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March 1985
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The Apple Journal

inCider

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- Get Your Back-Up
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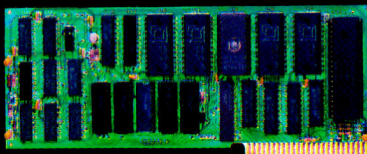


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PROMETHEUS

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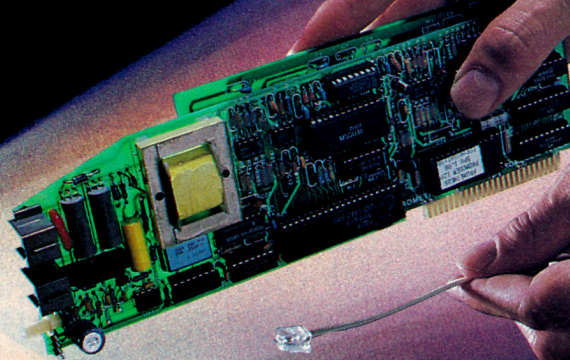
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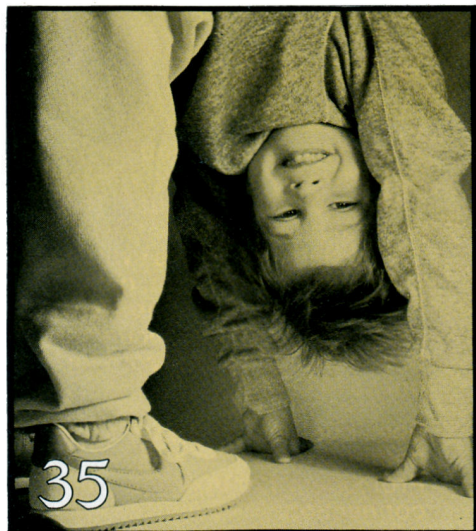
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PROMETHEUS

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Spreadsheets Come of Age

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Sharpen your firm's competitive edge with the latest in spreadsheet know-how.

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Simple as ABC

by Bob Ryan, inCider staff

Keep Webster's on the shelf. Reach for a spelling checker—and inCider's helpful buyer's guide—when you proofread reports and correspondence.

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Get Your Back-up

by P.R. Blackwell **Free Listing!**

Accidents happen, so safeguard your programs against eradication with Back-Up EXEC File Writer.

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Trap It!

by Ken Hummel **Free Listing!**

Try to corral a bouncing ball that's faster than lightning. No room for fence-sitters in this game!

32

Something Ventured, Everything Gained

Building a successful small business is a tantalizing prospect. And if you own an Apple, your pipe dream may be a lot closer to reality than you imagined. Here are six case histories that show how it can be done.

35

The Incredible Shrinking Catalog

by John T. White **Free Listing!**

Identify disk contents at a glance. Mini-Catalog prints catalog listings small enough for disk sleeves.

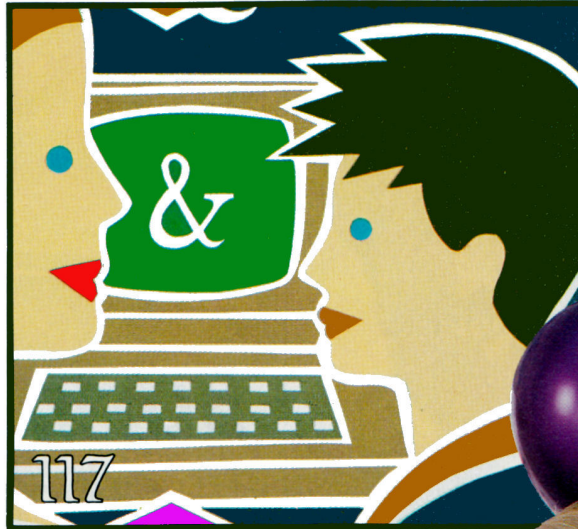
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Win an Apple //e! inCider's Great Apple Trivia Contest

How's your Apple IQ? Correctly answer our multiple-choice quiz and you could win a brand new Apple //e Professional System.

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Note: Part 2 of "Learning ProDOS" by Lee Swoboda will appear in the April 1985 inCider.



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



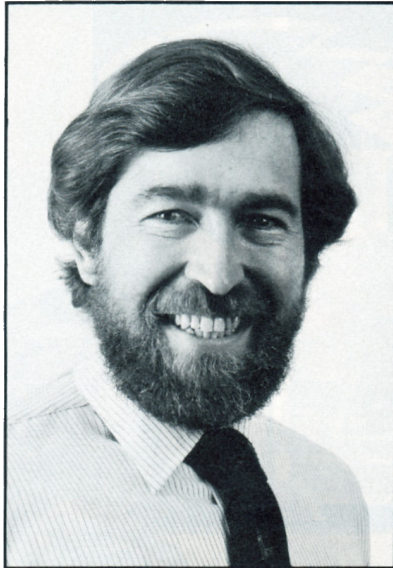
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FERMENTATIONS



Business as Usual

After a four-month hiatus, the Apple Clinic is once again open for business. For new readers, the Apple Clinic is our hardware repair and maintenance forum for Apple owners who enjoy probing the guts of their machines.

Launched in November 1983, the column was originally authored by hardware expert Earle Hancock. Under Earle's tutelage, the Apple Clinic was an instant success. It established itself as one of *inCider's* top features, indicating a healthy reader appetite for technical fare. Earle has now gone on to other projects and with him go our thanks for a splendid job.

His successor is Jim Sather who, to many of you, needs no introduction. Jim is, without question, one of the top Apple II hardware experts this side of Cupertino. I mean, how many people could write a book—*Understanding the Apple II*—and get Steve Wozniak to write the foreword? (Jim's second book, *Understanding the Apple IIe*, will be released soon.) We caught up with Jim between book manuscripts and signed him on as the Apple Clinic's new motive force. We're pleased to

have Jim on the team, and we invite you to put him to work.

All Boarded Up

Hello, world. . .the *inCider* bulletin board is up and running. On-line 24 hours a day, the board operates from one of our *IIe's* attended by a gaggle of disk drives. For software, we chose ABBS from Software Sorcery, McLean, Virginia, and it's working out well.

Response? Well, we thought the whole affair would start off slowly, since we kept it low-key in the beginning. Certainly no one on the staff expected the number of calls to jump from a trickle to a torrent in just a few weeks. But that's exactly what has happened. Right now, readers are logging on at the rate of more than 100 per week. It seems that busy signals, prime-time phone rates, and an occasional hung system do little to dampen the spirits of an Apple user in pursuit of a hot download.

To date we've listed six free programs and we'll add more. As time permits, somebody on the staff, usually Ryan, posts late-breaking news from within the Apple community. And then there's the message ex-

change with editors and fellow callers. Hey, being a sysop's all right!

After we install our new Corvus hard disk, we'll start some other little projects, like establishing a few SIGs. In the meantime, why not rev up your modem and log on. The number is (603) 924-9801.

The Domestic Scene

If you've found an innovative way to use your Apple around the house, we'd like to know about it. It's commonly said that home applications are make-work tasks better done the old-fashioned way—manually. We're not buying that. What we *are* buying are solid ideas for home applications that we can print in *inCider* (see last month's *Fermentations*).

Household financial management, home security, self-improvement, environmental control, home inventory. . .any Apple application that improves your domestic lifestyle is what we're looking for. So, whether you're using commercially grown software or a program you wrote yourself, send the particulars to: *inCider*, Attn: Domestic Affairs Editor, Elm Street and Route 101, Peterborough, NH 03458. ■

by Paul Quinn

NOW YOU CAN PUT YOUR APPLE TO WORK IN YOUR GARDEN.

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Plant type	<input type="checkbox"/> ALL C
	<input type="checkbox"/> BLUE
Height	<input type="checkbox"/> LAVEN
	<input type="checkbox"/> ORAN
Colors	<input checked="" type="checkbox"/> PINK
	<input type="checkbox"/> PURP
	<input type="checkbox"/> RED
Planting Time	<input type="checkbox"/>

LETTERS

What's the Story?

Enough is enough. I can't take another //c versus PCjr article (August 1984, p. 80) no matter which magazine it appears in—and just about every journal has been running these stories.

The //c wasn't released as an alternative to the PCjr. Rather, the PCjr was released to take the home market from the Apple II family.

The //c's true function is to ensure that Apple retains its hold on the home market. But journalists, in their never-ending quest for the big story, have reversed the situation. Comparing the //c to the PCjr is like comparing TVs to sports cars—they're in two different classes.

The //c is a *transportable*. Of course, it isn't going to be expandable. Of course, it isn't going to have the memory and disk capacity of a desktop system. And there is the real difference: PCjr is a *desktop* system. No matter what IBM may say, the PCjr is as transportable as my //e. I can disconnect all the components and move it from room to room, but even that's a hassle. To take it on the road, I'd need a crate!

Why not concentrate on the real story—the battle for the home market? Could it be because there is no story? After all, if you want to talk true expandability, versatility, and software selection, the //e has PCjr beat, hands down. Even PCsr had a tough time against the //e. The only place it scored a victory was in the business market (the *big* business market), but even that was limited. At last report the II, II Plus, and //e were still the number one choice of small, cost-conscious businesses.

Let's face it. Apple has Big Blue beat in the battle for the home front. There is absolutely no reason why home users should choose IBM over Apple, and //e, //c, and Mac sales are proving it. The //e alone is setting new sales records while IBM is lowering prices on the PC and jr in order to compete.

Where's the story, the sensational byline? It's in the reporter's mind. Neither company will put the other out of business. In 2010, both Apple and IBM will still be around. Apple will still be selling excellent computers, and IBM will still be selling excellent typewriters.

David K. Simerly
125B Gladys Avenue
Mountain View, CA 94043

//c Satisfaction

My husband and I are school teachers. When we were looking for the computer system that was right for us, we surveyed the market for quality and price. We decided against the Commodore and Atari systems, and felt that the IBM PC was limiting because of price, software availability, and system compatibility.

When we decided on Apple, we had to choose the model. We selected the //c, monitor and stand, second disk drive, and Scribe printer. We also purchased AppleWorks. We chose the //c because we aren't really interested in expanding our system. (There are //e's at school.) The appearance of the //c also made it aesthetically attractive.

Having worked with //e's, we find the //c far superior. The keyboard is much more comfortable to use, given the design of the keys and the tilt of the board. The monitor is a good size with good resolution. We haven't transported our unit yet, but it certainly sets up easily. The Scribe's print quality is excellent, especially in the letter-quality mode, but we probably wouldn't recommend it to anyone because its ribbons are very short. We use one ribbon every two to three weeks. At \$10 each, it would have been wiser to have purchased a good letter-quality dot-matrix printer.

We fit the //c owner personality profile. We're not concerned with what is under the hood—as long as it

performs. The //c was a utilitarian purchase, since it lets us move through our workload with ease. My husband uses AppleWorks for his correspondence, rank book, and data base. He uses the word processor to write reports to parents. (We may sell the electric typewriter—it's obsolete!) I use AppleWorks for all my communications. I have an extensive inventory on disk, with plans to use the data base to process bids for items purchased by the department. Preparing reports is a snap when using this integrated program. I find it convenient to carry the program and data disks between school and home.

Our future plans include the purchase of a color monitor, a VCR, SuperPILOT, and a modem. It's hard to imagine that a year ago we were computer illiterate. Now we feel comfortable with the technology, since we know what we want it to do for us and what we don't want to do with it—like program in BASIC.

Rose Colby
23 Schurman Drive
Derry, NH 03038

Legal Banter

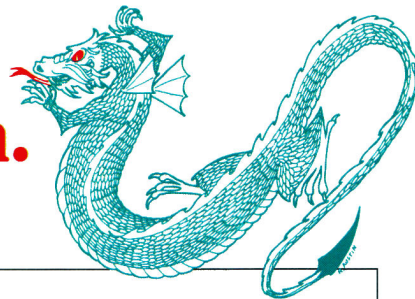
My college has purchased a number of Apples over the past few years. When I filled out the warranty information for Quick File and Apple Writer, I noted statements that indicated each computer should have its own copy of the software. I did purchase additional copies of each for two computers, but before buying another one, or restricting use to specific machines, I thought it wise to ask if Apple is legally correct on this matter.

Martin LaBar
Central Wesleyan College
Central, SC 29630

You refer to section three, "Restrictions on Use and Transfer," of Apple's software license agreement, which reads: "The original and any back-up copies of the Apple

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Wizardry is powerful and sophisticated. A simple command system, 3D maze displays and superb programming provide you with month after month of involvement and satisfaction.

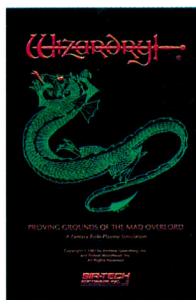
Four years old and still growing, the game is already recognized by critics and game lovers as a classic.

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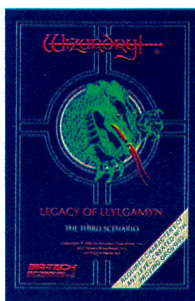


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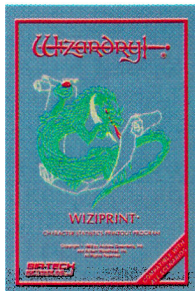


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LETTERS

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The software license agreement is common practice in the software industry, but it isn't clear if it's legally acceptable. To date, no one has successfully challenged it in court. —eds.

Sound Off

The comment in Letters (November 1984, p. 14) regarding *inCider's* "industrial strength" programs has disturbed my silence. While I, and others of the mostly silent majority, may not often commend you on a particularly outstanding article or series, neither do we pick at things we don't appreciate. For once, let me sound off.

Personally, I don't care for The Cider Press, The Game Reserve, or the sheer volume of reviews. I suspect that reviews attract advertisers, so about 50 to 60 percent of my distaste comes with the territory. Also, some readers may like reviews—at \$40 and up for most software, it would be easy to dump a pile of green down a worm hole without some guidance (and no store demos).

On the positive side, I enjoy the occasional longer program or series that is useful or instructive. There is a middle ground between the commercial program "that does it all" and the shorter (sometimes trivial) program that may be instructive, but not always useful. The commercial programs often seem to be overkill

for a simple task, or they fail to live up to the user's expectations on serious applications.

The column, Fudge It!, is absolutely great and its programs are well worth the effort to enter, although I'd hardly call the amount of code trivial. Likewise, "The Compleat Text File Primer" series was outstanding, well-written, instructive, and useful.

Other examples abound. The point complainers miss is that you don't have to enter the code to benefit from the article. The code illustrates the author's points and is a potentially valuable resource if the reader needs a similar program. After all, no one loses by studying and understanding another programmer's techniques.

Every issue need not carry a longer feature article or program, but please don't reject them merely because a few vocal readers aren't interested in entering them.

Ralph C. Moredock
4044 LeMoyné Way
Campbell, CA 95008

We appreciate your comments—both negative and positive. They help us see how we stand with our readers. But we can only reiterate that most readers groan at the thought of typing in long program listings. Quality—not quantity—is what we and our readers demand. Keep in mind that we are providing for those interested in long listings by putting some of those we have run on our bulletin board so people can dump them directly to disk. The bulletin board number is (603) 924-9801. —eds.

Correction

"Trim an Apple Tree" (December 1984) contains an erroneous reference on page 40 to lines 50 and 55. The correct reference is to lines 40 and 60.

inCider

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Senior Editor Peg LePage
Review/New Products Editor Kerry J. Lanz
Education Editor Joan Witham
News Editor Cynthia K. Carr
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West Coast Editor James Forbes
(415) 328-3470

Advertising

Sales Manager/Northeast Paul Boule
Sales Representative (800) 441-4403
(603) 924-7138
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Sales Representative (800) 441-4403
Northwest Sales Donna Pomponi
Representative 1060 Marsh Road
Menlo Park, CA
94025
(415) 328-3470
Southwest Sales Charles Durham
Representative 2082 South East
Bristol Street
Santa Ana, CA 92707
(714) 756-1984
Advertising Coordinator Kim Labbe
(800) 441-4403

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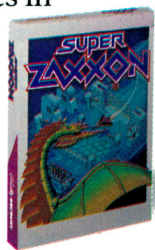
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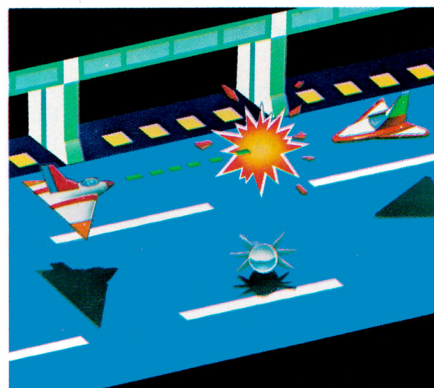
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Just like future home owners, realtors dread driving all over the countryside to look at less than perfect foundations, floors, and woodwork. Exchange Network, a nationwide real estate marketing and

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Since it's part of General Electric Company's 750-city telecommunications system, the Exchange Network tips real estate agents as to what the market is like across the country.

"The Exchange Net-

work makes it possible for a realtor in an oversold city such as Washington, DC, where there is a lack of investment opportunities, to instantly have access to investment opportunities in a booming city such as Austin, Texas," says Charles L. Huggins, founder of the service.

Members can buy, sell, exchange, finance, and transfer real estate using their own computers. Available services include electronic mail, bulletin boards, interactive marketing programs, a newsletter, and on-line consultations. Also, there's a provision to download software from its real estate software catalog.

According to Huggins,

the Network's 24-hour service should make a realtor's job easier and provide for faster marketing results at lower cost.

"This group of networking real estate professionals moves millions of dollars' worth of property each year," Huggins says. "Until now, [they have] relied on the telephone, mail, and personal meetings for their business. With the computerized Exchange Network, these same realtors and others almost certainly will achieve even higher levels of productivity and profits."

To join the Exchange Network, write to 4360 Northlake Boulevard, Suite 206, Palm Beach Gardens, FL 33410, or call (305) 694-1280.

The Place to Be

Come and feast at a computer smorgasbord. There's something for every high-tech taste at ComputerPlace, part of Boston's Museum of Science, where more than 70 computers and 400 pieces of software are on the menu. You can touch, experiment, and question the technology to your heart's content.

With a \$250,000 grant from the Lowell Institute, ComputerPlace set out to train teachers in computer literacy—tuition free. According to chief instructor Ron Sweet, the program took on more dimensions under the guidance of a new director, Dr. Roger Nichols. The program expanded to include computer courses for children

and adults, a "drop-in" time for visitors to ask questions, and "fun time" for everyone to play with entertaining, yet educational, games.

ComputerPlace has 12 Apple II's, 30 IBM PC's, and a number of other computers from companies like Hewlett-Packard and Digital Equipment Corporation. Its software library sports more than 400 programs, donated by manufacturers and available to teachers free of charge.

During "drop-in" time, museum visitors stop by and ask the staff questions about computers. "We attempt to satisfy the computer needs of some of these people. . . or those who don't know what they're looking for," Sweet says. "We try to give these people an honest appraisal of what they need."

Sweet stresses that the

ComputerPlace staff takes an unbiased approach toward helping people. "We don't sell anything here," he says. "People can come and try things. We won't convince them to buy anything."

With more than 800,000 people attending the museum each year, Sweet notes that they see people from every stream of life—doctors, construction workers, students, waitresses—a variety that is reflected in ComputerPlace's course offerings. You don't know anything about computers? Take Computer Smorgasbord for a taste of different applications: word processing, data-base management, Logo, and BASIC. Other course topics include word processing for the home, record keeping, and computer repair and maintenance.

The most popular

course, according to Sweet, is All in the Family, where a parent and child share a computer and learn Logo together. There's room for ten parent-child pairs in the class, and Sweet notes that it has been overbooked every time. "The energy [in the class] has been really wonderful."

Four full-time and 14 hourly instructors make up the ComputerPlace staff. In 1985, the offerings will expand from four to 15 classes. Other plans include gathering public domain software.

"We want to collaborate with as many computer or activity sources [as possible] to . . . get one good, national collection of usable public domain software," Sweet says.

If you'd like to help with the public domain software project, call Sweet at (617) 723-2500.

edited by Cynthia Carr

Readin', Writin', and Apple

For most of us, reading is as natural as breathing. But for others, reading is as difficult as digging ditches. Abe Worenklein, Ph.D., a clinical psychologist, has developed a series of programs for the Apple II/e that help learning-disabled children improve their reading and language skills.

Worenklein says he became interested in applying the Apple to his work after he took a computer course and recognized the computer's limitless possibilities. His workshops aid both the teacher and the student. Teachers learn how to teach better; students learn skills faster. Specifically, Worenklein's programs develop thinking, reading fluency and comprehension, arithmetic skills, written language, and visual memory.

Apple's SuperPILOT (see "SuperPILOT: Between Student and Teacher," *inCider*, September 1984, p. 57) and Sunburst's Magic Slate are two of the programs Worenklein uses. "Within a few hours [of using SuperPILOT], people can be writing sophisticated programs," Worenklein says. He also indicates he has seen students increase their reading levels tremendously with Magic Slate. One 18-year-old woman improved her reading speed of 130 words per minute to 380 wpm and a 70 percent comprehension rate to 90 percent. "She has one complaint," Worenklein says. "She can't stop reading."

A number of lessons comprise Worenklein's

program. Visual memory exercises display objects on screen for a moment, then the student must indicate how many objects appeared. In problem-solving lessons, the student has to solve a problem from provided clues. The idea is to solve it with as few clues as possible.

While many teachers still rely on traditional methods (workbooks, dittos, one-to-one instruction), Worenklein says children can find this approach "boring, repetitive, and dull." He doesn't cast aside these methods, but merely uses the computer as a supplement. Comparing two groups, traditional methodology and computer/traditional, Worenklein reports the computer instruction group showed a 72 percent improvement over the traditional.

Children, teachers, and parents are pleased with the program's results. Worenklein says parents have been so happy that close to 100 of them have purchased computers of their own. "Parents of learning-disabled children are willing to try almost anything," he states.

Workshop fees vary, so for more information write to Worenklein at 6227 Wilderton Avenue, Montreal, Quebec, Canada H3S 2L3, or call (514) 342-2282.



Dialing for Software

Florida oranges, designer clothes, oriental rugs—you can order just about anything these days over the phone, software included. MasterLine, part of Control Video Corporation (CVC), is a subscription service that sends educational and entertainment software through the phone to your home computer.

Subscribers receive a monthly magazine that lists 20 programs developed by leading software publishers to choose from. MasterLine's top-20 has featured Scarborough's Master Type, Electronic Arts' Hard Hat Mack, and Peachtree/Eduware's Tranquility Base. The software titles are selected every month to ensure new programs of interest to all age groups.

"For the first time, a service is being offered that will appeal to all

members of the family," says William von Meister, CVC's chairman and chief executive officer. "MasterLine can bring an array of services into the home inexpensively."

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Computer users don't need to buy additional equipment, since MasterLine provides a Master Module that connects the computer and telephone. Because all calls are local, there are no long-distance telephone charges.

CVC intends to bring MasterLine's services to other major cities during 1985.

Got a hot news tip? Send it to The Cider Press, inCider, 80 Pine Street, Peterborough, NH 03458.

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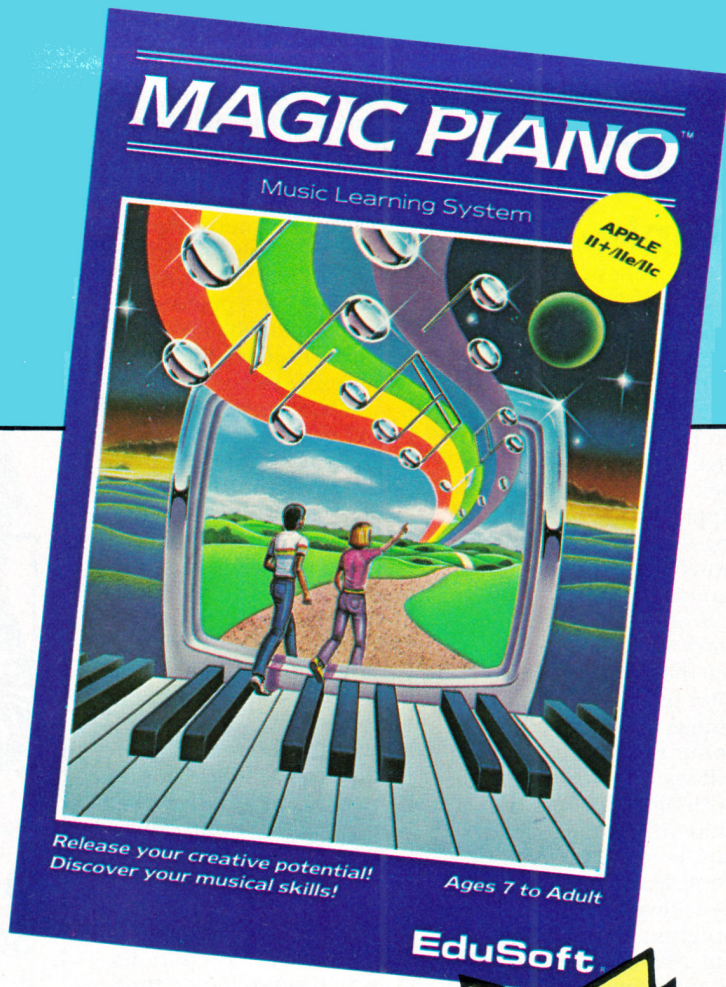
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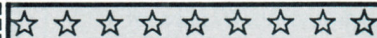
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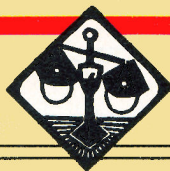
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Business Mail

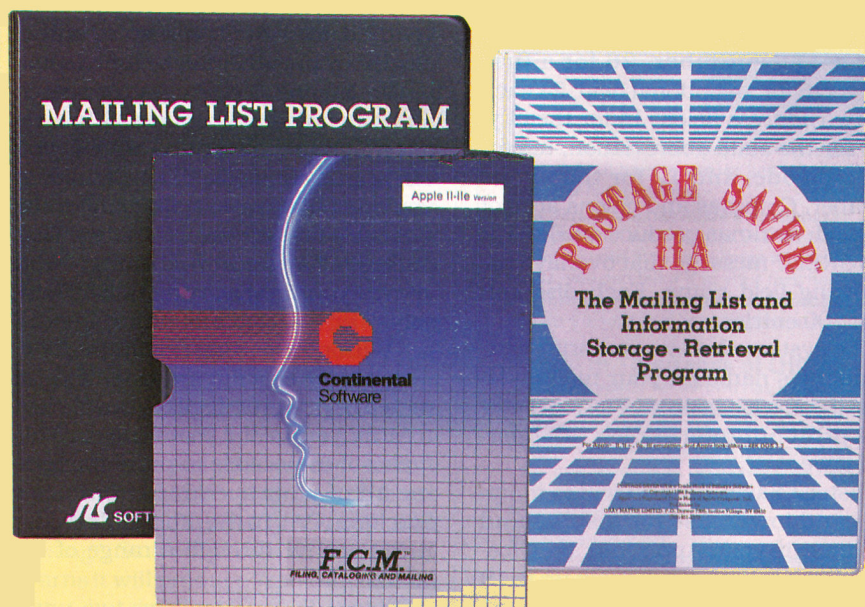
One of the most helpful things your Apple can do for your business is generate mailing labels for direct mail communication with your customers. This month I'm going to examine three mailing-label programs designed specifically to store names and addresses and then print out the ones your business needs: F.C.M. (Filing, Cataloging, Mailing), the Mailing List Program, and Postage Saver IIA.

Documentation

The basic thrust of F.C.M. is to combine filing, cataloging, and mailing in one system. Each area is explained well in the 108-page indexed manual, which also contains a good tutorial and reference material. However, it's to the program's credit that, even without the manual, you can do most things just by working your way through the system menus.

The Mailing List Program has the briefest (14-page) manual and the simplest design. The manual is entirely a tutorial, and the program's menus make its use easy even without reading the documentation. Unfortunately, some typographical errors and incomplete instructions mar this system's manual.

Postage Saver IIA arrives with a 61-page indexed manual with sample screens so small you'll need a magni-



fying glass to read them. The text is generally helpful and leads you through each step of the system, but the small sample screens and a couple of typos really detract from this program's documentation.

Data In and Out

F.C.M. does all its work through a series of menus, which makes it an easy program to get around in. There's some delay when you move from one menu to another, but it's only slightly objectionable.

The program is very straightforward. Comparing it to a card file, each card can store up to 132 characters (letters or numbers) of data, in up to ten fields (each field containing a line on the card).

While F.C.M.'s fields are already named and its field lengths specified, they are easy to change to fit your own requirements. Each disk can contain only one file and will hold about 750 records.

With F.C.M., you can include de-

Mailing label programs speed up and simplify your bulk-mailing tasks.

by Gregory R. Glau

faults for any or all lines. These can be either the same default entry repeated over and over, or the *last* entry you made—a flexible way to speed data input.

The Mailing List Program is the least flexible of these three systems, as it comes with a design for eight entry fields with preset lengths, and doesn't allow for changes to be made. Field lengths are fixed at five characters for an account number, 26 for a first name, 18 for an optional field, 24 each for two address fields, 14 for the city, two for the state abbreviation, ten for the zip code, and 12 for the phone number. Commas and colons are not allowed; commas produce an EXTRA IGNORED? message that overlays the following field name. Each disk can hold 800 entries.

The system also lets you print your company's name on your mailing labels, if you wish to do so. You can enter and print out information in upper- and lowercase.

Postage Saver IIA also works in upper- and lowercase for display and printing, if your Apple has that feature. Each record can contain up to 19 lines, with a maximum of 29 characters per line. The number of records a data disk can store varies according to the number of lines each record actually uses. For instance, if you want to keep about 750 records on a disk (comparable to what the other two programs will store), this system allows six fields with a total of 175 characters. If you'd like 19 data lines for each record, you can save 238 records on each data disk.

Once you inform Postage Saver IIA of the number of fields in each record, it formats a data disk. As with all three of these programs, each disk can hold only one file of information. The program is generally menu-driven, but uses a few editing commands also. Postage Saver IIA allows defaults, so if you have a lot of entries in, say, Prescott, AZ, you only have to enter the city and state once and the program will take it from there. The system's mathematical functions, although limited, are useful for invoicing purposes.

Searching and Sorting

With F.C.M., you can expand your initial file to more than one data disk,

but must search and sort each disk separately. If you wish, you can sort your files alphabetically or numerically before printing them. You can print all of your records or only selected ones. All searches are done on an AND basis—if you specify more than one search criterion, all conditions must be met before the record is printed. F.C.M.'s menus are intelligently designed: Most require only a single key press to select a function.

The Mailing List Program's search and sort function is limited. When requesting to see or print a record, you can search on one field only, and then you must have an exact match for the system to find your search string. That makes it harder to find things—did you file your best account under "Wilson's" or "Wilson's Sporting Goods" or "Wilson's Sporting Goods, Inc."?

When the program does find a match, it prints or displays the file and returns you to the main menu. This makes it impossible to print or examine all of your accounts from, say, Stockton, CA. To the program's credit, it can search through a range of zip codes.

Postage Saver IIA allows two types of search patterns. The first asks for an exact match, which means spaces and punctuation marks must be the same as those in your data field, and it searches through your first field only. A slightly slower method, both flexible and fast, finds your search item on any line, even if other characters surround it. The program includes not only a find and edit function, but also find and delete.

Postage Saver IIA also includes a helpful feature that deletes duplicate records. Like its search function, this one works fast and will compare data on one line only or for the entire record. Before a record is removed from your files, you can confirm the deletion. The extra space becomes available, of course, for new information.

Postage Saver IIA has a powerful sort capability that lets you sort five levels deep, but again the program is hampered by its poor manual. The sorting instructions should provide good detail because of the system's flexibility, but in fact they're incomplete, and the four screens used as examples of a multi-level sort are, once again, impossible to read. That aside,

the system lets you sort data for up to 99 disks and sort just a portion of your information.

Printing Your Data

F.C.M. permits only capital letters, which seems to minimize its value as a form-letter mailing program. However, when I interfaced letters I'd created on my word processor, Magic Window II, with data in F.C.M. files, the program automatically converted my entries to upper- and lowercase text. In most situations, pressing the P key prints your screen—a helpful function.

Unfortunately, while F.C.M. lets you designate label size and the number of labels across you plan to print, you don't learn how to make these specifications until you're well into the reference section near the end of the manual. This information should have been included in the tutorial. The system, however, does let you send control codes to your printer to produce things like boldface.

The Mailing List Program is designed to print all of your labels, or just one of them. It also has a quick-print mode that prints all of your information without sorting it, but it can print labels only one across.

Postage Saver IIA lets you input information from your data files to a text file you created with a word-processing program. The manual is unclear on much of this, however, and focuses on limited instructions about embedded commands that change your text's format, instead of helping with the procedure needed for the word-processing interface. For mailing labels, Postage Saver IIA allows up to four labels across, and you select exactly what you want to print and where it should go.

On the Weak Side

F.C.M. isn't perfect, even though it's a strong program. More often than not, with a single-drive system it doesn't prompt you to insert the right disk; instead, it beeps first and then displays a message to put the proper disk in. Attempting to put too many characters into a data field returns you to the start of the entry line. I'd prefer it if, once a line were full, the program stopped data entry with a gentle beep but left the characters already typed in intact.

Product Information

F.C.M.

Continental Software
11223 South Hindry Avenue
Los Angeles, CA 90045
(213) 410-3977

F.C.M. runs on any of the Apple II family with one disk drive. The program requires two disk drives to transfer data from one list to another.

\$99.95

Mailing List Program

Five Minute Software
281 Albany Street
Cambridge, MA 02139
(617) 864-0222

The Mailing List Program runs on any of the Apple II family with one disk drive. \$65

Postage Saver IIA

Gray Matter Limited
P.O. Box 7900
Incline Village, NV 89450
(702) 831-2523

Postage Saver IIA runs on any of the Apple II family with one disk drive. \$150

In a Nutshell

The Mailing List Program is an easy, basic system for printing labels, but includes only limited searching and sorting functions. Postage Saver IIA is potentially the most flexible of these three packages, but is hurt by poor example screens in its manual—they're too small to read. It's also more expensive than F.C.M., which combines excellent documentation and power at a good price. □

You're not allowed to use a comma, colon, or semicolon in your fields (although the manual doesn't mention this). Whatever comes after one of these items is lost. A back-up copy of your F.C.M. disk costs \$20.

The Mailing List Program is a simple package without any strong search capabilities. It prints your entire mailing list each time, and is also very poor when you make an entry error. For example, it happily lets you put more characters into a field than the system expects. Once you press the return key to tell it the entry is complete, the program takes you back to the start of that entry line, but leaves all the other text on your screen and doesn't warn that you've exceeded its limits. If you really get carried away and type a lot of words, they spill down over the following fields and their data entry areas, and some text even ends up and *stays* on your screen, to the left of the field names.

Postage Saver IIA comes with a demonstration on disk, but my copy simply returned to BASIC when I asked to use this function. If you try to copy your Postage Saver IIA disk, the program warns it will produce "random data errors," but the manual offers you a back-up copy for \$15.

There's no question that its poor manual is the weakest link in the Postage Saver IIA system. And it's too bad, because the program includes some useful power and flexibility (deleting duplicate records, and a fast and complex sort function). A few more dollars spent on its documentation could make Postage Saver IIA an excellent package.

A Buying Decision

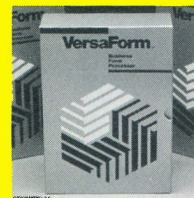
The weakest and least flexible of these three packages is the Mailing List Program. Within its limits, however, it does an efficient job sorting information, and it isn't expensive. Of the other two, the nod for the better program must go to F.C.M. It's not more powerful than Postage Saver IIA, and in fact doesn't include all the functions the latter package gives you. But it's easier to learn and understand, and its manual is much clearer and more effective. ■

You can write to Greg Glau at P.O. Box 1627, Prescott, AZ 86302.

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	1985	1986	1987	
8	2974.92	3331.91	3731.74	41
6	13415.76	15025.65	16828.73	1884
51	1448.73	1622.58	1817.29	203
46	3733.48	4181.50	4683.28	524
38	16080.27	18009.90	20171.09	22591
42	4492.79	5031.93	5635.76	6312
45	6701.46	7505.64	8406.31	9415
45	4394.27	4921.58	5512.17	6173
87	308.97	346.05	387.57	434
42	6731.67	7539.47	8444.21	9457
87	524.02	586.90	657.33	736.2
76	5987.26	6705.73	7510.41	8411.6
39	5255.47	5886.13	6592.47	7383.5
77	239.42	268.15	300.33	336.37
79	5939.13	6651.82	7450.04	8344.04
53	5925.39	6636.44	7432.81	8324.75
64	870.96	975.47	1092.53	1223.63
19	4064.70	4552.46	5098.75	5710.61
07	5495.92	6155.43	6894.09	7721.38
38	1599.79	1791.76	2006.77	2247.59
36	6021.52	6744.10	7553.39	8459.80
99	2368.78	2653.04	2971.40	3327.97
74	5906.59	6615.38	7409.22	8
		10791.79	12086.81	13



Spreadsheets Come of Age

*Calculate, analyze, even predict
business trends with a
spreadsheet—and turn your
“what if?” into a “why not?”*

Oby Archie Mason

Of course, you'll need a spreadsheet program. . .” says the salesperson, as the various boxes accumulate on the counter. “It and a word processor will really make your computer pay its way.”

“But what *is* a spreadsheet,” you say, “and what does it *do*?” This article will answer these questions. And if you already use a spreadsheet program, don't go away. I've included information that will help you understand more about how it works.

A spreadsheet is a program that establishes a system of locations (or cells) within the computer's memory for storing data. It is easy to think of this system visually as a matrix, because that is how it is represented on paper. Indeed, a spreadsheet printout takes the form of the familiar green sheets full of columns and rows used by accountants. A spreadsheet designates the position of a data cell by a letter-number combination, such as A1, G99, BK254, the letters representing columns and the numbers representing rows.

Special relationships between cells, represented by *formulas* inserted into the matrix, make possible an infinite variety of mathematical calculations—adding cells, dividing one cell's value by another's, multiplying the result of

adding six cells by the result of adding 40, for instance. These formulas are structured sequences of characters, many using familiar English words, by which the spreadsheet program understands the calculation you want.

Because numerical values are represented in the formulas by their cell locations rather than by actual numbers, there is no need to re-enter any formulas if the value in a location changes. A change in one value automatically converts other values accordingly. Chain reactions are possible, with a hierarchy of new values arising from an input of data. The sums of the columns become the cross-checked totals, and percentages are developed as the calculations automatically march across the sheet.

You can print the result of your work (a financial statement, forecast, or checkbook manager, for example) so others can read it or use it as a business document. You can also save the entire matrix to disk and modify it when necessary; you never have to start over.

The Early Days

In 1979, the pioneer of the genre, VisiCalc from Personal Software (now Paladin), was fascinating, immensely productive, and started people thinking. A second release following about

a year later was a big improvement on the original. In addition to the usual mathematical functions, a new range of conditional-statement (Boolean-logic) capabilities was introduced in the formulas. If a total were greater than X, one command would be performed; if the total proved to be less, then another command would be invoked. These IF. . . AND and IF. . . OR statements gave the spreadsheet a what-if capability, enabling businessmen in both large and small companies to look at virtually every conceivable circumstance in financial planning.

As the market spotted a winner, other spreadsheet programs appeared with all the VisiCalc built-in functions like sine, cosine, net present value, and logarithmic arithmetic. Some added the ability to manipulate text as if it were a value (if cross-checking is incorrect, write OUT OF BALANCE!; if correct, write CONGRATULATIONS!), and improved formatting with variable column width. With a spreadsheet you could look at every percentage from zero to 100, every sales force possibility, and more—plus have the computer print out documents in perfect order.

What Is Integration?

The appearance of the integrated program, the next and most recent mile-

stone in spreadsheet development, thrust the industry into the midst of a confusing revolution. The definition of *integration* remains in the hands of the software publisher. Some claims emphasize that different, separate modules can share data: others that each member program is "only a keystroke away" (but then you usually have to change disks first).

Other programs, however, are truly integrated and use the original menu for spreadsheets, data-base management, and word processing. Keystroke sequences for the different applications are common or identical (or should be), thus cutting down on memorization of commands; the COPY command, for instance, is performed the same way for spreadsheets, word processing, and data-base management.

One of the earliest and most famous of these programs, Lotus 1-2-3, set a new standard for integration. At a dealer show in November, Lotus announced Jazz, a version for the Macintosh. An Apple product, AppleWorks (see July 1984, p. 80, for a review) is an excellent, easy-to-use and learn in-

tegrated program that can fill many of the requirements of the small business.

What Do You Do with Spreadsheets?

The opposite question is probably easier to answer. It seems that there is virtually nothing a spreadsheet program *cannot* do. Readers of InterCalc's monthly spreadsheet newsletter, aptly named *SpreadSheet*, send ideas, contribute tips, and tell the myriad ways they are using spreadsheet capabilities. For example:

- A man and wife team using VisiCalc to manage a rent-a-llama operation in the Grand Canyon.
- An Indian tribe performing book-keeping and financial projections for a gift shop on their reservation.
- Company presidents (from Fortune 500 companies and two-person operations) doing financial projections for their corporations.
- Game freaks playing blackjack, or battleship, or star wars on a spreadsheet.
- Housewives, authors, high school kids, college students, CPAs, house-

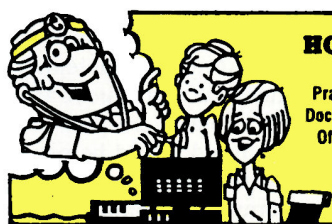
painters, and on and on—all gaining something from the magic capabilities of a spreadsheet.

Your First Choice

The first program you learn in any category (word processing, graphics, communications) tends to become the one most familiar to you, and consequently the one you remain faithful to despite newer programs, new capabilities, or new trends. But it's best to start with something simple and proceed to bigger challenges and opportunities as your competence increases.

I recommend VisiCalc as your first spreadsheet program. This may be bucking a trend, since VisiCalc's popularity has been dwindling, but the latest release from Software Arts is truly a winner, and the manual is good and easy to follow. Even the previous version is a good preparation for learning other spreadsheet programs—familiarizing you with the concept of spreadsheets, spacial relationships, and formula composition.

