THE APPLE II MAGAZINE

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Page 86

inCider

A CWC/I PUBLICATION

December 1986
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VISIT EXOTIC LANDS AND WIN OVER THE NATIVES.

There is a place, probably a long, long way from where you're sitting right now, where grown men actually wear dresses and throw telephone poles in the air as a sign of athletic prowess.

It is true.

There is another rather bizarre land where grown men actually throw *themselves* in the air as a sign of athletic prowess.

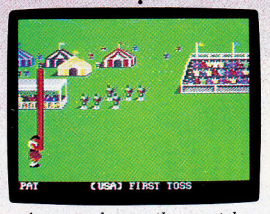
Right off the edge of a cliff.

We're talking, of course, about Scotland's famous Caber Toss and the death-defying divers of Acapulco.

Two of the events you'll find in *World Games*,™ the newest sequel in our bestselling "Games" series.

Here's your chance to dash around the globe as a big-time international athlete competing in 8 extraordinary sports.

Go stomach to stomach with a 400 pound sumo. Jump barrels in Germany.



Anyone who can throw a telephone pole long distance is entitled to wear a dress.



You haven't lived until you've taken a log out for a spin.

Try Canada's ridiculously difficult log roll. Or ski the brutal, wintry slopes of France.

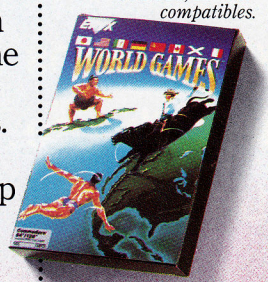
Then it's back to the good old US of A to ride a bucking bull. And off again to bully Moscow with some heavy-duty weight lifting.

If you manage to upset enough countries, your name will be permanently inscribed in the World Hall of Fame.

This then, is a challenge of global proportions.

The question is, are you ready to go the distance?

One to eight players. Amiga, Apple II & compatibles, Atari ST, C64/128, IBM & compatibles.



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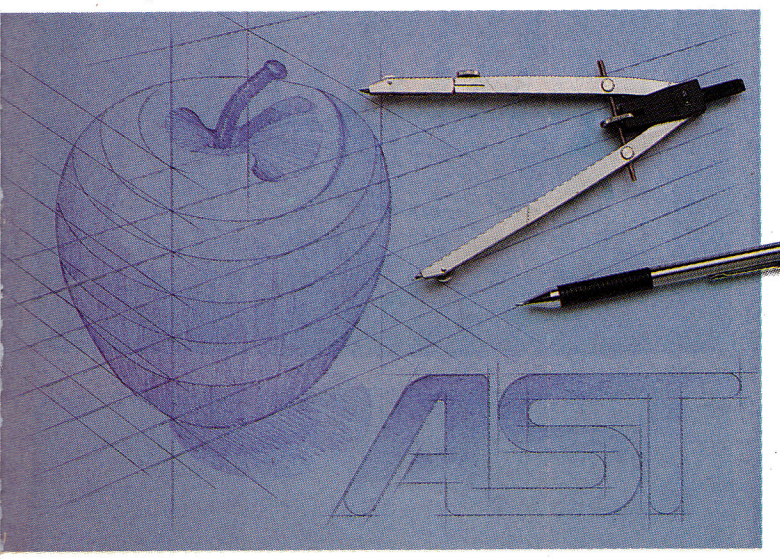
We've got designs for Apple's® future.

Apple is getting faster and more versatile. And with the introduction of the IIGS™, comes AST's state-of-the-art enhancements that not only support, but augment Apple's bold claim to the future. Our design formula: compatibility, flexibility and performance.

Complete compatibility. Throughout product development we work closely with major hardware and software manufacturers to incorporate leading industry standards. With AST's Apple IIGS products, you can continue to count on instant compatibility with popular application software and peripherals.



Flexibility to suit your system needs. Our Apple IIGS products are expandable. You can buy the minimal configuration today and upgrade as your needs grow. Whether you work at home, school or in business, you'll find AST products designed to keep up with changing applications.

Enhanced Performance. When you buy an AST Apple product you buy the latest, most advanced technology available. That's because our engineering staff represents several years dedicated to improving Apple computers beyond their original design.

We Make Apples Grow!

All of AST's solutions for the IIGS, including the SprintDisk™ 1 MB RAM disk card and AST-2000™ 20 MB hard disk/20 MB tape backup SCSI storage subsystem, incorporate AST's design formula. And our new, exciting memory and graphics products create new directions in personal computing.

For a complete layout on AST's Apple IIGS designs, contact your nearest AST-authorized Apple dealer, or fill out the coupon below and send it to the AST Apple Products Group: AST Research, Inc., 2121 Alton Avenue, Irvine, California 92714-4992. **(714) 553-0340**. BBS: (714) 660-9175. FAX: (714) 660-8063.

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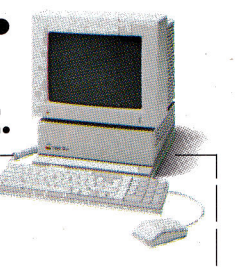

Yes, I want more information about AST Apple IIGS innovations.

☐ memory ☐ storage subsystems
☐ graphics

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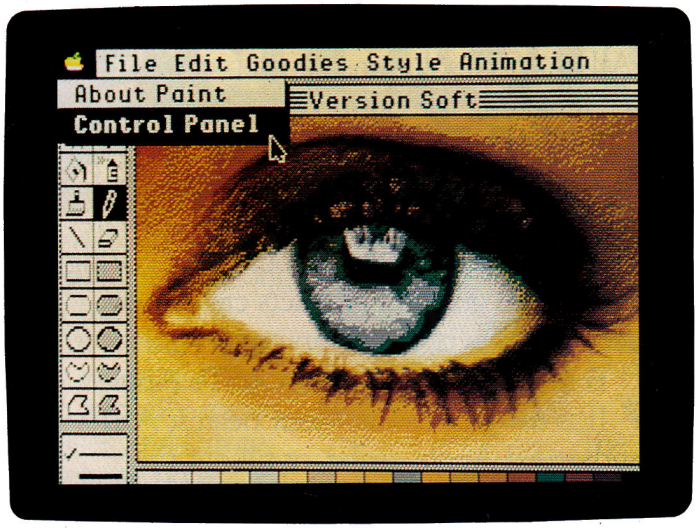
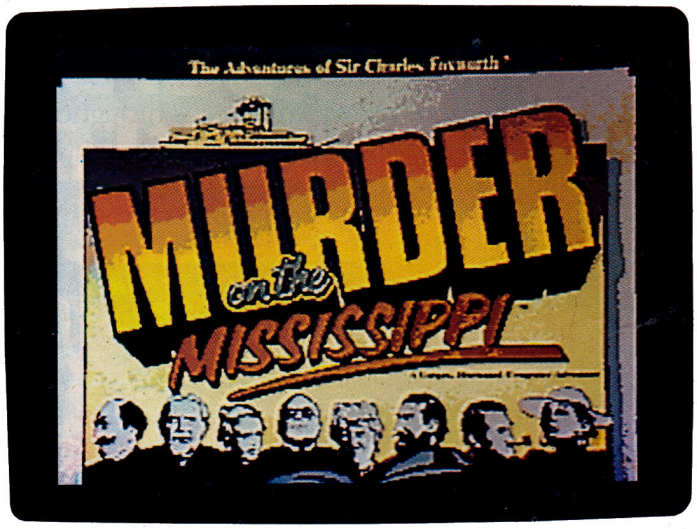
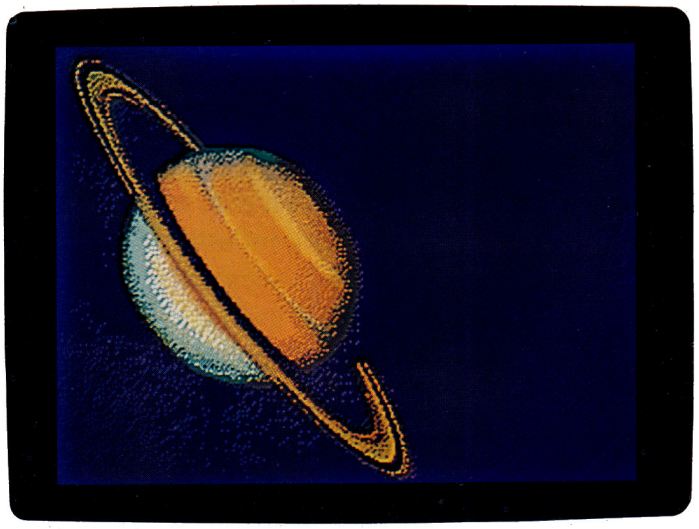
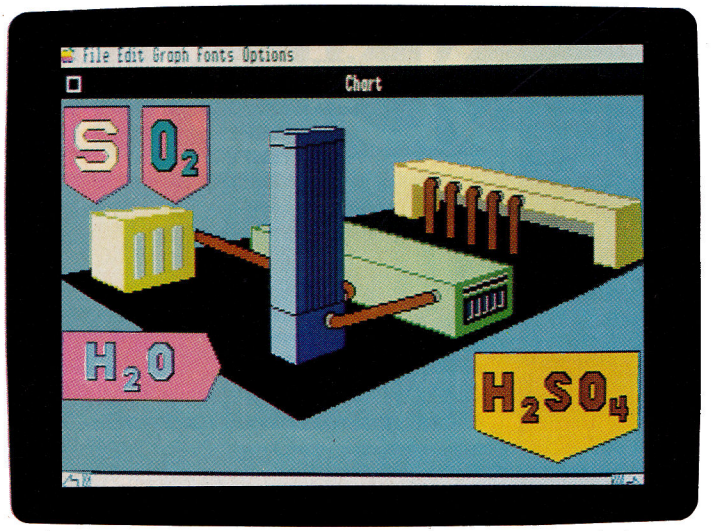








