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# inCider

The Apple II Journal

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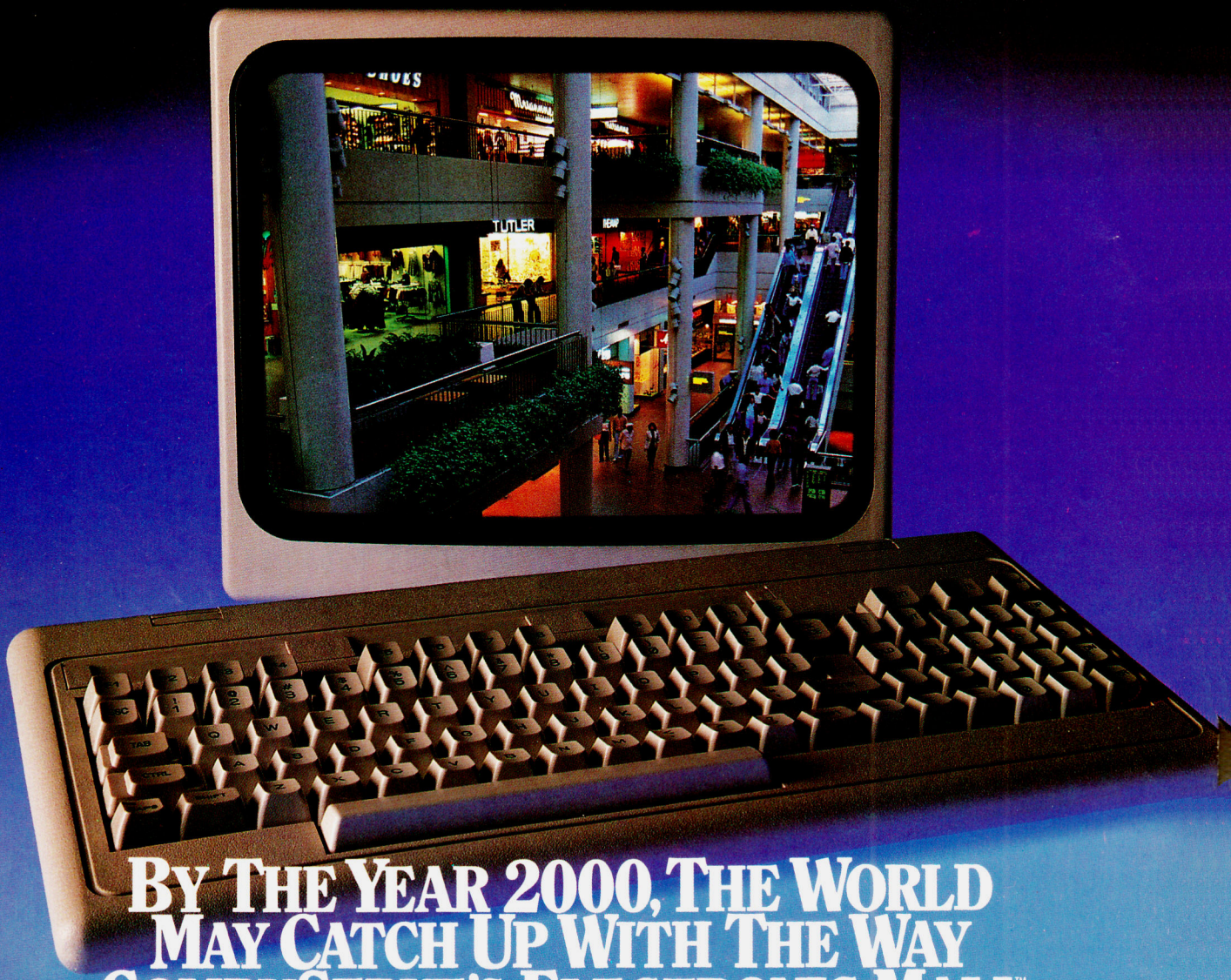


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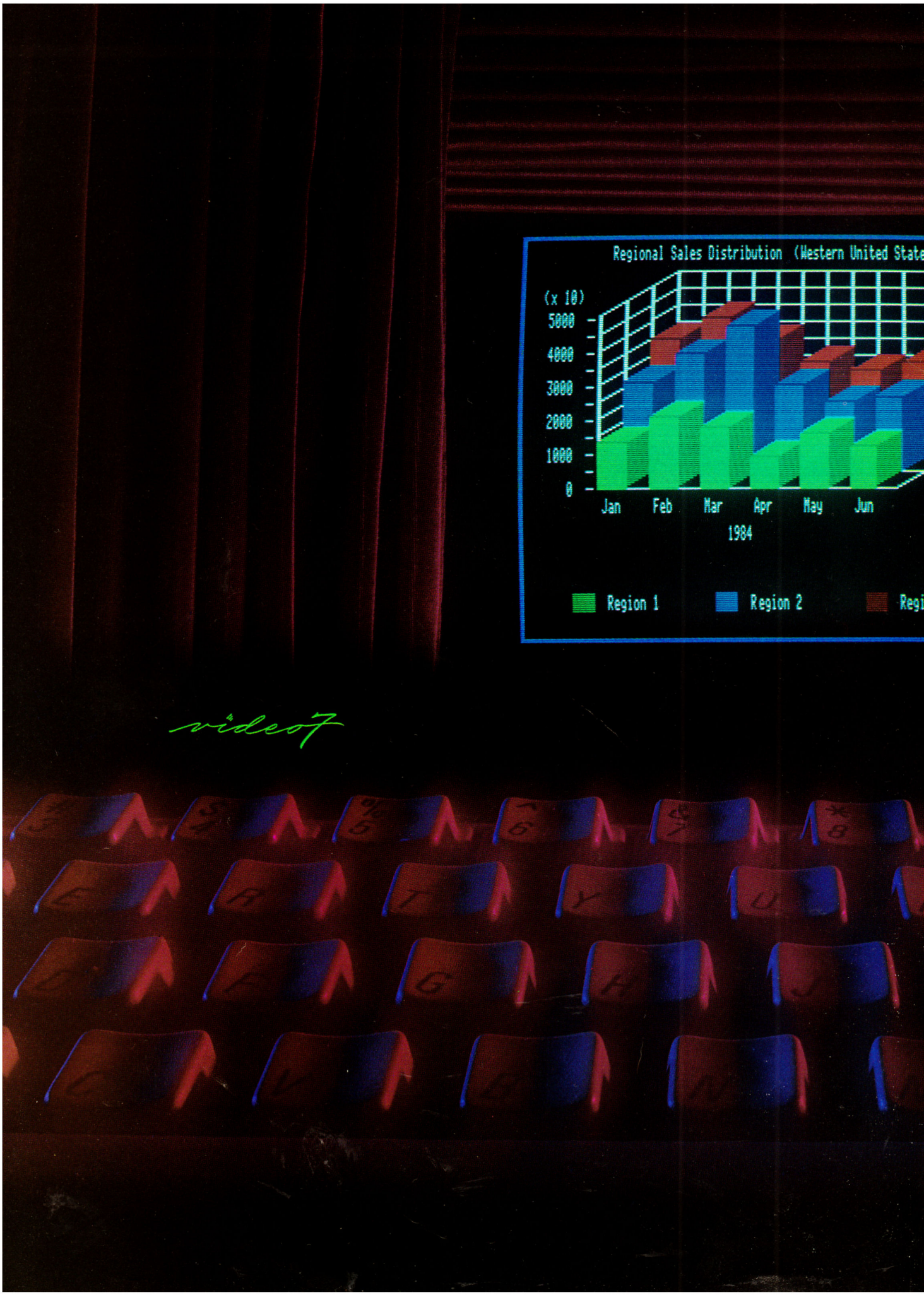
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## ARTICLES


| | | |
|---|---|---|
| ***inCider*'s On-line Sampler** | Get a taste for what's on-line. Our selections should tempt your data-base craving. | **15** |
| **Travel First Class**<br>*by Brian J. Murphy* | Packing is your only chore after on-line travel services take the frustration out of planning your trip. | **20** |
| **Demystifying Delphi**<br>*by Cynthia K. Carr* | Discover if Delphi fulfills its prophecy as "the fastest-growing information utility" in the country. | **26** |
| **Leaving the Escape Mode Behind**<br>*by James M. Wilson* | BASIC programmers *can* use a word processor to write programs—without much fuss or aggravation. | **32** |
| **Using ProDOS—Part 4: A New Order**<br>*by Lee Swoboda* | For ProDOS alone. Nine distinct commands put ProDOS at your beck and call. | **37** |
| **Rocket Man**<br>*by Damien Lindauer* | Explore an ancient Zenon cargo ship with Galactic Jim as he searches for quasar crystals. Beware the radioactive ghosts! | **46** |
| ***inCider*'s 2-Bit Programming Contest** | Accept our latest challenge and win up to $200 for your two-line Applesoft program. There's nothing small-time about it. | **116** |


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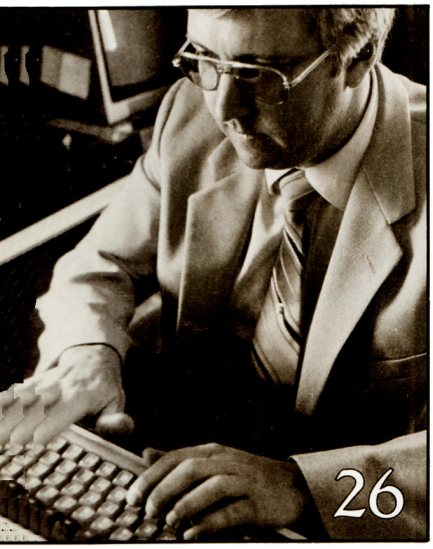
June 1985 Vol. 3 No. 6



# DEPARTMENTS

**Editorial** 6

**Letters** 8

**Corrections** 10

**The Cider Press** 12
Apple Management Defections; Youth Fitness Scores; Computer Gardening

**Calendar** 13

**Fudge It!** 53
Tuning Up

**O'Brien's Journal** 61
Dynamics of Data Bases

**Ask *inCider*** 69
Answers to your software and programming questions

**The Applesoft Adviser** 73
Functioning in Applesoft BASIC

**Software Reviews** 86
Back to Basics Accounting System; Dazzle Draw; Logic Builders; GraphWorks; PFS:Access; The Running Coach; Lucky's Magic Hat; V-Grid Lister

**Hardware Reviews** 95
Flat Panel Display; Animation Station; The Kameleon

**New Software** 101

**New Products** 107

**Beginner's Cookbook** 110
Step-by-step instructions on how to type in *inCider*'s program listings

**The Game Reserve** 113
Fahrenheit 451; F-15 Strike Eagle; Solo Flight; Spy vs. Spy; Short Circuit; Star League Baseball

**Apple Clinic** 117
Answers to your hardware and firmware questions

**Hints 'n' Techniques** 122
Monitoring Your Listings; POKE Aid; Column Support

**Data-Gram** 125
A column devoted to free on-line data bases and money-saving tips

**Reader Services** 126

**Editors' Choice** 128
*inCider* editors cast their vote for the product of the month: Zoom/Modem IIe

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# Editorial

## Wonderland Revisited

I'm glad that my first official act as *inCider*'s new editor in chief was to attend this year's tenth annual West Coast Computer Faire in San Francisco: it certainly put things in perspective.

Historically the most significant end-user event in microcomputing's annual calendar, the Faire itself embodied all the industry's contradictions—from the sideshow demonstrations of the entrepreneur launching a new software distribution venture (via radio), to the stolid preeminence of corporations like AT&T, whose pedestaled booth dominated the show's main entrance.

The Faire itself is no longer the venture of a few ardent computer enthusiasts, but is now mounted by a large corporation (Prentice-Hall) and was moved this year from the slightly seedy Civic Auditorium to the spiffy Moscone Center. Yet the keynote address assembled some of the old sages—Jim Warren, the Faire's founder, among them. They could have merely waxed nostalgic for the good old days and left it at that; instead, they conveyed to us in the audience the sense of creativity and promise still available as part of microcomputing's legacy.

Lee Felsenstein, self-described "adventurer," creator of the Osborne 1, and founder of the Community Memory Project, described the first West Coast Faire as "the closest I've ever been to Wonderland," and his memory of his own and his colleagues' early work in personal computers as "assembling a package of dreams." When asked if the "ship had sailed" for the would-be entrepreneurs now facing the dominance of IBM, Lotus, Ashton-Tate, and other major players, he replied no, but that we might instead "have to replace a generation of managers" taught to function under the premise that IBM was, if nothing else, a safe buy.

Others on the panel agreed. Gordon Eubanks, who authored CBASIC, and now chairs Symantec, a software company in Cupertino, encouraged people to think positively about starting up software ventures as "higher-risk opportunities."

And whose name was mentioned first as the most significant contributor to the annals of the past decade of microcomputing history? None other than Steve Wozniak's. At the Faire, as everywhere else, he and Steve Jobs personify the hacker/marketeer duality: a Woz creates the product; a Jobs packages it.

While vendors held forth on the show floor, veteran users and hackers comprised a standing-room-only audience in the auditorium. A show of hands revealed that a good 30 percent of them had attended the first Faire. Mention of Wozniak's importance, by the way, elicited a cry from that group: Why were "they" trying to kill his machine, the Apple II?

I'll leave you to guess who "they" are. We at *inCider* know who *you* are. Like many of the readers I talked to at the Faire, you're looking for the kind of product support we're providing through hands-on tutorials, how-to projects, useful applications, ready-to-type-in games and utilities, and timely reviews of products for the Apple II line—to us, an entity very much alive indeed.

Another speaker at the West Coast Computer Faire, Jerry Pournelle, made a prediction I'm going to pass along to you. He contended that not only is the industry still ripe for innovation, but since more—not fewer—users have started to write software, "One of you in this audience is more likely to produce the next best-selling program than someone employed by a major corporation."

Translate that to *our* audience, you the readers, as well, and all I have left to add to his paean to the entrepreneurial spirit is a hearty "Hear, hear!"■

***by Susan Gubernat***

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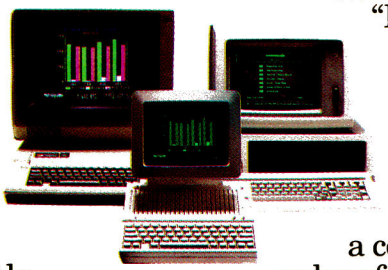

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# LETTERS

## Adventure in Italy

I'm an Italian reader, and I own an Apple //e that I use for many purposes, but I like adventure games more than anything else. Unfortunately, here in Italy, these games aren't very popular.

Is there anyone who would like to correspond with me about adventure games or computing in general?

**Enrico Angelini**
**Via Garibaldi 9**
**20010 Buscate (MI)**
**Italy**

## Look Before You Tinker

Recently, my daughter was using Apple Writer II when she complained that the left-arrow key was wiping out text. I tried to stop my empty disk drive with control-reset, but it continued to spin. Also, this method of stopping a program rebooted the disk.

I decided that the problem was caused by a short in the open-apple key. Determined, I was prepared to dismantle the computer as shown in the *Apple Reference Manual*. Fortunately, first I read about the keyboard and its circuits and discovered that the open-apple key is connected to the one-bit game inputs.

I ran back to the computer and found that my cleaning lady, who is never satisfied to leave anything where it is, had turned the KoalaPad upside down. I simply turned it right side up and relieved the pressure on the buttons, thus removing the "short" in the open-apple key.

**Alan Polsky**
**4236 Miraleste Drive**
**Rancho Palos Verdes, CA 90274**

## //c Q & A

Is anyone else with a //c having problems with Michael Seeds' Munch Mouse program (July 1984, p. 35)? I typed it in several times and still can't get the mouse to do more than dance at one location. Is it meant for DOS 3.3 and not ProDOS?

By the way, please tell me what I'm doing wrong. The //c system utilities disk lets you format a disk as DOS 3.3. However, when I try to boot this disk, my monitor freezes all further action with the statement "Unable to load ProDOS."

**Lawrence Seliski**
**Box 1385**
**Oroville, WA 98844**

*ProDOS creates a DOS 3.3 data disk. It doesn't put DOS 3.3 on the disk, but merely marks the disk so it can accept DOS 3.3 data. Your Apple dealer can provide you with DOS 3.3—for a price.* —eds.

## Hate Mail

Regarding your response to Robert N. Clarkson (Letters, January 1985, p. 10), I'd like to give you my solution to the tear-out card problem.

As soon as I buy or receive a magazine, I tear out all of the tear-out cards. Then, I immediately dispose of the cards. Since these cards were purposely inserted to keep flipping the pages to advertisers, I figure I'm hurting the advertisers instead of (or at least more than) myself. If I later realize I wanted the product, I try to buy a competitor's. I hate those cards. I've been tearing them out for at least ten years and intend to continue my crusade until publishers start listening to their readers.

**Sid Martin**
**1380 Foxton Drive**
**Monroe, MI 48161**

*It seems we've touched a sore spot with this issue. Any other solutions to the reader service-subscription card dilemma? Send your comments to Letters,* inCider, *80 Pine Street, Peterborough, NH 03458.* —eds.

## The Profit Motive

Your editorial in the January 1985 issue (Fermentations, "What's Up Apple's Sleeve?" p. 6) worries me.

I think Apple should stay away from the $500-and-below market. Instead, Apple should go for a more powerful machine that may cost more. The following are some of my reasons:

- *The bottom line*: A 10 percent profit from a $2000 machine is $200; a 10 percent profit from a $500 machine is only $50. Apple needs the extra profit not only for research and development, but to withstand future recessions.
- *The lesson*: Texas Instruments lost too much money when it tried to cut prices on the TI 99/4A. Coleco couldn't make enough money from its Adam. If you cut price, you must cut cost. The result is always an inferior product that costs the company's reputation. Apple is trying to build a name. Losing user confidence and respect (Radio Shack style) isn't good for Apple.
- *The home-computer buyer's profile*: They like good-looking machines such as the //c. They are $30,000-a-year junior executives trying to climb up to the $40,000-a-year bracket. They know financing; if they were to put $250 down and $250 each month for 12 months, they would have a complete Apple. No, this isn't enough for a PC, and too much for the C-64, but the PC is something the company pays for, not the individual. No one needs the power and speed of the PC at home. Besides, the Apple owner doesn't want someone else to preset a dBase III template or a Lotus template. AppleWorks can give the owner total personal control.

Seventy percent of C-20/C-64 owners that I know gave up on their Commodores. Twenty percent bought an Apple clone within two years. Apple clone owners don't buy programs.


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They copy pirated ones and don't have (or don't want to spend) the money for buying instruction books. Most don't know how VisiCalc works; almost none know how dBase II 2.3 crashes. Within two years, most Apple clones become expensive video game machines. Most real Apple owners (who didn't have their rich parents buy the machines but bought their own machines themselves) buy original programs and develop their own useful applications.

● *Research and development conducted by Apple support industry*: I randomly picked ten peripheral manufacturers who advertise in your magazine. They represent some $2500 of add-on items. Together, they make a very powerful Apple.

This Apple is a 65C02 machine that runs 3.5 times faster than my Apple; it has 512K RAM; it powers up to ProDOS, Applesoft under real-time-clock control auto dating with access to EDX/AB and Ampergraph command from the EPROM RAM-DISK. Other features include a built-in screen dump (text and/or graphics) button; built-in RGB interface; built-in 1200-baud modem; and built-in numeric keyboard. Also, an optional 5/10-megabyte hard disk is just a cable away.

If Apple used this existing technology, it could create a fully equipped machine at half the price it costs to buy the boards.

● *Marketing the "Apple XT"*: I believe every third Apple owner (and newcomers) will want a more powerful Apple. The large software base for the II family makes Apple the best-supported machine on earth. And thanks to the pirates, some older, slower, but still useful programs will actually help sell the newer, more powerful machine. (This is already happening to the //c.)

Where do Apple and *inCider* go from here?

I look forward to your making the Apple II a greater machine. Software; improvements to AppleWorks, VisiTrend/Plot, The Print Shop, B/Graph; and those improvements that enhance hardware capabilities will make the Apple II great.

**Eddie Sung**
**P.O. Box 3596**
**Main Post Office**
**Vancouver, BC V6B 3Y6**

*The under-$500 price range is an economically feasible alternative for Apple. Given the laws of supply and demand, middle America's increased purchase power is nothing to scoff at. The competition recognizes this target group and Apple must follow suit. This isn't to say Apple should devote itself exclusively to a lower-priced machine, but merely expand into other proven markets.* —eds.

## Corrections

The final line of the Program listing in "4 the Fun of It" (April, p. 66) is missing. This line should read:

```
1990- 07 C9 05 D0 D8 60
```

There is an error in line 235 of the Program listing for the March 1985 Applesoft Adviser (p. 66). The line should read:

```
235 IF A$(AI(MM)) > A$(I) THEN
MX = MM: GOTO 200
```

## What's in a Pathname?

I've been working with ProDOS since October 1984 and have been looking forward to your ProDOS series. I did find two misleading items, however, in Lee Swoboda's article ("Using ProDOS—Part 1: The Multilayered DOS," February 1985, p. 33) that should be mentioned. Table 2 on page 38 shows valid and invalid volume names, not complete pathnames as indicated. All of his examples lack a file name. On the same page he refers to the use of prefixes in writing pathnames. The continuation of a prefix for the pathname must start with a letter, not a slash as shown. When ProDOS sees the slash as the first part of the pathname it disregards the prefix.

**Jerry Ray Bertelsen**
**909 South Wayne Street**
**Martinsville, IN 46151**

*Your findings are correct, Jerry. We apologize for any inconvenience this oversight has caused.* —eds.

## Raiders' Haven

I just entered a listed program for the first time and it was Tim Wiley's Raider ("Galactic Invasion," February 1985, p. 61). Good game, but in the listing, V1 can never be anything but 1 or −1. For example, if PDL(1) = 4 when you get to line 540, since 4 < 105, V1 = 1 and the program jumps to line 620.

I changed lines 540 through 570 so the program looks for the smallest number first, and lines 580 through 600 to look for the largest first. My fighter then handled much better. (Line 540 should be swapped with line 570; 550 should be swapped with 560; and 600 should be swapped with 580.)

I had a lot of fun turning a printed page into a video game. Now if I can just figure out how you're calling up machine code for the shapes. . .

**Scott Edick**
**5400 River Ridge Drive**
**Flushing, MI 48433**

*Glad to oblige, Scott. The whole idea is to tell the program where the shape table is being drawn. On line 50, POKE 232,0 and POKE 233,64 tell where the shape table starts in memory. The DRAW and XDRAW commands state which shape is drawn at a certain point and use both constants and variables to signify which shape in the shape table is being drawn.* —eds.

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*We know Apple II users are making news. Let us tell our readers what's going on in your corner of the Apple world. Write to The Cider Press, inCider, 80 Pine Street, Peterborough, NH 03458.*

## Plant a Carrot. . .

How does your garden grow? Microcomputer owners with a green thumb can turn to *The Online Gardener*, a newsletter about computer applications in the home garden. Published quarterly, the newsletter reports news, trends in the computer-gardening field, and publishes product and software reviews. Topics include how to use data-base programs with your garden and computer-garden planning services.

"The Online Gardener is for those home-computer users who want to branch out from conventional word-processing and financial programs and put the microcomputer to work in their yards and gardens," publisher Stephen Enniss says—with no pun intended.

Gardening with your computer's help is a budding enterprise, according to Enniss. He says that CompuServe, a popular on-line information service, posts a gardening special-interest group. Also, Ortho, a national agricultural products distributor, produces a data-base program that lists which plants will grow well in your geographic area.

Enniss also notes that *The Online Gardener* serves as a forum for gardeners and home-computer users. Subscribers' letters, questions, and suggestions are encouraged. Yearly subscriptions cost $8, and you should address inquiries to *The Online Gardener*, 1287 McLendon Avenue, Atlanta, GA 30307.

## Corporate Malaise

Resignations, plant closings, declining employee morale. Sounds like a recession-era report on American industries, right? But all three factors contribute to none other than Apple Computer Inc.'s recent corporate shake-up.

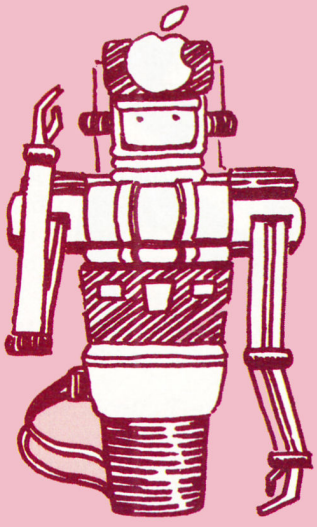
Soon after co-founder Steve Wozniak resigned to start a home-video and home-control-devices business, he announced the sale of more than three million shares of his Apple stock. Once Apple's third largest shareholder, Wozniak told *The Wall Street Journal*, "I just want to simplify my life." The stock sale added to the mounting morale problems among Apple II workers. Even though the Apple II line has been the company's mainstay, *The Wall Street Journal* reports that the Apple's Macintosh/Lisa hype has created a sibling rivalry between the divisions.

Before workers—or the public—had a chance to catch their breath, Apple closed four of its plants for one week in the spring. The plants affected were in: Fremont, California; Dallas, Texas; Cork, Ireland; and Singapore. The Dallas and Cork plants manufacture Apple II's, while the Fremont plant produces the Mac. The Singapore operation handles circuit boards. Apple attributed the plant closings to disappointing year-end sales and to dealers' overstocked inventory.

## Name That Robot

Despite internal security, IBM has infiltrated Apple's rank and file. If you drop in at one of Apple's personal-computer plants, you many notice that one of the workers is a little out of the ordinary. No, there's no need to call for a union investigation. It's just that one of the assembly-line workers happens to be a robot. And not just any robot, mind you. This one is of IBM lineage.

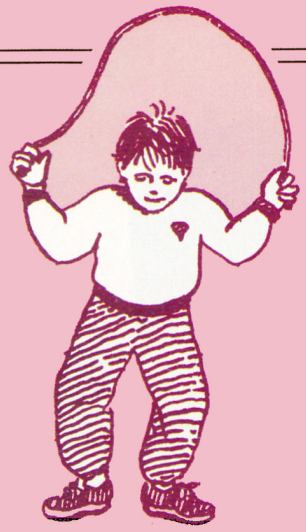
Given the competitive relationship of the two corporations, who would have thought anything stamped "IBM" would appear within Apple's inner



sanctum? Actually, Apple took care of the more than recognizable piece of IBM technology by affixing Apple's unmistakable six-color logo to the robot. So much for initiation rites.

***by Cynthia K. Carr***

# Failing Fitness Grades



Despite the booming popularity of various exercise programs—from at-home aerobics sessions to health-club memberships—more than a few eyebrows were raised when the 1984 National Conference on Youth Fitness reported that children's fitness scores haven't improved in 15 years. The study showed that 50 percent of children aged 6 through 17 are unable to meet recommended fitness levels.

In response to the conference's findings, the President's Council on Physical Fitness and Sports presented a new, national computerized youth-fitness testing program called Fitnessgram. Developed by the Institute for Aerobics Research (IAR) with tests designed by the American Alliance for Health, Physical Education, Recreation and Dance, Fitnessgram records children's endurance, strength, and flexibility scores in a computerized report-card format.

Fitnessgram, sponsored by Campbell Soup Company, operates on an Apple //e system. According to Jennifer Schade, an account executive with Golin/Harris Communications, the Apple //e was chosen because it's the most widely used computer in education—70 percent of the schools polled in a PTA survey used the //e. "Any school with an Apple //e can participate in the program," she says. Those without Apples can network with IAR's mainframe computer in Dallas. Campbell will provide participating schools with the software and blank "report cards."

The computer system will store results and then provide parents with a report card that compares their child's scores to the national average. Fitnessgram also recommends specific activities to improve the child's physical fitness. "Fitnessgrams are prescriptions for individual improvement and, thereby, for improving the national condition of youth fitness," says Kenneth Cooper, IAR's founder and noted expert in aerobic fitness.

Intended for implementation during the 1985-86 school year, Fitnessgram is expected to reach ten million students in grades K through 12, Schade says. For enrollment information, write to Youth Fitness, Institute for Aerobics Research, 12200 Preston Road, Dallas, TX 75230.

# Look It Up

You don't need a card to use The Library, a bulletin-board system based in Hershey, Pennsylvania. Open 24 hours, seven days a week, The Library features e-mail, downloads, reviews and news, and users' original articles.

Sysop Frank English says The Library also has seven message bases that include a fantasy role-playing base, the Apple Core message base for Apple owners seeking answers about their computers, and a sysops' board. The Library operates on an Apple II Plus and three drives, and English has a 10-megabyte drive on order. He reports that The Library has more than 500 members and has logged around 6000 calls.

Even if you're just browsing, use your modem to call The Library at (717) 534-1460. For more information, write to English at P.O. Box 37, Hershey, PA 17033.

# Calendar

## June

### 2-5
**CONSUMER ELECTRONICS SHOW**
Chicago, IL
contact:
Dennis S. Corcoran
2001 Eye Street, NW
Washington, DC 20006
(202) 457-8700

### 6-9
**COMPUTER SHOWCASE EXPO**
Dallas, TX
Seattle, WA
contact:
Linda M. Yogel
The Interface Group
300 First Avenue
Needham, MA 02194
(617) 449-6600

### 8-9
**COMPUTER SUPERMARKET**
San Mateo, CA
contact:
Jim O'Donnell
Microshows
1209 Donnelly Avenue
Suite 203
Burlingame, CA 94010
(415) 340-9114

### 12-14
**INFO/WEST**
Anaheim, CA
contact:
Laura Incerto
INFO/West
999 Summer Street
Stamford, CT 06905
(203) 964-0000

### 13-16
**COMPUTER SHOWCASE EXPO**
Philadelphia, PA
contact:
Linda M. Yogel
The Interface Group
300 First Avenue
Needham, MA 02194
(617) 449-6600

### 20-23
**COMPUTER SHOWCASE EXPO**
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*Illustrations by Katherine Mahoney*

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**Circle 54 on Reader Service Card.**

## Tantalizing data bases to entice everyone—from the wildcatter to the epicure. Try to resist the temptation.

The Information Revolution is here—a fact substantiated by the number and variety of accessible on-line data bases. A comprehensive data-base listing would be enormous and outdated before *inCider* could publish it. Instead, we offer this sampler of on-line data bases—to give you an overview of the incredible amount of information at your fingertips.

The Sampler describes 18 data bases. You can access some directly; others you must access through an information service like DIALOG, CompuServe, or The Source. Access information is available from the vendors.

We hope that our Sampler will whet your appetite for information. You'll find varied, tasty treats inside.

### Bacchus

If you want to learn more about wine, but are intimidated by know-it-all sales clerks, check out this helpful little data base available on CompuServe. You'll acquire a taste for varieties and vintages and receive a wine lover's primer.

CompuServe Information Service
5000 Arlington Centre Boulevard
Columbus, OH 43220
(614) 457-8650

### Academic American Encyclopedia

You can access more than 31,000 articles with a subscription to the on-line version of the *Academic American Encyclopedia*. Unlike its printed cousin, this encyclopedia is frequently updated to keep pace with current events.

Grolier Electronic Publishing
95 Madison Avenue
New York, NY 10016

### AGNET

Agriculture is a complex industry, and the people in it—from farmers to commodity traders—need massive amounts of information just to stay in business. AGNET, a service of the University of Nebraska at Lincoln, provides this information. Commodity futures, government reports, and a multitude of programs are available to keep you on top of the agriculture business.

AGNET
University of Nebraska
Lincoln, NE 68583
(402) 472-1892

### National College Databank

This is an on-line version of *Peterson's College Guide*. It not only lists information about thousands of colleges, but it also lets you enter your criteria for choosing a college. Then it searches its data base for colleges that meet these specifications. Access to this service would be a valuable addition to every high-school guidance office.

Peterson's Guides
P.O. Box 2123
Princeton, NJ 08540
(609) 924-5338

### GAMBIT 2

This data base is invaluable to government watchers. It tracks the progress of every piece of legislation introduced in the United States House of Representatives or the Senate. The data base is updated daily, so you can find out when specific legislation is scheduled for a committee hearing or a vote.

Computer Research Group
823 United Nations Plaza
New York, NY 10017
(212) 599-2765

### Compudex

Large, general-interest data bases like The Source use giant mainframe computers to house their data bases. By accessing Compudex, you can use the power of these mainframes for your own purposes.

Source Telecomputing
1616 Anderson Road
McLean, VA 22102
(800) 336-3366

### Online Microcomputer Software Guide and Directory

As the number of microcomputer software titles grows every day, so does this data base. It lists descriptions and specifications for thousands of commercially available software titles and updates them regularly to coincide with new product releases.

Online
P.O. Box 89
Georgetown, CT 06829
(203) 227-8466

### CARE

This medical data base (available on The Source) supplies the common man and woman with information about symptoms and medical problems, and can help them decide if they need professional health care.

Dr. Donald M. Vickery
Center for Corporate Health Promotion
11490 Commerce Park Drive
Suite 140
Reston, VA 22091
(703) 620-5666

### GeoRef

The earth's structure and dynamics are the subjects of this data base. GeoRef includes data and references about structural geology, petroleum geology, mineralogy, and geophysics.

American Geological Institute
GeoRef Information System
4220 King Street
Alexandria, VA 22302
(703) 379-2480

*Illustration: Carl Wesley  Photography: Torsheya Studio*

### Real-Time Weather

If your business or occupation depends upon timely weather information, then you need Real-Time Weather. Its information also aids climatic and atmospheric researchers—and weathermen who never seem to get it right.

Weather Services International
131 The Great Road
Bedford, MA 01730
(617) 275-5300

### US Census 1980 Data Base

The Constitution mandates that the United States population be counted every ten years, mainly to allocate seats in the House of Representatives. The census also provides demographics, and the US Census 1980 Data Base gives you access to the raw census data.

National Planning Data Corporation
P.O. Box 610
Ithaca, NY 14850
(607) 273-8208

### JOBNET

JOBNET brings employers and potential employees together. Employers can search through on-line resumés for people to fill particular openings. The service is free to job hunters (the employers foot the bill) and confidential. If you're looking for a technical job, or if your company has technical positions open, you may find what you want via JOBNET.

JOBNET
10 DeAngelo Drive
Bedford, MA 01730
(617) 275-3011

### DISCLOSURE II

Public corporations in the United States are required to file periodic performance reports. The DISCLOSURE II data base contains information gleaned from these reports that is vital to investors and researchers.

Disclosure
5161 River Road
Bethesda, MD 20816
(301) 951-1300

### WESTLAW

Success in the legal profession depends as much upon hard work and preparation as it does upon a sharp mind and a silk tongue. WESTLAW provides members of the legal profession with access to mountains of information about statutes, court decisions, and precedents.

West Publishing Company
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St. Paul, MN 55165
(612) 228-2692

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COMP-U-CARD of America
777 Summer Street
Stamford, CT 06901
(203) 324-9261

### Microcomputer Index

This data base contains abstracts from dozens of publications in the microcomputer field. Microcomputer Index can save you time and frustration when you want to find out when and where articles were published.

Microcomputer Information Services
2464 El Camino Real, Suite 247
Santa Clara, CA 95051
(408) 984-1097

### Wharton Econometric Databases

Government, academic, and business planners will find invaluable information about the U.S. economy in these data bases. The Wharton Econometric Databases aren't cheap, but for those who require the information, they're a tremendous value.

Wharton Econometric Forecasting Associates
3624 Science Center
Philadelphia, PA 19104
(215) 386-9000

### Nucleic Acid Sequence Data Base

DNA and RNA molecules are the master molecules of life. They determine the form and function of all biological systems. The Nucleic Acid Sequence Data Base contains known DNA and RNA nucleotide sequences. (Nucleotides are small molecules that make up DNA and RNA.) This information is invaluable to researchers striving to keep up with the complex world of molecular biology.

National Biomedical Research Foundation
3900 Reservoir Road, NW
Washington, DC 20007
(202) 625-2121

*Illustration: Carl Wesley* *Photography: Torsheya Studio*

# Travel First Class

## Make your modem your travel agent: book a flight, check the weather, rent a cottage—without leaving home.

***by Brian J. Murphy***

Bermuda, Paris, San Francisco, Hawaii. Travel can be an adventure, but sometimes the hassles can detract from the enjoyment. Travel arrangements—for business or for pleasure—are easier thanks to telecommunications. During the past 20 years, the travel industry has increasingly used computer systems to book flights, make hotel arrangements, and reserve rental cars. This computer network has extended beyond the airport ticket counter into homes and offices through convenient on-line travel services.

One of the leaders in home-computer travel services is CompuServe, the Ohio-based nationwide information utility. CompuServe offers a diverse selection of travel services that range from airline schedules and fare information to vacation rentals, timeshares, state department advisories, and flight reservations.

Photography: Torsheya Studio

DEPARTURES
DEST FLIGHT TIME
ATLANTA 409 2:10
BOSTON 011 2:35
NEW YORK 106 3:15
CHICAGO 712 3:20
NEW YORK 311 3:50
SAN FRAN 718 4:00
UNITED AIRLINES
Manchester
Ticket for:
UNITED
ADVANCE CHECK-IN
BOARDING PASS
AIRPORT COPY
DETACH THIS PORTION AND GIVE TO AIRPORT CHECK-IN PERSONNEL
FLIGHT
DATE
TO
SMOKE
YES
NO
ROW-SEAT
NAME
16A
6/27
CLUB M
Winter/Spring 1984
a holiday holiday
BERMU
SPRING

**Travel at Your Fingertips**

To look at these services, access CompuServe and enter the command GO HOM-90. This takes you directly to CompuServe's travel services menu (**Table 1**).

***Table 1.*** *CompuServe's travel services menu.*

```
 1 OFFICIAL AIRLINE GUIDE
 2 WWX HOLIDAYS-YACHTS-RVS
 3 STATE DEPARTMENT TRAVEL
   ADVISORIES
 4 PAN AM TRAVEL GUIDE
 5 TRAVEL FAX
 6 TRAVELVISION
 7 WEST COAST
 8 FORUMS
 9 DISCOVER ORLANDO
10 TRAVELSHOPPER
```

Before you head off to Shangri-la, you need to determine your travel itinerary. The first step is to learn the flight's arrival and departure times and the ticket cost. For that reason, begin with menu selection 1, the Official Airline Guide (OAG) Electronic Edition. Be warned, there is a stiff access fee above and beyond the regular CompuServe rates. For now, follow along with this guide.

**Official Airline Guide**

The OAG is the official travel industry databank for flight times, fares, and conditions. It doesn't provide information on availability—a travel term for empty seats. (Another CompuServe service, Travelshopper, offers this feature.) To move around the OAG, you'll need to know the basic commands. Most are composed of two characters—a slash followed by a letter. For example, /S gets flight schedules; /Q quits the session. A very flexible system, the OAG lets you use most of these commands at almost any time.

While in the guide, a dialog sets up your search's parameters. First, you're prompted for the name of your departure city or airline code (for example, Los Angeles or the airport code LAX are both acceptable). Next, you're asked for your destination (such as Honolulu or HNL). Then you must enter the date (6 Feb for February 6). Finally the system asks you to choose either direct flights or connecting flights (or both) to your destination.

Once you decide, the system compiles a list of the flights that meet your parameters. Within a few seconds a flight list, such as the following, appears on screen:

```
2.  900A  JFK  430P  HNL  AA  1  D10  B  1
5. 1045A  JFK  610P  HNL  UA  3  747  L  1
```

From left to right, the information breaks down as: flight departure time, departure airport code (in this case, JFK International in New York), arrival time and destination airport (the code HNL stands for Honolulu Airport), the airline flight number (AA stands for American Airlines and UA is for United Airlines), the type of aircraft (D10 stands for Douglas DC-10 and 747 is a Boeing 747), the meal served (breakfast, lunch, dinner, or a snack) and the number of stops en route (in both cases, one).

With arrival and departure set, look at the fares. When you press the F key (for fares) and the number 2 key (for line 2), you get a price list for American Airlines Flight 1:

```
1.      663.94   1327.88   AA/Y      Y29
2*               668.94    AA/M   MWR30
```

Fares come in several categories: first class (F), coach (Y), and excursion and special fares (M, B, and L). The amount in the first column is the one-way fare (notice that no one-way fare is quoted on line 2). The second amount represents the round-trip price. The AA/Y and AA/M stand for airline and class of service (Y is coach and M is special-fare class); the Y29 and MWR30 are the ticket codes to ask for when you book the flight.

The asterisk (*) on line 2 indicates special conditions and limitations. Use the designated command, L2 (for limitations, line 2) to call up the data:

```
NYC/HNL CLASS:M FARE CODE: MWR30
FARES DESCRIPTION; COACH/OFF
PEAK COACH FARES
BOOKING CODE: M/Q
FARE IS ONLY AVAILABLE FOR TRAVEL
ON SATURDAY. TRAVEL MUST BEGIN
ON OR BEFORE 16 DEC 85. MAXIMUM
STAY ALLOWED IS 30 DAYS.
```

So much for traveling on a Wednesday. Another bargain fare looks like:

```
4*              568.95   AA/Y   YXR30
```

The L4 command should be more to your liking. The limitations display reveals that you can travel on a Tuesday or Wednesday and can stay for 45 days maximum, as long as you purchase tickets 14 days or more in advance of the flight.

The OAG lets you fiddle with fares and flights to your heart's content. You can pull up return flight schedules and explore the labyrinth of fares and limitations. With the information, you can tinker until you organize your travel arrangements to suit your needs. Your next step is to take the information to your travel agent or airline ticket counter and book the flight.

**Travelshopper**

Of course, you could avoid the waiting and make your reservations right on-line with Travelshopper, a consumer-oriented service based on the TWA computer reservations system, PARS. Travelshopper's data base is the same as the one used by airlines and travel agencies, but its format is different for consumers. Like the OAG, a browsing feature allows you to check flights and fares without requiring reservations.

Flight scheduling information is strikingly similar to the OAG's. Although there are different one-letter commands, the information results are comparable. Travelshopper differs from the OAG in that it has a readout on availability—the number of unsold seats on a particular flight. The TWA system even lets you determine how many seats are available in each fare class on a given flight.

To book flights through the service, you must be a member of TWA's Frequent Flight Bonus program (FFB)—which you can join on-line through CompuServe. You'll be assigned an FFB number that serves as your password to get into the booking phase of the operation. The password also entitles you to 3000 FFB mileage credits and 500 bonus credits during the first few weeks of membership for travel booked through the system. You can still browse through the system and gain availability, schedules, and fare data without the number, however.

Once you enter the system with your FFB number, you're presented with the menu choices in **Table 2**.

***Table 2.*** *Travelshopper's menu choices.*

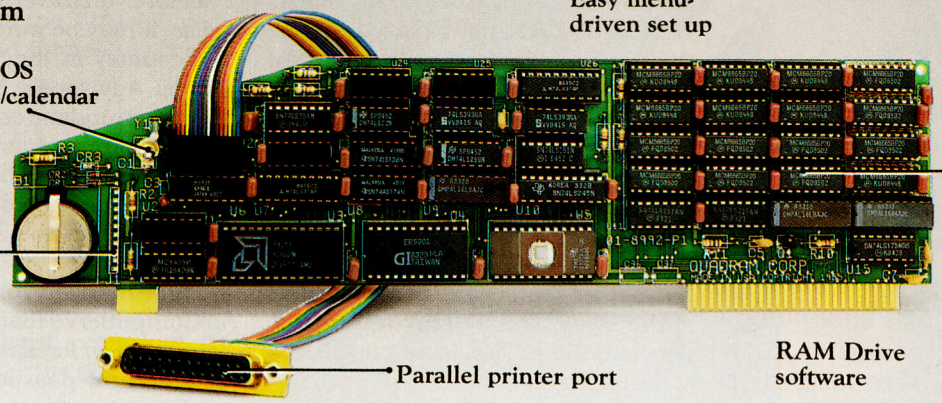
| Selection | Option |
|---|---|
| A | Available Flights and Make a Reservation |
| F | Fares/Fare Restrictions? |
| R | Make a Reservation/Specific Flight Information and Codes are Known |
| P | Look At or Change Your Reservation |
| B | FFB Mileage |

If you select option F, you're prompted for your departure and arrival cities and your travel date. You can ask for the fares for a specific airline like TWA, Pan Am, or Delta. You can also request

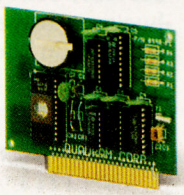
# Quadram Enhances Apples!

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**

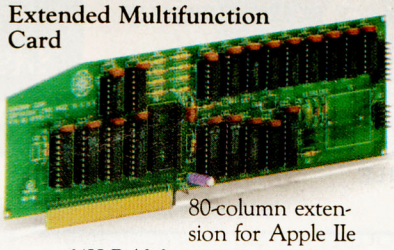



**Pro-DOS Clock/calendar**



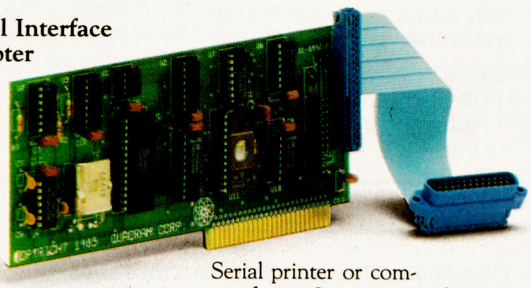
Long-life Lithium battery • Easy to use date/time software.

**Extended Multifunction Card**



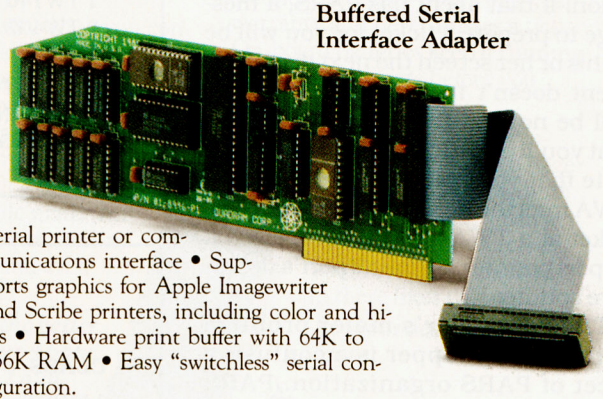
80-column extension for Apple IIe • 64K RAM expansion option • Color RGB interface • ProDOS clock/calendar.

**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

a screen that lists fares for every airline. (See **Table 3.**) For information about flight limitations and conditions, press D1. (Refer to **Table 4** for a screen example.)

From here, you can conduct another fare search, check availability, or make reservations. Once again, you must enter your arrival and departure cities, travel date, and travel time. Your screen will look like the one in **Table 5** for a St. Louis to New York flight. If you press D1 on this menu, you'll obtain the availability for TWA Flight 140, which appears in **Table 6.** This display details what you can and can't procure on TWA Flight 140. For fares, press the F key and start the fares sequence outlined earlier.

*Table 3. Travelshopper flight fares.*

| FARE # | AIRLINE CODE | FARE CODE | AMOUNT USED |
|---|---|---|---|
| 1 | TW | MEWR6 | $218.00 |
| 2 | PA | M | $260.00 |
| 3 | PA | MZ6 | $285.00 |

KEY D AND FARE # TO SEE RESTRICTIONS
F-FARES A-AVAILABLE FLIGHTS

### Ticket, Please

If you decide to book one of these flights, a seat or seats (maximum of four) will be reserved under your name until you purchase a ticket. Then you'll be prompted for the name of a travel agent who will handle the ticket acquisition. If that agent has PARS, a message to prepare a ticket for you will be on his or her screen the next day. If the agent doesn't have PARS, he or she will be notified through other means that you'll come in to ticket your flight. Note that you hold the option to have TWA mail the ticket or to purchase the ticket at a TWA Travel Store, a TWA airport counter, or the airport's departure counter.

*Table 4. Travelshopper flight limitations.*

FARE #: 1
AIRLINE: TRANS WORLD
FARE CODE: MEWR6
BOOKING CODE: M
EARLIEST TRAVEL DATE: 13SEP85
MUST START TRAVEL BY: NO RESTRICTIONS
ADVANCE TICKET PURCHASE: NONE
MINIMUM STAY: NONE
MAXIMUM STAY: 3 DAYS
NOTE: OTHER RESTRICTIONS MAY APPLY
A/M/H/E

The consumer's major problem with Travelshopper is a confusing facet of PARS organization. PARS doesn't price special fares more than one or two months in the future. Some fares listed as available for dates after this may not be bookable. Make sure that fare is in effect for a date you wish. Carefully check the restrictions, limitations, and conditions before you reserve seats.

### CompuServe's Travel Services

Another CompuServe service is Worldwide Exchange Holidays, a classified-ads section for people who want to rent, buy, or exchange vacation real estate such as apartments, condominiums, cottages, timeshare properties, yachts, and recreational vehicles.

A logical system of prompts leads you to various geographical areas. Selecting one specific area brings up all the ads for that locale. Frankly, some of the areas have skimpy representation, and there are evident mistakes in some listings.

If you look at Connecticut, for example, a Manchester listing is described as on the shore—evidently another Manchester since Connecticut's is 50 miles inland. A Westport listing was described as near Bar Harbor, which is actually 300 miles away in Maine. Still, the exchange is a good idea because it covers locations all over the world.

Before you travel to some exotic paradise, it may be worthwhile to look up the country in the State Department Travel Advisories. This reviews subjects as mundane as the latest visa requirements and as important as regions afflicted with bubonic plague, the provinces noted for guerrilla warfare, and cities notorious for harassing Americans.