A somewhat more complicated program, Lotus 1-2-3 is good for the beginner; however, avoid Symphony at first because it is difficult to learn, even for graduates of 1-2-3. Framework is also an excellent program, one of the few approaching integration from a word-processing rather than a spreadsheet aspect. Coming from word processing, the management of text, Framework "thinks" in a less technical fashion. The spreadsheet part, however, is full-function and complete.



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Criteria for Choosing a Spreadsheet

First analyze your requirements. If you are a heavy number cruncher, with most of your work suitable for spreadsheets, then avoid the integrated programs and features you'll never use. For example, you don't need a communications feature if you don't even have a modem. However, if you frequently pass data originally created in a spreadsheet to a graphics program to make charts, or to a data-base manager to be sorted, or to a word processor to be incorporated into form letters, then an integrated program may be for you.

Before buying any program, *get a demonstration*, check the prices, and make your own value rating using the following checklist of features:

● **Capacity.** Ascertain your computer's maximum capacity, and deter-

Spreadsheet Guide

AppleWorks

Apple Computer
20525 Mariani Avenue
Cupertino, CA 95014
(408) 973-2042
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VisiCorp
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Supercalc 3

Sorcim/IUS
2195 Fortune Drive
San Jose, CA 95131
(408) 942-1727
//e
\$99

VisiCalc Package

Software Arts
27 Mica Lane
Wellesley, MA 02181
(617) 237-4000
II Plus, //e, //c
\$179



mine if this amount suffices for the spreadsheet. Each program indicates the minimum RAM memory it requires to operate, and the matrix occupies additional space. The smaller size (stated in either cells or in columns and rows) of less expensive programs may suit you, but I suggest you buy the largest possible; spreadsheet matrices grow rapidly as you find more and more useful things to include in them.

● **Formatting.** Examine your standard reports. Check the program features and decide which ones you need—titling, labeling, variable column widths, placing negative amounts in parentheses, dollar signs, and so on. Not all programs have all possibilities, so you may have to compromise. Make sure that the program works on your printer and doesn't limit printout possibilities.

● **Functions.** All spreadsheets perform simple calculations—addition, subtraction, multiplication, and division. But net present value, discounted cash flow, log, sine, and other esoteric functions are also available on some programs. If you need them, check that you have found a program that has them built in.

● **Ease of use.** Is the error trapping useful? (Does the program tell you where it is having a problem with your entry, so that you can figure out what to do?) Can you review formulas and

edit them after they are entered? Is matrix modification easy? (With some programs you can move whole columns and rows to other locations, and the program automatically makes the adjustments in all the formulas.) If you are a new user, is there a "help" function to remind you of the next or alternative steps at each stage of development? Also, does the number of keystroke sequences look manageable to learn?

Finally, make sure that you've heard of the software house that produces the program. In these days of sudden death in the software business, you want assurance that there will be updates and that the publisher will be around when you need help.

Getting Started

If the program has a tutorial package or a series of steps designed to get you going, follow them religiously. Reading the manual will discourage early bad habits and frustrating delays. I cannot attest to all manuals being terrific, but at least the authors have good intentions.

Start with a job you do regularly, rather than designing a completely new format, so you can concentrate on the entry of the matrix and the formulas. Your standard monthly report or financial statement would serve well. Put whatever document you are using

on the screen in the matrix. Form columns and column headings, and then type in the entries down the left-hand side. Now start entering the data, using the spreadsheet formulas to add figures together or to insert percentages. You need to explain the components to your matrix only once.

It may be useful in this early stage to use your calculator to double check complex calculations. If you have trouble figuring out how to nest parenthetical statements for the spreadsheet program to execute in the correct order, verbally expressing the calculation may help. For example,

(@SUM(A1..A52) + (G19*M41))/@SUM(X1..X52)

in VisiCalc means, "Take the total of column A and add to it the result of multiplying the value in G19 by the value in M41, then express the total as a percentage of the sum of column X."

If this overview of spreadsheets has convinced you to check them out for yourself, or has suggested you should investigate others than the one you have, then consult the accompanying guide. There you will find a list of programs, system requirements, prices, and names and addresses of the manufacturers. ■

Archie Mason will answer your questions about spreadsheets at 10 Dzamba Grove, Stamford, CT 06903.

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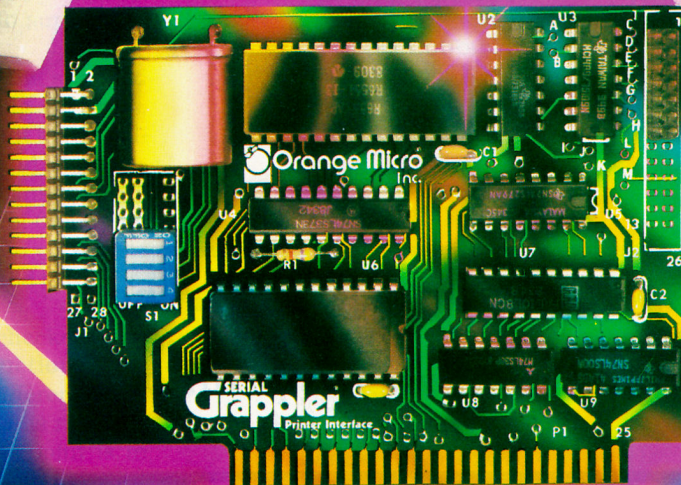
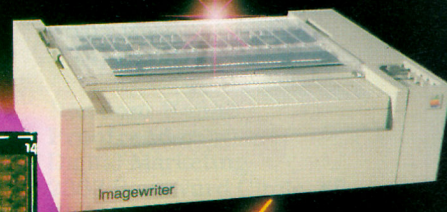
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Simple as ABC

Spelling checkers catch the misspellings you've missed, so your documents print out letter-perfect.

Tby Bob Ryan, inCider staff

he heating system in your office is working overtime, and so are you. Your eyes stare at the 30-page report due for a 9 a.m. meeting. You rest your eyes, just for a minute, just a minute. . . .

Miss Woslawski glares at you from the front of the class. Your heart pounds, your palms sweat, your mind races. "Why doesn't she call on someone else? What do I know about i's and e's and c's? Why do I have to learn how to spell, anyway?"

You wake with a start, Miss Woslawski's disappointment still vivid after 20 years. Your eyes return to the video display—30 pages chock-full of spelling mistakes. Your grammar school teacher would've sentenced you to a

lifetime detention. You think, "If Miss Woslawski couldn't help me, who or what can?" The answer, of course, is staring you in the face. . . your computer.

Spelling checkers are programs that take the anxiety out of writing. With a spelling checker, you can concentrate on the contents of your document without having to consult a dictionary constantly for particular spellings. A spelling checker, as an adjunct to your word-processing system, helps you produce quality documents faster than a manual system, because mistakes are easier to detect and correct.

Most spelling checkers work on a one-drive system, but two drives are highly recommended to avoid a lot of

disk swapping. Generally, you put the spelling-checker program into your first drive, and the document disk containing the file you want checked into drive 2. After the checker loads into memory, it reads your document and compares every word with the checker's dictionary. These dictionaries contain about 20,000 words—not a large percentage of the words in the English language, but a very large percentage of the commonly used words.

When the spelling checker encounters a word in your document that isn't in its dictionary, it flags the word: It either pauses and lets you decide to change or leave the word, or it writes the word to a report file for you to print after proofing. The latter enables you

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to leave the computer unattended when proofing a document, then use the printed report to make corrections later.

A spelling checker can't, nor is it intended to, replace your Webster's or Oxford dictionary. The checker only flags words it doesn't recognize. It's up to you to determine if the flagged words are incorrect or were merely omitted from the checker's dictionary. If incorrect, it's still up to you to supply the correct spelling.

You can add words to the supplied dictionary in most spelling checkers. This is especially important to specialists in business, science, and engineering who use technical terms that are obscure to others outside of their field. As before, it's up to you to check the spelling of any word you add to the dictionary.

Although all spelling checkers perform the same basic functions, you should investigate their differences before you decide which one is right for you. The most important point is to determine what type of document files your word processor produces and then choose a spelling checker that proofs that type of file.

Other important comparison features are the size of the dictionary and the number of words you can add to the dictionary. You should also decide if you need a checker that will proof a document automatically and produce a report file, or if manual operation (where the checker stops at every unfamiliar word) is sufficient. You may also want to know how a checker flags a word: Does it put the word in context, or does it give you the page and line number?

Evaluate all of these factors according to the kinds of documents you produce and the price you're willing to pay. Whatever you decide, be assured that a spelling checker is the best way to put the specter of your Miss Wosowski to rest. ■

Manufacturers' Addresses

Bank Street Speller
Broderbund Software
17 Paul Drive
San Rafael, CA 94903
(415) 479-1170

The Benchmark Spelling Checker
Metasoft
711 East Cottonwood Lane, Suite E
Casa Grande, AZ 85222
(602) 961-0003

The Dic-tion-ary and HomeWord Speller
Sierra
P.O. Box 485
Coarsegold, CA 93614
(209) 683-6858

Dispell
IOTC
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Minneapolis, MN 55410
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(800) 328-5727

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(818) 985-5763

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Megahaus
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San Diego, CA 92121
(619) 450-1230

Perfect Speller
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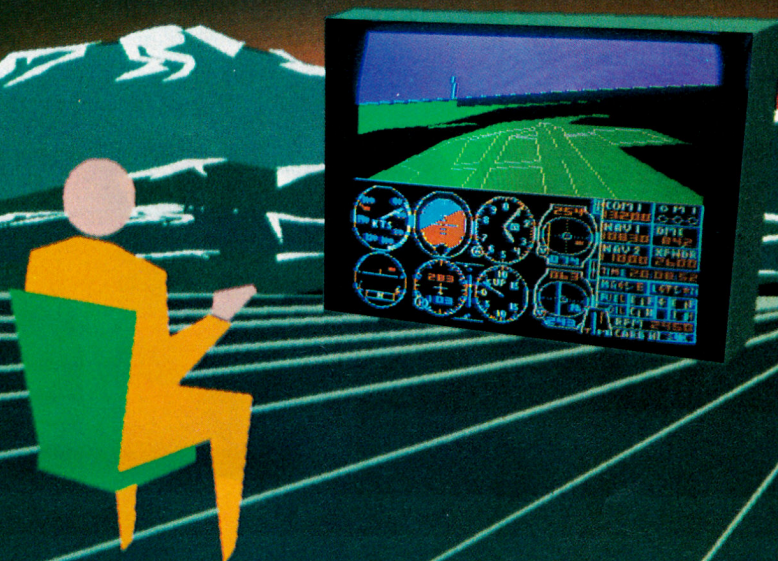
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		RAM	Disk Drives	Other		DOS Binary	DOS Text	ProDOS	Other		Number of Words	User-Expandable Words
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Get Your Back-up

My P.R. Blackwell

aking back-up copies of programs as I'm writing and debugging them is one of those nagging chores I often postpone. Then, usually about two o'clock in the morning, and just after I've eradicated a particularly nasty bug, I kick back my chair to stretch and, with amazing accuracy, catch my Apple's power cord with the big toe of my left foot. Blip, blam, cuss: another four hours of work lost!

If you're a procrastinator too, try my program BKUPWRITER—short for Back-Up EXEC File Writer.

The EXEC File

An EXEC file, an ordinary text file consisting of BASIC commands or program lines, provides a handy way to load favorite subroutines into a new program. When you type in the DOS command EXEC(filename) the computer executes the commands or program lines in the file named (filename) just as if they were being typed on the keyboard. Thus, any commands pre-

ceded by a number are entered as program lines and incorporated into any program lines already in memory.

If the text file being EXECed contains immediate execution commands, the computer will execute them immediately. This is how BKUPWRITER will relieve you of the drudgery of making timely copies of programs in progress.

Because EXEC files are text files, you can't save them as you save program files: by typing a simple command from the keyboard. Instead, they must be written to the disk from within a program. One solution is to use your word processor to write them. Most word processors that store their files in text file format will work. Just boot up and type in the desired commands or program lines. The other way requires a short program, like BKUPWRITER, to create the text file.

What BKUPWRITER Does

BKUPWRITER produces a text file consisting of legal Applesoft com-

mands. When EXECed, the file takes control of your computer and performs the back-up chore for you. The first command issued by the EXEC file—MON C,I,O—displays the subsequent commands so you'll know what's going on. Next, the EXEC file deletes (filename).BKUP2, where (filename) is the name of your Applesoft program. Then it renames (filename).BKUP1, (filename).BKUP2, renames (filename), (filename).BKUP1, and saves (filename). The oldest version of your program is forgotten, the middle versions are shifted down, and the program in memory is saved under (filename). Thus, if you EXEC BKUPWRITER frequently, you'll always have the three most current versions of your program saved to disk.

Before returning control of the computer to you, the EXEC file removes MON C,I,O so you won't have to. If you're paranoid (or unlucky), an option in BKUPWRITER lets you specify a dual-drive back-up. If enabled, this feature repeats the entire procedure

Keep your programming library au courant before misfortune turns files into random electrons.

for a formatted disk already in drive 2.

The first two times you EXEC BKUP.(filename) you'll get FILE NOT FOUND errors because the two back-up files (filename.BKUP1 and filename.BKUP2), which the EXEC file tries to delete or rename, won't yet exist on disk. Such errors don't terminate an EXECing file, so they won't cause any problems beyond the irritating beeps and error messages. Once the Rename commands have established both back-up files, there should be no further problems.

How BKUPWRITER Works

BKUPWRITER first declares D\$ = CHR\$(4), which is control-D. DOS, when it is in effect, monitors all data going into or out of the Apple and uses a carriage return [CHR\$(13)] followed by control-D [CHR\$(4)] to alert itself that what follows is a DOS command. The carriage return requirement explains why DOS sometimes misses a command. If, for instance, the last PRINT statement preceding the DOS command ends in a semicolon, the carriage return preceding control-D would be missing and DOS would fail to intercept the subsequent command. Commas cause the same problem, as do GET statements. For this reason, some programmers define D\$ as CHR\$(13) + CHR\$(4). I prefer to add an extra PRINT statement when this problem occurs (see line 160 in the **Program listing**.)

Lines 100 through 125 briefly describe the program's function; then line 130 asks for a filename. This should be the name of the Applesoft program file that you want to back up. Next you must choose between a single drive back-up or a dual drive back-up. Type in 1 for the single, and 2 for the dual setup.

After a second chance to correct the inputs in line 150 and an opportunity to insert a different disk to hold the EXEC file in line 155, line 160 prepares to create the text file. Notice the PRINT D\$:PRINT D\$, which overcomes the GET statement in the pre-

vious line. The text file named BKUP.(filename) is opened (in case it doesn't yet exist), deleted (in case an old text file exists under the same name which is longer than the new one), and reopened before the WRITE command is issued.

The next few lines write the actual contents of the text file. Because a file is opened and prepared for writing, any PRINT statements are sent to the file on the currently selected disk instead of to the text screen. The first one, MON C,I,O, displays the other DOS commands as they are EXECed.

The FOR...NEXT loop in line 170 determines if this is to be a single back-up or dual back-up file. The lines within the loop create the deleting, renaming, and saving commands, and line 220 turns off the MON function.

The final step in creating a text file is to close it. Line 230 shows the proper format. Failure to close a text file can be disastrous.

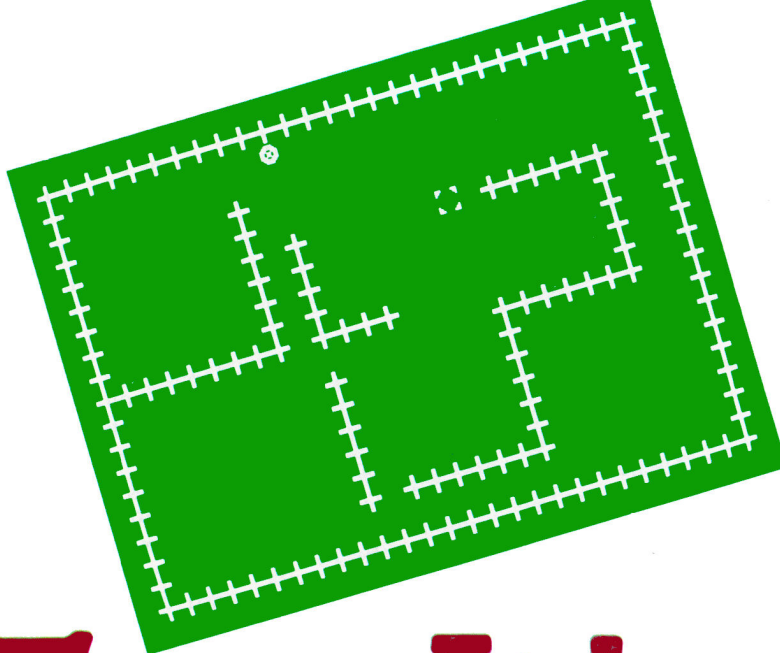
The EXEC has many other uses, such as finding BLOAD addresses, bypassing a lengthy question-and-answer session at the beginning of a favorite program, or resetting program pointers to relocate an Applesoft program. You can plot almost any command sequence you type on the keyboard into an EXEC file. For more information on EXEC files, see the *DOS Manual*. As for me, I'm going to back up *this* file before I kick the plug again. ■

Contact P.R. Blackwell at 201 San Augustine Street, Center, TX 75935.

Program listing. Back-up EXEC File Writer.

```
10 REM *** BKUP WRITER ***
   PR BLACKWELL
   201 SAN AUGUSTINE ST.
   CENTER, TX 75935
   COPYRIGHT (C) 12/83

20 D$ = CHR$ (4)
100 HOME : PRINT TAB( 7);"*** BACK-UP EXEC WRITER **
   *"
110 VTAB 3: PRINT "THIS PROGRAM WILL CREATE A TEXT FI
   LE 'BKUP.(FILENAME)' WHICH, WHEN EXECED, WIL
   L PERFORM THE FOLLOWING:"; PRINT
120 PRINT "INITIATE MON C,I,O DE
   LETE (FILENAME).BKUP2 RENAME (FIL
   ENAME).BKUP1,(FILENAME).BKUP2RENAME (FILENAME),(F
   ILENAME).BKUP1 SAVE (FILENAME)
   TURN OFF MON C,I,O"
125 PRINT "REPEAT THE ABOVE FOR DIRVE 2 (OPTIONAL)"
130 VTAB 15: INPUT "FILENAME? ";N$
140 PRINT : INPUT "(1)=SINGLE OR (2)=DUAL DRIVE BACKU
   P? ";D$
150 VTAB 21: PRINT "ABOVE OK? (Y OR N) ";: GET Z$: HTAB
   1: CALL - 868: ON Z$ = "Y" GOTO 155: ON Z$ = "N"
   GOTO 130: PRINT CHR$ (7): GOTO 150
155 PRINT "INSERT EXEC FILE DISK & PRESS RETURN ";: GET
   Z$: HTAB 1: CALL - 868
160 PRINT D$: PRINT D$;"OPEN BKUP.";N$: PRINT D$;"DEL
   ETE BKUP.";N$: PRINT D$;"OPEN BKUP.";N$: PRINT D$
   ;"WRITE BKUP.";N$
165 PRINT "MON C,I,O"
170 FOR D = 1 TO D$
180 PRINT "DELETE";N$;".BKUP2,D";D
190 PRINT "RENAME";N$;".BKUP1,";N$;".BKUP2"
195 PRINT "RENAME";N$;",";N$;".BKUP1"
200 PRINT "SAVE";N$
210 NEXT D
220 PRINT "NOMON"
230 PRINT D$;"CLOSE BKUP.";N$
240 VTAB 19: PRINT "DONE! - TO BACKUP THE APPLESOFT
   PROGRAM";N$;" TYPE:"; PRINT : PRINT TAB( 11)"E
   XEC BKUP.";N$
```

Trap It!

Round 'em up. Fence in a bouncing ball that's as slippery as a greased pig.

Mby Ken Hummel

Most computer games pit you against the computer and end when you're some monster's dinner or vaporized by a missile. Trap It! reverses the odds. You always win, and the computer always loses—eventually.

Trap It! runs on any Apple II with 48K of RAM and one disk drive. The computer plays the part of a bouncing ball you must chase down and trap within a fence. The fence is built of "plus signs," as you can see in the **Photo**. Eight adjacent sections of fence forming a square will trap the ball. To progressively narrow down the area in which the ball can move, you can build fences in any configuration you want. The ball can't penetrate a solid fence, although it will pass diagonally through a hole.

The four-cornered cursor is moved with the I, J, K, and M keys. Sections of fence are installed with the F key.

There are two game formats. In the first, a fence is already in place around the perimeter of the screen and the ball moves within that area. The second, more difficult, format provides no fence, so as the ball moves back and

Listing 1. Scorekeeper.

```

10 HOME : DIM A$(20),A(20)
20 D$ = CHR$(4)
30 FOR I = 1 TO 20:A(I) = 2500
40 A$(I) = "*****": NEXT
50 PRINT D$;"OPEN TRAP SCORES"
60 PRINT D$;"DELETE TRAP SCORES"
70 PRINT D$;"OPEN TRAP SCORES"
80 PRINT D$;"WRITE TRAP SCORES"
90 FOR I = 1 TO 20: PRINT A$(I)
100 PRINT A(I): NEXT
110 PRINT D$;"CLOSE"
```

forth and up and down across the screen, it will leave the screen and appear on the opposite side.

The object of the game is to trap the ball quickly and minimize your score. You are charged one point for each space the ball moves and two points for each fence post you use. In format 2 a score under 400 is good, under 200 excellent, under 100 fantastic, and under 40 probably impossible.

The Programs

To maintain a record of scores, I've included a program called Scorekeeper (**Listing 1**) that creates a textfile of the best scores in each game format.

Before you type in the main program, type in Scorekeeper and save it. Then run it to create the textfile for the main program to use. You'll never need to run Scorekeeper again (unless you want to save your ego by erasing bad scores and starting over fresh).

The main program, Trap It!, appears in **Listing 2**. Refer to the **Table** for a list of the variables.

Lines 370–560 and 1040–1080 control the scoring. The machine-language program that creates the introductory music is in memory locations 777–826, the shape table for the graphics in locations 38200–38280, and the current status of the game board in 37600–38200. HIMEM is 37600.

A checksum for the data statements is computed when the program runs. An incorrect sum produces a message that there's an error in your data statements. Execution won't continue until they're correct.

You may notice a little white lie in lines 460–470. When "Give me a minute to check your score" appears on the screen, the computer isn't really reviewing scores; that's already been

Continued on p. 120.

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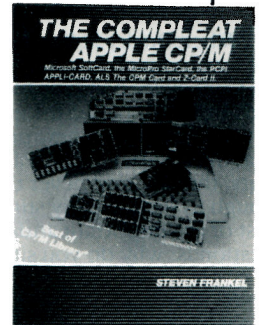
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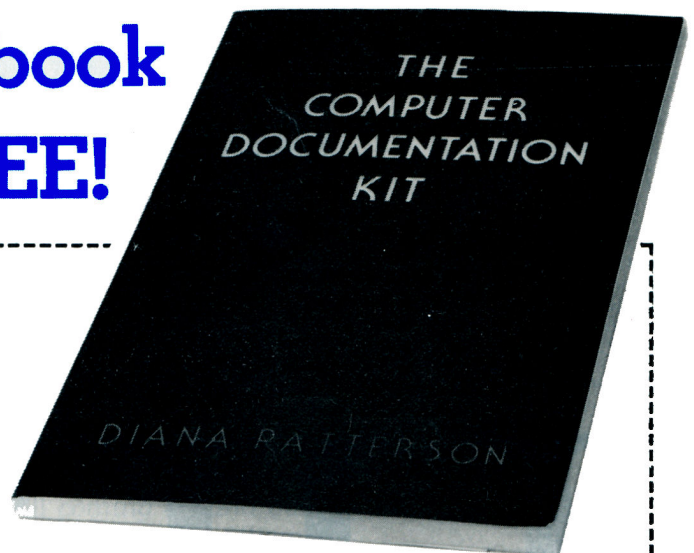
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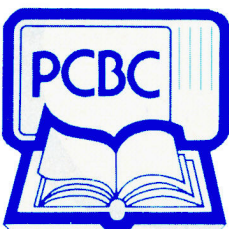
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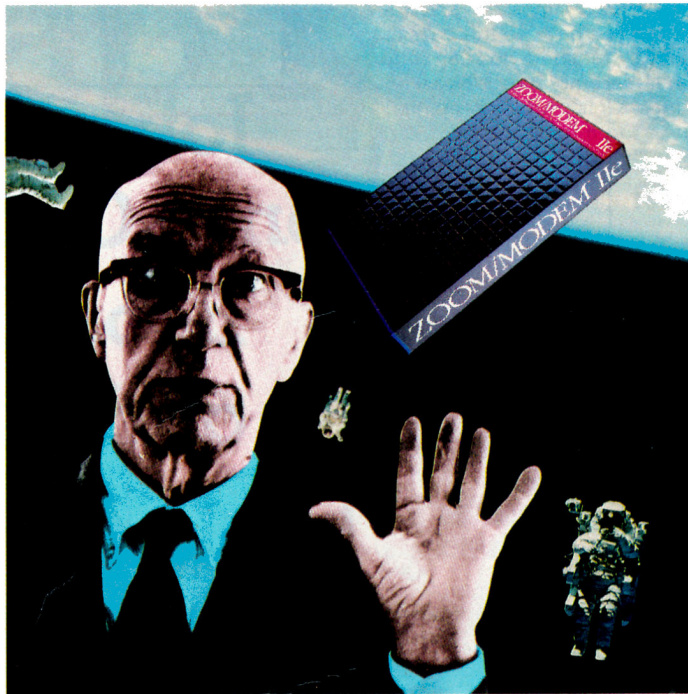
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R. BUCKMINSTER FULLER,
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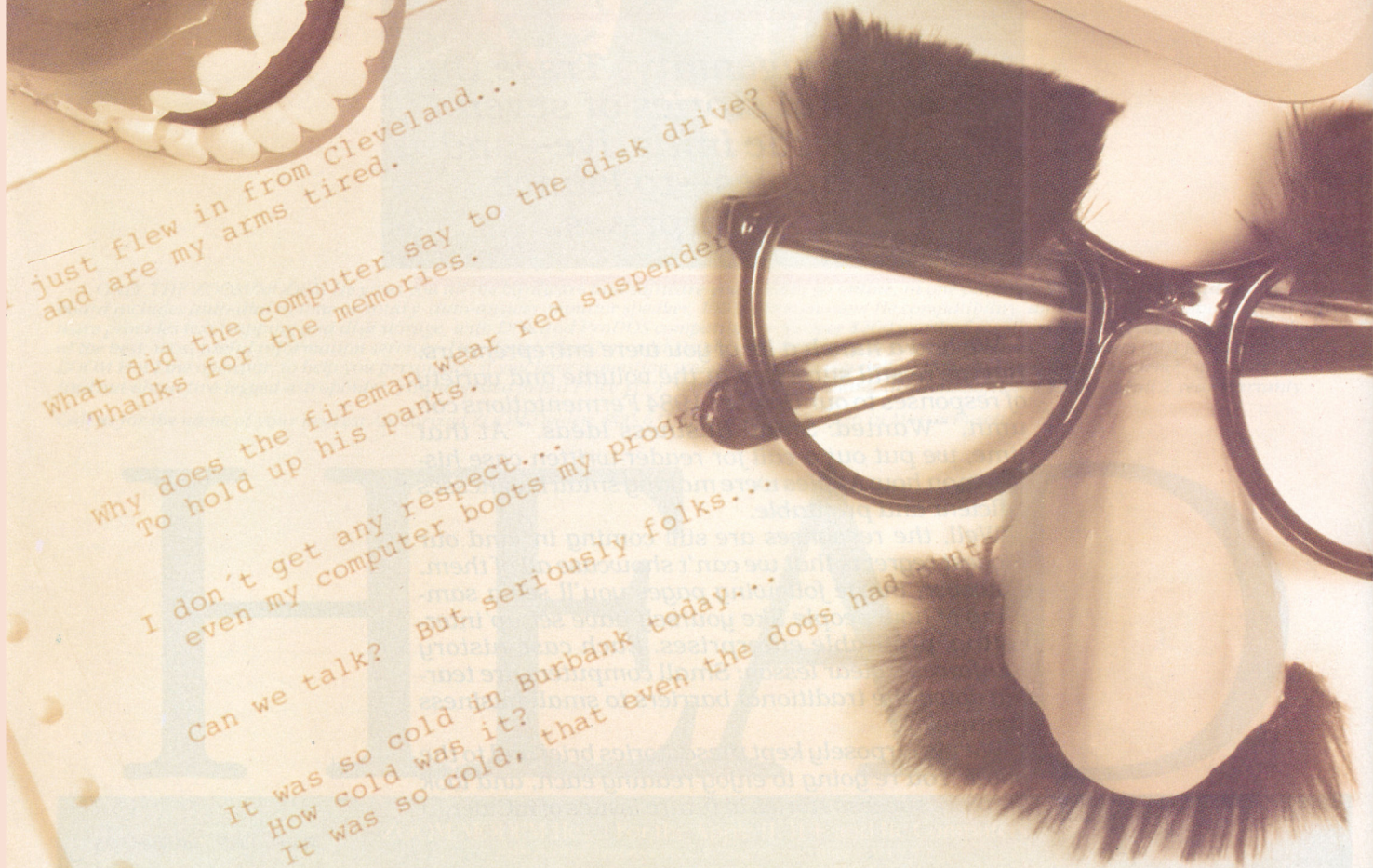
Something Ventured, Everything Gained

American ingenuity: Trace the successful stories of seven who took the initiative—and their Apples—to launch their enterprises.

We had a hunch a lot of you were entrepreneurs. But we're still surprised at the volume and variety of responses to our October 1984 Fermentations column, "Wanted: Small-Business Ideas." At that time, we put out a call for reader-written case histories on how Apples were making small businesses efficient and profitable.

Well, the responses are still coming in, and our biggest regret is that we can't showcase all of them. However, in the following pages you'll see a sampling of how people like yourself have set up interesting, profitable enterprises. Each case history reinforces a clear lesson: Small computers are tearing down the traditional barriers to small-business ventures.

We've purposely kept these stories brief and to the point. You're going to enjoy reading each, and look for more success stories in future issues of inCider. □



just flew in from Cleveland...
and are my arms tired.

What did the computer say to the disk drive?
Thanks for the memories.

Why does the fireman wear red suspenders
To hold up his pants.

I don't get any respect...
even my computer boots my program.

Can we talk? But seriously folks...

It was so cold in Burbank today...
How cold was it?
It was so cold, that even the dogs had pants.

They Laugh When I Sit Down at the Keyboard

Jean W. Yeager, Inc.
Creative Services
Owner: Jean W. Yeager
6334 Gaston Avenue
Suite 212
Dallas, TX 75214

So, you're probably thinking that comedy and computers rarely, if ever, mix, eh? Well, boopie, not true! I can trace much of my success as a comedy writer to the day my Apple //e came into my life.

About three years ago, I left a safe, secure, and sane staff-writing position to open my own creative service. And some not-so-funny things happened.

I was accustomed to secretaries who kept track of information for me. When I went free-lance, I couldn't afford the luxury of a secretary. Salesmanship (leads, calls, mailing lists) became of prime importance. (If you don't sell, you don't write, and if you don't write, you don't eat.) Accounting and book-keeping rose to new heights on my priority list. (You can't be in the funny business if you're out of business.)

So, I was faced with a decision: hire some help or... and the "or" turned out to be two brains.

I was lost when I had to decide

which computer to buy, so I opted for simplicity and portability. My first "brain" was a Radio Shack TRS-80 Model 100, which I promptly hooked up to an Epson MX-80 printer. But, the screen size and lack of full-page display really hurt—especially when you consider that roughly 50 percent of my work requires a two-column, vertical page-split for industrial-film format. (Text formatting is possible with software available for the Model 100, but the programs weren't exactly what I needed.)

Then several months ago, Portable Computer Support Group developed DISK+, an innovative software package that allowed my Model 100 to interface with a personal computer like an Apple.

About the same time, Apple dropped the //e's price. I rushed out, bought a //e starter system (64K, single disk drive), and Apple Writer //.

The Second Brain

Now I have the best of both worlds—portability and the ability to dump from the Model 100 to the Apple for formatting and editing. The Model 100 handles business chores like time-keeping and mailing lists. I use the

Model 100's built-in modem for the on-line services, like CompuServe, and for networking with other writers. Additionally, I use the Model 100 as a printer-buffer and let it deal with printing chores while I'm working on the //e.

Most people think it odd to use two computers, but I'm sold on the Apple and the Model 100. For me, they solved some very not-so-funny business problems. The combined system of the Apple //e and the Model 100 gives me two "brains" which can function independently. Best of all, many producers use computers to program their shows and most have modems. With the Model 100, I can work on a script anywhere and still file it with a producer via the telecommunications system.

Now I have three brains: one in my head, one on my desk, and one in my briefcase. I still don't have a secretary, but I also don't have to budget for the added sick time, insurance payments, and salary. Unfortunately, the Apple doesn't make coffee or answer the phone. To top it off, my wife accuses me of not being able to keep my hands off the "help."

—Jean W. Yeager

March 1985 inCider 37



How We Became Independent Types

Professional Secretarial Services

Owner: June Dutton
Route 1, Box 93A
Gays Mills, WI 54631

When my husband retired in 1977, I gave up my executive secretary job to build a new home in rural, south-west Wisconsin. I thought a quiet place would give me the chance to pursue my writing interests in my spare time. Once we hammered our last nail, I had that spare time and signed up to take an evening computer course at the local high school. The moment I touched their Apple II, I knew it was for me.

Secretary for Hire

While taking the course, I decided to open a secretarial service out of my home. Such word-processing services aren't unusual, but most are found in metropolitan areas—not in the middle of a rural town. Backed by my experience (25 years as a certified professional secretary with five more years in advertising), I put myself in business with an Apple IIe, an Apple Monitor II, two disk drives, a letter-quality Comrex CR-1 printer, and the Apple Writer II word-processing program. An Olivetti dot-matrix printer produces rough drafts and saves my bigger printer for bigger jobs.

Before I started Professional Secretarial Services in 1984, people told me that the company wouldn't be profitable. Time has been too short to recoup my \$3400 investment, but I feel the company is successful. If it's any indication, my biggest problem is ensuring that I don't get too busy.

I've been devoted to off-the-shelf software: Sensible Speller is excellent for college manuscripts; Debit-Credit Connection, although confusing at first, is a good, reasonably priced program for my company's books; Speed File keeps track of my customers and mailing list.

One of my problems is actually an asset—no one, not even my teacher, can answer all my questions, so I've spent a lot of time at the machine learning for myself. And I've enjoyed experimenting.

I've been a secretary for many years, but I find I can do much better work with Apple Writer than I ever could on any typewriter. The program is excellent for my writing routine: I can edit to my heart's content, then go for a coffee break while it retypes the copy.

—June Dutton

Typing Plus

Owner: Marge Burley
3301 15th Street
Menominee, MI 49858

At one time or another, everyone needs a secretary to answer correspondence, type letters, or proofread reports. My service helps people out of the time crunch. I run Typing Plus, a typing and word-processing service for business and personal use.

Prior to opening Typing Plus, I worked for the local chamber of commerce. The job gave me the opportunity to meet business people and understand their problems. Many small businesses can't afford a full-time secretary, but at times they do need professional-looking letters or reports.

That's where I come in. Businesses contract Typing Plus for only the time it takes to complete the job.

My equipment consists of an Apple IIe, Comrex Monitor, two Disk II drives, and a Silver Reed EXP-550 printer. I also have a Smith-Corona DeVille Messenger electronic typewriter that can interface with the computer. The typewriter is handy for filling out the occasional form or, heaven forbid, if my printer breaks down in the middle of a rush project. So far, my equipment has cost \$3800. I've been using Apple Writer II and it has more than met each task.

Business of the Day

What makes—and keeps—the job interesting is that it's hardly ever the same. Some days it's the on-going process of typing a book, making it camera-ready for a publisher. Other days it may be a set of specs for a contractor, a resumé, business letters for an independent insurance agent, or a poem done in script.

The response has been great. The business reflects what people are saying: There is a need for this service. My clients include local businesses, private citizens, and college students.

My office, by the way, is in my home. Zoning regulations posed no problem; in fact I didn't bump into any stumbling blocks at all along the way. For those wanting to start a similar business, be patient on the days you're not needed. These days are always useful for furthering your computer knowledge and planning business services. Believe me, it's worth the wait.

—Marge Burley



Keeping My Gymboree Franchise in Shape

Illinois Playtime, Inc.
Co-owner: Sharon Silverman
2723 Woodland Road
Evanston, IL 60201

Jane Fonda may "make it burn," but at Gymboree "wee workout and you can too." I am co-owner of Illinois Playtime, Inc., which holds the Gymboree franchise for Chicago's north side and adjacent suburbs. Gymboree is an exercise class for children (three months to four years) and their parents. During a 45-minute weekly class, children and parents share movement and play experiences. We have three sites where bright, large rooms are filled with 40 pieces of specially sized and designed play equipment. Everyone has fun and exercises under the guidance of a trained instructor.

We opened our first site one year ago. Our initial investment for franchise fees and equipment was about \$50,000. Today we serve approximately 500 children and have four teachers and three substitutes working for us. Part of our investment covered the cost of our Apple IIe, two Apple disk drives, a Video 100G monitor, and an Epson RX-80 printer. Since our record keeping is automated, we make extensive use of the BPI General Ledger System, Quick File, and VisiCalc.

A Computer Workout

The BPI General Ledger System

maintains our accounting records. Each month we prepare financial statements, including data to determine our franchise's profitability. We also prepare the appropriate income and withholding tax returns, given the information prepared by the General Ledger System.

Our computer system also facilitates the quarterly financial reporting process mandated by the Gymboree Corporation. A VisiCalc template lets us take the financial information from the general ledger and put it in the required Gymboree format. The program breaks down common expenses according to site. This report takes only minutes now, instead of the two hours it took to prepare manually.

Aside from accounting, our software helps us keep tabs on our clients. Quick File, one of our most-used programs, stores client information and generates mailing labels for our direct-marketing program. For each session, we set up a record for each child including name, birthdate, parents, address, how they heard about Gymboree, and the amount paid.

Building Demographics

Given this data, we can specify the type of report. Teachers receive a listing of each child in their class, along with the parent's name, address, and phone number. An alphabetical list of the children helps the business office

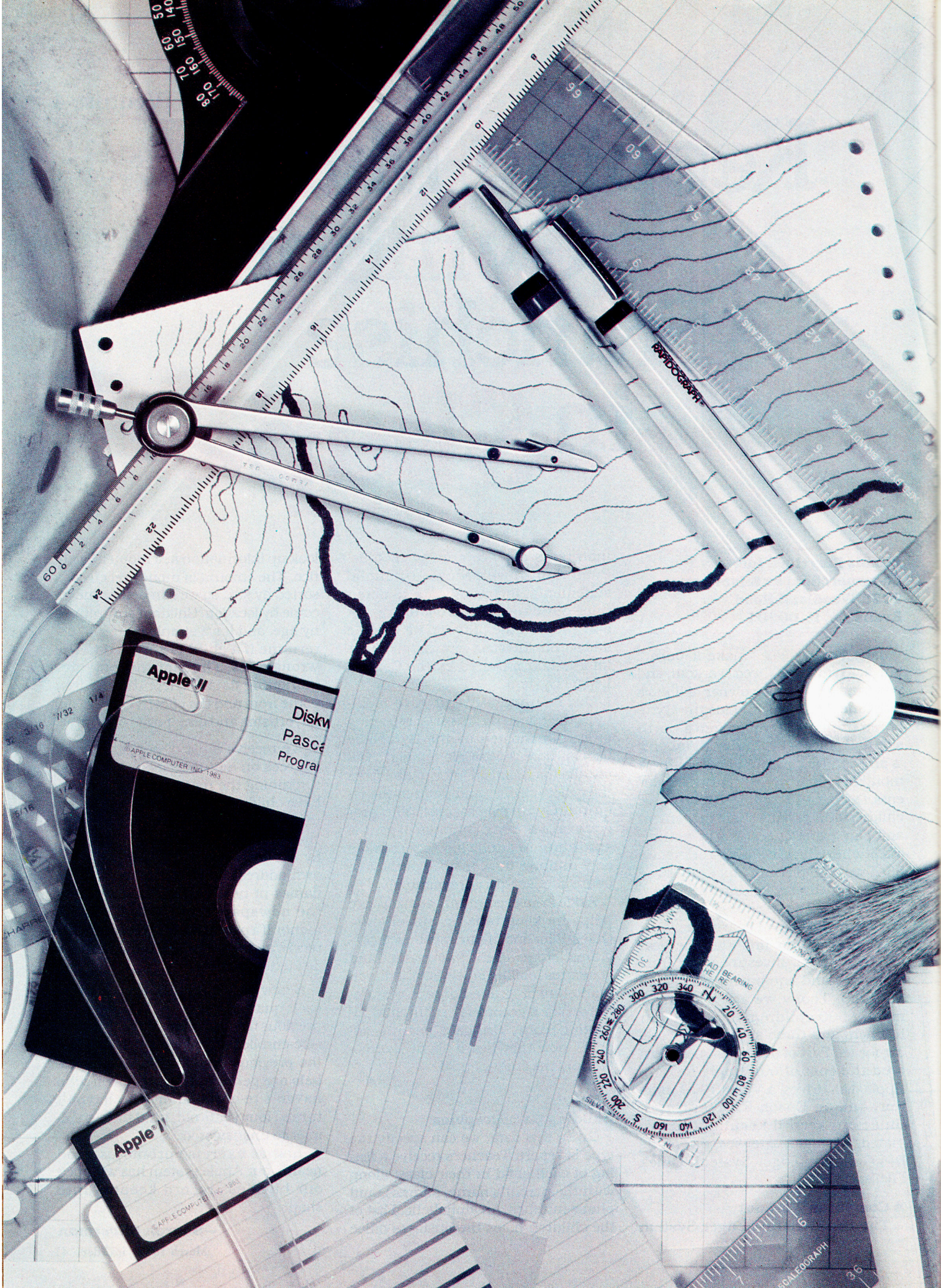
look up information at a moment's notice. The amount of money received is sorted by site, so we can determine income by location. Children are grouped by age, and it's a simple matter to determine if a child is enrolled in the wrong class. The same file provides marketing data—where the children come from and the effectiveness of our advertising and direct-mail program.