You won't believe







Every image you see here was generated by the new Apple IIGS™ Personal Computer.

It can create graphics in 4,096 colors. With near-photographic quality in two new modes–640 x 200 or 320 x 200 pixels.

The power behind this display is a 16-bit 65C816 microprocessor and a standard 256K of RAM, expandable to an awesome 8 megabytes with the appropriate card.

Even with such spectacular talents, the Apple IIGS hasn't forgotten its heritage. In fact, we've combined the hearts and minds of the Apple IIe and the Apple IIc on a single IIGS chip. So it can run nearly all 10,000 existing Apple II programs–but up to three times faster than they've ever run before.

Like the IIe, the Apple IIGS is eminently expandable, with seven expansion slots for peripherals and a new memory expansion slot. Like the IIc, it has built-in peripheral ports for disk drives, printers, modems, the AppleTalk® Personal Network and Apple DeskTop Bus devices such as a detachable keyboard and mouse.

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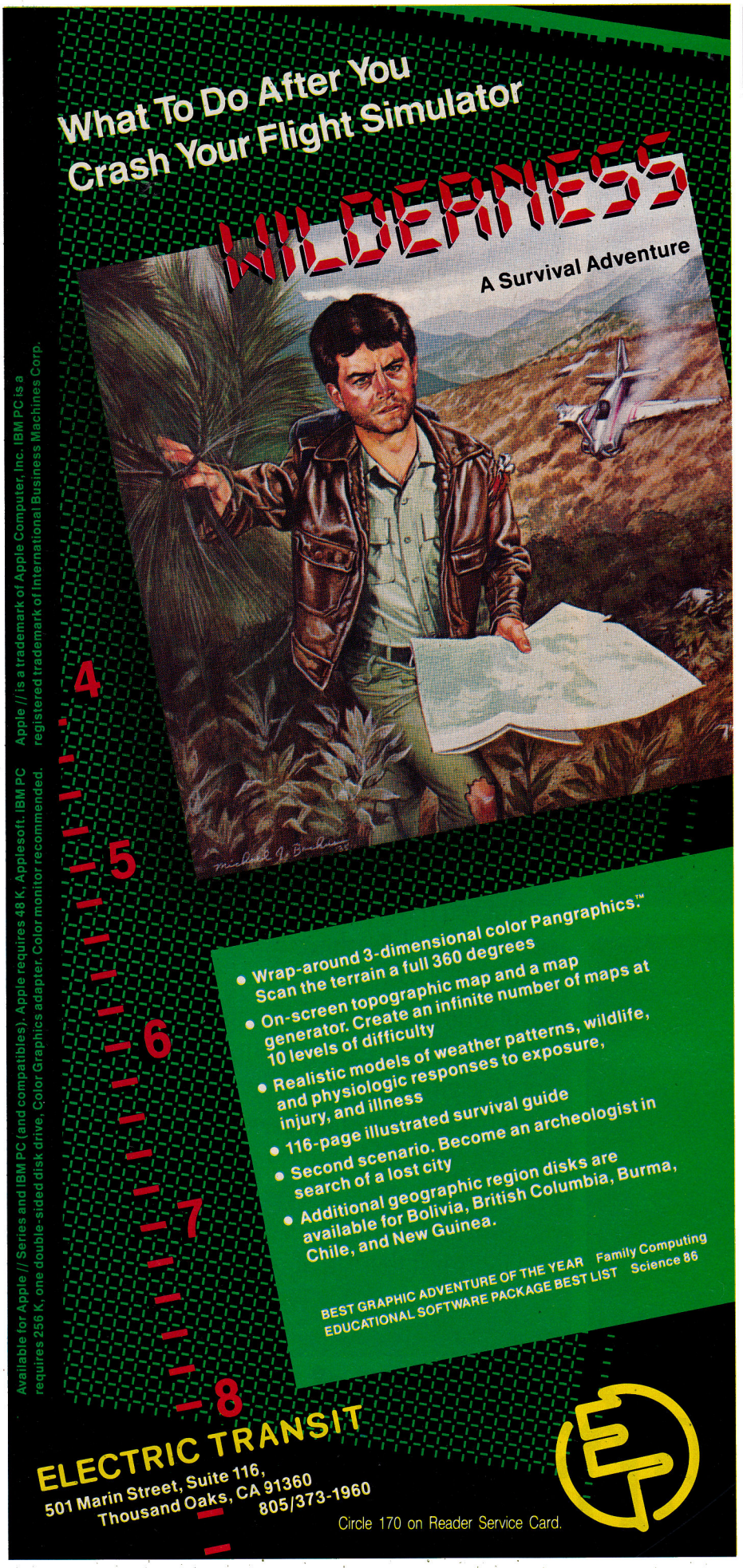
That means it can reproduce everything from the glory of a symphony orchestra to the subtleties of human speech.

For a closer look, visit your authorized Apple dealer.

You'll find it an eye-opening experience. And that's just the half of it.

The new Apple IIGS. The power to be your best.℠

your ears, either.