Pan American runs a guide service in CompuServe that provides basic information on foreign destinations such as visa and passport requirements and vaccinations. The service also includes updates on Pan Am travel services and special offers. Another service, Travel Facts, will appeal to business travelers with foreign destinations on their itineraries. Informa-

*Table 5. Travelshopper St. Louis-New York flight schedule.*

**1 OCT ST. LOUIS/NEW YORK 10A MONDAY**

| # FLIGHT | DEPART | ARRIVE | EQP | STOP |
|---|---|---|---|---|
| 1 TW140 | STL-1000A | LGA-116P | 767 | 0 |
| 2 TW402 | STL-1000A | EWR-114P | 767 | 0 |
| 3 CB22 | STL = 1040A | EWR-150P | 727 | 0 |

KEY RETURN TO SEE MORE
KEY D AND LINE # FOR BOOKING DETAILS
1-CHANGE DATE 2-RETURN FLIGHTS

*Table 6. TWA Flight 140 availability on Travelshopper.*

| CLASS | BOOKING CODE | SEATS |
|---|---|---|
| 1 FIRST | F | AVAILABLE |
| 2 BUSINESS | C | WAITLIST ONLY |
| 3 COACH | Y | AVAILABLE |
| 4 SPECIALS | B | AVAILABLE |
| 5 SPECIALS | M | WAITLIST ONLY |

tion categories include climate, passport and visa requirements, internal travel, business hours, holidays, and currency.

Travel Vision provides an order service for maps, atlases, and other graphics aids for travelers. Designed for motor-vehicle travelers, the service also supplies (for a small fee) maps marked with your travel routes. Another service, tours recorded on cassette tape, takes you to various destinations in North America, England, and Ireland. Travel maps, historical maps, and antique-map reproductions are also available.

In the Travel Forum, a CompuServe Special Interest Group (SIG), members exchange information and messages about travel. From the Travel Forum, you can download interesting, newsworthy travel articles.

**Future Travelers**

In its troubleshooter role, telecommunications can organize your travel plans in less time than it takes to decide upon your destination. In the future you can expect to find virtually every aspect of travel on-line. That's when your Apple will really put the world at your fingertips. ■

---

*Write to Brian J. Murphy at 133 Post Road, Fairfield, CT 06430.*

## On-line Travel Service Connect Time

**CompuServe Information Service**

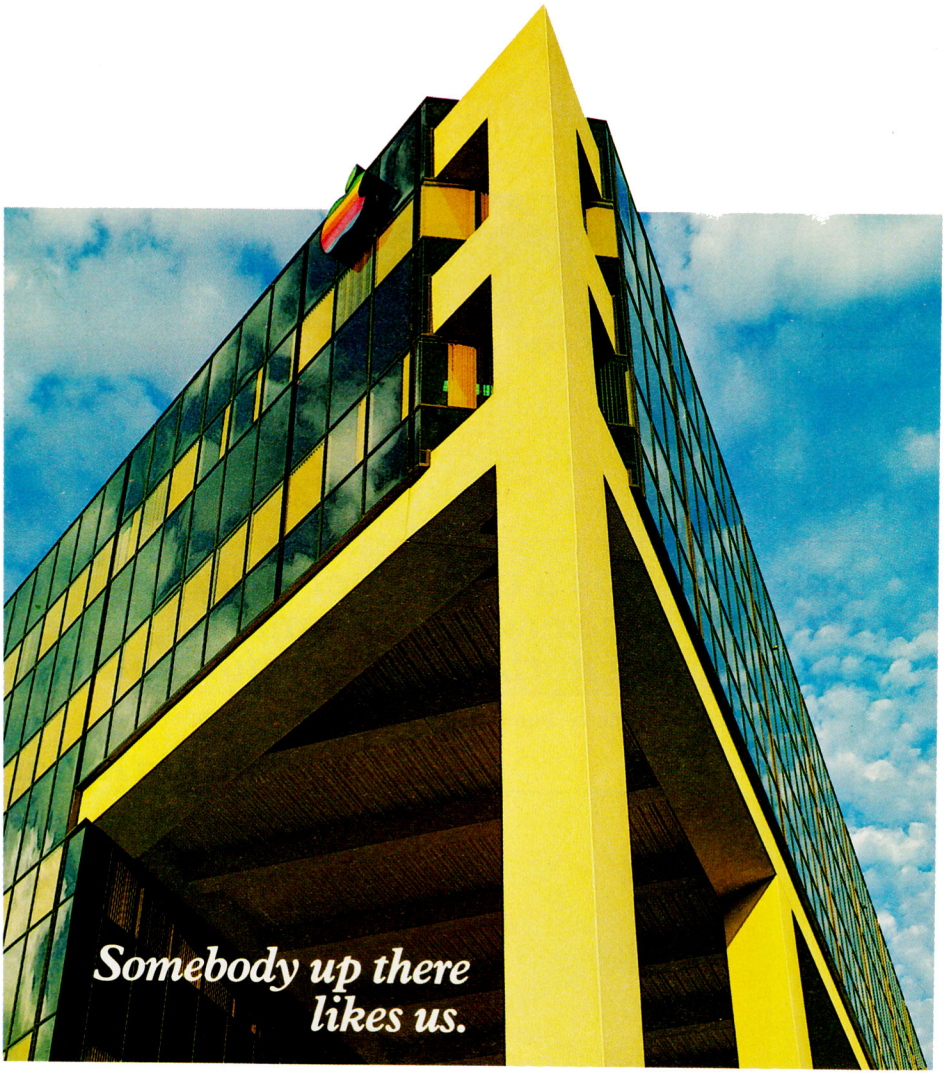
Standard Time (6 p.m. to 5 a.m., Monday through Friday and all day Saturday and Sunday): $6 per hour for 300 baud; $12.50 for 1200 baud. Prime Connect Time (8 a.m. to 6 p.m.): $12.50 per hour for 300 baud and $15 per hour for 1200 baud. Communications surcharges are extra.

**Official Airline Guide Electronic Edition**

CIS Standard Time: $21 per hour; CIS Prime Time: $32 per hour

**Travelshopper (TWA PARS)**

CIS Standard Time: $21 per hour; CIS Prime Time: $32 per hour




The people at Apple® should know a good peripheral when they see one. And when they developed ProDOS™ to upgrade the Apple II line, they made it automatically recognize and read Thunderclock.

Not surprising, when you consider Thunderclock's long list of useful applications. In the office, the lab and at home. It starts with time and date stamping disk files and just keeps growing. To automatically accessing data bases, sending electronic mail, timing experiments, controlling your sprinklers and even tracking satellites.

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Thunderclock adds a new dimension to all the new ProDOS-based software (like APPLEWORKS™ and WORD JUGGLER IIe™). And gives you access to the time from years down to milliseconds. It comes with a one-year warranty and never misses a tick. On-board batteries keep it running for up to four years before you snap in a new pair.

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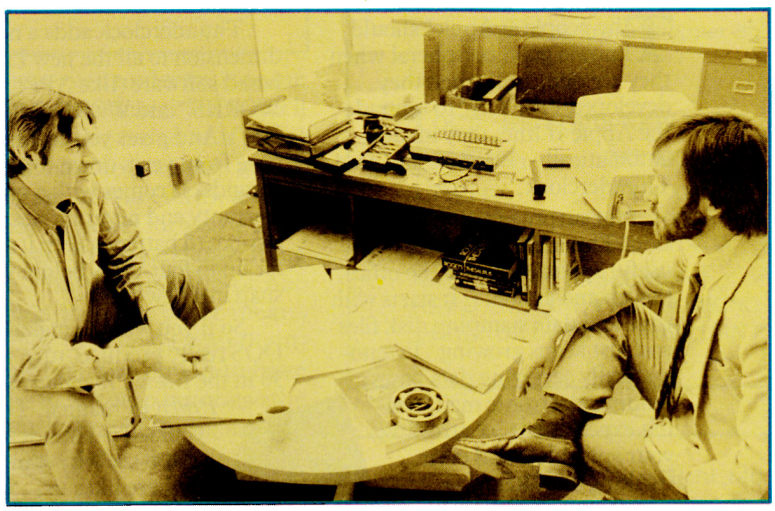
**Circle 129 on Reader Service Card.**

# Demystifying Delphi

***This oracle is a consumer-oriented information service in Cambridge, MA. And there's nothing mysterious about it.***

***by Cynthia K. Carr, inCider staff***

It's never easy being the new kid in town. The slow, scrutinizing, sidelong glances. The inevitable confrontation between established and newcomer. Delphi's the new kid on Telecommunications Avenue. A consumer-oriented, on-line information service, Delphi moves into a neighborhood governed by the traditional likes of CompuServe and The Source—the recognized leaders among on-line services.

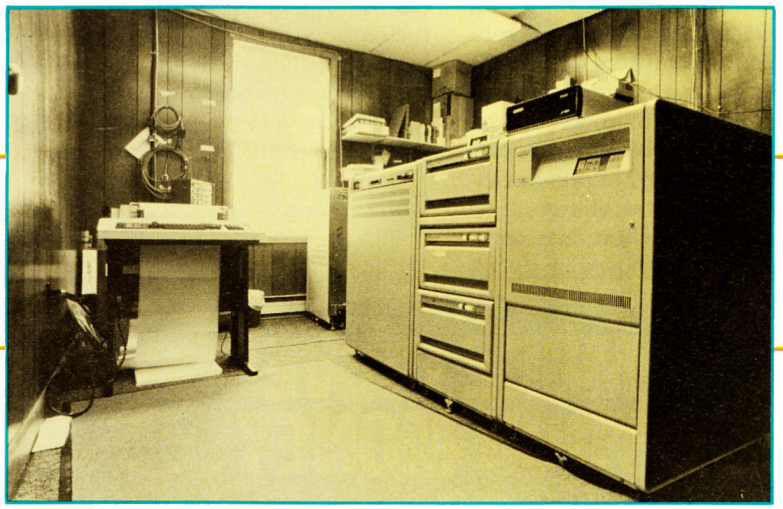


*J. Wesley Kussmaul (right), president and chief executive officer of General Videotex Corporation, is given credit for developing Delphi, a consumer-oriented, on-line information utility, in 1983.*

The increased popularity and convenience of telecommunications spawned these information utilities. CompuServe claims 192,000 subscribers across the world. CompuServe and The Source comprised the unquestioned elite, the undisputed champions until February 1983, when Delphi entered the scene. Under the auspices of General Videotex Corporation in Cambridge, Massachusetts, Delphi professes to be the fastest growing on-line information service in the country. The company reports a growth rate of 15 percent a month, quickly making it a three-way race for the telecommunications information market share.

"Our goal is to provide on-line services of great variety and usefulness and our approach is particularly oriented toward communities of interest," says J. Wesley Kussmaul, president and chief executive officer of General Videotex Corporation. "We believe the user ideally wants to remember a limited number of user names and passwords and we want to provide as much as easily and as economically possible with one user name and password."

What keeps Delphi up and running is the VAX (Virtual Accessing Executive) supermini computer from Digital Equipment Corporation. Hundreds of callers may be on the system at any given time, and although VAX can handle one caller at a time, its process



*Delphi's power relies on the VAX (Virtual Accessing Executive) supermini computer from Digital Equipment Corporation.*

is so fast that callers don't experience a noticeable delay when logging on. Delphi's system has 10 megabytes of main memory and just under 3 gigabytes of on-line disk storage.

Delphi supplies information on financial matters, travel arrangements, entertainment—you name it. Although Delphi's offerings are similar to those on CompuServe and The Source, the Delphi difference is its consumer-oriented approach: Delphi is receptive to—and encourages—subscriber comments and suggestions. But its major advantage is its common-sense menu structure. With Delphi, you choose menu options by typing in the first one or two letters of the selection. You don't have to worry about memorizing options and their corresponding numbers, as with CompuServe. It's all part of Delphi's no-nonsense, straightforward style.

"We tend to think of ourselves as the most user-friendly service," Assistant Product Manager Kelly Thebodo says. "You don't have to remember numbers as with other services. Delphi deals more with English. If you want mail, there's M for mail."

The menu system is devised to suit the user's abilities. Those more accustomed to the service can turn off the menus at will. "I think this is a very good service for the novice," Thebodo notes. "You can tailor Delphi to your specific needs and level of expertise."

*Photography: Torsheya Studio*

*Administrative Assistant Joanne Petrucci is part of the Delphi team devoted to serving subscriber needs.*

**The Delphi Connection**

You can link up to Delphi through the packet-switch networks: Tymnet, Datapac, Uninet, or the foreign-sponsored networks. There is no extra fee for this service; you pay for only the hourly connect time. A one-time subscription costs $49.95, which includes a handbook and two free hours of evening connect time. Starter kits are available for $29.95 with a command card and one free evening hour. According to Kussmaul, major credit-card holders can call Delphi's cus-

tomer-service department, sign up, and be on-line by 6 p.m.

Access charges for both 300- and 1200-baud modems are $16 per hour on weekdays, 8 a.m. until 6 p.m., and $6 per hour during evenings and on weekends. This past January, Delphi instituted 2400-baud access at a $5 per hour surcharge. Under Delphi's associate membership plan, groups or businesses can establish autonomous accounts that are billed to one principle account at no extra charge. (See the **Table** for a rate chart that compares CompuServe, Delphi, and The Source.)

In line with Delphi's devotion to the subscriber, as a first-time user you are welcomed to the system by Max, the Delphi tour guide. Max takes you to the security department to enter your password, then explains the system's various commands and features. For someone new to on-line services, Max is the ideal translator.

**On-line Yuppies**

The average Delphi subscriber is a professional male in his 30's who is "likely to use the system for professional and quasi-professional purposes," Kussmaul says. He maintains, however, that Delphi boasts a better balance between male and female membership than the other on-line services. Thebodo indicates future subscribers learn about Delphi through computer magazines and by word of mouth.

Delphi's real-time conference feature attracts the professional, according to Kussmaul. This popular feature lets an unlimited number of people communicate with one another about subjects ranging from tax shelters to Academy Award winners.

Another draw is electronic mail (e-mail). Not only does Delphi include Telex and ECOM, but the service also lets you send mail to those who use CompuServe or The Source for 75 cents per message. Currently, Delphi handles the mail on a one-way route since CompuServe and The Source don't reciprocate delivery. Kussmaul contends the process is in the works. "At Videotex '82 or '83. . .Jeff Wilkins made a strong statement that all on-line services should be linked together and I believe he meant it," Kussmaul says.

Away from the home front, Kussmaul reports Delphi has developed into a successful enterprise in Japan. He says the Japanese are attracted by GlobaLink, an on-line language feature that translates original text into other languages such as French, Spanish, German, or Portuguese. The entire process is handled through Delphi's electronic mail. Translations cost 3 cents per character.

**In the Beginning. . .**

During Delphi's planning stages, Thebodo explains that service ideas were just that—ideas. Service originators presented their ideas, but didn't bother with the legwork necessary to complete the job. Now Delphi requires its information providers, or IP's as they're known, to follow contracted guidelines and submit a small-scale business plan. Each special service has its own IP. For example, Delphi's travel service is sponsored by IOS, a Cambridge-based, on-line travel agency; North American Investment Corporation supplies financial services like stock transactions and tax consul-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tations. Since Delphi doesn't list any free services, there's an additional fee for special services.

An on-line banking service is still in negotiations, but other information services include Autonet, a car-buyer's comparison/information center; Peoplenet, where you tell about yourself or search for people with common interests; and an on-line market to shop at home. Subscribers can also participate in Delphi's continuing poll. Topics cover anything and everything—from high-school vandalism to the controversial issue of toe biting. A publishing section lets people post articles, poetry, and novels.

One of the "team efforts," The Adventures of Stephanie, is a continuing novel that started as one of Delphi's original offerings in December 1983. For those who tuned in late, events have compelled Stephanie to go off on a murdering spree. What will become of Stephanie? Callers can read Stephanie's latest exploits and then determine her fate in the next chapter.

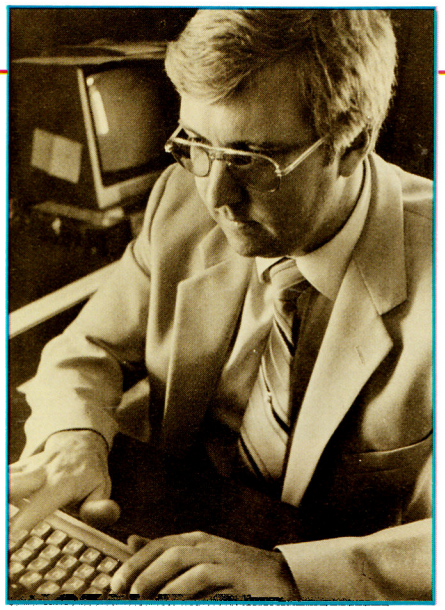
### The Oracle at Delphi

But it's in Delphi's namesake that one of the more popular services, The Oracle, arrives. If you remember your high-school Greek mythology, the Oracle at Delphi knew all. Here you can obtain the answer to anything from a hardware question to human relationships to the best seafood restaurant in Peoria. "It's almost a 'Dear Abby' type of thing," Thebodo explains. "You'll always get an answer, but it may be a little tongue-in-cheek."

For the researcher, Delphi's Library service opens a collection of reference materials: The Kussmaul Encyclopedia, an on-line encyclopedia capable of cross referencing its 20,000 subjects; The Librarian, who does the research for you (this IP can tell you how long the Mississippi River is—in centimeters); and The Research Library which provides access to Dialog, a collection of more than 200 data bases.

### Of Special Interest

Besides its general services, Delphi has 17 public-access special-interest groups (SIGs) under Product Manager John Gibney's guidance. SIG's usually have their own bulletin boards, newsletters, and conference times. But, as with the general services, SIGs must follow set requirements. Gibney says he personally meets each sysop (system operator) before signing him or her to a five-year contract with Delphi. According to Gibney, the agreement basically outlines what Delphi will do and what the sysop will do. The tactics help promote Delphi.



*Seventeen public-access special interest groups fall under Product Manager John Gibney's direction.*

"It isn't selling user ID's that will make us money," Gibney states. "It's getting Delphi out there."

Gibney came to Delphi in November 1984 after four and one-half years at CompuServe, where he says he was the last of its 17 originators to leave because of company policy changes. "Once CompuServe put business-oriented managers in charge of information services, it wasn't for the consumer anymore," he says.

People join SIGs for a purpose, and Gibney says Delphi must give them a reason to log-on. Whether it's for group harmony or a "batteries included" subscription package, members should feel they're getting some value out of the SIG.

The Performing Artists Network (PAN) is a popular Delphi SIG for professional musicians, actors, talent scouts, and those involved in the entertainment industry. Members can use the SIG to post and book acts, for example.

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*Table.* On-line rate comparison chart.

| | Registration Fees | Monthly Minimum | Access Rates (per hour) | |
|---|---|---|---|---|
| **CompuServe** | | | | |
| 5000 Arlington Centre Boulevard<br>Columbus, OH 43220<br>(800) 848-8199<br>(614) 457-0802 | Consumer Information Starter Kit: $39.95<br>Executive Information Service Starter Kit: $69.95 | None | 300 baud:<br><br>1200 baud: | $12.50 weekdays<br>$6 evenings, weekends<br>$15 weekdays<br>$12.50 evenings, weekends |
| **Delphi** | | | | |
| General Videotex Corporation<br>3 Blackstone Street<br>Cambridge, MA 02139<br>(800) 544-4005<br>(617) 491-3393 | $49.95 (handbook and one free evening hour)<br>Starter Kit: $29.95 (command card and one free evening hour) | None | 300/1200 baud:<br>2400 baud: | $16 weekdays<br>$6 evenings, weekends<br>$5 surcharge |
| **The Source** | | | | |
| 1616 Anderson Road<br>McLean, VA 22102<br>(800) 336-3366<br>(703) 734-7500 | $49.95 | $10 | 300 baud:<br><br>1200 baud: | $20.75 weekdays<br>$7.75 evenings, weekends<br>$25.75 weekdays<br>$10.75 evenings, weekends |

prophetess, Gibney confidently predicts a strong future for the on-line information utility. He anticipates 100,000 active users by October—a number he substantiates by his suggested order for six VAX 785 computers. "I believe in everything by the six-pack," he remarks.

His claim is also backed by the addition of the Micronetworked Apple Users Group (MAUG) to Delphi's ranks this past March. Gibney expects 12,000 MAUG members, once associated solely with CompuServe, to migrate to Delphi by year's end. But according to Paul Battaglia, the CompuServe account representative with Golin/Harris Communications, the MAUG is still up and running. He emphasizes that "MAUG is an important part of CompuServe."

Gibney explains that their strategic market position results from Delphi being at "the right time, the right place with the right people."

According to Thebodo, "Our name is being recognized and we're not just another passing utility."

To support Delphi's promotion as "the fastest-growing utility," Kussmaul cites a recent Harvard Business School undergraduate study of Delphi users. "Naturally, the user tended to rate Delphi highest, but that's because these were Delphi subscribers they were surveying. However, we were rated higher by those who subscribed to one or both of the other services [CompuServe or The Source] than those who subscribed to Delphi only."

Kussmaul contends that despite the market and the increasing amount of media attention devoted to the better-known on-line information services, competition isn't a factor. "There are a lot of people in the on-line services business and I don't think any of them are exactly head-to-head. We all have our own kind of unique approach to on-line services. It's very much a cooperative environment. There are a lot of players. We gateway through to a lot of the other players. Delphi MailThru is an example. A lot of our subscribers subscribe to more than one service.

"We're not in business to take subscribers away from other organizations," he continues. "We're in the business of providing valuable on-line services to people with personal computers and terminals."■


**Circle 361 on Reader Service Card.**

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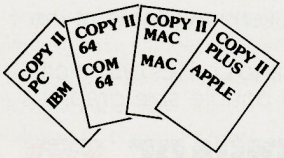


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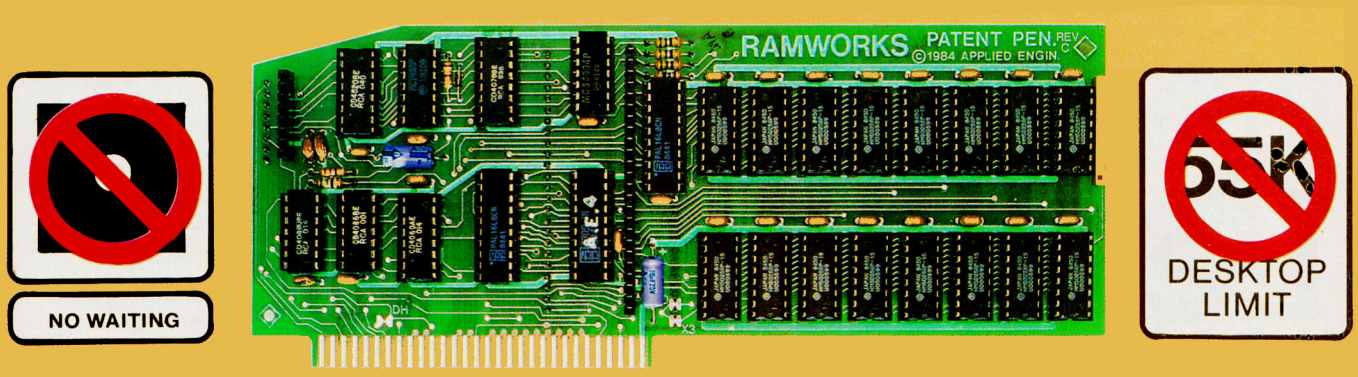


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RAMWORKS has taken the "waiting" out of computing. Floppies and hard disks are OK for long term storage. But they fall far short as on line storage. If you are using high level languages, spelling checkers, spread sheets, word processors, databases and other disk intensive software, RAMWORKS will save you time and make you more productive.

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*by James M. Wilson*

**Frustrated with Applesoft editing? Your word processor is a better BASIC editor.**

Apple tinkerers serious about writing BASIC programs understand what a trying experience the process can be. Between program statements that you can't easily change or correct and modifications that involve overhauling program sections, sometimes you wonder if BASIC is worth the trouble. Although the Apple does come with an editor, it's neither powerful nor useful.

Equipped with a good program editor, you can reduce the time, effort, and aggravation associated with writing and debugging a program. Many specialized program editors are available: GPLE by Beagle Bros and GALE from Micro-Sparc are examples. Many people already have a program editor, but don't realize it. Word processors like Apple Writer read and save documents as text files and can readily write and edit BASIC programs.

### From Text to Applesoft and Back Again

A program written with a word processor can be translated into an Applesoft program very easily. First, press control-N to clear the Apple's memory and then type in EXEC *program name*. If the program is saved as a text file on disk, this process loads the program into memory. It can then be run as any other BASIC program or saved as an Applesoft program.

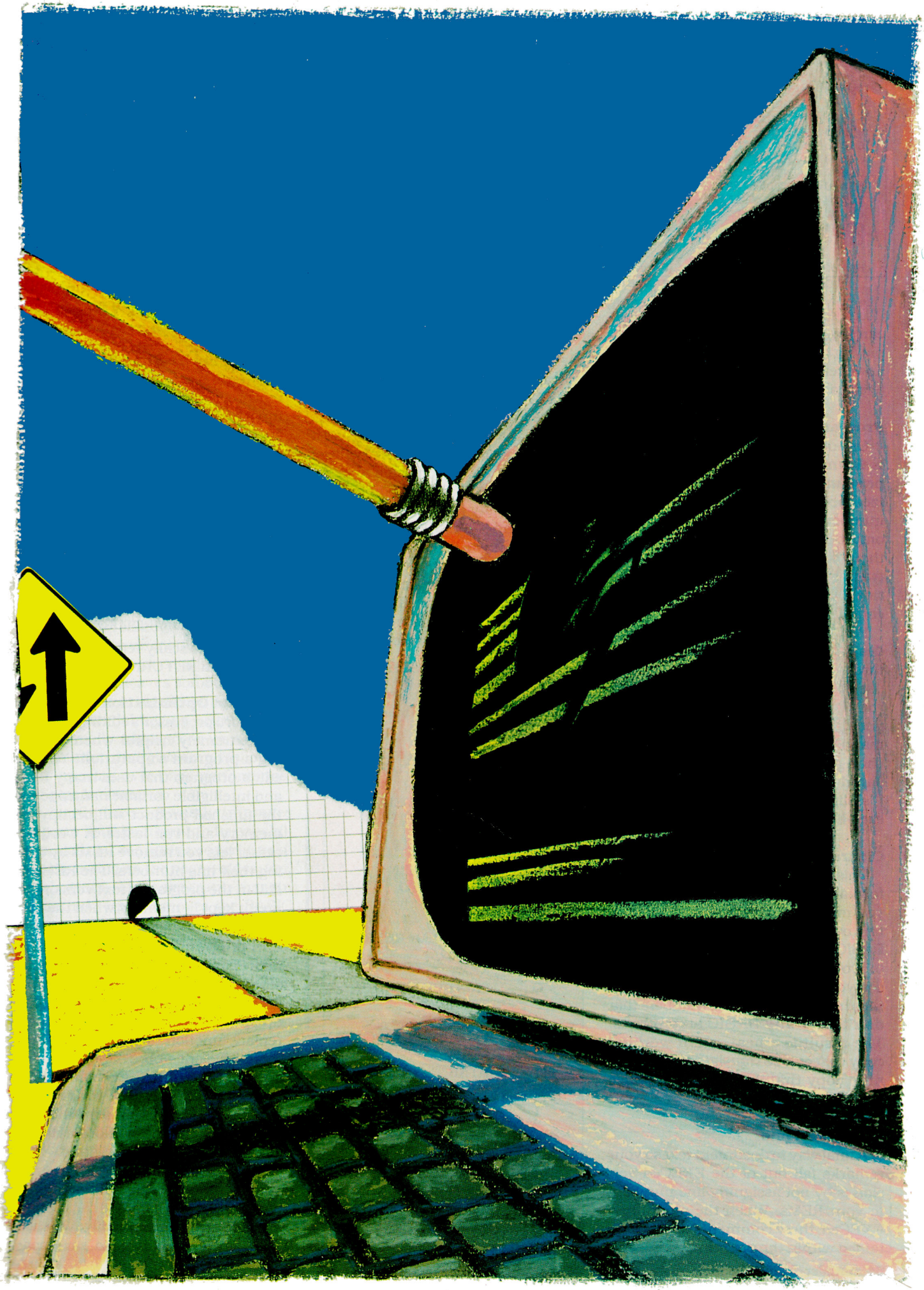
This process can also merge several text files of different program segments into a single program. For example, if you load the first segment (as described above) and then want to add a second part, simply enter EXEC *PART-TWO*. This would load the second segment, PART-TWO, into memory with the first segment. You don't need to load the programs in proper sequence, either. The line numbers assigned to the statements ensure that the various parts go where they should.

Before you begin, be sure that your text files contain no duplicate line numbers. If they do, the program will load and run without problem, but only the last duplicate line EXECed will appear in the program. Since the EXEC process will insert a duplicate line in place of the earlier line, if you have ten of line 100 in your text file, only the last one will remain when the EXEC process is finished.

The EXEC process lets you convert a word-processed program into BASIC. You can similarly reverse the procedure to translate a BASIC program into a text file that can be read and modified by your word processor. Use the Capture routine in **Listing 1** to accomplish the task.

Add this routine to the end of the BASIC program you want to save as a text file. Enter the command RUN 63000, and save the file under a chosen file name. As with other documents, use your word processor to modify this "document." It's useful to leave the Capture routine in your programs until you make all changes.

*Illustration: Jamie Hogan*



***Listing 1.*** *Capture routine.*

```
63000 D$=CHR$(4)
63010 INPUT"FILE NAME TO SAVE
      PROGRAM UNDER: ";F$
63020 IF LEN(F$)=0 THEN END
63030 PRINTD$;"OPEN";F$
63040 PRINTD$;"DELETE";F$
63050 POKE 33,33
63060 PRINTD$;"OPEN";F$
63070 PRINTD$;"WRITE";F$
63080 LIST 1,63110
63090 PRINTD$;"CLOSE";F$
63100 POKE 33,40
63110 PRINT"FINISHED"
```

Backed by these procedures, you can move files between BASIC and Apple Writer. Other techniques exist, however, that can make creating or altering a program much easier.

### Programming Aids

One of BASIC's most annoying tasks is the numbering of every line in the program. Some computers or specialized program editors automatically number the lines so you need to enter only the appropriate statements. Although Apple Writer can't provide this twist, it can achieve a fair approximation by setting up a document that contains only line numbers.

For example, I have a file of 100 lines designated by line numbers (lines 10 through 1000 in increments of 10). I use this as my building base to enter the BASIC commands on each line and then I use the cursor-control commands to move to the next line. Although somewhat awkward compared to automatic line numbering, it's slightly quicker than numbering each line manually.

### Clearer Remarks

This approach clearly allocates space for various purposes. For example, you may want to set off each subroutine or program section with borders. BASIC requires blank REM insertions to provide space. Using a word processor, you can insert blank lines between these sections or list line numbers that don't have any BASIC statements. The result is a neat, clean working copy that can be translated into a running copy that doesn't waste space with unused REMs.

### One More Time

A final way to document text so your remarks fall out of the EXECed version is by not assigning line numbers to your REMs. When the program is EXECed, these comments won't be retained within the program.

You could also avoid labeling the remarks as REMs and delete both the line number *and* the REM designation. This REM method allows you to enter comments—if you don't mind the SYNTAX ERROR warnings when you EXEC the program. The Apple will try to interpret your comments as direct BASIC commands, but an error will result. The procedure won't affect your program unless your comment is a BASIC command. It's safer to label REMs and avoid the problem. **Listing 2** shows the three REM methods.

### Predefined Commands and Statements

A second useful file takes advantage of Apple Writer's glossary function. It lets you define a character that represents a longer word or phrase. You can use the designated character, in turn, to recall the longer word and insert it into your document. (A glossary file of common BASIC commands appears in the **Table**.) With the commands, you can readily insert a PRINT statement just by entering control-G P.

Note that all BASIC commands must be typed in uppercase letters. Lowercase letters create a SYNTAX ERROR when you run the program, because the BASIC interpreter doesn't recognize them. The case-lock mode on most word processors takes care of this requirement. With Apple Writer, issue a control-K command before entering BASIC statements.

***Table.*** *BASIC command glossary.*

| Character | BASIC Command |
|---|---|
| A | AND |
| B | NORMAL |
| C | PRINT D$;"CLOSE |
| D | D$ = CHR$(4) |
| E | PRINT D$;"DELETE |
| F | FOR I = 1 TO |
| G | GOSUB |
| H | HOME |
| I | IF ?? = !! THEN |
| J | FOR J = 1 TO |
| K | POKE |
| L | LEN |
| M | POKE 216,0: ONERR GOTO |
| N | NEXT |
| O | PRINT D$;"OPEN |
| P | PRINT |
| Q | PEEK( |
| R | PRINT D$;"READ |
| S | STR$( |
| T | HTAB |
| U | VAL( |
| V | VTAB |
| W | PRINT D$;"WRITE |
| X | TEXT |
| Y | INVERSE |
| Z | END |
| < | LEFT$( |
| > | RIGHT$( |
| ^ | MID$( |

Not only can you use simple commands, but you can even store more complex, multi-statement commands in your glossary. (The Apple Writer manual explains the procedures to create and save glossary files.) It's possible to have several glossaries and use them for programs that have different frequently used BASIC commands. A base file of line numbers and a glossary file of common commands will let you write programs more efficiently and effectively.

### Search and Ye Shall Find

Often, it's necessary to update or correct programs and sometimes changes must be made throughout a program—such as a misspelled word. Without an editor, you'd have to search every line and correct each error individually—a very time-consuming task. The word processor's search and replace feature tackles the job in a fraction of the time. In Apple Writer, to replace a RETORN with RETURN, first go to the beginning of the file with control-B. Then type:

control-F /RETORN/RETURN/A

This automatically replaces every RETORN with RETURN.

### Program Optimization

A word processor's editing functions are extremely helpful when optimizing a program's operation. You can edit a program that uses many REMs and intelligible variable names so that the finished product will occupy less memory and run faster. A word processor lets you remove REMs by deleting their line numbers. The REMs are still in the program's text version, but aren't kept in memory when the file is EXECed.

In programs, descriptive variable names are easier to write and understand but once you complete a program, these names unnecessarily take up space. The automatic search and replace function can readily substitute more efficient abbreviations. For example, DAILY.SALES could be replaced by DS. This way, you can store more data. Space conservation not only makes room for more data, but also speeds program operation.

When you write a BASIC program, you should put each statement on its own line, so you can read the program and find errors more readily. When the program is error free, to save space

***Listing 2.*** *REM methods.*

```
10 PRINT "THIS IS A SAMPLE"
20 REM  THIS REM WILL REMAIN
   IN THE FINISHED PROGRAM

   REM  THIS REM WILL NOT GO
   INTO THE FINISHED PROGRAM

   THIS REM WILL NOT GO INTO
   THE FINISHED PROGRAM AND IT
   WILL CAUSE A SYNTAX ERROR
   WHEN EXEC'ED
30 PRINT"THIS IS THE LAST LINE"
```

and speed the program's operation, you should combine several single statement lines into one multi-statement line. If you try to combine several lines by re-entering all of the BASIC commands, you'll be faced by a sizable task. It's easier to use the word processor's cursor-control and deletion commands to delete line numbers and carriage returns and then insert colons. To correct errors, you can return to the program, break the incorrect line, and renumber the new segment.

### Program Listings and Documentation

One of a word processor's finest applications is to produce highly readable program listings. Unfortunately, the tried-and-true method to print by turning the printer on with PR#1 and entering LIST leaves something to be desired. The printed listings are acceptable for debugging and the like, but not really appropriate for a formal presentation; margins aren't followed, print appears over page perforations, and type is cramped.

A word processor vastly improves program listings. Through its capabilities, defined margins properly position the listing on the page—sides, top, and bottom. The paragraph margin command –.pm 3 moves the BASIC command line numbers three spaces to the left of the margin to improve legibility by distinguishing between different program lines. Your presentable program can easily be incorporated into other written material or documentation.

In spite of its reputation as a glorified typewriter, a word processor is a very helpful programming tool. With just a little effort on your part, a word processor can create and edit text files, easing your programming efforts. ■

*Address correspondence to James M. Wilson at 25 Bute Gardens, Glasgow, G12 8RT, Scotland, UK.*

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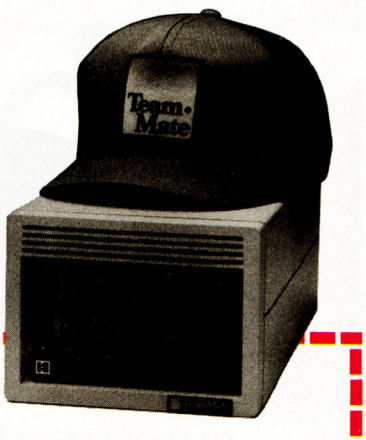


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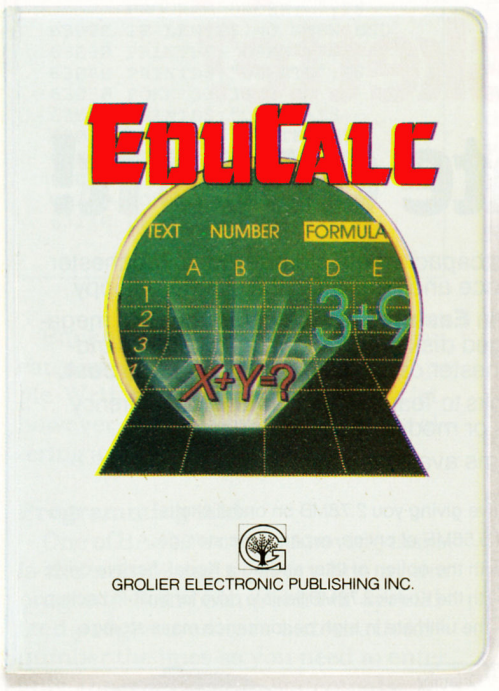


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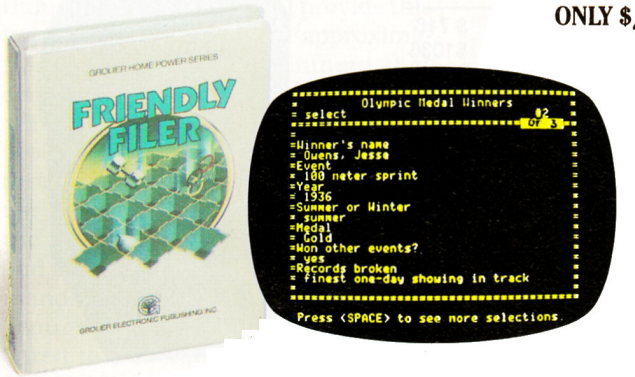


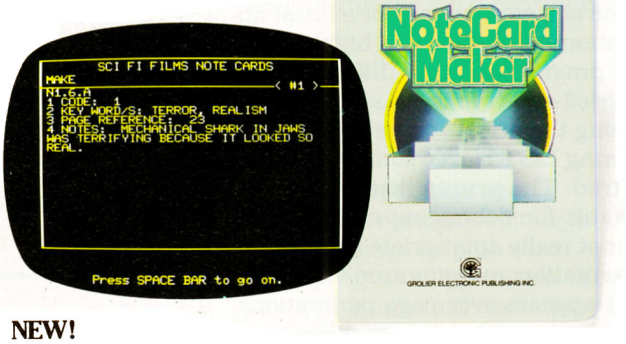


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**Circle 198 on Reader Service Card.**

# Using ProDOS Part 4

# A New Order

*by Lee Swoboda*

Last month you learned about the commands ProDOS shares with DOS 3.3. To work its magic, Apple has also added nine new commands to ProDOS. They are listed in **Table 1**.

There are a number of things to keep in mind as you read the descriptions of the commands. First, in the model of the command format (in bold type), the commands themselves appear in uppercase letters, and information you, the user, must input is in lowercase. Information in italics is optional for you to enter. (**Table 2** defines these parameters and lists the range of their values.) Examples without line numbers are in immediate mode; all other examples are in deferred mode.

***Table 1.*** *Commands new to ProDOS.*

| | |
|---|---|
| CAT | FRE |
| CHAIN | PREFIX |
| CREATE | RESTORE |
| DASH (-) | STORE |
| FLUSH | |

***Nine commands unique to ProDOS make life easier for the BASIC programmer.***

In the discussion of each command, you must provide all the information including the part in quotation marks. This latter information tells ProDOS what to do and what pathname to use. When used in a program, it won't appear on the screen. Following the discussion is a "hands-on" section which provides an example for you to try.

**CAT *pathname,Sn,Dn***

ProDOS examples:

```
CAT
CAT /volumename/subdirectory
999 PRINT D$;"CAT"
```

Apple claims CAT is a new command, but it actually performs the same function as CATALOG does in DOS 3.3: It prints a 40-column list of the disk's files to the video screen. (See Part 3.)

The CAT display, however, doesn't look quite like the CATALOG display. The screen CAT produces is similar to the **Figure** and includes:

- An asterisk in the left column if the file is locked.
- The file's name.
- A three-letter abbreviation of the file's type (see **Table 3**).
- The number of 512-byte blocks the file occupies on the disk.
- The date the file was last modified (in mm/dd/yy format).
- The total number of 512-byte blocks

used on the entire disk (not just the current directory) and the number still available.

If you use the CAT command without a pathname, the computer will list the files in the default pathname—your "boot" drive, probably drive 1—unless you've changed it with the PREFIX command. If you do specify a pathname, the computer will list the files in that path. Specifying just the volume directory in the pathname makes CAT list only the subdirectories (DIR files) in that directory, but including a subdirectory in the pathname makes CAT list only the files in that subdirectory.

The CAT command will let you list all the files on the disk only if you don't have any subdirectories, so you must design your disk directories thoughtfully. If your directory structure is complex, you may find yourself CATing through every directory trying to find a "lost" file. Conversely, if you've designed logical directories, you won't have to scan through several screens of files, as with DOS 3.3, to find the one you want; merely CAT the appropriate subdirectory. (See "More than Meets the Eye" by Viktor Rubenfeld, April 1985, p. 32.)

**CHAIN pathname,*@n,Sn,Dn***
ProDOS example:

```
999 PRINT D$;"CHAIN /PETS/DOGS/
    DOBERMAN"
```

When an Applesoft program ends, its program variables remain in memory. When the next Applesoft program begins execution, it destroys these variables. The CHAIN command saves the names and values of variables generated by one program for use in another. CHAIN combines the functions of STORE, RUN, and RESTORE.

Hands on:

From the BASIC prompt, type NEW and press the return key, then type the following BASIC program:

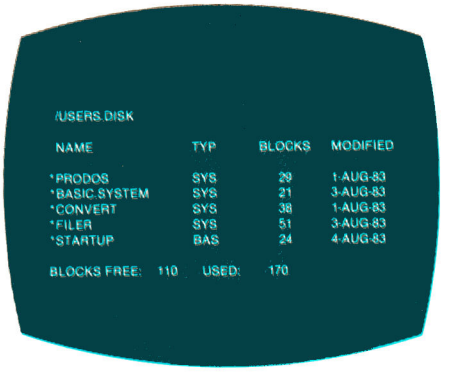
```
10 PRINT A
20 PRINT A$
30 END
```

Save the program as ETC, then type:

```
10 D$ = CHR$(4)
20 A = 1
30 A$ = "Hello"
40 PRINT D$;"CHAIN ETC"
```

Now type RUN and press the return key. The computer will print the value "1" and the string "Hello" on the screen. The second example above generated the values, then passed them to ETC using the CHAIN command. Type LIST and press return to verify that the first program executed the second. The CHAIN function is useful when you are constructing a program in modules; one module can end by chaining another module and passing its variables along.

***Figure.*** *ProDOS CAT command screen.*




**CREATE pathname,*Txxx,Sn,Dn***
ProDOS examples:

```
CREATE /PETS/DOGS/DACHSHUND
999 PRINT D$;"CREATE /PETS/DOGS/
    DACHSHUND"
```

ProDOS uses the CREATE command to establish a file. Normally you'd use it to establish new subdirectories, but you may establish any of the file types listed in **Table 3** by adding the type parameter to the command. You compose the type parameter from the letter T plus the three-character file type. If you don't specify a type, ProDOS will assume the default TDIR and establish a directory file.

When you use the CREATE command to establish a subdirectory, ProDOS establishes a valid DIR file in the directory, inserts all the appropriate information (dates, times, size) in the file, and then locks the file.

Just because you can establish file types other than DIR with CREATE doesn't mean you can do much with the file. ProDOS treats established files as sequential text files (which is what a DIR file is). So, if you CREATE a BAS file, when you try to load or run it, you will get an "Out of Data" error because there is nothing in the file. What the CREATE command does is reserve space in the directory.

Hands on:

From the BASIC prompt, type CREATE USERS.DISK/TEST (or CREATE UTILITIES/TEST if you're using the //c's version 1.0.2), and press the return key. When the drive stops running, CAT the disk. The computer will list the new file "TEST", which is a DIR (directory) file.

**– pathname,*Sn,Dn***
ProDOS examples:

```
– /PETS/DOGS/DACHSHUND
999 PRINT D$;"– /PETS/DOGS/
    DACHSHUND"
```

The DASH command (the symbol –) is a substitute and abbreviation for RUN, BRUN, and EXEC. The computer will look at the file type and select the correct command: RUN for file type BAS, BRUN for file type BIN, and EXEC for file type TXT.

Hands on:

From the BASIC prompt, type –STARTUP and press the return key to execute the start-up program.

**FLUSH *pathname***
ProDOS examples:

```
FLUSH /PETS/DOGS/DACHSHUND
999 PRINT D$;"FLUSH /PETS/DOGS/
    DACHSHUND"
```

The FLUSH command performs the rather gauche task that its name suggests: It transfers data in a file's buffer

***Continued on p. 42.***

***Table 2.*** *Optional parameters of ProDOS commands.*

| Description | Syntax | Range of n |
|---|---|---|
| Slot number | ,Sn | 1 to 7 |
| Drive number | ,Dn | 1 or 2 |
| Field number | ,Fn | 0 to 65535 |
| Record number | ,Rn | 0 to 65535* |
| Number of bytes | ,Bn | 0 to 65534** |
| Address in RAM | ,An | 0 to 65535 |
| Length in bytes | ,Ln | 1 to 65535 |
| End address in RAM | ,En | 1 to 65535 |
| At line number | ,@n | 0 to 65535 |
| Slot number*** | n | 0 to 7 |
| File type | Txxx | see Table 3 |

* Rn is limited to 16 megabytes divided by record length (L) or 65535, whichever is smaller.

** Bn is limited to one less than the record length (L – 1) or 65534, whichever is smaller.

*** Used in the IN# and PR# commands.

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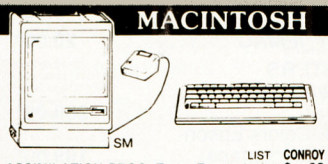

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| **MICRO-SCI,** A2 Disk Drive, 143K | $ 345 | $ 185 |
| A2 Controller Card | $ 100 | $ 60 |
| Half Height Drive for IIe | $ 269 | $ 189 |
| Half Height Drive for IIc | $ 299 | $ 199 |
| **RANA,** Elite I, 163K, 40 Track | $ 299 | $ 189 |
| Elite II, 326K, 80 Track | $ 499 | $ 369 |
| Elite Controller | $ 145 | $ 79 |

## HARD DISKS

| | | |
|---|---|---|
| **QUARK,** QC10 for IIc/IIe/III/MAC | $1995 | $1595 |

## OTHER HARDWARE

| | | |
|---|---|---|
| **CCS,** 7711 or 7710-A Interface, ea. | $ 115 | $ 85 |
| **CPS/EASTSIDE,** Wild Card II (copier, II+/IIe) | $ 140 | $ 99 |
| **COMX,** 80 Col. + 64K RAM Card (IIe) | $ 199 | $ 99 |
| 16K RAM Card (II+), 1 yr ltd wty | $ 119 | $ 29 |
| **HAYES,** Mach II/III Joystick (II+/IIe) | | CALL |
| **KENSINGTON,** System Saver Fan | $ 90 | $ 65 |
| **KEY TRONIC,** KB200 Keyboard | $ 298 | $ 188 |
| **KOALA,** Muppet Keys | $ 80 | $ 49 |
| Touch Tablet w/Micro Illustrator (IIe/IIc) | $ 125 | $ 75 |
| **KRAFT,** Joystick (II/II+/IIe) | $ 65 | $ 35 |
| Game Paddles (II/II+/IIe) | $ 50 | $ 26 |
| **MICROSOFT,** Premium Softcard (IIe) | $ 395 | $ 275 |
| **ORANGE MICRO,** Buffered Grappler Plus, 16K | $ 239 | $ 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 IIe | $ 319 | $ 219 |
| 128K RAM Card (II+) | $ 269 | $ 189 |
| **TRACKHOUSE,** Numeric Key Pad (II+/IIe) | $ 149 | $ 94 |
| **TG,** Select-a-Port | $ 40 | $ 26 |
| Joystick or Game Paddles, each | $ 35 | $ 22 |
| **VIDEO V Color 7, IIc RGB Card** | $ 200 | $ 139 |
| **V Color 7, IIe RGB Card** | $ 250 | $ 169 |
| **VIDEX,** UltraTerm (II+/IIe) | $ 379 | $ 229 |
| VideoTerm 80 Col. Card (II+/IIe) | $ 279 | $ 175 |
| **WICO,** Smartcard (spec. II/II+/IIe) | $ 199 | $ 159 |

## BUSINESS SOFTWARE

| | LIST | CONROY |
|---|---|---|
| **ALS,** Word or List Handler, ea. | $ 80 | $ 36 |
| Handler Pak (Word/List/Spell) | $ 170 | $ 73 |
| **ASHTON-TATE,** dBase II (Reg 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 |
| **CDEX,** for Visicalc, Multiplan, Apple IIe, ea. | $ 60 | $ 40 |
| **DOW JONES,** Market Manager Plus | $ 249 | $ 159 |
| Market Analyzer or Microscope, ea. | $ 349 | $ 219 |
| **HOWARD SOFT,** Tax Preparer for '84 taxes | $ 250 | $ 165 |
| Kit for California | $ 95 | $ 63 |
| **HUMAN EDGE,** Sales or Mgmt Edge, ea. | $ 250 | $ 165 |
| **LIVING VIDEOTEXT,** Think Tank | $ 145 | $ 89 |
| **MECA,** Managing Your Money | $ 200 | $ 125 |
| **MEGAHAUS,** Megawriter | $ 100 | $ 65 |
| 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 | $ 69 |
| **QUARK,** Word Juggler & Lexicheck (IIe/IIc) | $ 189 | $ 129 |
| **SENSIBLE,** Sensible Speller | $ 125 | $ 79 |
| **SIERRA/ON-LINE,** Homeword | $ 50 | $ 45 |
| Screen Writer II, 2 Pak w/Dictionary | $ 130 | $ 79 |
| **SOFTWARE PUBL,** PFS:File or Write, each | $ 125 | $ 79 |
| PFS:Graph or Report, each | $ 125 | $ 79 |
| **STONEWARE,** DB Master, v. 4 | $ 350 | $ 225 |

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| **BEAGLE,** GPLE, Alpha Plot or B.Basic, ea | $ 50 | $ 27 |
| Pronto DOS, Disk Quick, Ap. Mech. or I.O. Silver, ea | $ 30 | $ 19 |
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| 3 Pak (Pasc, Turbo Tut, Toolbox) **NEW** | $ 105 | $ 59 |
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| **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 |
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| Your Personal Net Worth | $ 80 | $ 50 |
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| ProModem 1200 w/software (MAC) | $ 549 | $ 429 |
| ProModem 1200A (AP) | $ 449 | $ 349 |
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| **QUADRAM,** Quadmodem, Internal (IBM) | $ 595 | $ 425 |
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| Color 500 — Comp/VCR/RGB/Audio | $ 525 | $ 375 |
| Color 600 — Hi Res/RGB/Audio | $ 599 | $ 449 |
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| 182 — 120 cps/80 col | $ 299 | $ 239 |
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|---|---|---|
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| **MPC,** Apple II I/F & Cable for Epson & Gemini | $ 95 | $ 59 |
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| **ORANGE MICRO,** Grappler Plus for Apple | $ 149 | $ 99 |
| Serial Grappler | $ 119 | $ 79 |
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| **QUADRAM,** Microfazers, full line IN STOCK | | CALL |
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| **INNOVATIVE,** Flip-n-File 50 (disk holder) | $ 22 | $ 15 |
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***Table 3.*** *ProDOS file types.*

| Contents of File | Type |
|---|---|
| Sequential text | TXT |
| Random access text | TXT |
| Binary | BIN |
| Applesoft BASIC program | BAS |
| Relocatable file | REL |
| Integer BASIC program | INT* |
| Integer BASIC variables | INV* |
| Directory | DIR |
| Applesoft variables | VAR |
| User defined | $F1 to $F8 |
| ProDOS system file | SYS |
| ProDOS added command file | CMD |
| ProDOS reserved | $F9 |
| ProDOS reserved | $C0 to $EF |
| Typeless file | $00 |
| Bad block file | BAD |

* Not executable under ProDOS

***Continued from p. 38.***

to disk, or "flushes" the buffer. FLUSH is similar to a partial WRITE command, which writes only unsaved data to the file. If your program may stop unexpectedly, FLUSHing avoids losing data that hasn't been written to a file yet. For example, perhaps your program waits to write a series of new records to a file until after all the records have been input. You might want to FLUSH the file after you enter each record to ensure that a data-entry error on one record won't destroy all the others.