We receive most of our direct-mail sources on a purchased mailing list containing the names of parents who have children of Gymboree age in our targeted ZIP-code areas. The purchased list, however, is supplemented by our own house list. We print our own address labels. Also, we add the names of new parents after we read the newspaper's birth announcements. If a parent doesn't respond after receiving three mailings, the name is deleted from the list.

A new enrollment file is created for each quarterly session, but the three previous files are maintained. If a child is re-enrolled, the name is deleted from the previous sessions file. Mailing labels are generated for children who haven't re-enrolled or who haven't turned four years old, until three mailings go unanswered.

Just as exercise promotes good health, our Apple system has whipped our business record keeping into shape.

—Sharon Silverman



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When it comes to roadway-alignment design, subdivision and commercial development, and land surveying, we're the folks people turn to. Ours isn't a new venture. In fact, civil engineering and surveying is one of the oldest types of engineering, and until recently all work was calculated, coordinated, scaled, and drawn by hand using tables, slide rules, and scales. These calculations tend to be fairly repetitive and time-consuming.

Engineering Calculations

When coordinate geometry and surveying software became available, we entered the scene with our Apple II

Plus and the determination to increase the efficiency of our calculations. We bought Surveyor One to accurately calculate coordinates for boundaries, rights-of-way, and easements in almost half the time it takes by hand. The system was so profitable that we purchased Houston Instrument's plotter and another package by Carlson Software that works with Surveyor One to drive the plotter. Our present system can produce full-size engineering drawings (24 inches by 36 inches) at a time savings of up to 75 percent for some applications.

Streamlined Applications

Excited by the system's speed and versatility, we explored the possibilities of writing our own drafting software. One of our programs streamlined drafting a series of cross sections along a roadway alignment, a particularly repetitious and tedious task usually done by hand. Cross-section sheets are part of any road-construction proj-

ect's drawing package. Our program to plot existing cross sections took 40 hours of programming time, which we felt wasn't too bad for two amateur programmers.

We have plans to expand our cross-section program to include plotting proposed roadway sections and automatic calculation of earthwork volumes. Currently, we can input data for cross sections (using a numeric keypad) and draft a sheet in one quarter of the time it used to take. Not only that, but the finished product has a more uniform, professional appearance.

We're extremely pleased with our Apple II system. It lets us increase profitability while at the same time lowers the final project-design cost for our clients. We're so pleased, we'll be putting a new Apple //e system to work shortly. Two hands are always better than one.

**—David L. Cox and
James B. Kleingers**

those I know personally, "Sincerely" for those I don't know quite as well. (My mother's record has "Love" in that field. See how computers are de-humanizing us?)

Don't underestimate this customizing ability in direct-mail and survey applications. One of my mail surveys involved a 500-piece mailing where I needed to maximize the response rate. Normally, I would have been happy with a 4 percent to 5 percent response, but with my personalized cover letters I achieved a response rate of more than 20 percent.

I've applied the hierarchical structure of General Manager in my Rep Database Service, where data appears in a screen pulled from the parent mailing list screen. With this service, which I market through personalized direct mail, my clients can locate independent sales representatives who handle compatible product lines and call the same target groups.

Additionally, I segmented the telecommunications industry into six customer categories and nine product classifications, which are coded for quick identification.

A third sorting field lets my client select and cover a specific geographic area using standard two-letter state abbreviations. Other fields print useful client information like representative firm size, time in business, and currency of data.

With my printing, I invested in continuous letterhead stationery and a separate-feed mechanism for the Olympia. It became agonizing to watch the Olympia grunt through the white space between pages, so I replaced it with a Silver Reed EXP-550. To keep up the workload, I added Practical Peripherals' Microbuffer with 128K ahead of the Silver Reed. My two disk drives were hard-pressed to keep up with the growing data base, so I recently added the third and fourth drives. I may consider a hard disk in the future, but not until I get a //c for word processing. Then I'll be tempted into ProDOS and have to upgrade the II Plus to a //e.

Of course, I have peripheral programs like ThinkTank and Sensible Speller, but what I've told you makes up 95 percent of my story. One thing is for sure: Since day one, the Apple has freed me from many of a one-man shop's day-to-day business concerns, and it allows me to concentrate on my client's problems. After all, that's what they pay me for. ■

—Bruce F. Bond

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Editors' note: Some products mentioned in the accompanying article may not be available or are no longer manufactured.

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It's the most versatile, most convenient, most useful peripheral ever made for the Apple.*

System Saver® filters out damaging AC line noise and power surges.

70-90% of all microcomputer malfunctions can be traced to power line problems*. Problems your System Saver guards against.

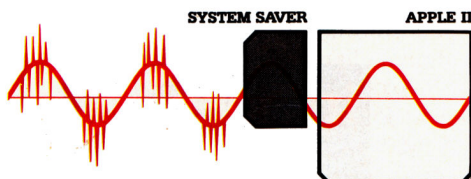
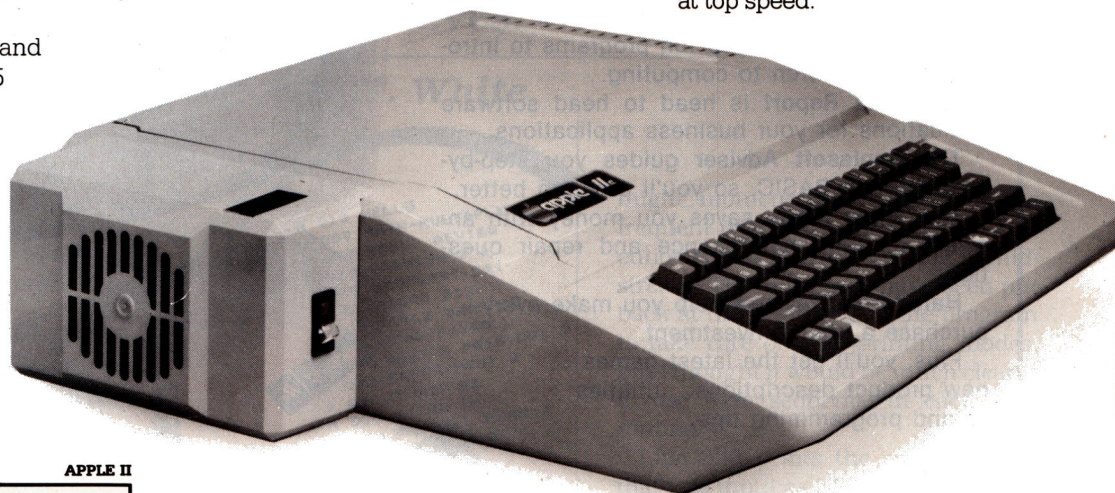
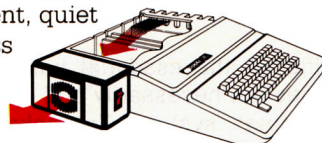
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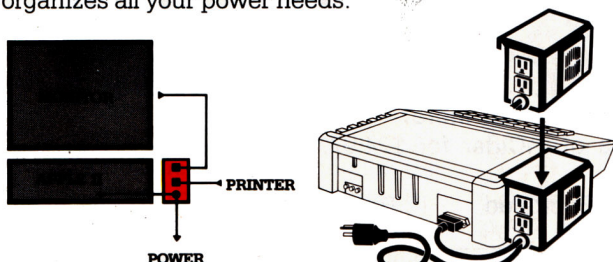
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*PC Magazine: March 1983.

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353B5

The Incredible Shrinking Catalog

Create comprehensive catalog labels small enough to fit on disk sleeves.

by John T. White

Mini-Catalog is the result of dozens of seemingly endless searches for programs and utilities that I knew I had—somewhere.

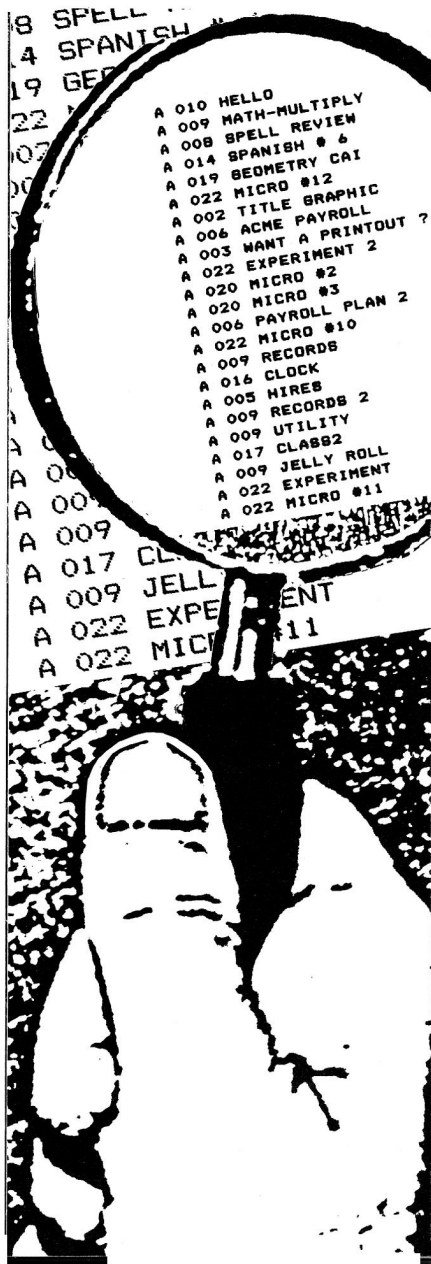
If all you want is a nice neat printout of your disk catalog, a single key-press starts you on your way. But, the real beauty of Mini-Catalog lies in its ability to live up to its name! By printing the catalog listing in *miniature*, it creates a contents label small enough to attach to disk envelopes or boxes to help you locate lost items at a glance.

Study the **Program listing**. Line 3 clears the screen, and line 5 establishes the identity of DOS.

Lines 80–125 provide directions for program use. I always find this useful, even in my own programs. Lines 127–160 clear the screen, print a menu, and wait for a single keypress. Line 168 is one of those all-important traps that force you to stay within the limits of the options provided. (I find that many programmers neglect this aspect.) Line 170 directs execution to the appropriate subroutine. The remainder of the program contains the three subroutines that match the main menu selections.

Line 305 asks you to input a name for the listing printout, and then reminds you to ready the printer for what's to come.

Line 315 eliminates the catalog pause, as in the Beagle Bros POKE chart. Leaving out this program line



might momentarily baffle even the frequent user when the program execution comes to an abrupt halt in mid-stream. This line could have been put back at the beginning of the program to take care of both printing modes, but I thought it would be much clearer to use it in sequence in each subroutine.

Line 320 prints the catalog name that was input as N\$ in line 610. Line 330 prints the catalog listing, and line 335 advances the print page 12 lines before returning command to the keyboard. You can substitute a number for the 12 in line 335 for your own purposes.

Lines 405–412 comprise the normal printing routine. Lines 415–420 compress, subscript, double-strike, and alter line spacing in one majestic swoop. If you don't have an Epson printer, slight alterations might be necessary here.

Line 445 clears all the special codes used in lines 415–420 and makes a return to the menu a smooth transition.

Those with a control-reset fetish might wonder why I bother with an ending at all. You'll have to admit that even though a menu with only three selections looks lost on a bleak monitor screen, a menu with two items might make you think you were in a totalitarian restaurant. ■

Write to John T. White at Route #1, Box 252, Arrington, VA 22922.

Program listing. MINI-CATALOG.

```

3 TEXT : HOME
5 D$ = CHR$ (4)
8 REM
10 REM *****
15 REM *      MINI-CATALOG      *
20 REM *
25 REM * FOR EPSON PRINTERS *
30 REM *
35 REM *      BY      *
40 REM *
50 REM *      JOHN T. WHITE      *
60 REM *****
70 REM
78 REM : PROGRAM DIRECTIONS MODULE
80 VTAB 2
85 PRINT "      THIS PROGRAM WILL ALLOW THE USER": PRINT
90 PRINT "TO MAKE A ";: INVERSE : PRINT "HARD COPY";: NORMAL :
  PRINT " OF A DISKETTE": PRINT
95 PRINT "CATALOG IN EITHER OF TWO WAYS. A NAME": PRINT
100 PRINT "MAY ALSO BE ASSIGNED TO THE CATALOG": PRINT
103 PRINT "LIST.": PRINT
105 PRINT "      THE PRINT-OUT MAY EITHER BE REDUCED": PRINT
110 PRINT "IN SIZE (";: INVERSE : PRINT "MINI-CATALOG";: NORMAL
  : PRINT ") OR IT MAY BE": PRINT
115 PRINT "PRINTED IN NORMAL SIZE PRINTER MODE.": PRINT
116 PRINT "      THE ";: INVERSE : PRINT "MINI";: NORMAL : PRINT
  " SIZE CATALOG MAKES A GREAT": PRINT
117 PRINT "LABEL FOR THE DISKETTE BOX OR ENVELOPE."
120 VTAB 23: PRINT TAB( 7)"(PRESS ANY KEY TO CONTINUE.)"
125 GET A$
127 REM : MENU MODULE.
128 HOME
130 VTAB 5: HTAB 18: INVERSE :
135 PRINT "MENU": NORMAL : PRINT : PRINT
140 PRINT TAB( 6)"1. NORMAL MODE PRINT-OUT": PRINT
145 PRINT TAB( 6)"2. MINI MODE PRINT-OUT": PRINT
150 PRINT TAB( 6)"3. EXIT THE PROGRAM": PRINT : PRINT : PRINT
155 INVERSE : PRINT "SELECT A NUMBER": NORMAL
160 GET A$
165 I = VAL (A$)
168 IF I < 1 OR I > 3 THEN 160
170 ON I GOSUB 300,400,500
180 GOTO 128
300 REM : NORMAL MODE MODULE
302 HOME
305 GOSUB 600: GOSUB 700
310 PRINT D$;"PR#1"
315 POKE 44596,234: POKE 44597,234: POKE 44598,234
320 PRINT N$
330 PRINT D$;"CATALOG"
335 FOR X = 1 TO 12: PRINT : NEXT X
340 PRINT D$;"PR#0"
350 RETURN
400 REM : MINI MODE MODULE
402 HOME
405 GOSUB 600: GOSUB 700
410 PRINT D$;"PR#1"
412 POKE 44596,234: POKE 44597,234: POKE 44598,234
415 PRINT CHR$ (27)"S" CHR$ (1): PRINT CHR$ (15)
420 PRINT CHR$ (27)"1"
430 PRINT N$
435 PRINT D$;"CATALOG"
440 PRINT
445 PRINT CHR$ (27)"@"
446 FOR X = 1 TO 12: PRINT : NEXT X
448 PRINT D$;"PR#0"
450 RETURN
500 REM : ENDING MODULE
505 HOME
510 VTAB 6: PRINT TAB( 6)"THANKS FOR USING ";: INVERSE : PRINT
  "MINI-CATALOG": NORMAL
550 END
600 VTAB 4: PRINT "WHAT NAME DO YOU WISH TO GIVE": PRINT
610 INPUT "THIS CATALOG ? ";N$
620 HOME
630 RETURN
700 REM : PRINTER REMINDER
705 VTAB 6
710 PRINT "BE SURE PRINTER IS ON AND PAPER IS": PRINT
715 PRINT "ADJUSTED."
720 VTAB 22
725 PRINT TAB( 8)"PRESS ";: INVERSE : PRINT "P";: NORMAL : PRINT
  " TO BEGIN PRINTING."
730 GET P$
735 IF P$ < > "P" THEN 730
740 PRINT : HOME
750 RETURN

```

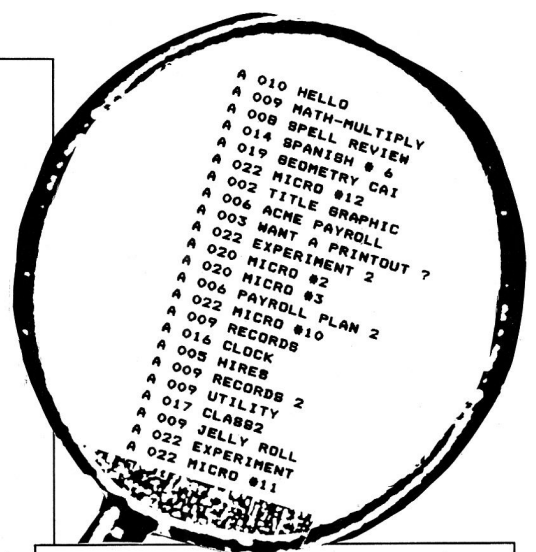


Figure 1. A catalog printout in normal mode.

```

A 010 HELLO
A 009 MATH-MULTIPLY
A 008 SPELL REVIEW
A 014 SPANISH # 6
A 019 GEOMETRY CAI
A 022 MICRO #12
A 002 TITLE GRAPHIC
A 006 ACME PAYROLL
A 003 WANT A PRINTOUT ?
A 022 EXPERIMENT 2
A 020 MICRO #2
A 020 MICRO #3
A 006 PAYROLL PLAN 2
A 022 MICRO #10
A 009 RECORDS
A 016 CLOCK
A 005 HIRES
A 009 RECORDS 2
A 009 UTILITY
A 017 CLASS2
A 009 JELLY ROLL
A 022 EXPERIMENT
A 022 MICRO #11

```

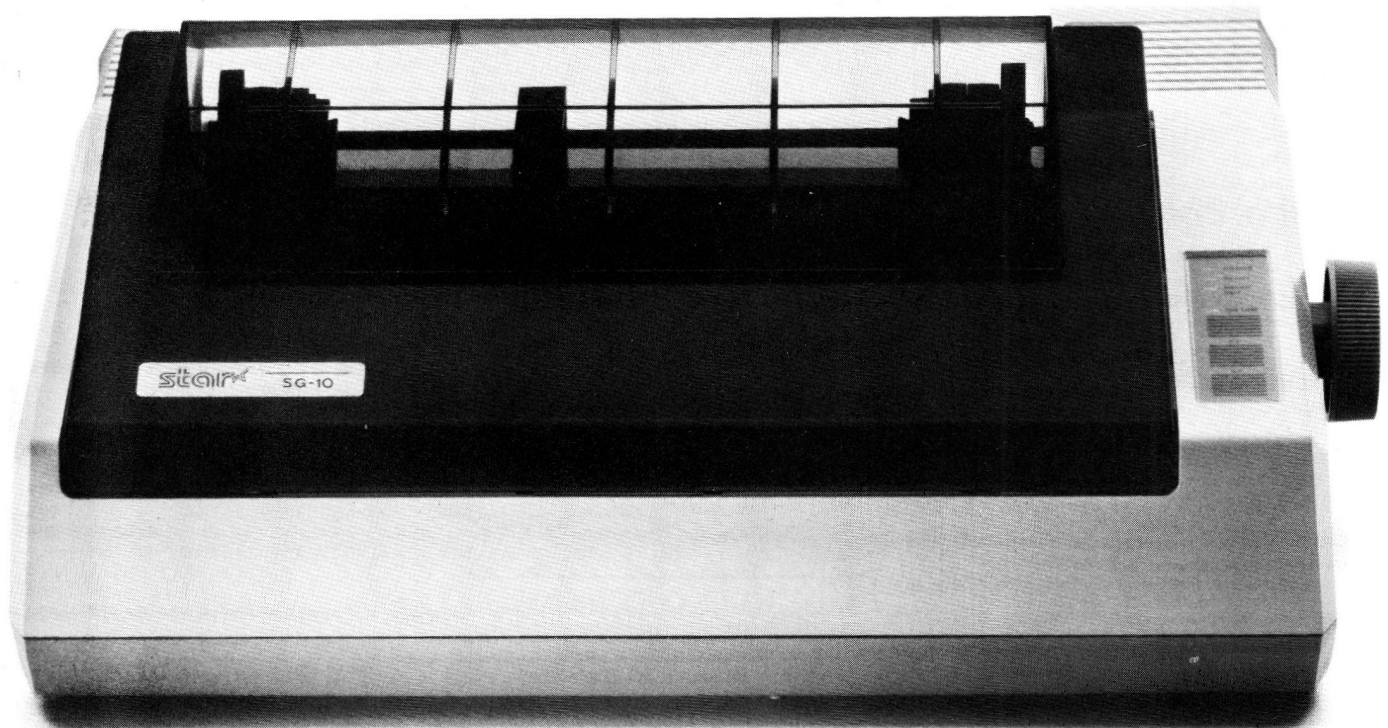
Figure 2. A catalog printout in Mini-Catalog mode.

```

A 010 HELLO
A 009 MATH-MULTIPLY
A 008 SPELL REVIEW
A 014 SPANISH # 6
A 019 GEOMETRY CAI
A 022 MICRO #12
A 002 TITLE GRAPHIC
A 006 ACME PAYROLL
A 003 WANT A PRINTOUT ?
A 022 EXPERIMENT 2
A 020 MICRO #2
A 020 MICRO #3
A 006 PAYROLL PLAN 2
A 022 MICRO #10
A 009 RECORDS
A 016 CLOCK
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A 009 UTILITY
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A 009 JELLY ROLL
A 022 EXPERIMENT
A 022 MICRO #11

```


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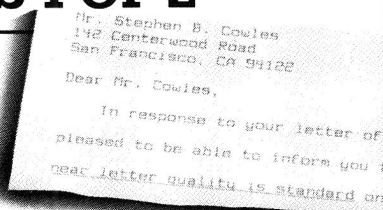
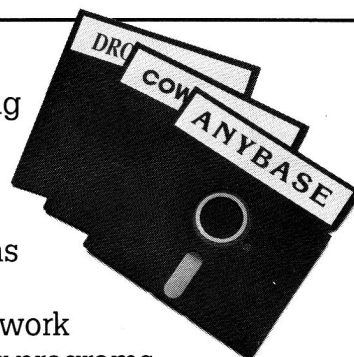
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Circle 193 on Reader Service Card.

Surprise! This is Jim Sather, not Earle Hancock. Earle has moved on to other projects, and I'm taking over Apple Clinic. His will be a tough act to follow, but I bring to the task extensive Apple II experience, including both hardware and programming, plus a vigorous enthusiasm for this family of machines.

Since this is the beginning for me, I'd like to chart a path for my new undertaking. The Apple Clinic is a forum in which you and I can discuss Apple II hardware and related subjects. Much of the dialogue will be in the form of questions and answers, which I welcome. But, there is also room for readers to make a statement because I know from experience that many Apple II enthusiasts have things to say, not just questions to ask. Whether you are a beginner or an expert, I extend an invitation to participate, to ask questions, to make statements, and to chip in and set the record straight if something in the column seems incorrect or inadequate.

In addition to answering your questions, I plan to provide occasional tutorial and reference material concerning Apple hardware. I like to design peripheral cards for the Apple, and perhaps I'll present an original circuit design or two in the coming months. I also hope that readers who dabble in such pursuits will share their efforts in the Apple Clinic.

It's time to get down to business now, for the mailbox is full of letters. I trust you'll find them as interesting as I have.

Slot Switching

In your August 1984 column you mention a Slot Swapper from Johnson Associates. As you supplied no address, I would appreciate it if you would pass the enclosed letter on to this company. I have no other way to



contact the company, and an immediate solution must be found to the slot 4/6 dilemma with hard disk drives.

Patricia Probert
New South Wales, Australia

I have forwarded your letter, Patricia. The address is Johnson Associates, 6342 West Bell Road, Glendale, AZ 85308.

The problem Patricia refers to is that when a hard disk interface card is installed in slot 6 and the floppy disk controller is in another slot, some floppy disk software won't work. For some people a slot swapper is the best solution, but consider a couple of other suggestions.

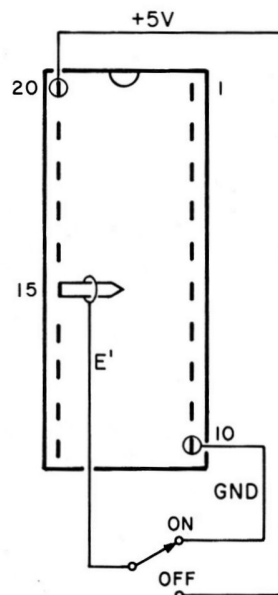
If more than one bootable device is connected to an Apple, the motherboard firmware boots the device connected to the highest numbered slot each time you do a power-up reset. Assuming your hard disk will work there, you can install its interface card in slot 7 and the floppy disk controller in slot 6. The hard disk will then be the boot drive.

Another option involves a little soldering to install an enable/disable switch for selecting hard disk or floppy disk autostart booting.

Wire an enable/disable switch to a 20-pin IC socket (see the Figure) and install the bootstrap (P5) ROM on the floppy disk controller through this wired socket. Then install the floppy disk controller in slot 6 with the enable/disable switch mounted on the back of the Apple and the hard disk interface card installed in a lower numbered slot.

The switch disables floppy disk booting, but doesn't disable floppy I/O if the Apple has a floppy DOS. If booting the hard disk brings hard and floppy drivers into RAM, you can probably leave the switch in the boot disable position at all times, except when programs can be run only by booting a floppy disk.

Figure. The bottom view of a floppy disk controller boot disable switch. The P5 ROM is inserted into this 20-pin IC socket. Solder wires at the bases of pins 10 and 20, so they make contact when this socket is inserted into the D3 socket on the controller. Bend down pin 15, so it doesn't make contact. When finished, mount this switch on the back of your Apple.



by Jim Sather

The accompanying **Figure** shows how to wire a boot disable socket that works on the disk controller Apple manufactures. First, you need to obtain any 20-pin IC socket and single-pole, double-throw switch. Bend pin 15 of the socket over so it doesn't make contact when inserted into another socket. Cut three 6-inch insulated wires (24-gauge, single-strand wire is recommended). Strip the wire ends and connect and solder the three wires as shown.

After wiring the socket and switch, remove the P5 ROM from its socket at location D3 on the controller. Insert the P5 ROM into the wired socket, and install them together into the vacated socket on the controller. A similar socket and switch can probably be devised for most alternate source disk controllers. The trick is to disable the bootstrap ROM while leaving other functions intact. As a last resort, you can always open the I/O SELECT line coming from pin 1 of the controller edge connector and install an enable/disable switch across the gap.

Rub-a-Dub-Dub

Is it okay to clean my disk drive read/write head with rubbing alcohol? Also, if I wanted to clean the read/write head of drive 1, I would insert a disk head cleaner and then boot the disk, but what would I do if I wanted to clean drive 2?

Soon Kim
Sun Valley, CA

Let me think. I used to clean heads when I was in the navy, but it's been a long time. Oh well. I'll give it a shot.

Sure you can use rubbing alcohol. I clean mine that way, although not very often. Just take the drive mechanism out of its enclosure, dip a cotton swab in alcohol, and rub-a-dub-dub. Check the condition of the felt pressure pad while you're at it, but be careful not to get alcohol on it.

Since the head cleaning kit you describe directs you to boot the drive, I assume its cleaning surface is on track 0. The assembly-language routine in the accompanying Program listing will turn on drive 2 and step it to track 0 so you can clean drive

Program listing. Assembly-language routine to prepare drive 2 for head cleaning.

1000: A2 60	LDX	#\$60	Assumes slot 6
1002: 86 2B	STX	\$2B	
1004: BD8E C0	LDA	\$C08E,X	Set controller to read
1007: BD8C C0	LDA	\$C08C,X	
100A: BD8B C0	LDA	\$C08B,X	Drive 2
100D: 4C38 C6	JMP	\$C638	Assumes slot 6

2. Nothing magic here, it just turns on drive 2 then jumps into the bootstrap routine on the disk controller. Enter this code with the monitor or miniassembler, then execute it (\$1000G from the monitor) to set up drive 2 for head cleaning. If your controller is not in slot 6, change the data at \$1001 from \$60 to \$n0, and change the data at \$100F from \$C6 to \$Cn where n is the controller slot number.

Franklin Works?

I own a Franklin Ace 1200 with a 16K RAM card, dual-interface card, 80-column card, Z-80 card, and disk controller. They are arranged in slots 0, 1, 3, 4, and 6, respectively.

I recently purchased Apple's new integrated software package, AppleWorks, and even with a ProDOS patch that lets me use ProDOS on the Franklin, I have been unable to get AppleWorks running. The disk will boot, present the ProDOS page, and then display the message APPLEWORKS WILL ONLY WORK ON AN 80-COLUMN //E.

Apple won't assist me in configuring the program to my Franklin, so I hope you can help.

Leonard Rosenthol
Willow Grove, PA

Sorry about that, Leonard; AppleWorks won't even work in an Apple II or II Plus, not to mention a Franklin. It is written to work only in an 80-column Apple //e or Apple //c. When a program is written for Apple //e, //c, and II Plus with various 80-column drivers, its structure must be adaptable to different hardware environments. If a program works only on the //e and //c, it's probable that rewriting it to support other computers and peripherals

will be too difficult to be worthwhile. I suspect that this is the case with AppleWorks, but perhaps a reader will prove me wrong and send a solution to the Apple Clinic.

Printer Command Problems

In regard to J. Chumley's letter in the October 1984 Apple Clinic, there is a simple solution for Apple Writer print command problems. I have an Apple //e and a C. Itoh Prowriter at home and a II Plus with an Epson in my high school classroom. Every time I tried to underline, I got something like t_h_i_s, just as Chumley did with his Epson.

Then I picked up a copy of *Minute Manual for Apple Writer //e* at a B. Dalton bookstore and found explicit directions for creating and saving to disk a glossary of print commands. Instead, I sent the author, Jim Pirisino (MinuteWare, P.O. Box 2392, Columbia, MD 21045), \$14.95 plus \$1 shipping for a ready-made glossary disk and first rate documentation. I am ecstatic with the results.

This disk works for all of the following printers: Epson FX, MX, and RX; Gemini 10, 15, and 10X; Okidata 92 and 83; Prowriter; Apple DMP or ImageWriter; and NEC 8023A. It does everything Pirisino said it would, and I didn't even have to pop the lid on my Apple. He also has "minute manuals" for a variety of other subjects.

Peggie Painter
Orlando, FL

Mr. Chumley's letter and the response in Apple Clinic created an influx of letters that confirms my prior belief that obtaining a formatted printout is one of the most confusing and frustrating things one can do with a computer. The letters

elaborated on the problems and solutions encountered when embedding Epson MX-80 printer commands in Apple Writer text files. Several readers sent in helpful letters that showed how to make an MX-80 with Grafrax Plus ROMs print in various formats from Apple Writer. But of all the solutions, I like Peggie's the most because it lets Mr. Pirisino do all the work.

Reading about the printer control functions in the letters was educational for me since I don't use this type of printer. (I use an adapted IBM Selectric, a COEX 80, and a little 40-column thermal printer that I bought in Tokyo.) Unfortunately, I found some contradicting statements, and it was sometimes hard for me to tell whether or not Grafrax Plus or Grafrax 80 was necessary for a printer command to work.

I went to B. Dalton and picked up copies of the Minute Manual for Apple Writer II (MinuteWare, 1983) and Minute Manual for Apple Writer //e (MinuteWare, 1983) and found them to be concise and helpful guides to Apple Writer II and Apple Writer //e. Both manuals give valuable printer-control information, including detailed sequences for subscripting and superscripting in normal, emphasized, and double-strike mode. The //e manual also explains that Apple Writer //e cannot superscript or underline with Epson MX printers because it cannot send the control-@ command to a printer.

These manuals are a good buy at \$7.95 each. They do not, however, describe the control of Epson printers clearly enough that an Epson novice like me has no further questions. But I did find a book that finally put together the remaining pieces of the puzzle: The Epson Connection: Apple by W.H. Darnall and D.B. Corner (Reston, 1984, \$16.95 at B. Dalton). Among numerous other features, this book has tables that show control of all Epson dot-matrix printers, including very old MX printers with type I firmware, old type II firmware, Grafrax 80 firmware, and Grafrax Plus firmware. It also provides an easy means of identifying the type of firmware in an MX printer.

For readers seeking much information about Epson printers, I rec-

Table. Some MX-80 control codes.

Shift Key Mod	No Shift Key Mod	Function
ESC - CTRL-A	ESC ESC - CTRL-A	Underline on*
ESC - CTRL-@	ESC ESC - CTRL-@	Underline off*
ESC 4	ESC ESC 4	Italics on**
ESC 5	ESC ESC 5	Italics off**
ESC SHFT-E	ESC ESC ESC E	Emphasized on
ESC SHFT-F	ESC ESC ESC F	Emphasized off
ESC SHFT-G	ESC ESC ESC G	Double strike on
ESC SHFT-H	ESC ESC ESC H	Double strike off
ESC SHFT-S CTRL-A	ESC ESC ESC S CTRL-A	Subscript on*
ESC SHFT-S CTRL-@	ESC ESC ESC S CTRL-@	Superscript on*
ESC SHFT-T	ESC ESC ESC T	Subscript/superscript off*
ESC SHFT-U CTRL-A	ESC ESC ESC U CTRL-A	Unidirectional print on*
ESC SHFT-U CTRL-@	ESC ESC ESC U CTRL-@	Unidirectional print off*
ESC <	ESC ESC <	Unidirectional (one line)
CTRL-O	CTRL-O	Compressed print on
CTRL-R	CTRL-R	Compressed print off
CTRL-N	CTRL-N	Double width on
CTRL-T	CTRL-T	Double width off
CTRL-H	CTRL-H	Backspace***
* Requires Grafrax Plus firmware.		
** Requires Grafrax 80 or Grafrax Plus firmware.		
*** Requires Type II, Grafrax Plus, or Grafrax 80 firmware.		

ommend The Epson Connection: Apple. For those interested in Apple Writer II and //e and some valuable printer information, I recommend Pirisino's minute manuals. If you don't care how the printer works, Peggie's recommendation of the MinuteWare glossary disks sounds good.

The single fact that sticks in my mind after reading up on Epson printers is that owners of MX printers should have the Grafrax Plus firmware installed if it isn't already. Both Grafrax 80 and Grafrax Plus firmware support Apple hi-res dumps, but the Grafrax Plus firmware is necessary for subscripting, superscripting, and convenient underlining. The accompanying Table shows some MX-80 control functions that letter writers indicated they are interested in. These codes are embedded in text in Apple Writer by preceding and following them with control-V.

Jack Rickling (Cape Canaveral, FL) wrote to say that, with an Apple II or II Plus, shift-control-M can be used in place of the space bar to underline the blank spaces between words. He also said he was having trouble embedding the code for escape in edit mode. It is possible, Jack. Press control-V, escape, escape, control-V if Apple Writer is

configured for shifting via the escape key, and press control-V, escape, control-V if Apple Writer is configured for shifting via the shift-key mod.

Anthony Brancato (Merchantville, NJ) sent a letter asking how to make ACEWriter II print superscript and subscript on a Franklin Ace 1000, Epson FX-80, and Grappler Plus interface card. I am not familiar with ACEWriter II, Anthony, but most word processors provide some way of embedding control character ASCII in the normal text (similar to Apple Writer's control-V feature). If you can find that procedure in the ACEWriter reference manual, then the control codes in the Table will work on the FX-80. Refer to "The Docile Printer" by James Munro (February 1985, p. 75) for more information on control codes. ■

Jim Sather is an author, engineer, and computer programmer specializing in the Apple II line of computers. He has experience in electronic circuit design and repair, and has spent the better part of the last two years investigating and writing about Apple II hardware. His works include the books Understanding the Apple II and Understanding the Apple IIe, and design of the quikLoader firmware card and operating system. Address your mail to Jim c/o Apple Clinic, in-Cider, 80 Pine Street, Peterborough, NH 03458.



Cottage Industry Consultants

During the 1970s, a company wasn't on a par with its peers if it didn't have its own computer installation. Microcomputers didn't count. By and large, there were none. But individual companies had to spend about a million dollars on the latest in mainframe or minicomputer power.

Ironically, by the turn of the decade, many of these companies were trying to sell off their free computer time. Apparently, they weren't generating enough continuous work for the machines to pay for themselves. It happens.

A time-sharing cottage industry evolved from that situation. Anyone with a modem and a multiplexer thought that time on his mainframe system could be marketed to others who needed it but couldn't afford an albatross of their own. Like all such ventures, some succeeded and some failed. The dividing line was in their professionalism.

Imitation Is the Sincerest Form of Imitation

As we rapidly parallel those conditions today in the personal computer domain, it's not surprising that quite a few people with micros feel that they can expand their expertise as cottage-industry entrepreneurs.

When people began by writing and marketing games, there was really no harm in it. A game was good or bad, depending on your own judgment, and that was the end of the matter.



Illustration by Richard Cowdrey

Even when they began creating canned home and business software you had some leeway. If a package was good, it survived. If it wasn't quite up to par, then it vanished. Darwinian principles determined survival in the early history of software development.

Now, with a few years of micro experience under their belts, some people feel they can come into your business and advise you, and even create the "correct" programs for your operation. If you have never courted disaster before, the situation is rife with opportunity.

Foundation

Before going any further, I want you to grab a pen and write something down on your desk calendar—or on the wall next to you. They're just some words of wisdom I want you to be reminded of whenever your eyes leave the page:

"The only successful business is one run on sound and practical ideas. The

Your small business can benefit from the advice—and consent—of both analyst and programmer.

by Bill O'Brien

only successful business person is one who understands the principles upon which his or her company operates." We'll come back to this in a moment.

In the course of your war to squeeze productivity from your microcomputer, at some time or other you'll be approached by someone who says he or she has the ultimate computer solution to all of your problems. It's a possibility.

When that happens, you must be aware enough to realize that you shouldn't hire the bug-eyed kid with the bulbous head, thick glasses, and spidery fingers just because he or she fits the stereotype of what a "computer person" should look like.

If you do find yourself in need of computer talent, you should look for two distinct types of individuals. One is a consultant; the other, a programmer. Both rarely come in the same package, though they are as integral to each other as day and night. You'll find yourself very involved with the former and, hopefully, never involved with the latter. Let's find out why.

Parameters

Before you call someone in to help, return to our motto above. No one can assist you if you don't thoroughly understand what's happening in your own operation. You must be aware of where every piece of paper comes from, who handles it, what they add or detract from it, and where it goes from there. If you can't track your own paperwork, don't expect that anyone else can.

Likewise, if your business is doing poorly, don't expect a computer consultant or programmer to come in and make everything right. If you need to establish correct operating procedures, see a business analyst first. Computers, programs, and people can't manufacture Band-Aids to heal your boo-boo. All the magicians have passed on.

Once you've assured yourself that your business is sound, and therefore your procedures are correct, then you can start to computerize. First find yourself a consultant. That's not as easy as it sounds. The stories of people passing themselves off as consultants, taking money, and then making a mess of everything could fill this magazine ten times over.

The Road Signs

A consultant is a situation analyst. His or her job is to come into your operation, observe it for a period of time, analyze the findings, and present you with a report or "needs analysis."

For several days, this person will be looking everything over, poking his or her nose into places you didn't think existed. A consultant will pester you and your employees with questions about why things are done a particular way.

That's very different from going down to your local computer store, explaining your situation to the salesperson, and getting a quote on equipment and software. For one thing, in the store you'll never tell the salesperson the truth. Whether you mean to or not, it's a fact of life that certain basic ways you do things slip back into the subconscious after you've been doing them a while.

After the consultant has poked, probed, and questioned, the needs analysis you're handed should be somewhat of a surprise to you. Not only should it cover what you already know, but it should also point out things you had forgotten or were unaware of. It had better—consultants are expensive.

A reasonable, low-end price would be about \$250 per day. And the price goes up depending upon a variety of factors. A typical analysis of your operation could take as few as three days, but may take several weeks, depending on its complexity.

Forewarned Is Forearmed

Once your analysis has been completed, your next job is to sit down with the consultant and smooth out the rough edges. The documentation that follows will be a joint effort.

Using the analysis as a foundation, you and your consultant should arrive at your system specifications. The results become your ironclad contract spelling out what can, can't, should, and shouldn't be automated. If you haven't as yet purchased the hardware, this is also the time to decide what it should be.

Use your own judgment to gauge your consultant's accuracy. If you're doing volume printing of accounts receivable statements, you don't really

want a letter printer. They're too slow. If you're sending letters out for solicitation, you don't want a dot-matrix printer. They're never good enough. If you need both, get both.

In all things, your consultant should prove sensible. If it's suggested that you use merely a dual-floppy Apple system to handle your 20,000 customers, you should immediately become suspicious of his or her qualifications. Common sense doesn't shrivel up and blow away on the day you consider computerizing.

Up the Ladder

When you have the system specifications in hand, bring in the programmer. And have the consultant—not you—do the hiring. You're paying the consultant for the job. You don't want two sets of fingers pointed with the fatal words "Well, he said..." followed by "But she said...". The consultant becomes the project manager, responsible for the productivity and accuracy of the programmer's work.

If you think about it, armed with the specifications, a consultant should require only an hour or two per day of simple supervision to be assured that the programmer is actually following the plan. And most consultants will have some association with a variety of programmers in an equally wide area of specializations.

Understanding the Rules

Don't assume that the programmer knows how to program. You should expect some proof of that before the work begins. Before starting, you should receive a program specifications book for your approval. This book should contain sample data entry screens as they'll appear in your program.

After studying your business, the consultant should be able to tell whether your employees will be able to understand these screens. You must get involved in this phase as well. Take samples around to those who will be using them. Find out if they can work with them. The format of the entry screens should approximate that of the paperwork they're used to.

The programming book should also contain file definitions. These explanations of the various files and data

SCRG PRODUCTS FOR THE APPLE COMPUTER

SWITCH-A-SLOT



\$179.50

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

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

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

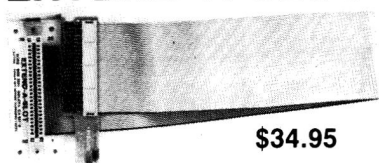
New—resistive terminations for better response



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



EXTEND-A-SLOT



\$34.95

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

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

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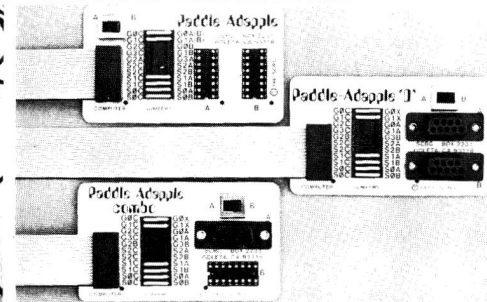
EASY TO USE—just plug it in as you would any expansion card, then plug your card in. When you want to change cards, do it easily outside the computer, without the wear and tear on the computer expansion slot.