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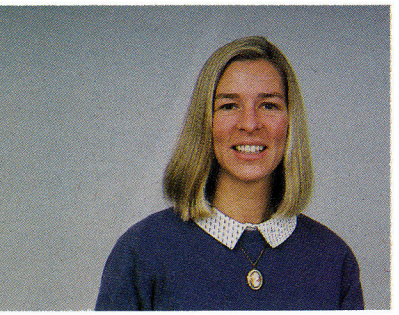
INCIDER'S VIEW



Why Do We Need Computers?

"Computers let people share information and ideas throughout the world."

by Deborah de Peyster

It's Christmas, the end of the year, a time to reflect on some of the people we met this year while covering stories for *inCider*. Some of them, such as singer Judy Collins, are famous; others, such as the 19 teachers from New Jersey and the family from Hopkinton, New Hampshire, are less widely known. All of them had something to tell us about using computers: clever ways to set them up, to expand their power, to achieve a specific end. But each of them also touched on one purpose of computing that goes beyond products, promotions, and purchasing.

The 19 teachers on the September cover (see "Teachers' Best: 16 Winning Ideas," September 1986, p. 42) had all won awards from Apple for using computers in their classrooms in creative ways to stimulate learning. They didn't have big budgets, large staffs, or, in many cases, extensive computer knowledge. They did have the determination to expand the learning experience for their students and to make it more meaningful.

One of my favorite stories from our interviews with those teachers is about the class that traded letters between pen pals via modem. The students found their pen pals by matching interests on PFS:File disks sent between schools. When a mutual interest, such as baseball, was found, a correspondence began. For eight months the pen pals wrote each other, sharing ideas, hobbies, and fun. They developed strong friendships and frequently asked, "Can we keep in touch?" "Can you call me?" "I really want to meet you."

What caught my eye was that the pen-pal friendships developed between schools that couldn't have been more different—at least on the surface. One school was primarily attended by white, middle-class students, while the other was mostly made up of disadvantaged black and Hispanic students. The physical differences that might at first have put students off from sharing information about themselves were transcended by the computer, where ideas and thoughts are what count.

And it is ideas that hold sway on the computer—from the simple expressions of a two-year-old child named Luke Morgan (see "Beginners' Luck," June 1986, p. 42) who could control the computer with the click of a mouse to draw beautiful pictures, to your nominations for our People's Choice Award (this issue, p. 42). When describing why a particular product was your favorite, you often talked about the way it helped you put your ideas on paper: "I can write what I'm thinking," "I can design the greeting card that really says what's on my mind," and, from a man who said he was recently disabled, "[The computer is the tool] that helps me fulfill my life."

Those sentiments raise computing from a nuts-and-bolts exercise into the realm of something more important—something, we learned, that Judy Collins hopes all of us might focus on more often. In the course of an afternoon spent talking with her in New York for our March cover story on AppleWorks (p. 18), we learned a lot about why the '60's singer-composer granted us an interview about a subject so seemingly mundane as computers and software.

Judy told us of the fun she had using computers and discovering the wealth of information they make easily available. Computers, she says, let people share information and ideas throughout the world. By telling us her experience in learning about computers, she said she hoped she might help others who are intimidated by the technology to realize it's not so difficult, that they can share in the information exchange. For, she says, sharing information is the only way people will better understand each other and find more effective solutions to problems facing the world today: "I hope we can be as good as our computers, that we can be up to presenting them the problems they can solve, because they can help us solve problems in a worldwide sense and give us some answers to questions that need answers."

To all of you from everyone at *inCider*, have a happy, healthy, and peaceful holiday. ■

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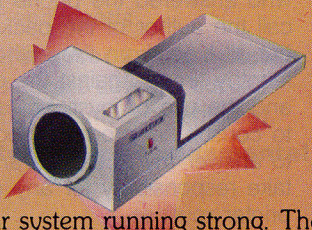
APPLE IIGS JuiceBox™



Your new Apple IIGS will require proper care, and Orange Micro's **JuiceBox**™ has everything you need to keep your system running strong. The **JuiceBox**™ provides surge protected power for your Apple IIGS and any two additional peripherals from a single convenient switch; a third unswitched power outlet; a powerful fan to provide filtered, cooling air; and an hour meter that tells you how long your system has been powered up. We have even included a guide of scheduled maintenance for use with the hour meter to help you properly care for your new computer. The **JuiceBox**™ is a complete package that lets you relax knowing that your new investment is well protected.

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These high quality products represent Orange Micro's continued commitment to Apple and the landmark Apple II series of computers. Our development efforts are, and have been, totally dedicated to bright ideas for Apple Computers. We've been dedicated to it for years and we aren't going to change now. So when you pick up your IIGS, take a look at us. Enhance your system with solutions from Orange Micro.

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Circle 120 on Reader Service Card.

LETTERS

Back to the Drawing Board

We're planning to build a new home and want to be involved with many of the details. We've been looking for software that will do exactly what the Design Your Own Home series (see "You Can Do Better," May 1986, p. 50) from Avant-Garde purports to do. We saw advertisements for this package and ordered it on the basis of that description.

Our experience with the package was dismal. It doesn't allow keyboard control, so it was very hard to work with. It requires a joystick (which still didn't work very well), paddles, or a KoalaPad. As we have neither of the latter two devices, I can't say how well the program works with them.

The printer interfaces have numerous I/O errors—so many in fact that I was never able to print anything I produced with the program. The documentation is inadequate and left many questions unanswered.

I wasn't able to solve some of these problems, so I called the company only to discover it has no technical department to answer questions. I left my name and number five times after being assured someone would call back. I never received a return phone call. At one point, the person who answered the phone suggested I call the author of the package. I did, but all I got from the author was a lengthy tirade against the company and the use of joysticks. He refused to consult his program documentation to answer my questions and wouldn't take responsibility for any of the printer routines.

The end result was that I sent the package back for a full refund. It was very disappointing, because now I'm literally back to the drawing board, working out our house design the "old-fashioned" way.

Lisbet O. Temple
1542 East 170th Street
South Holland, IL 60473

Abracadata has taken over distribution of the Design Your Own Home series and has allegedly made some improvements, including incorporation of Beagle Bros' graphics-print routines, which support 47 printers and 64 interface cards. It has also established a disk-exchange policy for owners of older versions of the program. Contact the company for details and exchange authorization at (503) 342-3030. —eds.

Printing by Threes

In your July Letters column (p. 8), Roser Salavert asked about printing three columns of labels with AppleWorks. I do this routinely by running the labels through three times, with LM (left margin) set at zero, 2.8, and 5.6 for the three runs, doing one-third of the labels on each run.

A very big time-saver has been to make the AppleWorks label printout on paper, then use a Canon PC copier with Avery labels (#5351) to make copies of the labels from the AppleWorks three-column printout.

My Apple //e and Canon PC copier with The Print Shop and AppleWorks have been a great combination for preparing various types of mailings.

J.J. Pastorek
9335 West Damuth Drive
Baton Rouge, LA 70815

Service Above and Beyond

Usually when I read about a product or vendor in your Letters column, it's a complaint about unfair treatment. I must take this chance to go on record as a true fan of Videx Inc. of Corvallis, Oregon. To say it has treated me fairly would be unfair to Videx. In my mind, it has set a new standard for customer consideration. Your readers deserve to hear some of the good news about companies whose products they see advertised in your magazine.

My Videx Videoterm 80-column card was apparently damaged in the process of trying to fix an unrelated problem with my Apple II Plus. I didn't dare call a repair shop or the manufacturer for fear of a $25 bench charge, with actual repair costs on top of that. A friend suggested the problem might be the output transistor, so I pulled one of its pads off the circuit board. I tried to wire a jumper, but the card still didn't work.

