard 2	98.89
Millionaire	32.89	Gemini-10X	234.95
Murder on the Zind	23.99	Okidata Printers	LOW
Music Construction	26.99	Colored printer ribbons	CALL
NATO Commander	24.95	Amdek Monitors	LOW
One-On-One	26.99		

## SILICON EXPRESS

4555-11 Groves Road  
Columbus, Ohio 43232  
614/868-6868

Your Toll Free Access Outside Ohio  
**1-800-228-0755**

No additional surcharge on MasterCard, Visa, or School purchase orders. Personal checks allow 2 weeks. Shipping charges are \$2.50 for software & \$5.00 for printers & monitors. Ohio residents add 5% state sales tax. Prices are subject to change without notice.



Dr's' CHOICE

With MouseWrite, a new word processor from Roger Wagner Publishing, the "radical ease of use" that characterizes the Macintosh now belongs to the Apple II.

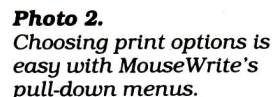
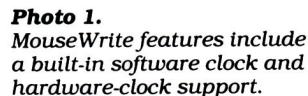
MouseWrite is a direct result of the //e enhancement Apple announced in March. (The upgrade is available to current //e owners for \$70.) Apple replaced the microprocessor, monitor ROM's, and video-generator ROM with a new set of chips offering greater compatibility with the //c, greater support for the AppleMouse—and an environment that makes it easier to write programs employing a Mac-like user interface.

Technical Editor Bob Ryan adds, "Even if MouseWrite had a standard interface, it would still be a powerful word processor. The addition of the Mac-like interface, however, makes it just about the easiest-to-use full-featured word processor on the Apple market." (See **Photo 1.**)

MouseWrite runs under ProDOS, giving it a crucial advantage over MacWrite, as Review Editor Paul Statt points out. "MouseWrite is fast," Statt notes. "You don't waste a lot of time listening to the disk drives hum."

clone—it can't produce a variety of fonts, for instance, as MacWrite can. But MouseWrite is the best reason yet for an Apple II owner to purchase one of those curious rodents from Apple.

MouseWrite is marketed by Roger Wagner Publishing, Inc., 10761 Woodside Avenue, Suite E, Santee, CA 92071, (619) 562-3670. MouseWrite runs on the //c or 128K //e with the enhancement kit installed. At press time, the suggested retail price was expected to be \$125. ■





# Introducing the Most Powerful Business Software Ever!

Circle 66 on Reader Service Card.

TRS-80™ (Model I, II, III, or 16) • APPLE™ • IBM™ • OSBORNE™ • CP/M™ • XEROX™



## The VERSABUSINESS™ Series

Each VERSABUSINESS module can be purchased and used independently, or can be linked in any combination to form a complete, coordinated business system.

### VERSA RECEIVABLES™

\$99.95

VERSA RECEIVABLES™ is a complete menu-driven accounts receivable, invoicing, and monthly statement-generating system. It keeps track of all information related to who owes you or your company money, and can provide automatic billing for past due accounts. VERSA RECEIVABLES™ prints all necessary statements, invoices, and summary reports and can be linked with VERSA LEDGER II™ and VERSA INVENTORY™.

### VERSA PAYABLES™

\$99.95

VERSA PAYABLES™ is designed to keep track of current and aged payables, keeping you in touch with all information regarding how much money your company owes, and to whom. VERSA PAYABLES™ maintains a complete record on each vendor, prints checks, check registers, vouchers, transaction reports, aged payables reports, vendor reports, and more. With VERSA PAYABLES™, you can even let your computer automatically select which vouchers are to be paid.

### VERSA PAYROLL™

\$99.95

VERSA PAYROLL™ is a powerful and sophisticated, but easy to use payroll system that keeps track of all government-required payroll information. Complete employee records are maintained, and all necessary payroll calculations are performed automatically, with totals displayed on screen for operator approval. A payroll can be run totally, automatically, or the operator can intervene to prevent a check from being printed, or to alter information on it. If desired, totals may be posted to the VERSA LEDGER II™ system.

### VERSA INVENTORY™

\$99.95

VERSA INVENTORY™ is a complete inventory control system that gives you instant access to data on any item. VERSA INVENTORY™ keeps track of all information related to what items are in stock, out of stock, on backorder, etc., stores sales and pricing data, alerts you when an item falls below a preset reorder point, and allows you to enter and print invoices directly or to link with the VERSA RECEIVABLES™ system. VERSA INVENTORY™ prints all needed inventory listings, reports of items below reorder point, inventory value reports, period and year-to-date sales reports, price lists, inventory checklists, etc.

### VERSA LEDGER II™

\$149.95

VERSA LEDGER II™ is a complete accounting system that grows as your business grows. VERSA LEDGER II™ can be used as a simple personal checkbook register, expanded to a small business bookkeeping system or developed into a large corporate general ledger system **without any additional software.**

- VERSA LEDGER II™ gives you almost unlimited storage capacity (300 to 10,000 entries per month, depending on the system),
- stores all check and general ledger information forever,
- prints tractor-feed checks,
- handles multiple checkbooks and general ledgers,
- prints 17 customized accounting reports including check registers, balance sheets, income statements, transaction reports, account listings, etc.