OTHER PRODUCTS

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

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

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- Works with all Apple compatible joysticks, paddles and other I/O devices.
- Select one of two devices or . . .
- Use 4 paddles simultaneously.
- Unique "Jumpers" socket allows you to configure to meet your needs.
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- All Strobes, annunciators and power available on all 16 pin connectors.
- Supplied with 18" cable.

\$29.95

The **Paddle-Adapple** has two 16 pin sockets

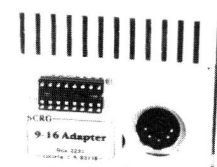
The **Paddle-Adapple "D"** works with the subminiature D connectors.

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

NEW 9-16 Adapter

For Apple //e and //c

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



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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 from 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 TIBBITT 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 O. A disk drive is required to save data.

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

\$179.50

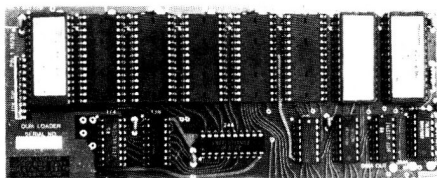
PROmGRAMER™

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

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

\$149.50

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 appropriate royalties), or the author can take care of all marketing. In either case, we will make known to our customers the availability of these programs.

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fields are important. As the program grows, the definition sections should get thicker. Later, if you want modifications made to the program, this book will serve as another programmer's bible.

When the program is finished, insist on the definitions. If there is some reluctance to provide you with them, you might show the same reluctance to submit payment until the definitions materialize in a format that is both complete and comprehensible.

But don't mistake these definitions for program documentation. That's your bible and as important to you as it is to the people using the system. Documentation should be clear and concise, with adequate illustrations of startup and data entry procedures and should be equally lucid about problem-solving. A manual isn't "correct" if people already familiar with your business can't use the system in a short while.

General Rules

If the programmer is working at your location, don't bother him or her. You wouldn't interrupt an employee in order to discuss either the machine he or she is working on or the future of the business; likewise, don't disrupt the programmer's labor.

Most contracts are written to ensure that the programmer receives a set amount based on an assumed hourly rate for a projected number of hours. A good contract will have a small overrun written into it.

But the best way to get the job off to a flying *stop* is to interfere. Your contact is with the consultant who is also getting a share of the fee. If the programmer can't get any work done because you're taking up half the day *kvetching*, he or she will complain to the consultant, who will complain to you.

If this cycle continues, you may well find yourself with partially completed software and no one to finish the job. People in the industry do talk to each other. If you're pegged as a pain, the price goes up—unless no one's willing to work with you at all.

Don't make changes while the programming is in progress. The right time for that is while you're outlining the system specifications. Later, changes are costly and time-consuming. "Oh, but I didn't realize" isn't an

excuse. Ask all your questions before the fingers start tapping at the keyboard.

Payment

Payment is always a touchy subject. One side wants to be assured of getting paid, the other of getting what they paid for. Programmers and consultants have been burned as many times as have the people who use them. There are some general guidelines, however. Needs analyses are always paid for in full when the first report is handed over. After that, there are quite a few variations.

The usual procedure is the 40-30-30 plan. When you sign the contract agreeing to the system specifications, you also hand over 40 percent of the agreed amount. Midway through the specified completion period, and after some results have been demonstrated, you pay another 30 percent.

Finally, when the programming is done, and is shown to be in working order, you pay the last 30 percent. After that, are you left in the lurch? No. Wisely, you've had a support period written into the contract. For an agreed-upon period of time, at an agreed-upon price (if it's not included in the overall amount), the consultant will be available to answer questions either by phone or in person.

A warranty, also included in the contract, should guarantee that, for a specified period of time, the program will perform as outlined in the specifications. During that period, any and all flaws will be corrected at no charge.

Anticipate finding a few bugs. Some situations can't be adequately tested until the program is in use. Obviously, the system shouldn't crash every time you make a menu selection. But flaws should be weeded out in the first six months of use—while you're using your old manual system at the same time.

Should you still have problems after that, refer to the other section of the contract—sometimes called the Sanity Clause—stating you're due a refund if the program proves unusable.

On the other hand, if, by mutual agreement, your software and computer system were designed to handle a specific maximum amount of work and your business exceeds that quantity, don't expect a free fix. Always have the hardware and software orga-

nized so that they will handle 10 percent more work than you thought possible.

The Last Hurrah

Following all of the above recommendations, you should be able to get your system up and running well. Some final warnings are in order: Check references (and don't be afraid to ask for them). Expect to get what you're willing to pay for, and don't expect more than what you are paying for. Haggling is great for souvenir-buying at the Pyramid of the Sun. Leave it there.

Don't hire a friend either as a programmer or as a consultant. You won't be friends by the time the project's over (if, in fact, it is ever completed). And most importantly, remember that your Apple and the software written for it are tools. Had you never used a fork, you might expect that eating with one would prove a little difficult at first. That's predictable. Just make sure you're not trying to use it for soup.

Keeping all this in mind, you may be able to get your business "on-line" like the Joneses'. But finally, consider that not every business benefits from being computerized. Trends notwithstanding, sometimes the manual system is the better of the two.

A Quick Close

Thank you for the letters. I'm trying to answer as many as time permits. Please try not to forget the SASE (self-addressed, stamped envelope) if you want a reply. So far, I haven't discriminated, but that's bound to change especially as the postal rates climb.

I've been remiss in my CompuServe account. If you've left mail for me there and I haven't gotten back to you, I apologize. That should have changed by the time you read this.

If you're on CompuServe and haven't joined MAUG (Micronet Apple User's Group) yet, you're missing something. It's not a copy-protection breaking ring, as can be found in some other services. They're just plain folk who know enough to help each other out. Try them—telecommunications shouldn't be wasted on the young. ■

Contact Bill O'Brien at P.O. Box 1010A, Fort Lee, NJ 07024 or through CompuServe at user ID 74216,1215.

Ampersand Printing

This month I bring you a couple of hi-res character generators with special talents. They are based on ampersand routines, rather than the usual input/output "hook" changes. First, let's define some terms.

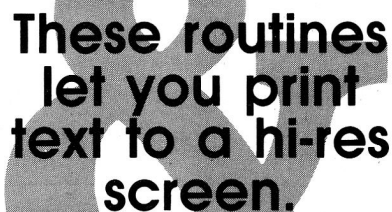
A *hi-res character generator* is a machine-language routine that enables you to print upper- and lowercase text to a hi-res graphics screen (screen 1 at RAM addresses \$2000-\$3FFF hex and/or screen 2 at addresses \$4000-\$5FFF) instead of to the text screen. Normal BASIC PRINT statements cannot address hi-res graphics screens.

Hi-res character generators commonly use input/output hook changes to make BASIC PRINT statements display on hi-res. *Input/output hooks* are locations very low in memory (on the zero page, \$0-\$FF) that specify where input and output will go. Locations \$38 and \$39 (56 and 57 decimal) are input hooks; locations \$36 and \$37 (54 and 55) are monitor output registers and DOS output hooks. Changing the latter hooks by POKEing into 54 and 55 makes PRINTing occur elsewhere than on the text screen.

An *ampersand routine* is a machine-language routine that is triggered by an ampersand character (&) in an Applesoft program, as in the line: 10 & "HELLO". The hi-res character generators in this article, HRCG1 (**Listing 1**) and HRCG2 (**Listing 2**), are run from ampersand routines. Input/output hooks are not used at all.

Why It's Better to &PRINT

There are definite advantages to using ampersand-driven hi-res character



These routines
let you print
text to a hi-res
screen.

generators over conventional generators. They include:

- 1) *Memory savings.* The conventional routine I used before took up five pages of memory, counting the character table that went with it, and the character table had to start at an even \$N000 or \$N800 (N being any digit). This meant that the routine commandeered about eight pages of memory. My routines require \$6E and \$8C bytes, respectively, and my character table uses \$300 bytes, a total of only about three-and-one-half pages.
- 2) *Display and printout savings.* Normal PRINT statements waste space in displays and printouts. It's true you can type "?" rather than "PRINT" when keying them in, but later when you run them out you'll find the word "PRINT" all through your listings. With HRCG1 and HRCG2, the & remains and there's no unwanted line expansion.
- 3) *Speed.* The & sends execution into machine-language interpreting immediately.
- 4) *No need to change input/output*

hooks. Three POKEs (explained below) at the beginning of your Applesoft program are all you need to make the program work with my generators. With normal generators you have to use several POKEs (and other commands, such as TEXT, PR#0, IN#0, and PRINT" ") every time you switch from text to hi-res graphics screen prints.

5) *DOS remains active.* In normal generators, locations \$36 and \$37 are DOS output hooks, as well as monitor output registers, so DOS is disabled during hi-res printing. This doesn't happen with my generators.

6) *Permanent tabbing.* In the routine I formerly used, the PRINT statements would take HTAB values, but once the string being printed hit the right edge of the screen, the next character would always fall on the next line at HTAB1. Therefore, if I were indenting an entire paragraph, I had to specify an HTAB for every line. My routines, on the other hand, retain an HTAB setting until it is reset.

There is one advantage to conventional generators: PRINT commands can be dual-purpose—that is, they can work on both text and graphics screens (depending on input/output hook POKEs).

The Programs

I assembled HRCG1 and HRCG2 on my Apple with a Lisa assembler. To work, they need a character table. Block shape tables are best for this purpose, because block shapes are speedier than vector shapes. The block shape table in this article is called BLOCKCHAR. Find it in **Listing 3**.

by Don Fudge

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If you'll be using your generator to label graphs and pictures, and are, therefore, content with single-line capacity, use HRCG1. If you'll need paragraphs and, therefore, multiple-line capacity, use HRCG2. HRCG2 automatically wraps around from the bottom to the top of the screen. It also offers the permanent HTABing.

Incidentally, with my generators in effect you can still PRINT normally, and PRINTs and &PRINTs can occur in the same program line with no commands in between.

Type in HRCG1 or HRCG2 (or both) and save it with BSAVE HRCG1, A\$1C92, L\$6E or BSAVE HRCG2, A\$1C74, L\$8C. Refer to "Beginner's Cookbook" on p. 110 to learn how to enter hex listings. Now key in BLOCK-CHAR, saving it with BSAVE BLOCK-CHAR, A\$1D00, L\$300.

There is a little detail you must take care of before you can begin printing text to the hi-res screen. Page 3 (\$300-\$3FF) in memory has a few locations near the end known as jump vectors. The ampersand jump vector locations begin at \$3F5 and end at \$3F7 (decimal 1013-1015). These vectors tell your Apple's program interpreter where to go when it encounters an ampersand command.

The "little detail" is to POKE the proper numbers into these jump vector locations so an ampersand will send your program interpreter to HRCG1 or HRCG2. HRCG1 starts at \$1C92 and requires POKE 1013,76 : POKE 1014,146 : POKE 1015,28. HRCG2 starts at \$1C74 and needs the same three POKES, except for changing POKE 1014,146 to POKE 1014,116. These POKES need to happen once only, either in your Applesoft program (preferably at the beginning) or in a hello program.

The Test Programs

TEST1 (Listing 4) demonstrates how HRCG1 works, TEST2 (Listing 5) demonstrates how HRCG2 works, and TESTLC (Listing 6) demonstrates how to change uppercase text to lowercase if you have an Apple with no upper/lowercase keyboard. Type in and SAVE any of these listings that are appropriate for you. Make sure POKE 104,64 and POKE 16384,0 appear in the program that runs prior to the test programs.

Listing 1. HRCG1.

```
1C92- A5 25 0A 0A 0A A0
1C98- 00 A2 00 20 11 F4 A5 26
1CA0- 85 08 A5 27 85 09 A2 01
1CA8- 86 BF 20 B1 00 C9 22 D0
1CB0- 07 E6 B8 A2 20 86 BF 60
1CB8- 20 C3 1C E6 24 20 B1 00
1CC0- 4C AD 1C A2 00 86 07 85
1CC8- 06 06 06 26 07 06 06 26
1CD0- 07 06 06 26 07 18 A5 07
1CD8- 69 1C 85 07 A5 08 85 26
1CE0- A5 09 85 27 A2 00 A0 00
1CE8- B1 06 A4 24 91 26 A5 27
1CF0- 18 69 04 85 27 E8 E0 08
1CF8- F0 04 E6 06 D0 E8 60 00
```

Listing 2. HRCG2.

```
1C74- A2 01 86 BF
1C78- A6 24 86 19 A5 25 85 E3
1C80- 0A 0A 0A A0 00 A2 00 20
1C88- 11 F4 A5 26 85 08 A5 27
1C90- 85 09 20 B1 00 C9 22 D0
1C98- 07 E6 B8 A2 20 86 BF 60
1CA0- 20 C4 1C E6 24 A6 24 E0
1CA8- 28 90 13 A6 19 86 24 E6
1CB0- 25 A6 25 E0 18 90 04 A2
1CB8- 00 86 25 4C 7C 1C 20 B1
1CC0- 00 4C 95 1C A2 00 86 07
1CC8- 85 06 06 06 26 07 06 06
1CD0- 26 07 06 06 26 07 18 A5
1CD8- 07 69 1C 85 07 A5 08 85
1CE0- 26 A5 09 85 27 A2 00 A0
1CE8- 00 B1 06 A4 24 91 26 A5
1CF0- 27 18 69 04 85 27 E8 E0
1CF8- 08 F0 04 E6 06 D0 E8 60
```

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```

1D00- 00 00 00 00 00 00 00 00
1D08- 04 04 04 04 04 04 04 00
1D10- 0A 0A 0A 00 00 00 00 00
1D18- 0A 0A 1F 0A 1F 0A 0A 00
1D20- 04 1E 05 0E 14 0F 04 00
1D28- 03 13 08 04 02 19 18 00
1D30- 02 05 05 02 15 09 16 00
1D38- 04 04 04 00 00 00 00 00
1D40- 04 02 01 01 01 02 04 00
1D48- 04 08 10 10 10 08 04 00
1D50- 04 15 0E 04 0E 15 04 00
1D58- 00 04 04 1F 04 04 00 00
1D60- 00 00 00 00 00 04 04 02
1D68- 00 00 00 1F 00 00 00 00
1D70- 00 00 00 00 00 00 04 00
1D78- 00 10 08 04 02 01 00 00
1D80- 0E 11 19 15 13 11 0E 00
1D88- 04 06 04 04 04 04 0E 00
1D90- 0E 11 10 0C 02 01 1F 00
1D98- 1F 10 08 0C 10 11 0E 00
1DA0- 08 0C 0A 09 1F 08 08 00
1DA8- 1F 01 0F 10 10 11 0E 00
1DB0- 1C 02 01 0F 11 11 0E 00
1DB8- 1F 10 08 04 02 02 02 00
1DC0- 0E 11 11 0E 11 11 0E 00
1DC8- 0E 11 11 1E 10 08 07 00
1DD0- 00 00 04 00 04 00 00 00
1DD8- 00 00 00 04 00 04 04 02
1DE0- 08 04 02 01 02 04 08 00
1DE8- 00 00 1F 00 1F 00 00 00
1DF0- 02 04 08 10 08 04 02 00
1DF8- 0E 11 08 04 04 00 04 00
1E00- 0E 11 15 1D 0D 01 1E 00
1E08- 04 0A 11 11 1F 11 11 00
1E10- 0F 11 11 0F 11 11 0F 00
1E18- 0E 11 01 01 01 11 0E 00
1E20- 0F 11 11 11 11 11 0F 00
1E28- 1F 01 01 0F 01 01 1F 00
1E30- 1F 01 01 0F 01 01 01 00
1E38- 1E 01 01 01 19 11 1E 00
1E40- 11 11 11 1F 11 11 11 00
1E48- 0E 04 04 04 04 04 0E 00
1E50- 10 10 10 10 10 11 0E 00
1E58- 11 09 05 03 05 09 11 00
1E60- 01 01 01 01 01 01 1F 00
1E68- 11 1B 15 11 11 11 11 00
1E70- 11 11 13 15 19 11 11 00
1E78- 0E 11 11 11 11 11 0E 00
1E80- 0F 11 11 0F 01 01 01 00
1E88- 0E 11 11 11 15 09 16 00
1E90- 0F 11 11 0F 05 09 11 00
1E98- 0E 11 01 0E 10 11 0E 00
1EA0- 1F 04 04 04 04 04 04 00
1EA8- 11 11 11 11 11 11 0E 00
1EB0- 11 11 11 11 11 0A 04 00
1EB8- 11 11 11 15 1B 11 00
1EC0- 11 11 0A 04 0A 11 11 00
1EC8- 11 11 0A 04 04 04 04 00
1ED0- 1F 10 08 04 02 01 1F 00
1ED8- 1F 03 03 03 03 03 1F 00
1EE0- 00 01 02 04 08 10 00 00
1EE8- 1F 18 18 18 18 18 1F 00
1EF0- 00 00 04 0A 11 00 00 00
1EF8- 00 00 00 00 00 00 01 1F
1F00- 02 04 08 00 00 00 00 00
1F08- 00 00 0E 08 0E 09 1E 00
1F10- 01 01 0D 13 11 13 0D 00
1F18- 00 00 1E 01 01 01 1E 00
1F20- 10 10 16 19 11 19 16 00
1F28- 00 00 0E 11 1F 01 0E 00
1F30- 0C 12 02 07 02 02 02 00
1F38- 00 00 16 19 19 16 10 0E
1F40- 01 01 0D 13 11 11 11 00
1F48- 04 00 06 04 04 04 0E 00
1F50- 04 00 06 04 04 04 05 02
1F58- 01 01 09 05 03 05 09 00
1F60- 06 04 04 04 04 04 0E 00
1F68- 00 00 0B 15 15 15 15 00
1F70- 00 00 0D 13 11 11 11 00
1F78- 00 00 0E 11 11 11 0E 00
1F80- 00 00 0F 11 11 0F 01 01
1F88- 00 00 0E 09 09 0E 08 18
1F90- 00 00 0D 13 01 01 01 00
1F98- 00 00 1E 01 0E 10 0F 00
1FA0- 04 04 0E 04 04 04 04 00
1FAB- 00 00 11 11 11 11 0E 00
1FB0- 00 00 11 11 11 0A 04 00
1FB8- 00 00 11 15 15 15 0A 00
1FC0- 00 00 11 0A 04 0A 11 00
1FC8- 00 00 11 11 11 1E 10 0E
1FD0- 00 00 1F 08 04 02 1F 00
1FD8- 1C 02 04 03 04 02 1C 00
1FE0- 02 04 08 10 08 04 02 00
1FE8- 07 08 04 18 04 08 07 00
1FF0- 02 15 08 00 00 00 00 00
1FF8- 7F

```

F U D G E I T !

Run TESTLC with HRCG1 and BLOCKCHAR on your disk. You'll see strings printed in uppercase, then in lowercase. TESTLC is &PRINTing the uppercase strings normally, and then changing the strings to lowercase, and finally printing these edited strings. To change the strings, the program has to locate the Applesoft program TESTLC in memory and then find double quotes. It changes all the characters after those quotes and before the next ones. It continues until the program's end, symbolized by three zeroes in a row in Applesoft. Hit control-reset to stop the program, but don't press reset while your drive is running.

Incidentally, so the letters in double quotes in line 5 of TESTLC won't be changed (they're not &PRINT command strings), only quotes following ampersands are counted as fair game. Double quotes are ASCII 34 and ampersands are tokenized with \$AF (175 decimal). Clicks mean "ampersand is found." To turn a letter's ASCII value into the lowercase value, we simply add 32.

Carriage Return and Line Feed

I didn't require the (invisible) hi-res text-printing cursor in HRCG1 and HRCG2 to jump down a line after doing an &PRINT, so you'll find no simulated carriage returns and line feeds. The cursor moves down only when printing reaches the right screen boundary. If you &PRINT, do a calculation, and then return to &PRINTing, your cursor will be where you left it.

If you'd like to add a carriage return and line-feed effect, type:

```
10 & "HELLO": PRINT
```

Then change HRCG2 by typing the following:

```
BLOAD HRCG2
CALL - 151
```

Listing 4. TEST1.

```

0 REM TEST1
2 POKE 1013,76: POKE 1014,146: POKE 1015,28
5 D$ = CHR$(4): PRINT D$ "BLOADB
LOCKCHAR": PRINT D$ "BLOADHRC
G1": HGR: POKE - 16302,0
20 HTAB 20: VTAB 12: & "TEST"
30 & "NO AUTO-SCROLL"
40 HTAB 1: VTAB 1: & "THIS IS ON
LY A TEST!"
50 HTAB 40: VTAB 24: & ", "
60 HTAB 3: VTAB 3: & "goldfish."

```

```

1C6E<1C74.1C9EM
1C99:E6 25 A9 00 85 24
control-C-return
BSAVE HRCG2,A$1C6E,L$92

```

Finally, change line 2 in TEST2 so that 110, not 116, is POKEd into 1014.

These hi-res character generators offer all sorts of possibilities for combining graphics screens and text. Labeling pictures and splitting the screen into half graphics and half text are a couple of examples. Have fun experimenting and. . .

See you next time! ■

You can write to Don Fudge at Avant-Garde, P.O. Box 30160, Eugene, OR 97403.

Listing 5. TEST2.

```

0 REM TEST2
2 POKE 1013,76: POKE 1014,116: POKE 1015,28
5 D$ = CHR$(4): PRINT D$ "BLOADB
LOCKCHAR": PRINT D$ "BLOADHRC
G2": HGR: POKE - 16302,0
20 HTAB 20: VTAB 12: & "TEST"
30 & "NO AUTO-SCROLL"
40 HTAB 1: VTAB 1: & "THIS IS ON
LY A TEST!"
50 HTAB 40: VTAB 24: & ", "
60 HTAB 3: VTAB 3: & "goldfish."
70 HTAB 21: VTAB 22: & "12345678
9012345678901234567890123456
7890123456789012345678901234
5678901234567890123456789012
3456789012345678901234567890
1234567890123456789012345678
901234567890123"

```

Listing 6. TESTLC.

```

0 REM TESTLC
2 POKE 1013,76: POKE 1014,146: POKE 1015,28
5 D$ = CHR$(4): PRINT D$ "BLOADB
LOCKCHAR": PRINT D$ "BLOADHRC
G1": HGR: POKE - 16302,0
20 HTAB 20: VTAB 12: & "TEST"
30 & "NO AUTO-SCROLL"
40 HTAB 1: VTAB 1: & "THIS IS ON
LY A TEST!"
50 HTAB 40: VTAB 24: & ", "
60 HTAB 3: VTAB 3: & "GOLDFISH."
70 HTAB 10: VTAB 10: & "LOWER"
80 FOR A = 16384 TO 20000: B = PEEK
(A): IF B = 0 THEN IF PEEK
(A + 1) = 0 AND PEEK (A + 2)
= 0 THEN PRINT CHR$(7):
CALL 54915: PRINT CHR$(13)
): GOTO 0
90 IF B = 175 THEN GOSUB 200: P =
PEEK (- 16336) + PEEK (-
16336)
100 NEXT
200 C = A + 2
210 D = PEEK (C): IF D = 34 THEN
RETURN
220 IF D < 91 AND D > 64 THEN POKE
C,D + 32
225 C = C + 1: GOTO 210

```


The Efficient BASIC Sort

In my January column, I presented two simple procedures for sorting an array of data elements, the bubble sort and the exchange sort. Both of these techniques involve rearranging the data elements so that the resulting array will be in alphanumeric order. Though easy to understand, neither of these sorts is suitable for most real-life situations.

For one thing, both techniques are very slow. Each time a data element is found that needs to go in a different location, the computer must manipulate at least three strings to accomplish the move. Usually data is kept in tandem in several related arrays, and during a sort in which the elements within one array must be exchanged, the corresponding elements in all the other arrays must be exchanged also.

Another disadvantage to having your data "physically" arranged in a given order is that the entire file must be re-sorted each time new additions are made to the data set. If you have 2000 items in your inventory and must

The binary search and the indexed array produce a "jet-age" sorting procedure.

conduct a fresh sort each day, you will be ready to sell your computer and return to your old card-filing system before the first month is out.

A third disadvantage is that only one criterion may be used on which to base the sort. For example, suppose you wished to maintain a file that contained the names of your business clients, their account numbers, and their addresses, along with other information. At any given time you could have this file organized by name, by account number, or by ZIP code. Then each time you wanted to reference the file based on a different scheme you would have to wait while the computer re-sorted the entire file accordingly.

There is a way out of these three dilemmas: a procedure called the indexed sort/merge. With this technique, the elements in your array are never actually rearranged, and new elements go in the most convenient available spot. Yet this array can be searched, displayed, or printed at any time, based on any of several criteria. No time is lost waiting for the computer to conduct a sort operation.

The Binary Search

Before discussing the indexed sort/merge technique, it is important that you fully understand a concept that forms its basis: the binary search. The binary search is a very fast method for locating a given item within a sorted array, or for locating where a new item should be merged into a sorted array.

The array must be accessible in sorted order for this technique to work, and you must know how large the array is. As you begin the search, the first and last elements of the array are the limits of the search. First you calculate the middle item between these limits, then compare this middle element with the item you are searching for. If your search item is larger than (comes after) the middle element, you need no longer search the first half of the array, and vice versa.

So, your next step is to redefine the search range so the middle element just selected becomes one limit, there-

Figure 1. Using a binary search to locate the word "monopoly" in a dictionary. The illustration shows the dictionary after the first two accesses.

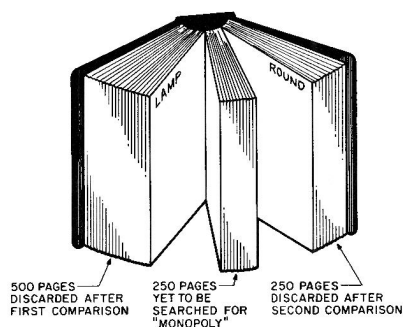
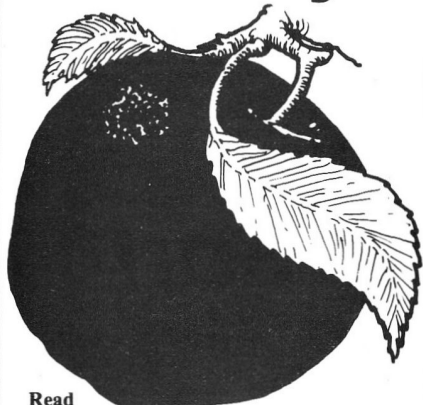


Figure 2. A sort-index array associated with a data array containing a list of breakfast items. Note that the values in the index array are subscripts from the data array that reference the data elements in alphabetical order.

ARRAY A\$(i)		INDEX ARRAY AI(i)	
1	EGGS	2	1 A\$(1) = "EGGS"
2	BACON	9	2. BUT
3	HAM	1	A\$(AI(1)) = "BACON"
4	SAUSAGE	3	
5	MILK	8	
6	TOAST	7	
7	JUICE	5	
8	HOTCAKES	4	
9	COFFEE	6	
10		10	
11		11	
12		12	

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Program listing. A sample program to illustrate the index sort/merge method of ordering data elements and to show how a binary-search process functions.

```

9  REM *** INDEXED SORT/MERGE EXAMPLE ***
10 HOME :N = 26 * 3: REM NUMBER OF ITEMS IN ORIGINAL
    LIST TO BE SORTED.
15 DIM A$(110),AI(110)
20 GOSUB 1000: REM LOAD ARRAY TO BE SORTED
25 FOR I = N + 1 TO 110:A$(I) = " ": NEXT I: REM B
    LANK UNUSED ARRAY ELEMENTS
30 GOSUB 300: REM DISPLAY UNSORTED ARRAY
35 HTAB (1): PRINT "SORTING...ONE MOMENT PLEASE...";:
    GOSUB 100: REM SET UP AND SORT INDEX ARRAY
40 A$(0) = " ": GOSUB 400: REM DISPLAY ARRAY USING
    SORT INDEX
45 HOME : PRINT "ENTER THREE CHARACTERS TO MATCH WITH
    AN ARRAY ELEMENT."
50 INPUT "ENTER <Q> TO QUIT...";R$
55 IF R$ = "Q" THEN END
60 GOSUB 500: REM FIND MATCH FOR R$
65 IF MA < > 0 THEN 45
70 PRINT : PRINT "DO YOU WANT TO ADD "R$" TO THE LIST
    ?"
75 INPUT "(Y/N)...";X$: IF X$ = "N" THEN 45
80 IF X$ < > "Y" THEN HOME : GOTO 70
85 N = N + 1:I = N:A$(I) = LEFT$(R$ + " ",3): REM
    PLACE NEW ITEM AT END OF DATA LIST
90 MN = 1:MX = N:MZ = N: REM INITIALIZE VALUES FOR ME
    RGING NEW ITEM INTO INDEX
95 GOSUB 200: GOSUB 270:A$(0) = " ": GOSUB 400: GOTO
    45: REM MERGE NEW ITEM INTO INDEX AND DISPLAY NE
    W SORTED DATA
98 REM
99 REM ***** SET UP SORT INDEX *****
100 AI(1) = 1:MZ = 1: REM TOTAL NUMBER OF SORTED ELEM
    ENTS AT START
105 FOR I = 2 TO N
110 MN = 1:MX = MZ: REM SET BOUNDARIES FOR SEARCH/SOR
    T
115 GOSUB 200: REM FIND LOCATION FOR MERGING A$(I)
120 GOSUB 270: REM CARRY OUT MERGE USING INDEX ARRAY
125 MZ = MZ + 1
130 NEXT I
135 RETURN
198 REM
199 REM *** ROUTINE TO LOCATE MERGE POSITIONS AS MM
200 MA = 0: IF (MX - MN) > 1 THEN 230
205 MM = MN
210 IF A$(AI(MM)) > A$(I) THEN 245
215 MN = MN + 1:MM = MN
220 IF MN > MZ THEN 250
225 GOTO 210
230 MM = MN + INT ((MX - MN) / 2 + .1)
235 IF A$(AI(MM)) > A$(I) THEN MX = MN: GOTO 200
240 IF A$(AI(MM)) < A$(I) THEN MN = MM: GOTO 200
245 IF A$(AI(MM)) = A$(I) THEN MA = MM
250 RETURN
268 REM
269 REM *** MERGE CURRENT ITEM INTO INDEX ARRAY
270 IF MM > MZ THEN MZ = MZ + 1: GOTO 290
275 FOR J = MZ TO MM STEP - 1
280 AI(J + 1) = AI(J)
285 NEXT J
290 AI(MM) = I
295 RETURN
298 REM
299 REM ***** DISPLAY UNSORTED ARRAY
300 HOME : PRINT "UNSORTED ARRAY: "
310 FOR I = 1 TO 21

```

Listing continued.

Listing continued.

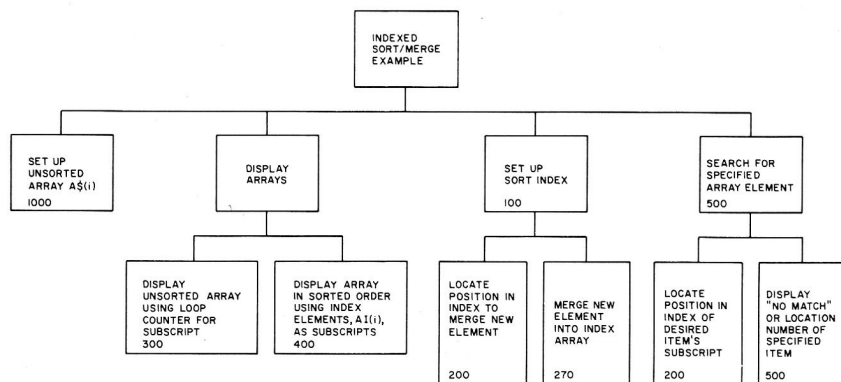
```

315 IF I < 10 THEN PRINT " ";
320 PRINT I;" ";A$(I);" ";I + 21;" ";A$(I + 21);" "
;
330 PRINT I + 42;" ";A$(I + 42);" ";I + 63;" ";A$(I +
63);" ";
335 IF (I + 84) < 100 THEN PRINT " ";
340 PRINT I + 84;" ";A$(I + 84)
350 NEXT I
360 INPUT "PRESS <RETURN> TO CONTINUE...";X$
370 RETURN
398 REM
399 REM **** ROUTINE TO DISPLAY SORTED ARRAY USING
INDEX VALUES
400 HOME : PRINT "UNSORTED ARRAY DISPLAYED USING INDE
X:"
410 FOR I = 1 TO 21
415 IF I < 10 THEN PRINT " ";
420 PRINT I;" ";A$(AI(I));" ";I + 21;" ";A$(AI(I + 2
1));" ";
430 PRINT I + 42;" ";A$(AI(I + 42));" ";I + 63;" ";A
$(AI(I + 63));" ";
435 IF (I + 84) < 100 THEN PRINT " ";
440 PRINT I + 84;" ";A$(AI(I + 84))
450 NEXT I
460 INPUT "PRESS <RETURN> TO CONTINUE...";X$
470 RETURN
498 REM
499 REM **** ARRAY SEARCH FOR MATCH ROUTINE
500 I = 0:A$(I) = R$
505 MX = N:MZ = N:MN = 1: GOSUB 200
510 IF MA = 0 THEN PRINT "SORRY, NO MATCH FOUND.": GOTO
550
515 MM = MA - 1: IF MM = 0 THEN 525
520 IF A$(AI(MM)) = A$(I) THEN MA = MM: GOTO 515
525 PRINT "YOUR SELECTION, "A$(I)", IS FIRST FOUND"
530 PRINT "AT INDEX LOCATION "MA" AND IS ARRAY"
535 PRINT "ELEMENT NUMBER "AI(MA)".
550 INPUT "PRESS <RETURN> TO CONTINUE...";X$: RETURN
998 REM
999 REM *** ROUTINE TO FILL ARRAY WITH ALPHA CHARACT
ERS
1000 FOR I = 0 TO 2: REM THREE ALPHABETS IN ARRAY
1010 FOR J = 1 TO 26: REM LOOP FOR EACH ALPHABET
1020 X$ = CHR$(91 - J): REM CREATE LETTER BASED ON
J
1030 A$(J + 26 * I) = X$ + X$ + X$: REM ASSIGN ARRAY
VALUE AS THREE LETTERS
1040 NEXT J
1050 NEXT I
1060 RETURN

```

End of listing.

Figure 3. The hierarchy diagram for the instructions in the Program listing.



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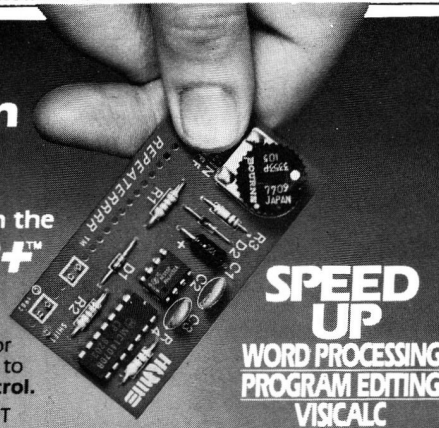
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by eliminating one half of the array. Then you calculate where the middle element of this new, smaller range is and select it from the array. After a second comparison with your search item you can eliminate half of this smaller range. In just two comparisons you have removed 75 percent of the array from consideration.

Figure 1 illustrates a binary search with a well-known example: finding a word, such as "monopoly," in a dictionary. On opening the dictionary to its middle page, you find that you are in the L's, so you know you can forget all the pages to the left. In dividing the right half of the dictionary in two, you come to the R's, so you can eliminate all pages to the right. Now you only have to search the pages between the one-half and three-quarter positions in the dictionary.

With a binary search, you can find a given item from within a sorted list of 2000 items with no more than 12 comparisons. This certainly beats a sequential search!

Now, suppose you are trying to determine where to place a new item in the sorted array. Of course, if you find an element already in the array that exactly matches it, you will know right away where the new item should go (either before or after the existing element). But, even without an exact match, a binary search will identify where the new item should go. It will be the last position left to be checked for a possible match—the position where the element just before is less than the new item, and the element just after is greater than the new item. All that remains is to move all following items one place further along in the array to make room for the new one.

Interestingly, the same sequence of code can both insert new items and search for old ones. For instance, in the **Program listing**, line 115, which is part of the subroutine that merges new items into the sorted list, and line 505, which is part of the subroutine that searches for a matching item, both use the binary-search subroutine (in lines 200 and 250).

The Index Sort

To avoid having to rearrange the elements in a data array to establish a sorted order, you can set up a second array to serve as an index. The index

array will contain only numbers, even if the original array contains strings. The numbers will correspond to the subscripts (locations) of the elements in the data array. **Figure 2** illustrates how this can be done.

The data array A\$() contains elements corresponding to a breakfast menu, arranged in no particular order. It is obvious that element 2, BACON, should appear first when these items are sorted alphabetically. But rather than actually placing BACON in position 1 of the data array, we place its present location or subscript, 2, in the first element of the index array AI(). Similarly, item 9 in the data array, COFFEE, should be second in an alphabetical list, so 9 appears in the second position of the index.

Now, if you have a complete index for your data array, you can use the index elements in sequence to access the data array in sorted order. That is, to list the first element you would call for A\$(AI(1)) rather than A\$(1). A\$(1) is EGGS, but, since AI(1) equals 2, A\$(AI(1)) is A\$(2), or BACON.

Now, recall that the binary search requires that the list being searched be accessible in alphabetical order. This does not mean that the list itself must be alphabetized; you can still do a binary search by using an index to access the list. It's like having a dictionary with words listed in random order and a complementary second volume that holds a sorted index to the dictionary. Whenever you want to look up a word in the dictionary, you perform a binary search on the index, then use the dictionary itself only to look up the words the index refers you to.

Sample Program

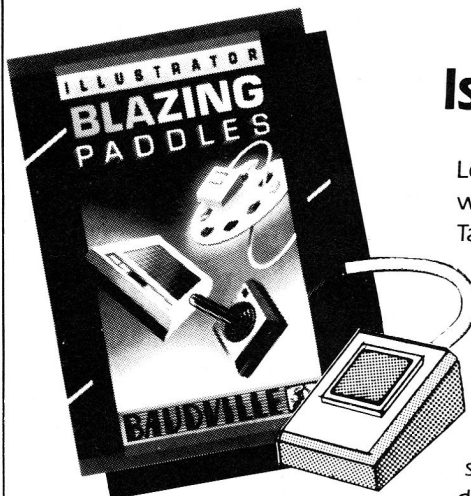
The **Program listing** illustrates these concepts. The pattern for this program follows that of the two sort programs presented in January's column. **Figure 3** is the hierarchy diagram showing the program's functional units. **Figure 4** is a flowchart for the main program. Most of the elements of the main program are subroutine calls.

The subroutine at line 1000 that fills the A\$ array with data is the same subroutine that appeared in the January article. It assigns three alphabetical lists, ordered from ZZZ to AAA, to 78 elements in A\$, providing a worst-case

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(backwards) situation for a sorting routine.

Figure 5 is the flowchart for the subroutine that determines what numbers are to be assigned to the index elements. It assumes that only one element exists at the start, and that element is assigned to AI(1), with the counter for total sorted elements, MZ, being set to 1 as well. Then each data element is taken in sequence and its subscript is merged into the appropriate index position.

Although this example uses a data array that is completely established prior to the sort/merge routine, the same code can be used to merge a new

element's subscript into an old index. If each new element's subscript is merged immediately into the index, you'll never have to wait for a sort again. To illustrate this function, lines 70-95 let you add three characters to the original data set, then the existing subroutines merge each entry into its appropriate position in the index, making it part of the sorted array.

In real situations you can set up as many index arrays on a set of data as you wish. One index array could list clients by name in alphabetical order, another by account number in numerical order, and a third by ZIP code in numerical order.

Figure 6 is the flowchart for the heart of the program, the binary-search procedure. Lines 230-250 are the instructions for the successive halving of the index array, narrowing the search ultimately down to the last two items in the data array. Lines 205-225 then make the final decision as to where to place the search item in the array. The result is MM, the index-array subscript for the index element that should contain the new item's data-array subscript.

So, if a new item is placed in element 28 of a data array, and it is determined by the binary search that this item would be fourth in an alphabetical list,

Figure 4. The flowchart for the main module (lines 10-85) in the Program listing. Note the extensive use of subroutines.

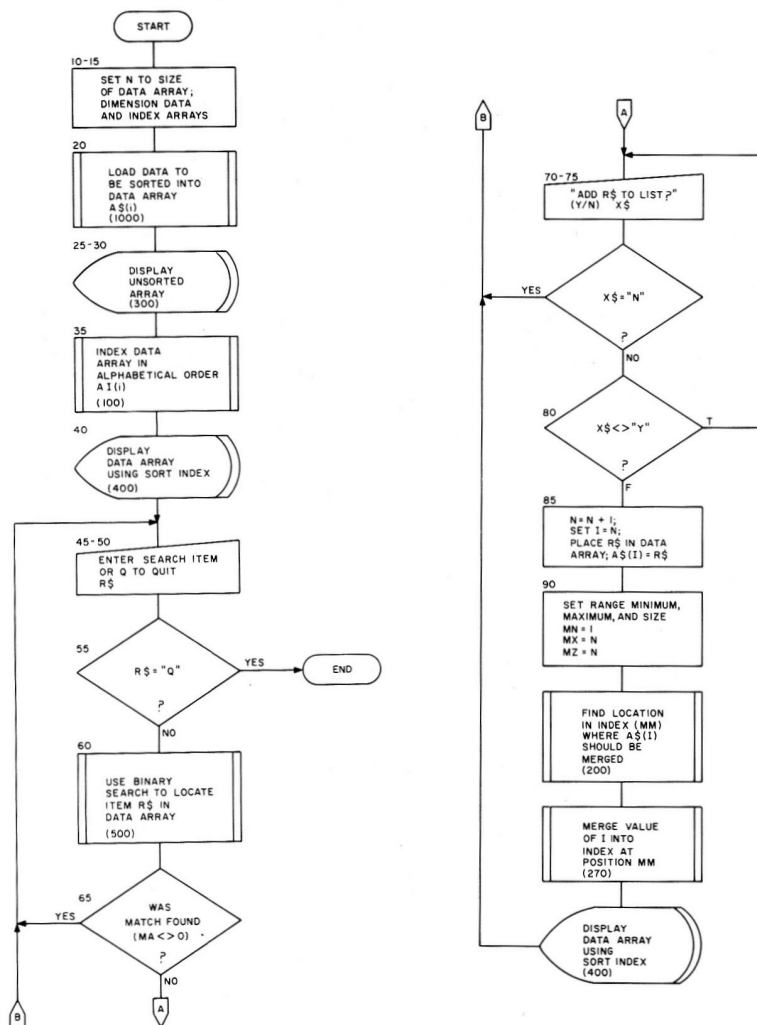
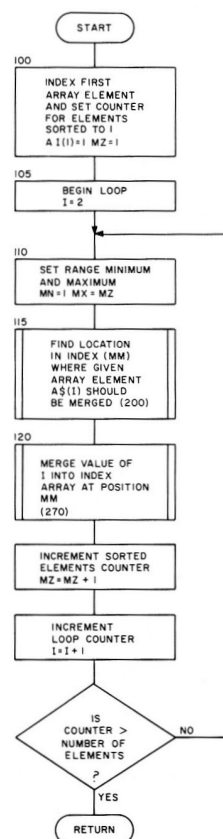


Figure 5. The flowchart for the index sort/merge operation (lines 100-135) in the Program listing.



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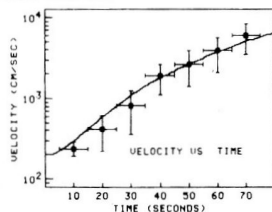
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SAMPLE AMPERGRAPH PROGRAM LISTING:

```
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 + T/2: NEXT T
35 FOR T = 10 TO 70 STEP 10
40 &CLOSED SQUARE, T, (150 + T/2) * (.8 + .4 * RND(3))
45 &ERROR BARS, 5, T/2/2
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:

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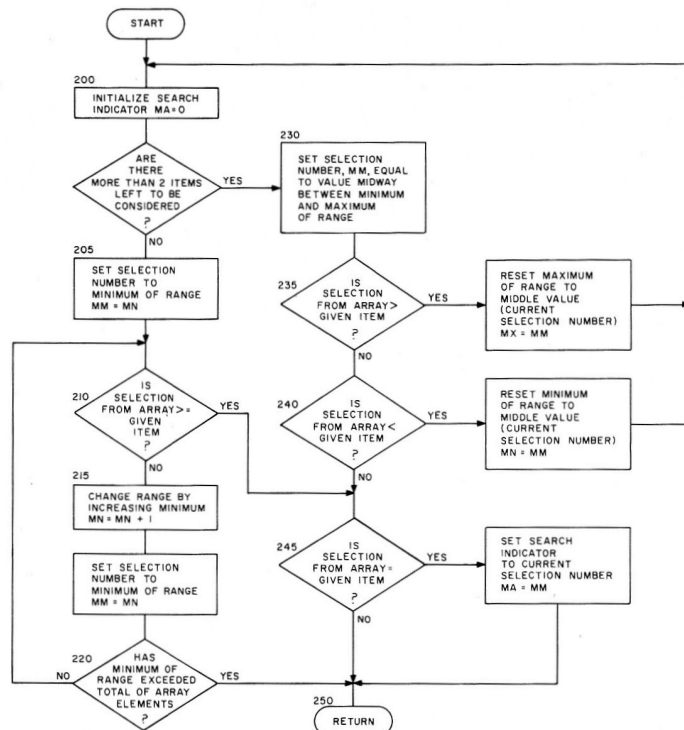
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Figure 6. The flowchart for the binary-search subroutine (lines 200–250) in the Program listing. MA, MM, MN, and MX all refer to subscripts for the index array.



then index-array element 4 will hold the value 28. Thus MM will equal 4 at the end of the binary-search process, and after moving all other index elements out of the way to make room, 28 will be deposited in AI(MM).