In desperation, I called the service department at Videx. To my surprise and delight, I was told by a friendly young man that there would be no repair charge. I protested, saying that I had clearly broken the card myself and that it was not in the least a manufacturing fault. Besides, I had owned the card for almost three years—well past any usual warranty period. I was assured there would be no charge.

I sent my old card to Videx with great hope, but I was still wondering if the support people wouldn't call and say there had been a misunderstanding and they would be happy to fix it if I were to send a cashier's check for one month's wages. I'm writing this letter (in 80 beautiful columns) with Videx's brand-new card installed in my venerable Apple II Plus. Not only did it replace the broken card, it sent the replacement by second-day air. Such service goes so far beyond fairness that I now consider myself to be a debtor, not a customer.

John M. Craig
155 South 1200 West, #24
Orem, UT 84058

Hands On

In response to the letter "Girls' Turn," from A. MacKenzie Elliot in the July *inCider* (p. 8), I'd like to suggest a possible solution to the problem of the absence of girls in computer clubs at the high-school level. In my opinion, early exposure may very well be the answer to developing their interest in computer science and mathematics.

I'm a computer coordinator and instructor in a parochial elementary school, with an enrollment of 530 children. Every one of them, from kindergarten through eighth grade, gets "hands-on" computer time. At Christ the King School, there are no problems with females not having equal time at the computers, for they all participate and enjoy it. In fact, I have trouble getting the kids out of the computer center to go to their next class. The children are exposed to a variety of highly motivating software that teaches many academic skills.

Antoinette M. Votava
52651 Brookdale Drive
South Bend, IN 46637

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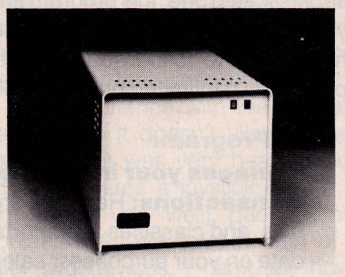

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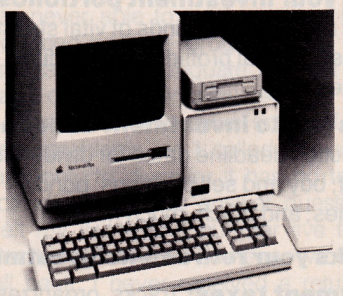

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LETTERS

Kernel Confusion

I don't mean to sound harsh, but I'd like to ensure that my point gets across. Let's get something straight once and for all. Countless times, in many of your articles and correspondence with other readers, you confuse the ProDOS kernel with the ProDOS-Applesoft interpreter, BASIC System.

ProDOS is a program that lives in a file called "ProDOS." Its commands are things like GET-FILE-INFO, SET-MARK, GET-BUF, WRITE-BLOCK, and ALLOC-INTERRUPT. It returns hexadecimal error messages, not things like "NO BUFFERS AVAILABLE," as was printed on page 22 of your September issue. This is a case in point.

BASIC System is a program that lives in a file called "BASIC.SYSTEM." Its commands are things like OPEN, CREATE, DELETE, and FRE. It does issue textual error messages.

The confusion isn't entirely your fault, though. From day one, Apple has also blurred the borderline between ProDOS and BASIC System. Since *inCider*'s *The Apple II Magazine*, though, you should supply accurate information, correcting Apple's mistakes when necessary. Just because information comes from Apple doesn't mean it's correct. It has made its fair share of blunders. Maybe it's just me, but I believe that information in magazines should be as accurate as possible, since thousands of people read them. Please correct this problem. Thank you.

Paul Lucas
One Bittersweet Lane
Levittown, NY 11756

You're absolutely right, and we apologize for the inaccuracy. —eds.

Homemade Modem

I found the article "Make a Modem" (May 1986, p. 75) very interesting. My problem is that I've got a //c. Can you tell me how to use this modem with that machine?

I'd also like to use my Hayes modem and Cricket Speech Synthesizer at the same time, but these two peripherals use the same port. What do I need to do?

German Sumbre
V. Del Pino 1739 16 B
Buenos Aires
Argentina

I'm in a bit of a bind. I'm building the modem featured in "Make a Mo-

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dem," and I'd like to use it on my //c. I suppose I should connect it to port 2, but how? I have a //c Scribe printer cable. Will this work?

In any case, I'd like to know how a modem communicates with the //c—which of the five pins on the port end do what, and so on. Your advice and information would be much appreciated.

Christopher Olmsted
21121 Richmond Circle
Huntington Beach, CA 92646

Sorry, inCider*'s homemade modem needs an open system—like a //e or II Plus—to tap into the power supply and the serial interface card. See "Any Port in a Storm" (July 1985, p. 28) for an explanation of //c ports. To use your Hayes modem and Cricket Speech synthesizer at the same time, you'd have to have two //c's. —eds.*

The Micro Lab Mystery

In response to "No Renewal" (Letters, August 1986, p. 10), I've also been burned by Micro Lab. I sent in the annual renewal fee of $30 and to date have received nothing in return. I can provide Mr. Keady with Micro Lab's new address, although I have yet to receive any correspondence back: P.O. Box 852, 559 Roger Williams Avenue, Highland Park, IL 60035.

Living in a remote area, I do most of my computer purchasing through mail order. Micro Lab is the only company with which I've ever had any trouble. Luckily, companies that offer technical aid and advice, such as Electronic Arts, Beagle Bros, and Sweet Micro, build confidence for the mail-order purchaser.

I kept my problem with Micro Lab to myself, but I believe Mr. Keady has the right idea. We should communicate with one another to fight companies that are ripping us off. On the other hand, a little praise for the companies that are going out of their way to help us wouldn't hurt, either.

Terry L. Gray
129 Queen City Circle
Parachute, CO 81635

Just a year ago, I purchased Micro Lab's Payroll Manager for a client. A short time later, we had a problem with it and received prompt, courteous, satisfactory service. A week later, I had to call about another problem and was told the company didn't do technical support any more.

I told the service people I expected that I'd need more help, but the person to whom I was talking confided to me, "This company is going bankrupt."

The dealer made a full refund, and we purchased another package. All of this took place before August 26, 1985, the date of my order for BPI's payroll module. Perhaps this will help complete your information.

David M. Hoban
4824 Westcreek Drive
Fort Worth, TX 76133

Micro Lab ceased operation about a year ago because of bankruptcy. The rights to externally written programs and games, such as Tax Manager and Miner 2049er, reverted to their original authors.

The educational software, such as Constitution Tutor, English SAT 1, Math SAT 1, and others, have been acquired by Word Associates, 3096 Summit Avenue, Highland Park, IL 60035, (312) 433-3076. Contact Myrna Helfand.

The data-base and programming-language utilities, such as Data Factory and Language Plus, have been acquired by my firm, Disk & Data Company, Box 648, Waukegan, IL 60079, (312) 244-8587.

Curt Rostenbach
Disk & Data Company
Box 648
Waukegan, IL 60079

Printing Problems

James Troutman's article, "Making the Grade with AppleWorks" (August 1986, p. 63) was a fine contribution to *inCider*. I feel, however, the article didn't address the problem of printing AppleWorks spreadsheets—a serious deterrent for teachers.