VERSA LEDGER II™ comes with a professionally-written 160 page manual designed for first-time users. The VERSA LEDGER II™ manual will help you become quickly familiar with VERSA LEDGER II™, using complete sample data files supplied on diskette and more than 50 pages of sample printouts.

### SATISFACTION GUARANTEED!

Every VERSABUSINESS™ module is guaranteed to outperform all other competitive systems, and at a fraction of their cost. If you are not satisfied with any VERSABUSINESS™ module, you may return it within 30 days for a refund. Manuals for any VERSABUSINESS™ module may be purchased for \$25 each, credited toward a later purchase of that module.

#### To Order:

**Write or call Toll-free (800) 431-2818**  
(N.Y.S. residents call 914-425-1535)

- \* add \$3 for shipping in UPS areas
- \* add \$4 for C.O.D. or non-UPS areas

- \* add \$5 to CANADA or MEXICO
- \* add proper postage elsewhere

#### DEALER INQUIRIES WELCOME

All prices and specifications subject to change / Delivery subject to availability.

# COMPUTRONICS!

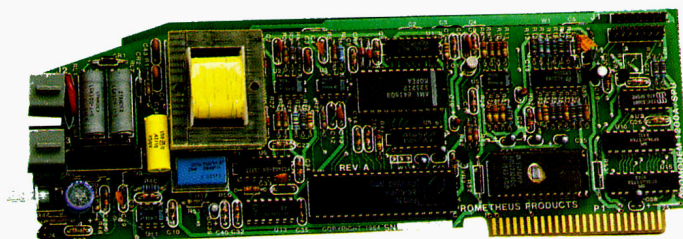
50 N. PASCACK ROAD, SPRING VALLEY, N.Y. 10977

\* TRS-80 is a trademark of the Radio Shack Division of Tandy Corp. • \*APPLE is a trademark of Apple Corp. • \*IBM is a trademark of IBM Corp. • \*OSBORNE is a trademark of Osborne Corp. • \*CP/M is a trademark of Digital Research • \*XEROX is a trademark of Xerox Corp.



# The Apple II... **HOT-LINE**

## A Plug-In 1200/300 Baud Intelligent Modem For Your Apple II... Just \$449 Including Software



ProModem 1200A is a 1200/300 baud Hayes compatible auto-dial modem card that plugs directly into any expansion slot in the Apple II, II+, or IIe. All you have to do is plug it in and connect the telephone cord.

Ours is the only 1200 baud modem to seriously consider for your Apple II. At just \$449, it's priced well below its nearest competitor, yet it does much more. No longer do you have to buy an external modem, a serial card, an RS232C cable and communications software which, combined, would cost you hundreds of dollars more. There's really no comparison.

ProModem 1200A is the best modem, too. The internal software in its on-board ROM consists of a powerful menu driven terminal program. There is no need for a separate software disk. After a few keystrokes you'll be on-line and communicating.

Features include: Auto-dial/Auto-answer, tone and pulse dial, help commands, built-in diagnostics, two phone jacks, line status detect with redial on busy, full and half duplex and speaker with volume control.

You just can't lose when our plug-in Pro-Modem 1200A comes ready to use, with on-board software, easy to understand documentation and a telephone cord — all for just \$449.

### A Powerful Menu-Driven Terminal Program

<input type="radio"/>	1200A TERMINAL DRIVER
<input type="radio"/>	© PROMETHEUS PRODUCTS INC.
<input type="radio"/>	1) COMMUNICATIONS
<input type="radio"/>	2) FILE TRANSFER
<input type="radio"/>	3) OPTIONS
<input type="radio"/>	USE ESC TO EXIT
<input type="radio"/>	ENTER SELECTION
<input type="radio"/>	1) BAUD RATE 1200 300
<input type="radio"/>	2) DATA BITS 8 7
<input type="radio"/>	3) PARITY NONE ODD EVEN MARK SPACE
<input type="radio"/>	USE ESC TO EXIT
<input type="radio"/>	ENTER SELECTION
<input type="radio"/>	1) TYPE XMODEM LINE
<input type="radio"/>	2) DIRECTION SEND RECEIVE
<input type="radio"/>	3) FILE NAME
<input type="radio"/>	USE ESC TO EXIT
<input type="radio"/>	ENTER SELECTION
<input type="radio"/>	1) PRINTER ON OFF
<input type="radio"/>	2) CLOCK ON OFF
<input type="radio"/>	3) STATUS LINE ON OFF
<input type="radio"/>	4) KEYBOARD ON OFF
<input type="radio"/>	5) CAP LOCK ON OFF
<input type="radio"/>	6) ECHO ON OFF
<input type="radio"/>	7) LF AFTER CR ON OFF
<input type="radio"/>	USE ESC TO EXIT
<input type="radio"/>	ENTER SELECTION



*The Hot Line*

**PROMETHEUS  
PRODUCTS INCORPORATED**

4545 Cushing Pkwy. • Fremont CA 94538

Call Now For  
Complete Info...  
**415/490-2370**

Circle 268 on Reader Service Card.