If the binary search is locating an item already in the data array, when an exact match to the search item is found, the subroutine will return MA with a value that is the index-array subscript for the index element that contains the subscript for the matching item in the data array. If no match is found, MA returns with a value of zero.

Figure 7 is the flowchart for the search routine beginning at line 500. As mentioned, this subroutine employs the same binary-search subroutine used to determine where a new item should go in the index array. However, this subroutine has one additional feature. Unlike the sequential search, which always locates the first occurrence of a matching element, the binary search may first find a match other than the first occurrence. Lines 515–520 solve this problem by checking each element prior to a match until

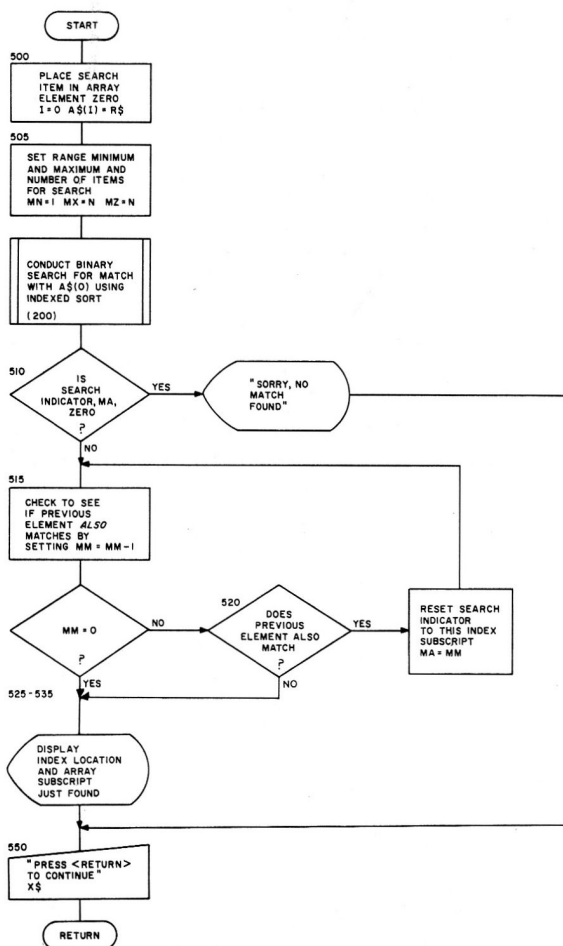
they find an element that does not match. The element following the non-match is the first occurrence of the match.

Running the Program

When running the program, you will first see a display showing the data array in its unsorted order. By pressing the return key, you will activate the subroutine that sets up the sort/merge index to the data array, then the message SORTING. . . ONE MOMENT PLEASE. . . will appear at the bottom of the screen. After about one minute, the array elements will again be displayed, this time using the index to access the array so the elements appear in alphabetical order.

Press return again, then enter three characters for the program to find. If you enter less than three characters, the computer will pad your entry with trailing blank spaces, so that, for example, "SO" becomes "SO ". It will then use the binary search to locate the first occurrence of your item in the data list and tell you where it appears in the index and data arrays. If it doesn't find the item, the computer will tell you so

Figure 7. The flowchart for the subroutine (lines 500-550) that searches an indexed data array to find an element that matches a given item, A\$(0). Note that this module uses the same binary-search routine used by the module that sets up the sort index in the first place.



and offer you a chance to add the element. If you respond with a Y, it will add the element to the end of the current array and the index will be updated to merge your entry into its proper alphabetical location.

If you decide not to add your entry to the data array, and respond with N, the program will cycle back to ask for another three-character entry for a new search. If you enter Q, the program will end.

Conclusion

Setting up the sort index for the data in this program requires about 90 seconds, nearly half the time required by the bubble sort and one-quarter the time needed by the exchange sort. Even more time savings would be realized with larger arrays.

Sort-index arrays are also used extensively with disk-data files, where

the numbers stored in the index are record numbers from the disk-data file, rather than data-array subscripts. The only change needed in the code for this type of application is that the data elements being compared to the given item must be retrieved from disk before the comparison can be made. This will affect line 210 and lines 235-245 of the listing.

Experiment with these subroutines. You may end up using them in most of the programs you write. If you have programs that use the old sorting procedures, you will find these routines easy to insert. Once they become a part of your programs, you'll feel like you've entered the jet age! ■

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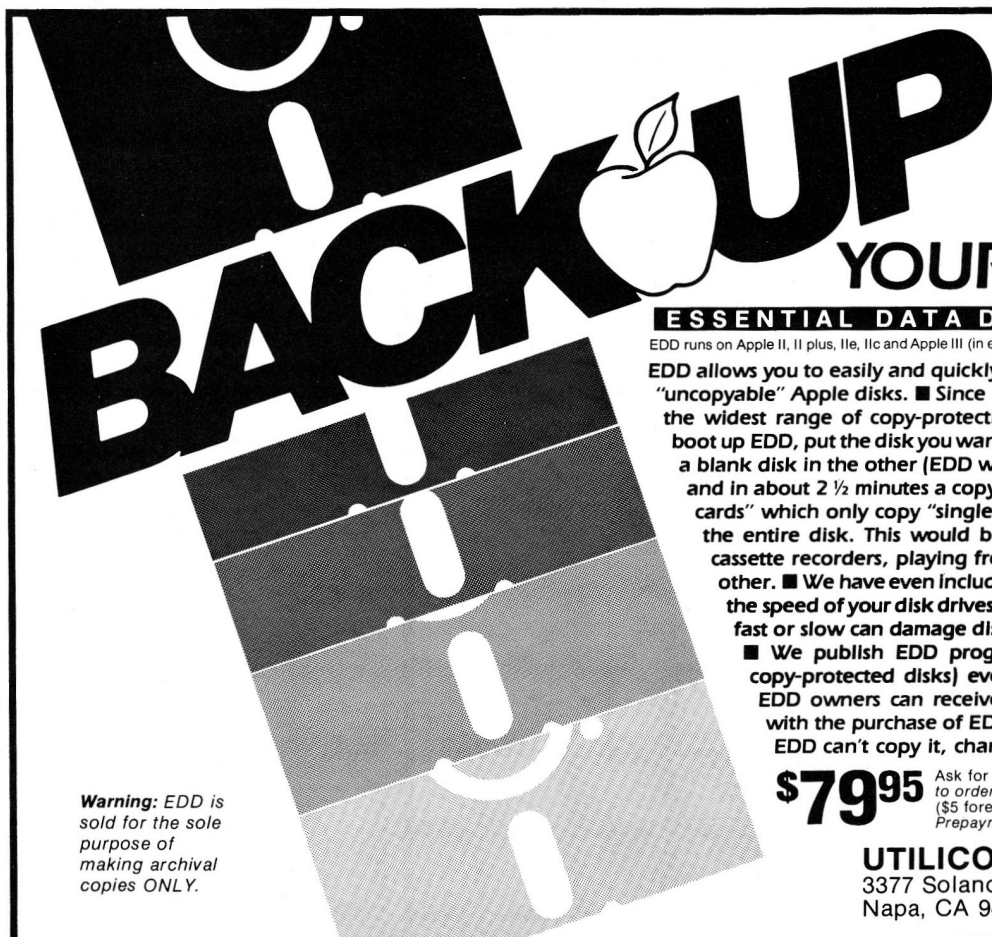
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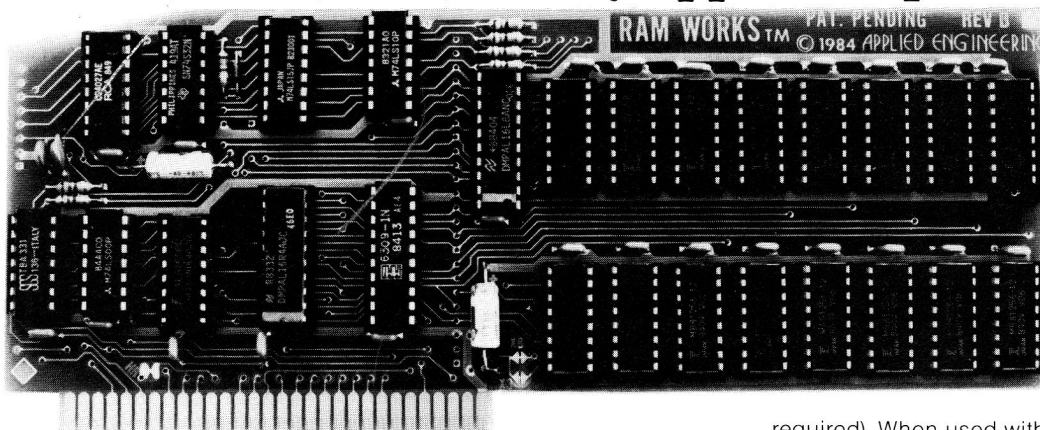
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If you have a question, our technical editor has the answer. Send your queries about Apple computing to Bob Ryan, Ask inCider, 80 Pine Street, Peterborough, NH 03458.

Rank and File

Dear inCider:

I have written a program in which I input a large number of strings that are then printed out on a large form. I would like to know how to save all those strings to disk so I can print the same form at another time. Also, is it possible to allow for corrections if the input string isn't entered properly?

Elia Van Tuyl
4017 Middlefield Road
Palo Alto, CA 94303

Dear Elia:

Your problem can be easily solved using sequential-access text files. Since you want to enter data once, yet print it many times, you should split your program in two, the first program for data entry, the second for printing.

Your new data-entry program will resemble the data-entry portion of your current program. Before you enter strings, however, open a data file as shown on page 65 of the DOS Programmer's Manual. Your program line should look something like this:

```
20 PRINT CHR$(4) "OPEN DATAFILE"
```

Whenever you input a string, follow the INPUT statement with statements that let you write to disk. For example:

```
100 INPUT "ENTER CUSTOMER NAME"; A1$
110 PRINT CHR$(4) "WRITE DATAFILE"
120 PRINT A1$
```

In line 100, the program receives data from the keyboard and puts it into the variable A1\$. Line 110 tells DOS that until the next DOS command or INPUT statement, all PRINT statements will direct output to the

"Because of their tremendous speed advantage over disk drives, RAM disks are perfect for programs that access the disk a lot."

disk file, and not to the screen. Line 120 writes the contents of the variable A1\$ to the file named DATAFILE. If you repeat this sequence after every INPUT statement, you'll save all of your strings to disk. Remember to insert a CLOSE statement after your last INPUT statement.

Your new form-printing program will resemble the printing portion of your current program. The differences are that you'll insert the strings into the variables by reading them from the disk, not by entering them from the keyboard. To read from a data file, you once again have to open it:

```
10 PRINT CHR$(4) "OPEN DATAFILE"
```

and tell DOS that all input is to come from the disk:

```
20 PRINT CHR$(4) "READ DATAFILE"
```

Now you can fill up your variables with the data from the disk file by using INPUT statements. For example:

```
30 INPUT A1$ : REM CUSTOMER NAME
40 INPUT A2$ : REM CUSTOMER ADDRESS
```

You input from the disk in the same order you wrote to it. If the customer name is the first string you enter, it will be the first string in the data file and will be read with the first INPUT statement that accesses the data file. You should have only as

many INPUT statements as strings you wrote to the file. (There are ways around this, but they involve checking for the end-of-file.) You should also avoid writing commas to the disk file until you feel comfortable using GET statements instead of INPUT statements. Once the strings are safely ensconced in their respective variables, close the file and print the forms.

You should perform error-checking before you write your data to disk. In the data-entry example I used, you need to add something like the following:

```
105 INPUT "CORRECT? Y/N"; X$: IF X$ = "N" THEN 100
```

For more information about sequential-access files, see the DOS Programmer's Manual (pp. 65-71). To learn about detecting the end-of-file marker, see the Applesoft BASIC Programming Reference Manual (pp. 80-81). A list of DOS error codes is found on page 168 of the DOS Programmer's Manual and on the Quick Reference Chart.

Instant Disk

Dear inCider:

I own an Apple //e and am considering the purchase of a second disk drive. I'm interested in learning the advantages and disadvantages of buying a RAM card instead of a second disk drive. I've seen ads, like Applied Engineering's ad for the Memory-Master, that claim the card acts like a disk drive while increasing the memory capacity of the CPU. Is it difficult or time-consuming to use this kind of card as a substitute drive? Is the documentation clear enough so a novice can learn how to use it? Are there real differences between the different RAM cards on the market?

I'm primarily interested in using a RAM card with Apple Writer. I have a disk full of WPL programs and I'd like

by Bob Ryan, inCider Technical Editor

to put them into the RAM disk and my documents disk into the disk drive. I'd also like to use the RAM disk with AppleWorks and possibly DB Master. Any help would be greatly appreciated.

Caroline S. Fairley
3574 Monteith Avenue
Cincinnati, OH 45208

Dear Caroline:

RAM disks are electronic disk drives. Their advantage over conventional drives is their speed: Any file can be loaded and any record can be accessed in fractions of a second. The disadvantage is that they are volatile devices. You lose the data on them the second you turn the computer off (or there's a power failure).

RAM disks aren't difficult to install and use. Except for the fact that they're nearly instantaneous, they work just like regular disk drives. The many RAM disks on the market differ in the features they offer, such as amount of memory, but are very similar in their operation.

Because of their tremendous speed advantage over disk drives, RAM disks are perfect for programs that access the disk a lot—a data-base program or a virtual-memory word processor like Screenwriter, for instance. They are also useful for expanding main memory for programs designed to use them, usually spreadsheets.

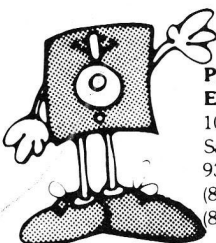
Since RAM disks are volatile devices, you must copy the files you want to use to them before you begin your application. If you store data on them, you must transfer this data to a standard disk before turning your computer off. It is this need to copy files to and from the RAM disk that limits their usefulness in applications that don't require a lot of disk access. Since you plan to buy a second drive to use with Apple Writer, which doesn't require a lot of disk access, I recommend that you buy a conventional disk drive. If you ever want a third drive, however. . . ■



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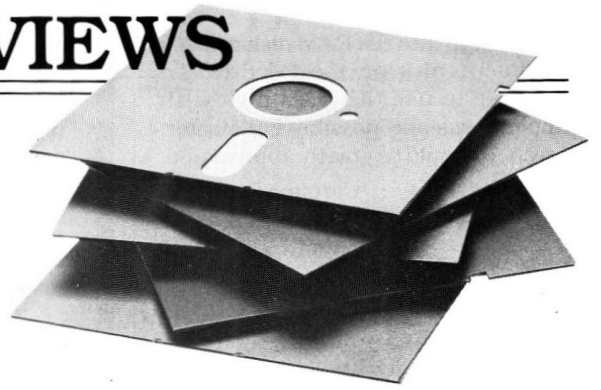
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SOFTWARE REVIEWS



inCider's Ratings

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

Graphics Exhibitor Programmer's Tool Kit

Koala Technologies
3100 Patrick Henry Drive
Santa Clara, CA 95052

Utilities
Apple II, 64K
\$39.95 each

★★★

Two utility packages from Koala Technologies—Graphics Exhibitor and Programmer's Tool Kit—will expand the repertoire of your KoalaPad graphics tablet (reviewed in *inCider*, May 1984, p. 120). The Graphics Exhibitor edits graphics and then displays them in a "slide show" display on a monitor or prints them out on a black-and-white or color printer. The Programmer's Tool Kit offers various utilities that expand the KoalaPad's graphics creation capabilities.

Graphics Exhibitor

The Graphics Exhibitor, while designed for the KoalaPad, will actually work with the Power Pad MicroIllustrator and Scarborough PictureWriter

as well, because of its method of storing graphics on disk. It supports more than 20 printers and 15 interface cards (check the package to make sure yours are included), and encompasses three modes: configure, edit/print, and exhibit.

- Configure, for specifying your system's printer/interface configuration.

- Edit, for creating pictures. You can "cut and paste" portions of your pictures to modify them and you can create new ones. You can also add text to the pictures from a choice of fonts.

- Print, for generating hardcopy graphics. This mode doesn't merely dump the picture to the printer; it also lets you change the size of the picture, its orientation on the paper, and the shades or colors produced.

On a black-and-white printer, you must juggle the 16 shades of gray so the dot density representing one screen color isn't too close to that of

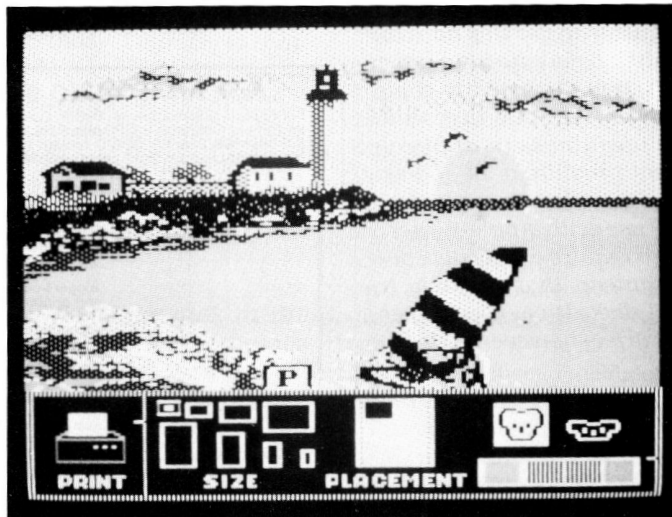
the adjacent ones; otherwise they will blend into one another. Changing colors is easy. Place the cursor at the desired dot density selection, then press the "select" button. Note that labels, printed in black or white (which ever is opposite the background color), can disappear if you switch the background color. You may have to switch the label color, too.

If you use a color printer, the quality of the picture depends on the capabilities of the particular printer. Experiment to adjust color densities for your printer/interface configuration.

- Exhibit, for producing "slide shows." This mode displays a series of pictures on the monitor screen. You can control picture changes directly or have them occur at a preset pace.

Programmer's Tool Kit

The Programmer's Tool Kit incorporates many of the KoalaPad's most



Sample screen from the Graphics Exhibitor.

attractive features. Raw Data reads z- and y-coordinates from the tablet, a filter module sets boundaries for input data, Smooth draws smooth lines, and Lock traps the last values entered when you touched the pad. The disk demonstrates how these modules can be used with and without each other, and the documentation provides information on starting addresses, variables, and subroutines each module calls.

A set of cursor tools enables you to inverse text, turn a shape from the shape table into a cursor, increase the level of detail the cursor defines, and split the screen into two parts, each with its own cursor.

The hi-res graphics tools produce dots, lines, boxes, circles, and hi-res text. The first four can be used in either normal mode or an erasable "rubber" mode (similar to XDRAW). The hi-res text module includes a window capability.

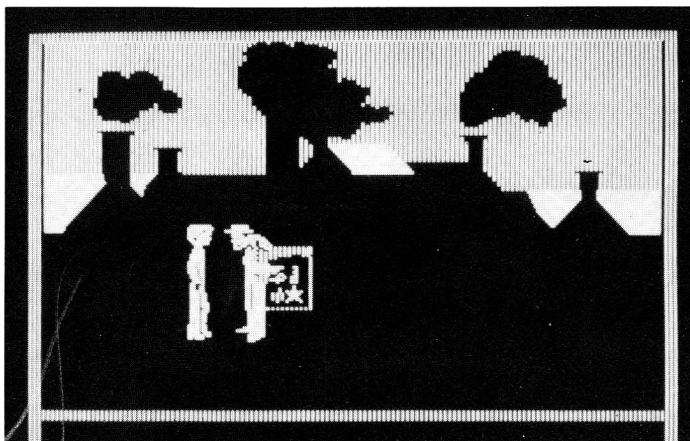
The Programmer's Tool Kit manual provides PEEK, POKE, and CALL data, as well as information about using shape tables, scaling graphics, and loading and saving pictures. It also discusses problems associated with using the various routines, and offers suggestions to help you avoid them.

Side 2 of the disk contains modifiable assembly source code in textfiles that can be read by the Big Mac assembler (from A.P.P.L.E., 21246 68th Avenue S., Kent, WA 98032). Note that a license enclosed in the package specifies that you "may not... distribute any portion of the source code, modified or not." Object code, however, is under no such restriction.

Koala's claim that the Programmer's Tool Kit is suitable for programmers with about three months' experience is misleading. Understanding the program's functions requires familiarity with subroutines, direct memory access, and jump tables, and at least rudimentary knowledge of assembly directives. Also, the documentation swings from assuming considerable programming knowledge to assuming almost none, which can be aggravating.

Disregarding these minor issues, however, Graphics Exhibitor and the Programmer's Tool Kit should be welcome additions to any KoalaPad library. ■

**Janet Meizel
Davis, CA**



The Peddler has a special deal in Merry Canned Nightmares.

Merry Canned Nightmares and Dreams

Management Science America

Peachtree Software
3445 Peachtree Road, N.E.
Atlanta, GA 30326

Role-playing game
\$49

★★

Merry Canned Nightmares and Dreams, a lively, interactive, goal-based game designed for two to four players, encourages concentration and strategy formation.

The game presupposes that you understand the underlying concepts of strategy formation and mapping. You must also be skillful enough at keyboard control to perform math computation while manipulating animated "Dreamer" characters through keyboard commands. Beginners will need to depend on the helpful game strategies in the user's manual (or memorize the commands that move the Dreamers).

The object of the game is to gain points in four goal categories (Fame, Knowledge, Wealth, and Happiness) according to the number of goal points you set at the start. Goal points are kept secret; players tally points on a scorecard, rather than by the computer. The first player to achieve his or her goals wins. Before action begins, each player is assigned specific character strengths and weaknesses and a treasure chest to store goal points.

The land of Merry Canned Nightmares and Dreams is populated by

characters (Wizard, Farmer, Child, Peddler, Vulture, or Spider) who either help you by assigning points to a goal category, or hinder you by taking away points in a category. Each dreamscape may contain a resident character, a treasure chest, or nothing at all. Use a map to track your dreamer and to list the scenes' contents.

To earn points, you interact with 12 colorful, animated, musical scenes. The characters provide clues about where to find a treasure chest or another character. You accumulate points by having your dream characters ask questions, defeat a Spider, or steal from a treasure chest. For example, you can add wealth points to your total by stealing from a treasure chest, but the action subtracts happiness points. You can also gain knowledge points when the Wizard agrees to answer a question about the number of wealth points in your chest. The Peddler, however, takes away wealth points for each question asked of him.

Since you tabulate your own points on the scorecard, the game doubles as an arithmetic lesson. It also allows you to keep information for your eyes only.

Once you find which characters inhabit various scenes, you should place each scene on the scorecard's map. When you complete your map, you can manipulate scenes either by avoiding character confrontations or by entering scenes with helpful characters.

The only problem I encountered was that sometimes when a player asked a character a question, the answer flashed off the screen before he or she could read it and transfer the information to the scorecard.

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SOFTWARE REVIEWS

Dreams is fairly lengthy, so it will keep home players occupied. The game may be inappropriate for the classroom, however, because of time constraints, and despite its lively, colorful scenes, requires strategy and mapping skills too advanced for young children.

Unlike many computer games, Merry Canned Nightmares and Dreams provides for more than one player at a time, thus encouraging peer interaction and competition. The game is fun and helps develop goal-setting, problem-solving, and logic skills. ■

Julie Dalton
La Jolla, CA

Magic Office System

Artsci

5547 Satsuma Avenue
North Hollywood, CA 91601

Word processor, spelling checker, spreadsheet, business graphics
Apple II, 64K, 80 columns, two disk drives
\$295

★★

Eliminating problems of incompatibility, lost time, and excessive disk handling when programs used together occupy different disks, Magic Office System from Artsci integrates word processing, on-line spelling checking, spreadsheet analysis, and business graphics onto one floppy. Four programs—OfficeWrite, Spelling Checker, OfficeCalc, and OfficeGraph—comprise the package, which is designed for the business or professional user who wants it all and is willing to pay for it.

Patterned after a familiar business icon, the filing cabinet, the Magic Office System helps you keep things in order with screen depictions of file drawers, folders, scratch pads, and documents. The concept works quite well; you move between the four applications smoothly and rapidly, with virtually no chance of losing your way. Simply open your electronic file drawer, pick the folder you want, select a document, and go to work.

The four programs are only partially integrated, however. You can merge text created in OfficeWrite (an updated

version of Artsci's Magic Window II) with other text files, go through the document with the on-line Spelling Checker, and insert OfficeCalc spreadsheets and OfficeGraph data tables. Information contained in OfficeCalc and OfficeGraph can each merge with the other. You cannot, however, merge OfficeWrite text into OfficeCalc or OfficeGraph displays, nor insert an OfficeGraph graph into an OfficeWrite file.

The quality of the individual programs varies. Without question, OfficeCalc is the best: You can tailor spreadsheets to meet any business need; data entry is a breeze; and the dozens of formatting, calculating, and forecasting features save time and money.

Data, entered as numbers, labels, or equations, is reproduced over a range of 16,002 cells (254 rows by 63 columns), and recalculations can be done automatically over the entire range or a specified range (great for what-if projections). Two windows, split horizontally or vertically, can keep certain data like totals on-screen at all times, and can scroll together or independently.

Values can be expressed logarithmically (base e or base 10) or exponentially; as dollars, integers, or absolutes; or rounded off to a specified number of decimal places. The program calculates averages, totals, and square roots, returns integers, employs logical operators, determines net present values (value of specified cash flows at a given discount), and more. In short, OfficeCalc is terrific.

OfficeGraph, similar to OfficeCalc, has a smaller worksheet—192 cells (8 rows by 24 columns). Thirty-one cells are reserved for titles, leaving a 7-by-23 data grid. Enter data in tabular form and type /G to produce a graph—pie or bar—which the program instantly draws. The program labels and scales axes automatically, calculates percentages (pie graph only), displays titles, and nicely shades graph sections. It works like a charm, and printing the table or graph requires only a few keystrokes. Again, my only quarrel with OfficeGraph is that you cannot merge a graph with a word-processing document.

OfficeWrite and its Spelling Checker together are the Achilles' heel of Magic Office System. Although suitable for simple document and letter prepara-

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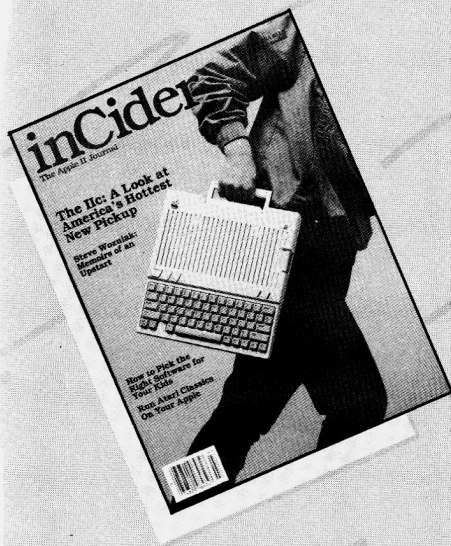
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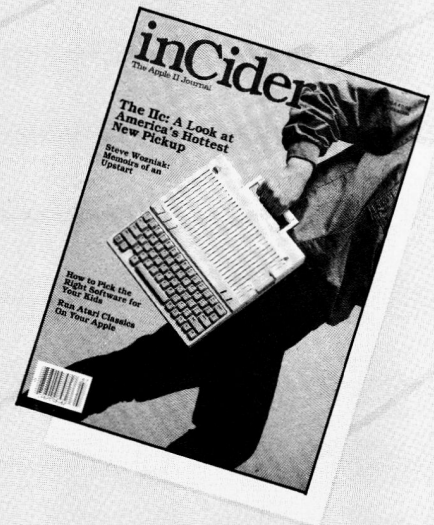
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tion, OfficeWrite lacks enough flexibility to make it a full-featured word processor. Cursor movement is limited to a character at a time laterally, and text insertion is awkward. Surprising, too, is the inoperative delete key.

OfficeWrite accommodates a 25K text file (about eight pages) and comes with a 16-line copy buffer. The buffer recalls material one line at a time using a last-in, first-out sequence. The Spelling Checker contains 14,000 words, and you can create different dictionaries for different purposes. Your choices in verifying spelling are ignoring a word, adding it to the dictionary, changing it, or marking it for future verification, which you must do yourself.

In sum, Magic Office System has its virtues, but also some very real limitations, which make its \$295 cost seem excessive. ■

Wayne Sassano
Wethersfield, CT

Snoopy's Skywriter Scrambler

Random House Software

201 East 50th Street
New York, NY 10022

Word game
\$39.95

★★

Snoopy's Skywriter Scrambler is one of a series of games from Random House Software based on

Charles M. Schultz' Peanuts characters. Skywriter Scrambler is a colorful and addictive word game that isn't structured to expand vocabulary as much as to test the player's existing vocabulary. It is suitable for fun, but not for serious instruction.

In this one- or two-player game, recommended for ages 8 to adult, you are given a word from which you must form other words by rearranging or dropping letters. You select from three levels of difficulty, then the first of five game words appears on a banner trailing Snoopy's fighter plane. Snoopy's dialogue balloon tells you how many words can be spelled from the letters in the banner, then Snoopy asks how many of them you think you can find.

You have 90 seconds to come up with as many words as possible. If you meet or exceed your estimate, you receive points for each correct word. If you fail to meet your estimate, you get no points. The program doesn't add or subtract points for unacceptable words.

If you do better than your estimate for two rounds, you get bonus time to continue making words. If you exceed the estimate for three rounds you win an extra round. Exceed the estimate for every round and you are awarded bonus points without having to earn them.

The bank of game words—and each word's list of derivable words—can be modified. You may enter your own game words and as many derived words as you can think of. However, if you enter your own game words, you

must be certain to enter every possibility into the derived-words list and to spell them correctly. It could be embarrassing to have a player complain that the game doesn't accept a word because you didn't think to put it into the word bank or you spelled it wrong.

Snoopy's Skywriter Scrambler is an enjoyable word game, but it doesn't actually teach meanings or new words. Also, there's no way, aside from a list of top-ten scores, to evaluate your success. This program should be considered entertainment. In that role it succeeds nicely. ■

Brian J. Murphy
Fairfield, CT

Superbase

Precision Software

3003 Summer Street
Stamford, CT 06905

Data-base manager
Apple //e or //c
\$149

★★★

Precision Software's sophisticated data base, Superbase, has entered the Apple world. If you own a //e or //c, you will want to consider Superbase as your primary data-base program. It is one fine, feature-laden program at a reasonable price.

Superbase resides on a DOS 3.3 disk, but the program itself is protected. Slave and data disks may be used, so a master (two are provided) is needed only for the original boot. Each data base can contain up to 15 files and each file an unlimited number of records—up to the storage capacity of the disk. In actual practice this means about 800 very short records or 200–400 lengthy ones. A file cannot be spread over several disks.

If you can think of a feature, Superbase probably has it. It provides versatile format development with field definitions of many types including key (for alphabetical storage), text, numeric, result, constants, date, and period. Most are self-explanatory, but notice date and period. You can force any date entered to display the day of the week, and a period field will calculate the days between two date fields. Numeric and result fields can be affected by any mathematical computa-



Help Snoopy discover scrambled words.

tion available in BASIC. This includes trig functions, making Superbase especially suited for scientific or technical applications.

Each record can include up to four monitor screens (40- or 80-column) and 1100 characters of text, plus another 1000 characters that are common to all records. With as many as 127 fields possible in each record and with Superbase's mathematical potential, a host of unique applications becomes available for the experienced user. For example, a data base of many spreadsheets could be created, with information entered and extracted quickly and easily from the entire file.

Superbase includes menu-driven utilities for formatting, sorting, printing (output), system status, disk access, report generation, and more. You can draw lo-res graphs from your data, although sending this display to a printer is difficult. Immediate math calculations are possible, and help screens are available for the primary commands. In addition, you can create your own help or memo screens. Superbase can transpose your records to sequential format for use by a word processor like Screenwriter or Write Away.

The most exciting feature of Superbase is its programming language. Superbase commands are really BASIC statements that can be executed immediately or in a BASIC program. Most of the Applesoft language is still available to you, along with over 90 new Superbase commands. As you start using the new commands, you'll wish they were available for all your programming. A 4K program memory area is provided for developing your own applications, report formats, and user programs. The 4K limit is of minor consequence, as programs may be linked and variables passed. With its own BASIC language, Superbase becomes ideally suited for many business activities you may not normally attempt with a data-base program, such as accounts receivable/payable, payroll, and scheduling.

You'll find Superbase time-consuming to master, and you'll have to keep the excellent, indexed, 230-page manual close at hand. However, an experienced user can program a turn-key system to make Superbase easy to use for even a novice. Two phone calls to

Precision Software put me in touch with cordial, knowledgeable people, anxious to solve my programming problems.

If your data-base needs are very simple, such as name, address, and telephone lists, you may be better off with Apple's QuickFile or Trutec's Person-to-Person. They are easier to use and quicker to respond. If you require unlimited record capability, you might prefer DB Master or VersaForm. However, if Superbase's record limitation is of no consequence to you, and you want a data base with tremendous potential at a reasonable price, you must consider Superbase when shopping for a data-base program. ■

**Arthur H. Ude
Stoddard, NH**

Olin in Emerald

Adventure International

P.O. Box 3435
Longwood, FL 32750

Illustrated adventure
\$19.95

★★

Good King Olin has been kidnapped, and it's up to children ages 9 to 14 to release him from the clutches of the evil Vargor. A child can rescue the king by playing Olin in Emerald, a cleverly-written, slow-paced, nonviolent, and graphically pleasing game that incorporates various mental tasks. However, despite its advertised

educational value, Olin in Emerald offers little real intellectual challenge. It does require solving some mathematical problems, answering some factual questions, and invoking some thinking skills, but it remains essentially a trial-and-error exercise.

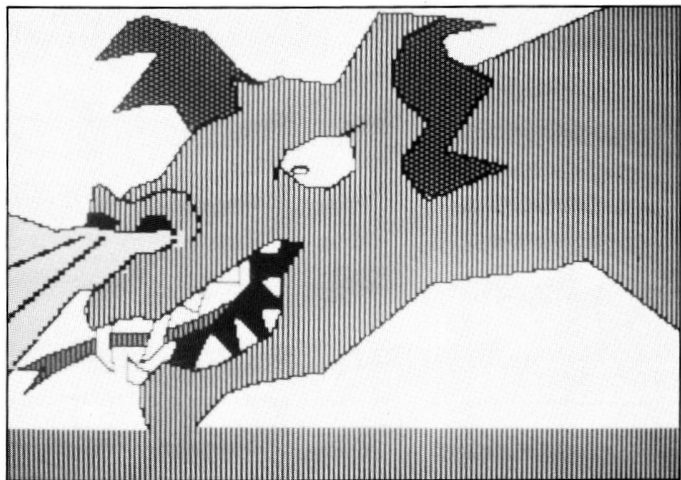
Children may play Olin in Emerald alone, in pairs, or in groups. The directions are brief and easy to follow.

The story, which is divided into ten different scenarios (chapters), begins in a forest, leads the player through various obstacles and adventures (such as a cave, a swamp, and a balloon ride), and ends at the spot where Vargor holds King Olin captive.

To move through the scenarios, the player chooses from direction possibilities shown on the screen. However, at times only one of the choices is actually viable. For example, the program may reject a decision to move south with "There is nothing there," or "Anara won't let you go that way." Chances are, this will leave the player feeling resentful at having so little control of the game.

Throughout the search, the player must gather objects, like a magic wand, that will help in advancing from chapter to chapter. It is important to heed advice offered by the character Anara, and to refer to the game's Clue Sheet for hints. Also, drawing maps as reminders of where choices lead or where objects are located will aid in avoiding loops and dead ends.

After the computer poses open-ended questions or math problems, it keeps prompting the player to try again



Olin in Emerald includes puzzles and dragons.

until the answer is right, and it won't continue until then. However, the machine offers no help. It needs most answers typed in in capital letters or they'll be considered wrong.

The math problems are probably the most intellectually stimulating questions. They range from simple addition to metric conversions. But questions like "What color was George Washington's white horse?" are beneath children of the targeted age group.

Olin in Emerald takes a long while to complete the first time through—at least two to four hours. But the game has a unique feature to accommodate its length. At the end of each chapter, Anara offers the player a chance to rest—to turn off the computer and return later to the same chapter.

Because of the basically linear route the player must follow, the novelty of Olin in Emerald wears off quickly. This is a definite disadvantage for the home, but in a classroom situation or a computer camp the "one-time-through" nature of the game may be advantageous; after they find King Olin, children will probably let their peers have a turn. ■

Julie L. Dalton
La Jolla, CA

First Base Software

McGraw-Hill Book Company

1221 Avenue of the Americas
New York, NY 10020

Data-base management
Any Apple II, 64K, CP/M
\$29.95 Home programs
\$49.95 Business programs

★ ★ ★

McGraw-Hill's new small-business line is the essence of good software: It combines functionality and reasonable cost, thereby producing more value from the product than the price paid for it. The 12 programs, ranging from home use systems to business inventory control, are particularly suited to folks who have neither the time nor the inclination to design their own data bases. (I'll examine four of the programs here—Business Inventory Manager, Business Address Manager, Home Address Manager, and Personal Income Tax Records Manager.)

Once you learn how to run one program, using the others is easy. All work with CP/M, come with a program disk you can copy, and use the same basic menu structure. Each program is menu-driven, eliminating the tedious task of memorizing commands. The packages are also data-base oriented; the fields for information storage are predesigned and the field lengths preset.

You can, of course, quickly sort or search through up to ten fields and pull out the items you want to examine or change. To select information to display or print, you can ask for an exact match or for data that's either greater than or less than your search criteria. All searches, however, are AND searches: If you ask for more than one search criterion, the program finds the information only if each condition matches. You can't ask for a wild-card search (find the item if the field *includes* this. . .).

The documentation contains a minor error. The manuals (each about 30 pages) say you can use an MT (more than) search or an ME (more than or equal to) search. Unfortunately, your screen doesn't show these search patterns; instead, it uses GT (greater than) and GE (greater than or equal to). This problem, though, is easy to figure out and will be corrected in the next printing.

An additional feature is a Utility section that helps you create new data disks, then checks the system for bad sectors to isolate any problems it finds, and so on. You can also print reports in 80 or 132 columns, but the card must be in slot 1.