In teaching AppleWorks to teachers, I've suggested they use the open apple-H command, rather than the conventional print command. This is helpful because it includes the row numbers on the left-hand margin. It provides an easy guide for the teacher as well as the student. Current grade posting can be done "anonymously"

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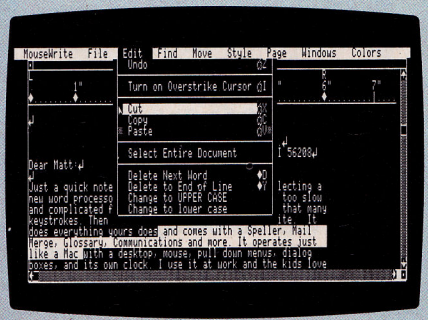

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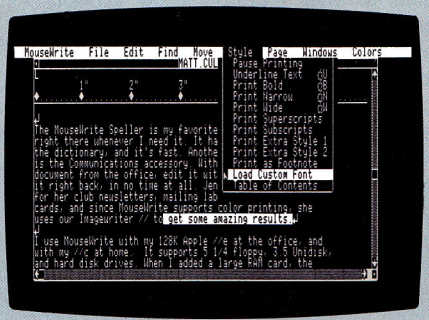

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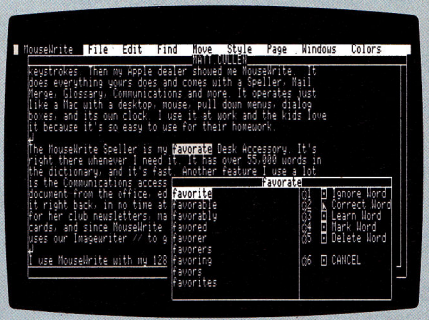

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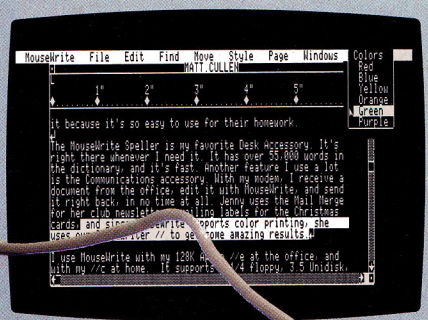

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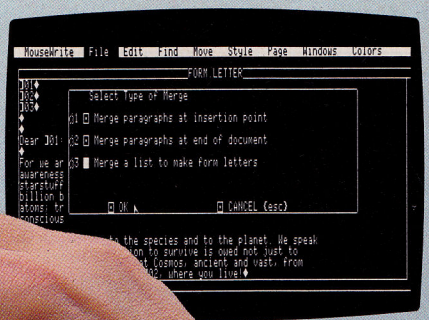

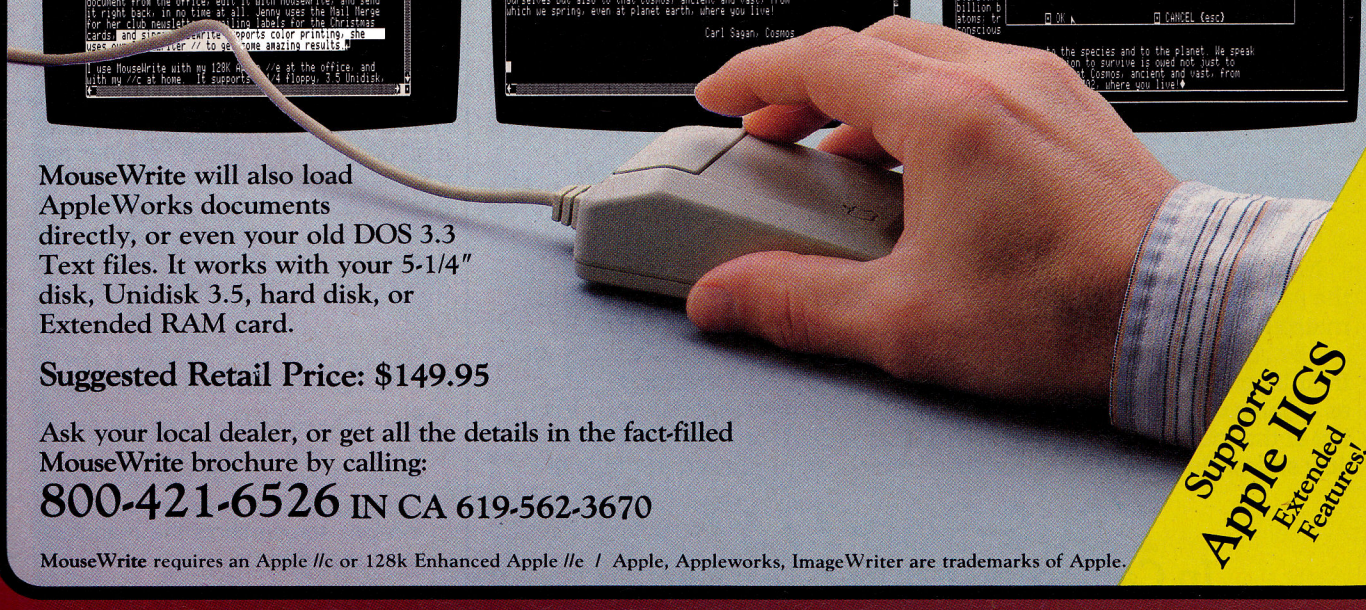

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when each student knows his or her row number.

Another solution to printing difficulties would be a program to print spreadsheets sideways. I've used Power Up's Widespread program very successfully.

Feeling that AppleWorks is the educator's finest tool, I would suggest that teachers not reinvent the wheel. Creating templates by grade level and subject area and sharing that information with other teachers, would make our jobs much easier.

Rose LaRochelle-Colby
23 Schuman Drive
Derry, NH 03038

Education Applications

I loved "Teachers' Best: 16 Winning Ideas" (September 1986, p. 42). I'm a secondary special-education teacher and have found that application software is absolutely best when it comes to using the computer as a teaching tool. Last year I had two English classes for learning-disabled students and one English class for mentally retarded students. They all used The Newsroom, The Print Shop, and word-processing programs.

Our whole school is involved in a writing-across-the-curriculum project, and the computer has proved invaluable in implementing this concept. Students in the MR class used The Newsroom to write their own newspaper. With the computer's professional results, they were eager to share it with other schools, students in our school, and their parents. They gained valuable experience as reporters, writers, editors, and publishers—and valuable praise and recognition from their audience. Our room was decorated with wonderful posters and signs created with The Print Shop, too. The cards they produced for friends, parents, and teachers really let them express themselves.

Kids who never cared if a sentence was complete or a word spelled correctly worked their hearts out to produce an absolutely perfect final product—thanks to The Newsroom. Their writing improved amazingly with Bank Street Writer.

This year, we'll have a double disk drive, so I'll be teaching them AppleWorks, which I've been using to write all my tests.

Linda Metzke
4291 Highway S.E.
East Troy, WI 53120

Financially Speaking

I've been a subscriber to your magazine for a long time, and I find it very worthwhile, so I'm hoping you can assist me in making a decision.

I'm looking for a comparison review of the leading personal-financial-management programs—describing program features, pluses, and minuses. I was wondering if your magazine has done any such comparison in the past, or if you have plans for one in the future? I'm especially interested in Dollars and $ense and Andrew Tobias' Managing Your Money.

Joseph F. Keady
15415 Silvan Glen Drive
Dumfries, VA 22026

See next month's inCider *for a comparative review of ten financial-management programs, including the current versions of Dollars and $ense and Managing Your Money. —eds.*

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

CORRECTIONS

The pictures printed with the review of Dam Busters (July 1986 Game Room, p. 97) did not depict Apple graphics. They were Commodore screen shots the manufacturer provided us.

The caption beneath the photo of the Scooter surge protector in our September 1986 New Products (p. 106) incorrectly identified the manufacturer. The Scooter is a product of Ohm/Electronics, as stated in the accompanying text.