The CLOSE command also does a FLUSH to clear the file buffer before it closes a file.

**FRE**

ProDOS example:

```
10 PRINT D$;"FRE"
```

As Applesoft creates (concatenates) new strings from a collection of old ones, it leaves the old ones in memory. Eventually, free memory fills with "garbage" consisting of pieces of old strings. When that happens, the computer automatically "collects" the garbage—it gets rid of it—and you temporarily lose control of the keyboard. This process may take several minutes, and, of course, Murphy's Law dictates that this situation occurs at the most inconvenient point in the program. The Applesoft FRE command lets you control when your computer collects garbage, but it doesn't affect how long the collecting takes. You can only divide a long clean-up process into smaller pieces.

ProDOS's new FRE garbage-collection procedure is much faster than Applesoft's. The Applesoft FRE still works, but use the ProDOS example above to speed garbage collection.

**PREFIX *pathname,Sn,Dn***

ProDOS examples:

```
PREFIX /USERS.DISK/
999 PRINT D$;"PREFIX /USERS.DISK/"
```

The PREFIX command "teaches" the computer part of a pathname so you won't have to type the entire pathname each time you want to refer to a file. If all the files you want to select are in a particular subdirectory, set the prefix to the volume name and subdirectory. You may then refer to the files by typing only their file name; the computer automatically adds the prefix.

Hands on:

From the BASIC prompt, type PREFIX /USERS.DISK/TEST (or PREFIX /UTILITIES/TEST for the //c) and press the return key. Type CAT and press return again. Because you didn't specify a pathname, the computer will list the files in the directory with the prefix name. There aren't any files in the subdirectory /TEST, so the computer won't list any.

**STORE pathname,*Sn,Dn***

ProDOS examples:

```
STORE /PETS/DOGS/DACHS
999 PRINT D$;"STORE /PETS/DOGS/
    DACHS"
```

Normally, when you end a BASIC program, any variables the program used disappear into oblivion, unless you write them to a text file. STORE saves the names and current values of these variables in a special file (named "DACHS" in the example above), without your having to save each one individually. This special file is of the type VAR (see **Table 3**).

Hands on:

From the BASIC prompt, type NEW and press the return key, then type:

```
10 D$ = CHR$(4)
20 A = 1
30 A$ = "Hello"
40 PRINT D$;"STORE VARIABLES"
```

Type RUN and press the return key. When the drive stops running, type CAT and press return again. The computer lists the files in the subdirectory TEST, which now includes VARIABLES.

**RESTORE pathname,*Sn,Dn***

ProDOS example:

```
RESTORE /PETS/DOGS/DACHS
PRINT D$;"RESTORE /PETS/DOGS/
      DACHS"
```

RESTORE recovers variable names and values that STORE saved.

Hands on:

To recover the variables STORE saved, type:

```
10 D$ = CHR$(4)
20 PRINT D$;"RESTORE VARIABLES"
30 PRINT A
40 PRINT A$
```

Type RUN and press the return key. The computer will print a "1" and "Hello" on the screen, indicating it has "remembered" both the name and value of the two variables in the STORE example.

**COMING UP**

Parts 5 and 6 of this series will delve more deeply into using ProDOS commands in BASIC programs, including the critical issue of making DOS 3.3 BASIC programs run under ProDOS. I hope you'll join me. ■

*Lee Swoboda can't answer all your questions individually. However, if the answer is not lengthy and you include a stamped, self-addressed envelope, he'll do his best to respond. He'll include answers to other pertinent questions in future articles or in* inCider's *Letters column. You can write to Lee Swoboda at Padapple Computer Consulting, 1451 NE Paulson Road, Poulsbo, WA 98370.*

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| **Elephant** SS/DD | 12.50 |
| **Elephant** DS/DD | 21.00 |
| **Verbatim** SS/DD | 18.00 |
| **Verbatim** DS/DD | 26.00 |
| **Memorex** SS/DD | 18.00 |
| **Memorex** (Mac 3½") | 34.00 |
| **BASF** SS/DD | 17.00 |
| **Maxell** SS/DD | 17.00 |

## Educational

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| **APPLE** Logo II | 84.00 |
| **BARRONS** Computer SAT | 53.00 |
| **CBS** | |
| Mastering the SAT | 92.00 |
| Murder by the Dozen | 21.90 |
| **DAVIDSON AND ASSOCIATES** | |
| Speed Reader II | 41.00 |
| Word Attack | 30.00 |
| Math Blaster | 30.00 |
| **DESIGNWARE** | |
| Spellicopter | 24.00 |
| Crypto Cube | 24.00 |
| Spellikazam | 18.00 |
| **DLM** | |
| Alien Addition | 20.50 |
| Medior Multiplication | 20.50 |
| Demolition Division | 20.50 |
| Alligator Mix | 20.50 |
| Dragon Mix | 20.50 |
| **EDU-WARE (PEACHTREE)** | |
| Compu-Read | 17.00 |
| Compu-Math | 29.00 |
| SAT Word Attack Skills | 28.00 |
| PSAT 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 | 47.00 |
| Fractions | 31.90 |
| Decimals | 31.90 |
| **HARCOURT BRACE JOVANOVICH** | |
| SAT | 47.00 |
| GRE Test | 59.90 |
| **HAYDEN SOFTWARE** | |
| Micro Math (Add-Sub) | 20.90 |
| Micro Math (Multi-Div) | 20.90 |
| **LEARNING COMPANY** | |
| 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 |
| **MECA** | |
| Basic Building Blocks | 49.00 |
| The Running Program | 49.00 |
| **MICROLAB** English SAT | 20.00 |
| Math SAT | 20.00 |
| **PROGRAM DESIGN** | |
| The New Step by Step | 73.00 |
| Step By Step II | 73.00 |
| Step By Step III | 73.00 |
| **SCARBOROUGH SYSTEMS** | |
| Songwriter & Picturewriter | 24.00 |
| Phi Beta Philer | 24.00 |
| Master Type | 24.00 |
| **SCHOLASTIC WIZWARE** | |
| Fact & Fiction Tool Kit IIc | 24.00 |
| Microzine (1-6) | ea. 24.00 |
| Story Tree | 24.00 |
| Turtle Tracks | 24.00 |
| **SPINNAKER SOFTWARE** | |
| Fraction Fever | 19.00 |
| Trains | 21.90 |
| Facemaker | 19.00 |
| Snooper Troops 1 & 2 | 27.25 |
| Story Machine | 21.90 |
| Kindercomp | 19.00 |
| Delta Drawing | 31.00 |
| Kids on Keys | 19.00 |
| Alphabet Zoo | 19.00 |
| Hey Diddle Diddle | 17.00 |
| In Search of | 25.00 |
| Aerobics | 27.00 |
| Grandma's House | 19.00 |
| Kidwriter | 19.00 |
| **SPRINGBOARD** | |
| Early Games For Young Children | 21.00 |
| Matchmaker | 19.00 |
| Piece of Cake | 21.00 |
| Fraction Factory | 19.00 |
| **SUNBURST** | |
| The Factory | 30.00 |
| Teasers by Tobbs | 30.00 |
| **TERRAPIN** Logo | 60.00 |
| **XEROX** | |
| Sticky Bear ABC | 24.00 |
| Sticky Bear Numbers | 24.00 |
| Sticky Bear Bop | 24.00 |
| Sticky Bear Opposites | 24.00 |
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## Business

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| **APPLE** | |
| Appleworks | Call |
| Apple Writer IIe | 124.90 |
| **ARTSCI** | |
| Magic Office Systems | 187.90 |
| Magic Calc | 94.00 |
| Magic Window II | 94.00 |
| **ASHTON-TATE** DB II | 278.00 |
| **BPI** | |
| General Accounting | 235.00 |
| GL, AR, AP, PR or INV | 235.00 |
| **CONTINENTAL** | |
| Home Accountant | 43.00 |
| Tax Advantage | 41.90 |
| FCM/FL | 61.00 |
| G/L, A/R, A/P | 144.00 |
| **DOW JONES SOFTWARE** | |
| The Market Analyzer | 208.00 |
| Market Manager | 148.00 |
| **HARPER AND ROW** | |
| The Write Stuff | 41.00 |
| **HOWARD SOFTWARE SERVICES** | |
| Real Estate Analyzer II | 145.00 |
| **KENSINGTON** | |
| Format II Enhanced | 92.00 |
| **LIVING VIDEO** Think Tank II/IIe | 86.00 |
| **MEGAHAUS** | |
| MegaFinder | 98.00 |
| MegaSpell | 38.00 |
| MegaWorks | Call |
| MegaWriter | 64.00 |
| **MICROPRO** | |
| Wordstar | 217.00 |
| Calcstar | 49.00 |
| Wordstar W/Z Card | 228.00 |
| **MICROSOFT** Multiplan | 75.00 |
| **PEACHTREE** Peach Calc | 91.90 |
| **QUARK** | |
| Lexicheck/Word Juggler IIe | 118.00 |
| **SENSIBLE SOFTWARE** | |
| Sensible Speller | 72.00 |
| Bookends | 72.00 |
| Report Card | 37.00 |
| **SIERRA ON-LINE** | |
| The General Manager II | 131.00 |
| Homeword | 43.00 |
| ScreenWriter IIe | 78.00 |
| **SILICON VALLEY** | |
| The Handlers Package | 103.00 |
| List Handler | 46.90 |
| The Word Handler II | 46.90 |
| **SOFTWARE ARTS** | |
| Visicalc Package | 114.00 |
| **SOFTWARE PUBLISHING** | |
| PFS: Access | Call |
| PFS: Write | 72.00 |
| PFS: File | 72.00 |
| PFS: Graph | 72.00 |
| PFS: Report | 72.00 |
| **STONEWARE** | |
| DB Master 4 Plus | 208.00 |
| **VISICORP** | |
| Visitrend/Visiplot | 60.00 |

## MacIntosh

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|---|---|
| PFS: File | 74.00 |
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| PFS: File/Report | 117.00 |
| Typing Tutor III | 31.00 |
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| 1st Base | 116.00 |
| DB Master (Mac) | 117.00 |
| DaVinci (series) | ea. 30.00 |
| Habadex | 72.00 |
| TK Solver | 148.00 |

## Printers

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|---|---|
| **APPLE** | |
| Imagewriter (10 & 15") | Call |
| **BROTHER** | |
| HR-25 | 655.00 |
| HR-35 | 830.00 |
| **DAISY WRITER 2000** | Call |
| **DIABLO** | |
| 620 (RS-232C) | 850.00 |
| 630 (PC) | 1,785.00 |
| Ink Jet Printer | 1,150.00 |
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| **EPSON** | |
| FX-80 | Call |
| FX-100 | Call |
| RX-80F/T | Call |
| RX-100 | Call |
| LQ-1500 | Call |
| **MEC INFO SYSTEMS** | |
| N2030 | 680.00 |
| N3530 | 1,255.00 |
| P2T | 665.00 |
| **JUKI 6100** | 395.00 |
| **MANNENSMANN TALLY** | |
| MT-160L | 605.00 |
| MT-180L | 795.00 |
| MT-Spirit | 295.00 |
| **OKIDATA** | |
| Microline 82A | 305.00 |
| Microline 83A | 435.00 |
| Microline 92P | 355.00 |
| Microline 93P | 595.00 |
| **PANASONIC** | |
| KXP 1090 | 215.00 |
| KXP 1091 | 295.00 |
| KXP 1092 | 435.00 |
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| 8510AP | 295.00 |
| 1550AP | 445.00 |
| 8510SP | 395.00 |
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| Daisywheel A10-20S | 505.00 |
| **QUME** Printers | Call |
| **SILVER REED** | |
| EXP400P | 265.00 |
| EXP500P | 325.00 |
| EXP550P | 395.00 |
| EXP770P | 745.00 |
| **STAR MICRONICS** | |
| SG 10 | 235.00 |
| SG 15 | 395.00 |
| SR 10 | 495.00 |
| SR 15 | 595.00 |
| SD 10 | 345.00 |
| SD 15 | 475.00 |
| **TOSHIBA** Printers | Call |
| **TRANSTAR** | |
| 120P | 425.00 |
| 130P | 550.00 |
| 315 | 455.00 |
| Pics Card | 95.00 |

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|---|---|
| **APPLE** | |
| Disk II Drive | 299.00 |
| Duo Disk w/acc. kit | Call |
| Pro File Disk Drive | Call |
| IIc Add-On | Call |
| Mac Add-On | Call |
| **INFAX** | |
| 101 10 Meg | 2,145.00 |
| 102 20 Meg | 3,350.00 |
| **INDUS GT** Slimline | 250.00 |
| **MICRO SCI** | |
| A2 143K | 190.00 |
| Slimline IIe | 193.00 |
| Slimline IIc | 207.00 |
| Micro SCI Controller | 57.00 |
| **QUENTIN** | |
| AP 100A Full Height | 198.00 |
| AP 105 Slimline | 210.00 |
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| **RANA** | |
| Elite I | 195.00 |
| Elite II | 355.00 |
| Elite III | 428.00 |

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|---|---|
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| Color 300 | 235.00 |
| Color 500 | 395.00 |
| Color 600 | 415.00 |
| Video 300G Green | 128.00 |
| Video 300A Amber | 138.00 |
| DVM II or III | 130.00 |
| **BMC** | |
| Color Plus Monitor | 239.00 |
| BM12 AOW Green | 95.00 |
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| TR 120 Green | 145.00 |
| TR 120 Amber | 150.00 |
| DTD 1300 RGB | 400.00 |
| **PRINCETON** | |
| HX-12 | 469.00 |
| **RGB Interface** | 155.00 |
| **SAKATA** | |
| SC-100 Color | 245.00 |
| SC-200 RGB Color | 455.00 |
| SG-1000 Green | 95.00 |
| **TAXAN** | |
| Green (Hi-Res) | 120.00 |
| Amber (Hi-Res) | 130.00 |
| 210 13" Color (Lo-Res) | 264.00 |
| RGB Vision III | 398.00 |
| 410-64 RGB-2 Interface | 185.00 |

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|---|---|
| EDD III | 45.00 |
| Locksmith 5.0 | 66.00 |
| CIA Files | 48.00 |
| Back It Up III | 52.00 |
| Copy II+ | 21.00 |
| Wildcard II | 99.00 |
| Dollars & Sense/Mac | 87.00 |
| Copy Master II | Call |
| Copy Mac | 24.00 |
| Megaworks | Call |

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|---|---|
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| Beagle Graphics | 35.00 |
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| Frame Up | 18.00 |
| GPLE | 30.00 |
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| Utility City | 18.00 |
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| Visible 6502 | 32.00 |
| Crossword Magic | 31.00 |
| Einstein Compiler | 88.00 |
| Einstein Memory Trainer | 55.00 |
| 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 | 65.00 |
| DATA TRANSFORMS Fontrix | 44.90 |
| Font Paks 1-9 | ea. 12.50 |
| The Accountant | 60.90 |
| Cut & Paste | 34.00 |
| Financial Cookbook | 34.00 |
| FUNK Sideways | 36.00 |
| Orca/M | 63.00 |
| Compiler Plus (Hayden) | 38.00 |
| LAZERWARE Lisa V 2.6 | 54.00 |
| MECA Managing Your Money | 129.90 |
| Applesoft Compiler | 110.00 |
| Typing Tutor II | 15.00 |
| Typing Tutor III | 31.00 |
| Dollars & Sense | 59.00 |
| Dollars & Sense IIc | 70.00 |
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| New Complete Graphics System | 48.00 |
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| QUALITY Bag of Tricks | 26.00 |
| Merlin | 37.00 |
| Merlin Pro | 44.00 |
| Merlin Combo | 66.00 |
| SOFTRONICS Softerm II | 128.00 |
| TURNING POINT Time is Money | 61.00 |
| ASCII Pro | 78.00 |
| Micro Cookbook II/IIe | 23.00 |
| CPM Gold Card (Digital) | 248.00 |
| Hayes Mach II | 29.00 |
| Hayes Mach III | 34.00 |
| Kraft Joystick | 34.00 |
| TG Joystick | Call |
| TG Select-A-Port | 28.00 |
| Micromodem IIe/w SC I | 218.00 |
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| The Gibson Light Pen | 158.00 |
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| Ram Card | 68.00 |
| Soft Card | 230.00 |
| Premium Softcard IIe | 294.00 |
| Apple Cat II | 193.00 |
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| ORANGE MICRO Grappler plus | Call |
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| PICASSO w/interface | 119.00 |
| PROMETHIUS Pro Modem 1200 | 335.00 |
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| SATURN 128K Ram Card | 215.00 |
| Accelerator IIe | Call |
| Popcom Modem (1200) | Call |
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| The Cricket | 125.00 |
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| Mockingboard "B" | 78.00 |
| Mockingboard "C" | 143.00 |
| Mockingboard "D" | 143.00 |
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| THIRDWARE Fingerprint | 105.00 |
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| Elephant Trunk | 19.00 |
| Compu Serve Starter Kit | 24.00 |
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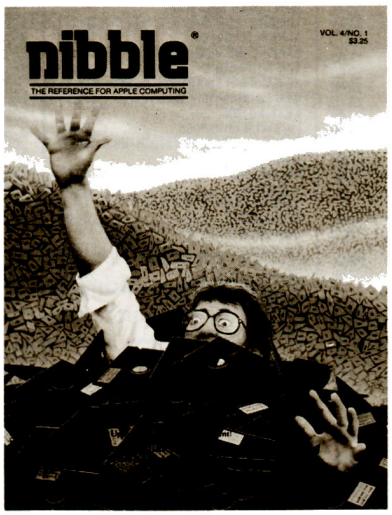


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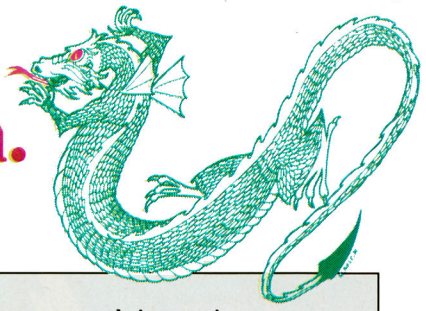

## It's the biggest game in town

Our dragon, of course, is Wizardry—that unique series of computer recreation programs designed for Apple users who are seeking the ultimate "big game" challenge.

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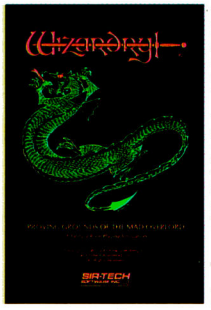


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Unlike any other game you have ever played. A fascinating 10-level maze full of monsters, sorcery, traps and treasures. As you gain skills, the characters you create grow stronger, richer, wiser and better able to survive. The final goal is elusive. Your experience . . . unforgettable.

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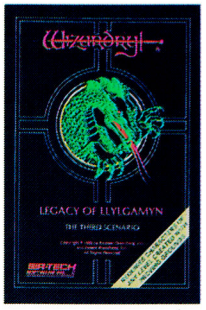


**Legacy of Llylgamyn**

*The Third Scenario*

A spellbinder that advances the classic traditions of Wizardry. Find the great dragon L'kbreth and save the people of Llylgamyn. Includes full screen maze display and Windo-Wizardry, the revolutionary pop-up window graphics system. Requires brave adventurers of any level developed in PROVING GROUNDS.

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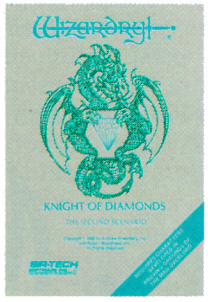


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This classic journey should only be attempted with those Wizardry heroes who have attained the 13th level of ability in PROVING GROUNDS. Their challenge—and yours—to adventure through a six-level maze and become the Knight of Diamonds. First-rate fantasy!

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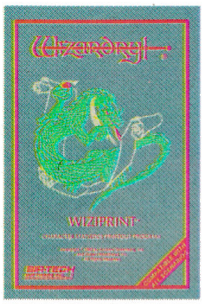


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A helpful utility program that prints the possessions, attributes and known spells of all your Wizardry characters. Quick, neat and easy-to-read. For use with 80-column printers. Compatible with all Wizardry scenarios. A real timesaver!

"Wiziprint is a very handy utility disk for ardent Wizardry players"
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# Rocket Man

## Galactic Jim's greed for quasar crystals draws him into the ancient cargo ship. The dead crew, Jim quickly discovers, does not care for looters.

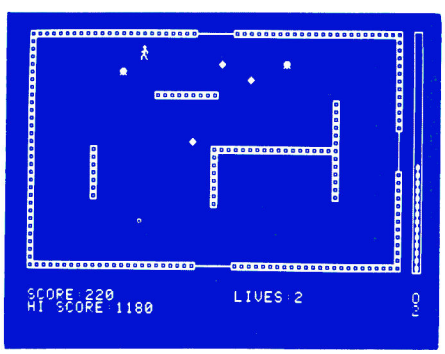
*by Damien Lindauer*

While flying through the universe searching for mythical treasures, Galactic Jim stumbles on an ancient Zenon cargo ship. Thousands of years ago, the Zenons were a super-intelligent race thriving on mining and selling quasar crystals, the most expensive gem in the universe. Now all that remains of that powerful civilization is the cargo ship full of these valuable crystals. . .and the Zenon ghosts.

As Galactic Jim, you wander through the endless maze of rooms searching for the gems. But it's not an easy task. The crystals are guarded by Zenon ghosts who roam the ship and lurk within the walls. Shooting the ghosts or running from them are your only means of defense. Be careful, though, the walls and the ghosts are dangerously radioactive; run into either and you'll instantly disintegrate.

And watch out, because while you're trying to avoid a ghost, your oxygen (O2) may run out, and then you'll suffocate. Before it's too late, you must refill your tank from old O2 tanks you find lying around. A gauge on the right side of the screen measures the amount of O2 you have left.

You control Galactic Jim from the keyboard. The ←, →, A, and Z keys move him (the caps-lock key must be down), the space bar fires his gun, the escape key freezes the game, and any other key stops Jim's movement. I have also included a special option to change the directional and firing keys if you desire.




To fire the gun, you must be moving in the direction of your aim. You can shoot only one bullet at a time, and cannot shoot again until the bullet has disappeared. Be sure you don't puncture an O2 tank, because it will burst into flames and you'll lose your life.

You accrue 100 points for gathering a quasar crystal, 25 points for shooting one, and 10 points for shooting a ghost. The bottom of the screen shows your present score, how many lives you have left out of a total of three, and your high score.

To play the game, you must type in two program listings. **Listing 1**, Galactic Jim, is the boot program. It loads the game program, **Listing 2**, above both hi-res pages at location 24576. Save **Listing 2** as GJ.MP so the boot program can automatically load it. ■

*Write to Damien Lindauer at Lindauer Software, P.O. Box 1535, Oroville, WA 98844.*

*Illustration: Robert Dale*

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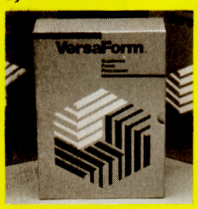


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***Listing 1.*** *Galactic Jim.*

```
0  REM  ## 'IN SEARCH OF THE
1  REM  ## QUASAR CRYSTALS'
6  REM  ## BY DAMIEN LINDAUER
7  REM  ##
8  REM  ## BOOT PROGRAM
9  REM  ##
10  HOME : PRINT : HTAB 4: PRINT "-> LINDAUER SOFTWARE
     PRESENTS <-"
20  VTAB 8: HTAB 3: PRINT "'IN SEARCH OF THE QUASAR CR
    YSTALS'"
30  PRINT : HTAB 10: PRINT "STARRING GALACTIC JIM"
40  VTAB 20: HTAB 10: PRINT "ONE MOMENT PLEASE..."
90 LOC = 16384 + 1: IF  PEEK (103) +  PEEK (104) * 256
     <  > LOC THEN  POKE LOC - 1,0: POKE 103,LOC -  INT
    (LOC / 256) * 256: POKE 104, INT (LOC / 256)
100  PRINT  CHR$ (4);"RUN GJ.MP"
```

***Listing 2.*** *GJ.MP.*

```
0  REM  ## 'IN SEARCH OF THE
1  REM  ## QUASAR CRYSTALS'
6  REM  ## BY DAMIEN LINDAUER
7  REM  ##
8  REM  ## MAIN PROGRAM
9  REM  ##
10  GOSUB 1130: GOTO 360
20 RN% = 2 *  RND (1) + 1: RETURN
40  VTAB 21: HTAB 7: PRINT SC%: RETURN
50  FOR L = ST% TO ED% STEP 5: DRAW BL% AT L,LN%: NEXT
    L: RETURN
60  FOR L = ST% TO ED% STEP 5: DRAW BL% AT LN%,L: NEXT
    L: RETURN
70 L% = NR% *  RND (1) + 1: IF RX%(L%) = 0 THEN  RETURN
80  XDRAW RB% AT RX%(L%),RY%(L%):RN% = 3 *  RND (1) +
    1: IF RN% = 1 THEN  GOTO 111
85  IF RX%(L%) > MX% THEN RX%(L%) = RX%(L%) - IN%: GOTO
    100
90  IF RX%(L%) < MX% THEN RX%(L%) = RX%(L%) + IN%
100  IF RY%(L%) > MY% THEN RY%(L%) = RY%(L%) - IN%: GOTO
    120
105  IF RY%(L%) < MY% THEN RY%(L%) = RY%(L%) + IN%
110  GOTO 120
111 RN% = 4 *  RND (1) + 1: ON RN% GOTO 112,114,116,11
    8
112  IF RX%(L%) > 5 THEN RX%(L%) = RX%(L%) - IN%
113  GOTO 120
114  IF RX%(L%) < 255 THEN RX%(L%) = RX%(L%) + IN%
115  GOTO 120
116  IF RY%(L%) > 5 THEN RY%(L%) = RY%(L%) - IN%
117  GOTO 120
118  IF RY%(L%) < 145 THEN RY%(L%) = RY%(L%) + IN%
120  XDRAW RB% AT RX%(L%),RY%(L%): IF RX%(L%) = MX% THEN
     IF (RY%(L%) = MY% OR RY%(L%) = MY% + IN%) THEN  POP
    : GOTO 670
130  IF BD% <  > 0 THEN  IF RX%(L%) = BX% AND RY%(L%) =
    BY% THEN  FOR L2 = 10 TO 100 STEP 10: POKE 768,L2
    : POKE 769,2: CALL 770: NEXT L2: XDRAW BU% AT BX%
    ,BY%: XDRAW RB% AT RX%(L%),RY%(L%):SC% = SC% + 10
    :RX%(L%) = 0: GOSUB 40:BD% = 0
140  RETURN
150  XDRAW BU% AT BX%,BY%
160  IF BD% = M3% THEN BX% = BX% - IN%: GOTO 270
190  IF BD% = M2% THEN BX% = BX% + IN%: GOTO 270
220  IF BD% = M4% THEN BY% = BY% - IN%: GOTO 270
250  IF BD% = M5% THEN BY% = BY% + IN%
270  XDRAW BU% AT BX%,BY%: IF  PEEK (234) = 1 THEN  RETURN
280 BD% = 0: XDRAW BU% AT BX%,BY%
290  FOR L = 1 TO NR%: IF RX%(L) = BX% AND RY%(L) = BY
    % THEN  FOR L2 = 10 TO 100 STEP 10: POKE 768,L2: POKE
    769,2: CALL 770: NEXT L2: XDRAW RB% AT RX%(L),RY%
    (L):SC% = SC% + 10:RX%(L) = 0: GOSUB 40: RETURN
300  NEXT L
```

***Listing continued.***

*Listing continued.*

```
310  FOR L = 1 TO ND%: IF DX%(L) = BX% AND DY%(L) = BY
     % THEN  POKE 768,100: POKE 769,10: CALL 770: XDRAW
     DM% AT DX%(L),DY%(L):SC% = SC% + 25: GOSUB 40: RETURN
320  NEXT L
330  FOR L = 1 TO NO%: IF OX%(L) = BX% AND OY%(L) = BY
     % THEN  POP : GOTO 680
340  NEXT L: RETURN
350 EX% = 1:SC% = 0:LI% = 3:AR% = 30:CA% = 0:CL% = 5:L
     V% = 1: RETURN
360  GOSUB 750
370 KP% =  PEEK ( - 16384): IF NR% > 0 THEN  GOSUB 70
380  IF BD% <  > 0 THEN  GOSUB 150
390 CA% = CA% + 1: IF CA% > TA% THEN  POKE 768,200: POKE
     769,5: CALL 770: XDRAW OT% AT 274,150 - (5 * AR%)
     :CA% = 0:AR% = AR% - 1: IF AR% =  - 1 THEN 690
400  IF KP% = CT%(1) THEN  XDRAW HP% AT MX%,MY%:HP% =
     M3%:MX% = MX% - IN%: GOTO 470
410  IF KP% = CT%(2) THEN  XDRAW HP% AT MX%,MY%:HP% =
     M2%:MX% = MX% + IN%: GOTO 470
420  IF KP% = CT%(3) THEN  XDRAW HP% AT MX%,MY%:HP% =
     M4%:MY% = MY% - IN%: GOTO 470
430  IF KP% = CT%(4) THEN  XDRAW HP% AT MX%,MY%:HP% =
     M5%:MY% = MY% + IN%: GOTO 470
440  IF KP% = CT%(5) THEN  IF HP% <  > M1% THEN  IF BD
     % = 0 THEN BD% = HP%:BX% = MX%:BY% = MY%: POKE 76
     8,100: POKE 769,10: CALL 770: GOSUB 160
450  IF KP% = 155 THEN  POKE  - 16368,0: VTAB 10: GET
     G$
460  XDRAW HP% AT MX%,MY%:HP% = M1%: XDRAW HP% AT MX%,
     MY%: GOTO 370
470  XDRAW HP% AT MX%,MY%: POKE 768,1: POKE 769,2: CALL
     770: IF  PEEK (234) <  > 20 THEN 500
490  GOTO 370
500  FOR L = 1 TO NO%
510  IF OX%(L) = MX% AND (OY%(L) = MY% OR OY%(L) = MY%
      + 5) THEN  GOTO 530
520  NEXT L: GOTO 560
530  XDRAW HP% AT MX%,MY%: XDRAW OT% AT OX%(L),OY%(L):
      XDRAW HP% AT MX%,MY%: IF AR% = 30 THEN  GOTO 370
540 RN% = 5 *  RND (1) + 1: IF RN% + AR% > 30 THEN  GOTO
     540
550  FOR L = 1 TO RN%: XDRAW OT% AT 274,150 - ((AR% *
     5) + (L * 5)): POKE 768,200: POKE 769,5: CALL 770
     : NEXT L:AR% = AR% + RN%: GOTO 370
560  FOR L = 1 TO ND%
570  IF DX%(L) = MX% AND (DY%(L) = MY% OR DY%(L) = MY%
      + 5) THEN  GOTO 590
580  NEXT L: GOTO 630
590  POKE 768,100: POKE 769,10: CALL 770: XDRAW HP% AT
     MX%,MY%: XDRAW DM% AT DX%(L),DY%(L): XDRAW HP% AT
     MX%,MY%:SC% = SC% + 100: GOSUB 40: GOTO 370
630  IF DO%(1) = 1 AND MY% = 0 AND MX% > 115 AND MX% <
     145 THEN EX% = 3: GOTO 360
640  IF DO%(2) = 1 AND MY% = 145 AND MX% > 115 AND MX%
      < 145 THEN EX% = 4: GOTO 360
650  IF DO%(3) = 1 AND MX% = 0 AND MY% > 60 AND MY% <
     85 THEN EX% = 1: GOTO 360
660  IF DO%(4) = 1 AND MX% = 260 AND MY% > 60 AND MY% <
     85 THEN EX% = 2: GOTO 360
670  FOR L = 1 TO 20: XDRAW HP% AT MX%,MY%: XDRAW OL% AT
     MX%,MY%: POKE 768,5: POKE 769,2: CALL 770: XDRAW
     OL% AT MX%,MY%: XDRAW HP% AT MX%,MY%: POKE 768,10
     : POKE 769,2: CALL 770: NEXT L: XDRAW HP% AT MX%,
     MY%: GOTO 700
680  FOR L = 1 TO 20: POKE 768,10: POKE 769,10: CALL 7
     70: POKE  - 16298,0: POKE 768,50: POKE 769,10: CALL
     770: POKE  - 16297,0: NEXT L: GOTO 700
690  FOR L = 10 TO 200 STEP 10: POKE 768,L: POKE 769,5
     : CALL 770: NEXT L: XDRAW HP% AT MX%,MY%: ROT= 16
     : XDRAW M1% AT MX%,MY%: ROT= 0: FOR L = 1 TO 1500
     : NEXT L:AR% = 30
700 LI% = LI% - 1: IF LI% <  > 0 THEN  GOTO 360
710  POKE  - 16368,0: VTAB 24: HTAB 1: FLASH : PRINT "
     GAME OVER";: NORMAL : PRINT "-ANOTHER GAME(Y/N)?
     ";: GET G$: IF G$ = "N" THEN  TEXT : HOME : VTAB
```

*Listing continued.*


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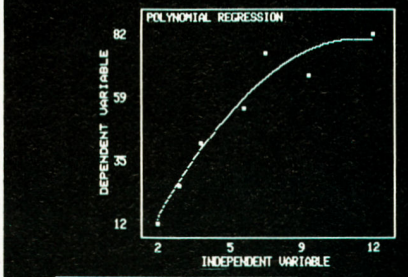


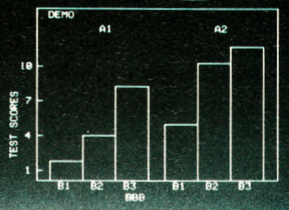

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***Listing continued.***

```
      22: END
  720  IF G$ <  > "Y" THEN  GOTO 710
  730  IF SC% > HS% THEN HS% = SC%
  740  GOSUB 350: GOTO 360
  750  POKE  - 16368,0:BD% = 0: HGR : HOME : POKE  - 163
       03,0: VTAB 21: PRINT "SCORE:";SC%: VTAB 21: HTAB
       22: PRINT "LIVES:";LI%: VTAB 22: PRINT "HI SCORE:
       ";HS%: VTAB 21: HTAB 40: PRINT "O": VTAB 22: HTAB
       40: PRINT "2"
  770  FOR L = 1 TO 4:DO%(L) = 0: NEXT L
  780 CN% = 0: GOSUB 20: IF RN% = 2 THEN CN% = CN% + 1:S
      T% = 0:ED% = 260:LN% = 0: GOSUB 50: GOTO 800
  790 ST% = 0:ED% = 115:LN% = 0: GOSUB 50: HPLOT 120,2 TO
       145,2:DO%(1) = 1:ST% = 145:ED% = 260:LN% = 0: GOSUB
       50
  800  GOSUB 20: IF RN% = 2 THEN CN% = CN% + 1:ST% = 0:E
       D% = 260:LN% = 150: GOSUB 50: GOTO 820
  810 ST% = 0:ED% = 115:LN% = 150: GOSUB 50: HPLOT 120,1
       52 TO 145,152:DO%(2) = 1:ST% = 145:ED% = 260:LN% =
       150: GOSUB 50
  820  GOSUB 20: IF RN% = 2 THEN CN% = CN% + 1:ST% = 5:E
       D% = 145:LN% = 0: GOSUB 60: GOTO 840
  830 ST% = 5:ED% = 60:LN% = 0: GOSUB 60: HPLOT 2,65 TO
       2,90:DO%(3) = 1:ST% = 90:ED% = 145:LN% = 0: GOSUB
       60
  840  GOSUB 20: IF RN% = 2 AND CN% <  > 3 THEN ST% = 5:
       ED% = 145:LN% = 260: GOSUB 60: GOTO 860
  850 ST% = 5:ED% = 60:LN% = 260: GOSUB 60: HPLOT 262,65
        TO 262,90:DO%(4) = 1:ST% = 90:ED% = 145:LN% = 26
       0: GOSUB 60
  860  FOR L2 = 1 TO 12: GOSUB 20: IF RN% = 2 THEN  ON L
       2 GOSUB 880,890,900,910,920,930,940,950,960,970,9
       80,990
  870  NEXT L2: GOTO 1000
  880 ST% = 90:ED% = 130:LN% = 40: GOSUB 50: RETURN
  890 ST% = 130:ED% = 170:LN% = 40: GOSUB 50: RETURN
  900 ST% = 45:ED% = 130:LN% = 75: GOSUB 50: RETURN
  910 ST% = 130:ED% = 215:LN% = 75: GOSUB 50: RETURN
  920 ST% = 90:ED% = 130:LN% = 110: GOSUB 50: RETURN
  930 ST% = 130:ED% = 170:LN% = 110: GOSUB 50: RETURN
  940 ST% = 45:ED% = 75:LN% = 45: GOSUB 60: RETURN
  950 ST% = 75:ED% = 105:LN% = 45: GOSUB 60: RETURN
  960 ST% = 40:ED% = 75:LN% = 130: GOSUB 60: RETURN
  970 ST% = 75:ED% = 110:LN% = 130: GOSUB 60: RETURN
  980 ST% = 45:ED% = 75:LN% = 215: GOSUB 60: RETURN
  990 ST% = 75:ED% = 105:LN% = 215: GOSUB 60: RETURN
 1000 NO% = 4 *  RND (1): IF NO% = 0 THEN  GOTO 1040
 1010  FOR L = 1 TO NO%
 1020 OX%(L) = 41 *  RND (1) + 4:OY%(L) = 22 *  RND (1)
       + 4:OX%(L) = OX%(L) * 5:OY%(L) = OY%(L) * 5: XDRAW
      OT% AT OX%(L),OY%(L): IF  PEEK (234) <  > 11 THEN
       XDRAW OT% AT OX%(L),OY%(L): GOTO 1020
 1030  NEXT L
 1040 ND% = 4 *  RND (1): IF ND% = 0 THEN  GOTO 1080
 1050  FOR L = 1 TO ND%
 1060 DX%(L) = 41 *  RND (1) + 4:DY%(L) = 22 *  RND (1)
       + 4:DX%(L) = DX%(L) * 5:DY%(L) = DY%(L) * 5: XDRAW
      DM% AT DX%(L),DY%(L): IF  PEEK (234) <  > 13 THEN
       XDRAW DM% AT DX%(L),DY%(L): GOTO 1060
 1070  NEXT L
 1080 NR% = 4 *  RND (1): IF NR% = 0 THEN  GOTO 1100
 1090  FOR L = 1 TO NR%:RX%(L) = 41 *  RND (1) + 4:RY%(
      L) = 22 *  RND (1) + 4:RX%(L) = RX%(L) * 5:RY%(L)
       = RY%(L) * 5: XDRAW RB% AT RX%(L),RY%(L): NEXT L
 1100  HPLOT 273,0 TO 273,155 TO 279,155 TO 279,0 TO 27
      3,0: FOR L = 0 TO AR%: XDRAW OT% AT 274,150 - (L *
      5): NEXT L
 1110 MX% = SX%(EX%):MY% = SY%(EX%):HP% = 5: XDRAW HP% AT
      MX%,MY%
 1120  POKE  - 16304,0: RETURN
 1130 SH = 795: POKE 232,SH -  INT (SH / 256) * 256: POKE
      233, INT (SH / 256)
 1131  FOR L = 0 TO 184: READ L2: POKE SH + L,L2: NEXT
      L
 1132  DATA  12,0,32,0,42,0,51,0,62,0,75,0,92,0,110,0,1
```

***Listing continued.***

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# A. S-T-I-C-K-Y-B-E-A-R!

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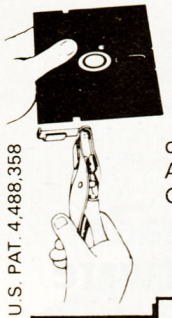

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***Listing continued.***

```
      28,0,144,0
 1133  DATA  160,0,179,0,182,0,184,0,5,0,5,0,54,54,45,4
      5,36,36,63,119
 1134  DATA  50,0,9,30,54,14,36,44,54,6,0,9,14,63,23,45
      ,45,30,63,14
 1135  DATA  5,0,41,117,31,31,46,45,245,63,30,13,13,5,0
      ,9,30,14,62,23
 1136  DATA  118,50,110,36,28,36,141,228,4,193,4,0,9,30
      ,13,30,62,23,182,18
 1137  DATA  5,193,100,36,45,158,21,54,6,0,9,30,13,30,4
      6,21,182,18,7,193
 1138  DATA  228,36,63,86,23,54,6,0,9,30,14,12,53,30,55
      ,54,53,190,35,228
 1139  DATA  32,12,4,0,9,14,23,28,55,14,53,54,55,118,33
      ,100,32,28,7,0
 1140  DATA  76,141,22,149,214,22,214,31,7,193,193,4,19
      3,7,193,193,68,7,0,137
 1141  DATA  50,0,0,0,0
 1150  SCALE= 1: ROT= 0: HCOLOR= 3
 1160  FOR L = 1 TO 4: READ SX%(L): READ SY%(L): NEXT L
 1170  DATA   250,75,10,75,130,135,130,10
 1180  GOSUB 350:IN% = 5:HS% = 0:BL% = 1:OT% = 2:DM% =
      3:RB% = 4:M1% = 5:M2% = 6:M3% = 7:M4% = 8:M5% = 9
      :OL% = 10:BU% = 11:TA% = 15
 1190  FOR L = 0 TO 23: READ L2: POKE 770 + L,L2: NEXT
      L
 1200  DATA  174,0,3,173,48,192,136,208,5,206,1,3,240,9
      ,202,208,245,174,0,3,76,5,3,96
 1210  FOR L = 1 TO 5: READ CT%(L): NEXT L
 1220  DATA  136,149,193,218,160
 1230  HOME : INVERSE : PRINT "                    CONTROLS
                    ": NORMAL
 1240  DATA   LEFT,RIGHT,UP,DOWN,FIRE
 1250  VTAB 4: FOR L = 1 TO 5: VTAB 2 * L + 2: PRINT "(
      ";L;").....": VTAB 2 *
      L + 2: HTAB 4: READ G$: PRINT G$: NEXT L
 1260  VTAB 15: PRINT "<ESC> FREEZES THE GAME UNTIL A K
      EYPRESS": PRINT : PRINT "(ANY OTHER KEY STOPS YOU
      R MOTION)"
 1270  FOR L = 1 TO 5: VTAB 2 * L + 2: HTAB 37: PRINT "
          ": VTAB 2 * L + 2: HTAB 37: IF CT%(L) = 160 THEN
       PRINT "<SB>": GOTO 1310
 1280  IF CT%(L) = 136 THEN  PRINT "<--": GOTO 1310
 1290  IF CT%(L) = 149 THEN  PRINT "-->": GOTO 1310
 1300 L2 = CT%(L) - 128: PRINT  CHR$ (L2)
 1310  NEXT L
 1320  VTAB 20: HTAB 1: PRINT "ENTER # TO CHANGE, OR ";
      : INVERSE : PRINT "RETURN";: NORMAL : PRINT " TO
      PLAY: ";: GET G$: IF G$ =  CHR$ (13) THEN  RETURN
 1330 L =  VAL (G$): IF L < 1 OR L > 5 THEN  GOTO 1320
 1340  PRINT G$
 1350  VTAB 22: HTAB 1: PRINT "PRESS NEW KEY: ";: GET G
      $:L2 =  ASC (G$): IF (L2 > 31 AND L2 < 91) OR L2 =
      8 OR L2 = 21 THEN  GOTO 1370
 1360  GOTO 1350
 1370 CT%(L) =  ASC (G$) + 128: VTAB 20: HTAB 1: CALL  -
      868: VTAB 22: HTAB 1: CALL  - 868: GOTO 1270
```

***End of listing.***

# Tuning up Your Apple

**Add melody and a little charm to your programs with Apple Music.**

In this article I'm presenting a program called Apple Music that will allow you to play your computer like a piano, with results that are reminiscent of either a piano or a violin. The program displays each note's name and clef position on the text screen, and I've included the capacity to save, retrieve, edit, and replay tunes you compose. Best of all, it includes a special utility that enables you to call up your compositions from other programs.

As you use Apple Music, you may wonder why the sounds seem limited compared to other machines, such as the Commodore-64. This is because the Apple has no programmable sound generator (PSG) like the Commodore. Of course, the Apple *does* have plenty of input/output slots for peripheral cards, and some of the Apple-compatible cards on the market utilize PSGs. The Mockingboard, and the Arcade Board, Supersprite, Sprite II, and Sprite & Stereo boards (two PSGs on the latter) are examples. With these boards, an Apple can produce sound effects and music at the same time the microprocessor is actively processing. This parallel processing precludes 6502 monopolizing, a constant problem with normal Apple sound production.

These PSGs can also produce three tones simultaneously. The best Apple software can do without PSG support is two tones, and most programs produce only one tone at a time. The most notable program that creates two-tone harmony on an Apple without a PSG is Electric Duet from Insoft.

Other Apple music alternatives include the dynamic sound chip in the Macintosh (a chip whose potentials have barely been tapped) and an Apple-run synthesizer such as the Alpha Syntauri, which includes a keyboard. So you can see, there are plenty of ways to make your Apple musical. My program is merely the cheapest!

### The Keyboard

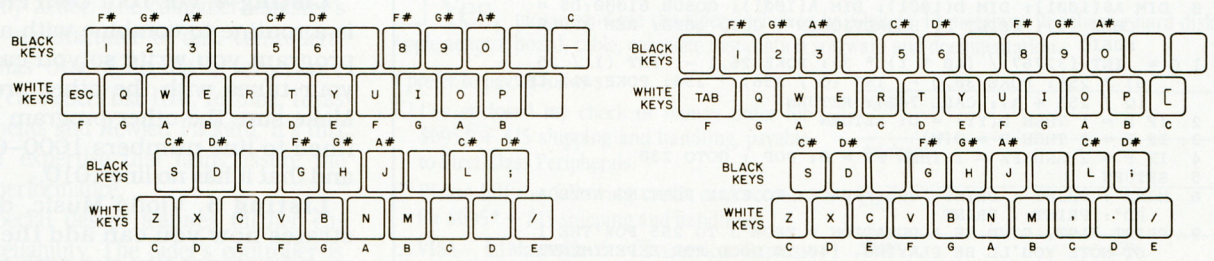
Examine the nearest piano. Notice that there are 88 keys, some white and some black, all in a row. Then notice that your Apple keyboard configuration bears little resemblance to it. However, we'll make do anyway. Take a look at the **Figure**. It diagrams how I've superimposed the piano keyboard onto the Apple II Plus and //e-//c keyboards.

There are a few differences between the relevant keys on the II Plus and those on the //e-//c. Apple replaced the escape key on the II Plus with a tab key on the //e and //c, the repeat key on the Plus with a left bracket on the e and c, and the dash on the Plus with an equals sign on the e and c. Note that I'm considering unshifted key characters only (but remember to keep the caps-lock key down), since you couldn't play an Apple "like a piano" if you had to press the shift key with your notes.