A Brief Rundown

The Business Inventory Manager is an inventory-control data base: It tracks your inventory using 17 data fields running from a place for your inventory number to retail price to physical location. A one-drive Apple stores 250 inventory items; a multiple-drive system, 825. You can keep a running balance of items on hand, print summaries that indicate what products have reached their minimum quantity, and so on. The program even tracks purchase order numbers, so you can ask for a detailed report of all items below minimum stock level that have not been ordered yet.

The Business Address Manager keeps

track of names, phone numbers, addresses and other data useful for sales prospect control. The 22 fields store the names of your prospect, colleagues, family, and friends. Depending on the amount of data each record contains, you can store from 25 to 100 people with a single-drive system, and up to 600 with a multi-drive Apple.

You'd use the Home Address Manager, similar to its business counterpart, to manage personal data—Christmas lists, for example. It has 19 fields, including one for noting people's interests.

With both address programs, interfacing with form letters written on a CP/M word processor (WordStar and Perfect Writer are two mentioned) is a straightforward and well-explained process. Both address systems can also print one size of mailing labels on one-across continuous sheets.

The Personal Income Tax Records Manager keeps track of income and deductions. It has 23 breakdowns—13 for listing deductions, six for detailing income, and the rest for listing check numbers, and so on. A single-drive Apple allows 100 entries; and a multi-drive system, 550. Instead of the Query function that the other programs use for either on-screen or printed summaries, this package sends all its reports to your printer.

A Few Slips

These programs have a few flaws. Their predesign, although okay for many functions, limits their usefulness because you can't add new fields or change their lengths. Some programs include fields you'll never use, but you still must skip through them as you use the files.

There's also no math capability; you can store numerals and search on a range of numbers, but you can't calculate, for example, the total value of your inventory. The Personal Income Tax Records Manager, however, *will* create summaries of your income, and can break down your deductions into three classifications and then total them.

Error checking for date entry is nonexistent: The programs happily accept the entry 34/76/11. When I tried to save data on a write-protected disk, I got the CP/M error message "Bdos Err On A: I/O". Unable to decipher it, I had



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1364	Home Accountant 2C/E-128K	74.95 48.05
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MACINTOSH

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1099	Helix	395.00 273.45
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to turn off my Apple and start again. While you can create reports the length of the available fields, the programs cannot send control codes to the printer to tell it to print in emphasized mode. If you want a wide printout with a lot of fields, you'll have to send the right codes to your printer through a BASIC program or by some other means.

How Good

All four programs work and give you some powerful software for the price. Because they use menus, they're easy to use. You'll need to know a bit about CP/M to copy and start new data disks, or to decipher an error code. All in all, they're definitely worth a close look at your local store. ■

**Gregory R. Glau
Prescott, AZ**

Polywriter

Passport Designs

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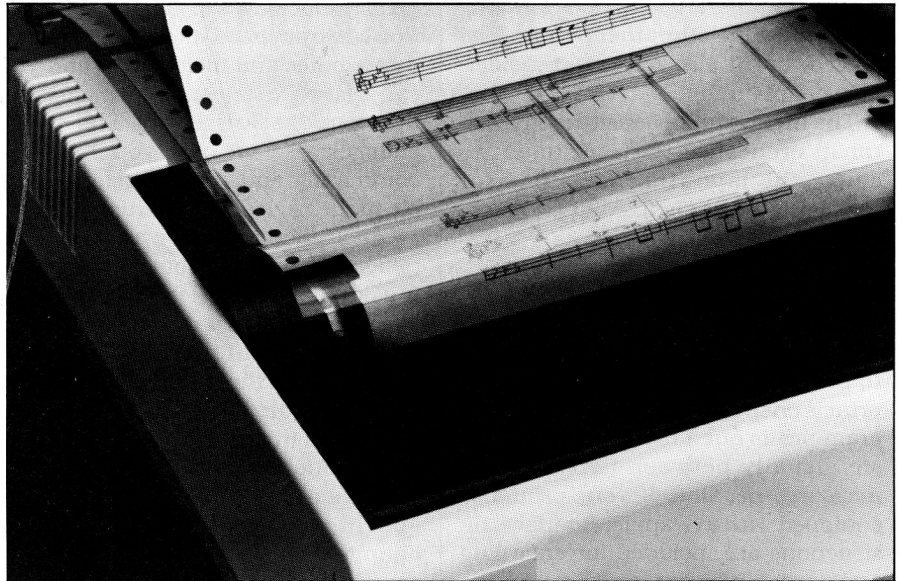
★★★

Polywriter is the "WordStar" of music—a program that simplifies the transcription of musical ideas by eliminating the instrument-to-paper-and-back-see-saw that music composition usually involves. A significant step forward for synthesizer composers, Polywriter is a powerful tool with few limitations and many capabilities and commands.

Polywriter offers multiple-part, multiple-staff transcription. It uses standard notation and can correctly print ties, beaming (the straight lines connecting notes), split stems, double sharps and flats, and octaves.

Creating Music

Menus and a series of commands with each mode control Polywriter. In the create mode, a menu lets you enter the title and choose an output form from among eight possibilities including treble, bass, piano, choral, and combinations of each with the orchestral form. You then enter the key and



Polywriter transcribes music on your printer.

meter, the tempo, the note density to appear on the final printed page, and the resolution (how accurate your playing must be to be transcribed correctly). Finding comfortable adjustments for tempo and resolution requires experimenting.

The electrical contact made when you press a key must be complete, because the program fills gaps with rests that cannot easily be edited out. It takes practice and can be frustrating to develop the needed accuracy. You must also play all notes as legato when entering them, because the program rounds off notes and may ignore staccato entries.

When you finish, Polywriter immediately asks if you wish to try again, then lets you adjust the meter and resolution and re-enter the music.

Separate sections of the 95-page booklet give detailed instructions for overdubbing—entry of music for an additional instrument—and entry of orchestral scores. While overdubbing is not difficult, orchestral scores require great care. They must be stored on individual data disks under one title, each instrument stored as a single staff with up to 16-voice polyphony. This is important because you cannot enter two instrumental parts with the same name. If you have separate parts for groups of the same instrument, they must be entered on the same staff and marked "divisi," or you can fudge by using the name of another instrument that uses that clef, but be extremely careful of meter.

You must enter the longest part of the orchestral piece first to transcribe

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it successfully. This provides a framework into which the other parts will be placed, but it also requires considerable pre-planning.

The menu option density isn't a factor in orchestral transcriptions because the layout of measures for orchestral scores is fixed at two measures per line.

Printing

The print mode is menu-driven from within the edit mode and enables you to print pages or entire scores. The print is crisp and clear, though the program prints out a narrow page of music, usually between two and four measures per line. If your printer is equipped with a Grappler interface, instructions are included for enlarging and darkening print, and for printing horizontally.

Edit Mode

A series of commands in the edit mode lets you scroll forward through each file (piece of music) by pages—

usually four staves or two grand staves. You can transpose, change, and add or delete notes and incidentals; and you can erase extraneous marks and redraw necessary ones. The basic changes are easy once you know the commands, and there is a reference table in the back of the instruction book.

Other changes, however, are more difficult. Changing notes in a piece of music that has been temporarily transposed requires that you remember how many half-tone steps comprise the change in the original key, not the transposition. When multiple notes are played in the same time span, the longer ones are usually considered "control notes" since they control the spacing of the others. When you change notes in that measure, you must indicate whether the note is a control note or a regular note.

If the pattern of notes is complicated, entering the rhythm with a single note first and then changing the notes to the more difficult pattern simplifies transcription.

Although each operation has several pages of detailed instructions and examples to help you, it is essential to read all the instructions before attempting to edit a piece of music, because the list of commands used to make these changes is long.

Text can be added to the music (although not to the orchestral format) either for titles or verses. It is stored in a separate file and merged with the music file. Text is limited to 32 characters per line, so you must use the least dense note configuration if you intend to add words. Sometimes even this does not allow enough space for correct placement.

Requirements

Polywriter requires an Apple II Plus or IIe with at least 64K RAM and one or two drives. It comes in three versions: one each for the Passport Designs Soundchaser four- and five-octave keyboards, and another for instruments equipped with Passport Designs' version of the musical instrument digital interface (MIDI). Polywriter also calls for a dot-matrix, graphics-capable printer and is compatible with Grappler, Prometheus, and Wizard cards.

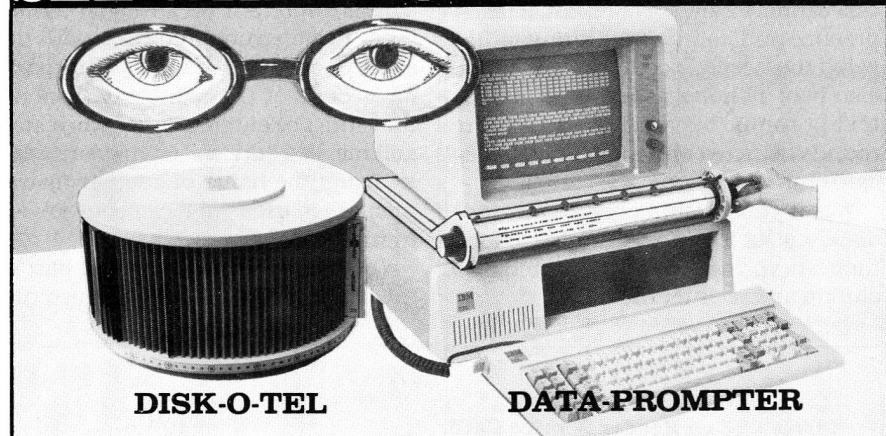
The Passport Designs MIDI interface package, at \$195, contains their MIDI interface card with two plugs and cables for keyboard communication. A third plug attaches the unit to a MIDI percussion instrument with an optional Drum Sync cable kit.

The interface supports multiple synthesizers, but only one, serving as the recording keyboard, is directly connected to the computer; others, connected via MIDI cables, serve only for music playback.

The MIDI interface requires a 48K Apple II with disk drive, a MIDI-compatible synthesizer, and an amplifier or headphones. Installation instructions are clear, and assembly of the system is easy. Only one aspect requires attention: You must connect the computer out cable to the synthesizer's in port and vice versa for the system to work. The number of voices you can use depends on your synthesizer's capacity. If you use an Apple IIe, the interface card functions properly only in slot 2. ■

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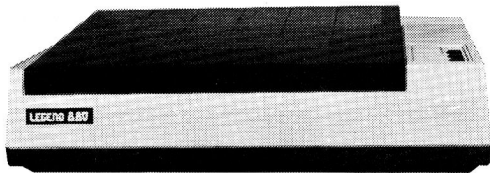
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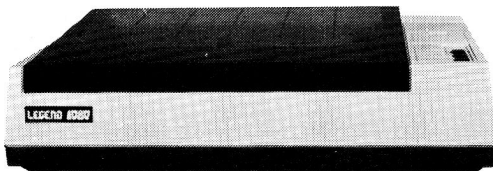


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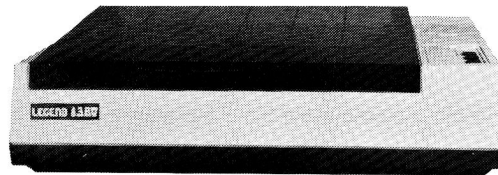
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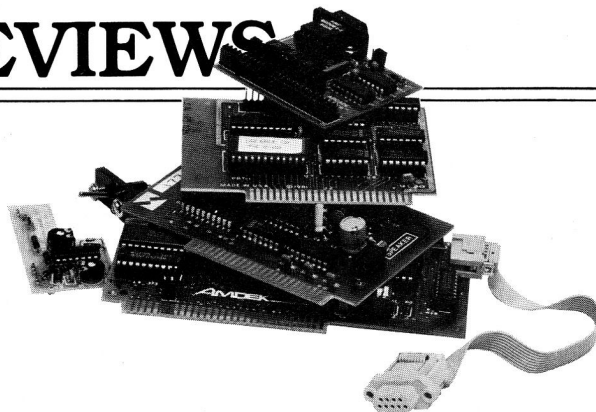
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Dot-matrix printer

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★★

Apple's newest printer, the Scribe, is an attractively packaged idea—but nothing to write home about. Its low price and the fact that it can be plugged directly into the //c will lure the new computer owner.

What sets the Scribe apart from other serial printers is the fact that it's a thermal-transfer, dot-matrix printer with a 24-vertical-element printhead that's a snap—literally—to replace.

Unlike an Epson, the Scribe isn't an impact printer. Its printhead presses a wax-based ribbon against the paper; the character heads heat up and melt the ink onto the paper. Since the character heads don't clack against the platen, it's quieter than dot matrix, though it sounds like R2D2 from Star Wars' fame as the printhead slides back and forth while printing.

Attractive and compact, the Scribe weighs 14.1 pounds and measures 14.5 inches by 12.4 inches by 6.1

inches. Transmission speed is 9600 baud (the //c's default configuration), but it's capable of 1200 baud. It accepts single sheets of paper, fanfold, sprocketed paper, or paper-backed transparencies.

Its sprocket assembly and paper-release lever are flimsy. I thought the lever would snap off every time I used it. The printer's interlock switch fits into an extension on the printer cover, but unless this switch is mated, the printer doesn't work. And the cover design makes it impossible to read your text until about five or six lines have been printed; you may want to wedge a piece of plastic in there, as I did, and leave the cover off.

Many Modes

Two-speed, dual-mode, the Scribe runs at 80 characters per second (cps) in the draft mode and at 50 cps in near-letter-quality mode. The Roman-faced letter mode prints 12-dot-by-15-dot characters in a 15-by-24 matrix. In the draft mode, the characters are 9 by 14 in a 12-by-24 matrix.

Both modes have alternate character sets for languages other than Amer-

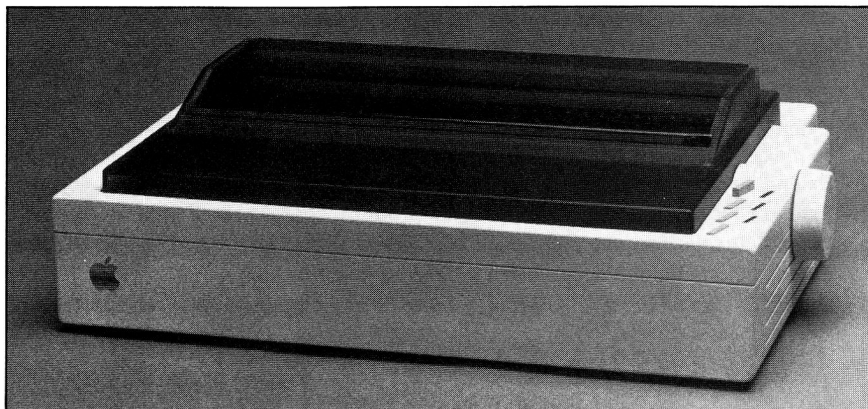
ican English. To use these characters, specify the appropriate control or escape sequences or set the printer's proper DIP switches. British, Swedish, German, Italian, Spanish, and French symbols are available.

Subscript, superscript, condensed and expanded typeface, and underlining are included in the letter and draft modes. Ninety-six ASCII characters and symbols and 25 European language characters are available, too.

Paper handling functions include form feed, top of form, line-feed spacing, line-feed direction, page length, a line-feed function that enables or cancels a carriage return, auto line-feed, carriage return, and auto-print action.

According to the manual, the Scribe has four lo- and two hi-res graphics modes. The lo-res modes are 72, 80, 144, and 160 horizontal dots per inch by 72 vertical dots per inch and the hi-res modes are 144 and 160 horizontal dots by 144 vertical dots. The manual doesn't say how to capture a screen dump of a picture saved to disk, though, and the demo programs are written in Pascal.

A nice feature, the 4K built-in buffer,



Apple's Scribe printer will lure the new computer user.

gobbles up about two pages of text and returns keyboard control to you that much faster.

The Scribe's manual is nicely printed but suffers from slipshod proofreading. For example, the self-test printout yields a graphics representation of the eight DIP-switch positions and (according to the manual) calls for an asterisk in one location, but it actually prints out elsewhere. On page 60, a blank space appears where the alternate character sets are supposed to be. Also, the control/escape codes for the American symbol set on page 60 are incorrect. The correct code appears on page 61.

Color Printing

The bands on the Scribe's color ribbons are arranged sequentially: 8 inches of yellow followed by 8 inches of magenta and then 8 inches of cyan. Color will enhance graphics printing (but remember there's little information available from Apple on that) because with the Scribe's ability to backspace and overprint lines, the three

primary colors can yield orange, green, purple, and black. But I suspect the novelty of the color graphics printout will wear off rapidly in direct proportion to the cost of these one-pass ribbons.

Printout quality ranges from mediocre in the draft mode to good in the letter mode. Unfortunately, the darkness of the letters varies. I couldn't determine whether this was a problem with the ribbon, the printhead elements, or the paper.

The biggest nuisance is embedding the escape and control codes in the text of word-processing programs. Because some special characters require six control strings to turn on, unless your program can create macros or a glossary, you'll have a problem.

Another problem stems from incompatible word processors. I tested Magic Window II with these codes and it misinterpreted some of them. I connected the Scribe to my II Plus with a serial card and RS-232C cable and tried printing with CP/M's "Type" command and with WordStar. Several

paragraphs were printed correctly, and then garbage came out later.

Although the Scribe appeals to the beginner, more experienced users should look at Discwasher's DIN-pin serial-to-Centronics parallel interface to use Epsoms and Okidatas with the //c. ■

Jay W. Schwarz
Port Chester, NY

Relax

Synapse Software

5221 Central Avenue
Richmond, CA 94804

Biofeedback monitor
\$139.95

★★

The 75 to 90 percent of us who regularly visit the doctor for stress-related problems can learn to control daily pressures via the computer. Relax, a biofeedback device from Synapse Software, uses the Apple II as part of a stress-management program. When operated properly and faithfully, this product works as promised in monitoring and reporting tension levels.

Biofeedback, a recent and effective clinical tool for stress control, monitors the body's relative level of skeletal muscle tension—closely linked to emotional stress—and teaches you to relax. Relax's EMG (electromyograph) measures electrical activity in your frontalis (forehead) muscles. These muscles are a good biofeedback gauge: Their convenient location makes monitoring their activity easy, and research has shown that they are among the most difficult muscles to relax.

Installation

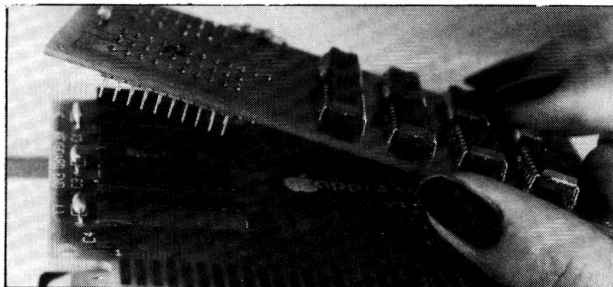
Relax comes as a one-size-fits-all system, compatible with several personal computers. It connects to the internal joystick port through an adapter cable. One end attaches to the EMG module's cable, while the other end has three branches—one of which fits the Apple. Unfortunately, the joystick port connector of the cable supplied with the test unit was installed backwards, making for a tight and clumsy fit.

The cable's two unused sections had to be mounted within the Apple's case

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as well and could get in the way or cause a short circuit. Synapse Software says that a future version of Relax will be on a dedicated, plug-in card for the Apple's main bus.

Attaching the headband is like putting on a rather tight sweatband. Padded and covered with blue corduroy, the band is held firmly in place with a velcro strip on the rear. Three dime-sized metal pads above your eyebrows press against your forehead to sense the electrical impulses from your muscles. Moistening the electrodes slightly with a saline solution increases conductivity between them and your skin and ensures that they work properly.

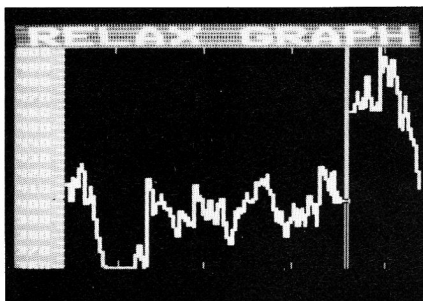
Operation

Two slide controls on the EMG unit let you set the sensitivity to the range that suits you. There are no absolute references, so the sensitivity varies for every user. Both the EMG settings and the screen scale are relative indications of relaxation trends, and have no bearing on the results.

The Relax program portrays your level of stress/relaxation in three ways: Relax Graph, an extremely sensitive graphing system, displays your relaxation state plotted against time; Kaleidoscope, a multi-colored pattern, changes in shape and hue according to your progress; and Balloon Game, a rather simple game routine, uses your tension level to control the flight of an on-screen balloon. Of these, I found the Relax Graph to be by far the most effective.

As the program starts, a scale from 350 to 500 appears on the left of the screen, and a small, battery-powered module receives and amplifies the minute electrical signals your muscular activity emits. Then the module converts these signals into a form that the Apple can understand, feeding it into the computer through the joystick port. Depending on the tension level the computer reads, a pointer on the scale moves up or down. A moving vertical bar traces this reading across the screen every four seconds, making it easy to monitor your progress. Reading the input signal directly produces a rather jagged line. You can also average the reading slightly over time.

When I first tried biofeedback, I was amazed at how difficult it was to relax completely; what I thought would be



Graph tension with Relax from Synapse.

calming (closing my eyes firmly or concentrating on a relaxing event, for example) actually caused higher readings. Eventually, I learned the proper way to let my body relax deeply—the equivalent of several hours of sleep—and 20 minutes or so with the device created a feeling of well-being and serenity. Once you learn the techniques that work best for you, it's easy to carry them over to everyday life.

Overall Impressions

As much potential as this system has, some features could have been put to more effective use—sonic feedback, for example. Almost all biofeedback units in clinical use rely on a tone that lowers in pitch or volume as you relax, letting you droop or close your eyes completely and still be able to monitor your state of relaxation.

Except for some video game-like blips in the Kaleidoscope and Balloon Game programs, Relax is based completely on graphics. While this has certain benefits of its own, requiring you to keep focusing your eyes on the monitor to see your progress is annoying and hinders complete relaxation. The signal coming from the EMG is simple from a software perspective, and a program to convert this into an audio tone would be easy to design, so it's surprising that the manufacturers didn't provide a conversion with this system.

Relax's sparse manual does almost nothing to explain how the system works or how to interface it with your own programs. Part of this can be traced to a one-size-fits-all-computers philosophy.

Despite its limitations, Relax is well-made and reasonably priced. Experimenters could have a field day with something like this—controlling programs or games with an input not too far removed from actual thought.

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HARDWARE REVIEWS

Game designers could easily use Relax's EMG unit to monitor a player's emotional condition and adjust the level of play accordingly. The system can also allow physically handicapped persons more freedom in using computers. The possibilities are endless. ■

W. Charles Doherty
South Dartmouth, MA

LQ-1500

Epson America

3415 Kashiwa Street
Torrance, CA 90505

Dot-matrix printer
\$1495

★ ★ ★

The Epson LQ-1500 wide-carriage dot-matrix printer offers the best of two worlds: genuine letter-quality print and close-to-normal dot-matrix speed. This new standard of performance is achieved through a new 24-pin printhead design. The machine also offers control codes that are upward-compatible with those on older Epson printers when you're doing word processing, spreadsheets, and (to a degree) graphics.

The LQ-1500 delivers genuine letter quality at 67 characters per second (cps), good draft quality at 200 cps, high-resolution graphics in four densities, 54 print styles—including emphasized, double-strike, italics, subscript, and superscript—and all of the special features normally used in business and professional offices. In the letter-quality mode, any of nine international character sets can be chosen with a pitch of five or ten characters per inch (cpi) for pica type or six or 12 cpi for elite type, plus proportional character spacing. The draft mode adds the compressed pitches of eight and 16.9 cpi.

The printer can handle 4-inch to 16-inch continuous paper (with an optional tractor feed) or up to 14-inch cut paper. Epson has maintained its rear paper feed, but has added a single-sheet load button and newly designed cut-sheet paper guide. Also, a single-bin, 200-sheet automatic paper feeder is now available, and a two-bin model is "currently in the qualifying stage."

Form formatting includes the usual top, bottom, left, and right margins, and horizontal and vertical tabs. Form feed and line feed control paper movement. You can also print out hexadecimal code instead of the normal ASCII characters by holding down the form-feed and line-feed buttons.

Interchangeable plug-in interface modules make the LQ-1500 compatible with most microcomputers. You must purchase a module that matches your computer's interface card (\$95 for parallel and \$150 for RS-232C serial). The interface module's built-in 2048-character (2K) print buffer eliminates the periodic pause common with older models. Adding a pin-feed tractor, the list price comes to about \$1700; I consider this cost effective for a dependable, ruggedly built machine with wide support from software manufacturers.

The software control codes that drive the LQ-1500 are a "superset" of those used in earlier MX-, RX-, and FX-series models, letting you continue to use your word processing and spreadsheet software. Graphics programs will run, but they require a new driver to produce the correct height-to-width proportions. (The literature fails to mention this.) Epson claims that more than 30 major manufacturers are presently developing LQ-1500 drivers.

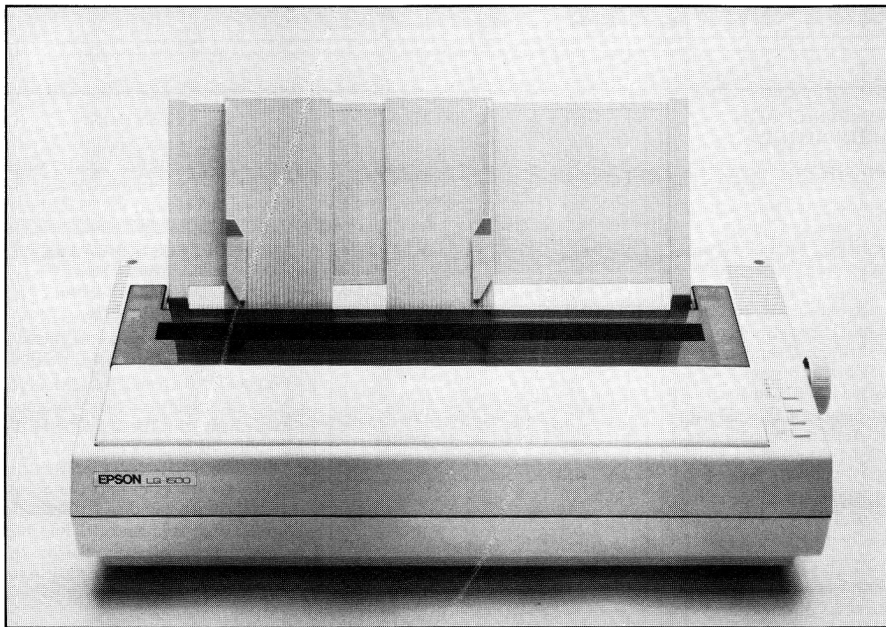
Installing the Printer

The first 44 pages of the 100-page manual use simple text, supplemented with well thought-out drawings, to explain the assembly process. The manual also describes all components so you can easily recognize them and set up the printer without much, if any, difficulty. (It took me 30 and 15 minutes on two successive occasions, but I do have some experience with these things.)

The DIP switches for establishing default settings are located in the interface modules, on the outside of the printer at the back. This is convenient as long as you can face the rear of the printer, and no continuous paper is installed.

Printer Control

If you are familiar with BASIC and how to send printer commands within software, then the manual does an excellent job of presenting the material



The Epson LQ-1500 dot-matrix printer.

clearly and completely. A very good and removable quick reference chart is provided at the back of the book.

However, if you don't already have this knowledge about printer controls, reading this section will be more confusing than informative. I recommend that you read my article, "The Docile Printer" (*inCider*, February 1985, p. 75), for a primer on how to send printer-control codes through software. An optional programmer's manual, available from Epson for \$25, also

delves into the mysteries of graphics and custom-designed fonts.

The Bottom Line

I use LQ-1500s in my business and am delighted with their performance. My only complaint is that, considering the emphasis placed on "upward compatibility," Epson's literature should mention the need for new printer drivers for graphics software. ■

James Munro
Youngstown, NY

Examples of letter-quality print using the LQ-1500.

LQ-1500 LETTER QUALITY

This is Pica the default condition

This is Pica Expanded

This is Pica subscript

This is Pica Emphasized

This is Pica Emphasized Doublestrike

This is Elite

This is Elite Expanded

This is Elite subscript

This is Elite Emphasized

This is Elite Emphasized Doublestrike

This the default condition again

This is Proportional

This is Proportional Expanded

This is Proportional subscript

This is Proportional Emphasized

This is Proportional Emphasized Doublestrike

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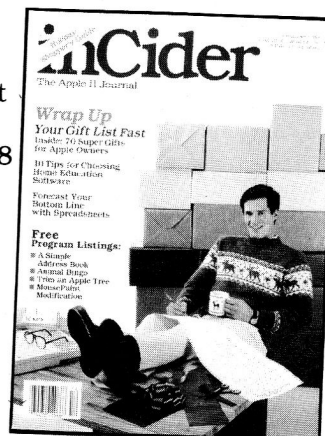
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SUPRTERM	MORE	NO	YES	NO	NO	NO	NO	YES	YES
WIZARD 80	MORE	NO	NO	NO	NO	YES	NO	YES	YES
VISION 80	MORE	YES	YES	NO	NO	NO	NO	YES	YES
OMNIVISION	MORE	NO	YES	NO	NO	NO	NO	YES	YES
VIEWMAX 80	MORE	YES	YES	NO	NO	YES	NO	NO	YES
SMARTERM	MORE	YES	YES	NO	NO	NO	YES	YES	NO
VIDEX	MORE	NO	YES	YES	NO	YES	YES	NO	YES

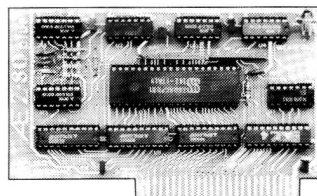
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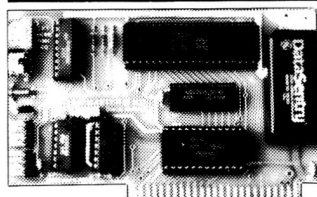
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	PRO-DOS COMPATIBLE	INCLUDES DOS DATER	MILLISECOND TIME	YEAR DATA	LARGEST SAMPLE SOFTWARE	REMOTE SET PORT	BSR PORT	EMULATES ALL OTHER CLOCKS
H.O.	YES	YES	YES	YES	YES	YES	YES	YES
BRAND A	NO	NO	YES	NO	NO	NO	NO	NO
BRAND C	NO	NO	NO	NO	NO	NO	NO	NO
BRAND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

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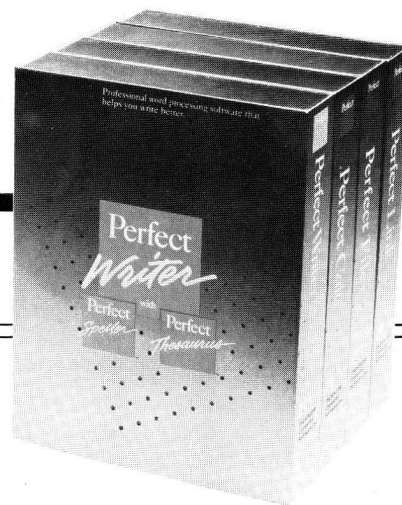
Product descriptions contained in this section are based on information supplied to us by the respective manufacturers. These announcements are provided solely as a service to our readers and do not constitute endorsement by inCider of any given product.

Computers in Narnia

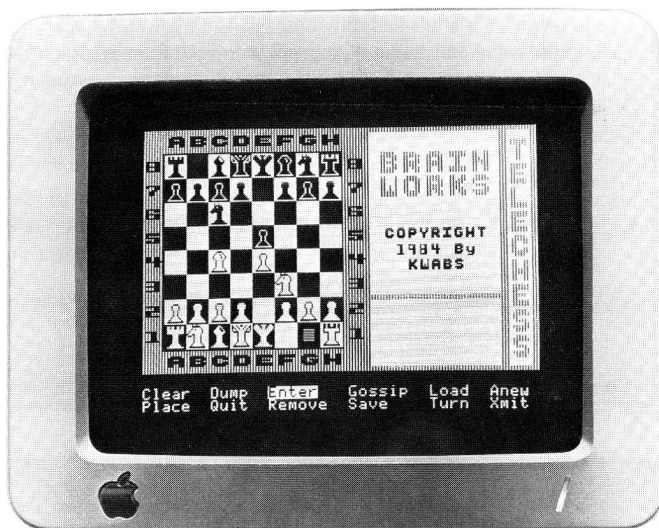
C.S. Lewis' land of Narnia sets the scene for computer games from Word Publishing. In **Narnia**, based on *The Lion, the Witch and the Wardrobe*, you evade dwarfs and ice crystals to find Aslan, the noble lion. Journey to Aslan's country in **Dawn Treader**. Both games are filled with arcade-style action based on the books' images and plots. They work on any Apple II computer, cost \$39.95 each, and come from Word Publishing, P.O. Box 1790, Waco, TX 76796. Use number 450 on the Reader Service card.

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Computer games are set in C.S. Lewis' Narnia.

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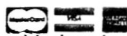
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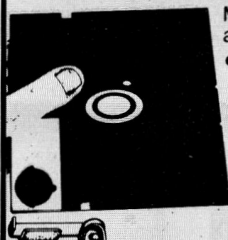


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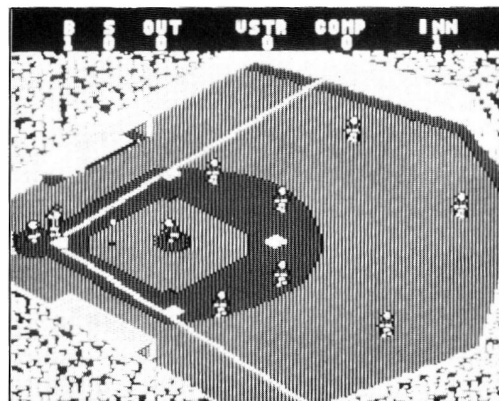
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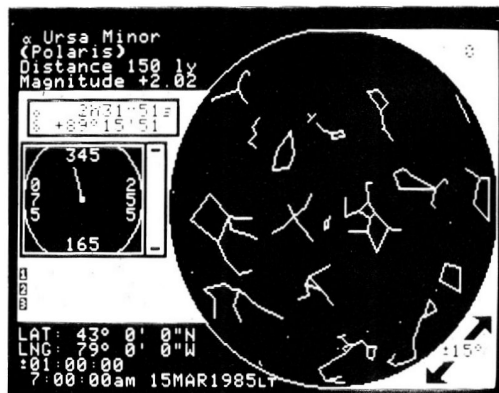
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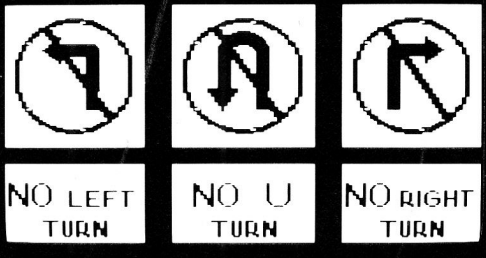
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And When Elected...

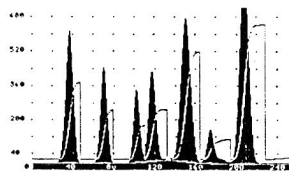
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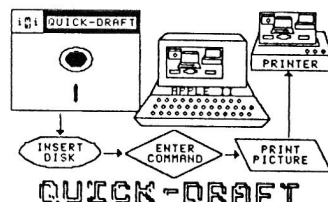
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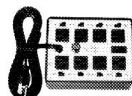
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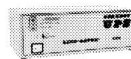
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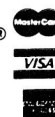
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Swapping Files

Use **Universal File Conversion** any time you need some moving done. This utility (\$34.95) moves data and programs among DOS 3.3, CP/M, Apple Pascal, SOS, and ProDOS. You can also initialize disks for any of these formats. It works on any Apple II with 64K, and comes from Quality Software, 21601 Marilla Street, Chatsworth, CA 91311. Check off number 458 on the Reader Service card.

Bet Tu, Caesar?

Like to sharpen your casino skills? Try **Caesar's Guide to Gaming**. The first, Blackjack (for \$69.95), covers blackjack as played at Caesar's Palace in Las Vegas, Lake Tahoe, and Atlantic City. Future titles will cover roulette, craps, baccarat, and slot machines. These tutorial simulations run on any of the Apple II computers. Place your bet with Screenplay, 1095 Airport Road, Minden, NV 89423, or bet number 459 on the Reader Service card.

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Thought Processor

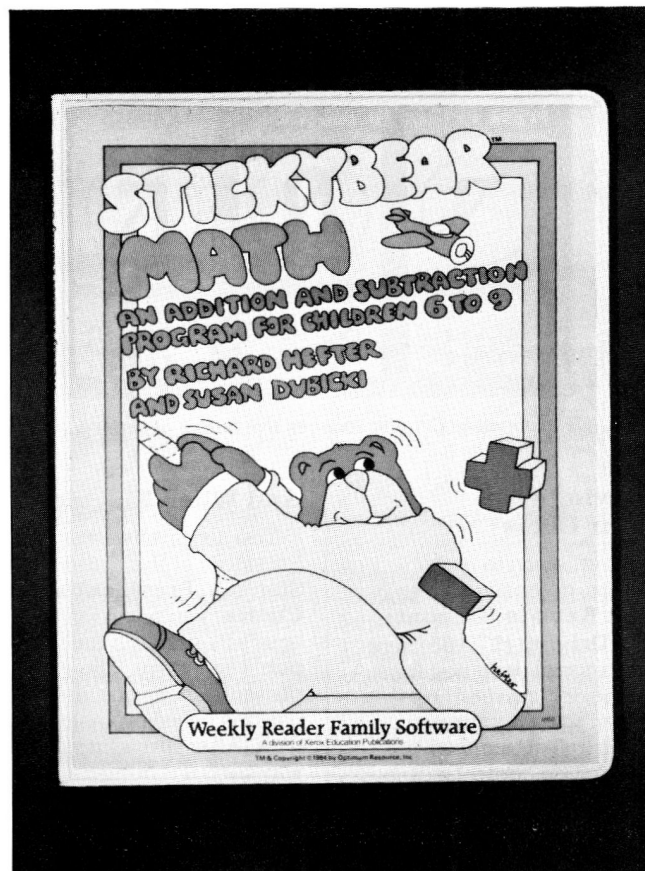
Organize your random thoughts and flashes of insight with **MaxThink**, priced at \$39.95. This tool helps you find, organize, and communicate relationships among ideas. Functions include: group ideas, create outlines, evaluate outlines, set boundaries on concepts, and reorganize. Any 64K Apple II can MaxThink, so contact MaxThink, 230 Crocker Avenue, Piedmont, CA 94610. Use number 468 on the Reader Service card.

Stickybear Grows Up

Stickybear, hero of the preschool set, goes to school. **Stickybear Reading** teaches vocabulary, parts of speech, and sentence structure. **Stickybear Math** has 20 levels of difficulty for practicing basic math skills. Priced at \$39.95 each, these programs run on all of the Apple II family of computers. Find out more from Weekly Reader Family Software, 245 Long Hill Road, Middletown, CT 06457, or circle number 454 on the Reader Service card.

X-ray Your Spreadsheets

Get the true story behind your spreadsheet with **V-Grid Lister** (\$49.95). This utility works on any Apple II computer and prints all the formulas that make up your model. It works on files created by VisiCalc and MagiCalc and lets you verify that the bottom line isn't taking any shortcuts. Contact FoggWare, 4913 Van Epps Road, Cleveland, OH 44131, or circle Reader Service number 467.



Stickybear goes to school with Math and Reading.

DB's Writer

DB Master has a new sibling, the **Business Writer** (\$149). This easy-to-use word processor is for quick memos, sophisticated mail merges, or the Great American Novel. Writer reads files created by DB Master, AppleWorks, PFS:File, VisiFile, and DIF programs. For complete details, write to Stoneware, 50 Belvedere Street, San Rafael, CA 94901, or mark number 461 on the Reader Service card.

Tracking Your Riches

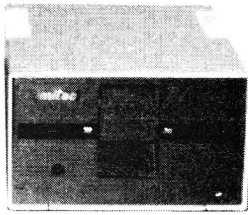
The popular **Rags to Riches** accounting system moves to the Apple //c for \$150. The package includes ledger, receivables, payables, and sales. The program needs all 128K of

the //c and uses a split screen to show details in the upper section and summaries in the lower. This product comes from Chang Labs, 5300 Stevens Creek Boulevard, San Jose, CA 95129. The Reader Service number is 469.

Explore New Worlds

For the serious star-pilot, **Universe** presents enough challenge for months of play. This four-disk game takes you from financing and outfitting your cruiser to exploring the local star group, until you find the object of your quest. Just reading the manual is an evening's entertainment. Beam up \$98.50 to Omnitrend Software, P.O. Box 3, West Simsbury, CT 06092, or check off number 466 on the Reader Service card.

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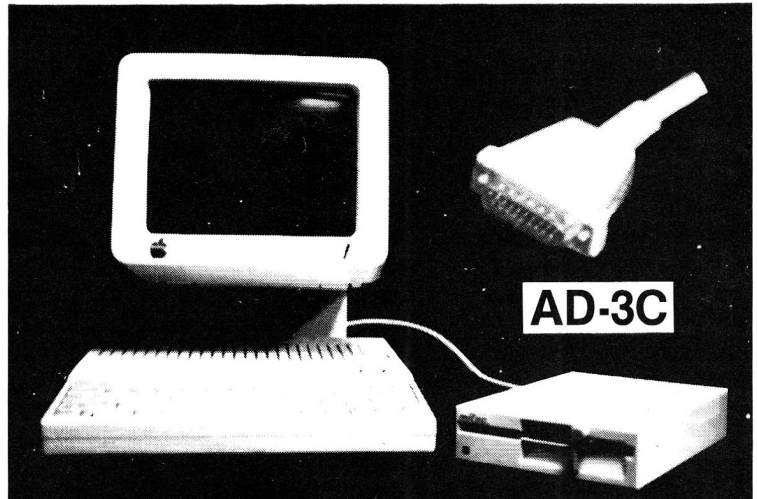
AD-1

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When you need a second drive for your Apple IIc*, consider MITAC's AD-3C. The AD-3C's ivory color and round shielded cable matches the IIc in appearance and functional compatibility. MITAC's suggested retail of \$199 shows why it makes sense to buy MITAC, the first name in second drives for Apple.