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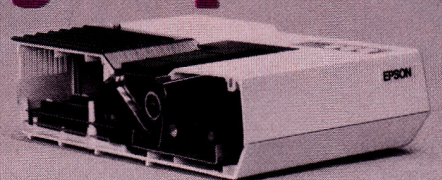

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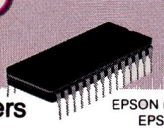
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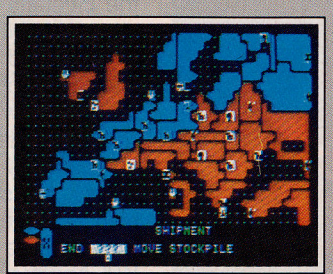

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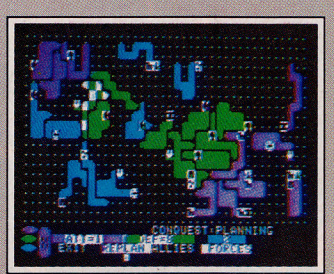

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Lords of Conquest is based on the board game "Borderlands™" by EON—the creators of "Cosmic Encounter.™"

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NEWS LINE

edited by *inCider* staff

Pep Rally

The air was crisp, the kids were psyched for the big game. Apple Computer doesn't have a football team, but this fall it launched the Apple IIGS in the De Anza College auditorium (next door to company headquarters in Cupertino, California) with all the hoopla of a homecoming pep rally.

A great gray flying saucer floated over the heads of a thousand ecstatic Apple employees and fans. Through smoke and laser beams, over the thumping beat of *The Heart of Apple II Is Still Beating*, we saw the newest part of the Apple team: the Apple IIGS.

"When we launch a product, we really *launch* one!" beamed Apple's Chief Operating Officer and "pep-club president" Del Yocam, with an eye on the GS suspended from the saucer. "Team captain"—and Apple president—John Sculley called the day "one of the most exciting in the history of Apple." He tackled the clone market and challenged computer manufacturers who "try to make history by doing what everybody else has already done" to match the Apple IIGS' advanced technology.



Courtesy of COMSTOCK PHOTOS/Mike and Carol Werner

But quarterback Steve Wozniak was the hero at this rally. His carefully rehearsed, painstakingly performed dialogue with Yocam made clear that the Apple IIGS is the machine Woz always wanted—with great graphics, super sound, and a technologically nifty 65C816 microprocessor.

Woz wasn't the only hero; the leader is no greater than the players are talented. Some of the three score employees—hardware and software designers, technical writers, quality controllers, and marketers—who filed proudly onto the stage remarked that the Apple II team had come a long way from the junior-varsity position it enjoyed when Steve Jobs was calling plays. "Some of us remember the Annual Meeting when the Mac workers saw Sculley 'live' in the auditorium, while we were in the cafeteria watching on closed-circuit TV," muttered a vindicated Apple II hardware developer.

But this was only a pep rally in September; when the game is selling computers, the season doesn't start until December, and the big date is the 25th. Will Apple have 35,000 Apple IIGS computers on the scoreboard by Christmas, as Sculley hopes?

Apple can make its goal only if software is ready for the IIGS. And software developers in September were still feeling underequipped and ill-prepared. Will ProDOS 16 be ready this winter, letting software developers take advantage of the power of the IIGS? Will the Apple IIGS C compiler emerge from the mists of "vapor" so that programmers can write software in the language Apple wants? Where's the Linker that permits programmers to write parts of programs in different languages? How about the Finder, which selects applications? Will anyone use the built-in AppleTalk network if Apple doesn't have a file server?

It's bad form to scowl during a pep rally, though. Anyway, we were pleasantly surprised at the tailgate party and product fair after the rally. A-Squared Systems (10 Skyway Lane, Oakland, CA 94619, 415-633-0703) showed off a video digitizer and frame grabber adapted from the Commodore Amiga in three weeks flat. Hayes (5923 Peachtree Industrial Boulevard, Norcross, GA 30092, 404-449-8791) even produced Smartcom for the IIGS, along with a Smartmodem 1200A. Great Wave Software (104 Gilbert Avenue, Menlo Park, CA 94025, 415-325-2202) played KidsTime II, a neat way to get kids into the computer by turning it into a piano. It was never a hit on the Mac—kids like color, and the Mac doesn't have great sound, either.

The Apple IIGS may not bode "Death to the Amiga," as an Apple staffer put it, but it will certainly give it a good game. **—P.S.**

The Christmas Apple

Yes, your Apple is irrepressible. It can travel with you on your holiday, stay at home in your family room, work with you in your kitchen—and now it's right there by your side helping you decorate your Christmas tree.



Courtesy of Taurus Photos/Susan Van Etten

Well, it's not actually stringing popcorn, but it can print Christmas-tree ornaments and decorations with a new software package from Activision called Paper Models: The Christmas Kit. Toy trains, sleighs, triangular gift boxes, and even a complete Dickens-style village can spew forth from the roll of your trusty dot-matrix printer.

While hanging an entire village on your tree might be a bit much even for those possessed with the largest evergreen and no tinsel, it still offers an option for unusual homemade Christmas decor. Paper Models contains the software and tools to create three-dimensional Christmas ornaments and decorations you can dress up with graphics—a special built-in paint program and ready-made clip art are part of the kit. It also includes a glue stick, ruler, red and green marking pens, and ten sheets of card stock for mounting the decorations. Paper Models is priced

In fact, with all those tools, why stop at decorations and ornaments? Maybe next year the kit will include a do-it-yourself Christmas tree. **—D. de P.**

AppleWorks Inspiration

Educators in search of novel AppleWorks applications now have another resource—the Teacher's Idea and Information Exchange. Organized and operated by one person, the exchange collects AppleWorks files from teachers and redistributes them.

James Carlisle, a fourth-grade teacher at Acre Elementary School, Cobleskill, New York, began the exchange last spring to help teachers make better use of computers in the classroom. "You can get isolated teaching in a classroom," Carlisle says. "I wanted to tap into all types of other people to see what they're doing and what their classrooms are doing."

The collection of files is not limited to any level of education and currently contains spreadsheet templates for gradebooks, yearly academic calendars, and weekly schedules; a data base of spelling words; tips and techniques on using AppleWorks; macros for Beagle Bros' MacroWorks; and product reviews. Carlisle hopes to receive additional classroom-management files and a wide range of curriculum-oriented files in general-information and test formats.

"I found myself reinventing the wheel many times—other people had done something I had just designed. It's nice to pick other people's brains," Carlisle says.

To receive AppleWorks files, send a disk (with mailer and postage) and $1 to James Carlisle, RD 2 Box 754, Cobleskill, NY 12043, or send $3 to cover the cost of a new disk and postage. Sending a file on disk entitles you to a free copy of a file disk.

Carlisle's students have previously used Apples to compose a newsletter with Springboard's Newsroom, create a data base of reading materials and authors, and learn basic word processing with Broderbund's Bank Street Writer. Sometime in the future, Carlisle hopes to start a pen-pal exchange between classrooms. Why these ambitious plans? "I'm just in love with playing with my Apple //e," Carlisle says.

—B.J.

Mindscape Acquires Scarborough Line

Mindscape, publisher of such simulations as Racter, The Halley Project, and The American Challenge, has become a larger force in the educational-software market, having recently acquired most of Scarborough Systems' product line, including the best-selling program MasterType.

"It's an opportunity to increase our IBM and Apple product lines," says Mindscape President Roger Buoy, who adds that his company is seeking further acquisitions. Mindscape's long-term goal is to increase its share of the educational- and consumer-software market, Buoy says.