I intended to use the repeat key on the II Plus for high C—it's in the proper position—but it was unusable. So I substituted the dash key, which is up and to the right. Don't let this throw you if you're playing on a II Plus—just use dash rather than repeat. The right-bracket key on the //e and //c, which *is* in the right spot for high C, works fine.

If you're a musician, you'll notice that the "black" keys are all labeled sharps on my diagrams. I know this doesn't wash well with music theory—whether they are sharps or flats de-

***Figure.*** *The Apple II keyboards configured as piano keyboards. The II Plus is on the left, the //e-//c on the right. The letters above and below the keys are the notes they play. All the "black" keys are called sharps for simplicity. The comma key is middle C.*




**by Don Fudge**

***Table 1.*** *Apple Music program line descriptions.*

| Line(s) | Function |
|---|---|
| 0 | Dimensions saving arrays, and initializes the piano and violin routines |
| 1 | Calls Violin |
| 2–5 | Save-or-recall GOSUB<br>F = 0 Play<br>F = 1 Play/save<br>F = 2 Replay |
| 35 | Main replay FOR. . .NEXT loop<br>YY — Total number of notes or duration changes<br>W — Current step<br>FG — Current HTAB value<br>P — Pitch value<br>D or D(W) — Duration value<br>X$ — Note name to print<br>A — ASCII value of note name<br>A$ or A$(W) — Note name |
| 37 | Playback |
| 38 | Play/remember |
| 50 | Play |
| 56 | Prints the clef |
| 57 | "Carriage return" function |
| 59 | Decides where to go according to key hit |
| 62–222 | Pitch/duration values |
| 226 | GOSUB 500 is the note player; PEEK(37) gives the cursor's current vertical tab. |
| 227 | Moves the music across the page |
| 530 | Runs the violin routine |
| 550 | Runs the piano routine |
| 600–750 | Save a tune<br>A$(W) = CHR$(A(W)) changes ASCII to a character<br>A(W) = ASC(A$(S)) changes a character to ASCII |
| 800–910 | Retrieve a tune |
| 1000–1050 | Menu |
| 2000–5010 | Edit |
| 61000 | Initializes the piano routine |
| 62000 | "Cymbal" buzz |
| 63000 | Pause routine |
| 63099 | Error handling |
| 63100 | END, so you can stop and examine an error; remove for a return to the menu |

***Listing 1.*** *Apple Music. The first version of line 59 is for the II Plus, the second version (screened) is for the //e and //c.*

```
0  DIM A$(1001): DIM D(1001): DIM A(1001): GOSUB 61000:D$ =
     CHR$ (4): PRINT D$"BLOADVIOLIN": GOTO 1000: REM APPLE
     MUSIC
1 Q =  INT (32767 / (40 * I) * 3): POKE 26,I -  INT (I / 25
    6) * 256: POKE 30,Q -  INT (Q / 256) * 256: POKE 31, INT
    (Q / 255 + A): CALL 7424: RETURN
2  IF F = 1 THEN D(YY) = D: RETURN
3  IF F = 2 THEN D = D(W)
4  IF F = 2 AND FZ = 1 THEN FZ = 0: POP : GOTO 230
5  RETURN
6  HOME : PRINT : PRINT "USE <SPACE> TO EXIT PLAYING KEYBOA
     RD": PRINT : PRINT
9  PRINT "1ST, GIVE ME A DURATION # FROM 3 TO 255 FOR THE 1
     ST NOTE YOU'LL BE PLAYING. (40 IS GOOD FOR EXPERIMENTI
     NG.)": PRINT :FG = 2
15  INPUT "DURATION OF 1ST NOTE:";D
29  REM
30  HOME : IF F = 0 THEN 40
```

***Continued on p. 58.***

pends on the musical key—but it makes things simpler.

### The Programs

There are five programs included in this article. **Listing 1** is the main program, Apple Music. Take a look and notice that line 59 appears twice. The first version (which appears like the rest of the listing) is for the Apple II Plus; the second version (which is screened) is an accommodation to the //e-//c keyboard. The ninth, 45th, 58th, and 61st numbers are different. If you use the wrong version of line 59, the program will produce wrong notes or rerun when you don't want it to. Line descriptions of Apple Music appear in **Table 1**.

Violin, **Listing 2**, is a routine that creates the buzzy "violin" option for Apple Music. BSAVE it at memory address $1D00 with a length of $43.

***Listing 2.*** *Violin.*

```
1D00- A5 1F 85 FF A5 1E 85 FE
1D08- A5 1A 85 1C 85 1B AD 30
1D10- C0 A5 1B E9 01 85 1B D0
1D18- 05 A5 1A 4C 0C 1D A5 1C
1D20- E9 01 85 1C D0 EB AD 30
1D28- C0 A5 1A 85 1C A5 FF E9
1D30- 01 85 FF D0 DC A5 1F 85
1D38- FF A5 FE E9 01 85 FE D0
1D40- D0 60 3C A2 28 A2 2D A2
```

**Listing 3** is a hello program that boots Apple Music and supplies POKEs that keep Apple Music and Violin from tromping on each other in memory.

***Listing 3.*** *The hello program.*

```
1  REM HELLO
60  POKE 104,64: POKE 16384,0
70  PRINT  CHR$ (4)"RUNAPPLE MUSIC"
```

**Listing 4**, For Your Own Program, is a routine to combine with another program you write so you can play your tunes with the other program. Make sure the other program is confined to line numbers 1000–60000, and that it has no line 1010.

**Listing 5**, Violin Music, demonstrates how you can add the violin sound to tunes you run with another program by BLOADing the Violin routine. Line 0 of Violin Music loads Violin, line 1 runs Violin's activator from

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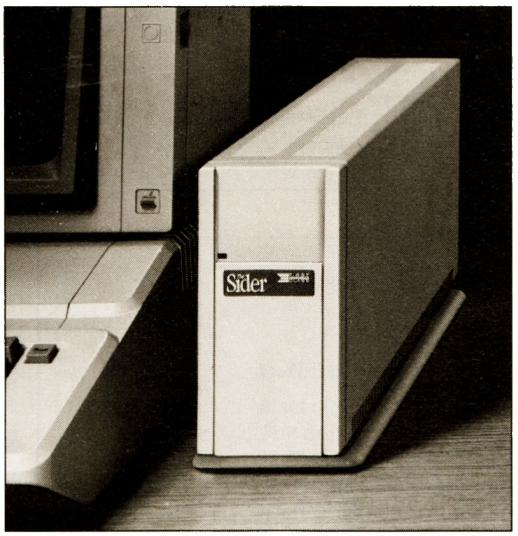


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***Listing 4.*** *For Your Own Program.*

```
0  GOSUB 61000:D$ =  CHR$ (4): PRINT D$"BLOADVIOLIN": DIM A
     $(15),D(15),A(15): GOTO 1000: REM FOR YOUR OWN PROGRAM
1 Q =  INT (32767 / (40 * I) * 3): POKE 26,I -  INT (I / 25
     6) * 256: POKE 30,Q -  INT (Q / 256) * 256: POKE 31, INT
     (Q / 255 + A): CALL 7424: RETURN
30  FOR W = 1 TO YY:A$ = A$(W)
59 A =  ASC (A$): ON A GOTO 0,0,0,0,0,0,0,0,65,0,0,0,0,0,0,0,
     0,0,0,0,0,0,63,0,0,0,0,0,0,62,0,0,0,0,0,73,0,0,0,0,0,0,0,0,0
     ,0,0,215,99,216,217,96,64,68,72,221,78,82,222,88,92,69
     ,218,0,0,0,0,0,0,67,170,140,130,74,71,160,180,90,200,220
     ,219,210,190,94,98,66,76
60  ON A - 82 GOTO 110,80,86,150,70,120,84,100,99
62 P = 72: GOTO 225
63 D = 30: GOTO 230
64 P = 67: GOTO 225
65 D = 15: GOTO 230
66 P = 64: GOTO 225
67 D = 60: GOTO 230
68 P = 60: GOTO 225
69 D = 90: GOTO 230
70 P = 56: GOTO 225
71  GOTO 62000
72 P = 53: GOTO 225
74 P = 50: GOTO 225
76 P = 47: GOTO 225
78 P = 45: GOTO 225
80 P = 42: GOTO 225
82 P = 40: GOTO 225
84 P = 37: GOTO 225
86 P = 35: GOTO 225
88 P = 33: GOTO 225
90 P = 31: GOTO 225
92 P = 29: GOTO 225
94 P = 28: GOTO 225
96 P = 26: GOTO 225
98 P = 25: GOTO 225
99 P = 23: GOTO 225
100 P = 192: GOTO 225
110 P = 182: GOTO 225
120 P = 172: GOTO 225
130 P = 162: GOTO 225
140 P = 154: GOTO 225
150 P = 146: GOTO 225
160 P = 137: GOTO 225
170 P = 128: GOTO 225
180 P = 121: GOTO 225
190 P = 114: GOTO 225
200 P = 108: GOTO 225
210 P = 102: GOTO 225
215 P = 96: GOTO 225
216 P = 85: GOTO 225
217 P = 76: GOTO 225
218 P = 80: GOTO 225
219 P = 90: GOTO 225
220 D = 240: GOTO 230
221 D = 120: GOTO 230
222 D = 180: GOTO 230
225  GOSUB 500
230  NEXT : RETURN
500 D = D(W)
530  IF VI = 1 THEN I = .96 * P:A = D / 12 - 2:A = (A * (A >
     = 1)) + (A < 1): GOSUB 1: RETURN
550  POKE 768,P: POKE 769,D: CALL 770: RETURN
800  PRINT D$"OPEN"TN$: PRINT D$"READ"TN$: INPUT YY: FOR W =
     1 TO YY: INPUT A(W):A$(W) =  CHR$ (A(W)): NEXT : FOR W
     = 1 TO YY: INPUT D(W): NEXT : PRINT D$"CLOSE": RETURN
1000  REM PUT YOUR PROGRAM FROM 1000-60000
1010 VI = 0:TN$ = "TUNE2": GOSUB 800: GOSUB 30: END
61000  RESTORE : FOR I = 770 TO 790: READ X: POKE I,X: NEXT
     : RETURN
61010  DATA  173,48,192,136,208,5,206,1,3,240,9,202,208,24
     5,174,0,3,76,2,3,96
62000  FOR WQ = 1 TO 80:V =  PEEK ( - 16336): NEXT : GOTO 2
     30
```

***Listing 5.*** *Violin Music.*

```
0  PRINT  CHR$ (4)"BLOADVIOLIN"
1  GOSUB 41000: END
42 Q =  INT (32767 / (40 * I) * 3): POKE 26,I -  INT (I / 2
     56) * 256: POKE 27, INT (I / 255 + A): POKE 30,Q -  INT
     (Q / 256) * 256: POKE 31, INT (Q / 255 + A): CALL 7424
     : RETURN
41000  FOR QW = 1 TO 26: READ I,A: GOSUB 42:I = I / 2: GOSUB
     42: NEXT : RETURN
63030  DATA 182,1,182,1,144,1,144,1,121,1,121,1,144,4,136,1
     ,136,1,162,1,162,1,194,1,194,1,245,4,182,1,182,1,144,1
     ,144,1,121,1,121,1,144,4,90,1,90,1,129 ,1,129,1,121,8
```

a data-reading subroutine, line 42 is Violin's activator, line 41000 is the data-reader subroutine (the data alternates pitch value and duration values), and line 63030 holds the tune data values.

### Making Music

When you boot up Apple Music, the following menu choices will appear:

1) Play the Piano with the Keyboard
2) Play the Violin with the Keyboard
3) Save a Tune (Use this option before you play, so that what you play will be saved)
4) Retrieve a Tune (Use Piano Mode)
5) Retrieve a Tune (Use Violin Mode)
6) Edit a Tune

Use options 1 and 2 to jump right in and play on your keyboard; nothing will be saved. Press the space bar to return to the menu.

Option 3 will save your tune. When the prompt asks for a duration value, respond with 60. Then type the following keys to create a tune: period, slash, comma, Z, B. (Is the caps-lock key down?) However, before pressing the B key, press K. This will change the duration of the last note to 240.

All the duration keys are listed in **Table 2**. The higher the number, the longer the note is held.

Duration choices, by the way, are not counted as notes—they do not alter note spacing nor add rests in the playback. They simply give a new duration value to the next note, and all subsequent notes, until you again press a duration-value key.

When you're done composing a tune, type ! to quit playing and access the saving procedure. Don't hit unauthorized keys, such as return, when you're playing or play-saving, because they'll return you to the menu.

Options 4 and 5 let you retrieve a saved tune from disk and hear it played automatically, complete with screen notes. You can play the tune back in either piano or violin mode, no matter which you saved it in. Options 4 and 5 include a display of the keys and duration values in your tune for reference purposes. The escape key displays as a blank.

### The Edit Feature

You can make changes in your tunes with option 6, but only after they

have been saved with option 3 and then retrieved with option 4 or 5. As you press the space bar, each note of your tune will play separately. If a note is okay, hit the return key to go on to duration. If that's okay, too, hit return again to go on to the next note. When you reach a note you want to change, press E to edit. Then press the note key you want, or hit return to go on to duration. When you change a note, duration comes up next automatically. After you're done with duration, press the return key to go on to the next note. Continue in this way through the whole tune, then save the new version with a different name. You won't be able to test your new tune unless you save it at this point.

**Musical Hints**

There are some musical considerations to keep in mind as you're creating your tunes. If you know nothing about music, refer to the glossary in **Table 3** as you read this section.

For the sake of simplicity, I recommend that you play in the key of C, because its scale contains no sharps or flats. Then you'll only need to use the sharp keys for minor or extended chords. I've listed some handy chords in the key of C, to use as arpeggios, in **Table 4**.

***Table 4.*** *Handy chords in the key of C.*

| Chord Name | Notes |
|---|---|
| C major | C, E, G, C |
| C subdominant | F, A, C, F |
| C dominant | G, B, D, G |
| C seventh | C, E, G, B♭ (A#) |
| C sixth | C, E, G, A |
| C minor | C, E♭ (D#), G, C |

The variable P in these programs represents "pitch value," a computer-music concept. The pitch values vary inversely with frequency. That is, the higher the pitch value, the lower the tone. For example, a tone with a pitch value of 100 is an octave lower than a tone whose pitch value is 50.

A list of pitch values I've used for both piano and violin sounds appears in **Table 5**. These values don't necessarily produce notes that correspond to their actual stated note values. That

***Table 2.*** *The duration keys.*

| Apple Key | Duration | Musical Term |
|---|---|---|
| K | 240 | Whole note |
| 7 | 180 | Dotted half note |
| 4 | 120 | Half note |
| : | 90 | Dotted quarter note |
| A | 60 | Quarter note |
| → | 30 | Eighth note |
| ← | 15 | Sixteenth note |
| F | "Cymbal" buzz | |

***Table 3.*** *Glossary of musical terms used in this article.*

| Term | Definition |
|---|---|
| Chord | A set of notes played together. |
| Frequency | The number of cycles per second of a sound's audio wave form. |
| Interval | The relationship between two tones with regard to pitch. |
| Key | A system of tones based on their relation to a keynote, or tonic, from which the key is named; also, the tonality of a certain scale, as "the key of C major." |
| Major | Based on the major scale mode. |
| Minor | Based on the minor scale mode; some notes are a half-step lower than the major. |
| Octave | Any note whose frequency is half or twice that of another note is said to be one octave away. In the do-re-mi-fa-so-la-ti-do scale, do and do are one octave apart and get the same note name, C. |
| Pitch | That property of a musical tone that is determined by its frequency; a frequency of 9000 creates a very high tone while a frequency of 80 creates a very low tone. |
| Scale | A graduated series of tones. |

***Table 5.*** *Pitch values.*

| Note | F# | G | G# | A | A# | B | C | C# | D | D# | E | F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Piano** | | | | | | | | | | | | |
| Octave 1 | | 255 | 243 | 231 | 217 | 203 | 192 | 182 | 172 | 162 | 154 | 146 |
| Octave 2 | 137 | 128 | 121 | 114 | 108 | 102 | 96 | 90 | 85 | 80 | 76 | 72 |
| Octave 3 | 67 | 64 | 60 | 56 | 53 | 50 | 47 | 45 | 42 | 40 | 37 | 35 |
| Octave 4 | 33 | 31 | 29 | 28 | 26 | 25 | 23 | 22 | 21 | 20 | 18 | 17 |
| Octave 5 | 16 | 15 | 14 | 13 | 12 | | | | | 11 | 10 | 9 |
| **Violin** | | | | | | | | | | | | |
| Octave 1 | 256 | 245 | 233 | 219 | 206 | 194 | 182 | 172 | 162 | 153 | 144 | 136 |
| Octave 2 | 129 | 122 | 116 | 110 | 103 | 96 | 90 | 85 | 81 | 76 | 71 | 67 |
| Octave 3 | 63 | 59 | 56 | 53 | 50 | 47 | 45 | 42 | 40 | 37 | 35 | 33 |
| Octave 4 | 31 | 29 | 27 | 25 | 24 | 23 | 22 | 20 | 19 | 18 | 17 | 16 |
| Octave 5 | 15 | 14 | 13 | | | | | | | | | |

*Continued from p. 54.*

```
31 FZ = 1: GOSUB 2:FZ = 0: IF F = 0 THEN 50
32  IF F > 0 THEN 36
33  GOTO 231
34  IF F <  > 1 THEN 40
35  FOR W = 1 TO YY
36  IF F = 1 THEN YY = YY + 1:W = YY
37  IF F = 2 THEN A$ = A$(W): GOTO 54
38  GET A$(W):A$ = A$(W): GOTO 54
40  FOR T = 12 TO 20 STEP 2: VTAB T: PRINT "---------------
     -------------------------": NEXT
49  IF F > 0 THEN 54
50  GET A$
54  IF FG <  > 40 THEN 58
56  HOME : FOR T = 12 TO 20 STEP 2: VTAB T: PRINT "--------
     --------------------------------": NEXT
57  IF FG = 40 THEN FG = 2
58 A =  ASC (A$)
59  ON A GOTO 0,0,0,0,0,0,0,65,0,0,0,0,0,0,0,0,0,0,0,63,0
    ,0,0,0,0,62,0,0,0,0,73,223,0,0,0,0,0,0,0,0,0,215,99,
    216,217,96,64,68,72,221,78,82,222,88,92,69,218,0,0,0,0
    ,0,67,170,140,130,74,71,160,180,90,200,220,219,210,190
    ,94,98,66,76

59  ON A GOTO 0,0,0,0,0,0,0,65,62,0,0,0,0,0,0,0,0,0,0,63,
    0,0,0,0,0,62,0,0,0,0,73,223,0,0,0,0,0,0,0,0,0,215,69
    ,216,217,96,64,68,72,221,78,82,222,88,92,0,218,0,99,0,
    0,0,67,170,140,130,74,71,160,180,90,200,220,219,210,19
    0,94,98,66,76
60  ON A - 82 GOTO 110,80,86,150,70,120,84,100,99
61  GOTO 0
62 P = 72:X$ = "F": VTAB 12: GOTO 225
63 D = 30: GOTO 31
64 P = 67:X$ = "F#": VTAB 12: GOTO 225
65 D = 15: GOTO 31
66 P = 64:X$ = "G": VTAB 11: GOTO 225
67 D = 60: GOTO 31
68 P = 60:X$ = "G#": VTAB 11: GOTO 225
69 D = 90: GOTO 31
70 P = 56:X$ = "A": VTAB 10: GOTO 225
71  GOTO 62000
72 P = 53:X$ = "A#": VTAB 10: GOTO 225
73  GOTO 1000
74 P = 50:X$ = "B": VTAB 9: GOTO 225
76 P = 47:X$ = "C": VTAB 8: GOTO 225
78 P = 45:X$ = "C#": VTAB 8: GOTO 225
80 P = 42:X$ = "D": VTAB 7: GOTO 225
82 P = 40:X$ = "D#": VTAB 7: GOTO 225
84 P = 37:X$ = "E": VTAB 6: GOTO 225
86 P = 35:X$ = "F": VTAB 5: GOTO 225
88 P = 33:X$ = "F#": VTAB 5: GOTO 225
90 P = 31:X$ = "G": VTAB 4: GOTO 225
92 P = 29:X$ = "G#": VTAB 4: GOTO 225
94 P = 28:X$ = "A": VTAB 3: GOTO 225
96 P = 26:X$ = "A#": VTAB 3: GOTO 225
98 P = 25:X$ = "B": VTAB 2: GOTO 225
99 P = 23:X$ = "C": VTAB 1: GOTO 225
100 P = 192:X$ = "C": VTAB 22: GOTO 225
110 P = 182:X$ = "C#": VTAB 22: GOTO 225
120 P = 172:X$ = "D": VTAB 21: GOTO 225
130 P = 162:X$ = "D#": VTAB 21: GOTO 225
140 P = 154:X$ = "E": VTAB 20: GOTO 225
150 P = 146:X$ = "F": VTAB 19: GOTO 225
160 P = 137:X$ = "F#": VTAB 19: GOTO 225
170 P = 128:X$ = "G": VTAB 18: GOTO 225
180 P = 121:X$ = "G#": VTAB 18: GOTO 225
190 P = 114:X$ = "A": VTAB 17: GOTO 225
200 P = 108:X$ = "A#": VTAB 17: GOTO 225
210 P = 102:X$ = "B": VTAB 16: GOTO 225
215 P = 96:X$ = "C": VTAB 15: GOTO 225
216 P = 85:X$ = "D": VTAB 14: GOTO 225
217 P = 76:X$ = "E": VTAB 13: GOTO 225
218 P = 80:X$ = "D#": VTAB 14: GOTO 225
219 P = 90:X$ = "C#": VTAB 15: GOTO 225
220 D = 240: GOTO 31
221 D = 120: GOTO 31
222 D = 180: GOTO 31
223 YY = YY - 1: GOTO 231
225  HTAB FG: PRINT X$
226  GOSUB 500: IF FE = 1 THEN QW =  PEEK (37): POKE 37,QW -
    1: GET Z$: PRINT  CHR$ (13): IF Z$ = "E" THEN  GOSUB 3
    000
227 FG = FG + 2
228  IF F = 0 THEN 50
229  IF F = 1 THEN 36
230  NEXT : GOSUB 5000: CALL 54915: IF FF = 1 THEN FF = 0: GOTO
    600
231  IF F = 1 THEN  VTAB 1: PRINT "
                    ": GOSUB 63000: HOME :FF = 1: GOTO 240
```

*Listing continued.*

is to say, your computer may not be in tune with your piano. The pitch values do, however, produce notes approximately correct relative to one another. If you'd like to "tune" any of the notes, alter their P values in lines 62–219 of Apple Music and For Your Own Program.

A pitch constant is a number by which a pitch value is multiplied to get the pitch value of a desired interval. Halving a pitch value, that is, multiplying it by the constant .5, yields a note that's an octave higher. Halving all the pitch values in a chord (say 100, 80, 67, and 50) produces a whole chord an octave higher. Pitch constants for some common intervals are listed in **Table 6**. You can use these constants to alter the programs if you wish.

***Table 6.*** *Pitch constants.*

| Interval | Constant |
|---|---|
| Octave | .5 |
| Fifth | .6745 |
| Fourth | .75 |
| Third | .796 |

***Table 7.*** *Rest durations.*

| Type of Rest | Duration |
|---|---|
| Whole | 500 |
| Half | 250 |
| Quarter | 125 |
| Eighth | 62 |
| Sixteenth | 31 |
| Thirty-second | 16 |

If you're a programmer, you may want to insert empty FOR. . .NEXT delay loops into Apple Music to create pauses between notes. If so, you'll need the rest values in **Table 7**. Use the numbers in the table for R in a line like FOR X = 1 TO R:NEXT.

Now you can compose great music.■

*Write to Don Fudge at P.O. Box 21271, Eugene, OR 97402.*

*Listing continued.*

```
  233  FOR V = 1 TO 4: VTAB V: CALL  - 868: NEXT : VTAB 1: GOSUB
       63000: HOME
  234  PRINT "WANT TO HEAR IT AGAIN? (Y/N): ";: GET RR$: PRINT
        CHR$ (13)
  235  IF RR$ = "Y" THEN FG = 40: GOTO 35
  239 FG = 2:F = 0: HOME : GOTO 1000
  240  HOME : PRINT "NOW WE'LL PLAY BACK YOUR TUNE:": GOSUB 6
       3000
  245  HOME
  246  FOR T = 12 TO 20 STEP 2: VTAB T: PRINT "--------------
       --------------------------": NEXT
  247 FG = 2
  250 F = 2: GOTO 35
  300 F = 1:FG = 2: HOME : PRINT "USE ! TO INDICATE END OF TU
      NE.": GOSUB 63000: HOME
  302  IF  PEEK (6) = 1 THEN VI = 1
  307  FOR T = 12 TO 20 STEP 2: VTAB T: PRINT "--------------
       --------------------------";: NEXT
  308  VTAB 3: INPUT "1ST NOTE'S DURATION:";D
  320 YY = 0: GOTO 36
  400 VI = 1: GOTO 6
  410 VI = 0: GOTO 6
  500  GOSUB 2
  530  IF VI = 1 THEN I = .96 * P:AA = A:A = D / 12 - 2:A = (
       A * (A >  = 1)) + (A < 1): GOSUB 1:A = AA: RETURN
  550  POKE 768,P: POKE 769,D: CALL 770: RETURN
  600  HOME : PRINT "WANT TO SAVE THIS TUNE IN A FILE?
       (Y/N): ";: GET RR$: PRINT  CHR$ (13)
  620  IF RR$ = "N" THEN 1000
  630  IF RR$ = "Y" THEN 650
  640  GOTO 600
  650  FOR W = 1 TO YY
  652 A(W) =  ASC (A$(W))
  654  NEXT
  655  HOME : PRINT : INPUT "TUNE NAME: ";TN$: IF  LEN (TN$) =
       0 THEN 1000
  659 D$ =  CHR$ (4): PRINT  CHR$ (13)
  660  PRINT D$"OPEN"TN$
  663  PRINT D$"DELETE"TN$
  666  PRINT D$"OPEN"TN$
  670  PRINT D$"WRITE"TN$
  675  PRINT YY
  680  FOR W = 1 TO YY
  690  PRINT A(W)
  700  NEXT
  710  FOR W = 1 TO YY
  720  PRINT D(W)
  730  NEXT
  740  PRINT D$"CLOSE"
  741  FOR W = 1 TO YY: PRINT A$(W),D(W): NEXT : GOSUB 63000
  750  GOTO 1000
  800 D$ =  CHR$ (4)
  801 FG = 40:F = 2
  802  PRINT  CHR$ (13)
  803 D$ =  CHR$ (4)
  804  IF  PEEK (6) = 1 THEN VI = 1
  805  HOME : PRINT : INPUT "TUNE NAME: ";TN$: IF  LEN (TN$) =
       0 THEN 1000
  810  PRINT D$"OPEN"TN$
  820  PRINT D$"READ"TN$
  830  INPUT YY
  840  FOR W = 1 TO YY
  850  INPUT A(W)
  860  NEXT
  870  FOR W = 1 TO YY
  880  INPUT D(W)
  890  NEXT
  900  PRINT D$"CLOSE"
  901  FOR W = 1 TO YY
  902 A$(W) =  CHR$ (A(W))
  903  PRINT A$(W),D(W)
  904  NEXT
  905  GOSUB 63000
  910  GOTO 35
 1000  CALL 54915:O =  FRE (0): TEXT : HOME : PRINT : HTAB 1
       0: PRINT "APPLE MUSIC"
 1001  ONERR  GOTO 63099
 1002 F = 0:FF = 0:FG = 0:FE = 0
 1010  PRINT : PRINT : PRINT "1. PLAY THE PIANO WITH THE KEY
       BOARD": PRINT : PRINT "2. PLAY THE VIOLIN WITH THE KEY
       BOARD": PRINT : PRINT "3. SAVE A TUNE (USE THIS OPTION
        BEFORE     YOU PLAY, SO THAT WHAT YOU PLAY WILL    BE
        SAVED)"
 1015  PRINT : PRINT "4. RETRIEVE A TUNE (USE PIANO MODE)": PRINT
       : PRINT "5. RETRIEVE A TUNE (USE VIOLIN MODE)": PRINT
       : PRINT "6. EDIT A TUNE": PRINT
 1020  PRINT "(CHOOSE 1-6): ";: GET A$: PRINT A$: PRINT  CHR$
       (13):A =  ASC (A$) - 48: IF A > 6 OR A < 1 THEN 1000
 1030  ON A GOTO 410,400,300,1040,1050,2000
 1040 VI = 0: POKE 6,0: GOTO 800
 1050 VI = 1: POKE 6,1: GOTO 800
 2000  HOME : PRINT "YOU MUST HAVE JUST USED ANY ONE OF
       OPTIONS 3, 4, OR 5 TO USE THE EDIT MODE SUCCESSFULLY.
        IF YOU FORGOT, PRESS ESC.": GOSUB 63000
 2010  IF XX = 155 THEN 1000
```

*Listing continued.*


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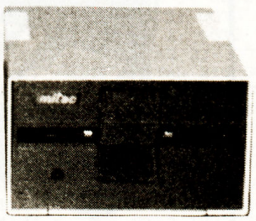
***Listing continued.***

```
2020  HOME : PRINT "PRESS SPACE TO GO ON AFTER EACH NO
      TE IN YOUR TUNE.  WHEN YOU HEAR THE WRONG NOTE(OR
       WRONG DURATION OR BOTH) PLAY, PRESS E TO EDIT AN
      D THEN PRESS THE CORRECT    DURATION AND NOTE KEY
      S, WHEN PROMPTED.": GOSUB 63000
2030 FE = 1:FG = 40:F = 2: GOTO 35
3000 Z$ = A$(W): VTAB 1: PRINT "USING THE KEYBOARD CHA
      RT, PRESS THE     CORRECT NOTE KEY NOW:": GOSUB 4
      000: GET A$(W):A(W) =  ASC (A$(W)): VTAB 1: CALL
       - 868: PRINT : CALL  - 868: PRINT : CALL  - 868
3005  IF  ASC (A$(W)) = 13 THEN A$(W) = Z$
3010 Z = D(W): VTAB 1: PRINT "USING THE KEYBOARD CHART
      , PRESS THE     CORRECT DURATION KEY NOW:": GOSUB
      4000: GET B$:D(W) =  ASC (B$): VTAB 1: CALL  - 86
      8: PRINT : CALL  - 868: PRINT : CALL  - 868
3015  IF D(W) = 13 THEN D(W) = Z: GOTO 3200
3016 D = D(W)
3020  IF D = 55 THEN D(W) = 180: GOTO 3200
3030  IF D = 52 THEN D(W) = 120: GOTO 3200
3040  IF D = 58 THEN D(W) = 90: GOTO 3200
3050  IF D = 65 THEN D(W) = 60: GOTO 3200
3060  IF D = 21 THEN D(W) = 30: GOTO 3200
3070  IF D = 8 THEN D(W) = 15: GOTO 3200
3080  IF D = 75 THEN D(W) = 240: GOTO 3200
3090  GOTO 3010
3200  RETURN
4000  PRINT "(USE RETURN KEY TO LEAVE IT AS IT IS)":
      RETURN
5000  IF FE = 1 THEN  POP : GOTO 600
5010  RETURN
61000  FOR I = 770 TO 790: READ D: POKE I,D: NEXT
      : RESTORE : RETURN
61010  DATA   173,48,192,136,208,5,206,1,3,240,9,202
      ,208,245,174,0,3,76,2,3,96
62000  FOR WQ = 1 TO 80:V =  PEEK ( - 16336): NEXT :
      GOTO 31
63000  PRINT : PRINT "(PRESS ANY KEY TO CONTINUE)":
       PRINT
63010 XX =  PEEK ( - 16384)
63020  IF XX > 127 THEN 63040
63030  GOTO 63010
63040  POKE  - 16368,0
63050  RETURN
63099  POKE 216,0: PRINT "": IF  PEEK (222) = 5 OR
      PEEK (222) = 6 THEN  PRINT  CHR$ (4)"DELETE "TN$
63100  END : GOTO 1000
```

***End of listing.***

## IT MAKE$ DOLLARS AND SENSE TO BUY MITAC DRIVES



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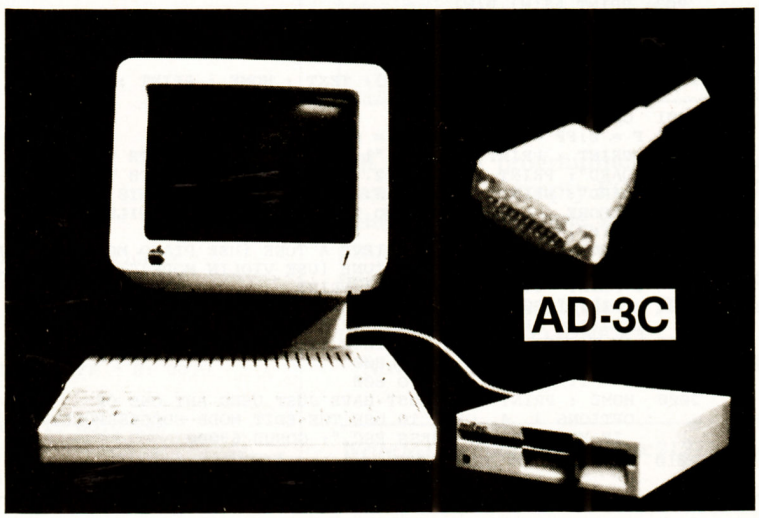


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# Dynamics of Data Bases

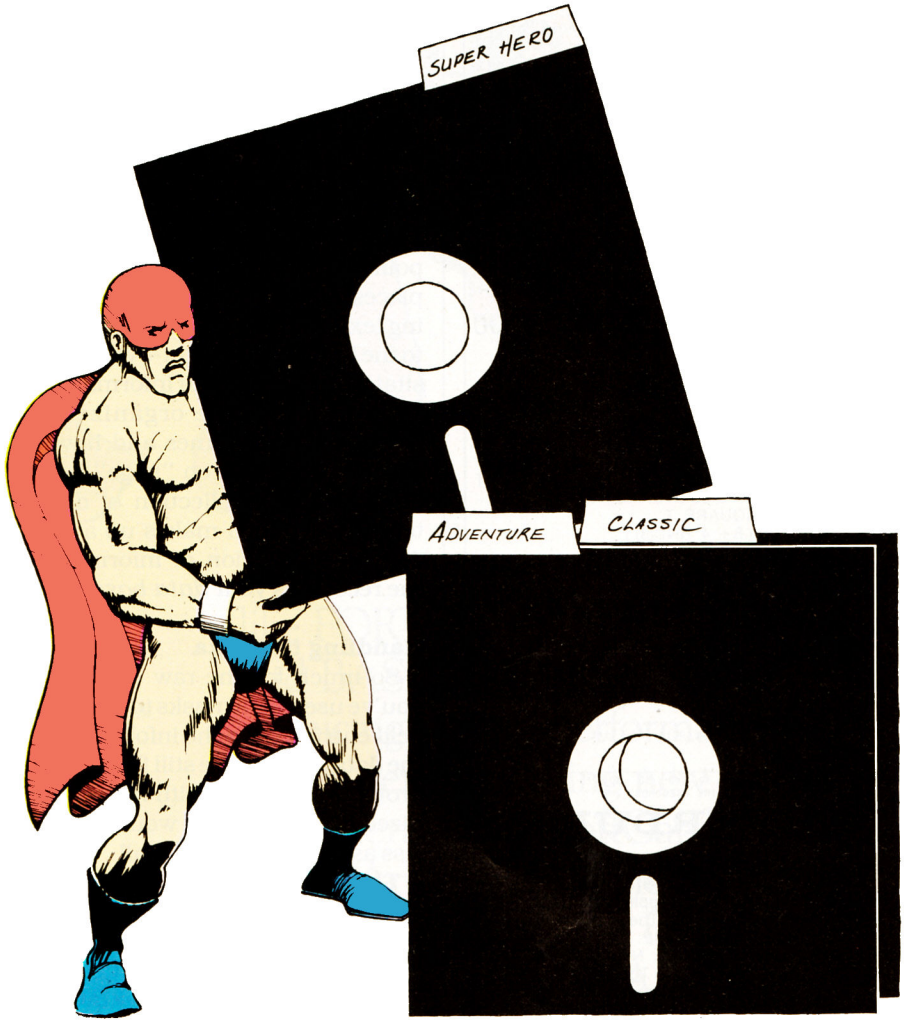



Illustration: Richard Coudrey

**Don't let your comic-book superheroes fly away—keep them under control in a data base.**

A data base isn't too difficult to understand. After all, it's only a collection of information. You can store text-file information using a word processor, a spreadsheet, or almost any other type of program that will let you save data to disk. In fact, you can even keep a data base on ordinary sheets of paper, using an old-fashioned input device called a pencil.

Why then, if data bases are so simple, are data-base programs so expensive? The answer involves semantics to a certain point and hard work for the rest. A "data-base program" is really a data (base) management system (DMS or DBMS). The software program manages the data: It handles the data, organizes it according to a particular pattern, and reports on it according to specific criteria—a complex, if not impossible, task to do manually. Entering information is the smallest (yet most laborious) part of the job for you.

### The Simplest Terms

An address book is a simple, manual data-management system that alphabetically organizes names, addresses, and phone numbers. The labels *Name*, *Address*, and *Phone* indicate the places where you should enter information.

Both the label and the place where information is entered are important concepts that carry over into a computerized DBMS. The label, called a field name, is simply a label that the program lets you create. The better data-base programs let you place that label anywhere on the screen.

A field, the space for the data, may have any different number of attributes. It could be the result of performing some arithmetic function on another field or a repetition of your last entry. It could even send information to an entirely different data base.

Depending on the sophistication of your data-base program, the field information will consist of the actual

**by Bill O'Brien**

## AMPERGRAPH

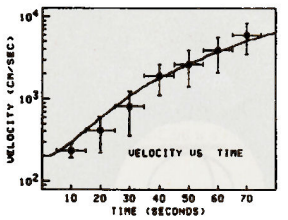
AMPERGRAPH is a powerful, easy-to-use relocatable graphics utility for the Apple II +/e/c. AMPERGRAPH adds twenty-two Applesoft commands that allow effortless generation of professional-looking plots of scientific or financial data. All of the necessary scaling and screen formatting is accomplished with just a few, simple Applesoft lines.

Unlike most other plotting systems for the Apple II which are stand-alone systems, the AMPERGRAPH utility provides extended BASIC graphics language macros that you can use directly in your own Applesoft programs. The additional commands are &SCALE, &LIMIT, &AXES, &GRID, &FRAME, &LOG X, &LOG Y, &LABEL AXES, &LABEL, &VLABEL, &CENTER LABEL, &CENTER VLABEL, &DRAW, &PENUP, &CROSS, &OPEN SQUARE, &CLOSED SQUARE, &OPEN CIRCLE, &CLOSED CIRCLE, &ERROR BARS, &DUMP (to dump the graph on a Silentype printer) and &*DUMP (to link with AMERDUMP, see below).

$45.00

SAMPLE AMPERGRAPH PROGRAM LISTING:

```
10 &SCALE, 0, 80, 80, 13000
15 LX$ = "TIME (SECONDS)":LY$ = "VELOCITY
   (CM/SEC)"
20 &LOG Y: &LABEL AXES, 10, 10
25 LABEL$ = "VELOCITY VS. TIME":&LABEL, 30,
   200
30 FOR T = 0 TO 80:&DRAW, T, 150 + T12:NEXT T
35 FOR T = 10 TO 70 STEP 10
40 &CLOSED SQUARE, T,
   (150 + T12)*(.8 + .4*RND(3) )
45 &ERROR BARS, 5, T12/2
50 NEXT T:&DUMP
```




## AMPERDUMP

AMPERDUMP is a high-resolution graphics dump utility which can be used either in menu-driven mode, or directly from your Applesoft program, with, or without AMPERGRAPH. The following printers will work with AMPERDUMP: Apple Dot Matrix, Imagewriter; Epson; Gemini; NEC PC-8023A-C; C. Itoh 1550, 8510A/B, 8600; Toshiba 1340, 1350. AMPERDUMP offers many features which are not available in other graphics dump routines:

- Horizontal magnifications: 3 to 12, depending on printer.
- Vertical magnifications: 2 to 9, depending on printer.
- Horizontal and vertical magnifications can be specified independently.
- Normal / Inverse dumps
- Adjustable horizontal tab
- Compatible with AMPERGRAPH
- Fast
- Easy to use
- Relocatable

$40.00

The AMPERGRAPH and AMPERDUMP graphics utilities require an Apple II +/e/c. The AMPERDUMP utility requires one of the following interface cards: Epson, Apple, Grappler, Interactive Structures, Mountain Computer, Epson Type2, Tymac, or Microbuffer II, Tackler, Microtek, Printerlink, Super Serial.

AMPERGRAPH and AMPERDUMP are available from your dealer or order direct. Include $2.00 for shipping and handling; Wisconsin residents add 5% sales tax.

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data you place there (like a name) and successive layers of information about that information—its position on the screen relative to everything else and the type of data it is (string, numeric, date, or phone, for example).

For certain types of data, you may have to define a mask to restrict the type of information in your field. A mask for a name might require letters in an uppercased format. A mask for a dollar amount would reject non-numeric characters (except the decimal point) and perhaps call for two decimal places. Formatting your field—centering text entries or justifying them fully, to the left, or to the right—would necessitate another piece of information.

The way you've organized your fields and field names and how they appear on the screen "page" is called the *form*. The collection of data entered into a form makes up a *record*. And the collection of information in the records is your *data base*.

### Handling the Data

So much for the raw data. Even if you've used data masks to format your field entries, once the information is in the data base you're still faced with the problem of dealing with it. An unorganized telephone book would be as useless as no phone book at all.

The simplest way to "handle" data is to look at it after you've entered it. That doesn't seem like much, but imagine if you had a data base with a thousand or more entries. My personal favorite is my own comic-book collection. With 1500 records, finding issue 27 of the X-men could be time-consuming. Even if I were to examine the records sequentially—one after another—at one-tenth of a second per record, it would take 150 seconds or two and a half minutes to find that particular comic (if it happened to be at the end of the data base).

Part of the problem is the slow, overall speed rating for mechanical disk drives. That leaves the search method open for improvement. A few years ago, the "trick" rapid-record access technique was called ISAM (indexed sequential-access method). Essentially, a separate data base is kept about your data base. To recall a record, you select one or more of your frequently used fields (in the case of comic books, it could be the title). The program then creates an index file, very close to what a book's index is like, containing the contents of every indexing field in each record and the number of the record in which they occur. By knowing the record number, the program can use a random access approach that leads directly to the record number in the index.

Programs vary their file-indexing techniques. Some programs will access the index from disk. They rationalize that no one would ever index every field in a data base, so even with disk drive delays, finding the indexed field and extracting the actual record will be faster. Others load the index file into memory. Because searches through RAM are much faster, access is more rapid as well.

Available storage space limits both of these techniques. If the data-base program is very large, there may not be enough memory to hold an index for a large data file. If the data file is very large, there may not be enough room on disk to hold the index, either. So, neither approach is foolproof. It is, I might point out, easier to get a larger capacity disk drive for the Apple than it is to increase its memory.

### Sort of Indexing

It might be helpful to mention the difference between indexing and sorting. Sorting rearranges your data file according to a specified pattern (ascending or descending alphabetic, for example). Indexing doesn't touch your physical file, but rather it creates another file showing the indexed fields.

This is important because some data-base programs will access your file only through the index. They'll find a specific record, but if you want to look at the very next record, you'll get the next record in index order, not in the file's natural order.

Suppose you entered X-men, issue 164, followed by an Avengers comic, issue number unknown. You could find that particular X-men issue and then ask for the next record. If the data base accesses your data file directly, it would work. If, however, you're indexing by title and the program works only by index order, X-men will be one of the last entries in the index file and Avengers will be at the front of the file, despite the physical positions of both in the data file.

You'd need to recall every Avengers

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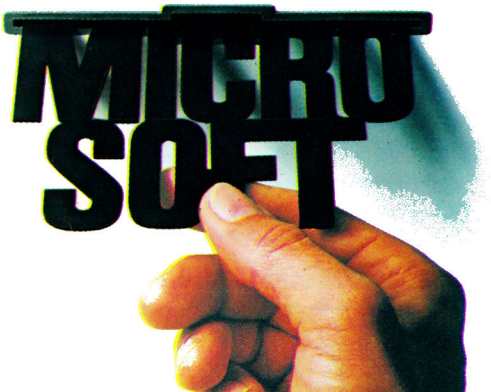


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comic you entered and check each against the one you thought was missing. If your program doesn't have range recalling, you'll have to print out the entire list—mine is 36 pages long. Therefore, recall procedures that allow both indexed and entry-order access are preferred.

**Data-Base Types**

Welcome to the ambiguous (and ambitious) world of data-base types. Formerly, definite distinctions existed in the way data-base programs handled data files. Unfortunately, as each one tried to become the best data-base program, most of the distinctions emerged decidedly indistinct. Still, some differences will affect your choice.

The simplest type of data base is called *free form* or *text*. It has no fields or field names. Each record is a textual passage. Most free-form data bases give you latitude in the amount of text you can enter, but the length of each passage and the available disk space will limit the number of records you can store.

If you're a writer or a researcher who constantly needs to recover references from previously written articles, or if you're a lawyer who'd like to track down an old brief that might be similar to the one you're currently working on, a free-form data base is the ideal solution.

Indexing becomes a problem, however, when you have no individual fields. While some free-form DMS programs let you search through each record using a phrase that you suspect may exist in the text you're looking for, it's more common to use a keyword approach. After you've entered the text, you're asked for a list of words to serve as identification for later retrieval. These can be unique to one particular text record, or you can use several of the same words throughout a range of records so they all can be retrieved at the same time.

**Of Great Import**

If you had to sit at the keyboard and type in several pages of text for every record, you'd quickly give up—no matter how valuable a free-form data base was to you. For that reason, free-form DMS programs include data import, a feature that lets you incorporate word-processing files stored in text format into your data file.

**"An unorganized phone book would be as useless as no phone book at all."**

Conversely, these programs also permit data export, giving you the opportunity to write records back to disk in a text format that most word processors can read. Lacking this flexibility, if the program costs more than $1.95, you'd be best advised to pass it by.

**Record Types**

The most common data bases deal with records partitioned into fields. PFS:File is a notable exception; it combines record and free-form types, but lacks data import/export features. Of the record types, the sophisticated versions include relational features, which let you use the information from a field in one data file to update an identical field in another. Some programs produce temporary files (usually called transaction files) to update several data files. Others use the information from several data files to create their own transaction file. One example is a payroll file that creates and maintains a separate withholdings data file (in aggregate form).

A field-oriented DMS should be able to add, modify, or delete one or more fields without destroying the file. This is a mandatory feature because no matter how well-planned you think your data form is, after entering a third of the information, you'll remember the field name you forgot to enter when you designed the form.

**Reports**

Aside from retrieving information, you may also want it in printed form. In that case, your DMS will need a report feature. Simply dumping record contents to your printer isn't a viable reporting system. The ability to add report titles and pagination should be included features, and mailing-label capability is mandatory.

Columnar reports are fine (typified by PFS:Report), but there are times when you'll need more than that. Employee rosters are great examples. The employee's personal information (name and address) would require three rows in the first column, while salary and employee number would produce two more columns in the first row.

Additional printing features might include direct printer control to produce several fonts, and bold and underlined portions of your report. A nice option is printing your report to disk in a text file that is identical to what the paper output will look like. You can then incorporate the data report into a larger document with your word processor.

**A Word on Networks**

If you're using an Apple in a local-area network, be careful. That isn't the typical configuration for the machine. As yet, no one has produced a data-base system that will work correctly in a network environment. The problem is one of data integrity.

Picture three data files for a customer named Jonn Jonzz. One is the main file containing his personal information, his current outstanding balance, and the date of his last purchase. Another is the company's accounts-receivable file that lists all of Mr. Jonzz's purchases and his total balance. The third is a transaction file used to enter new purchases and update the receivables file. Now comes the scenario.

Mr. Jonzz sends in a payment against his outstanding balance. On the day the check arrives, he makes a purchase at the store. Accounts receivable gets on one Apple in the network, while sales gets on another. They each pull up the respective file. If the receivables file is written back to the data base first, everything will be fine. The payment will be subtracted and the new purchase will be added to the resulting balance. If the purchasing record is written first, the new receivables data will overwrite it. Mr. Jonzz will be credited for his check and the purchase will disappear from the computer.

What's needed is a record-locking procedure that will prevent two people from accessing the same information at the same time. The closest anyone

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has come to that is a file-locking procedure that won't let you access anyone in the file if one record is open. That's hardly the best solution.

Since Apple has introduced its own office system, perhaps a real record-locking scheme will evolve. Right now, network users (and not just those using an Apple-based LAN) are walking on stilts.

### IN THE NEWS

Armed with data-base information, you can now sally forth and buy something promising. But according to *The Wall Street Journal* (March 1, 1985), you might have some trepidations about buying Apple at all. The newspaper reported Apple is suffering from middle-management departures and the Apple II group was rife with dissatisfaction and disappointment. Can this be the impending downfall of the computer company for the rest of us? News hype aside, and considering that any further results are better known to you as you read this than to me as I write it, I don't think so. Why then is Apple losing employees?

Well, first and foremost, the employee turnover rate in that fictitious place called Silicon Valley has always been high. Tradition dictates that if you want a better-paying job, you either start your own company or walk across the street and tell the competition you're available.

Second, Apple projects start five or six years before any machine appears. That's a long development cycle for any individual to continue doing the same thing—even if it is creating a new computer.