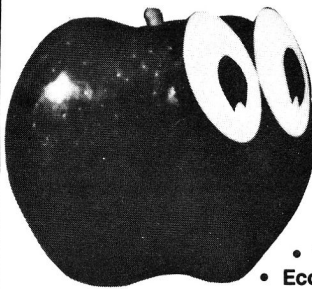
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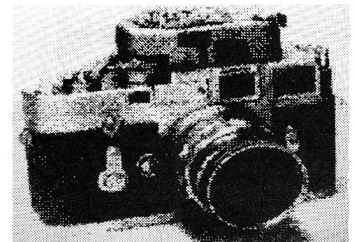
LET YOUR APPLE SEE THE WORLD!

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 x 256 picture element scan
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- **Economy** — A professional tool priced for the hobbyist

The DS-65 is an intelligent peripheral card with on-board software in 2708 EPROM. Check these software features:

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- Line-scan digitizing for reading charts or tracking objects
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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: \$79.95

*Paper Tiger is a trademark of Integral Data Systems, Inc.

THE **MICRO
WORKS**

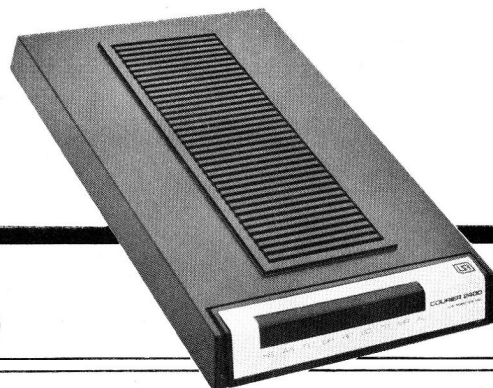
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The 2400's Are Coming

Major modem companies are entering the untested market of 2400 baud. Even before on-line data bases support this speed, you can gear up for the world of fast talk. The **Smartmodem 2400** costs \$899 and comes from Hayes Microcomputer Products, Norcross, GA (Reader Service number 470). U.S. Robotics, Chicago, IL (Reader Service number 471), offers the **Courier 2400** for \$895. Also at 2400 baud is the **2424AD** (\$795) from CTS Datacomm, Eden Prairie, MN (Reader Service number 472). Retailing at \$795, the **Professional 2400** is the entry from Novation, Tarzana, CA (Reader Service number 473). The **Cermetek 2400** was not priced at press time, but comes from Cermetek Microelectronics, Sunnyvale, CA (Reader Service number 474). Prometheus (Fremont, CA, Reader Service number 475) will also be represented, although their modem is yet unnamed.

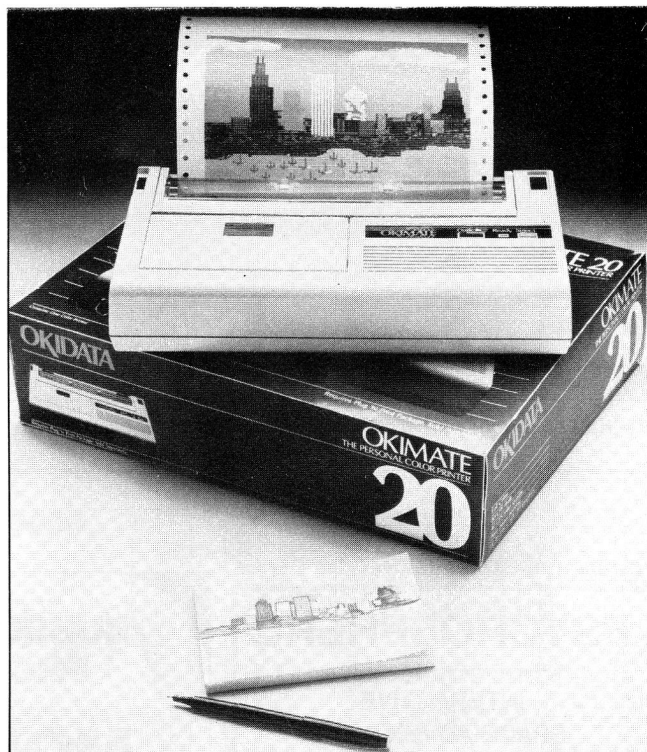
Product descriptions contained in this section are based on information supplied to us by the respective manufacturers. These announcements are provided solely as a service to our readers and do not constitute endorsement by inCider of any given product.

Low-Cost Color Printer

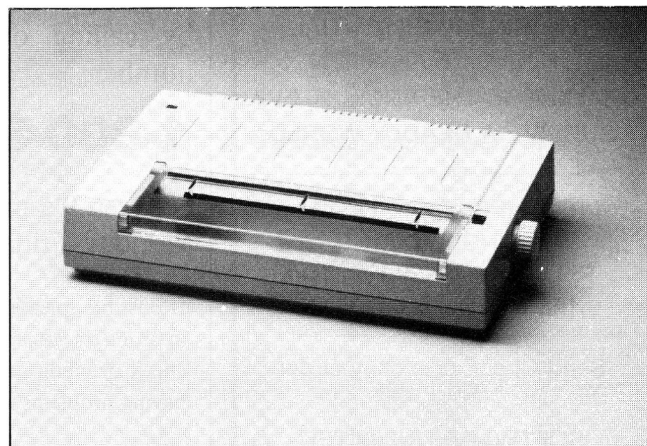
The **Okimate 20** gives you full-color printing for \$268. The printer has friction and tractor feed, works at 80 cps, and uses dot-matrix thermal transfer to create more than 100 different shades of color. A color screen dump and a self-teaching tutorial about color printing are included. You will need an interface kit (price to be announced) to hook up your Apple. Information comes from Okidata, 532 Fellowship Road, Mt. Laurel, NJ 08054. Use number 481 on the Reader Service card.

Letter-Quality Portable Printer

The **Riteman LQ** weighs in at 6.6 pounds but packs a letter-quality punch at 20 cps. For \$299, you get 80 columns, elite type, and Centronics-style parallel interface. Small enough to fit in a briefcase, the LQ provides economical printouts for word processing, business reports, and spreadsheets that require letter-quality print. Printing is done by a rotating character drum and easy-to-change ink roller. Get full information from Inforunner, 431 North Oak Street, Inglewood, CA 90302. The Reader Service number is 477.

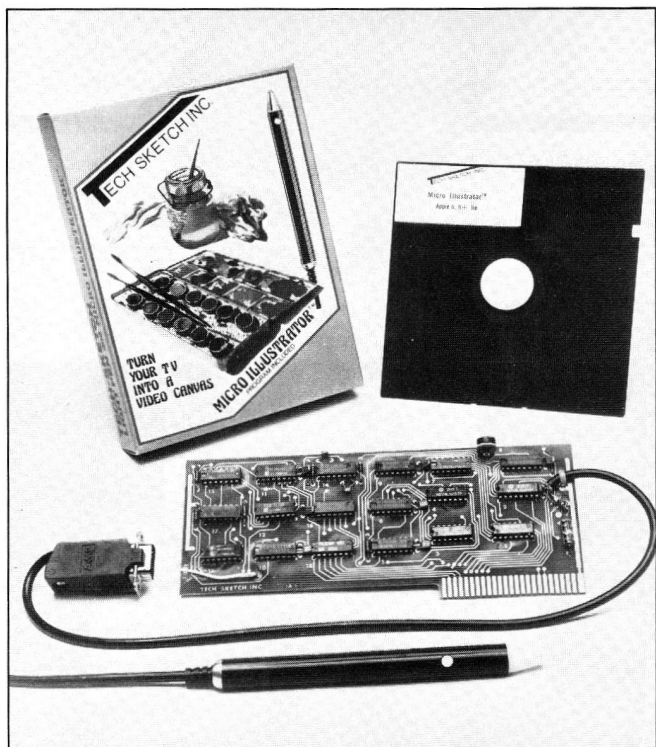


Okidata's full-color printer, the Okimate.



Riteman LQ is a heavy-duty lightweight.

edited by Kerry J. Lanz



Tech-Sketch light-pen graphics system.

Ouchless Graphics

Creating hi-res graphics is as easy as painting with the **Tech-Sketch Light Pen** (\$149.95). Like an electronic paintbrush, the light pen draws directly on your TV or monitor. The system works with the Apple II, II Plus, and IIe, and includes graphics software. Get information from Tech-Sketch, 26 Just Road, Fairfield, NJ 07006, or by checking Reader Service number 483.

Program Your Own Arcade

Have all the bells and whistles you like with the **Sprite & Stereo Board** (\$249) plugged into your Apple II Plus or IIe. There are over 140 functions easily used from any language. Each of the two audio channels has one

sound and three voice generators. The video chip (TMS 9918) supports 32 sprites for arcade-quality graphics. Get more details from Development Devices, RD 3, Box 490, Middlebury, VT 05753. Mark number 478 on the Reader Service card.

Trapping Your Mouse

A mouse is a fine accessory, but sometimes wanders under papers, scurries behind the drive, and even hides under the desk. **The Better Mouse-trap** (\$9.95) is just the thing to tame a wild mouse. Attached to the side of your monitor, this plastic accessory confines your mouse away from the clutter. It comes from Perk Company, 150 Commercial Street, Sunnyvale, CA 94086. Use number 491 on the Reader Service card.

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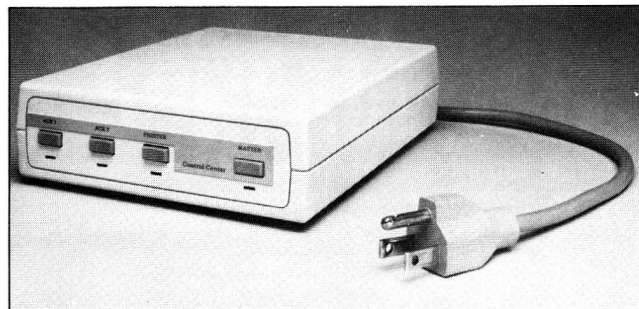
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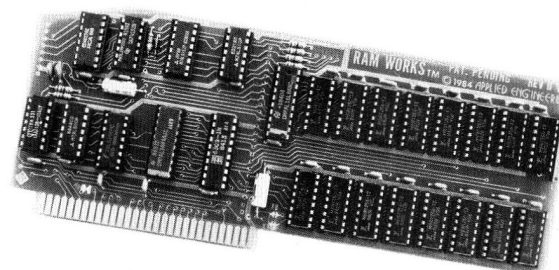
available for modifying popular operating systems, AppleWorks, and VisiCalc to use all that extra memory. Prices range from \$179 for 64K to \$1499 for 1 Mbyte. For more details, contact Applied Engineering, P.O. Box 798, Carrollton, TX 75006, or mark number 482 on the Reader Service card.

Slimline //c Drive

The **AD-3C** half-height disk drive plugs into your Apple //c drive port for that second drive so helpful in word processing, data base, and spreadsheet applications. Designed to complement the color and lines of the //c, this drive is priced at \$199 by American Mitac, 3385 Viso Court, Santa Clara, CA 95054. Use Reader Service number 493.



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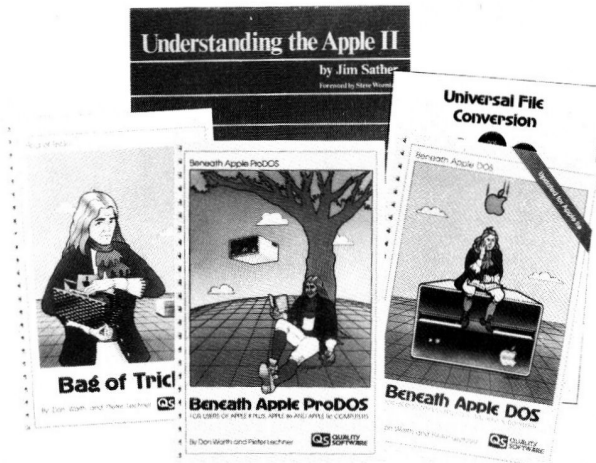
—Steve Wozniak

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NEW PRODUCTS

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VCR Tutor

Learn more about your new Apple and some powerful application programs with **CompuTutor**, a 90-minute videotape tutorial. Titles include: Using Your Apple IIe, Using VisiCalc, Using WordStar, and Using dBASE II. Each tape costs \$69.95 and is available in VHS and Beta formats. Write to Embassy Home Entertainment, 1901 Avenue of the Stars, Los Angeles, CA 90067. Use number 486 on the Reader Service card.

Adapting Drives

Equip your Apple IIc with any external drive available for the Apple II family by using an **AppleDaptor**. At \$32.95, this adapter plugs into the back of the IIc and connects with disk drives designed for the II, II Plus, or IIe. Learn more from Micro-Design, 6301 B Manchaca Road, Austin, TX 78745. Use number 489 on the Reader Service card.

Diablo Daisy Wheel

Xerox has introduced a new letter-quality printer, the Diablo **Advantage D25**, at \$745. This daisy-wheel printer is designed for heavy-duty use and comes in both serial and

parallel versions. It features proportional spacing, a speed of 25 cps, and variable lines and columns. Contact Xerox Corporation, Xerox Square, Rochester, NY 14644, or mark number 492 on the Reader Service card.

The Apple Touch

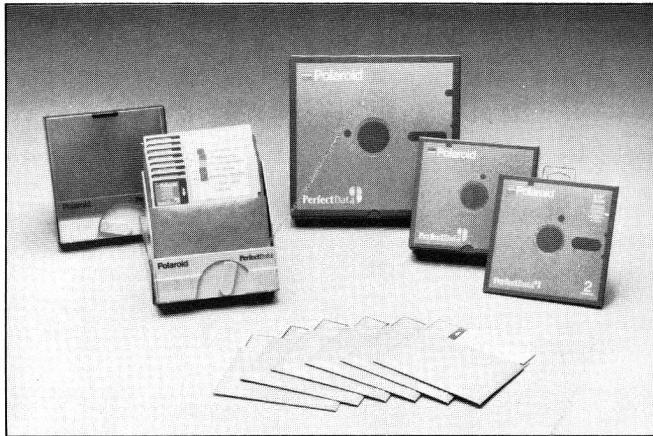
Give your Apple a touch screen with **Soft-Touch**. Your finger breaks an infrared beam where you touch the screen, then your II Plus or IIe reads the coordinates through a custom interface. The Soft-Touch system (beginning at \$1295) includes interface and custom 14-inch color monitor. Write for information to BFA, 1704 Moon NE, Albuquerque, NM 87112. The Reader Service number is 490.

External IIc Drive

Give your Apple IIc more bytting power with the **Micro Drive IIc**. This slimline disk drive is fully compatible with all Apple IIc software, yet works much faster than Apple drives. It comes with complete cabling to plug easily into the back of your IIc. Priced at \$279, this drive comes from Titan Data Systems, 2625 South Orange Avenue, Santa Ana, CA 92707. Use Reader Service number 476.

Printer Adapter for IIc

If you want the choice of using a parallel printer with your Apple IIc, then you need **PAC** (\$69). This interface lets the IIc use Centronics-style parallel printers. It plugs directly into the serial printer-port and requires no external power with most printers (except Epson). PAC is a product of Microsci, 2158 South Hathaway Street, Santa Ana, CA 92705. Use Reader Service number 484.



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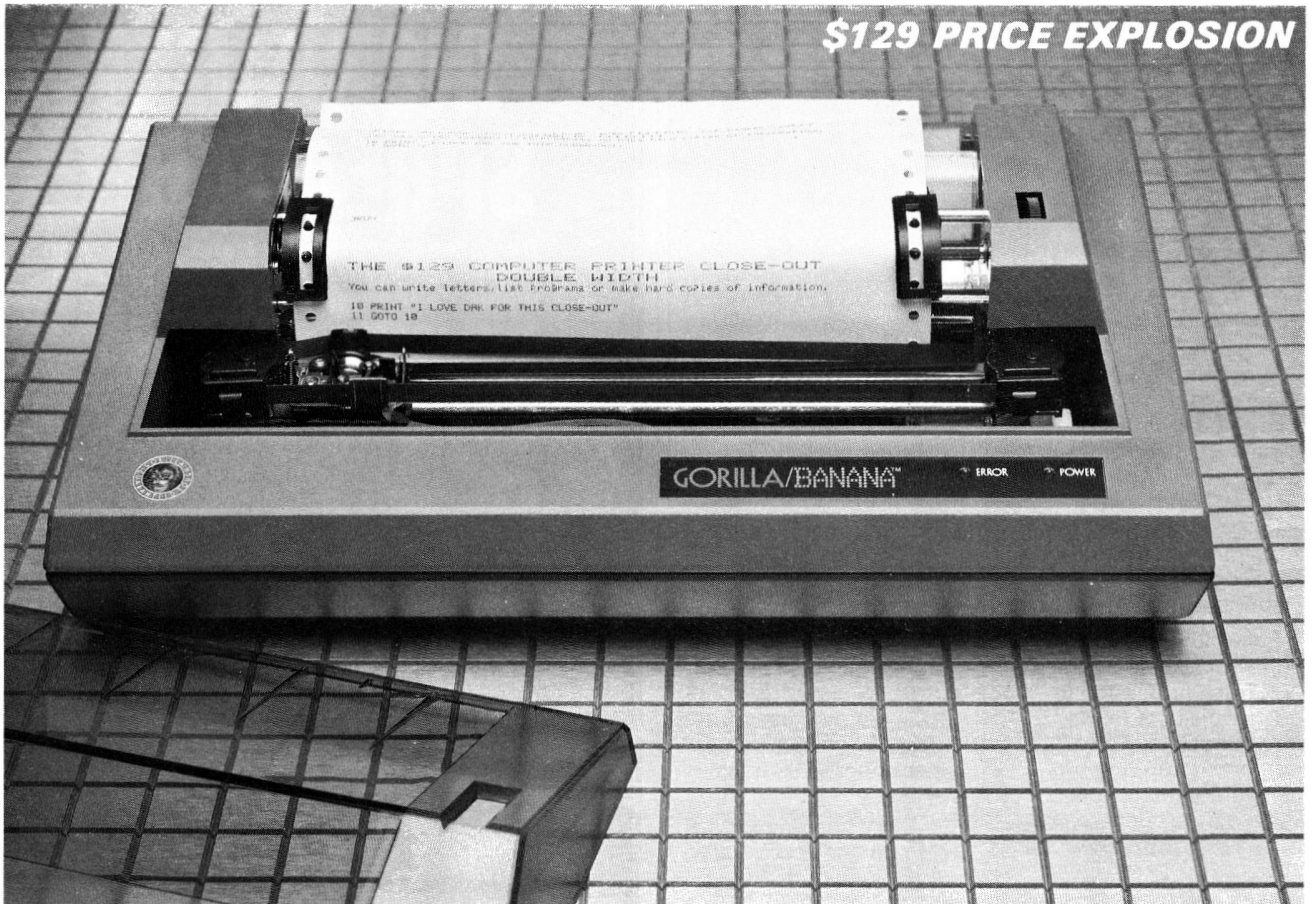


Standard, non-programmable models are also available for both the Apple Ile and Apple II+*. Ask your dealer for details.

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By Drew Kaplan

Complete your computer. Now you can harness the full power of your computer. From writing letters to listing programs, your computer will be incredibly more useful.

It uses plain paper and it's super reliable. It prints both upper and lower case characters. And, if you aren't using a printer with your computer, read on.

LISTING/INDEXES/LETTERS AND MORE

Experience the thrill of actually writing your letters and reports on your computer. Now you'll be able to use all of your computer's word processing and **correcting** capabilities to really explore your creative talents.

It's easy. Some of the new word processing programs are so 'user friendly' that you can learn to use them in just about 10 minutes. Change a line, change a word, move a line. Just push a button.

Are data bases a four letter word? Not on your life. Now you can use your computer to organize all your telephone numbers, your stocks, stamps, and recipes.

If you're using your computer for business, you can have a complete, instantly accessible file for each customer by name, what they bought, when, etc.

A data base will let you find or organize and print out any information you want, however you want, whenever you want.

There's no more complicated programming required. And, inexpensive data base programs are available at any computer store.

PERMANENT RECORD

If you have a modem, you're in for a treat. You can access encyclopedias, stock market reports, and much more. When you sign on a service like CompuServe or The Source, the world is quite literally at your finger tips.

With a printer, you can get a 'hard copy' of all the incoming information. You can get everything from SAT test simulations and IQ tests to loan amortization schedules.

AFRAID OF PROGRAMMING?

You don't need to know the first thing about programming to use this or any printer. But, if you've never typed in and run a program, here's the easiest one I know. Turn on your computer.

Commodore Owners, and Atari Owners, your computer, and most others will say 'Ready'. Just push Control and Reset on an Apple. Then type the following:

```
10 PRINT "DAK IS WONDERFUL"  
20 GOTO 10  
RUN
```

You should type a carriage return at the end of each line. Why not try this program now? Next time, I'll tell you how to get out of the program, and maybe even discuss peeks and pokes.

If the program isn't running, type LPRINT instead of PRINT in line 10.

To you sophisticated programmers, think how easy your life will be when you can print out program lists that you can study at length.

And, you won't have to load a bunch of disks to find a program when you print out a menu for each of your disks.

LOOK AT ALL IT DOES

An ad in several August computer magazines listed a \$149 thermal printer (that needs expensive thermal paper) as the lowest priced printer in the U.S.

Imagine a 50 character per second, plain paper, full 80 column dot, matrix printer with a built-in standard Centronics Parallel Interface, slashed to just \$129.

This printer handles plain old cheap standard fanfold pin feed computer paper from 4.5" to 9.5" wide, with it's built-in adjustable tractor pin feed drive.

It's so powerful you can even use two-part forms for a carbon copy. Plus, there's an impact control for print darkness.

It understands and prints 116 upper and lower case characters, numerals and symbols. And that's not all.

You can even print Double Width characters. **And, look at this.** This printer has full graphic capabilities with 480 dot horizontal resolution and 63 dot per inch vertical resolution. So, you can print out your pictures, pie charts or graphs.

It prints 10 characters to the inch, six lines to the inch. In short, it's going to make typewriters into dinosaurs. When hooked to your computer, you'll never have to retype anything again. If you find an error, just make the correction and let the computer retype your work for you.

The printer is made by C.I.TOH/Leading Edge in Japan. It's built to really take heavy use. But in the unlikely event that it should need service, there are approximately 400 service centers nation wide.

It takes standard long life inked ribbon cassettes that are readily available nation-wide. This is a printer that will give you many years of continuous reliable service and enjoyment.

AND NOW THE BAD NEWS

If you're the president of a large company sending important business letters, you may want a \$1000 daisy wheel printer. But for most uses, dot matrix printers are incredibly faster, and there isn't any way to print out a graph or picture on a daisy wheel printer.

But, there are two things you need to know about this printer. First, it has about the dumbest name I've ever seen. It's built tough and rugged. So, they named it The Gorilla Banana Printer.

Second, like many dot matrix printers, the letters g, j, p, q, and y are level with the other letters. Each letter is completely and perfectly formed, but each sits level with the rest of the alphabet.

Upper case letters and symbols are unaffected. So, if you don't want letters that look like they were printed by a computer, this printer isn't for you.

But for most letters, term papers or reports, programming and all the data bases and information you'll get through a modem, this printer is perfect.

COMPATIBLE COMPUTERS

Any Computer with a standard Centronics parallel port, such as: Apple, Franklin, IBM PC, TRS80, Osborn, Atari, Commodore VIC 20, Commodore 64, Kaypro, and virtually any other personal computer. Plus, most briefcase portables.

FEAR OF INTERFACES?

Your computer is smart. But, it doesn't know how to 'talk' to other devices. That's why you need an interface.

An interface isn't just a cable. It's actually an intelligent translator that lets your computer talk to other equipment.

Usually the computer manufacturers don't include the various interfaces when you buy your computer, because they don't know if you'll ever add peripherals such as disk drives, printers or modems.

So, rather than sell you something you don't need, you don't buy an interface until you add onto your computer.

There are two types of printer interfaces. The first allows you to do text word processing. For 99% of computer use, this is all that is needed. It translates all the possible letters and punctuation known as ASCII. This printer understands 116 characters and symbols.

A second type of interface also allows you to dump pictures or graphics from your screen or memory. This is more complicated because every dot must be told where to go. This interface, or 'driver program' as it is called, is available in two forms; built into an interface card, or as a program on a disk which you use in

conjunction with any standard interface.

Either way, you'll have the printer operating in just a few minutes. And if you already have a printer, the same Centronics parallel interface and cable (about 85% of all printers are compatible) should work with this printer.



With this printer you can alter your graphics as you desire. You can print normal or reversed (both shown above, reduced to fit in this catalog) and you can even print double size.

WHY SO CHEAP

A new model will emerge soon with a different name. Leading Edge had just 28,000 of these remarkable printers which have been selling at discount for as little as \$199, left in stock.

DAK bought them all for cold hard cash. And now we're offering them to you for less than the original price we were quoted as wholesale.

The printer is approximately 16½" wide, 9" deep and 7" tall. It's backed by Leading Edge's standard limited warranty.

ADD PRINTING POWER TO YOUR COMPUTER RISK FREE

Now you can really make use of your computer. 50 characters per second printing on plain paper for just \$129. Wow!

Now you can print out your programs, your notes or your letters. If you're not 100% satisfied, simply return the printer and any accessories in their original boxes to DAK within 30 days for a refund.

To order your 50 Character Per Second Dot Matrix, Plain Paper Printer with a built-in Centronics Parallel Interface, risk free with your credit card, call toll free, or send your check for the breakthrough close-out price of just \$129 plus \$8 for postage and handling to DAK. Order No. 4101. CA res add 6% sales tax.

Special Note: If you need a serial printer for a computer, such as the TRS80 Color Computer, order the identical printer with a built-in Serial Interface for the same price. Use Order No. 4102.

The Printer comes packaged with a long life ribbon. Extra ribbons are available at computer stores. DAK has them for \$4 each (\$1 P&H) Order No. 4103.

Standard Centronics Interfaces for your computer are available at any computer store. This Printer has its receiving inter-

face built in. You simply need one, complete with its cable, to plug into your computer 'to send' information. Below are our favorites for 5 of the most popular computers.

For your Apple. We have Practical Peripherals' text interface for just \$49 (\$2 P&H) Order No. 9877. We have their graphics capable interface for just \$79 (\$2 P&H) Order No. 4104. If you already have a Centronics Parallel Interface, we have a graphics driver program on disk for just \$7 (\$1 P&H) Order No. 4105.

For your IBM PC, you don't need an interface. It's usually already built-in. But, you do need a cable. We have a cable, ready to connect this printer to your computer, for just \$19 (\$2 P&H) Order No. 9879. We have a graphics driver program on disk for just \$7 (\$1 P&H) Order No. 4106.

For your Atari 800, 800XL, 400, or 600XL, we have a text interface for just \$69 (\$2 P&H) Order No. 9881. We have a graphics driver program on disk for just \$7 (\$1 P&H) Order No. 4107.

For your Commodore VIC 20 or 64, we have a text interface for just \$39 (\$2 P&H) Order No. 9883. We have a Graphics Interface for just \$54 (\$2 P&H) Order No. 4108.

Special Bonus for Commodore 64 owners. We have a powerful word processing program with editing, including changing a line, a word, or moving a line. Once you've tried computer word processing, you'll never want to look at a typewriter again.

Plus, we have a super data base program that lets you use 8 fields of information on up to 200 subjects at a time. Then you can search for any part, sort alphabetically or numerically and print out an address book, a list of your stocks or anything you can imagine. They're both yours for just \$5 (\$1 P&H) with purchase of the printer. Use Order No. 4122 for Disk, or Order No. 4123 for Cassette.

For most TRS80 Computers, you don't need an interface, just a cable. For the Black and White Computers, we have a Parallel Cable for just \$18 (\$2 P&H) Order No. 9885. For the Color Computers we have a Serial Cable (you need the Serial Printer as well) for just \$18 (\$2 P&H) Order No. 4109.

For briefcase-type portables, the Centronics Interface is usually built-in. Just stop by any computer store. All Centronics Printers use the same cable at the printer end, but you'll need a cable that fits your particular computer's plug.

Get hard copy print-outs of your programs or your graphics. Turn your computer into a powerful word processor. Forget retyping ever again. For just \$129 you can make your computer complete.

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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, IIe, or IIc 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 IIc

- 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 IIe 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*.

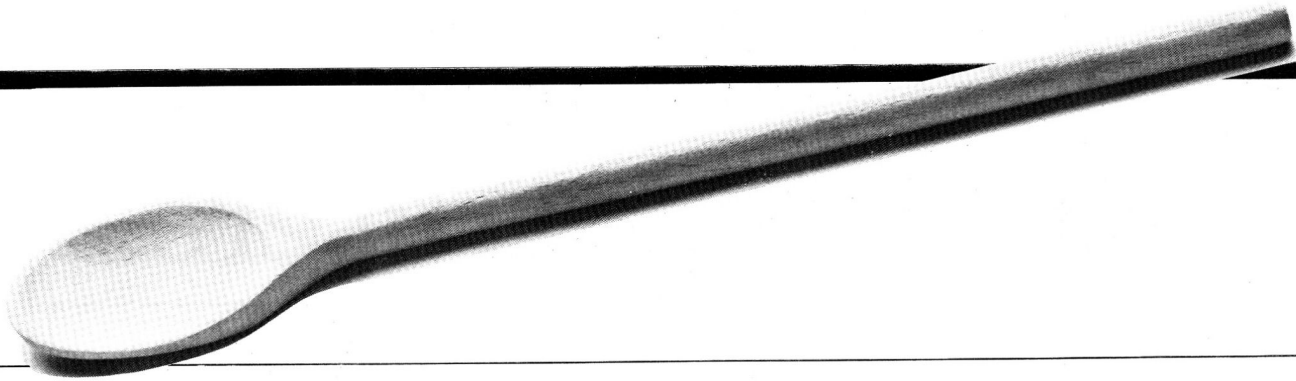
16) When you see the "Copy Complete" message, type in BASIC.SYSTEM and press the return key.

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 3DOG 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. ■

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Paul Boule, Sales Manager; Barbara Alvarez

Reader Service

This card valid until April 30, 1985

My vote for the best advertisement in this issue goes to
whose Reader Service number is _____.

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- ☐ 1. Personal subscription
☐ 2. Computer store
☐ 3. Newsstand
☐ 4. Bookstore
☐ 5. At work
☐ 6. Library
☐ 7. Friend/Colleague
☐ 8. Other

B. How many of each issue's program listings do you actually type in?

- ☐ 1. 0
☐ 2. 1
☐ 3. 2
☐ 4. 3
☐ 5. 4
☐ 6. 5 or more

C. Are you interested in reading more about the Macintosh or Lisa in inCider?

- ☐ 1. Yes, on the Macintosh
☐ 2. Yes, on Lisa
☐ 3. Yes, on both
☐ 4. No

D. Which of the following microcomputers do you own or use?

- ☐ 1. Apple II or II+
☐ 2. Apple IIe
☐ 3. Apple IIc
☐ 4. Apple III
☐ 5. Macintosh
☐ 6. Apple compatible
☐ 7. Other
☐ 8. Don't own or use one

E. What is your annual household income?

- ☐ 1. Under \$20,000
☐ 2. \$20,000 - \$40,000
☐ 3. \$40,000 - \$60,000
☐ 4. \$60,000 - \$80,000
☐ 5. \$80,000 - \$100,000
☐ 6. Over \$100,000

F. How much have you spent on computer hardware during the last 12 months?

- ☐ 1. Nothing
☐ 2. Under \$1,000
☐ 3. \$1,000 - \$2,000
☐ 4. \$2,000 - \$3,000
☐ 5. \$3,000 - \$4,000
☐ 6. \$4,000 - \$5,000
☐ 7. Over \$5,000

G. How much do you plan to spend on computer hardware during the next 12 months?

- ☐ 1. Nothing
☐ 2. Under \$1,000
☐ 3. \$1,000 - \$2,000
☐ 4. \$2,000 - \$3,000
☐ 5. \$3,000 - \$4,000
☐ 6. \$4,000 - \$5,000
☐ 7. Over \$5,000

H. How much have you spent on software during the last 12 months?

- ☐ 1. Nothing
☐ 2. Less than \$100
☐ 3. \$100 - \$250
☐ 4. \$250 - \$500
☐ 5. \$500 - \$1,000
☐ 6. Over \$1,000

I. What is your specific interest in the items circled at right?

- ☐ 1. Immediate purchase
☐ 2. Purchase within 6 months
☐ 3. Brand comparisons
☐ 4. Reference
☐ 5. Other

J. Do you influence computer purchases within your company?

- ☐ 1. Yes
☐ 2. No
☐ 3. Doesn't apply

K. On a scale of 1 (no interest) to 5 (great interest), please rate your interest in the following inCider columns:

- ☐ 1. Fermentations
☐ 2. The Game Reserve
☐ 3. The Glau Report
☐ 4. O'Brien's Journal
☐ 5. The Learning Machine
☐ 6. Child's Play
☐ 7. The Applesoft Adviser
☐ 8. The Cider Press
☐ 9. Fudge It!
☐ 10. Ask inCider
☐ 11. The Apple Clinic
☐ 12. Apple Extract

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102	107	112	117	122	252	257	262	267	272	402	407	412	417	422	552	557	562	567	572
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B. How many of each issue's program listings do you actually type in?

- ☐ 1. 0
☐ 2. 1
☐ 3. 2
☐ 4. 3
☐ 5. 4
☐ 6. 5 or more

C. Are you interested in reading more about the Macintosh or Lisa in inCider?

- ☐ 1. Yes, on the Macintosh
☐ 2. Yes, on Lisa
☐ 3. Yes, on both
☐ 4. No

D. Which of the following microcomputers do you own or use?

- ☐ 1. Apple II or II+
☐ 2. Apple IIe
☐ 3. Apple IIc
☐ 4. Apple III
☐ 5. Macintosh
☐ 6. Apple compatible
☐ 7. Other
☐ 8. Don't own or use one

E. What is your annual household income?

- ☐ 1. Under \$20,000
☐ 2. \$20,000 - \$40,000
☐ 3. \$40,000 - \$60,000
☐ 4. \$60,000 - \$80,000
☐ 5. \$80,000 - \$100,000
☐ 6. Over \$100,000

F. How much have you spent on computer hardware during the last 12 months?

- ☐ 1. Nothing
☐ 2. Under \$1,000
☐ 3. \$1,000 - \$2,000
☐ 4. \$2,000 - \$3,000
☐ 5. \$3,000 - \$4,000
☐ 6. \$4,000 - \$5,000
☐ 7. Over \$5,000

G. How much do you plan to spend on computer hardware during the next 12 months?

- ☐ 1. Nothing
☐ 2. Under \$1,000
☐ 3. \$1,000 - \$2,000
☐ 4. \$2,000 - \$3,000
☐ 5. \$3,000 - \$4,000
☐ 6. \$4,000 - \$5,000
☐ 7. Over \$5,000

H. How much have you spent on software during the last 12 months?

- ☐ 1. Nothing
☐ 2. Less than \$100
☐ 3. \$100 - \$250
☐ 4. \$250 - \$500
☐ 5. \$500 - \$1,000
☐ 6. Over \$1,000

I. What is your specific interest in the items circled at right?

- ☐ 1. Immediate purchase
☐ 2. Purchase within 6 months
☐ 3. Brand comparisons
☐ 4. Reference
☐ 5. Other

J. Do you influence computer purchases within your company?

- ☐ 1. Yes
☐ 2. No
☐ 3. Doesn't apply

K. On a scale of 1 (no interest) to 5 (great interest), please rate your interest in the following inCider columns:

- ☐ 1. Fermentations
☐ 2. The Game Reserve
☐ 3. The Glau Report
☐ 4. O'Brien's Journal
☐ 5. The Learning Machine
☐ 6. Child's Play
☐ 7. The Applesoft Adviser
☐ 8. The Cider Press
☐ 9. Fudge It!
☐ 10. Ask inCider
☐ 11. The Apple Clinic
☐ 12. Apple Extract

L. If you are not a subscriber, please circle 500.

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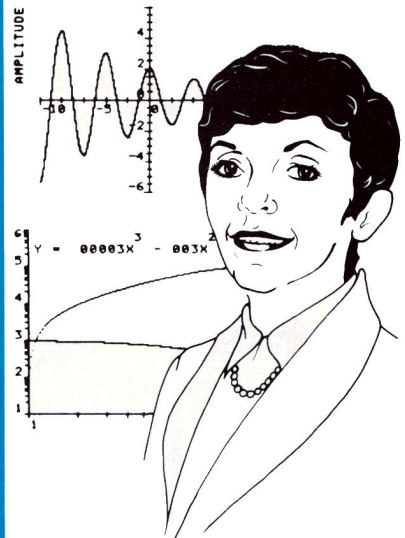
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- **How to Buy a Printer**
- **A directory of under-\$500 printers for home and business**
- **ProDOS, Part II: Menus**
- **The World's Fastest Typist... and her Dvorak-equipped //c**
- **Curing those caps-lock blues**
- **Get the right clock for your Apple**
- **Payroll programs for small business**
- **Major-league baseball teams getting an EDGE with Apples**
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Microcomputer Show
and Fleamarket
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March 11-13
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 IEEE Computer Society
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March 12
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 Payne B47, Arizona
 State University
 Tempe, AZ 85287
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 NACCIS
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 Tucson, AZ 85716
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March 21-24
COMDEX/Winter
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March 22-24
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National Computer
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Vogelback Computing
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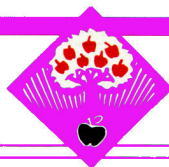
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A Computer Miscellany

In the more than five years I've been involved with Apples, parents have asked me many questions about improving their children's education through the use of the computer. The following collection represents questions I've been asked by readers and by customers in my former computer store.

How much time should my 11-year-old daughter spend each day on the computer?

There is no set amount of time that a child of any age should spend daily on the computer. The computer isn't an end in itself; it's simply a tool to help get a job done. Rather, you should be concerned with how much time your child spends on homework. After all, you don't concern yourself with how much time your child should spend with a ball-point pen. So the answer is simple: She should spend as long as necessary to accomplish the goal you've established.

Should I spend time making sure my child is computer literate?

Again, the computer is just a tool to be used in a way that benefits your child. Your child becomes computer literate by using a computer, not by learning what a CPU is, who made the first computer, or how many sectors occupy a disk. When cassette recorders were first introduced, no one talked about "cassette literacy." You become literate about cassettes by using them. The same holds true when

Almost everything you've ever wanted to know about computers and your child



Illustration by John Pirman

by Fred Huntington

learning to use a computer—you become literate about the computer by using it.

What type of printer should I get for my child's homework?

Generally, it's best to buy a dot-matrix, rather than a letter-quality, printer because the former is faster (120 characters a second on a typical dot-matrix versus 18 characters per second on a letter-quality printer), the ribbons last longer and are cheaper, you have more flexibility, and it's cheaper in the first place. Also, you won't need daisy wheels and you'll be able to do graphics. Most schools, even many universities, accept dot-matrix print. Some universities accept a doctoral dissertation done on a dot matrix, with only the very last, final copy, having to be done on a letter-quality printer. You can always rent a letter-quality printer for one job or borrow one from a friend. Of course, if you have unlimited funds, spend \$3500 for one of the new laser printers.

What is the best word processor for my child?

I usually recommend Bank Street Writer, HomeWord, or Milliken Word Processor (with a slight preference for the last). If you have older children who are going to do a lot of typing, I'd go with WordStar, the same word processor this column is composed on every month. There are many other good word processors. Of course, the best way to decide is to try them out. (See my November column for an in-depth look at word processing for children.)

Do I need two disk drives?

Not necessarily, unless you're using some sophisticated programs like MicroPro's WordStar or Ashton Tate's dBase II. Of course, it is often easier to work on a computer when you have two drives. A second drive is something you should add as soon as you can afford it.

What's a good program that teaches children about the computer?

I recommend Step By Step by Program Design. It sells for \$79.95 and gives a good introduction to BASIC programming.

At what age should my child start on the computer?

In the fifth grade or sooner if he or she asks for it. Both my children

"You become literate about the computer by using it."

started at age 2. But never force a computer on your children. Research doesn't support the common belief, for example, that the earlier a child learns to read, the better reader he will be; the same should hold true for computer literacy.

What typing program do you recommend?

My favorite typing program (even for young-at-heart adults) is Scarborough's MasterType. Thousands have been sold and there is nothing else that even comes close. If you're not a game-player, try Microsoft's Typing Tutor II (\$39.95).

Is spelling easily taught on the computer?

Spelling isn't a subject that is taught well using a computer. Basically, teaching spelling skills is teaching reading skills. Even the drill in spelling programs is different from what is taught in school. I think I've improved my spelling greatly by using a spelling checker with my word processor. I had been misspelling words for years until I started using one. So spelling can be taught incidentally on the computer, but not, in my opinion, as a separate subject.

There's a lot of public domain software out there. Could I just get by using the free stuff?

It depends. If you want your child to learn through a consistent, well-designed program, buy commercially available programs. If you aren't concerned that your child learns, use the free stuff.

My son doesn't know how to tell time yet. Is there a program available for this?

Yes, Hartley Courseware makes a beautiful program for \$29.95 called The Clock. It simulates a clock on the screen and has a digital clock you can turn on and off.

I've heard so much about the poor quality of educational software, I don't know whether I should in-

vest in programs for my child. I don't want to waste my money. Are there good programs out there?

In the first three or four years after the Apple was introduced, there was very little educational software available. And what was available was often of poor quality and usually not educationally sound. Thankfully, times have changed. Oh, there are still bad programs out there. But there are many outstanding programs available now. Many of the big educational companies have begun producing educational software, much of which is excellent. I've said it a million times, but it still holds: try before you buy.

With the Atari computer you can hook up the cassette recorder and have audio along with the computer. Is there any way to do that with an Apple?

Yes, Hartley Courseware makes a cassette control device for \$79.95 that can be used in conjunction with much of that company's software and a cassette recorder.

I'm looking for a program that will let me make up review questions for my daughter, yet still be fun for her. What do you recommend?

One of my favorite programs is The Game Show by Advanced Ideas. This game is modeled after the old television program Password and sells for \$39.95. You can make up your own questions, or use the ones that come with it, and play against an opponent or the computer.