Mindscape has purchased marketing rights to ten Scarborough programs. Prices of the packages won't change, but Mindscape will use its logo to market them more aggressively and will continue customer service, according to company officials.

Northeastern Software

Many of you have written to us with complaints about Northeastern Software, a mail-order company in Shelton, Connecticut. You've told us you're frustrated and angry, and you're out your money or your merchandise. You've also expressed those complaints to the Connecticut Attorney General's office. Now you've been heard.

A "large number of consumer complaints" received by the Attorney General's office has caused it to begin an investigation of Northeastern, according to Steven Schwane, attorney at the legal division of the Consumer Protection branch of the Connecticut Attorney General's office.

While the investigation is ongoing, Schwane can't elaborate on Northeastern's problems, he says, but he notes that he expects the investigation to take anywhere from two to six months.

In the meantime, business appears to be as usual at Northeastern. *inCider* phoned the company and had no problem placing an order.

We'll keep you posted as we learn more of the Northeastern story. **—L.L.**



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NEWS LINE

Scarborough's premiere product was MasterType, a typing-instruction program that has sold more than 400,000 copies, making it the software industry's most successful educational product, according to Buoy.

Hudson Technologies Inc. is the name of the company that will follow in Scarborough's wake. But according to Hudson president Francis P. Pandolfi, the company "will be moving away from the home-software market and concentrating solely on the growing programming- and software-development-tools segment of the industry."

Having recently merged with Scarborough, Lifeboat Associates will become a division of Hudson Technologies and will continue to publish software-development tools such as the Lattice C compiler.

Mindscape (3444 Dundee Road, Northbrook, IL 60062, 312-480-7667) is a wholly owned subsidiary of SFN Companies Inc., of Glenview, Illinois, an educational-publishing, information, and communications company. **—B.J.**

No Bargain, but Not Bad

When *inCider* visited Apple Computer last June to preview the IIGS, the 16-bit machine's price hadn't been set, but Apple execs dampened any hopes of a clone-beating bargain—the figure most often hinted at was something around $1200 or $1300 for the system unit. As it happens, the new Apple's price tag is quite reasonable—or at least reasonable enough to make //e and //c prices seem steep.

As of September 15, the list price of a IIGS with 256K of RAM, mouse, and keyboard (but no disk drives or monitor) is $999. The upgrade kit that turns a //e into a IIGS (minus keyboard and mouse), promised for January delivery, is an affordable $499.

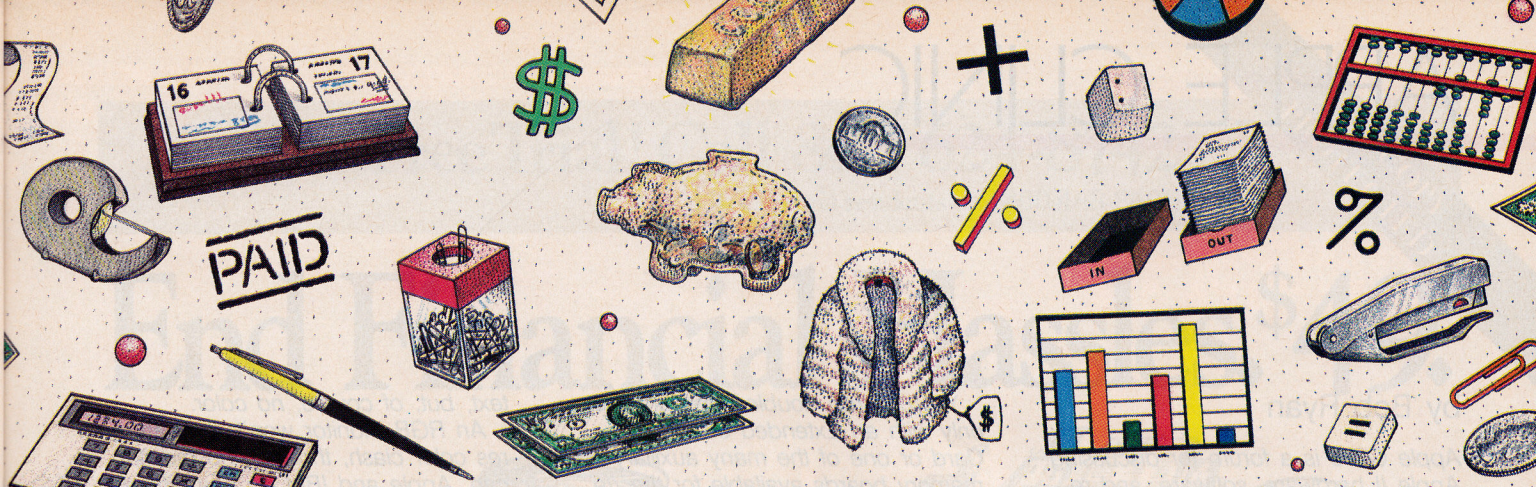
As for peripherals, the daisy-chainable Apple 5¼-inch drive is $299, while an 800K, 3½-inch drive is $399. The desirable AppleColor analog RGB monitor will set super-hi-res fans back $499, while a composite monochrome monitor is $129 and a composite color unit $379. Apple's SCSI (Small Computer Systems Interface) card for the //e or IIGS is $129; the Hard Disk 20SC that goes with it is $1299.

This means that a deluxe IIGS system, with RGB monitor and one drive of each size, will retail for $2196—not cheap, but not atrocious considering the IIGS' sound, graphics, and expandability. If anything, the surprise in Apple's strategy is the narrow gap between the IIGS and older 8-bit models. The official tag for a 128K Apple //e without drives or monitor is $829, while the 128K, one-disk //c is listed at $940.

While the IIGS takes on Atari's ST and Commodore's Amiga, the //c, billed in press releases as "Apple's most attractively priced entry-level machine," will compete with Tandy's new 1000 EX, offering 256K of RAM, //c-style features like a built-in disk drive and headphone jack, and IBM PC compatibility at better-than-PC speed for $799. Apple isn't pricing itself out of the market, but there's no doubt other companies are gunning for Apple's market share. **—E.G.**

We're always looking for news of the Apple world. If you're making news, send your press releases and photographs to News Line, inCider, Elm Street, Peterborough, NH 03458.

Circle 273 on Reader Service Card.



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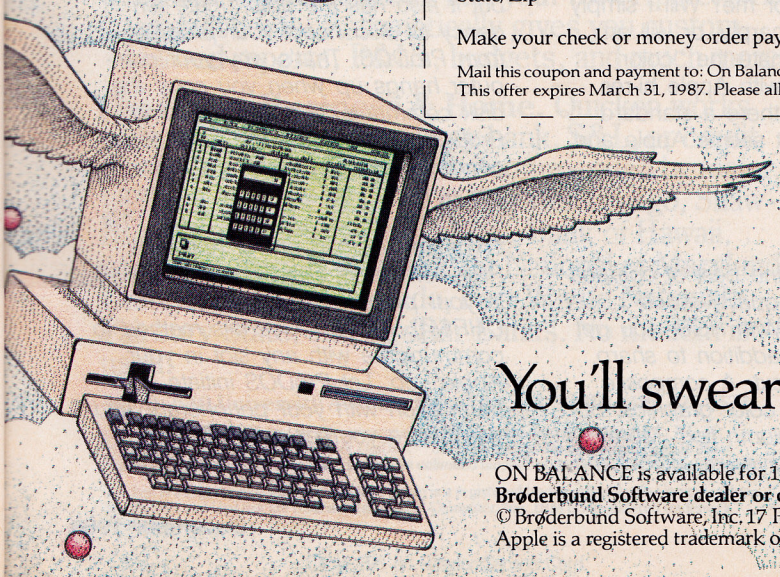

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APPLE CLINIC

by Bob Ryan

Apple Clinic is a forum for discussing Apple II hardware, software, and related subjects. If you have questions or answers, or want to make a statement, write to Apple Clinic, inCider, *Elm Street, Peterborough, NH 03458.*

Interlaced Memory

Please explain how double-high-resolution graphics differs from standard high-resolution graphics. Must I modify my Apple //e, or is double-hi-res available in an unenhanced //e? How can I incorporate double-hi-res graphics into Applesoft BASIC programs?