Finally, the environment at Apple is changing. The company knows that at some point in the not too distant future it is going to saturate the personal (not home) computer market. When that happens, the only vertical sales market that will be open to Apple is the corporate level. The Macintosh is the first compromise toward that market. It's an ambivalent machine with a foot in both the home and business markets.

John Sculley is nosing the company in that direction, and Sculley's brand of management isn't the loose, "let it flow" environment Apple's employees are used to. It's now a rule of the suits. Employees either adapt or disappear. Steve Wozniak is one of the latest casualties.

So where does that leave you? The same place you've always been. If Apple folded tomorrow, you probably wouldn't miss the company. Everyone sells add-ons and Apples are incredibly simple to repair, so you wouldn't need the company after you bought its computer. You probably haven't ever bought another product from Apple after you bought your computer.

Will Apple go out of business? Not in my lifetime, and I hope to live a good bit longer. But my crystal ball says you should look for a true 32-bit, multi-megabyte of memory "microframe" computer in the next two years. If you don't see it, then you can start to worry.

Apple can't abandon the personal market, but if anyone is going to open up true home applications, I'd keep my eye on Steve Wozniak. He's afflicted with dreamer's disease, and if he can ever become interested in a project again (instead of attached to it), there's no telling what he'll come up with.

### RAM RESULTS

With no names mentioned, the most sensible use for a RAM disk (and there was only one letter suggesting it) is in a bulletin-board environment. A non-mechanical disk drive is the perfect solution to days of continual access by callers. The savings in wear and tear on a Disk II is immense. Bravo, it was the only letter to convince me that there really is a place for a virtual disk in the Apple.

### WRAP-UP

If you get a chance, I'd like to hear from anyone using accounting software. The last time I looked at any (about a year ago), every package required a lot of compromise in operation methods. I'd like to know if that's changed (or if it hasn't).

Until next time, if you find yourself in a computer store standing next to someone contemplating buying an IBM computer, just walk up close and whisper, "A mind is a terrible thing to waste."■

*Write to Bill O'Brien at P.O. Box 1010A, Fort Lee, NJ 07024. Or call him up on CompuServe. His user ID is 74216,125.*

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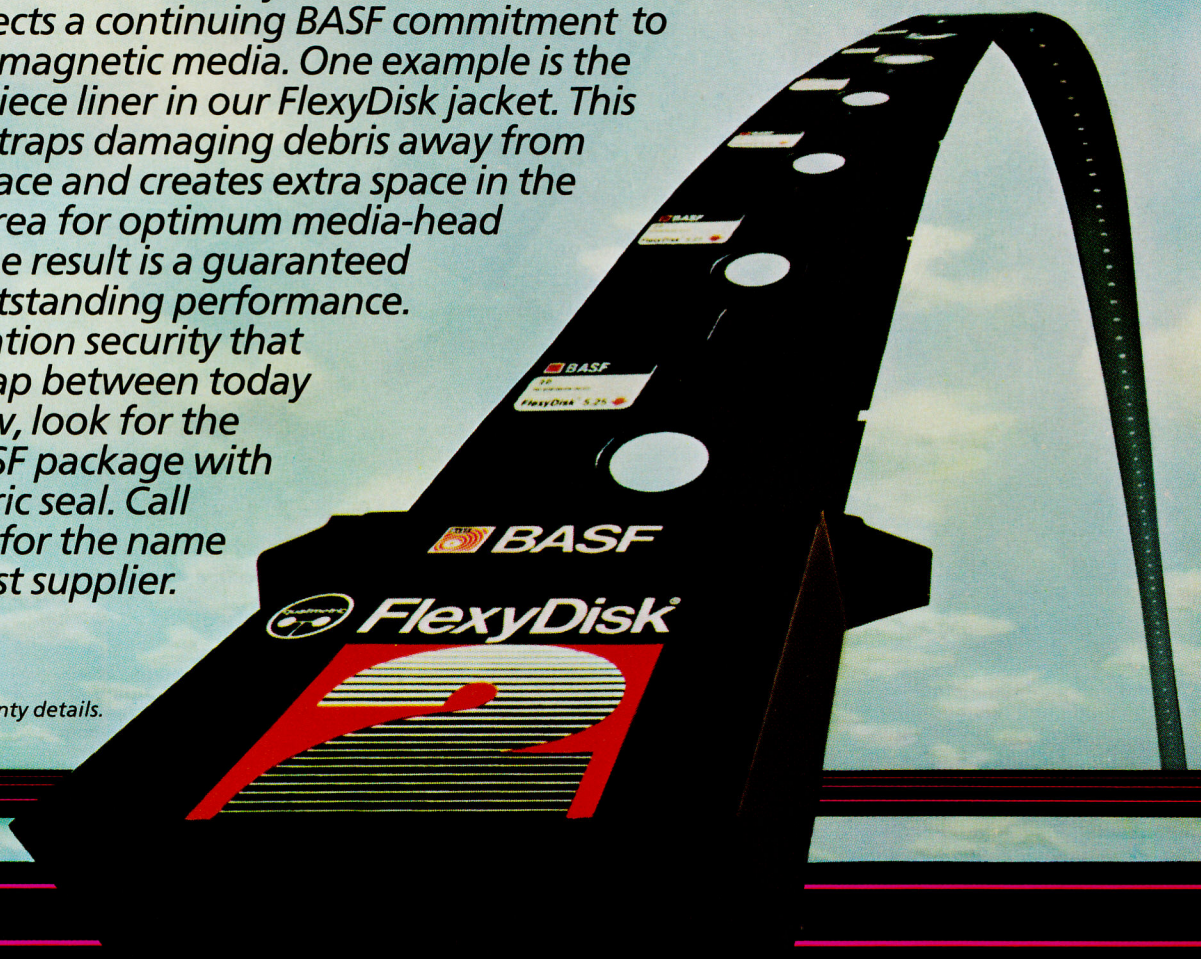


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# ASK inCIDER

*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.*

## Open-Door Policy?

Dear *inCider*:

I own an Apple //e equipped with an Apple DuoDisk drive. I've looked through my DuoDisk owner's manual, but haven't found if I should keep the drive doors open or closed when the drives aren't in use. What do you think?

Jay A. Kring
1309 Ashover Drive
Bloomfield Hills, MI 48013

*Dear Jay:*

*There are two schools of thought: The closed-door contingency advocates that the doors impede dust and other environmental hazards that can degrade the drives' performance. The open-door people believe it's better to relieve the tension on the read/write head-positioning assembly by leaving the doors open. Personally, I'm an open-door person, but it's your system and your decision.*

## Potpourri

Dear *inCider*:

I'm an avid *inCider* reader and I have a few questions.

In "Spreadsheets Come of Age" (March 1985, p. 21), I was puzzled by one thing. The author mentioned that high-school students could make use of a spreadsheet. It was a good, well-written article, but what would a high-school student *do* with a spreadsheet program?

There probably is a simple solution, but whenever I print a program listing on my Apple Dot-Matrix Printer, the listing always comes out in 40-column instead of the 80-column format I want. I load the program, type PR#1, and then enter LIST. Can you help me get an 80-column listing on my printer?

I'm eagerly awaiting the release of Ultima IV. I heard that it was supposed to be released at Christmastime. What happened? Have they cancelled or delayed production?

Can you help me with a subscription problem? I have a one-year subscription to *inCider* that I recently extended through a school-subscription service. Although I clearly marked the renewal box, I'm receiving two copies of every issue. I love your magazine, but I don't need two copies each month!

Mike Toji
9429 East Steel Street
Rosemead, CA 91770

*Dear Mike:*

*First of all, I have no idea what a high-school student would do with a spreadsheet. I certainly didn't use one when I was in high school (of course, spreadsheets weren't around then; I had to find other diversions). Since I may be out of touch, I forwarded your question to Archie Mason, the author of "Spreadsheets Come of Age."*

*You'll be glad to know it's easy to get 80-column listings on your printer. After you type in PR#1—but* before *you enter LIST—type in PRINT CHR$ (9)"80N" and then press return. Your listing will be printed in 80 columns. For slightly narrower width, just substitute some other number for the 80 in the PRINT statement.*

*Ultima IV: The Quest of the Avatar was scheduled for a January-February 1985 release. Then the date was pushed back to the spring, which is why we ran a new-product announcement in the May 1985 issue. Kerry Lanz, our new products/review editor, reports that Ultima IV has been delayed yet again. Expect it in the fall. Lanz says Ultima IV is 16 times larger than Ultima III and fills both sides of two floppy disks. No wonder product development is taking so long.*

*Lanz also notes that Origin Systems is introducing a new series. The first installment is called Moebius: The Orb of Celestial Harmony, and it should be in the stores now. For more information, contact Origin Systems, 340 Harvey Road, Manchester, NH 03103, (603) 644-3360.*

*I forwarded your subscription problem to our fine circulation department. If you still have problems, call (800) 645-9559 during normal business hours or write to* inCider, *P.O. Box 911, Farmingdale, NY 11737. For fast service, you should contact the subscription people directly rather than write to me. (For dealing with other problems, check out Reader Services, listed in the table of contents.)*

## Three for the c

Dear *inCider*:

Concerning the Apple //c: Can I use the Micro Illustrator/KoalaPad I purchased for the //e if I use the joystick adapter in Tom Benford's article ("A Crafty Joystick Adapter," January 1985, p. 66)?

Can I run DiversiDOS programs on the //c or will I have to substitute DOS 3.3 or ProDOS on DiversiDOS disks?

I enjoyed the interactive-video article in the January 1985 issue ("VCR and CRT: The Latest Media Marriage," p. 32), and I would like to know if interactive video is a possibility for the //c.

Bill Leirer
1530 South Taylor
Cleveland Heights, OH 44118

*Dear Bill:*

*Tom Benford's joystick adapter does let you use the KoalaPad with Micro Illustrator on the //c. You can also run DiversiDOS on a //c. Interactive video is another story, though. You need a special interface card to hook up your Apple to a videotape*

***by Bob Ryan, inCider Technical Editor***

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**Advertisement prepared April 1, 1984**

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| Gibson Light Pen | 159.00 |

*player. The //c doesn't have slots, so there is no place to install an interface card. Therefore, I don't think the //c's foreseeable future includes interactive video.*

## Printez-vous Français?

Dear *inCider*:

I need a word processor for a very specific purpose. I do a lot of academic writing in English and French. Much of my writing combines the two languages, and I need a convenient means to write them with the same word processor. (WordStar and others let you insert accents, but only by hitting three separate keys, and you don't see what you get.) The word processor must be full-featured and permit large document size. A program designed specifically for the //c would be nice.

William S. Turley
300 Friedline Drive
Carbondale, IL 62901

*Dear William:*

*There are two parts to your problem: how to get French-language characters on-screen and how to print them out.*

*The on-screen problem has a software solution. Gutenburg JR and Gutenburg SR from Micromation Limited, 1 Yorkdale Road, Suite 406, Toronto, Canada M6A 3A1, display text on the Apple hi-res screen and come with French (and other European) language fonts. When you indicate that you want the French character set, the software redefines some of your keys so that they produce the French characters on-screen.*

*A more elegant solution (in my sophisticated reasoning) for the //c involves hardware. Excluding power requirements, the main differences between European and American //c's are the character-generator ROMs and the keycaps. On American //c's, the primary character set is American English and the alternate character set is Dvorak. The character-generator ROMs for the //c's sold in France contain American and French character sets. I suggest you ask your Apple dealer to order and install a French-language character-generator ROM in your //c. Such a chip lets you use any word processor to produce French-language characters. Then you can switch between French and American characters by toggling the //c's keyboard switch. If your dealer is unable or unwilling to get the ROM chip you need, contact Apple directly.*

*You've won half the battle, but what about printing out the characters you get on your screen? The solution depends on your printer. If you own a daisy-wheel printer, you need to replace the print wheel with one that contains the foreign characters and make sure the code that prints these characters is the same as the code that generates them on the screen. I don't know where you can get foreign-language print wheels, but your dealer does.*

*Dot-matrix printers are a different story. To print foreign characters, you need a printer that either offers foreign-language fonts as an alternate character set under DIP-switch control or one that provides download character definitions from your computer. Most modern dot-matrix printers have one or both of these fea-*


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*tures built-in. Once again, it's up to you to make certain that the codes that produce foreign characters on-screen produce the same printed characters.*

## Pascal and CP/M

Dear *inCider*:

I'd like to learn Pascal, but I'm not sure what I need to run Pascal on my Apple II Plus. Do I need software only? If so, what do you recommend?

A friend told me that CP/M is for the IBM only. From what I've read, however, that doesn't appear true. If I want to get CP/M for my Apple, do I need to buy a Z-80 card and CP/M software? What is the advantage of CP/M? Do you recommend any particular card?

Forrest G. Smith
15 Vineyard Road
North Haven, CT 06473

*Dear Forrest:*

*The most popular Pascal implementation for the Apple II, Apple Pascal, is available from Apple Computer. The Apple Pascal package will run on any Apple computer equipped with 64K bytes of random-access memory. Apple Pascal is not only a language system, it's also a full-blown operating system. You don't need special hardware to run Apple Pascal, but two disk drives and an 80-column card are recommended.*

*The other Pascal versions for the Apple run under the CP/M operating system. CP/M is a software system designed for the 8080 and Z-80 microprocessors. To run CP/M on an Apple, you need to plug a card with a Z-80 into your computer.*

*Many excellent Z-80 cards are on the market, but Microsoft's Softcard is the standard because it runs the most software. Microsoft also produces the Premium Softcard for the //e which has 80 columns and another 64K RAM built-in. Digital Research, the producer of CP/M, makes the Gold Card. PCPI makes the Appli-Card (a product I particularly like) and ALS makes the CP/M Card. These are all fine products and each comes bundled with a CP/M master disk. Cheaper Z-80 boards appear on dealer shelves, but they don't include the features or the software packaged with the above products.*

*CP/M allows you to run a lot more software on your Apple, and there are two software categories that exemplify this distinct advantage. The first is business software: More business software is available under CP/M than under any of Apple's disk operating systems. Also, the CP/M business software is sometimes more powerful than the native Apple counterparts. For example, not many Apple word processors are as powerful as WordStar.*

*For the serious programmer, CP/M offers a wider array of programming languages and utilities than what is available for native-mode Apples. There are many fine languages available under CP/M. I'm currently enamored with Turbo Pascal from Borland International. Borland has developed a good reputation for quality products at reasonable prices.*

*It's very difficult to rate Z-80 cards. Each has different features and merits individual consideration. A good reference is* The Compleat Apple CP/M *by Steven Frankel. It is published by Reston Publishing Co., Reston, VA.* ■


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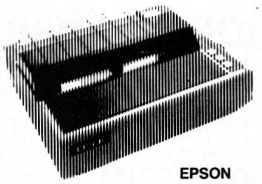

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# Functioning in Applesoft BASIC

Most common BASIC interpreters provide many time-saving features to ease your programming burden. Among them are built-in functions that replace entire subroutines with a single command. In addition, BASIC lets you create your own functions with the "Define Function," or DEF FN, command. This month I'll deal with both these user-defined and built-in math functions of Applesoft BASIC.

**Sample a few of BASIC's built-in functions, then try creating some of your own.**

**General Format:**
**Stating the Argument**

The general format for specifying functions in BASIC begins with a three- to six-letter keyword identifying the function, followed by one or more constants, variables, or mathematical expressions enclosed in parentheses. For example, A = RND(1) generates a random number and gives the resulting value to A.

Items enclosed in parentheses are referred to as the function's "arguments." In the example above, the number 1 is the argument of the random-number generator function, RND. The specific function determines the number and nature of these arguments. Some functions allow only a single argument, while others may require two or three. Some functions require that the argument be a string constant or variable; others allow only numeric arguments; still others require both.

If a function requires more than one argument, use commas to separate them. The MID$ function, described in February's column, is an example of a multiple-argument function: X$ = MID$("INCIDER",4,2). This command assigns the value "ID" to X$ (two characters taken from the first argument, beginning with the fourth character from the left).

In February's column, I covered Applesoft's built-in set of "string functions"—LEFT$, RIGHT$, MID$, LEN, and SPC. By way of quick review, **Table 1** lists these five functions and their roles, along with the STR$, VAL, CHR$, and ASC functions, which also deal with strings.

The STR$ and VAL functions are complementary, as are CHR$ and ASC. That is, one member of the pair reverses the action of the other. A command such as A = VAL(STR$(A)) leaves A unchanged as long as A is greater than +0.01 or less than −0.01. As soon as the STR$ function has turned the number represented by A into a character string of digits, VAL attacks the character string and converts it to a numeric value, with the result assigned to A.

The STR$ function requires a single

***Table 1.*** *String functions available to Applesoft BASIC.*

| Function | Format of Command | Purpose |
|---|---|---|
| LEFT$ | X$ = LEFT$(A$,N) | Copies the leftmost N characters from A$. |
| RIGHT$ | X$ = RIGHT$(A$,N) | Copies the rightmost N characters from A$. |
| MID$ | X$ = MID$(A$,M,N) | Copies N characters from A$, starting at the M'th character from the left. |
| LEN | X = LEN(A$) | Returns the number of characters in A$. |
| SPC | PRINT SPC(N) | Prints N spaces. |
| STR$ | X$ = STR$(A) | Converts a numeric value into a string of digits. |
| VAL | X = VAL(A$) | Converts a string of digits into a numeric value (see text for qualifications). |
| CHR$ | X$ = CHR$(N) | Returns the character represented by the ASCII code N. N must be between zero and 255. |
| ASC | X = ASC(A$) | Returns the ASCII code for the first character in A$. |

***by Dan Bishop***

numeric argument and converts it to a string of digits. VAL requires a single string argument and tries to convert the string to a number. Recall that the difference between a numeric value and a string of digits is that numeric values can be added, subtracted, multiplied, and so on, and must be represented in the computer by numeric variables. A string of digits may look no different from a group of numeric values on screen, but your computer won't let any numeric operation function on the string. Furthermore, the value must be represented internally by a string variable. The advantage of representing a number as a string is that string operators can function on a string of digits, whereas they cannot work with numeric values. These two functions in combination can help you accomplish some significant tasks.

Not all strings can be converted to numbers, of course. The VAL function starts with the leftmost character in its argument and works to the right, one character at a time, until it hits a character it can't include as part of the developing number. It then stops functioning, and the resulting value corresponds to whatever digits the VAL function was able to obtain. For example, VAL("SOUP") results in a numeric value of zero; VAL("1210 RIVERSIDE AVE") produces the numeric value 1210; and VAL(" - 13.72/2") yields the numeric value - 13.72.

***Listing 1.*** *Program listing containing a useful subroutine for formatting numbers for display or printout purposes. The subroutine formats all numbers to a prespecified string length and rounds all numbers to provide a specified number of decimal places. This subroutine lets you create tables of numbers with decimal points aligned.*

```
1  REM  LINES 19-37 CONTAIN SUBROUTINE TO CONVERT A NUMBER
2  REM  TO A STRING OF LENGTH L% AND HAVING D% DIGITS
3  REM  TO THE RIGHT OF THE DECIMAL.  TO USE 14 AND 2, DO A
4  REM  GOSUB 19;  OTHERWISE PREDEFINE L% & D% AND GOSUB 20.
5  REM
6  REM  BEFORE USING THE SUBROUTINE, THE LENGTH OF THE STRING
7  REM  (L%) MUST BE DEFINED, THE NUMBER OF DECIMAL DIGITS
8  REM  (D%) MUST BE DEFINED, AND THE NUMBER TO BE CONVER-
9  REM  TED MUST BE ASSIGNED TO THE VARIABLE  X.  THE
10  REM  VARIABLE X$ IS RETURNED.  L% WILL ALWAYS BE AT
11  REM  LEAST 3 DIGITS LONGER THAN D%, TO ACCOMODATE
12  REM  THE SIGN, LEADING ZERO, AND DECIMAL POINT.
13  REM  D% MAY HAVE ANY VALUE FROM 0 TO 8.  LARGER VALUES
14  REM  CANNOT MAINTAIN ACCURACY IN LAST PLACES DUE TO
15  REM  COMPUTER LIMITATION.  L% <=16.
16  DIM X(20),X$(20)
17  FOR I = 1 TO 20:X$(I) = "":X(I) = 0: NEXT I
18  GOTO 1000
19 D% = 2:L% = 14
20 X =  INT (X * 10 ^ D% + .5) /  INT (10 ^ D% + .5): REM  ROUN
     D & TRUNCATE X
21 L$ =  CHR$ (32 + 13 * (X < 0)) +  STR$ ( INT ( ABS (X)))
22  REM  L$ CONTAINS THE SIGN AND DIGITS TO LEFT OF DECIMAL PT.
23  IF L% < D% +  LEN (L$) + 1 THEN L% = D% +  LEN (L$) + 1
24 X =  ABS (X) -  INT ( ABS (X)) + 10 ^  - (D% + 1): REM  X IS
     DEC. PART
25 X =  - (X < 0) + (X > 0) + X: REM  A + OR -1 IS ADDED TO THE
26  REM       NUMBER TO PREVENT EXPONENTIAL FORMAT.
27  IF  ABS (X) = 1 THEN X$ =  LEFT$ ("0L.00000000",D% + 2): GOTO
     36
29 X$ =  MID$ ( STR$ ( ABS (X)) + "00000000",2,D% + 1)
30  REM  LINE 29 ADDS TRAILING ZEROES TO X$
31 R$ = " ": IF D% <  > 0 THEN R$ = "." +  RIGHT$ (X$,D%)
32 X$ = L$ + R$: REM  X$ NOW CONTAINS BOTH PARTS OF THE NUMBER.
33  IF  ABS ( VAL (X$)) > 999 THEN X$ =  LEFT$ (X$, LEN (L$) -
     3) + "," +  RIGHT$ (X$, LEN (R$) + 3)
34  IF  ABS ( VAL (X$)) > 999 THEN X$ =  LEFT$ (X$, LEN (L$) -
     6) + "," +  RIGHT$ (X$, LEN (R$) + 7)
35  REM  LINES 33 AND 34 PLACE COMMAS INTO X$.
36 X$ =  RIGHT$ ("                " + X$,L%): REM  16 BLANKS
37  RETURN
1000 CT = 0
1005  INPUT "NUMBER OF DEC. DIGITS: ";D%
1010  INPUT "TOTAL LENGTH OF STRING: ";L%
1015 CT = CT + 1: IF CT = 21 THEN CT = 1
1020  INPUT "ENTER NUMBER: ";X(CT)
1025 X = X(CT): GOSUB 20
1030 X$(CT) = X$: HOME
1035  FOR I = 1 TO 20
1040  PRINT X$(I):
1045  NEXT I
1060  GOTO 1015
```

### Formatting Numbers in BASIC

**Listing 1** presents a useful routine illustrating the way STR$ and VAL functions work together. Whenever numbers that include decimals are represented in tables, they should all generally have the same number of digits to the right of the decimal point, so that you can print or display them with decimal points aligned. A problem occurs when Applesoft BASIC automatically truncates trailing zeros from numbers—25.00 will appear simply as 25, while 38.44 will be printed as 38.44. This plays havoc with decimal-point alignment, because the 25 will appear directly above the two fours of 38.44. The situation worsens if you're using small numbers (such as 0.00043), which Applesoft displays in scientific "E" format.

**Listing 1**, which first appeared in my June 1983 column, addresses this problem. It rounds all numbers to a display format that includes a specified number of digits (D%) to the right of the decimal point and returns a string that occupies a predetermined number of columns (L%). Large numbers are displayed with commas in appropriate positions. To change the number of digits or the length of the string, change the value assigned to D% or L% in line 19 of the subroutine, or assign specific values to these two variables and GOSUB 20 instead. For display purposes, the number is used in its string representation, retaining any trailing zeros. To include any of these numbers in calculations, simply convert the number to a numeric value using the VAL function: A = VAL(A$).

As presented here, **Listing 1** first asks you to specify the number of digits and length of the screen. It then lets you build a display column containing up to 20 numbers, all with decimal points aligned (a neat trick for an Ap-

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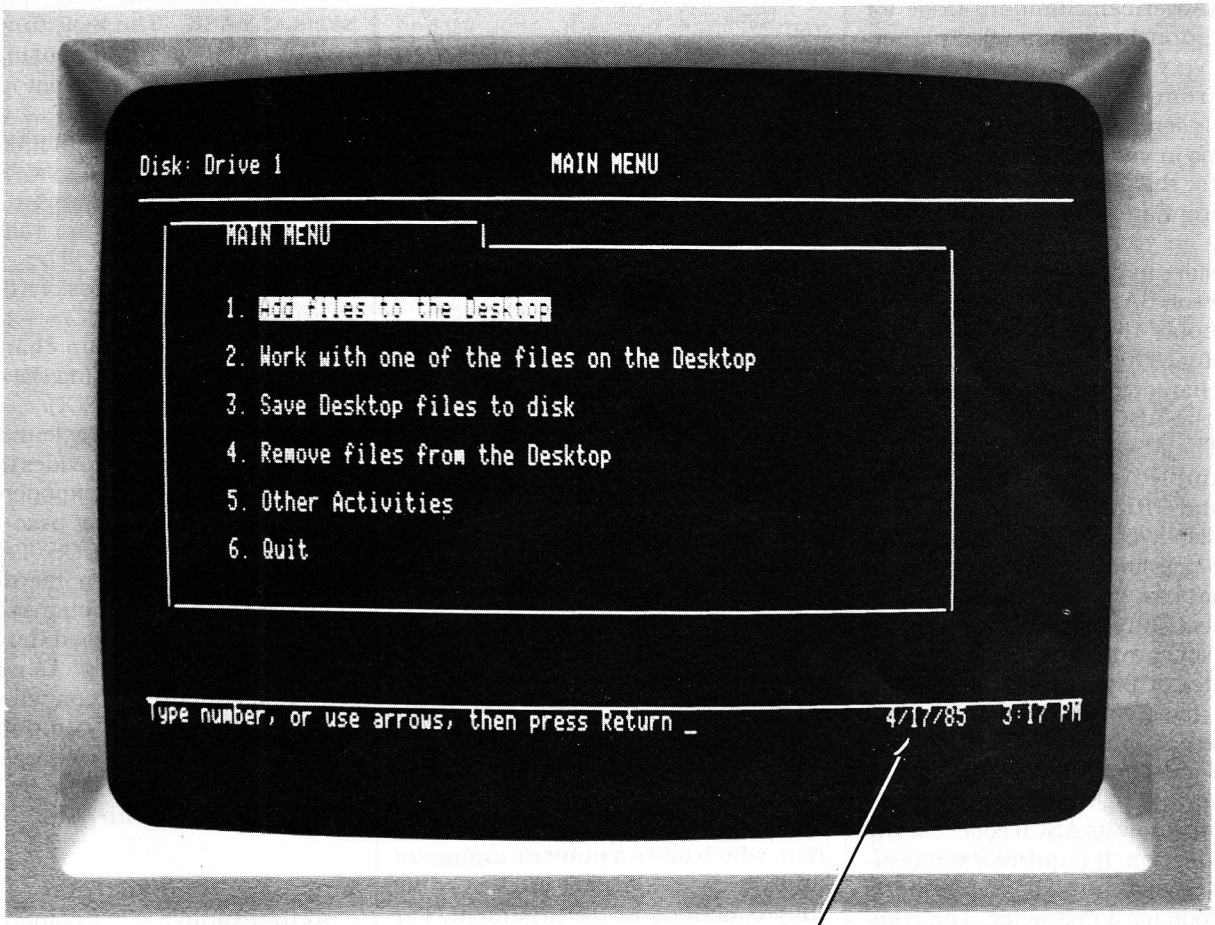


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ple). You may continue to add numbers beyond the original 20, but the new ones will merely replace earlier numbers at the top of the column.

### Discovering ASCII Code

All of the characters you see on screen are represented in memory in an 8-bit binary code referred to as ASCII (American Standard Code for Information Interchange). Furthermore, every character sent down the cable from your computer to the printer is sent as an ASCII code. One of the chips in your Apple is a character generator that converts ASCII code to the appropriate set of lighted pixels for display on your monitor. A similar chip resides in your printer.

Applesoft BASIC's ASC function lets you display the code value for any character. This function requires a string character as its argument, and yields the ASCII code for the argument. The ASCII code for the letter A, for example, is 65. If you enter the command PRINT ASC("A") you will see 65 displayed on your screen. There are 256 possible values (zero through 255) that can be represented in 8 binary bits. Many of these codes are reserved as commands to control the computer or printer. On some computers, many of these values are used to represent graphics symbols, such as diamonds, hearts, faces, and so on.

To work with a specific character when you know its ASCII code, use the CHR$ function. It requires a single argument, which must be the numeric ASCII code for a character. The command PRINT CHR$(65) tells the computer to display or print the letter A. Often more characters are programmed into a computer's character-generator chip than appear on the keyboard. You can discover these "hidden" characters by using the CHR$ function. Use **Listing 2** to display them, along with their ASCII codes. Add the line 90 PR#1 to **Listing 2**, and you'll get a printout of your printer's character set (assuming your printer is connected through port 1).

You can switch many special printer functions on or off using the PRINT CHR$( ) commands. For example, the Epson series of printers uses CHR$(15) to turn compressed mode on and CHR$(18) to turn it off. Some printer commands require a sequence of two or three codes. My Epson FX-80 turns on underline mode with a PRINT CHR$(27)" – "CHR$(1) sequence, and turns it off with PRINT CHR$(27) " – "CHR$(48). Consult your printer manual for control codes specific to that printer. (Note: CHR$(27) is often represented in printer manuals as "Esc.")

***Listing 2.*** *Program listing to display your computer's and printer's ASCII codes and the characters they represent.*

```
10 REM PROGRAM TO LIST ASCII
   CODES
20 REM AND THEIR CORRESPONDI
   NG
30 REM CHARACTERS ON THE SCR
   EEN.
40 REM ADD A LINE 90 TO OBTA
   IN THE
50 REM SET OF CHARACTERS FRO
   M YOUR
60 PRINTER.
70 REM    90 PR#1
80 REM   PRESS <CTRL> S TO
   STOP AND
90 REM  RESTART THE SCROLLIN
   G DISPLAY
100 FOR I = 0 TO 255
110 PRINT I, CHR$ (I)
120 FOR J = 1 TO 100: NEXT J
130 NEXT I
```

### A Variety of Numeric Functions

Two of the most common built-in numeric functions are INT and ABS (see **Table 2**). INT is the integer function, which takes a numeric argument and yields the largest integer value fully contained in the argument. For positive numbers it simply lops off (truncates) any decimal fraction and uses the result. No attempt is made to round the result up or down—the decimal fraction simply disappears. Thus INT(12.5) results in 12, and INT(0.999) gives zero. For negative arguments, the INT function yields the next lowest integer. INT(–35.001) produces –36 because –36 is the largest complete integer contained in –35.001 on an algebraic number line.

The ABS function converts its numeric argument into a positive number. This is the standard "absolute value" function of algebra. **Listing 1** uses both functions.

The SQR function yields the square root of its single numeric argument. Thus X = SQR(25) assigns the value 5 to X. Of course, you can use a numeric variable or an expression that evaluates to a numeric value as an argument as well as a numeric constant. The only restriction is that, for the SQR function, the value of the argument must not be negative. Furthermore, you must be careful when working with some non-Apple versions of BASIC. The SQR function is used to square the argument in at least one version; the square-root function in that interpreter is SQRT.

You can use the SGN function with a numeric argument to readily determine whether the argument is less than, equal to, or greater than zero. The value that results will be –1, 0, or +1. Thus the two expressions IF XZ < 0 THEN and IF SGN(XZ) = –1 THEN are equivalent. You can change the sign of a number by using the expression X = –SGN(X)*ABS(X).

For mathematicians, scientists, and engineers, Applesoft provides the EXP and LOG functions for exponentiation (base e) and natural (*not* base 10) logarithms, and the SIN, COS, TAN, and ATN (arctangent) trigonometric functions. Use of the trig functions requires that angles be expressed in radians rather than in degrees. As with the SQR function, use caution when dealing with a non-Apple computer system. I have run into a few cases where the LOG function *was* base 10, and an LN function dealt with natural logs.

### Functions Made to Order

As the example above points out, using a built-in function to accomplish a given task is quite simple. The number of ready-to-use functions, however, is limited. Only the most widely used functions have been included as part of Applesoft BASIC.

BASIC provides a command that lets you make up for this limitation by allowing you to define your own tailor-made functions. You may employ these "user-defined" functions throughout your program exactly as you would the built-in functions.

Suppose you've defined a function named AC that calculates the area of a circle of radius R. You can write the command X = FNAC(R) and X will be given the area of that circle. Later in the program, when you have a differ-

ent circle of radius Z, you can issue the command Y = FNAC(Z) and Y will contain the value for that circle's area. Notice that although the function's name is AC, it is preceded by FN in both of these examples. FN tells BASIC that you are referring to a user-defined function—your own construction—and not a simple array variable.

Many versions of BASIC allow great flexibility in setting up user-defined functions. Applesoft BASIC, however, restricts you to numeric functions with a single numeric argument and does not permit string functions, string arguments, or functions using more than one argument.

The command that defines a function is DEF FN followed by the name you decide to use to represent that function, and a numeric variable argument enclosed in parentheses. The name you choose for the function must follow the same rules Applesoft uses for numeric variables. That is, it must start with an alphabetic character, it must consist of only one or two characters, and the optional second character may be alphabetic or numeric.

For the function that calculates the area of a circle, you might use DEF FNAC(X). To complete the function definition, you must follow this phrase with "=" and the equation that ac-

***Table 2.*** *Numeric functions available to Applesoft BASIC.*

| Function | Format of Command | Purpose |
|---|---|---|
| ABS | X = ABS(A) | Returns the absolute value of A. |
| INT | X = INT(A) | Returns the largest integer fully contained in A (see text). |
| SQR | X = SQR(A) | Returns the square root of A (A must be positive). |
| RND | X = RND(A) | Returns a random number between zero and 1 if A = 1. Returns the most recent random value generated if A = zero. |
| SGN | X = SGN(A) | Returns a value of −1, zero, or +1 depending on whether A is negative, zero, or positive. |
| FRE | X = FRE(A) | Returns the amount of memory still available. A is a dummy variable. This function also forces Applesoft to remove old, unused string values from the string memory space (garbage collection). |
| LOG | X = LOG(A) | Returns the natural (base e) logarithm of A. To get the base 10 logarithm, use: X = 0.4343*LOG(A) |
| EXP | X = EXP(A) | Returns the value resulting from raising e (approximately 2.71828) to the A'th power. To get base 10 exponentiation, use: X = EXP(2.3026*A) |
| SIN | X = SIN(A) | Returns the trigonometric SINE of A. A must be expressed in radians. If A is in degrees use: X = SIN(0.017453*A) |
| COS | X = COS(A) | Returns the trigonometric COSINE of A. A must be expressed in radians. If A is in degrees use: X = COS(0.017453*A) |
| TAN | X = TAN(A) | Returns the trigonometric TANGENT of A. A must be expressed in radians. If A is in degrees use: X = TAN(0.017453*A) |
| ATN | X = ATN(A) | Returns the angle (in radians) that is a tangent of A. |


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tually carries out the desired task, using the argument (in this case X) wherever appropriate in the equation. For calculating the area of a circle when the radius is given, this would be DEF FNAC(X) = 3.14159*X*X.

The numeric variable X in this definition is a dummy variable. When you write the equation defining this function, use X wherever the value being passed from the program should fit. In the examples above, R and Z both represented this value at different times. No matter—Applesoft took the value from whatever variable happened to be the argument at the time and used it in the equation wherever the dummy argument appeared.

As you can see, you can use numeric constants in the equation for the function definition. You can also employ other variables besides the dummy, and the values inserted when that function is called will be the values those variables currently have in memory. It is up to you to be sure the appropriate values have been assigned before such a function is used.

**Functions vs. Subroutines**

Functions and subroutines are two ways to ask the computer to perform a specific, well-defined task that must be carried out frequently within a program. Use functions whenever the task can be accomplished by applying a single algebraic formula. Functions require no stack references, so execution speed and program efficiency are better than they are with subroutines. Furthermore, a dummy argument in the function definition lets you pass a value from the program to the function without having to first assign the value to the dummy variable. In the examples above, it wasn't necessary to include the statements X = R or X = Z before using the area function.

On the other hand, any repeated routine involving string manipulations, multiple steps, or a looping process should be handled by a subroutine.

Note that I didn't include conditional statements in the list of criteria for a subroutine. Many conditional situations that involve numeric calculations can be handled in a single algebraic formula. Applesoft's tolerance of Boolean expressions makes

*Continued on p. 81.*

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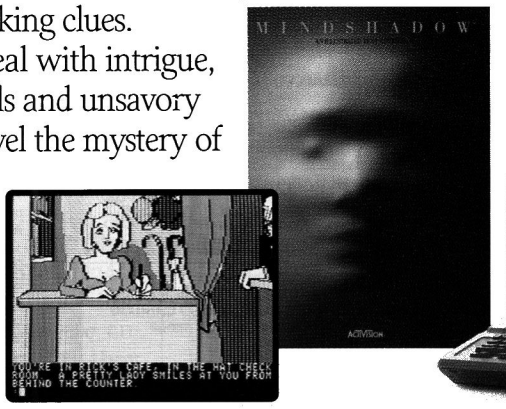


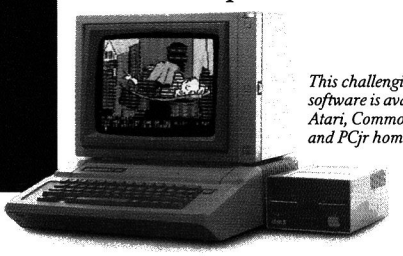

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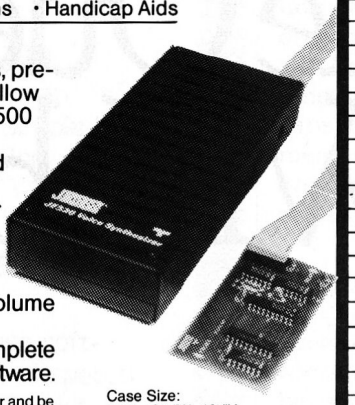

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*Continued from p. 78.*

this possible.

A Boolean expression is a mathematical statement that compares two values and comes back with a TRUE or FALSE result. Fortunately for us, the computer representations of TRUE and FALSE are numeric values. For Applesoft, TRUE is represented by a +1 in memory, while FALSE is represented by a zero. (Note: Most other microcomputers out there represent TRUE as a −1. This difference becomes significant if you try to translate a program that incorporates Boolean expressions or write a program for a non-Apple computer.)

What all this means is that you can formulate comparison expressions, such as (X = Y) or (AR < = DF), and know that they will result in a numeric value (+1 or zero) that can be used in an equation. For example, suppose you need to calculate square roots within your program. Applesoft's built-in function SQR works only if the argument is positive. A negative argument would crash the program. You might define your own square-root function to avoid program crashes and merely return a value of zero if the argument is negative. Such a function might look like this:

```
DEF FNSR(X) = (X>0)*SQR(ABS)X))
```

Since the SQR function finds the square root of the absolute value of X, the program will never crash from finding a negative argument for SQR. When we use the function later in the program, with an expression such as M = FNSR(R), the program will work regardless of the value for R. The result from the SQR function is multiplied by +1 (if R is positive) or by zero (if R is zero or negative). M will have a value of zero whenever the argument R is zero or negative. The Boolean expression (X>0) solves the problem.

You might also note from this example that you can use functions within the formulas being defined. The only restriction is that the definitions for such functions must be encountered in the program before they are called upon.

As another example, suppose you want to calculate a point value between zero and 4 (corresponding to a letter grade between F and A) based on a student's percentage grade in your


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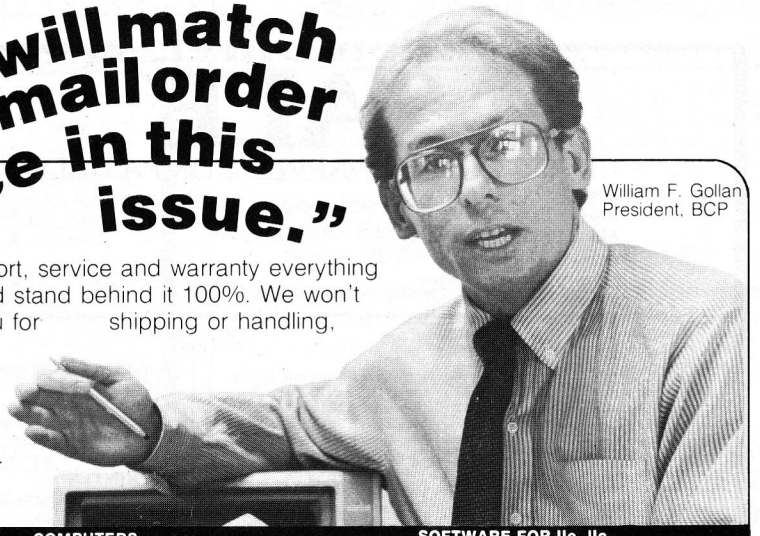

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class. If you use a 90/80/70/60 grading scale, you could define the following function to calculate point values:

```
DEF FNPV(P) = 4*(P>=.90) +
3*((P<.90)AND(P>=.80)) +
2*((P<.80)AND(P>=.70)) +
((P<.70)AND(P>=.60))
```

Now, in the program, when you arrive at an individual student's percentage score, PS, you can find the appropriate grade with GD = FNPV(PS), and the value for GD will be zero, 1, 2, 3, or 4. This formula works because, of the four Boolean expressions in the function definition, only one at most can be true. The remainder will be false. Since each of the false expressions evaluate to zero, those parts of the equation add in as zero. If you want to come up with a letter grade, you could assign F to GD$(0), D to GD$(1), and so on, and use the expression PRINT GD$(FNPV(PS)) instead.

This example illustrates the way you can combine Boolean comparisons with any of the three logic operators, AND, OR, and NOT. You'd have to write four IF. . .THEN statements to accomplish the same task this single function can.

## Conclusion

User-defined functions can be great fun to play around with. They can be as complex as you want to make them, limited only by the 239 characters per line BASIC allows. Using such functions to calculate subscripts for string arrays (as in the last example) provides a natural bridge to selecting specific string values from a list.

Let your programming imagination fly. Built-in functions save you time and effort, too, but writing your own presents a unique challenge, and makes programming in BASIC enjoyable.

Next month I'll turn to disk I/O (input/output) and describe the basic elements of storing data in random-access disk files and retrieving it. Until then, see what kind of useful, unusual, or downright weird functions you can come up with. If you send your best creations to me, you just may (no promises) see your name in print!■


*Write to Dan Bishop at 4124 Beaver Creek Drive, Fort Collins, CO 80526.*

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- Absolutely, positively, totally PRO-DOS and DOS 3.3 compatible.
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- 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.
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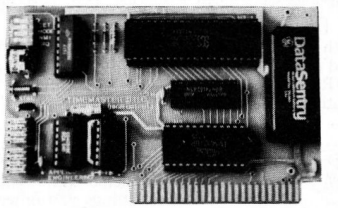


| | PRO-DOS COMPATIBLE | INCLUDES DOS DATER | MILLISECOND TIME | YEAR DATA | LARGEST SAMPLE SOFTWARE | REMOTE SET PORT | BSR PORT | EMULATES ALL OTHER CLOCKS |
|---|---|---|---|---|---|---|---|---|
| H.O | YES | YES | YES | YES | YES | YES | YES | YES |
| BRAND A | NO | NO | YES | NO | NO | NO | NO | NO |
| BRAND C | NO | NO | NO | NO | NO | NO | NO | NO |
| BRAND M | NO | NO | NO | NO | NO | NO | NO | NO |
| BRAND P | YES | YES | NO | YES | NO | NO | NO | NO |
| BRAND S | NO | NO | NO | YES | 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.

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- The VIEWMASTER incorporates all the features of all other 80 column cards, plus many new improvements.

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| WIZARD 80 | MORE | NO | NO | NO | NO | YES | NO | YES | YES |
| VISION 80 | MORE | YES | YES | NO | NO | YES | NO | NO | NO |
| OMNIVISION | MORE | NO | YES | NO | NO | NO | NO | YES | YES |
| VIEWMAX 80 | MORE | YES | YES | NO | NO | YES | NO | NO | YES |
| SMARTERM | MORE | YES | YES | NO | NO | NO | YES | YES | NO |
| VIDEX | MORE | NO | YES | YES | NO | YES | 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!

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- 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.

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# Beagle Bros Apple® Software Report

*Ad Number 221—Page 1* — *"All the News That Fits"* — *Summer 1985*

NEW! *ProDOS Disk with Tip Book!*

## PRO-BYTER™

$34.95 (Compatible with any version of Apple 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—*super-fast!* Works with normal Applesoft 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-saved 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).

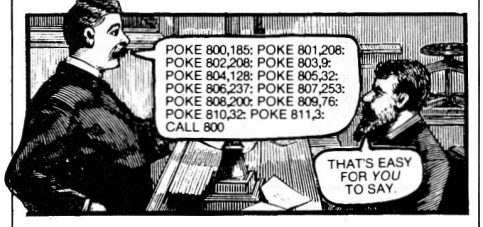
This easy-to-use editor also serves as a neat two-way-scrolling memory scanner. (Find out what's *really* going on inside your Apple's head.) The Pro-Byter manual shows you where in memory to look to find some very interesting stuff.

### 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!*

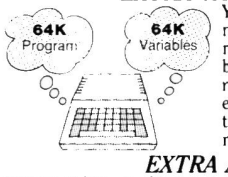
## EXTRA K™

$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 in a flash. 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*

EXTRA K's "nibble copier" duplicates *and verifies* unprotected floppy disks in 35 seconds instead of 1½ minutes (add 3-4 disk-swaps for 1-drive copy). Because of your Apple's extra memory, only 3 or 4 "passes" per disk is 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.

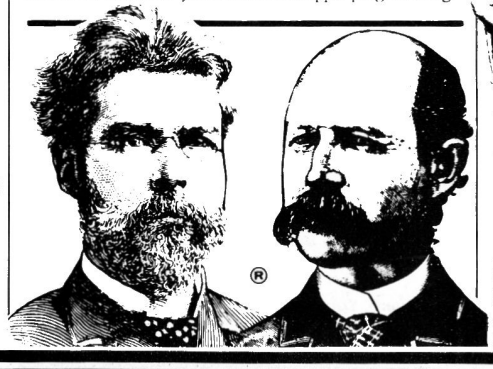
*EXTRA K allows high-speed multi-screen switching.*

## DOS BOSS™

$24.00 (Compatible with any version of Apple II, DOS 3.3)

### CUSTOMIZE DOS 3.3

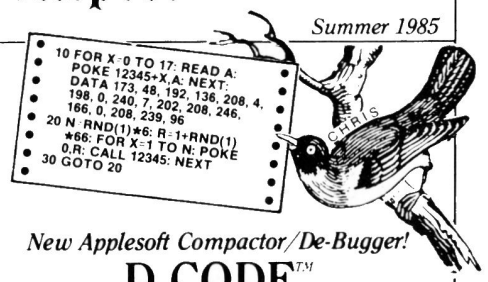
Change *Catalog* command to *Cat,* or *"Syntax Error"* to *"Oops!",* or anything you want. ***Protect your programs:*** An unauthorized Save-attempt can print "Not Copyable". List Prevention, other useful tips and fascinating experiments. DOS Boss will teach you a ton about Apple programming!




**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


*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 10-10,000 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.

### BREAKPOINTS

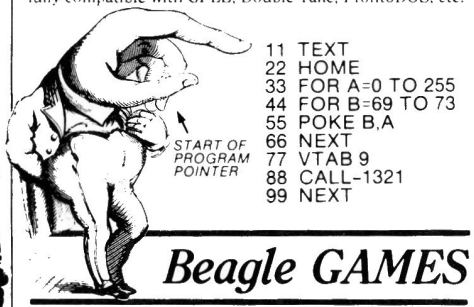
D CODE lets you set up de-bugging "breakpoints" so your program stops when you want. For example, you can ask that your program be stopped the moment X gets set to 99, or the 3rd time a particular program statement is encountered.

### *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.




## *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 pesty 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.




**Circle 179 on Reader Service Card.**

*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

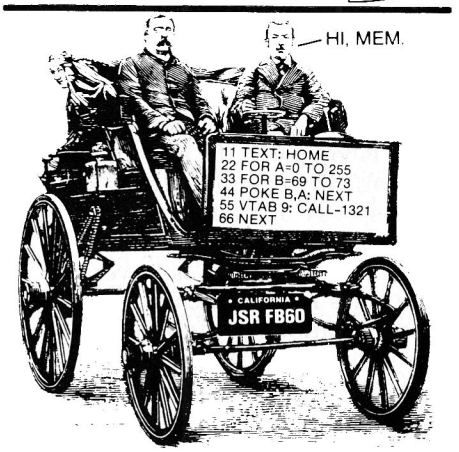
TRIPLE-DUMP lets your dot matrix graphics-capable printer print *(1)* Hi-Res and Double Hi-Res graphics. *(2)* Lo-Res and Double Lo-Res graphics. *(3)* Forty and 80-Column text screen text.

All kinds of images can be transfered 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.




# 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 reqd.) 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.

## 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.

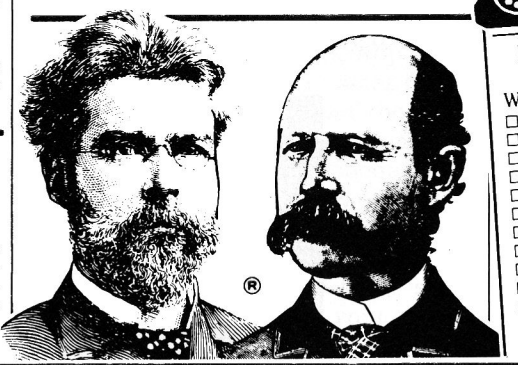
EXCELLENT REVIEWS—see Jan-85 *A-Plus* Magazine.