What's a good program for doing scientific plotting?

Interactive Microware makes a good graph-drawing program called Scientific Plotter that uses 20 different plotting symbols.

All my son wants to do on the computer is play games. Isn't this bad?

Not necessarily. Some games teach youngsters fine motor coordination. Others use reasoning and higher-level thinking skills. Figuring scores involves a certain amount of math computation. And besides, it's better than having him watch television, isn't it?

I don't own a computer yet. Which one should I buy for my child?

Buy an Apple. No other computer is even close when it comes to the amount of software available commercially.

The Apple is easily the most popular computer in the schools today.

Please don't hesitate to write me with your questions, and I'll do my best to answer them in this column.

Thanks for reading. ■

You can write Fred Huntington at 27127 Marjorie Avenue, Torrance, CA 90503.

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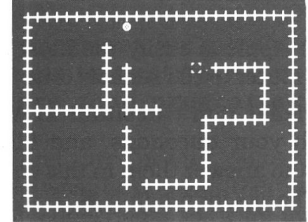


Dealer Inquiries Invited



Continued from p. 32.

Listing 2. Trap It!

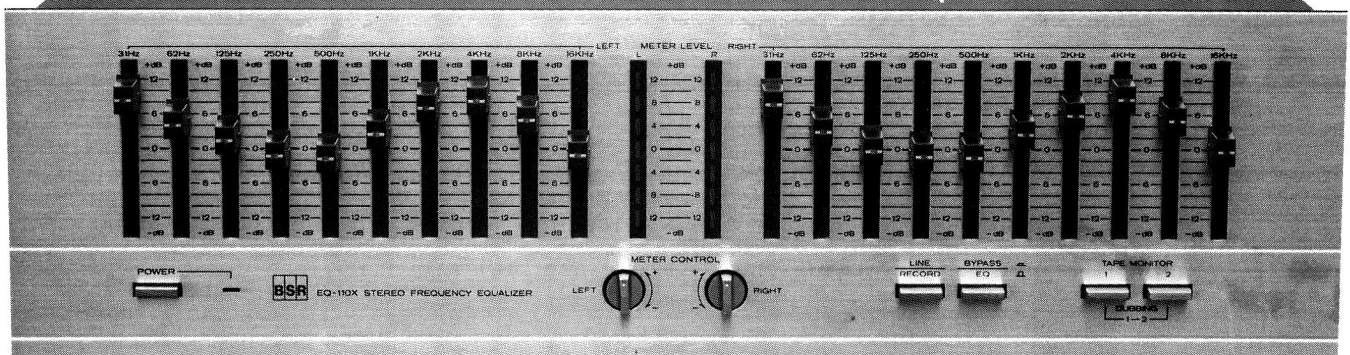


```

-10 TEXT : HOME : GOTO 660
-20 D = INT ( RND (U) * 9)
-30 C = Z:B = Z
-40 C = C + U: IF C = T THEN 330
-50 D = D + U: IF D > 8 THEN D = D - 9
-60 IF D = H THEN D = 4
-70 I = - U: IF D > 2 THEN I = Z
-80 IF D > 5 THEN I = U
-90 J = D: IF J > 4 THEN J = J - 6
-100 IF J > U THEN J = J - H
-110 P = (X / T) + I: Q = (Y / T) + J: IF P = - U THEN P = 2
      7
-120 IF P = 28 THEN P = Z
-130 IF Q = - U THEN Q = 18
-140 IF Q = 19 THEN Q = Z
-150 K = PEEK ( - 16384): POKE - 16368,0: IF K > 197 THEN
      210
-160 F = L + Q * H * T + P: IF PEEK (F) < > Z AND B = U THEN
      20
-170 IF PEEK (F) < > Z THEN 40
-180 IF (R / T = P OR S / T = Q) AND C < 4 THEN 30
-190 IF B = Z THEN GOSUB 320
-200 M = M + U: B = U: XDRAW U AT X,Y: X = T * P: Y = T * Q: DRAW
      U AT X,Y: K = PEEK ( - 16384): POKE - 16368,0: IF K <
      198 THEN 110
-210 K = K - 197: ON K GOTO 300,110,110,220,240,260,110,280:
      GOTO 110
-220 XDRAW H AT R,S: S = S - T: IF S = - T THEN S = 180
-230 DRAW H AT R,S: GOTO 110
-240 XDRAW H AT R,S: R = R - T: IF R = - T THEN R = 270
-250 DRAW H AT R,S: GOTO 110
-260 XDRAW H AT R,S: R = R + T: IF R = 280 THEN R = Z
-270 DRAW H AT R,S: GOTO 110
-280 XDRAW H AT R,S: S = S + T: IF S = 190 THEN S = Z
-290 DRAW H AT R,S: GOTO 110
-300 F = L + S * H + (R / T): IF PEEK (F) < > U AND (X < >
      R OR Y < > S) THEN N = N + U: DRAW 2 AT R,S: POKE F,U
      : GOSUB 320: GOTO 110
-310 GOTO 110
-320 POKE 798,U: POKE 799,200: POKE 800,20: CALL 801: RETURN
-330 RESTORE : FOR I = 1 TO 16: READ X,Y: POKE 798,U: POKE
      799,X: POKE 800,Y: CALL 801: NEXT
-340 TEXT : HOME : VTAB 8: PRINT "YOU REQUIRED ";N;" BLOCKS
      TO DO IT"
-350 VTAB 11: PRINT "THE BALL MADE ";M;" MOVES"
-360 E = M + 2 * N: VTAB 16: PRINT "YOUR TOTAL SCORE IS---";
      E
-370 IF W = 0 THEN W = 1: GOTO 1040
-380 A$(0) = N$: A(0) = E
-390 FOR I = 1 + T * (G - 1) TO T * G
-400 IF A(0) > A(I) THEN 440
-410 FOR J = T * G - 1 TO I STEP - 1
-420 A$(J + 1) = A$(J): A(J + 1) = A(J): NEXT
-430 A$(I) = N$: A(I) = E: I = T * G
-440 NEXT : POKE - 16368,0
-450 VTAB 23: PRINT "ANY LETTER TO CONTINUE?";
-460 GET A$: PRINT A$
-470 HOME : VTAB (8): PRINT "GIVE ME A MINUTE TO CHECK YOUR
      SCORE"
-480 PRINT "AGAINST WHAT OTHER PEOPLE HAVE DONE!"
-490 PRINT D$;"OPEN TRAP SCORES"
-500 PRINT D$;"WRITE TRAP SCORES"
-510 FOR I = 1 TO 20: PRINT A$(I): PRINT A(I): NEXT
-520 PRINT D$;"CLOSE"
-530 HOME : VTAB (4): PRINT TAB( 11)"BEST SCORES EVER MADE
      "
-540 VTAB 7: PRINT TAB( 18)"GAME #";G: PRINT
-550 FOR I = 1 + T * (G - 1) TO T * G
-560 PRINT TAB( 12)A$(I);: PRINT TAB( 27)A(I): NEXT
-570 PRINT : PRINT : PRINT "DOES ANYONE OUT THERE WANT TO P
      LAY? ";
-580 GET A$: IF A$ = "Y" THEN HOME : GOTO 910
-590 IF A$ < > "N" THEN HOME : PRINT " WHAT? -- I DIDN'
      T UNDERSTAND!";: PRINT : GOTO 570
-600 HOME : W = 0: A$ = "GOOD-BY!"
-610 FOR J = 1 TO 16: VTAB (8 + W): I = PEEK ( - 16336): PRINT
      TAB( J)A$: I = PEEK ( - 16336): NEXT
  
```

Listing continued.

\$89 CLOSE-OUT



Sound Detonator Plus

Make your stereo system's sound explode with life. Improve the sound quality by 30 to 50%. Plus, you'll add tape dubbing too with this limited BSR \$89 close-out.

It's like night and day. Crashing cymbals, the depth of a string bass, more trumpets or more voice will come bursting forth from your stereo at your command.

You'll make your music so vibrant that it will virtually knock your socks off when you use this professional quality 10 band stereo Sound Detonator Plus Equalizer.

It has a frequency response from 5hz to 100,000hz ± 1 db. BSR, the ADC equalizer people, make this super equalizer and back it with a 2 year limited warranty. Our \$89 close-out price is just a fraction of its true \$249 retail value.

CAN YOUR STEREO SOUND BETTER?

Incredibly better. Equalizers are different from regular bass and treble controls. And, 10 band EQs are the best.

Bass controls turn up the entire low end as well as the low mid-range, making the sound muddy and heavy. With an equalizer, you simply pick the exact frequencies you want to enhance.

You can boost the low-bass at 31hz, 62hz and/or 125hz, and the mid-bass at 250hz and 500hz to animate specific areas of the musical spectrum.

And, when you boost the part of the bass you like, you don't disturb the mid-range frequencies and make your favorite singer sound like he has a sore throat.

The high frequencies really determine the clarity and brilliance of your music.

You can boost the mid-range and highs at 1,000hz, 2,000hz, 4,000hz, 8,000hz and 16,000hz. So, you can bring crashing cymbals to life at 16,000hz while at the same time you cut tape hiss or annoying record scratches at 8000hz.

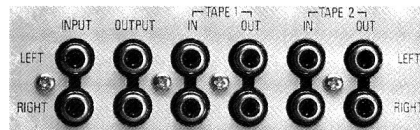
You can also boost or cut specific mid-range frequency areas to add or subtract vocal, trumpets, guitars or whatever instrument ranges you prefer.

GREAT FOR 2 TAPE DECKS

You can push a button and transfer all the equalization power to the inputs of two tape decks. So, if you have a cassette deck in your car or a personal stereo that you wear, now you can pre-equalize your cassettes as you record them.

Now you can get all the dramatically enhanced sound wherever you are. This

is an especially great feature for bass starved portables and high-end starved car stereos to make them come alive.



And, look at this. There are two tape inputs and outputs, so you can dub from tape deck A to B, or make two tapes at once with or without equalization.

EASY HOOK UP

Use your tape monitor circuit, but don't lose it. Now your one tape monitor circuit lets you connect two tape decks.

Just plug the equalizer into the tape 'in' and 'out' jacks on your receiver. We even supply the cables.

As you listen to your records, FM or 'aux', any time you push the tape monitor switch on your receiver you'll hear your music jump to life.

The output from your receiver is always fed directly to your tape decks for recording, and with the touch of a button, you can choose to send equalized or non-equalized signal to your recorders.

When you want to listen to a tape deck, just press a tape monitor button on the equalizer and your tape deck will work **exactly** as it did before. Except, that now you can choose to listen with or without equalization and you can dub.

You won't be listening to any distortion or hum. The Sound Detonator Plus has a 95db signal to noise ratio and total harmonic distortion of just 0.018%.

Once you've set your equalizer controls, switch it in and out of the system. You'll hear such an explosive improvement in sound, you'll think you've added thousands of dollars of new equipment.

WHY A CLOSE-OUT?

Last year DAK closed out over 18,000 of BSR's 7 band equalizers because BSR had decided to only sell equalizers under their ADC name and they still had some left with the BSR name on them.

Well, as Detroit comes out with new cars each year, ADC comes out with new equalizers. We got them to supply us

with just 15,000 of last year's model before they shut down for the new one.

They had already paid for all the tooling, all the research and design, so we were able to buy these for less than half the normal price, for cold hard cash.

So, you can go to any HiFi store and buy this year's design in an ADC equalizer made by the parent company BSR, or you can get this \$249 value BSR equalizer while our limited supply lasts, for \$89.

THE FINAL FACTS

There are 20 slide controls, each with a bright LED to clearly show its position. Each control will add or subtract up to 12db. (That's a 24db range!)

There are separate sound detonation slide controls for each channel at 31hz, 62hz, 125hz, 250hz, 500hz, 1,000hz, 2,000hz, 4,000hz, 8,000hz, and 16,000hz.

LED VU meters with ± 0.5 db accuracy show levels for each channel. It is 17" wide, 6 1/2" deep and 4 1/2" tall.

PUT LIFE INTO YOUR MUSIC RISK FREE

Prepare for a shock the first time you switch in this equalizer. Instruments you never heard in your music will emerge and bring a lifelike sound that will envelop you and revolutionize your stereo system.

If your system doesn't spring to life, simply return the equalizer within 30 days in its original box for a refund.

To order your Sound Detonator Plus Tape Dubbing BSR 110X10 Band Stereo Frequency Equalizer risk free with your credit card, call toll free or send your check not for ADC's \$249 value, but for only \$89 plus \$7 for postage and handling. Order No. 9724. CA res add 6% tax.

Wake up the sound in your stereo. Your sound will explode with life as you detonate each frequency band with new musical life. And now you'll be in control of two tape decks as an added plus.



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Table. Trap It! variable descriptions.

Variable	Description
B	Counter
C	Counter
D	Counter
E	Score for this game
F	Memory address of game-board direction
G	Format being played (1 or 2)
H	3
I,J	Ball direction
K	ASCII value of input
L	37600 (Himem value)
M	Number of moves ball has made
N	Number of blocks used
P,Q	Coordinates of possible new ball location
R,S	Cursor coordinates
T	10
U	1
W	Counter
X,Y	Present coordinates of ball
Z	0
D\$	Control-D
N\$	Player's name
A\$(I),A(I)	Names and scores of best players

done. Rather, while you're reading the message it is saving the updated records to disk. I use this ploy so players won't interfere with recordkeeping by interrupting the program.

Tricky Business

In order to speed up the execution of the program without using machine language, I've applied a few programming tricks that may look a little strange in the listing:

- 1) The lines responsible for the actual play of the game appear early in the program (lines 20-320). Instructions and recordkeeping come later.
- 2) Often-used numbers in the game playing section are assigned to variables, and the variable names are only one-letter.
- 3) The same variable name sometimes represents more than one set of values in the program. (Watch out for this one!)

Check your *Applesoft BASIC Programming Reference Manual*, Appendix E, p. 120, for further elaboration on these techniques.

That's it! I still hold the record for Trap It!, but surely someone can do better. Is it you? ■

Ken Hummel established the Trap It! record at 1308 Townley Drive, Bloomington, IL 61701. Write to him there with your score.

Listing continued.

```

*620 FOR J = 1 TO 700: NEXT
*630 IF W = 0 THEN W = 2:A$ = "SO LONG!": GOTO 610
*640 IF W = 2 THEN W = 4:A$ = "SEE YOU!": GOTO 610
*650 VTAB (1): END
*660 HIMEM: 37600
*670 Z = 0: FOR I = 1 TO 16: READ X,Y:Z = Z + X + Y: NEXT
*680 FOR I = 1 TO 80: READ U: POKE 38200 + I,U:Z = Z + U: NEXT
*690 FOR I = 777 TO 826: READ U: POKE I,U:Z = Z + U: NEXT
*700 IF Z < > 12163 THEN HOME : PRINT CHR$(7);: PRINT "
THERE IS AN ERROR IN THE DATA STATEMENTS": END
*710 VTAB 7: PRINT TAB( 16)"TRAP IT!"
*720 PRINT : SPEED= 120: PRINT TAB( 19)"BY": PRINT
*730 RESTORE : FOR I = 1 TO 16: READ X,Y: POKE 798,1: POKE
799,X: POKE 800,Y: CALL 801: NEXT
*740 PRINT : PRINT TAB( 15)"KEN HUMMEL": SPEED= 255
*750 FOR I = 2 TO 38: VTAB 14: PRINT TAB( I)"0":U = PEEK
( - 16336): PRINT TAB( 40 - I)"0":U = PEEK ( - 1633
6): NEXT
*760 VTAB 14: PRINT TAB( 39)" ": PRINT TAB( 2)" "
*770 PRINT : PRINT TAB( 3)"IT MOVES FAST, BUT YOU CAN DO I
T!"
*780 VTAB 22: PRINT "ANY LETTER TO CONTINUE";: GET A$: PRINT
A$
*790 TEXT : HOME : VTAB 4: PRINT " THE GAME PLAYS AS FOLLOW
S:"
*800 PRINT : PRINT : PRINT "THE LETTERS I,J,K,M MOVE YOUR M
ARKER"
*810 PRINT "THE LETTER 'F' PUTS IN YOUR BLOCKS."
*820 PRINT : PRINT "YOU MUST COMPLETELY ENTRAP THE BALL"
*830 PRINT "WITH BLOCKS TO END THE GAME."
*840 PRINT : PRINT "ONE POINT IS ADDED TO YOUR SCORE FOR"
*850 PRINT "EACH SPACE THE BALL MOVES AND TWO"
*860 PRINT "POINTS FOR EACH BLOCK YOU USE."
*870 PRINT : PRINT "GOOD LUCK--REMEMBER THE FASTER YOU DO"
*880 PRINT "IT THE LOWER YOUR SCORE!"
*890 POKE 232,57: POKE 233,149
*900 L = 37600:H = 3:T = 10:Z = 0:U = 1:W = 0
*910 PRINT : PRINT "CHOOSE GAME: 1 = BORDER"
*920 PRINT TAB( 14)"2 = NO BORDER-->";
*930 GET A$: PRINT A$:G = VAL (A$): IF G < > 1 AND G < >
2 THEN 910
*940 HOME : VTAB (5): INPUT "BY THE WAY, WHAT IS YOUR NAME?
-";N$
*950 HOME : PRINT : PRINT "BE PATIENT, ";N$; ", I'M WORKING!
"
*960 FOR J = Z TO 600: POKE L + J,Z: NEXT
*970 HCOLOR= H: ROT= Z: SCALE= U: HGR2
*980 IF G = 2 THEN 1010
*990 FOR J = Z TO 27: POKE L + J,U: POKE L + 540 + J,U: DRAW
2 AT J * T,Z: DRAW 2 AT J * T,180: NEXT
*1000 FOR J = Z TO 17: POKE L + 30 * J,U: POKE 37627 + 30 *
J,U: DRAW 2 AT Z,T * J: DRAW 2 AT 270,T * J: NEXT
*1010 PRINT CHR$(7); CHR$(7): FOR I = 1 TO 200: NEXT
*1020 X = T * ( INT (26 * RND (U) + U)):Y = T * ( INT (17 *
RND (U) + U))
*1030 DRAW U AT X,Y: DRAW H AT 130,90:R = 130:S = 90:N = Z:
M = Z: GOTO 20
*1040 DIM A$(20),A(20)
*1050 D$ = CHR$(4): PRINT D$;"OPEN TRAP SCORES"
*1060 PRINT D$;"READ TRAP SCORES"
*1070 FOR I = 1 TO 20: INPUT A$(I),A(I): NEXT
*1080 PRINT D$;"CLOSE": GOTO 380
*1090 DATA 102,40,102,80,102,40,102,40,113,40,102,40,95,120
,102,80
*1100 DATA 102,40,113,80,113,40,113,40,128,40,113,40,102,12
0,128,40
*1110 DATA 3,0,8,0,39,0,60,0,145,50,54,14,36,36,36,49
*1120 DATA 182,50,46,36,32,4,32,53,22,182,46,36,68,24,36,21
*1130 DATA 54,54,46,32,36,4,0,73,49,54,62,63,55,45,45,54
*1140 DATA 54,37,36,44,45,37,63,63,36,36,5,0,54,5,32,45
*1150 DATA 73,113,44,54,150,18,23,53,63,223,27,28,62,36,4,0
*1160 DATA 169,0,141,16,192,173,48,192,136,202,208,252,174,
8,3,173
*1170 DATA 0,192,16,236,96,96,95,0,173,48,192,136,208,5,206
,32
*1180 DATA 3,240,9,202,208,245,174,31,3,76,33,3,206,30,3,20
8,234,96

```

End of listing.

In Pursuit of Trivia

While I was an undergrad student at the Nairobi Polytechnical Institute of Advanced Physics, Creative Orthodontistry, and Video Game Appreciation, I received a gift from a fellow student. It was one of the very first trivia question-and-answer books. Well, I soon decided I liked learning who sponsored Milton Berle, which of the Byrds auditioned unsuccessfully for the Monkees, and where the burning of Atlanta in *Gone With the Wind* was staged lots more than learning the seven steps of mitosis.

Many years later I'm still so interested in trivia that I'm capable of spending \$48 I can't afford for Trivial Pursuit, and I actually care whether or not I have the "Baby Boomer's" edition.

I got my money's worth from Trivial Pursuit last year at the Shiftky Summer Base Lodge at Crampfish Lake, Maine. Then, back at the Winter Base

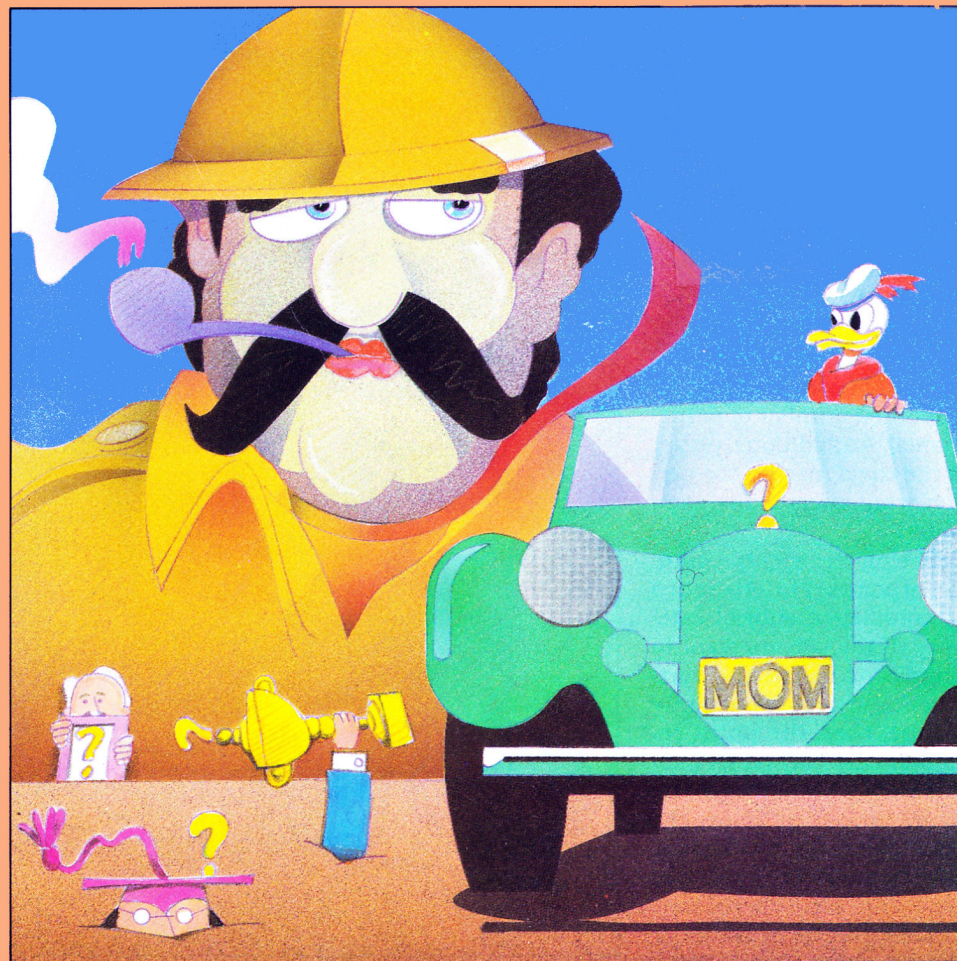


Illustration by Phil Geraci

Lodge on the Game Reserve, I found a herd of Apple II trivia games waiting to be tamed. In the process I learned two things: (1) There are a number of exceptionally good trivia games for the Apple II family of computers. (2) With all these games to play, I could have saved the \$48 for Trivial Pursuit.

Before we begin looking at the games, let's take a moment to differentiate "trivia" from "general knowledge." "General knowledge" is information you learn in school. It is part of some academic discipline or of current events, and it has some import.

A serious roundup of trivia games that test your knowledge of things great and small

with Warden Shiftky

"Trivia," on the other hand, is information that is really insignificant, but which you may have learned without even being aware of it. As I discuss the games, I'll identify the ones that really emphasize the trivial.

Trivia Fever

Let's start with a game that can be played with or without a computer:

Trivia Fever. It comes with a question-and-answer book that allows you to play without your Apple (see **Photo 1**), and if you return the disk, you get a small rebate. Trivia Fever, like Trivial Pursuit, is more a general-knowledge game than a real trivia game.

With the computer version, as many as eight individuals or teams can play (teams, of course, allow an unlimited number of participants). An additional player is the trivia master, the person who operates the computer.

The master sets the number of points (1 to 24) needed to complete a subject category. If the players want to handicap a real trivia genius (such as myself, I reluctantly admit) then the point requirements may be set individually. You follow the same procedure to set the time limit for answering questions. Everybody may have from 5 to 60 seconds to answer (I recommend 20), or the times may be set individually to handicap the best players.

Five out of seven categories are selected for play: Science and Technology, Geography, History, Sports, Films and Entertainment, Famous People, and Nature and Animals. Trivia Fever can randomly select the question categories to prevent players from selecting their favorite subjects exclusively.

Each time a category is picked, you select one of three difficulty levels. The higher the difficulty, the more points you win. While the question is displayed, the "clock" ticks off the seconds. If your answer is right, your score increases. You lose no points for a wrong response.

When you reach the point total for any category, you must answer a category-completion question (always from difficulty level 2). The first player to complete all categories is offered a game-winning question (generated randomly). He or she gets a game winner on each round until someone answers one right, ending the contest.

Once you exhaust the questions on

playing the game.

There's no handicapping. The number of points, 30 to 60, needed to win is not modifiable from player to player. A variable time limit of 20 to 60 seconds also applies to all.

Questions are randomly generated from the categories. You use a joystick button or the space bar for all responses.

To get a hint, you hit the button once; to see the answer, you quickly tap the same button twice (this isn't a game for arthritic hands). If you've got the right answer, two more quick taps will add the appropriate points to your score. When you finish, your joystick goes to the next player; there's no crowding around the keyboard, and, with 1300 questions, there's unlikely to be many duplications from session to session.

This is a compact game—all you need is the disk—and it's a good night's entertainment. The questions are, again, less on the order of trivia than general knowledge, but they are fairly difficult and winning is not easy.

Terminal Trivia

The trivia entry from H.U.M.A.N.S. Software is **Terminal Trivia**, a sophisticated little game with disks of 500 or more questions in movie, TV, and "Super Potluck" categories. One to five players may participate in this keyboard-input game. Play proceeds in "Round-

Robin" fashion, with the same question asked of each player, or in "Succession," each player receiving a different question. Before the game, you choose among three levels of difficulty, set the number of questions per game, and, if you like, opt for betting. In a betting game, you start with \$50 and bet on the outcome of each of your questions, before seeing the question. During game play, you choose from a list of answers generally with a single keystroke. You can adjust scores to give full credit for wrongly judged answers.

This game, of all the ones I tried, is the closest to a pure trivia game. Ad-



Photo 1. The computer is optional with Trivia Fever.

the original game disk, you can order more at \$24.95 each. There will be nine additional volumes in all, and the first three are already available. Professional Software also plans "Super Sports," "Entertainment Extra," and "What's in a Word," to be available for \$29.95 each.

CompuTrivia

Here's a tough little game from Extek Computer Aided Products. There is almost no trick at all to learning **Compu-Trivia**. The on-screen prompts are self-explanatory, and in no time at all two to six players can be old hands at

Circle 157 on Reader Service Card.



Photo 2. Is Uptown Trivia's answer correct?

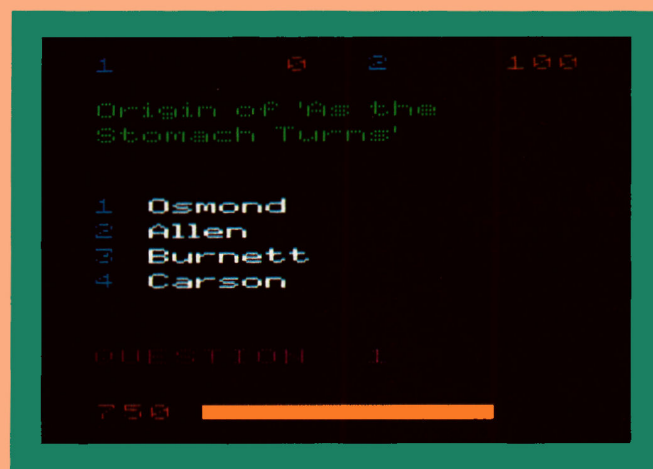


Photo 3. Some of the trivia from the Party Quiz Game.

ditional question disks are available, including sports, rock-and-roll, television, and science fiction.

Uptown Trivia

You can tell from the people depicted on the package that **Uptown Trivia** is aiming for an elitist audience—or at least an audience that thinks of itself as elite. The game accommodates from one to ten players, quizzing them in arts, entertainment, history, science, sports, and geography. You must correctly answer three questions in each category to win.

Uptown allows a great deal of modification, but no handicapping. You may set a time limit for responses or have no limit at all for more relaxed play. You can activate or deactivate players as you wish. If one of the intellectuals in the party wants to watch *Dukes of Hazard*, the game allows him to rejoin later. You may also increase the minimum number of questions per category needed to win. This feature allows you to turn the game into an all-nighter.

This proved to be the hardest trivia game I tried, not just because the questions are more difficult, but because of the way you are forced to answer. You are shown a question, and then the first of four possible answers. If you hit the return key, you select that answer. If you hit the space bar, you move to the next.

Here's the catch: If you pass by an answer, you can't go back to it! That means you have to recognize the right answer when you see it (see **Photo 2**), rather than deduce it by eliminating other choices. If the question comes up

again (and it can) you get a second try.

Uptown Trivia is a very good game. It is more of a general-knowledge quiz than a trivia test, and the level of difficulty for all the questions is fairly high. This is the one of the two games I saw that uses color graphics (the other being *P.Q.*, see below). Best of all, it never gives you the answer when you're wrong (which means the question can be used again), and the variation on the multiple-choice system here is diabolically clever.

The Party Quiz Game

The Party Quiz Game (referred to as *P.Q.* from here on) is different from all the others in one very conspicuous way—you get real, live hardware with it!

The game comes with four handheld "quick response" controllers that can be used to operate the program and to answer the game's questions. The controllers connect to an interface box, which in turn is equipped with pin and plug connectors for any and all Apple II game I/O interface ports.

One to four players participate (although only two, for some unknown reason, can play on the //c). Players have from three to ten seconds to respond to each question. The quicker you respond, the more points you earn. The maximum you can win is 1000 points per multiple-choice question (if you respond with phenomenal speed) and 500 for a true/false question.

Even though the general-knowledge questions used here appear in a multiple-choice format, they are no easier to answer than those of the other games (**Photo 3**). After all, with no more than ten seconds to respond, you really

have to know the answer to rack up any points.

A game is five rounds, with all questions drawn from a potpourri category. You may choose competitive play, where the first player to answer a question receives all the points, or social play, where all players can answer the question. This allows both sides to earn points and keeps the game from getting too one-sided.

Another method of evening the odds is handicapping a player. In a handicap situation, the player being hobbled has only half the response time. That really brings the scores close together.

Of all the games I tested, this is the one (thanks to the hardware) that makes the biggest impression on my friends who do not own or use computers. The game is colorful and fast-moving, and creates an exciting atmosphere at a party or other social gathering, such as a warthog roast here on the Reserve. And yes, there are supplementary question disks available.

The Warden's Trivia

That's it for now, but here are three of my own trivia questions. If you are first to send in all three correct answers, you'll see your name in the *Game Reserve* column later this year.

- 1) Who invented Pong?
- 2) Who invented the "analytical engine?"
- 3) In what application was the data punch-card first used, and in what country?

Okay trivia fans—show me how much you know!

One last note. Last October, I published the results of an SSI simulation game (President Elect) where President Reagan carried every state except the District of Columbia. In real life he lost Minnesota, too. All the same, it wasn't a bad job of predicting. Lou Harris, you know where you can find me. Aloha! ■

Send your comments, both trivial and critical, to Warden Shiftky, inCider, 80 Pine Street, Peterborough, NH 03458.

Product Information

CompuTrivia

Extex Computer
Aided Products
P.O. Box 305
Oakville, Ontario
Canada L6J 1N0
Any Apple II, 48K
\$34.95

The Party Quiz Game

Suncom
260 Holbrook Drive
Wheeling, IL 60090
Any Apple II, 48K
Includes four game
controllers, but only two
work with a //c
\$74.95

Terminal Trivia

H.U.M.A.N.S.
P.O. Box 82
Evington, VA 24550
Any Apple II (except //c),
48K
\$39.95

Trivia Fever

Professional Software
51 Fremont Street
Needham, MA 02194
Any Apple II, 64K
\$39.95

Uptown Trivia

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310 Franklin Street
Boston, MA 02110
Any Apple II, 48K
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It's really simple to enter the contest. No programming experience required. Just circle the correct answer to each question on the entry blank below. You'll probably know a few of the answers right off the top of your head, but others will require some digging. Clip and mail your entry to **inCider's** Great Apple Trivia Contest, 80 Pine Street, Peterborough, NH 03458. Entries must be postmarked by March 21, 1985. We'll announce the winner in our July issue.

HOW TO ENTER: Circle the correct answers on the official entry blank. All correctly completed entries will be placed in a drawing from which the winners will be selected at random.

1. What personal items did Jobs and Wozniak sell to finance the startup of Apple?
 - A. A VW bus and two calculators
 - B. A raccoon coat and an IBM-370
 - C. Their mothers' engagement rings
 - D. Their collection of Billie Holliday records and an ice cream maker

2. Is an Apple //e a
 - A. 16-bit machine
 - B. 32-bit machine
 - C. 8-bit machine
 - D. 2-bit machine?

3. For what large computer corporation did Steve Wozniak once work?
 - A. Hewlett-Packard
 - B. IBM
 - C. Franklin
 - D. Digital Frolic

4. How many expansion slots does a //c have?
 - A. 0
 - B. 2
 - C. 6
 - D. 7

5. What was the title of the now-famous Macintosh advertisement featuring a female hammer thrower?
 - A. Big Brother
 - B. Big Black and Blue
 - C. 1984
 - D. Screen Shot

6. You've heard of the Apple II Plus, but did Apple ever produce a III Plus?
 - A. Yes
 - B. No

7. Which Apple had the first built-in disk drive?
 - A. //c
 - B. Macintosh
 - C. Apple III
 - D. Lisa

8. Way back when, to what computer club did Steve Wozniak and Steve Jobs unveil the first Apple?
 - A. Bay Area Baudville Act
 - B. Homebrew Computer Club
 - C. Silicon Valley Computer Users
 - D. San Jose Hackers

9. What was the name of Steve Wozniak's rock music extravaganza?
 - A. Apple II Forever
 - B. The US Festivals
 - C. Woodstock, Take 2
 - D. The Woz Festivals

10. What did Apple chief John Sculley sell before computers?
 - A. Soft drinks
 - B. Designer jeans
 - C. Software
 - D. Printers

11. What microprocessor does a Macintosh employ?
 - A. 8088
 - B. 65816
 - C. 68000
 - D. 6502

12. When it was last produced, how much RAM was built into a standard Apple II Plus?
 - A. 16K
 - B. 48K
 - C. 64K
 - D. 128K

Some photos courtesy of Apple Computer, Inc.

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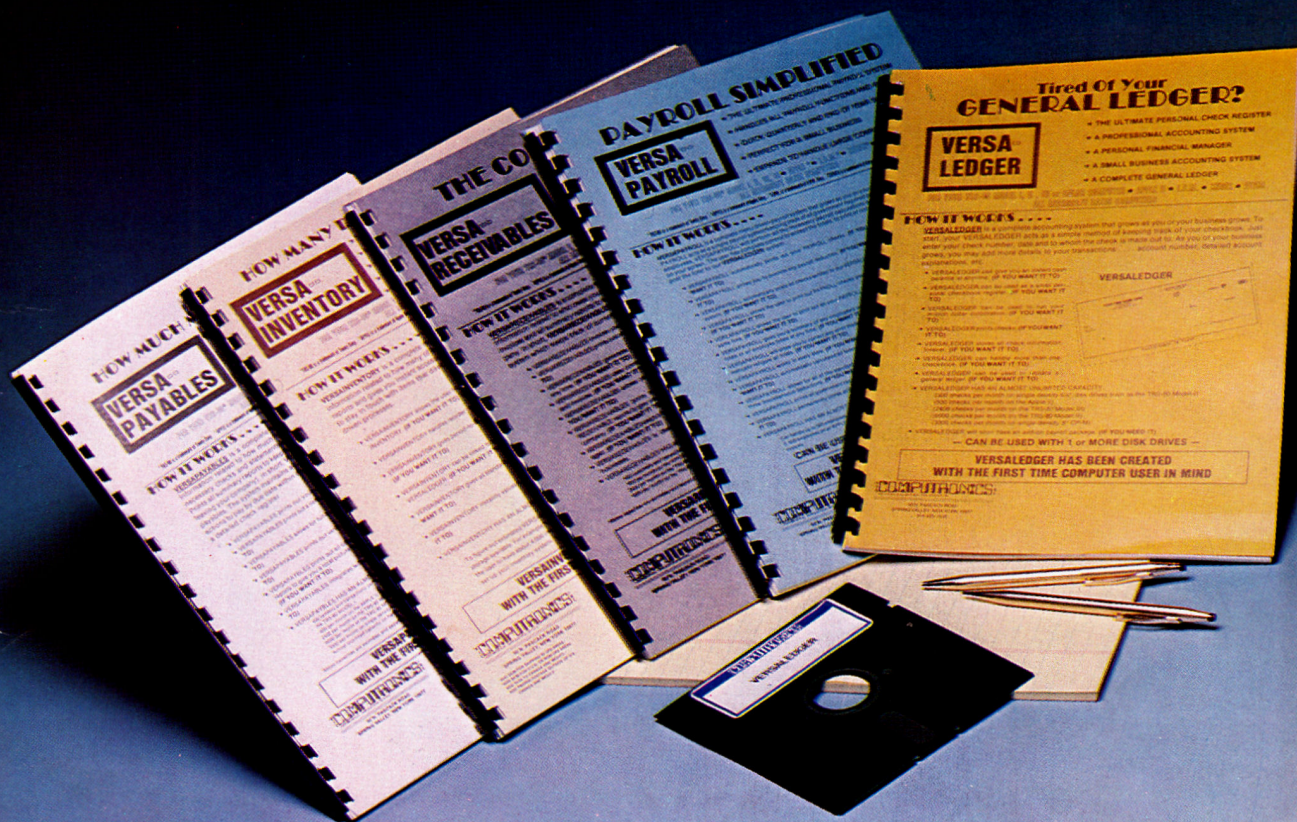
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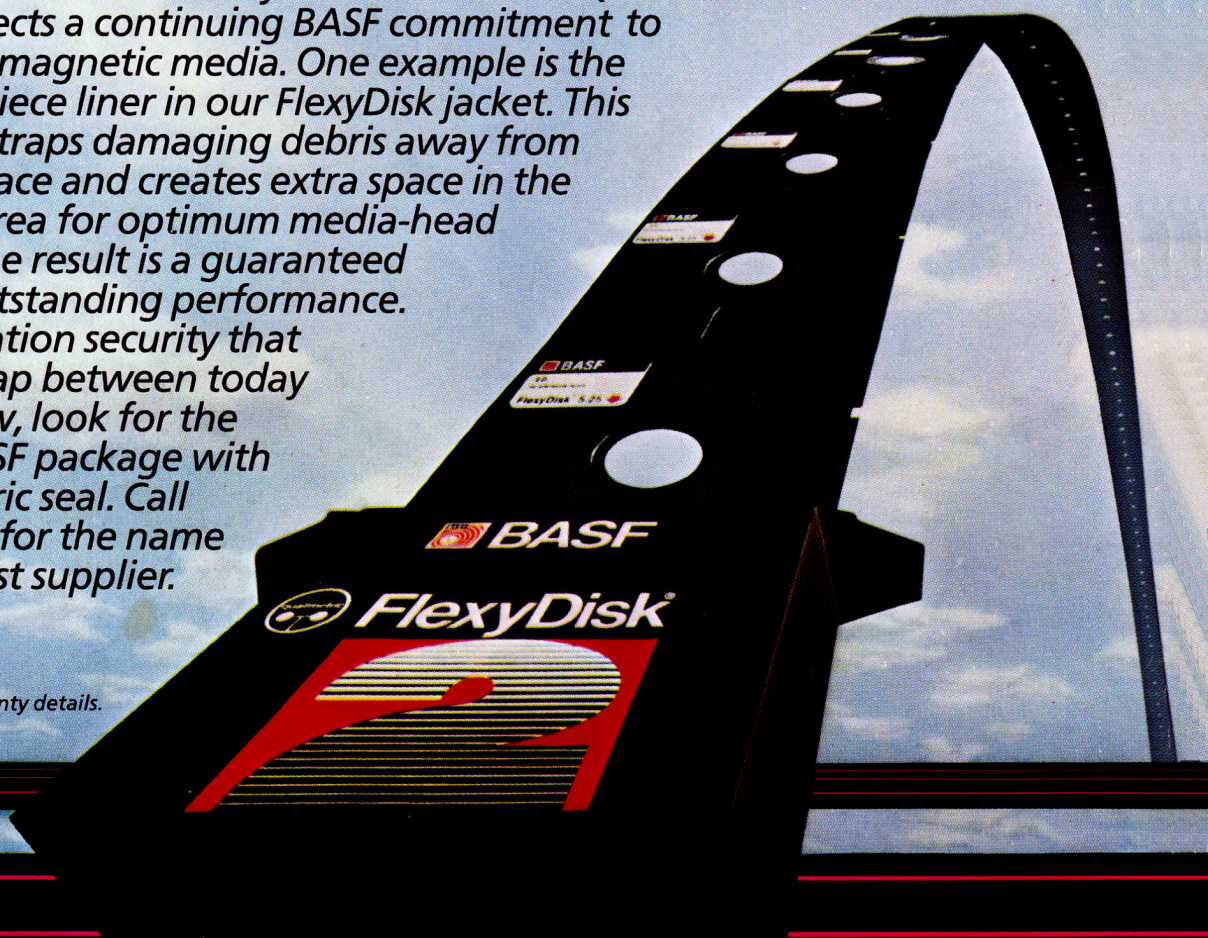
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