# 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...*



## Public Notice

Beagle Bros products are available at most Apple software stores. If your favorite dealer doesn't have a particular disk, get on his case. He can have it in his store for you in 2 or 3 days by phoning Beagle Bros or *any* U. S. Apple Software Distributor.

# 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$="ABC"<br>X=3.14159<br>Y=255 | **VARIABLE-DISPLAY:** Instantly prints all of your program's variables in the order used, with their current values |
| A$: 5 10 150<br>X: 10 20 3000<br>Y: 5 40 55 60 | **CROSS-REFERENCE:** Alphabetizes every variable your program uses, and displays them with their line numbers |

Plus **AUTO-LINE-NUMBER**, improved Re-Number, Hex-Dec Convert, Program Stats, eliminate/re-define the cursor...

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| ☐ Apple Mechanic | 29.50 | ☐ Flex Type | 29.50 |
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| ☐ Beagle Bag | 29.50 | ☐ GPLE | 49.95 |
| ☐ Beagle Basic | 34.95 | ☐ I. O. Silver | 29.95 |
| ☐ Beagle Graphics | 59.95 | ☐ Pro-Byter | 34.95 |
| ☐ D Code | 39.95 | ☐ ProntoDOS | 29.50 |
| ☐ DiskQuik | 29.50 | ☐ Silicon Salad | 24.95 |
| ☐ DOS Boss | 24.00 | ☐ Tip Disk#1 | 20.00 |
| ☐ Double-Take | 34.95 | ☐ Triple-Dump | 39.95 |
| ☐ Extra K | 39.95 | ☐ Utility City | 29.50 |

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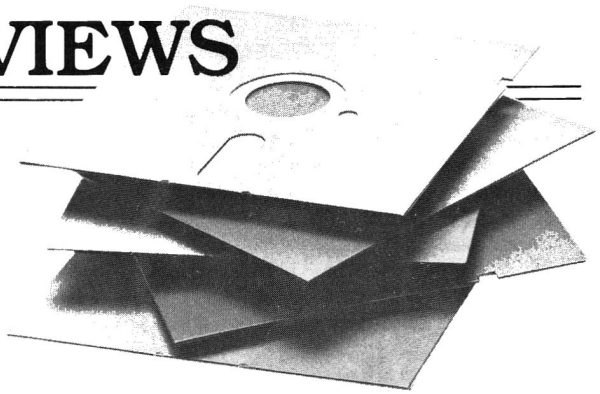
# SOFTWARE REVIEWS



## inCider's Ratings

★★★★ Superlative
★★★ Above average
★★ Good
★ Not recommended
Stay away

## Back to Basics Accounting System

**Peachtree Software**
Management Science America
3445 Peachtree Road, N.E.
Atlanta, GA 30326

General ledger, receivables, and payables
Apple //e and //c, 64K, two drives
$195

★★★

Peachtree's Back to Basics Accounting System combines tutorials with accounting programs in a complete and useful package ideal for a small business.

Among the package's strongest features is the terrific introduction to accounting that Peachtree provides in its 374-page manual. Not only do you learn how to operate the system itself, but also you'll benefit from what amounts to a basic accounting textbook in documentation written by accounting professionals and not by programmers.

### Doing the Books

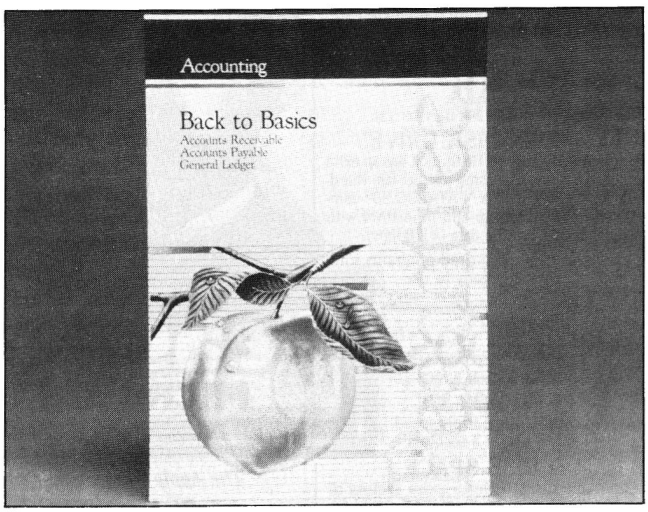
The program's three modules—general ledger, accounts receivable, and accounts payable—are all menu-driven. Each one can stand as an individual program, or the receivables and payables can send their summary data to the general ledger. The ledger then uses that data to print a trial balance, your income statement, a balance sheet, and so forth.

The general ledger provides for recurring expenses and, if you request it, will automatically make journal entries beginning at any time during the year. (You simply need to know the balance in each ledger account.) The general ledger includes a cash-disbursements journal to record information about the checks you write, a cash-receipts journal to record data about the cash you collect, and a cash-sales journal for the cash sales you make.

The accounts-receivable module tracks the amount of money owed to you and for what length of time. The program doesn't generate invoices, but it does have detailed options for producing statements. For instance, the program prints different messages for accounts of various ages on preprinted forms or plain stationery.

You can assign customers different credit limits; an on-screen message warns you if they exceed their allotments. If some transactions (like equipment sales) have a sales tax, while others (like labor) don't, the program will automatically calculate the tax where you specify and add it to the invoice total.

At the same time, however, the receivables module includes the severest limitations of the Peachtree system. First, you can break down sales accounts into a total of ten different areas only—not ten different breakdowns per invoice. Further, the system handles a maximum of 300 accounts—suitable only for a business with a stable base of 300 or fewer customers, or one that collects from most of its accounts every month and can remove them from the books to make room for new accounts. Since most businesses want to add new cus-



tomers, and since most customers don't pay bills immediately, this seems an impractical limitation.

The accounts-payable module tracks what you owe, writes checks, and so on. The system also provides a useful cash-requirement report that helps you take advantage of cash discounts for prompt payment.

**The Bottom Line**

The manual is outstanding from both an accounting and a user's standpoint, and all modules show a professional touch. The system understands upper- and lowercase entry, and when you enter your business name and its associated information, it's automatically sent to your data disks. You select the finance charges for late accounts and when they are applied.

In some modes, the ? key acts like a help key and pulls up a list of things like your chart of accounts or customer names. Payables and receivables both include a simple mailing-label generator. Once you're familiar with the system, you can switch to an advanced operating mode to speed data entry. The program allows for an optional password and also assigns a six-digit company code.

Despite the restrictions of the receivables module, the system as a whole is fully integrated and professional.■

**Gregory R. Glau**
**Prescott, AZ**

## Dazzle Draw

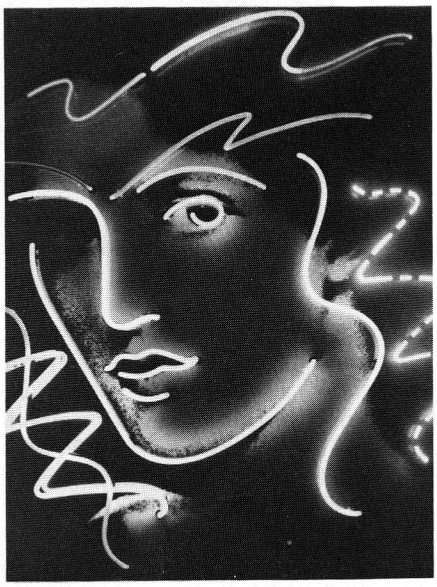
**Broderbund Software**
17 Paul Drive
San Rafael, CA 94903

Double hi-res graphics
Apple //c, //e with 128K
Input device required
$59.95

★★★★

You needn't be a Picasso or Rembrandt to enjoy Dazzle Draw, a delightful, double hi-res graphics program that will repay you with countless hours of pleasure and satisfaction. After dabbling for a few hours, you'll be able to create classic landscapes, holiday greetings, pop art, or illustrations with artistic flair.

Dazzle Draw operates like Macintosh software. You choose options via pull-down menus that appear across the top of your screen. There are no commands to memorize. Features and feedback are provided in windows.



*Dazzle Draw gives you a complete double hi-res drawing system.*

You can even use a mouse as your drawing and cursor-control tool. If you don't have a mouse in the house, you can use your joystick or graphics tablet. In any case, simply move the cursor to the desired feature and click the button on your input device.

Dazzle Draw's offerings are organized into five main menus: Crown, File, Tools, Edit, and Goodies. The Crown menu adjusts the color on your monitor or television, and sets up your printer correctly. Two choices from this menu teach you about the program and offer help. Unfortunately, the assistance is usually inadequate.

You'd expect to find many of Dazzle Draw's File menu options such as load, save, and delete. One special choice, however, lets you make self-running slide shows from your saved drawings. You can set up the show in many ways. Just pick the order in which your frames (pictures) should appear, then decide how long each will remain on the screen and how it will be replaced by the next frame—with scrolling or fading.

In the Tools menu you'll find your art supplies: paintbrushes (six shapes in four sizes each) and paint (16 brilliant colors). Unlike an ordinary paint box, Dazzle Draw gives you ready-made or readily modified multicolored patterns. With this selection, you can create special effects such as brick walls and zigzags.

For a finishing touch, select the Spray Paint, Flood Fill, or Text option. Dazzle Draw offers two type fonts (modern and serif) in three styles (plain, bold, and italic). "Goodies" you might try include drawing an object and watching it mirrored on the other side of the screen.

You can Capture part of your picture and Paste (repeat) it elsewhere. You can quickly prepare an electronic Easter greeting card this way by drawing one rabbit and then "reproducing" it repeatedly on the screen. Although rabbits are famous for such things, you can do the same with hearts, shamrocks, turkeys, or bells.

Depending upon how artistic you are, within a few hours you'll learn the tricks needed to use Dazzle Draw effectively. You're probably not as klutzy as I am; it took me some time to control my joystick, which is more accustomed to fast-paced shoot-'em-up's than it is to playing search and destroy with pixels. Frankly, I was not pleased with my freehand drawing efforts, but the Zoom feature helped me out. With Zoom, you can magnify a small section of the screen so that it takes up the entire monitor display.

What you see is a grid, and each square in the grid represents one dot to be colored in. This I could handle. Though tedious, it made my aim more precise and the results impressive. When I unZoomed my lo-res sketch, it turned into a double hi-res illustration with the ragged edges smoothed.

When the time comes to print out your masterpieces, any of more than a dozen popular graphics printers will do. Color printouts, however, are limited to the Apple Scribe and the Epson JX-80. With a black ribbon in my Epson RX-80, I generated decent printouts of my pictures, although the visual impact was lost in black, white, and shades of gray.

Dazzle Draw is stimulating and satisfying. It's even "dazzling." Most of all, it's affordable.■

**Cynthia E. Field**
**Wakefield, RI**

## Logic Builders

**Scholastic**
730 Broadway
New York, NY 10003

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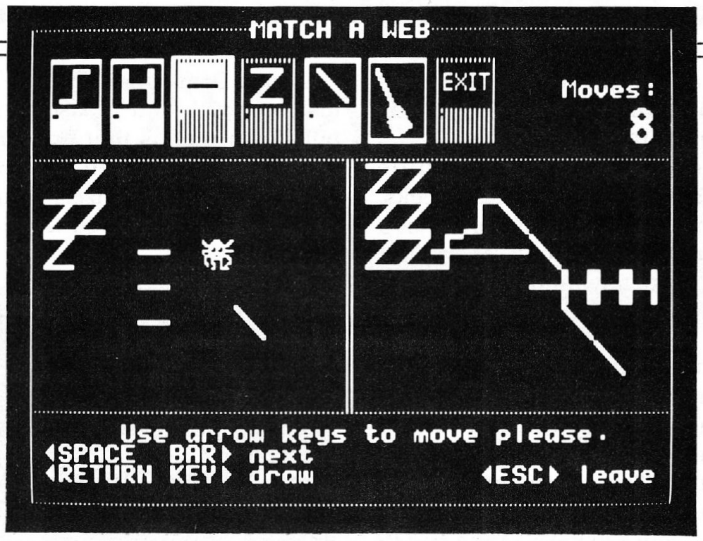
$39.95

★★★★




*In Logic Builders, you help friendly spiders build a web.*

Spiders are a child's best friend, at least in Logic Builders, an excellent educational program that provides children ages 7 and up with practice in problem solving, pattern recognition, and memory skills. Web weaving is the spiders' trade, but they need a child to help them. Together they weave new webs, draw existing webs in as few moves as possible, and re-create webs from memory. In latter segments, the child earns points for every promotion: manager, director, boss, and big boss.

In Draw a Web, a top panel on the screen displays a series of doors with symbols on them. When you press the return key, or the mouse or joystick button, a door opens and a spider climbs out. You move the spider into position, press the key or button again, and the spider draws a shape. When a whole web has been built of shapes, it can be stored on disk for later use in the match and recall segments.

In Match a Web, you copy the web design which appears on the right of the screen in as few moves as possible. You can erase mistakes with a broom, but there's a penalty: Broom sweeps cost two moves. When you think you've matched a web, select the exit door. Successful matches are rewarded by music and a point tally; if something's wrong, Big Boss will tell you more work is needed.

Once you master the duplication process, it's time to build a web from memory. Recall a Web displays the de-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sign, but as you begin construction, it disappears and the clock begins to time your progress. You may press P for a quick "peek," but peeks count against your score and are time-consuming.

As you use Logic Builders, you move from working with straightforward spiders that construct simple webs to tricky and extra-tricky spiders that build increasingly complex webs. Tricky spiders don't always do as you wish; sometimes they draw several shapes at a time, so you have to erase what you can't use.

It's helpful to discover a spider's drawing patterns, and the instructions suggest the best way is to test each on a small area of the screen. You won't be able to see much as the pile darkens, so listen to the number of beeps—one for each shape—as the spider draws. Once you know a spider's pattern, you can erase the pile with a few broom sweeps.

Logic Builders contains a program disk, reference manual, stickers, and web planner. As with other Scholastic programs, the instructions are simple, brief, and helpful. ■

**Bruce S. Trachtenberg**
**Port Chester, NY**

## GraphWorks

**PBI Software**
1155B-H Chess Drive
Foster City, CA 94404

Graphics for AppleWorks
Apple //e and //c
Requires spreadsheet files created by AppleWorks
$79.95

★★

GraphWorks is a business-graphics utility designed to complement AppleWorks by building graphs from the AppleWorks spreadsheet data files. It supports the Apple Imagewriter and Scribe printers and, on a limited basis, the Epson, Okidata, and Gemini series. It works with one or two floppy drives or a hard disk.

Advertised as a professional graphics package, GraphWorks does produce pie, line, bar, and stacked-bar graphs, but the charts are limited and in black-and-white only. The pie and bar charts, for instance, are created from up to 24 data points, but far fewer data points are actually readable in the finished product. Bar charts are restricted to only six legends, unless they're entered manually from the title editor. Similarly, stacked-bar charts with six ranges of 24 data points each and line graphs with six ranges of 52 data points are limited to six legends.

GraphWorks is menu-driven, but you'll need the manual. Unfortunately, the type is small, and the instructions are vague. PBI plans to rectify these problems soon. The main menu is easy to follow, and it's simple to configure the program to your system.

Loading a spreadsheet file into GraphWorks is similar to loading it into AppleWorks. Simply choose the file using the arrow keys. There is one


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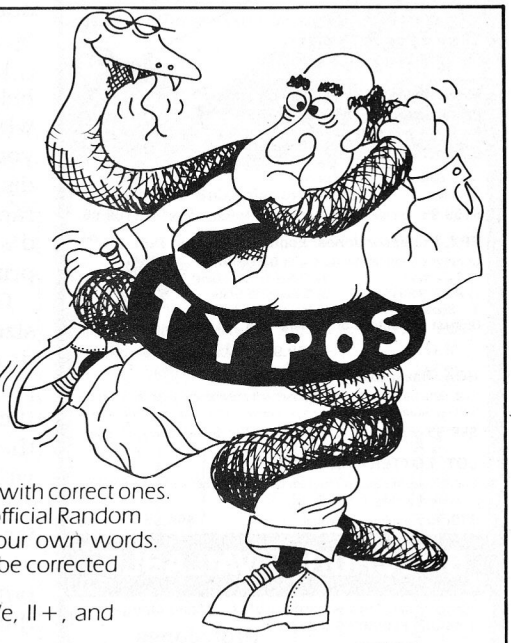


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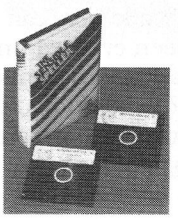

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(313) 258-5566

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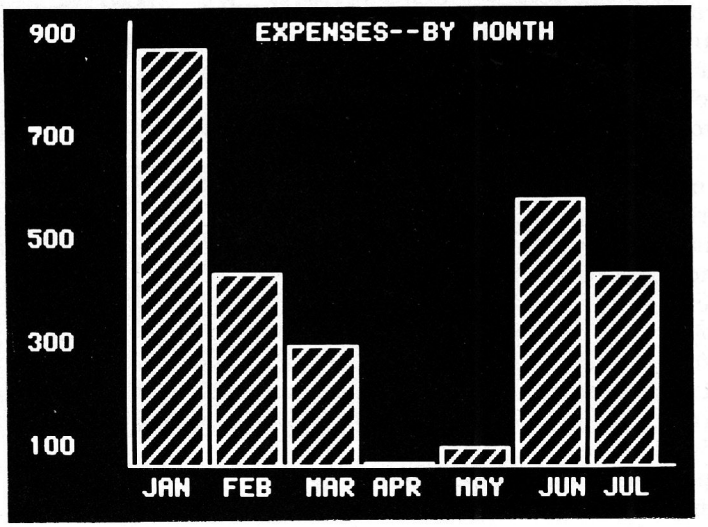



*GraphWorks plots with AppleWorks files.*

catch, though: Your spreadsheet file can't be larger than 12K or you must exit GraphWorks and edit it under AppleWorks. This is very annoying and time-consuming. Since GraphWorks can't edit AppleWorks spreadsheet data, it imposes restrictions on the data's setup. Although the restrictions are minor, keep them in mind when you create a spreadsheet.

You control GraphWorks through one-key commands that don't depend on the open-apple and control keys.

Unfortunately, the manual and the help menu don't adequately explain which keys control which functions. If you press O, however, the program displays a menu of the legends and ranges available for graphing, and G displays a graph on screen prior to printing.

GraphWorks offers two printing sizes: regular (one quarter of a standard 8½-by-11-inch page) or expanded (almost a full page). However, the expanded size is available on only the Apple dot-matrix printer or Imagewriter.

GraphWorks includes a title editor for creating titles and headings or revising text and numbers. Variable type size isn't available, however, so the titles, headings, and labels are the same size. This definitely detracts from the finished printed product.

Hobbyists may find GraphWorks' offerings useful, but the program's limitations don't make it an appropriate business tool. ■

**Stephen H. Ord**
**London, Ontario**

## PFS:Access

**Software Publishing**
1901 Landings Drive
Mountain View, CA 94043

Telecommunications
Apple //c, or //e with 128K
$70

★★★

Though not a communications package itself, PFS:Access, dedicated management software for external data bases (like The Source, CompuServe, or the Dow Jones services), provides great value to on-line service users.

With PFS:Access, you can establish a connection, deliver passwords, and directly enter a specific topic area of a service by bypassing its initial screens. PFS:Access lets you execute these functions at any time through a single menu selection. Keystrokes are captured while you establish a connection, so you don't have to remember the sequence off-line and then enter it accurately. The program files the sequence for later use.

The program's major drawback is its dependence upon Software Publishing's word processor, PFS:Write. Disks must be formatted under PFS: Write. And while you can send files that have been created under other word-processing programs, you can save a file received from a service only to a PFS:Write-formatted disk. Contented users of other word-processing

packages may be put off by such program integration.

**Program Operation**

While on-line with a service, PFS: Access reserves the top and bottom of the screen to communicate with you, devoting the middle to the service's transactions. You can download information or send out files prepared off-line, thus avoiding expensive connect time while composing and editing messages. PFS:Access even lets you establish security codes or encipher data intended only for authorized people.

The process is simple, especially since the program comes with many of the call-up and sign-on procedures for several popular services, such as MCI Mail and Western Union's Easy-Link. To get started, you need the service's local phone number and various access account numbers or passwords. (The manual tells you how to get account numbers and passwords from these services. It also lists some free services that you can access immediately.)

While on-line, the program can retain up to 30 screens of material. Off-line, you can scroll backward and reduce the chargeable time you'd use if you reviewed the data while connected. With PFS:Write, you can prepare material for uploading to a service.

At sign-off, a service usually lets you capture your connect-time data. PFS: Access doesn't provide this useful feature. To bear out the "full-service management" claims for its product, Software Publishing should add this capability to its next release. Then you'd be able to verify details of that inevitable invoice tabulating how much your on-line pleasure has cost you.■

**Archie Mason**
**Stamford, CT**

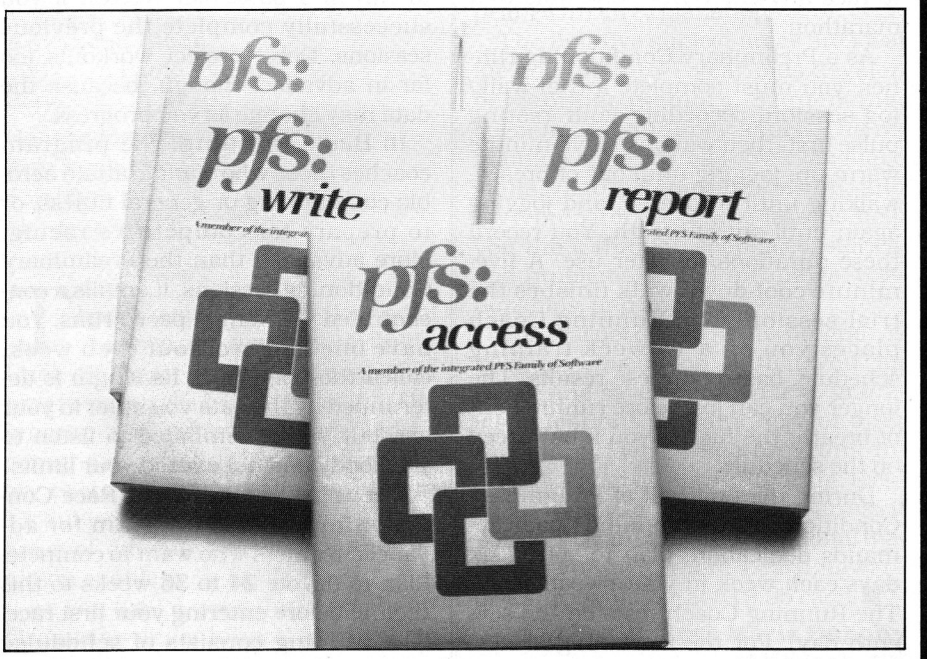
## The Running Coach

**Software Publishing**
1901 Landings Drive
Mountain View, CA 94043

Sports data base
Any Apple II, 48K
$69.95

★★★

Self-improvement programs are hot sellers on the market right now, and The Running Coach is the latest in the get-in-shape game. Designed for the beginner to the advanced runner, The Running Coach studies your level of physical conditioning and then creates a training schedule suited to your specific needs. Although great for beginners who know little about running, The Run-




*PFS:Access is valuable for users of on-line services.*

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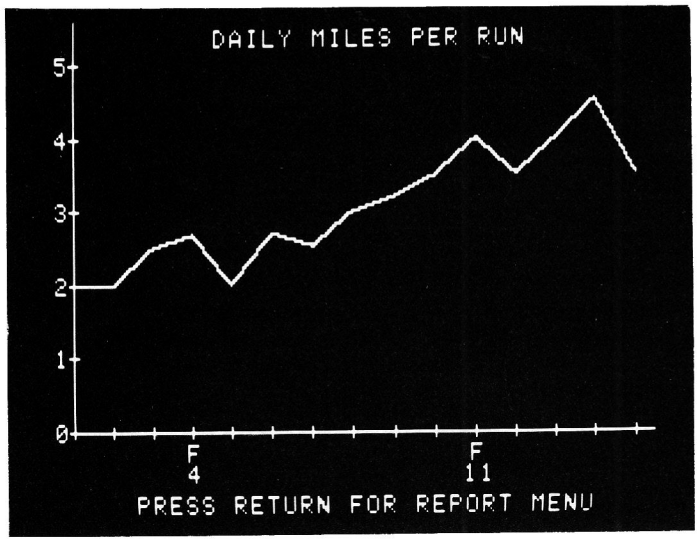


*The Running Coach tracks your daily progress.*

ning Coach may be too simplistic for dedicated, advanced runners who have developed their own schedules and routines.

Before digging your jogging shoes out of the closet, you must supply the program with information about your current physical condition. Based on this information, you choose one of three categories: Preliminary Conditioning for beginners, Basic Running for those who can run four miles or 35 minutes without walking and can train at least three days each week, or Race Conditioning for those who want to race anywhere from one mile to a marathon.

As a Preliminary Conditioning runner, you must complete a trial walk/jog session, recording your resting pulse first, then walking a five-minute warm-up, jogging until out of breath, walking until recovered, and jogging again until out of breath. You record these durations for later use. A five-minute cool-down walk finishes the trial session. The Running Coach places you on a 15-week training schedule, based on these results. The longer you can jog before running out of breath, the higher you'll be placed on the schedule.

During the first half of Preliminary Conditioning, The Running Coach demands dedication; plan to spend six days each week in your sweats (even The Running Coach rests on the seventh day). For the remaining weeks, two to three "days off" per week are allotted, but continuous running times increase. Whereas you may have alternated running six minutes and then walking two minutes in week six for a total of 30 minutes, by week 15 you'll be running for 35 minutes straight.

The Running Coach is designed to keep you from over-exerting. After each workout, you select the Standard Log Entry option to record your running times, pulse rates, and comments. This information determines the intensity of your next workout.

The program also projects future workouts—how much you can expect to run in a particular session if you successfully complete the previous sessions. Don't project workouts too far in advance, though, because the data may change as you progress.

In Basic Running, the program coaches those who want to attain aerobic conditioning or general fitness, or to prepare for competitive racing. More advanced than the Preliminary Conditioning sessions, it entails a concentrated workout of paced runs. You have one long workout each week, called the Long Run. Its length is determined by the data you enter in your log, but you're reminded to listen to your body and not exceed your limits.

The third training level, Race Conditioning, plots a program for advanced runners who want to compete. Plan to devote 24 to 36 weeks to this regime before entering your first race. The training consists of scheduled continuous aerobic runs, fartleks (fast-

running spurts inserted during the run), hill training, and intervals (controlled, variable-paced runs). These running forms build strength, endurance, flexibility, and anaerobic and aerobic capacity.

The Running Coach's Generate Reports option lets you view your progress. You can display or print out not only your weekly schedules, but six other reports as well: log pages, columns, totals/averages, graphs, personal records (fastest/slowest pace or highest/lowest pulse rate after a run), and custom reports (to design or retrieve a custom log-page, column, or totals/averages report and display it on-screen).

Excellent documentation assists The Running Coach. The manual explains the program thoroughly, and beginning runners will appreciate the tips section which covers running theory, warm-up and cool-down procedures, supplementary exercises, weather considerations, and diet.

Basically, this program is a coach that generates a personalized plan for your own running needs. Although advanced runners probably don't need it, beginners who want motivation and pacing will find what they're looking for in The Running Coach.■

**Cynthia K. Carr**
***inCider* staff**

## Lucky's Magic Hat

**Advanced Ideas**
2902 San Pablo Avenue
Berkeley, CA 94702

Home education
Any Apple II, 64K
$39.95

★★★★

There's a pot of gold at the end of your rainbow when you play Lucky's Magic Hat, an educational program for ages 5 through adult. The program's grand scope covers reading comprehension, math concepts, memory exercises, and creative writing in 17 subject areas and at varying degrees of difficulty. And an authoring option enables you to add more.

As you play, Lucky the Leprechaun disappears under his hat, and a magic scroll with clues appears on the screen.

*Lucky the Leprechaun helps you with grammar.*

You must study these clues, because Lucky will ask questions based on them. When you answer correctly, he rewards you with a gold coin, and sometimes he even dances a jig. After you've answered all the questions, Lucky gives you a tallied win, a wink, and a rainbow in your pot of gold.

To increase the challenge, you can decrease the scroll-display time. However, Lucky will let you review the clues if you need to by pressing the return key. The program accepts more than one correct answer, and no judgmental sounds accompany wrong answers. Instead, the correct one appears with an explanation.

The first five subject areas are ideal for helping 5-to-7-year-olds develop perception, memory, sequencing, speech, and auditory skills. The remaining subject areas cover language skills, reading comprehension, and SAT preparation. These lessons help you think through sentences, stories, and problems to find meanings, relationships, and analogies.

The real pot of gold in this program is the authoring option. With it, you can create and save your own text, graphics, questions and answers, or alter those provided by the program. Indeed, without custom authoring, teenagers may tire of Lucky's charms. If you don't want to create additional materials yourself, more Learningware disks are available at $19.95 each.■

**Rose Marie Dunphy**
**Holbrook, NY**

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$49.95
★★

V-Grid Lister, perhaps the only program designed specifically for users of extremely large spreadsheets, is an excellent program on the technical level, but beyond that it has problems. It prints out your VisiCalc or MagiCalc formulas, from the top down and in their correct column and row locations, in a clean and easy-to-read format. However, I found the program annoyingly inconsistent and sometimes tedious to use. It will be most useful to spreadsheet users who must document their matrices, do diagnostics off-line, or manage a large number of disks and spreadsheet files.

V-Grid Lister wraps long formulas so you can read them easily, and permits visual analysis for diagnostics. Additionally, it has some features that many similar programs don't have: selecting only a specific rectangle from a matrix, printing out disk catalogs, and creating a "cover page" to a printout that gives some important information for later reference.

The illogical way in which the program operates, though, makes me think that the programmer was unfamiliar with spreadsheet use, and only concerned about the problem of reading spreadsheet disk files. The material has no standard presentation. Reviews of lists occur in some places but not in others, making it difficult to confirm information, and menus flash (annoyingly), toggle, and have defaults only part of the time. Additionally, the language is obscure; one Y/N option screen appears to offer two positive options.

**"V-Grid Lister is designed specifically for users of extremely large spreadsheets."**

The flow of the program is poor. At one point you supply details about how to print the spreadsheet *before* you go to the catalog to select the file to be printed. In another place, a screen legend indicates that the program analyzes the spreadsheet, but it doesn't share that analysis with you; presumably the programmer expects you to load the file into the original spreadsheet program and make notes on a piece of paper before quitting and booting V-Grid Lister.

The program retains the requested column/row area choices for the current spreadsheet on disk so that when you want to review another matrix (even on another day), it offers the same segment to be printed—hardly what you'll want. There's no shortcut around tedious screen "remarks"—hard-to-understand explanations that are written in odd English. And you cannot quit or change your mind easily either, not even when you have mistakenly started to print an entire matrix, instead of only a smaller segment as intended.

Finally, this technically correct program surprisingly didn't go far enough in some areas. A sequence to prepare a cover page lets you print a sheet with the author's name, some remarks, and the specs of the part of the matrix you selected. V-Grid adds the global settings for the whole matrix at the end of the disk file—but then it only offers a glossary of what the various character sequences mean, which you can print out and append to the cover page. It would have been better if the software printed out the settings fully labelled with their meanings.

Once the program is set up, however, the most you have to do is type in the name of the file. V-Grid Lister comes with a 30-day trial period. If you aren't satisfied, simply return the program disk and documentation for a full refund. ■

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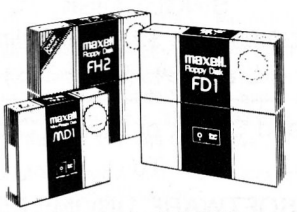


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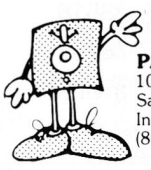

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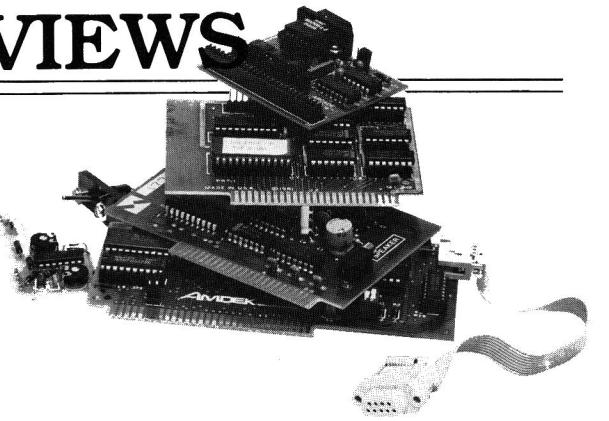


**inCider's Ratings**

★★★★ Superlative
★★★ Above average
★★ Good
★ Not recommended
Stay away

## Flat Panel Display

**Apple Computer**
20525 Mariani Avenue
Cupertino, CA 95014

LCD display
Apple //c
$599

★

Who would ever believe that this year's Apple harvest would offer a $600 lemon? The Flat Panel, the long-anticipated, liquid crystal display (LCD) for the //c, is a perfect example of form without function. The folks at Apple would have you believe that this monitor is just what you need to make your //c "a truly portable computer system." Not so.

It is true that this attractive, snow-beige unit is light, weighing less than three pounds. Its dimensions (11 inches wide by 5½ inches high by 1½ inches thick) make it a compact and stylish addition to the //c. But, as you've already learned from misjudging books by their covers, appearances can be deceiving.

A short, flat cable permanently connects the display to a boxy interface which plugs directly into the TV port on the //c's rear panel. This interface creates two problems. First, its use precludes the attachment of a color TV via the RF modulator that comes with the computer. So, unless you own a color monitor, color is out.

Second, the interface is large—not large enough to be unsightly but large enough to interfere with the //c's built-in handle. To worsen this configuration, the Flat Panel Display has an adjustable stand that merely rests in two of the ridged vents on top of the //c. The Flat Panel doesn't fold neatly over the keyboard as displays on some transportable computers do. If you try to carry this setup around, the display slides out of position.

Your only alternative is to disassemble the Flat Panel Display by unscrewing the interface from its port, an admittedly simple operation. You might wonder what the design engineers had in mind when that vital buzzword "portable" was bandied about.

### Lighting Problems

Unfortunately, the portability problem is the good news. The bad news is that the readability of displayed text is atrocious under all but the most controlled light conditions. In fact, when I first looked at the test monitor, I thought the unit was defective.

With the system in place on my desk near a south-facing window, I could barely see characters on the screen when I loaded an Apple Writer file for review. I took every step imaginable to try to remedy this unanticipated turn of events. I rechecked to be sure the interface was securely fastened. I turned off the system, disassembled the Flat Panel Display interface, and attached the RF modulator and a color TV to ascertain that the port was working properly.

Remembering that the manual had somewhat casually addressed the issue of ambient light intensity, I reattached the Flat Panel Display and started borrowing lamps from all over the house. I tried a variety of incandescent lamps—an ordinary table lamp, a

*Portability may be the Flat Panel Display's only advantage.*

three-way floor lamp, a goose-neck architect's lamp. I tried them individually; I tried them in combination. My study began to look like a TV studio.

The designers and marketing people who read this may be thinking, "What a spacebrain! We put a contrast knob on the display. We made the stand adjustable. We even put in a switch so dim-witted writers could select light characters on a dark background or dark characters on a light background."

Well, much to my dismay—and frustration—I tried all of these mechanical niceties. None worked. The contrast knob had too much play; half of its rotation did nothing at all. Tilting my head did more than adjusting the stand. And, while dark characters on a light background were more readable, they were far from pleasing.

Finally, in desperation, I perched a fluorescent desk lamp literally on top of the //c. Aha! I could now read text fairly well if I tilted and swiveled my head line by line. Eighty columns and 24 rows of text fit onto this small screen. Individual characters are well-formed, but the overall effect is a cluttered one.

**An Apple Lemon**

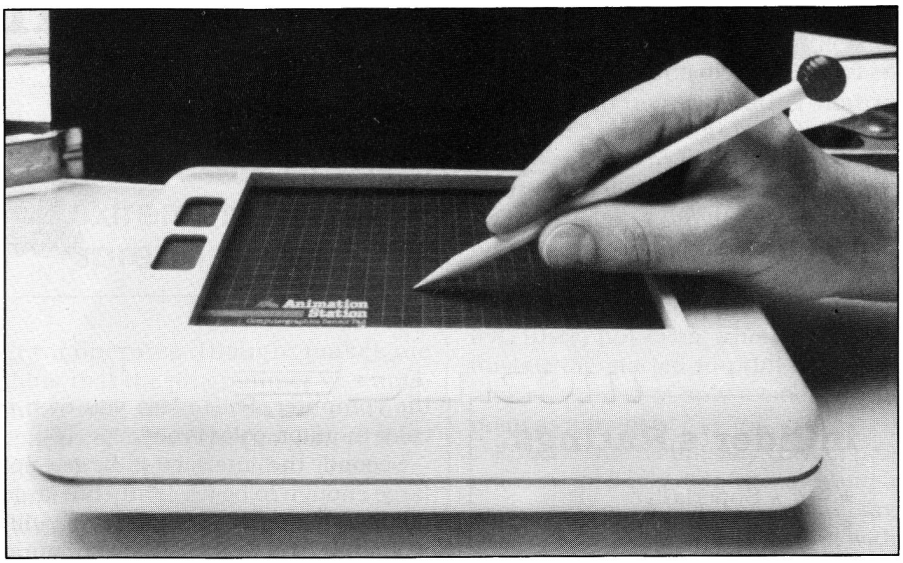
While the textual display is awful, graphics displays are horrendous. Pixels are arranged in a 560-by-192-dot grid, and resulting pictures are stretched out from left to right. An Olympic decathlon hurdler, for example, becomes a short, squat fellow with an atrophied right leg. A lo-res sailboat becomes a 40-meter yacht. A 20 by 20 crossword puzzle becomes a rectangle instead of a square.

Many of the problems I encountered with the Apple //c Flat Panel Display derive from the technology used. As we know, conventional monitors are far from portable due to their large cathode ray tube protuberances and external power requirements. An LCD unit draws less power because it's illuminated externally. Unfortunately, while ambient light is usually adequate for digital watches and calculators, Apple's LCD monitor functions poorly even when situated directly under a fluorescent desk lamp.

However, there are non-LCD alternatives to conventional CRT monitors. Emissive flat-panel-display technologies, where light is generated within the monitor, do exist. They are, like the //c Flat Panel Display, inordinately expensive at this time for the average person. They require an external power supply and are, therefore, less "portable." Still, you might wonder why Apple rejected these alternatives.

My initial thought that the LCD unit I tested was defective was a discerning one. Sadly, the much-touted, long-awaited Apple //c Flat Panel Display is neither portable nor readable. It is, in the worst sense of the phrase, a defective product—a lemon.■

**Cynthia E. Field**
**Wakefield, RI**




*The Animation Station graphics pad unleashes your creativity.*

## Animation Station

**Suncom**
260 Holbrook Drive
Wheeling, IL 60090

Input tablet and graphics software
Any Apple II, 48K
$99.95
★★★

The Animation Station graphics pad is neither a toy nor a tool for the professional. Producing artwork somewhere between the "fingerpainting" of a joystick and the sophisticated output of a graphics tablet, it seems best suited to the informal drawing needs of the grade-school set. Its price likewise falls between those of the other graphics devices.

The package includes the pad, connector cables, a documentation booklet, and the Design Lab, a graphics program from Baudville. Hookup to the Apple II or //e game socket or the //c D-connector takes about 30 seconds. Then, when you insert the disk and turn on the machine, Design Lab boots automatically.

The Animation Station is a nicely designed, attractive unit with a built-in stylus and several controls. The bottom buttons initiate drawing or make a menu selection, the top buttons erase the last shape or line drawn, a switch engages a simulated joystick mode, and the rear potentiometer controls center the joystick-mode cursor. In the back, a fold-out bracket props up the pad.

In use, an icon-type menu presents a choice of modes: a set of pictures or geometric shapes, a "spray gun," a character set for one-line input, various colors, zoom and edit, fill-in, cut-and-paste, free-sketch, disk access, and dump the screen to a printer. With a variety of "brushes," you can also mix colors for a textured background effect. Simply select the mode you want with the built-in stylus or your finger and press the bottom buttons.

After you select the free-sketch mode, the screen clears and the crosshair cursor appears when you touch the pad. Press either bottom button and as you draw, the cursor will follow your moves. Press the bottom button to fix the drawing. You can return to the menu at any time to change colors

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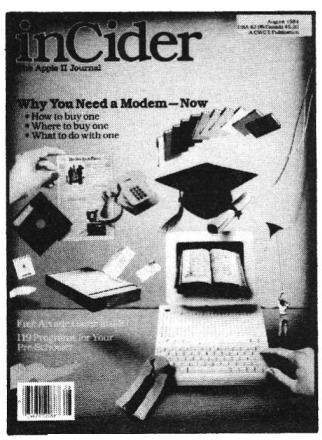

or brushes, select "canned" shapes to insert, or fill areas with color. You can even label your drawing with any of several character sets.

The Animation Station and Design Lab can be fun for any kid who has ever wielded a crayon. With adult guidance, even a 3-year-old will enjoy it, and older children can apply it to school assignments. Other software is being developed for the device, and, surprisingly, KoalaPad programs from Suncom's competitor will also run on it.

### Toy or Tool?

Suncom claims the Animation Station will produce high-quality drawings for demanding applications, as well, and that you can integrate the device or its graphics into your own programs. I haven't found these to be true.

Producing high-quality graphics is difficult because of limited resolution in the input matrix of a graphics device of this type. Also, there's a limited number of digital inputs on the game-port interface as compared to a graphics tablet's slot-based interface.

Since the driving software must make up for the minimal interface, if you draw quickly, discontinuous lines will appear, making freehand input awkward. Also, the matrix sometimes "sees" the stylus where it isn't, resulting in unwanted spots, and the cursor will occasionally jiggle between two or more positions, so drawing straight lines or smooth curves is a problem.

Tracing and freehand drawing are difficult also because you must use two hands in the drawing mode—one to press the action button and the other to move the stylus. An active stylus that detects position with light pressure and initiates drawing with heavier pressure is the solution, but it's an expensive alternative only appropriate to tablets.

A limitation to programmers is the impossibility of legally accessing the Design Lab code to enhance or modify it. You can't even create shape tables for other programs.

Even more serious is the lack of documentation on how to take raw data from the pad. This closed-door policy only hurts the company by discouraging experimenters from broadening the Animation Station's software base. ■

**Charles Engelsher**
**Schenectady, NY**

*Editor's note: At this writing, Suncom has released a new version of the software that allows easier integration of Animation Station-generated graphics and your BASIC programs.*

## The Kameleon

**Intronics**
P.O. Box 13723
Edwardsville, KS 66113

Parallel printer interface
Apple //c
$99.95
★★

The Kameleon solves a problem that may have prevented you from becoming an Apple //c owner: While you like the portability or some other feature of the //c, its serial port won't work with your perfectly good parallel printer (not to mention compatible software). For about the usual price of a printer interface, The Kameleon converts the //c's serial signals to the parallel ones your printer needs. The package even includes a disk with K-GRAPHICS, software that lets you print hi-res pictures already saved to disk.

The Kameleon works with ProDOS or DOS 3.3 and accesses the printer through slot 1—PRINT CHR$(4); "PR#1" from Applesoft. Plug one of the unit's cables into the //c's serial port and the other into the printer's parallel slot and, if your printer needs a power pack, plug the pack supplied into any electrical outlet. According to the Kameleon package, that's all you do; you don't even need to configure the //c's serial port. But, if you don't, the margins will go crazy and an Epson will print only in italics with some software.

### Configuring the Serial Port

There are two ways to configure the serial port. The first uses the //c System Utilities disk as a preboot. (See page 33 of the //c manual for the chapter on configuring the serial port.) The PIN (printer interface number) that worked for me was 156/1121. The main points are to set the baud rate at 9600, the transmission at 8 data bits with 1 stop bit, and the parity at N for none. If you have a wide-carriage printer or if you want elite, proportional, or compressed type, you must select "do not insert CR" to let the software determine the end of a line. After you save the new pin setting to disk, booting the System Utilities disk automatically configures the printer port correctly. Next, exit from the Utilities program, insert your applications disk, and type PR#6 to boot that disk.

The second way to configure the serial port is from within your applications software. This method works with software that expects to be connected to a serial printer such as AppleWorks or Apple Writer II, ProDOS version. You may have to experiment a little. I found that unless I changed Apple Writer //e to 7 bits, I could only print italic characters. (Remember, this version of Apple Writer never expected to talk to a printer through a serial port.) You may also have to use a different baud rate for some printers. I suggest you start with the settings described above and then vary them one at a time until it's right. It takes only a few seconds once you know the correct settings.

### K-GRAPHICS

With K-GRAPHICS, you can choose an inverse or normal image, page 1 or page 2 hi-res screens, and the height and width (size) of printout you want. You can also print only a portion of the image. This software supports several of the more popular brands of parallel printers, including Epson, Gemini, Okidata, Prowriter, and Seikosha. Check to make sure it's compatible with your specific model. K-GRAPHICS doesn't allow for the customary rotated and emphasized options most intelligent parallel-printer interface cards for the II Plus and //e provide.

### Summary

This product works, and the software is certainly handy and will do until something better comes along. The Kameleon's two-and-one-half-page photocopied "manual" and K-GRAPHICS's six-page documentation are poorly written, but nearly adequate. Save the outside of the package, as that's the only place you'll find the manufacturer's name and address. ■

**James B. Munro**
**Youngstown, NY**

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**The Programmable Game of Dimensional Strategy**

Direct from the J-K Design Works comes another new game of unlimited challenge. Anti-Gravity has **90 levels,** which take 5 hours of continuous play just to sample—and no one has ever mastered the highest level.

Anti-Gravity goes far beyond ordinary games; a **Built-in Editor** makes it easy for you to create your own levels of play; an **unprotected disk** makes it easy for you to make your own back-ups. And, all J-K products feature high-resolution, arcade-quality Apple II graphics.

**Save money-** buy Anti-Gravity directly from the designers and pay only a fraction of the retail price. Send just $16.50, plus $1.50 shipping and handling, to:

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# The Truth About inCider

You probably already know that **inCider** is the fastest-growing Apple*-specific magazine on the market today.

What you might not know is that there are nearly 2 million Apple computer owners out there. And, many of them buy their copies of **inCider** at dealerships like yours every month. They might even be buying it from your competitors. . ..

The remarkable success Apple has enjoyed shows no signs of slowing. As a result, **inCider**'s continued growth is assured—and so is yours, as an Apple dealer.

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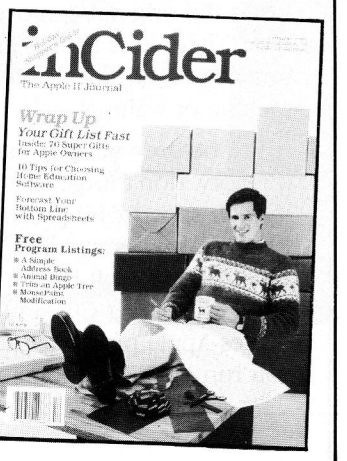


*Apple is a registered trademark of Apple Computer Inc.

# The Apple IIc 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 two disk drives. A 512K Z-RAM will give you a 413K available desktop. A 256K Z-RAM can be upgraded to 512K at a later date when your needs grow.

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, Pro-DOS, 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**
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**Call (214) 492-2027**
9 a.m. to 11 p.m. 7 days a week
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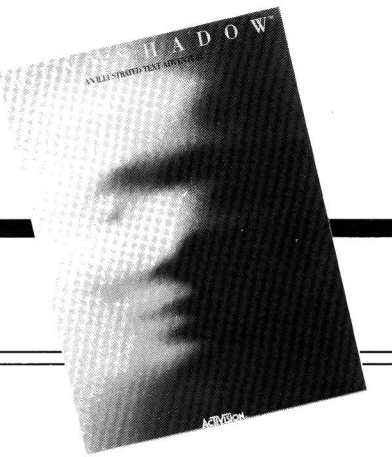



*Activision's new illustrated adventure, Mindshadow.*

## Activision Is Apple Active

**Mindshadow** and **The Tracer Sanction** combine mystery and challenge in illustrated adventures. The Apple version of **Pitfall II: Lost Caverns** brings the adventures of Pitfall Harry to your home. Use just a joystick to control sophisticated graphics and sound in **The Designer's Pencil**. These work on any Apple II, cost $39.95 each, and are produced by Activision, 2350 Bayshore Frontage Road, Mountain View, CA 94043. Reader Service number is 466.

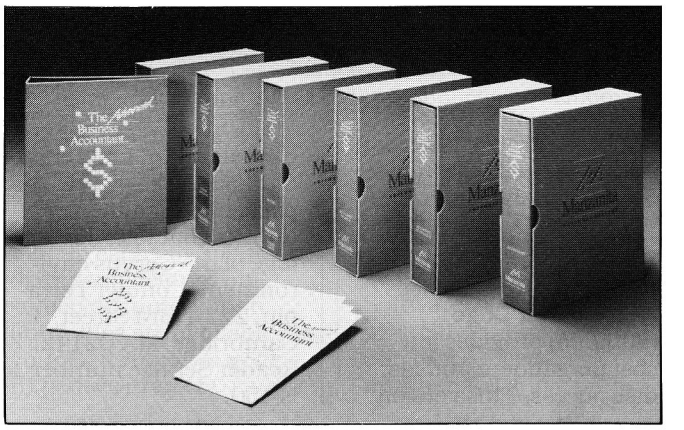
## Endangered Species

**Endangered Species** is a unique simulation where your decisions can wipe out or preserve a species. A tutorial reviews each of more than 90 species and the factors that threaten its survival. The two-disk program uses an Apple II Plus or //e and costs $49. Contact Yaker Environmental Systems, P.O. Box 18, Stanton, NJ 08885. Reader Service number is 456.

*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.*

## Business Accounting

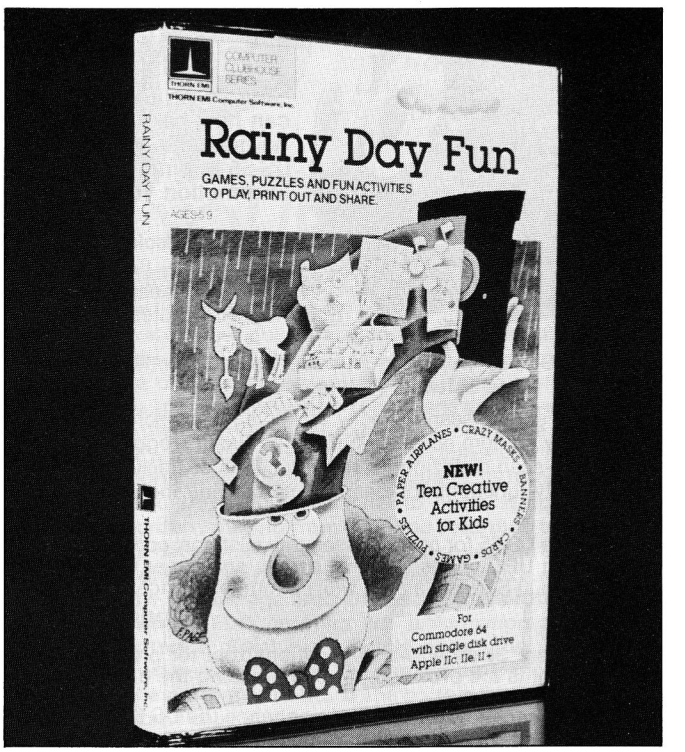
The **Advanced Business Accountant System** provides double-entry accounting for any small business and can convert its data into AppleWorks files. Modules ($395 each) include: Accountant, General Ledger, Accounts Payable, Accounts Receivable, and Inventory Control. Each can stand alone or work with the Ledger. These programs run on an Apple //e or //c and a ProDOS-compatible hard disk, and require the **System Manager** ($95). Demand a full accounting from Manzanita Software Systems, One Sierra Gate Plaza, Suite 200-A, Roseville, CA 95678. Use Reader Service number 463.




*The Advanced Business Accountant for small businesses.*

## Rainy Day Fun and Games

Children always have something to do with **Rainy Day Fun** ($39.95). Two disks feature ten games for children 5 through 9. The package includes Mask Maker, Paper Airplane, Connect-the-Dots, Fortune Teller, and Banner Maker. Fun works with any 48K Apple II and supports popular dot-matrix printers. Don't wait for a rainy day to contact Thorn EMI Computer Software, 3187C Airway Avenue, Costa Mesa, CA 92626. Mark Reader Service number 465.




*Rainy Day Fun features ten activities for children.*

***edited by Kerry J. Lanz***

*Terrapin Logo available for the Corvus hard disk.*

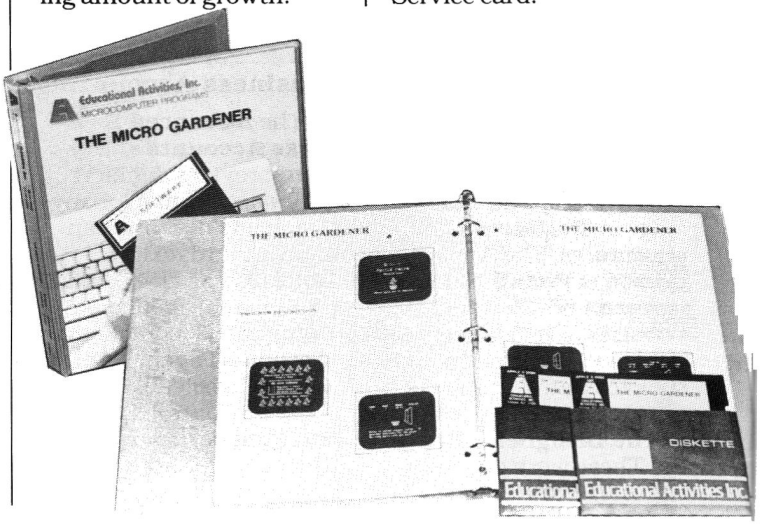
## Networking Logo

Terrapin Logo is now available for a hard disk. Written for the Corvus network of up to 64 devices, **Networked Logo** ($399.95) provides low cost per student and fast disk access. This version uses standard Logo commands, works on any Apple II, and includes utilities that take advantage of the Corvus environment. Contact Terrapin, 222 Third Street, Cambridge, MA 02142. Reader Service number is 450.

## Computer Terrarium

The **Micro Gardener** ($63) simulates 18 weeks of plant growth in 15 minutes. Students decide how much water, light, and heat their hi-res plant receives. From this information, the program then simulates the corresponding amount of growth.

More adventurous students can travel the **Santa Fe Trail** ($59.95) to simulate life and business in the 1820s. To get more information on these programs for any Apple II, contact Educational Activities, P.O. Box 392, Freeport, NY 11520. Circle number 462 on the Reader Service card.

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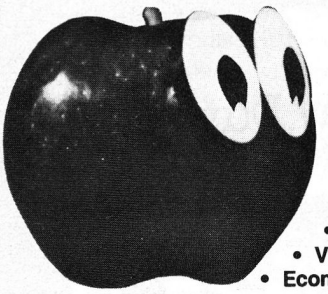
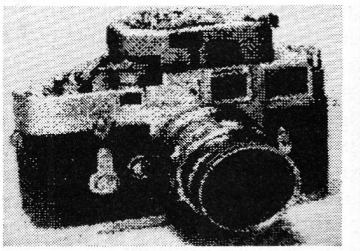


# LET YOUR APPLE SEE THE WORLD!

**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



**HI-RES PICTURE USING THE DS-65 AND PICTURE SCANNER SOFTWARE**

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

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## BASIC Converter

The **Cape Cod Convertible** ($150) moves programs from one BASIC environment to another including Applesoft, CP/M, MS-DOS, and True Basic. Other utilities on the same Apple II Plus or //e disk include string search, text file compare, REM removal, and line referencing. Contact Cape Cod Software, P.O. Box 177, South Yarmouth, MA 02664, or mark Reader Service number 458.

## Alien Laboratory

Turn your computer into a laboratory for studying alien creatures with **Discover: A Science Experiment**, where children learn problem solving as they experiment with hires aliens. Priced at $55, Discover includes teacher's guide, student worksheets, and disk for any Apple II computer. To discover more write to Sunburst Communications, 39 Washington Avenue, Pleasantville, NY 10570, or circle Reader Service number 454.

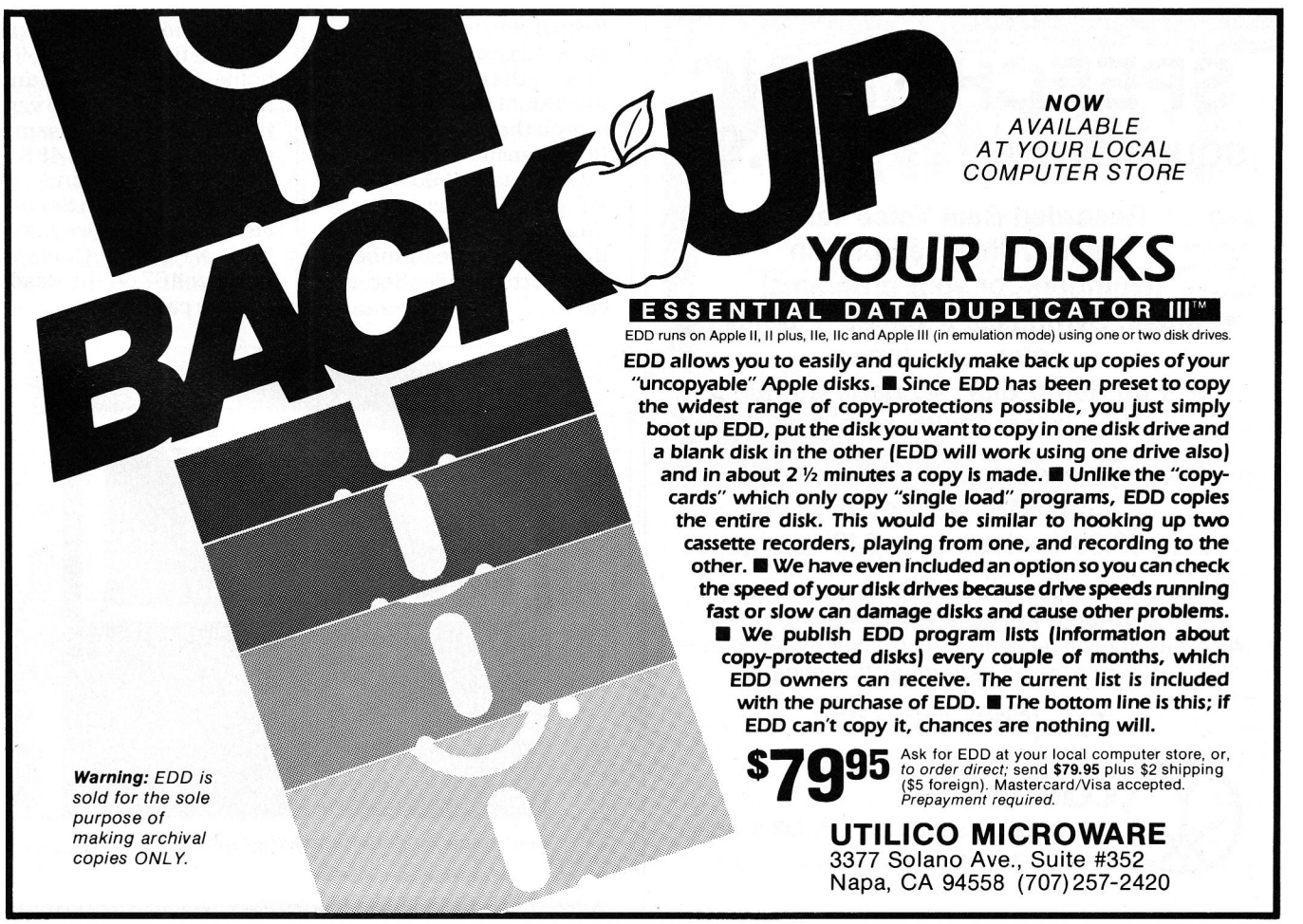
## Learning to LISP

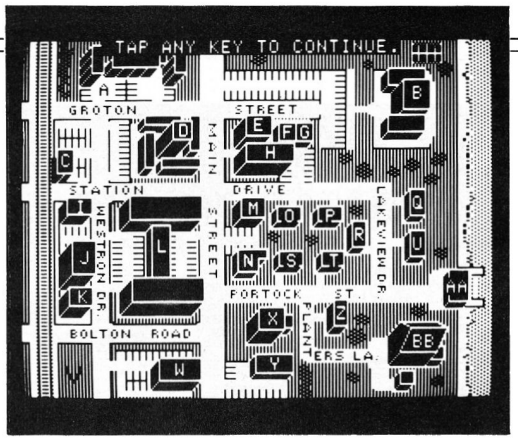
Enter the world of programming in LISP with **iLISP** ($49.95), available in an Apple CP/M format. The manual introduces you to programming in this version of LISP. The disk offers a LISP editor, function library, printing utility, and ELIZA (a famous "psychoanalysis" program). Your Apple will need a CP/M card to run iLISP. For more information, contact Computing Insights, P.O. Box 4033, Madison, WI 53711, or check off Reader Service number 468.

*Houseware products provide easy home management.*

## Home Management

Get practical programs with **Houseware**. These programs, priced at $29.95 each, are menu-driven and feature on-screen documentation. Four titles are available for your 64K Apple //e or //c: Expenses (track 50 categories), Checkbook (monitor checks, deposits, and balances), Decisions (rate choices in eight categories), and Dates (calendar data base). Details are available from September Software, 4706 South 48th Street, Lincoln, NE 68516. Use Reader Service number 451.




*Solve a dozen crimes in Felony.*

### Murder by the Second Dozen

Mystery fans should try **Felony** ($34.95), the sequel to Murder by the Dozen. From kidnapping to murder, 12 crimes await investigation by you and up to three other players. Compose your own games with **Adventure Master** ($44.95), a two-disk program for creating text and illustrated adventures. **Wordfinder** ($34.95) improves vocabulary and spelling skills as you try to find words within words. Travel with **The Sea Voyagers** ($39.95) to meet 30 New World explorers from Balboa to Vespucci. These products work on any Apple II and are published by CBS Software, One Fawcett Place, Greenwich, CT 06836. Reader Service number is 461.

### Plan Your Financial Future

Working with just a few current facts and any 48K Apple II, **GoldenYears** ($125) provides financial planning for your retirement. Specify current income, assets, expenses, inflation rate, age, and retirement plans and GoldenYears evaluates your financial needs. If you can't meet your goals, the program suggests changes. Plan on writing to JCW Enterprises, 25150 Thorndyke, Southfield, MI 48034, or mark number 464 on the Reader Service card.

### Bring Back Dead Data

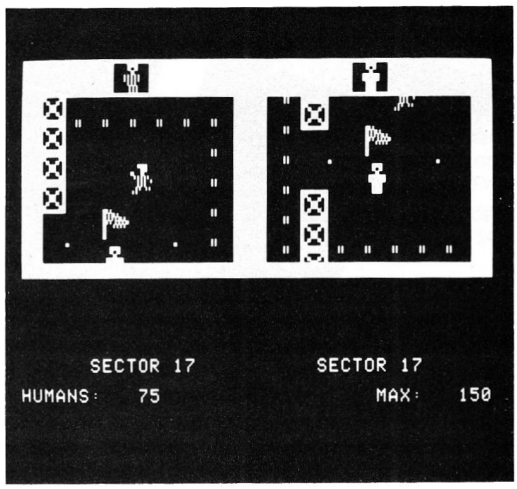
If your disks ever bomb, the **Disk Repair Kit** can pick up the pieces. This menu-driven DOS 3.3 utility runs on any 48K Apple II and repairs most disk damage automatically. Even if the disk catalog is gone, Kit can rebuild the files on the disk, initialize individual tracks, and search the disk for a particular string. The repair estimate is $29.95 from Penguin Software, 830 Fourth Avenue, Geneva, IL 60134. Circle number 455 on the Reader Service card.

### New from MicroLab

Race against time to disarm a doomsday bomb in the arcade game, **Short Circuit** ($20). Protect a nuclear power station on the moon in **Station 5** ($20). During more serious moments, **More Powers to You** ($35) teaches exponents and scientific notation. Children sharpen reading skills in **Myths, Magic, and Monsters** ($35). All of these programs work on any Apple II and are available from MicroLab, 2699 Skokie Valley Road, Highland Park, IL 60035. Circle Reader Service number 453.

### Capturing the Flag

Max, leader of the robots, challenges you and your team to **Bannercatch** ($39.95), a five-level game of strategy and skill. To win, your players must travel to Max's zone, capture his flag, and bring it home. Of course, Max and his team are trying to capture your flag at the same time. You need any 48K Apple II, joystick, and Bannercatch from Scholastic, 730 Broadway, New York, NY 10003. Circle number 467 on the Reader Service card.




*Your team must work together in Bannercatch.*

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## Scarborough Home Products

Youngsters use **Build-A-Book** ($34.95) to write a story using family and friends as characters. Then they print it out on four-color illustrated paper and bind their work into a durable book. Their parents can consult **The Original Boston Computer Diet** ($79.95) to tailor a weight-loss program for lifelong good health. Both programs are compatible with any Apple II and are published by Scarborough Systems, 25 North Broadway, Tarrytown, NY 10591. Use Reader Service number 460.

## Anatomy Software

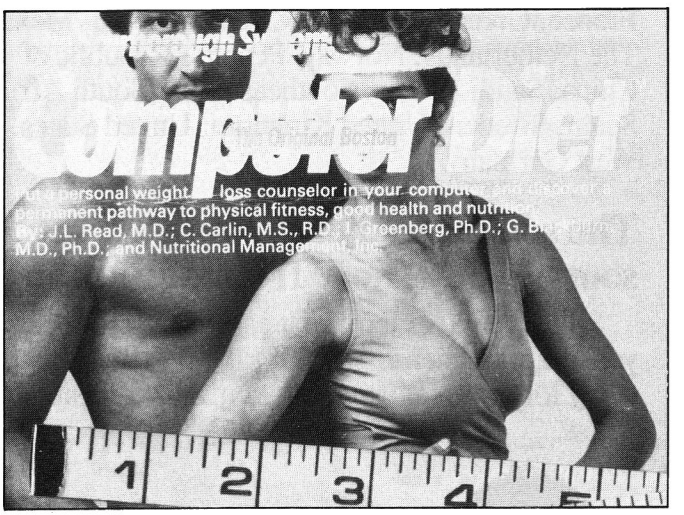
Health-science students and professionals can examine **The Anatomical Computer** on any Apple II. The program presents descriptions of regional anatomy with brief review quizzes. You can purchase the complete set of ten disks ($395) or buy individual disks ($45). Consult the University of Osteopathic Medicine and Health Sciences, 3200 Grand Avenue, Des Moines, IA 50312, or circle Reader Service number 459.

## Financial Planners

Purchase modules of **Plan Ahead** as you need them—they all share the same data structures. Retirement Planning combines your present assets and your future needs to create a total retirement plan. Life Insurance Planning helps you select the correct insurance policies. College Funding calculates a savings goal and compares ways to reach it. Each program ($29.95) runs on any Apple II and is produced by Advanced Financial Planning, 20922 Paseo Olma, El Toro, CA 92630. Use number 457 on the Reader Service card.

## Program for the Teacher

**Test Master** ($20) creates multiple-choice tests and presents the test on your computer. Compatible with any Apple II, Test Master stores test results, grades students, and reviews the correct answers. Tests and results can be printed out for classroom use. For details, write to Sunset Designs, 1815 Eighteenth Avenue, San Francisco, CA 94122, or mark Reader Service number 452.

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We also offer seven personal computer publications. InfoWorld, the personal computer weekly, is a general interest magazine for all personal computer users.

The other six are monthly magazines that concentrate on specific microcomputer systems. PC World, the comprehensive guide to IBM personal computers and compatibles. inCider, the Apple II journal. Macworld, the Macintosh magazine. 80 Micro, the magazine for TRS-80 users. HOT CoCo, the magazine for TRS-80 Color Computer and MC-10 users. And RUN, the Commodore 64 & VIC-20 magazine

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*Fiberbilt Case carries a full Apple //c system.*

### Safe Moves with Your //c

Move your computer system safely with a **Fiberbilt Case** ($175) for an Apple //c, monitor, stand, and external drive. An accessory compartment is big enough for your mouse or modem. The sturdy polyethylene case and aluminum frame surround your equipment with a thick foam lining. Pack up your cares with the help of Fiberbilt, 601 West 26th Street, New York, NY 10001. Mark number 474 on the Reader Service card.

### Data Encryption

Make your records more secure by hiring the **DES-2000** ($459) to encrypt your stored or transmitted data. With three levels of security and four methods of encryption, the DES-2000 connects your Apple II and modem by RS-232 interface and protects you from data thieves. Learn more from Practical Peripherals, 31245 LaBaya Drive, Westlake Village, CA 91362. Use Reader Service number 478.

*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.*

### Modem for Data and Voice

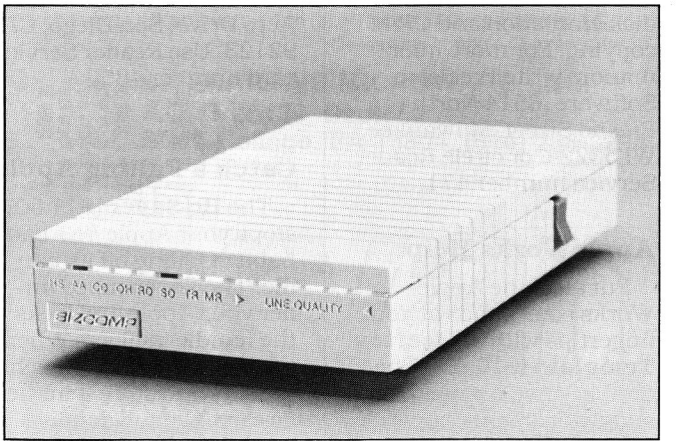
Get your Apple on-line with the **IntelliModem EXT** ($349) and your RS-232 interface. This 300/1200-baud modem features auto-dial and auto-answer, is completely Hayes compatible, and lets you combine voice and data communication without redialing. Contact Bizcomp, 532 Mercury Drive, Sunnyvale, CA 94086, or check off number 484 on the Reader Service card.

### Sakata Dot-Matrix Printer

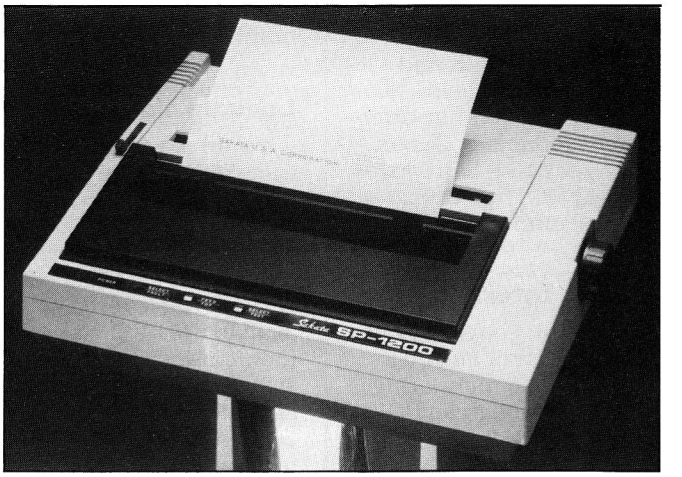
Sakata's new **SP-1200** dot-matrix printer delivers a printing speed of 120 cps, international character sets, and print styles such as emphasized, double-width, double-strike, and condensed. Priced at $399, the SP-1200 is available in serial or parallel models. Complete information is available from Sakata, 651 Bonnie Lane, Elk Grove Village, IL 60007. Use number 482 on the Reader Service card.

### CP/M on Your //c

Run CP/M on your Apple //c with the **CP/M Module** ($129). Be prepared to open your //c and fit this ingenious board snugly inside. The Module remains invisible to the computer's

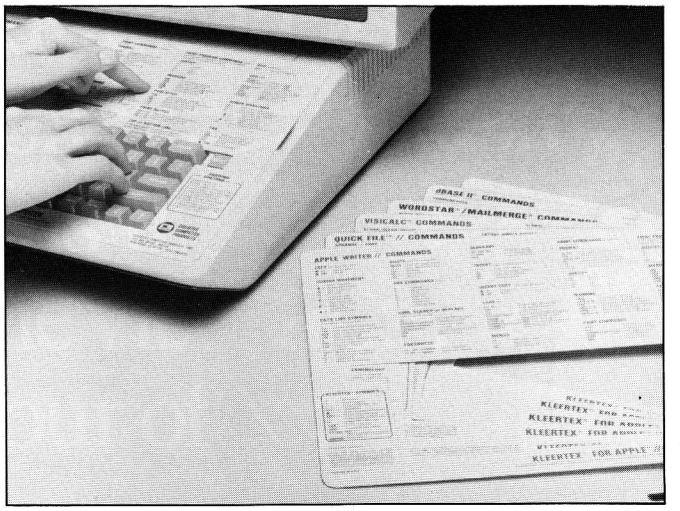



*The IntelliModem EXT 1200-baud modem.*




*The SP-1200 dot-matrix printer.*

***edited by Kerry J. Lanz***




*Help at your fingertips with an AppleWorks Template.*

operation until you boot a CP/M disk, then its Z-80 takes over. Also included is Ramdrive, software for disk emulation and CP/M copying. For more information, write Precision Software, 6514 North Fresno Street, Milwaukee, WI 53224, or circle Reader Service number 471.

## AppleWorks Help

Put all of the AppleWorks commands at your fingertips with a **Kleertex Template** ($19.95). The double-sided template lies snugly over your Apple //e keyboard and reminds you of the right moves for word processor, data base, and spreadsheet. Other templates include Apple Writer II, VisiCalc, and Multiplan. This help comes from Creative Computer Products, P.O. Box 85152-MB134, San Diego, CA 92138. The Reader Service number is 479.

## Sensor Interface

**Octapak** converts your Apple II Plus or //e into a sophisticated monitoring system. Through an RS-232 interface, your Apple logs and charts up to eight channels of data. Up to 16 Octapaks can be connected together for a maximum of 128 channels. Priced at $395, Octapak includes menu-driven software and is available from Action Instruments, 8601 Aero Drive, San Diego, CA 92123. Use Reader Service card number 485.

## Catch a Falling Apple

The **IIc-Saver** ($11.50) stops your Apple //c's bad habit of falling off its handle. The Saver snaps under your Apple and locks the handle in place. When traveling, you can detach it easily and store it in the //c case. Get full details from Step Ahead Products, P.O. Box 995, Skaggs Island, Sonoma, CA 95476. Reader Service number is 481.

## Lock up Your Apples

If your Apple II has to be accessible to many people, Sam will keep it secure. The **Sam II** ($99) lock system firmly locks your Apple to a table or other solid surface. Cables are also available ($14.95) for a monitor or printer. The system installs in minutes and doesn't require special tools. For details, contact Sam Systems, P.O. Box 2339, Hammond, IN 46323, or circle number 487 on the Reader Service card.

## Temperature Tracker

With **Temperature Plotter**, you can monitor up to four temperatures, graph the data, and save everything on disk. The temperature probes and interface ($30 as a kit, $50 assembled) connect to the game port of any Apple II computer while the software ($39.95) handles statistical analysis and graphing. The system is produced by Vernier Software, 2920 S.W. 89th Street, Portland, OR 97225. The Reader Service number is 486.

## Automatic Printer Switcher

Solve the problem of tangled cords and plugs when switching from a dot-matrix printer to a letter-quality printer. The **Switchless Switchbox** ($119.95 including AC adapter) sends data to two parallel printers at the same time. If only one printer is on, data is automatically sent to it without manual switching. Switchbox is produced by The Printer Works, 1961 Alpine Way, Hayward, CA 94545. Use Reader Service number 472.

## Thanks for Extra Memories

Get the capacity of 140 floppy disks with one **QC20** ($2595)—a 20-megabyte hard disk for the Apple //e, the Apple //c, and the Apple Talk network. Your QC20 can be segmented into volumes—each dedicated to its own operating system. Each volume also contains its own password-protection system. For more information about this disk, contact Quark, 2525 West Evans, Suite 220, Denver, CO 80219. Use number 476 on the Reader Service card.

## Listening Aid

Gain full control over your Apple's internal speaker with **A-Max** ($49.95) from Sweet Micro. Installation takes just minutes and Max requires no external power. Two 3-inch speakers and volume controls enhance sound effects, music, and speech synthesis. For private listening, use the stereo headphone jack. Write to Sweet Micro Systems, 50 Freeway Drive, Cranston, RI 02920, or use number 488 on the Reader Service card.

*The Switchless Switchbox runs two printers simultaneously.*

## Infrared Turtles

Logo comes alive when your Apple II and Apple Logo teach the **Valiant Turtle** ($399.95) new tricks. The Turtle carries a pen and duplicates every move of the on-screen turtle, drawing whatever is being drawn on the monitor screen. It takes orders by an infrared light beam, so there are no cumbersome wires. Write to the Turtle at Harvard Associates, 260 Beacon Street, Somerville, MA 02143. Circle number 473 on the Reader Service card.

## Wireless Modem

You can network up to 255 computers or other peripherals with the **ES-Teem Model 84** wireless modem ($995). The modem connects to your Apple II by RS-232 interface and operates on 24 channels. Redesigning the network is as simple as moving the computer, with no wires to restring. This system comes from Electronic Systems Technology, 1031 North Kellogg Street, Kennewick, WA 99336. Check off Reader Service number 475.

## Removable Hard Disk

Increase the memory of your Apple II Plus or //e with a **Hard Disk** ($1295 including interface card) expansion system. Each removable disk ($98) holds 5 megabytes formatted for a single-operating system or a mixture of DOS 3.3, ProDOS, CP/M, and Pascal. This product is part of the memory systems family from Digital Electronic Systems, 302 South Main Street, Estill Springs, TN 37330. Mark number 483 on the Reader Service card.

## Juki 6300

Juki expands its family of daisy-wheel printers with the **Juki 6300** ($995). Available in parallel or serial version, the Juki 6300 prints 40 characters per second, has a 3K memory buffer that is expandable to 15K, and offers popular features such as super- and subscripts, boldface, underlining, and graphics. Write to Juki Industries, 3555 Lomita Boulevard, Lomita, CA 90505. Circle number 480 on the Reader Service card.

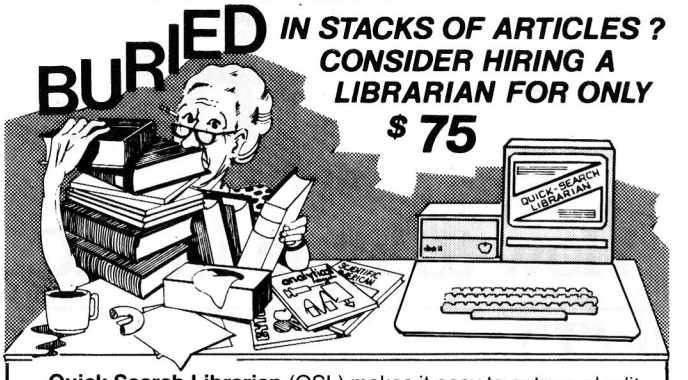
## Serial to Parallel Interface

If you have a parallel printer, **Serial Box** connects it to your new serial Apple //c. Priced at $89.95, the Box includes an AC adapter and complete cables for the printer and the //c. It's compatible with major parallel printers—such as Epson, Okidata, and C. Itoh—and handles most graphics commands. Get complete details from PBI Software, 1155B-H Chess Drive, Foster City, CA 94404, or use number 470 on the Reader Service card.

## Music to Compute By

Compose and play music with the Syntech **MIDI Keyboard and Interface**. The complete system costs $595, but components are available separately. The interface plugs into an Apple II Plus or //e slot and lets you connect your Apple to a stereo, headphone, or amplifier. Play melodies from the keyboard or the software music library. These notes come from Syntech, 7925 Maestro Avenue, Canoga Park, CA 91304. Circle Reader Service number 477.


Circle 12 on Reader Service Card.




**Quick Search Librarian** (QSL) makes it easy to enter and edit your journal references, search for articles, and print or sort a list of articles using the APPLE* II+/IIe computer. Important QSL features include:

- Two keystrokes select any one of 255 keywords or any one of 255 journal titles.
- Four lines available for listing authors, title and/or comments.
- Powerful data base screen editing, copying and merging features.
- Average search speed is 50 articles/second with multiple criteria; average sorting speed is 40 articles/second when sorting on 3 fields.
- Typically, 1000 articles can be stored on a single disk.
- Includes sample data base and tutorial for *Scientific American* magazine.

VISA or Mastercard orders accepted. QSL manual available separately for $5. (Price of manual deductible later with purchase of QSL software.) Add $2.50 for shipments made in U.S.A.
Telex: 705250 *Trademark of Apple Computer, Inc.

**INTERACTIVE MICROWARE, INC.**
**P.O. Box 139, Dept. 52**
**State College, PA 16804, (814) 238-8294**

kyan
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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.

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***Call: (415) 775-2923*** 1850 Union St., Ste. 183
MC/Visa Accepted San Francisco, CA 94123

Circle 91 on Reader Service Card.

# Beginner's Cookbook
## (or)
# How to Type in inCider Program Listings

The purpose of these pages is to give beginners the know-how they need to type in and enjoy the programs *inCider* publishes. It presents information in recipe form, with the number of potentially confusing explanations kept to a minimum.

The instructions assume that you have an Apple II, II Plus, //e, or //c computer with one disk drive and either DOS 3.3 or ProDOS. You also need one blank, 5¼-inch disk. To type in and run *inCider*'s programs, just follow the specific instructions for your computer-operating system combination.

### CREATING A BASIC PROGRAMS DISK

The first step is to prepare a disk on which to save your programs. This process is called *formatting*. In addition, ProDOS requires you to copy two files to create a startup disk.

**ProDOS, version 1.0.2—Apple //c**

1) Put your System Utilities disk into the internal drive.
2) Turn on your monitor or TV set.
3) Turn on your computer.
4) After the disk-use light goes out and the main System Utilities menu appears, type 6 and hit return.
5) At each of the next two menus, type 1 and hit the return key.
6) Accept the default volume name by pressing the return key.
7) Remove the System Utilities disk from the internal drive.
8) Insert the blank, unformatted disk into the drive and hit the return key.
9) After about 30 seconds, the message "Formatting. . .Done!" will appear. Hit the escape key.

Although formatted, the disk needs two files—PRODOS and BASIC.SYSTEM, both on the System Utilities disk—to be useful as a place to store programs. To copy them to your programs disk, continue with the following instructions:

10) Type 1 and hit the return key. (Do this three times.)
11) Remove your programs disk from the drive and insert the System Utilities disk.
12) Type S and hit the return key.
13) Press the down-arrow key until PRODOS is highlighted.
14) Hit the right-arrow key.
15) Hit the down-arrow key until the brackets surround the words BASIC .SYSTEM.
16) Hit the right-arrow key, then press the return key.
17) When prompted, remove the System Utilities disk and insert your programs disk (the destination disk). Then hit the return key.
18) When prompted, remove the programs disk and insert the System Utilities disk (the source disk). Again, hit the return key.
19) When prompted, remove the System Utilities disk and insert your programs disk. Hit the return key.
20) The message "Copying PRODOS. . .Done!" will appear, followed by "Copying BASIC.SYSTEM. . . ." When prompted, remove the programs disk and insert System Utilities. After that, hit the return key.
21) When prompted, remove the System Utilities disk and insert your programs disk. Hit the return key.
22) When copying is done, remove the disk, label it "inCider programs disk #1," and turn your computer off.

Note: You can avoid disk swapping if you have an external drive, but, for the sake of uniformity, that method isn't shown here. See page 20 of the *System Utilities Manual*.

**ProDOS, version 1.0.1—Apple //e or II Plus with 64K RAM**

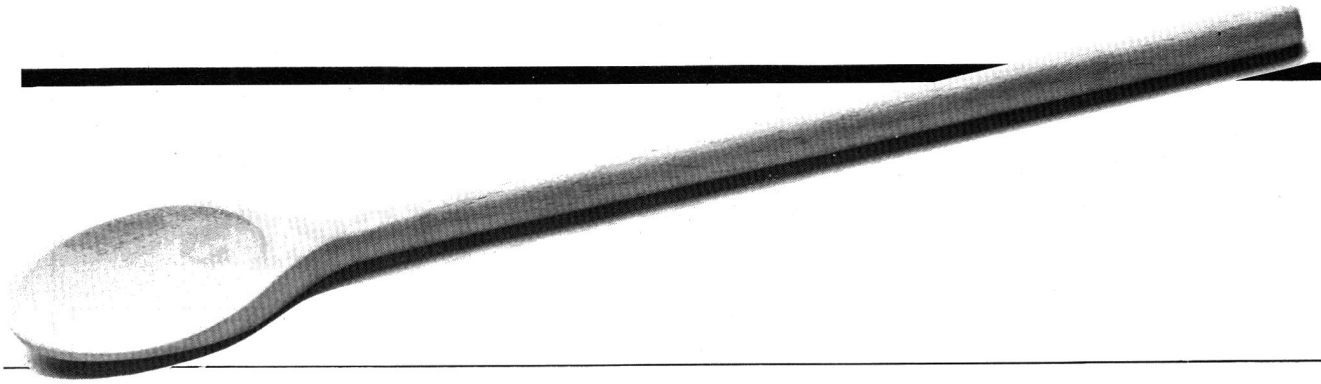
1) Insert the ProDOS User's Disk into drive 1.
2) Turn on your monitor or TV set.
3) Turn on your computer.
4) When the first menu comes up (after the disk stops working), hit the F key.
5) At the next menu, tap the V key.
6) Hit the F key, then press the return key twice.
7) Remove the User's Disk.
8) Insert a blank, unformatted disk into drive 1 and hit the return key.
9) When formatting is complete, hit the escape key twice.

You now have to copy PRODOS and BASIC.SYSTEM onto your newly formatted disk. To do so, follow these instructions. You should be at the Filer menu.

10) Hit the F key, then hit the C key.
11) Type PRODOS and hit return.
12) Type /BLANK00/PRODOS and hit the return key.
13) Remove the formatted disk (your programs disk) from drive 1.
14) Insert the User's Disk into drive 1. Now hit the return key.
15) At the prompt, remove the User's Disk (the source disk) and insert your programs disk (the destination disk) into drive 1. Hit the return key.

Note: If you have a two-drive system, drive 2 will spin for a while before you get the prompt to insert the destination disk. If you want to take advantage of your second drive in the copying process, see page 80 of the *ProDOS User's Manual*.

16) When you see the "Copy Complete" message, type in BASIC.SYSTEM and press the return key.
17) Type in /BLANK00/BASIC.SYSTEM and hit the return key.
18) Remove your programs disk from the drive and insert the User's Disk. Now hit the return key.
19) At the prompt, remove the User's Disk and insert your programs disk. Hit the return key.
20) When copying is complete, remove the programs disk, label it



"inCider programs disk #1," and turn off your computer.

**DOS 3.3—Apple II Series**

1) Insert the DOS 3.3 System Master disk into drive 1.
2) Turn on your monitor or TV and your computer.
3) If you have a //e, make sure the caps lock key is down.
4) When the disk stops and the Applesoft prompt "]" appears, type in NEW and hit the return key.
5) Type in 10 HOME and hit return.
6) Remove the System Master disk from drive 1 and insert a blank, unformatted disk there.
7) Type in INIT HELLO and press the return key.
8) When the disk stops working and the cursor appears, remove the disk from the drive, label it "inCider programs disk #1," and turn your computer off.

## TYPING IN APPLESOFT BASIC PROGRAMS

Instructions for typing in BASIC programs can't be as detailed as the instructions for formatting a disk because every program is different. In general, however, you should follow the guidelines given below.

- When you find a program you'd like to type in, put your programs disk into drive 1 (the internal drive on the //c) and turn on your computer. After the disk stops, the Applesoft prompt "]" appears near the upper-left corner of the screen. At this point, type in NEW and press return.
- Having cleared memory with the NEW command, you are now ready to enter the first line of the BASIC program. First, type in the line number (most BASIC programs begin with line 10), and then type the rest of the line exactly as it appears in the magazine. Don't worry if the line is longer than the width of your screen display. The program line will automatically jump to the next line on your screen. Once you have entered the entire program line, hit return.
- Continue to enter program lines in this manner until the entire program is in memory. Now, even before you run the program, save it to disk so that all of your work won't accidentally be lost. The SAVE command copies a program from main memory (RAM) to disk. Just type SAVE filename (where filename is the name of the program) and press return.
- Since the program is still in (RAM) memory, you can run it with the RUN command. Unless you are a very careful typist, you now face the task of removing syntax errors from the program. For example, if, when you run the program, you get a message saying SYNTAX ERROR IN 1050, it's a good bet that you made a typing error in line 1050. The simplest way to correct it is to retype the entire line. The computer will automatically delete the old line and replace it with the new one.
- When you have the program running properly, save the corrected version by typing SAVE filename again. This command overwrites the old version of the program with the corrected version.

## TYPING IN MACHINE-LANGUAGE PROGRAMS AND SHAPE TABLES

Many programs in *inCider* use machine-language routines and shape tables. The listings for machine code consist of hexadecimal RAM addresses followed by the hex code (5E00—A9 04 30 65 FA 8C 1B 09, for example). To type in such a listing, follow the guidelines below:

- Turn on your computer with your programs disk in drive 1.
- From the Applesoft prompt, type in CALL -151 (the dash is a minus sign) and hit the return key.
- An asterisk, the Monitor prompt, now replaces the Applesoft prompt.
- At this point, get the first address of the machine-language program from the listing. This address is the first four characters in the listing.
- Type in this address, followed by a colon (not a minus sign!). Now type in the hex numbers as they appear in the magazine. For example, if the hex line shown above were the first line of a hex program, you would enter:

5E00:A9 04 30 65 FA 8C 1B 09

and then hit the return key.
- For subsequent lines in the machine-language listing, you don't have to type in the address. Just type in a colon at the start of each line and then the hex bytes, followed by a return.
- To check your typing before you save the listing, type in the starting address of the program and hit the return key. Hitting it again produces the rest of the first program line on the screen. Subsequent returns make additional program lines appear for your inspection. If any line requires changing, just retype that line, being sure to include the address, and using a colon in place of the minus sign.
- Once the entire listing is correct, you have to save it. First, type in 3D0G and hit the return key to return to the Applesoft prompt.
- Now type BSAVE filename,Aa,Ll (where a is the starting address of the routine and l is the length). If these are hexadecimal instead of decimal values, then a $ will precede them. Don't worry about having to figure out the address and length parameters yourself; these are always published with the program.

You now know what it takes to type in and use the programs published by *inCider*. Consult your manuals for more detailed information. ■

# inCider's Index to Advertisers

| Reader Service | | Page |
|---|---|---|
| 125 | Activision | 79 |
| 75 | American Mitac | 60 |
| * | Applied Engineering | 31, 75, 83, 100 |
| 87 | Applied Software Tech. | 48 |
| 216 | AST Research | 1 |
| 88 | Axlon | 88 |
| 340 | BASF | 67 |
| 179 | Beagle Bros | 84, 85 |
| 70 | BroadReach | 60 |
| * | Business Computers of Peterborough | 82 |
| | CW Communications/Inc. | 106 |
| 361 | Central Point Software | 30 |
| 227 | Checkmate Technology | 119 |
| | Classified Ads | 98, 99 |
| 45 | Comp Doc | 92 |
| 124 | CompuServe | CII |
| 17 | Conroy-LaPointe | 39 |
| 163 | Core Concepts | 71 |
| 207 | Covox | 104 |
| 101 | Data Technology | 35 |
| 108 | Diversified Software (Research) | 66 |
| 404 | Elek-Tek | 72 |
| 161 | Fiberbilt | 59 |
| 510 | First Class Peripherals | 55 |
| 146 | Golem Computers | 77 |
| 198 | Grolier Electronics | 36 |
| 66 | H & E Computronics | 68 |
| 427 | Hardcore COMPUTIST | 91 |
| * | Human Systems Dynamics | 50 |
| | inCider Magazine | |
| | Dealer | 72 |
| | hotCider Sub | 64 |
| | Dealer Ad | 99 |
| | Moving | 105 |
| | Subscription Problems | 94 |
| 12 | Interactive Microware | 109 |
| 157 | International Apple Core | 44 |
| 536 | Jameco Electronics | 80 |
| 74 | JK Design Works | 99 |
| 62 | Kalglo Electronics | 105 |
| 86 | Kensington Microware | CIII |
| 91 | Kyan Software | 109 |
| * | Madwest Software | 62 |
| 208 | Micro City | 81 |
| * | Microsoft | 63 |
| 204 | Micro Works | 102 |
| 380 | Nibble Notch | 52 |
| 310 | Northeastern Software | 43 |
| 31 | Pacific Exchanges | 94 |
| * | PC Network | 40, 41 |
| 49 | Prof. Jones | 90 |
| 521 | Programs Plus | 70 |
| 268 | Prometheus Products | CIV |
| 234 | Quadram | 23 |
| 16 | Quinsept | 92 |
| 281 | Quinsept | 42 |
| 41 | Quorum | 120 |
| 223 | Sav-Soft Products | 93 |
| 353 | Sensible Software | 89 |
| 143 | Silicon Express | 49 |
| 218 | Sir-Tech | 45 |
| 376 | Software Unlimited | 93 |
| * | Softyme | 11 |
| 54 | Sorcim/IUS | 14 |
| * | Southern California Research Group | 123 |
| 67 | Stellation II | 94 |
| 355 | Street Electronics | 9 |
| 156 | Sublogic | 127 |
| 120 | Sunnyvale Communications | 121 |
| 221 | Sweet Micro Systems | 78 |
| 32 | Thirdware | 29 |
| 129 | Thunderware | 25 |
| 544 | Turning Point Software | 7 |
| 264 | Utilico Microware | 103 |
| 152 | Video-7 | 2, 3 |
| 350 | Wayne Green Int'l Ltd. | 28 |
| * | Xerox | 51 |

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# The GAME RESERVE

## Game Ratings

Boffo
Cut above
Mundane
Futile

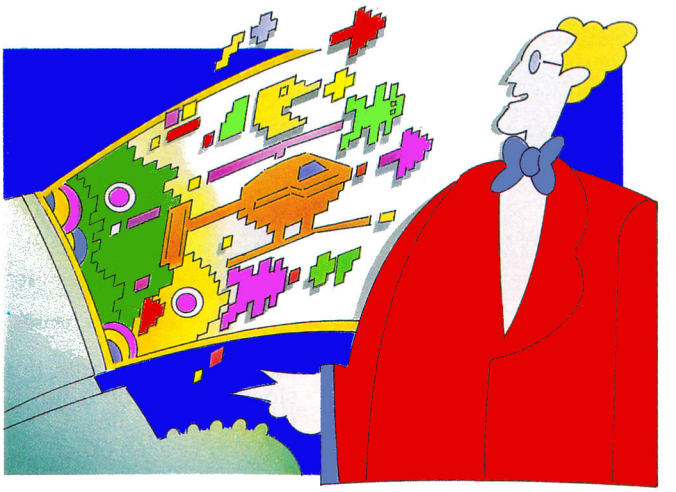
***In The Game Reserve, Brian Murphy reviews six to eight of the most recent Apple games to hit the market. Look here for* inCider*'s scoop on the latest fun.***

**Fahrenheit 451**

Telarium
One Kendall Square
Cambridge, MA 02139
Any Apple II, 64K
$39.95

It's about time Apple II and II Plus owners upgrade to 64K. Games arriving at the Game Reserve's gates are increasingly marked for use with a minimum of 64K RAM memory. If you want to play the new games, you'll need that 16K RAM card you've been putting off for so long.

A case in point is **Fahrenheit 451**, a superbly illustrated adventure from the Telarium division of Spinnaker Software. Science fiction fans know that Fahrenheit 451 is both the temperature where paper ignites and the title of Ray Bradbury's classic novel of a future where books are illegal.



The computer game is a sequel to the book and puts you in a paranoid world where ideas and knowledge are the official enemies of the state. Firemen are paid to start fires while a literate underground diligently memorizes endangered literature.

You play the role of Guy Montag, the hero of Bradbury's novel. He is an ex-fireman, converted from burning books to preserving them for the underground's memorizers. (Individual memorizers specialize in a single author or work—one memorizer may be "Jonathan Swift" and another may be "Emily Bronte.") In post-atomic-war New York City, Montag explores the ruins of the old culture and the sterile pleasure domes of the new, while he searches for clues and assistance toward preserving books—a large official collection may be in the former New York Public Library.

More than any adventure game I've recently encountered, Fahrenheit 451 generates its subject's mood, especially the tension and paranoia of a post-war police state in New York. As Montag, you need to find food, a valid ID, a way to recognize other members of the underground, a store of literary quotes (the passwords of the underground), and a way into the library. Meanwhile, mechanical hounds roam the streets, poised to deliver their poison bite for the slightest misstep.

Technically and artistically, Fahrenheit is quite an achievement. The game resides on two double-sided disks, requires 64K of RAM, and offers what seems to be an endless supply of locations, puzzles, and situations. You can play it with or without graphics, but for me, it's a better game with pictures. The full-color illustrations take the upper third of the screen (see **Photo 1**), are well drafted, and add to the atmosphere.

The parser allows chained commands like ENTER THE STORE and READ IT. The manual is brief, but concise, and first-time players will have no difficulty learning the game. Surviving is the hard part.

***Photo 1.*** *Scene from Telarium's Fahrenheit 451.*

***by Brian J. Murphy***

### F-15 Strike Eagle

MicroProse Software
120 Lakefront Drive
Hunt Valley, MD 21030
Any Apple II, 64K
Joystick required
$39.95

I love a good flight simulation. If you add a few air-to-air missiles, some SAM's (surface-to-air missiles), a few dogfights, a bomb run, and other transonic highjinks, so much the better. That is the appeal of MicroProse's **F-15 Strike Eagle**.

This game comes as close as you can get with an Apple II to simulating an F-15 pilot in combat. First, the program is a good flight simulator. You can put your plane through realistic combat maneuvers: jinks, rolls, loops, and yo-yo's. The game also simulates stalls, spins, and other potentially dangerous problems—all in a well-animated cockpit display.

Adding to the realism is the "heads-up" display (**Photo 2**) that simulates one of the features of modern avionics—sighting reticules and status reports projected on a transparent screen in front of the canopy. This system allows you to keep your eyes on the skies while scanning vital aircraft information.

Among the systems at your disposal are air-to-air missiles, electronic jamming, bombs, drop tanks with extra fuel, short- to long-range radar, afterburners for extra speed, and a speed brake for sudden deceleration. You fly the plane and fire weapons using a joystick, and keyboard controls access the special functions. The stick also provides a realistic feeling of flight—especially when you're in a dogfight!

***Photo 2.*** *F-15 puts you in the pilot's seat.*

Your missions, should you decide to accept them, increase in difficulty with targets in Libya, North Vietnam, Syria, Egypt (when you're flying for the Israeli Air Force), and Iran. You can fly each mission at different skill levels. Your opponents are realistically simulated, including Soviet fighters (like the MiG-21, MiG-23, and the Su-22) and other air- and ground-launched missiles.

You'll have to think and react quicker than in most arcade games to survive Strike Eagle combat. The level of challenge is advanced, to put it mildly, but the feeling of accomplishment and the simulation's realism are worth the time it takes to master the game.

### Solo Flight

MicroProse Software
120 Lakefront Drive
Hunt Valley, MD 21030
Any Apple II, 64K
Joystick recommended
$39.95

Need a little relaxation after all that intense combat? Well, **Solo Flight**, also by MicroProse, offers a nice change of pace. It's a little like F-15 Strike Eagle, but slower and without surface-to-air missiles.

If you've seen other flight simulators, you'll feel at home here—except that the color display isn't an "out-of-the-cockpit" view. You see your plane, its shadow, and every maneuver as if you're following it (see **Photo 3**). That slightly detracts from the realism, giving the game an arcade look. In every other way, though, Solo Flight provides high realism that is increased by clean graphics and good animation.

Flight controls are simple. A joystick maneuvers flight and single keypresses regulate landing gear, throttle, brakes, flaps, and the like. Once you have this mastered, your plane handles surprisingly well. Perhaps the nicest surprise is that the nemesis of the home computer pilot, the landing, is considerably easier in Solo Flight than in other flight simulations.

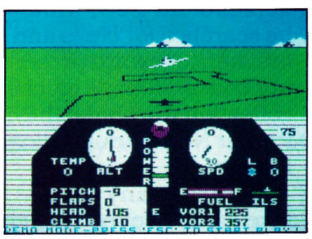



***Photo 3.*** *Landing at Solo Flight's Wichita airport.*

The game comes with a short flight manual that includes flight maps of Kansas, Colorado, and Washington with details on flying those areas by instrument and VOR (radio) navigation. The manual includes basic flight principles, rules for the challenging Mail Pilot scenario (completing a route in the shortest possible time), and tips on handling simulated emergencies—a feature at the more difficult levels.

Once you've completed your flight training, try a tougher level of challenge. You'll be confronted by situations that will call on all your skills as a flying ace.

### Spy vs. Spy

First Star Software
18 East 41st Street
New York, NY 10017
Any Apple II, 48K
Joystick is optional
$34.95

You think James Bond movies have been around for a long time? Well, not as long as the spies of Antonio Prohias. Since 1960, his black and white pencil-headed secret agents have been throwing bombs, knives, and even the kitchen sink at each other in a *Mad* magazine cartoon feature. Now you can proudly join "the usual gang of idiots" as you play the game based on Prohias' *Mad* comic-strip, **Spy vs. Spy**.

Spy vs. Spy is a challenging game that combines arcade and strategy skills with a non-stop melee through a foreign embassy. You'll be stealing secret briefcases and other classified goodies, setting booby traps, and clubbing your opponent's head at every opportunity.

The game is played on an ingenious split-screen color display (see **Photo 4**). The top half shows what the white spy (whom you control) is doing and the bottom screen displays what the computer-controlled black spy is up to. Using a joystick, you maneuver your spy around the embassy in a race against the clock to find a secret briefcase, a cache of money, a passport, and a key that are hidden in the building. Once you secure these items, you can attempt to escape the building and board a homeward-bound jet.

Being a secret agent demands resourcefulness and imagination. As you search, you can set booby traps ranging from bombs and electric traps to guns that fire when your enemy opens a door. The trick is to remember where you've hidden your little surprises so you don't set them off yourself.

From time to time you'll encounter the black spy, precipitating one-on-one combat. Using your joystick, you can club him over the head or jab him. After seven good hits, he's dead—for the time being—while your spy chortles in the true Spy vs. Spy manner.

You can select levels of difficulty. The embassy can contain just a few rooms or many rooms on one or more levels. The more rooms you have, the more frenzied the chase becomes. If you fail to complete the quest within an allotted time span, a bomb will blow your unlucky secret agent sky high.

Spy vs. Spy's animation is very good and the split screen makes the action more exciting and challenging. Some of the action options (setting traps and reading maps) are displayed as icons and are selectable during play. The best thing about Spy vs. Spy is that it preserves the spirit and sense of fun in the original Prohias cartoons—in the best (and nuttiest) tradition of *Mad* magazine.

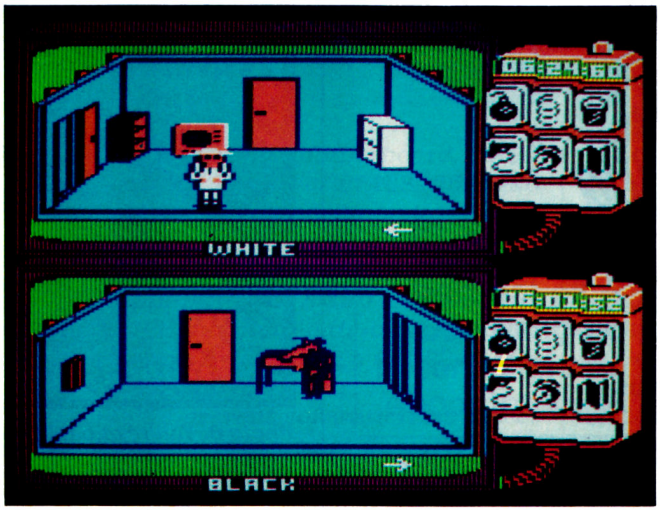



***Photo 4.*** *Split-screen intrigue from Spy vs. Spy.*

**Short Circuit**

MicroLab
2699 Skokie Valley Road
Highland Park, IL 60035
Any Apple II, 48K
Joystick required
$20

For an arcade game to stand out these days, it takes an original, offbeat approach. That's why **Short Circuit** is a special treat.

Here's the scenario: Earth is threatened with destruction by an accidentally activated microprocessor-controlled doomsday device. You must travel the integrated circuit chips of that device and disarm it. If you fumble the job. . .bye, bye Earth!

When the game begins, you're shrunk to a height of about one angstrom so you can be inserted into a microchip. Once inside, your joystick controls your travels down the circuit paths.

Jumping from circuit to circuit, you look for contacts that transfer power between three microbatteries (**Photo 5**). If one battery overloads, it becomes vulnerable to your attack. The strategy, then, is to transfer power from two batteries into the third. Extra power becomes available as you intercept microsparks of electricity and send surges of power to the batteries.

Each chip is guarded by neutrons, double neutrons, and photons. If your electron man runs into any of these patrolling particles, there will be an immediate voltage drain on the batteries. If the voltage supply is drained, you risk setting off the micropulse. Three micropulses and. . . blooie! If you run into five of these particles, the micropulse is transmitted automatically. Therefore, it's a good idea to quickly size up the pattern and speed of each proton patrol before you enter the danger zone.

You must disarm 12 microchips before you save the Earth. Each one is a little harder to disarm than the last. There are more and more neutrons in each successive chip, and they move faster and faster in less restricted patterns. It will take many attempts before you finally disarm the doomsday device. You can count on quite a few simulated apocalypses in the process. It'll be hard on old mother Earth, but fun for you.

**Star League Baseball**

Gamestar
1302 State Street
Santa Barbara, CA 93101
Any Apple II, 48K
Requires joystick
$29.95

Here's an Atari 800 game that's been converted for Apple II use.

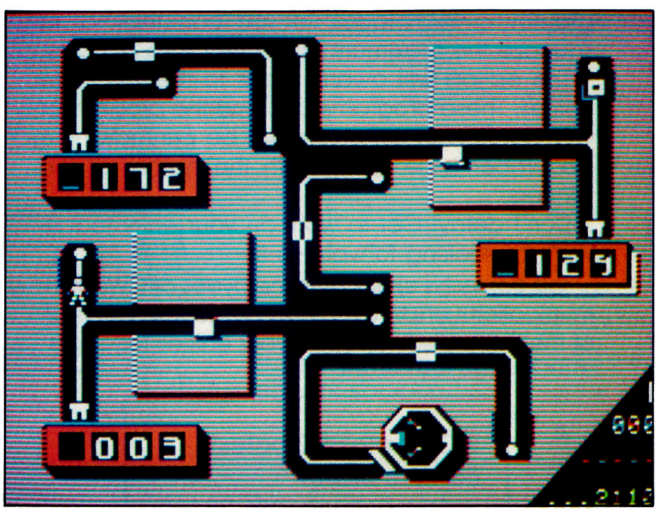


***Photo 5.*** *Try to Short Circuit the doomsday bomb.*

# inCider's 2-Bit Programming Contest

**Write the best program you can in 2 lines of Applesoft code.**

*inCider*'s 2-bit Programming Contest is simply a test of your skill and imagination as an Applesoft programmer. You don't have to send in a quarter or answer any off-the-wall questions.

The contest rules are simple. Write a two-line program with no more than one page of documentation (double spaced), and send it to *inCider* by July 15, 1985.

Your program can be any type—game, utility, data base, graphics—you name it. You can POKE shape tables into memory, use monitor routines—anything, in fact, that you can do in a normal Applesoft program. You just have to do it in two lines of code!

**FIRST PRIZE: $200**

**SECOND PRIZE: $100**

**THIRD PRIZE: $50**

Programs will be judged on the following criteria: First, your program must do something useful; a game, for instance, must be fun to play, and a data base should be able to access data files. Second, your program should be as original as possible. If you can do something in two lines that no one has ever done before, you'll be well on your way to the top prize. Finally, your program should exhibit some programming savvy. Use as many clever programming techniques as you can think of to squeeze the maximum out of two lines of code.

The editors will award prizes to the top three entries. These programs become the property of CW Communications and will be printed in the December issue along with the names of the winners.

Don't delay! Get to work on your entry today. We'll be looking forward to it!

This contest is closed to employees of CW Communications and their dependents. The decision of the editors is final. Send your entries to:

**inCider 2-Bit Contest**
**80 Pine Street**
**Peterborough, NH 03458**

Void where prohibited.

***Photo 6.*** *You're at bat in Star League Baseball.*

And like many others, it's a dandy. Simulating baseball action isn't new, but there's always room for a simulation that offers good graphics, great animation, dynamic sound, and a real challenge—as does **Star League Baseball**.

Perhaps one of the most difficult feats in computer-arcade games is hitting the ball in Star League Baseball (**Photo 6**). The computer-controlled hurlers throw a number of tricky pitches. There's a fastball ace who has a screwball, a hot fastball, a trio of sliders, and a mean change-up. The knuckleballer's pitches are hard to handle even when they're over the plate. The curveball artist keeps you guessing on his hurl's possible trajectory.

With pitching like this, you'd be wise to switch to the practice mode and learn how to find the ball. Batting practice makes perfect if you really expect competition, whether your foe is the deadly computer pitcher or another human.

Defensive play is a whole 'nother ballgame. The computer fields perfectly in the solitaire mode. The appropriate fielder always runs to meet the ball, always pegs it to the right base, and almost always in time to make an out. You'll have to learn to do all these things almost by reflex with your joystick. It will take time to learn how to move the right player after the ball, to throw out a runner, and to catch a fly ball. Yes, all these things will take time, practice, and a few humiliatingly one-sided defeats—like my 24 to 1 loss to the computer.

On the bright side, with enough batting practice you'll learn how to hit safely about a quarter of the time (don't laugh—.250 hitters make $800,000 a year). You'll also discover that if you mix up your pitches (selectable by joystick), you stand a better chance of striking out an opponent or forcing him into a ground out.

Remember the rationalization about going to the ball game that went, "Well, if nothing else we'll get some fresh air and see a little green grass?" Bear that in mind. In Star League Baseball, you'll have a chance to see some green pixels and watch fresh animation. The game is realistic and entertaining, and worth a try—especially when you eventually learn how to turn a double play. ■

*What do you think of current Apple II games? Are they hits or do they bomb? Brian wants to know what you think of them. Write to him at* inCider, *80 Pine Street, Peterborough, NH 03458.*

*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, Apple Clinic,* inCider, *80 Pine Street, Peterborough, NH 03458.*

## Disabling the 80-Column Card

I have an Apple //e with an extended 80-column card. Is there a quick way to force a program to boot in 40 columns (like the //c's 40/80 switch)? Specifically, I use Smartcom I with my Hayes Micromodem //e. Smartcom I is Pascal-based and looks for a card in the auxiliary slot. When it sees the card, it boots in 80 columns. I'd like to be in 40 columns when I call up local bulletin boards and in 80 columns when I call The Source or CompuServe. Currently, I have to remove the 80-column card from the auxiliary slot when I need 40 columns.

Can I add a switch (I can handle a soldering iron and am used to modifying circuits) that will make the software think that the auxiliary slot is empty?

Larry Krupp
Collinsville, IL

*Yes, you can. Programs test for the presence of an auxiliary RAM card by modifying an auxiliary RAM location, then checking the location to see if data is properly stored and retrieved. If you install a switch that disables MPU communication with auxiliary-card RAM, the test will fail and software will behave as if there is no auxiliary RAM card and no 80-column capability.*

*The data-bus-management signal that enables MPU communication with an auxiliary-card RAM is EN80' from pin 17 of the MMU. This signal falls during PHASE 0 of machine cycles in which the 6502 is reading to or writing from auxiliary-card RAM. On the motherboard, EN80' low enables 1/4 of a 74LS125 to gate R/W'80 (the auxiliary-RAM read/write' line) to pin 35 of the auxiliary slot during write cycles. On the 80-column card, EN80' low enables MPU/auxiliary-data-bus communication by enabling a 74LS245 bidirectional bus driver.*

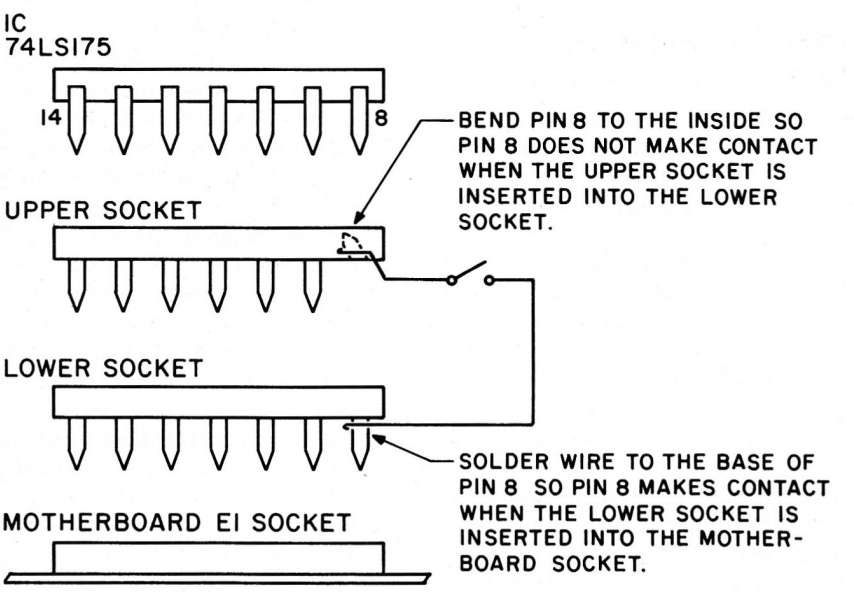
*To prevent software from detecting the presence of auxiliary RAM, you can install a switch that will disable auxiliary-RAM writing, but not auxiliary-RAM reading. The switch is connected so that it can break the R/W'80 connection between the LS125 and the auxiliary slot, without requiring modification of the motherboard or auxiliary card. With this switch, programs cannot detect 1K (80-column) and 64K (extended 80-column) cards.*

*Before you begin the installation procedure, you must first build the socket adapter shown in the accompanying* **Figure**:

*1) Obtain two 14-pin IC sockets and an on/off manual switch of your choosing.*
*2) Bend pin 8 of the upper socket out so it won't make contact with pin 8 of the lower socket when the two sockets are mated.*
*3) Select a location where you'll mount the switch as close as possible to the LS125 at E1 (C12 if a PAL/European motherboard).*
*4) Cut two equal lengths of insulated wire that will reach from the LS125 to the switch, keeping wire length as short as possible.*
*5) Solder one wire between the bent pin 8 of the upper socket and one contact of the switch.*
*6) Solder the second wire between the base of pin 8 on the lower socket and the other contact of the switch.*

*After you've built the socket adapter, insert the upper socket into the lower socket. With your computer turned off, remove the LS125 from the motherboard and insert it into*

***Figure.*** *A socket and switch that disables an Apple //e 80-column card.*




**by Jim Sather**

*the upper socket. Then insert the mated sockets and IC into the vacated motherboard socket. (Next time someone asks you what the 6502 stack is, tell him this is it.)*

*Mission accomplished. You can now make the auxiliary RAM card invisible to a program. If it doesn't work, check your wiring. If auxiliary-RAM access is unreliable, you probably made the wires too long. I used 8-inch wires on my installation and it works fine.*

*It's important to note an imperfection in this RAM-card disable switch: When the switch is in the disable position and a program makes the MPU attempt to write to auxiliary-card RAM, the auxiliary-card RAM chips and 74LS245 compete with each other for control of the auxiliary data bus (the lines between the RAM chips and the LS245). This "bus fight" probably hurts nothing, since it occurs only when software looks for the RAM card at initialization. Other switch locations don't cause bus fights, but do cause mechanical difficulties. You may wish to consider installing a switch between MMU-17 and LS125-10/AUX-26 on the motherboard or a switch between pin 26 and LS245-19 on a 1K or 64K RAM card.*

## Disk-Drive Speed Alignment

I've just purchased a second drive for my Apple //e—a standard, Shugart SA390 from Micro City (advertised in your magazine). I believe its speed is incorrect, making it foul up my data disks. I've already returned one drive to them for this reason, but the replacement still isn't good. I've read that there's a procedure that lets you correct the speed by adjusting the drive yourself. Can you help me?

Gerry Boulton
Point Roberts, WA

*One quick way to check disk-drive speed alignment is to format a disk using the ProDOS FILER utility. The formatting routine has fairly tight drive-speed requirements, and it returns a drive-speed error if the speed isn't close to 300 rpm. If FILER does format disks in your drive, chances are speed alignment isn't causing your problems.*

**"A disk drive advertised as Apple II compatible should plug into a healthy Apple II and work without a hitch."**

*If you can locate the speed-adjustment potentiometer, you can adjust the drive speed. However, location varies with different drive manufacturers. If the drive has only one adjustment screw, that's probably it; if there are more than one, the speed-adjustment screw is probably the most accessible one. You might be able to access the correct screw through a hole in the case or from the side when you dismantle the drive cover. In any case, proceed very carefully until you're sure you've located the correct adjustment screw.*

*Several disk utilities have drive-speed verification routines. If you don't have access to such a program, it isn't necessary to rush out and buy one. Most drives have a 50/60-Hz strobe-alignment pattern on a wheel underneath the drive mechanism, and you get enough 60-Hz flicker from most American artificial lighting to get a reading off the wheel. Just remove the drive mechanism from the cover and turn it upside down so you can see the wheel. Perform a disk boot with no disk installed to make the drive run, and tweak the speed adjustment until the 60-Hz marks on the wheel appear to be stationary under electric lighting powered by 60-Hz alternating current. This includes any light connected to standard American household wiring, but not sunlight, battery-powered lamps, or light from lamps that have an energy-saving button rectifier installed.*

*Besides speed, other forms of drive misalignment (such as head positioning) may be causing your problems. You can try the drive-alignment procedures presented in the November 1983 and August 1984 Apple Clinics, or you can take the drive to a service center for alignment. But in all honesty, Gerry, I think you should return your drive to the retailer and demand your money back. When a disk drive is advertised as Apple II compatible, that should mean that you can plug it into a healthy Apple II and have it work without a hitch. This has been my experience with Apple-compatible drives, and I wouldn't settle for anything less.*

## EPROM-Resident DOS

Is it difficult to put both DOS 3.2 and 3.3 into EPROMs and perhaps substitute these for some RAM on a suitably modified language card? I'd like to do this for flexibility and use of essentially DOS-less disks. (A few sectors might be necessary to perform the appropriate POKEs and CALLs needed to activate the required memory addresses at boot-up.) Some proficient hackers might have useful ideas along these lines, or perhaps you can refer me to some good literature. The concept might even be extended to include CP/M in ROM and/or to put one or more languages (Integer, for example) onto a "super card" in slot 0. Dreaming a bit, it'd be great to choose the desired language/operating system without the usual fuss.

Ralph C. Moredock
Campbell, CA

*Everything you suggest is entirely possible and supported to some extent with commercially available products. The availability of 8-, 16-, 32-, and 64-kilobyte EPROM makes it possible to store significant programs in EPROM, and the versatility of the Apple II and //e makes it possible to design peripheral cards that take advantage of the big EPROMs.*

*You might consider the SCRG quikLoader—a ROM card that holds 16 to 512 kilobytes of EPROM, depending on the size of EPROM plugged in. It comes with DOS 3.3,*

*Integer BASIC, FID, and COPYA resident, as well as an operating system that supports cataloging, loading, and running of user-application programs. I designed the quikLoader for the Southern California Research Group, so I can't give you an unbiased recommendation to buy it. However, if you want DOS and application programs in ROM/EPROM, you should investigate the quikLoader for yourself.*

*Another commercially available card is the Insta-DOS card from Horizon Computer Products. The ads for Insta-DOS seem to indicate that the card comes with a resident DOS that is compatible with DOS 3.3. This is considerably less ambitious than the quikLoader, but the price is right.*

*Finally, if you own one of the 12K Applesoft or Integer firmware cards that Apple used to sell for the //e, you can configure the jumpers on the 12K card for EPROM and install DOS 3.3 and a custom reset handler on the card in any Apple II or //e slot. The reset handler intercepts all resets, but normally passes control directly to the motherboard reset handler. However, if the operator signals the reset handler that he wants a DOS boot (for example, by pressing a joystick button while pressing the reset key), then the reset handler transfers DOS to RAM and cold-starts DOS.*

*I've packed DOS 3.3 into a 12K firmware card and written a reset-handler and DOS-transfer routine to go with it. Unfortunately, I don't have enough space to present them here. Instead, Ralph, I'm sending you a copy of an application note from* Understanding the Apple IIe *(Quality Software, 1985) in which I show how to modify a 12K firmware card into a 24K firmware card with DOS 3.3, Integer BASIC, and a custom reset handler resident. If there is sufficient reader interest, I'll present further information on this subject in the coming months.*

## Jilted Computer

It was with interest that I read the October Apple Clinic. It seems to me that you left out one very important step in the Guru Repair Guide. Between steps 3 and 4, there should have been a step that said something about muttering (just loud enough for the defective equipment to hear) "Keep this up and you're gonna get it!" It works most of the time for me.

I'm one of those who was lured by the low price of a "compatible" disk drive from one of your advertisers. I've yet to be sorry; the drive has worked fine from the first time it was plugged into my old Apple II. I have five disk drives, none of which has given me much trouble. The Rana Elite 3 is drive 1, the "compatible" drive is 2, and two Apple Disk IIs are drives 3 and 4. The fifth drive, another Apple Disk II, is on a card by itself in slot 5. I'm using the Rana controller card with the first four drives in slot 6.

You asked for problems Apple users have had. Here's my sad tale: When my Apple II was new, it had a very bad habit of not booting the disk when it was turned on, and once it did boot, it wouldn't always stay on. The slightest physical jarring of the computer would send it into never never land. My local dealer couldn't find what the problem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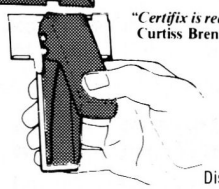

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was (although he did try). So about a month before I was to go on vacation to Houston, I sent the computer back to Apple with a letter explaining the problem. The day before I was to depart, the computer came back. There wasn't enough time to check it out, but since Apple had given it a once over, I thought that everything would be in great shape.

How wrong I was. When in Houston, the computer did the same thing that it did before I sent it to Apple. I took it to a "franchised service center" and *showed* them what it did. They charged me for an IC that I really didn't need, but didn't fix the computer. They said that if it still did the bad things, I should bring it back, even after I told them that I lived over 600 miles away.

When I got back home, I decided to forget the warranty and drilled the pop rivets out of the power supply case. Inside, I found poor-solder and no-solder joints. After I fixed the solder joints, the major cause of my troubles was gone. I still had to replace all of the cards that had ever been plugged into the computer (including the keyboard), and the motherboard had to be replaced. It seems that the spikes that came from the power supply, due to the parts not making good contact, made all of the cards and the motherboard act funny. (I've been an electronics technician for more than 30 years, so this fix wasn't really an accident.) Your readers might be interested in knowing how a real-life problem with an Apple II was solved.

Now for a comment that has nothing to do with the Apple Clinic. (It has to do with Letters from readers.) Just because something is new doesn't mean that it's better. *Updating* doesn't necessarily mean *upgrading*.

John W. Davison
Ft. Walton Beach, FL

***Thanks for the description of a difficult problem, John. The real world can be a cold place. I think if my Apple ever rubs out all my peripheral cards, I'll convert it into an outhouse for my dog, Scuz Beagle. You don't say what troubleshooting checks you made to determine that you had a power supply problem. Could you elaborate on that in a short follow-up?***

***As an electronic technician, you know that the quality of work in different shops will vary. Car owners know that the quality of a dealer's service department should be considered when they buy a vehicle. Computerists should accept the same fact of life. To be sure, familiarity with a good service shop with reliable, friendly, and talented technicians is a treasure to be coveted.***

***I don't think the poor workmanship in your power supply was normal. Apple relies on outside vendors for the power supply and it's very possible for them to receive some bad ones. If many Apples were sold with power supplies like yours, it would be a major catastrophe for Apple. I do think that you'd have been within your rights to show the power supply with unsoldered connections to your dealer and demand a new Apple and replacement of all damaged peripherals.***

***Like you, I've had no bad experiences with alternate-source floppy-disk drives. I use a Disk II (Shugart), a Solo Vista (Shugart), and a Fourth Dimension (Siemens) with no problems. The 4D drive is my personal favorite, because it is quiet and has an electrical stop at track 0.***■

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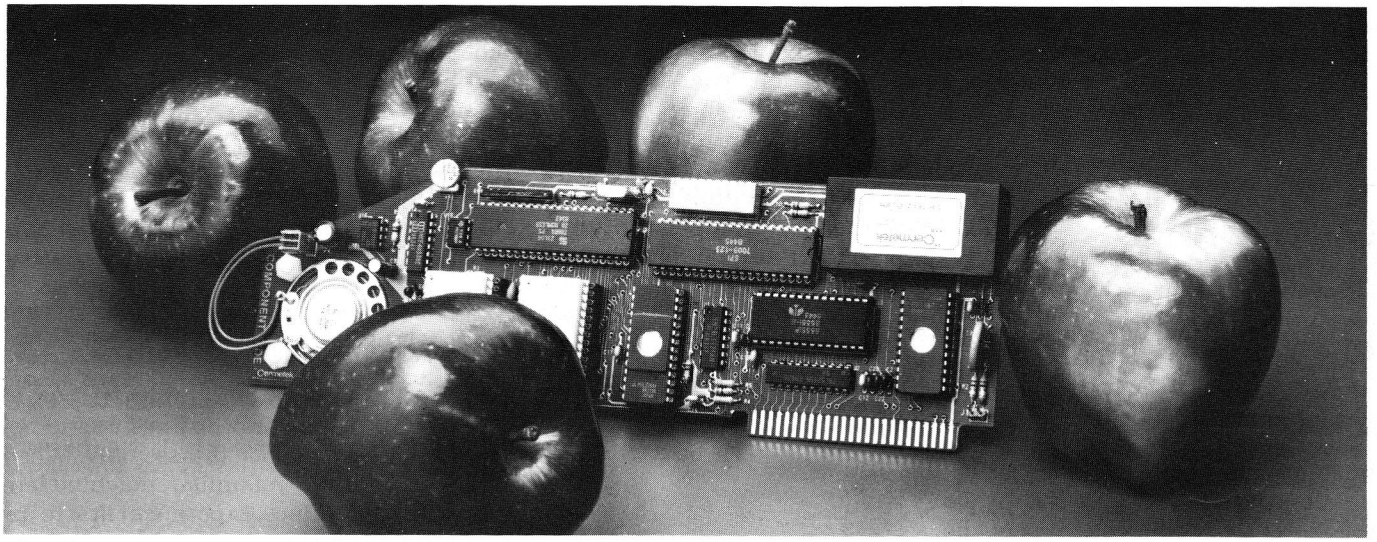

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# Monitoring Your Listings

## *by Paul K. Pagel*

Exploring the Apple computer at the monitor level and using its built-in subroutines is challenging, educational, fun—and frustrating. To guide you around the rough spots, the following tips should help you use the monitor when you're trying to dump machine-language listings to your printer.

Refer to chapter 5 of the Apple //e's *Reference Manual* for information on using the monitor. Page 102 says that if you type:

(slot number) control-P

from the monitor, it will direct output to the device connected to that peripheral slot. Since a printer-interface card is usually installed in slot 1, you'd assume that if you typed 1 control-P, then pressed the return key, and finally typed 0300L or 300L, it would direct the disassembled code (beginning at address $0300) to the printer. If you do this, the printer does come on and possibly prints an asterisk (the monitor prompt), but then it scrolls the memory contents onto the screen. The reason? The return-key press was a bit premature; it should follow the LIST instruction. Type:

1 control-P 300L

and then press the return key. Output should now be directed to the printer.

Although disassembled machine-language code is a helpful feature, the monitor sometimes "misinterprets" what you want and prints the code incorrectly. Compare **Listings 1** and **2**, for example.

In **Listing 1**, the hexadecimal numbers AA and 55 (170 and 85 decimal) in memory addresses $0300 and $0301 produce a tone of a certain pitch and duration. The "working part" of the routine (beginning at $0302) uses these numbers to create the sound. Attempting to list the routine to the screen (by typing $300L) or to the printer (by typing 1 control-P 300L) produces the result shown in **Listing 2**.

Compare the two listings and you'll see that the first 2 bytes in **Listing 1** are offset to the left and are followed by

***Listing 1.*** *Listing as you want it to look.*

```
0300- AA
0301- 55
0302-   A0 00      LDY   #$00
0304-   AE 00 03   LDX   $0300
0307-   AD 30 C0   LDA   $C030
030A-   88         DEY
030B-   D0 05      BNE   $0312
030D-   CE 01 03   DEC   $0301
0310-   F0 05      BEQ   $0317
0312-   CA         DEX
0313-   D0 F5      BNE   $030A
0315-   F0 ED      BEQ   $0304
0317-   A9 55      LDA   #$55
0319-   8D 01 03   STA   $0301
031C-   60         RTS
031D-   00         BRK
031E-   00         BRK
031F-   00         BRK
0320-   00         BRK
0321-   00         BRK
0322-   00         BRK
0323-   00         BRK
```

no mnemonics: They're simply data bytes. In **Listing 2**, however, the monitor has interpreted the first 2 bytes ($0300 and $0301) as op-codes instead of data. To get the printer to display the listing correctly, type:

1 control-P 300 N 301 N 302L

and hit the return key. The N's act as delimiters that tell the monitor to treat those bytes as separate entities. (Pages 101, 104, and 106 of the *Reference Manual* touch upon the use of N as a delimiter, but don't explain the topic adequately for beginners.)

***Listing 2.*** *Listing as it is printed.*

```
0300-   AA         TAX
0301-   55 A0      EOR   $A0,X
0303-   00         BRK
0304-   AE 00 03   LDX   $0300
0307-   AD 30 C0   LDA   $C030
030A-   88         DEY
030B-   D0 05      BNE   $0312
030D-   CE 01 03   DEC   $0301
0310-   F0 05      BEQ   $0317
0312-   CA         DEX
0313-   D0 F5      BNE   $030A
0315-   F0 ED      BEQ   $0304
0317-   A9 55      LDA   #$55
0319-   8D 01 03   STA   $0301
031C-   60         RTS
031D-   00         BRK
031E-   00         BRK
031F-   00         BRK
0320-   00         BRK
0321-   00         BRK
```

These tips should prepare you to deal with monitor listings and to obtain printed code disassembly. When examining unfamiliar machine-language routines, experiment first to determine the starting point of the routine.■

*Contact Paul K. Pagel at 4 Roberts Road, Enfield, CT 06082.*

# POKE Aid

## *by Mark J. Yannone*

Sooner or later, you may want to reset one or more of your Apple's many pointers. Normally, you'd have to calculate the new values manually. **Listing 3** is a one-line utility that helps you tackle that task by showing you the proper numbers to POKE and just where to POKE them.

The Apple stores numbers larger than 255 in 2 consecutive bytes (memory addresses) called high-order and low-order bytes. The high-order byte contains the value obtained from dividing the number into 256, and the low-order byte contains the remainder of the division. Numbers smaller than 256 are stored in 1 byte.

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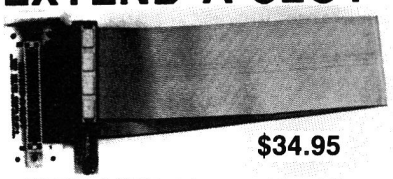

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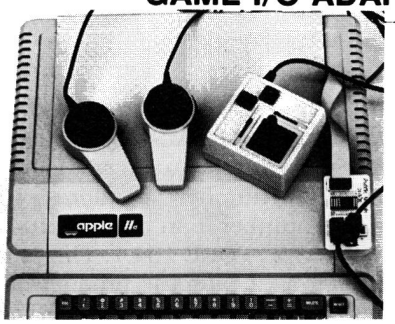


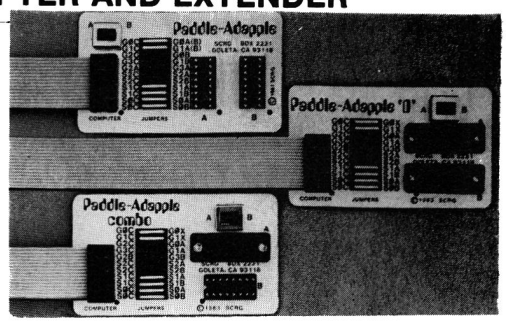


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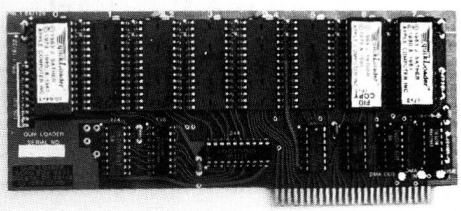
## quikLoader™



**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 (Q-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 **PROmGRAMER.** 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 appropiate 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) 709-1721).

**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 0. 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.

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

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***Listing 3.*** *Significant bit calculator.*

```
Ø    HOME : PRINT TAB( 8)"SIGNIFICANT BIT CALCULATOR": VTAB 1Ø:
INPUT "DECIMAL: ";A:B = INT (A / 256): PRINT : PRINT "POKE LOW,
"A - B * 256": POKE HIGH,"B: VTAB 24: PRINT "ANY KEY ";: GET A$:
RUN
```

For example, to store the number 258 somewhere in memory (using addresses 103 and 104), you would have to POKE the number 2 in address 103 and the number 1 in address 104—POKE 103,2 : POKE 104,1. This is interpreted as 2 plus the product of 1 times 256 (256 goes into 258 once with 2 remaining). Simple.

If you want to change the start-of-program pointer located at addresses 103 and 104 from the normal 2049 to 4015, for instance, running **Listing 3** performs the necessary calculations and reveals that you must POKE 103, 175 and POKE 104,15. Now, experiment on your own.■


*Address correspondence to Mark J. Yannone, 2202 North Laurel Avenue, Phoenix, AZ 85007.*


# Column Support

## *by Josephine R.L. Earl*

If you use control codes in Apple Writer, printing columns is difficult because Apple Writer includes the codes in the character count for the line. To avoid adding spaces manually to achieve the proper alignment, you can let your printer and computer perform the task.

Many printers use control-I for horizontal tabs (also Apple Writer's horizontal tab control). Additionally, many printer interface cards use control-I—CHR$(9)—as a "wake-up" (command coming) signal. If you must type:

PRINT CHR$(9);"80N"

from Applesoft to instruct your printer to yield a full-width printed line, then your printer card uses the first control-I it sees for this purpose. (If this isn't the case, use control-I wherever you see control-I control-I.)

Implementing the printer's tab capabilities involves two steps. In the set-up step, you must load the tab locations into the printer before you actually wish to tab. You can do this at the beginning of text or before the column(s) where it's needed. For the Okidata 92 printer:

escape control-I n1 n2 n3 return

sends the printer escape control-I and the column number as three digits (n1, n2, and n3). This is followed by a carriage return. If you want tabs set at columns 40 and 60, you must send:

escape control-I control-I 040, 060 return

(Remember, the interface card gets the first control-I.) To send this to the printer via Apple Writer, you must use control-V before and after the code:

control-V escape control-I control-I control-V 040, 060 return

For the Apple Dot-Matrix Printer, the signal to set up a horizontal tab is escape (, so use:

control-V escape control-V ( 040, 060 return

If you use a different printer, check its manual for the appropriate codes and make sure that you designate three-digit numbers for the columns if your printer requires them.

The second step's procedure is the same for the Okidata 92 and the Apple Dot-Matrix Printer. To tab to the beginning of the next column, enter the following commands *immediately* before the first character to appear in the column:

control-V control-I control-I control-V

The screen won't show the tabbing, but the printer will print the columns properly—provided you're not already past the tab stops. If you want to skip a column, use an additional control-I command:

control-V control-I control-I control-I control-V

The first control-I is always for the printer card; all others tell the printer to tab.

You can store these character sequences in a glossary, so you can use them at will. To find out how, see your Apple Writer reference manual or read "Apple Writer Patchwork" by Nadine L. Keilholz (June 1984, p. 36).■


*Write to Mrs. Josephine Earl at 440 Harrell Drive, Spartanburg, SC 29302.*


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**by Matthew Lesko**

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Get away from it all with TeleTravel. The service offers free information on tours, campgrounds, ski areas, tours, and national parks. It even adds a history lesson for those interested in vacationing in the Northwest. Use your modem to call (206) 823-6091. With your telephone, call Ken Kerst at (206) 823-6335.

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Computer Exchange Remote Access, a free bulletin board, acts as a brokerage service for buying and selling used computer equipment or related computer services. There's a fee to place an ad, but it costs nothing to browse. Use your modem to call (206) 431-8664. For details, contact Computer Exchange Remote Access, P.O. Box 66643, Seattle, WA 98166, (206) 246-2851.

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There was a time when Microsearch, a data base that provides buying information on software, hardware, accessories, peripherals, and services, was only available on SDC's Orbit System at $100 per hour. Now, you can get it through The Source for $20.75 during the day and $7.75 at night. For further information, contact The Source at 1616 Anderson Road, McLean, VA 22102, (800) 336-3366.

### Checks and Balances

The MagiComp bulletin board tells you how to obtain a copy of a small-business general ledger and a checking-account system for $25. The user-supported software is designed for CP/M computers. A shopping list of sale items and special-interest messages also appears on the bulletin board. With your modem, call (215) 473-2360. Direct inquiries to MagiComp, 2710 West Country Club Road, Philadelphia, PA 19131, (215) 473-6599.

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*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.*■

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*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.*

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- **Trivia contest winners announced**
- **New Pascal tutorial column**
- **Hardware project: An analog to digital converter**
- **Customized fonts for special effects**
- **Moving pictures: Graphics animation**
- **The multilingual Apple**
- **Configuring the //c's serial ports**
- **A decision-making program for car buyers**
- **Wrapping up our series on ProDOS**

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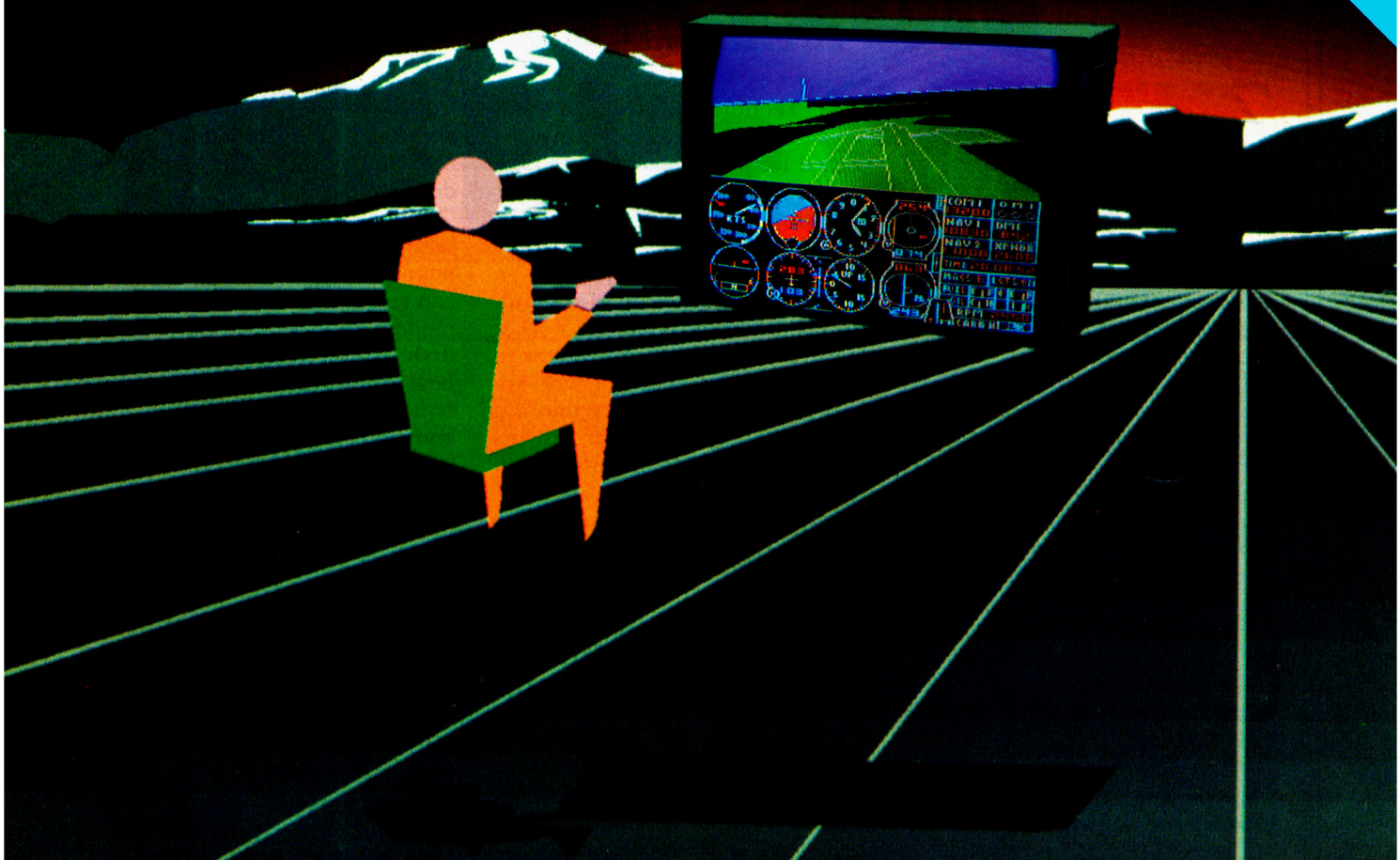
# Flight Simulator II

For Apple II+, Apple IIe, & Apple IIc



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# Editors' CHOICE

*Every month, hardware and software manufacturers release dozens of new products into the Apple II market. The Editors' Choice singles out one product each month that the* inCider *editors have evaluated and feel is a significant addition to the Apple II family of products.*

Zoom Telephonics' Networker modem, priced at just $99, introduced thousands to the world of telecommunications. Their **Zoom/Modem IIe** is destined to continue that tradition. This month's Editors' Choice combines a dependable product with a low price to deliver solid value to the beginner and experienced user.

The basic Zoom/Modem IIe ($179) includes the modem card, phone cord, documentation, and communications software—everything you need to get on-line. For $229, you get all the above but the enhanced software includes file transfer, printer control, editing of captured text, and dialing from a directory of names and numbers. Since the Zoom/Modem is Hayes compatible, most commercial telecommunications software runs without any modifications.

"I like complete telecommunications packages, with full-featured modem and software in one package," Technical Editor Bob Ryan says. Referring to modems designed for many systems, he continues, "I also like packages that you know will run on your computer. The Zoom/Modem IIe fits the bill at a very reasonable price."

Although limited to 300 baud, the Zoom/Modem offers every other feature you'd want: a speaker to monitor dialing, auto-dial, auto-answer, and tone or rotary dialing. There's no need for a serial card, because the Zoom/Modem fits into an Apple II, II Plus, or //e slot.

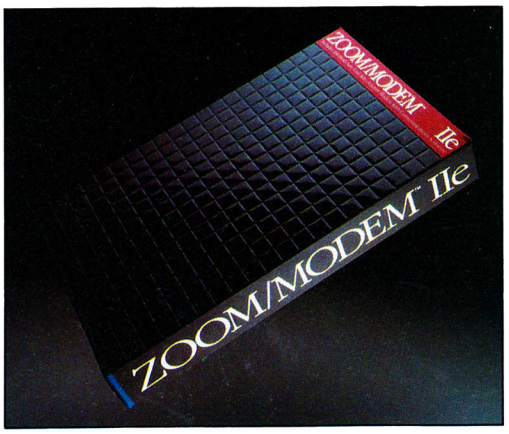
Two communications programs come with the modem. One, a barebones program built into the hardware, is adequate for accessing on-line services or another computer. The other program comes on disk, is fully menu-driven, and provides 80-column support, text capture, text storage on disk, and DOS/ProDOS compatibility. The firmware communications program is convenient and can be accessed without a disk. The software program, however, was more useful and offers everything you need for serious modem use.

The disk program features one-key toggle of text capture. So at any point during an on-line session, you can store what is coming over the modem and then send it to a data disk. An on-screen prompt tells how much room is left in the text buffer. Zoom's enhanced program and many popular word processors let you edit and manipulate the text.

Review Editor Kerry Lanz tested the Zoom/Modem on an electronic mail service, CompuServe, Dow Jones News/Retrieval, and *inCider*'s Bulletin Board (603-924-9801). "Each time I used the Zoom/Modem it worked without a hitch," he reports. "The clear documentation made installation a breeze. Both the on-board program and the software are menu-driven, so commands are mostly one keystroke. This is a well-made product, and the price is right."

Text capture is accurate and incredibly simple. As we downloaded news from CompuServe, only one key turned capture on and off. In the middle of reading electronic mail, we could decide to stop capturing it and still not interfere with the flow of text to the screen. After saving text to a disk, we could edit it with Apple Writer II.

For the complete story, contact your local computer store or write to Zoom Telephonics, 207 South Street, Boston, MA 02111, (617) 423-1072. ■

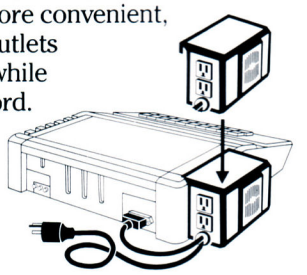


# CLOSE TO ¼ MILLION APPLE II's SAVED

**SYSTEM SAVER®** from Kensington Microware quietly protects close to ¼ 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.



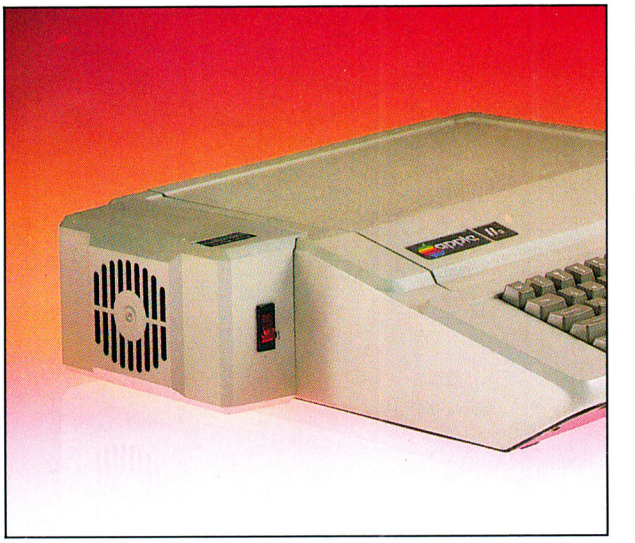
### System Saver solves power line problems.

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.

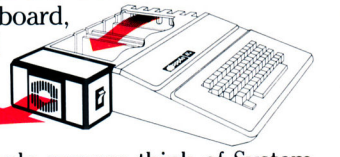
System Saver clips surges and spikes at a safe level and filters out line noise. It makes your Apple more accurate, more efficient and more reliable.

### 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 ¼ million Apple owners think of System Saver as the piece Apple forgot. And ¼ 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.

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System Saver is UL Listed. System Saver's surge suppression circuitry conforms to IEEE specification 507 1980, Category A. Also available in 220/240 Volts, 50/60 Hz.

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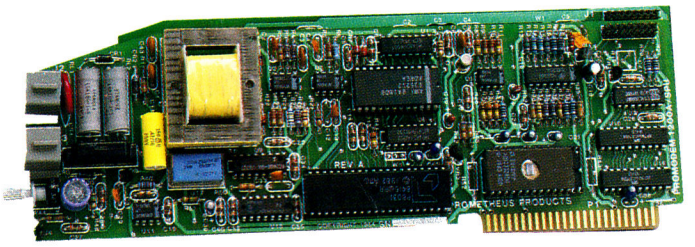
# The Apple II... HOT-LINE

## 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 ProModem 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

```
        1200A TERMINAL DRIVER
    © PROMETHEUS PRODUCTS INC.
```

```
1} COMMUNICATIONS
2} FILE TRANSFER
3} OPTIONS
            USE ESC TO EXIT
            ENTER SELECTION
```

```
1} BAUD RATE  1200  300
2} DATA BITS  8  7
3} PARITY  NONE  ODD  EVEN  MARK  SPACE
            USE ESC TO EXIT
            ENTER SELECTION
```

```
1} TYPE       XMODEM  LINE
2} DIRECTION  SEND  RECEIVE
3} FILE NAME
            USE ESC TO EXIT
            ENTER SELECTION
```

```
1} PRINTER       ON  OFF
2} CLOCK         ON  OFF
3} STATUS LINE   ON  OFF
4} KEYBOARD      ON  OFF
5} CAP LOCK      ON  OFF
6} ECHO          ON  OFF
7} LF AFTER CR   ON  OFF
            USE ESC TO EXIT
            ENTER SELECTION
```

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