Thomas J. Painter
Bedford Heights, OH

Before Apple introduced the //e in 1983, it built into the machine the ability to expand the internal memory to 128K via a card in the auxiliary slot. It also tied the auxiliary slot into the video-generation circuitry, thus allowing a standard method for getting 80-column text output on an Apple. (All previous Apple II's needed third-party hardware to get an 80-column text display.)

Forty columns of text are stored in the video memory of the motherboard (just as in earlier Apple II's), while the other 40 columns are stored in the card in the auxiliary slot. Under control by appropriate firmware, these two memory areas are combined (interlaced, actually, with alternating columns coming from alternating text-memory areas) to give an 80-column display.

Like text, graphics information is stored in predefined areas of your Apple's memory. The video processor, however, interprets graphics differently from text. While designing the Extended 80-Column Card for the //e (the one with 64K of memory on it), Apple engineers discovered they could interlace the graphics memory on the card with the graphics memory on the motherboard, just as they had done to produce the 80-column text display for the //e. Thus, double-hi-res graphics doubles the horizontal resolution of hi-res graphics—from 280 dots to 560—just as 80-column text is double the resolution of 40-column text.

You can run double-hi-res graphics only with an Extended 80-Column Card or one of the many auxiliary-slot memory boards available for the //e. (A simple 80-column card doesn't have enough memory to store half the double-hi-res display.) Also required is a revision B motherboard for your //e; except for the very earliest production models, all //e's have them.

You can plot double-hi-res graphics from Applesoft BASIC, although you'll have to do a lot of poking around with the soft switches on page $C000 to do it. Applesoft was burned into ROM long before double-hi-res was conceived, so it doesn't directly support this mode.

For examples of how you can program double-hi-res graphics from Applesoft, see page 8-44 of Jim Sather's book, Understanding the Apple //e *(Quality Software, 21601 Marilla Street, Chatsworth, CA 91311, 818-709-1721, $22.95). You'll also find double-hi-res plotting routines on the hotCider Volume 3 disk available from* inCider *(CW Communications). You'll find, however, that double-hi-res plotting with Applesoft isn't what I'd describe as fast (it's about as quick as arms-control negotiations). The only practical way to program double-hi-res graphics is through assembly language.*

The RGB Advantage

I'm an electronics engineer, but after reading Apple reference manuals, magazine articles, and advertisements, I'm still confused. What will an RGB monitor do for me? Will I simply see things more sharply, or will an RGB monitor eliminate the "color clash" associated with Apple hi-res graphics? Also, is there a standard for RGB signals? It seems Apple and IBM are different.

R. Schneider
Sierra Vista, AZ

RGB combines the best of composite-video and high-quality monochrome monitors. With RGB, you get color graphics, in addition to sharp, clear, 80-column text. A composite monitor gives you color graphics, but limits you to 40-column text. Monochrome monitors give you 80-column text, but, of course, no color.

An RGB monitor won't eliminate hi-res color clash, though—no monitor can. Apple and IBM do use different RGB signals, so make sure your RGB setup is compatible with your computer.

Until now, digital RGB monitors were just fine for all Apple II's. With the advent of the IIGS, though, analog monitors will be much more important in the Apple market. Digital monitors are restricted to displaying 16 colors at a time, while gradations of analog-monitor color are limited only by the hardware and software you're using.

Good-bye DOS

I'm having problems saving my BASIC programs that put my Apple //e into 80-column mode. Whenever I try to save a program that contains a line like 15 PR#3, the cursor disappears, and about 15 seconds later my computer gives a little beep, then hangs up. The only way to unlock the computer is to reset it. To work in 80-column mode, I now enter PR#3 in immediate mode. When I want to save the program, I enter Escape-Control-Q to return to 40-column mode. How can I include a PR#3 in my programs to avoid this sequence?

Robert B. Sax
Sarasota, FL

You're using the wrong PR# command to change your screen display. The Applesoft PR#3 command does indeed put you into 80-column mode, but it also has the unfortunate tendency to disconnect your program from ProDOS. That's why your computer hangs up when you enter the disk command SAVE—it can't find ProDOS. While there are ways to reconnect the disk-operating system, I recommend you avoid the problem altogether by using the ProDOS PR# command instead of the Applesoft PR# command: Simply replace PR#3 in your programs with PRINT CHR$(4) "PR#3". Use this method to communicate with any slot in your Apple, too. Let ProDOS initiate communication with your peripherals, and you'll save yourself a lot of grief.

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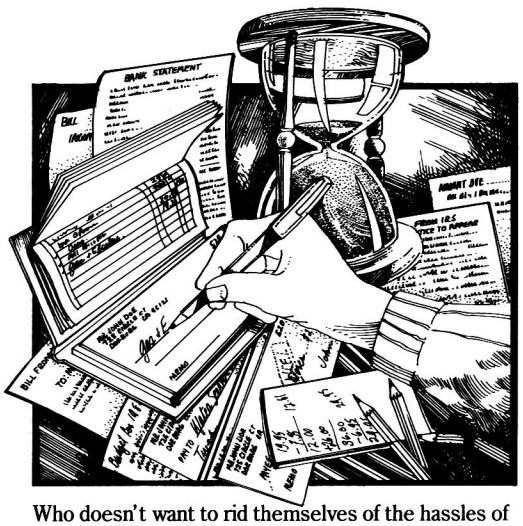

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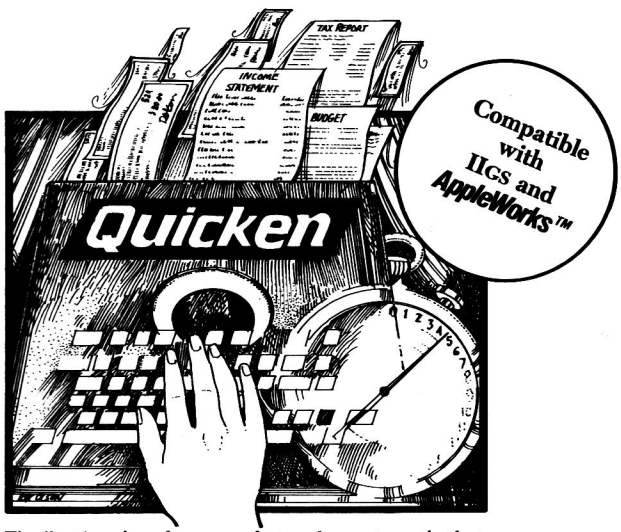

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Recognition Problems

On my Apple II Plus I'm writing a very large program that uses 70 blocks on disk and requires a large array space. I've installed the Apple 256K memory-expansion card, but I can't seem to get the computer or my program to recognize it. As my program expands, I'm starting to see out-of-memory error messages. Is there anything I can do to utilize the memory from my Applesoft programs?

Jim Sullivan
Palmer, MA

You've run across a fundamental limitation of Applesoft: It was designed to run in a 48K memory space. Although Apples have added more and more memory options over the years, Applesoft isn't able to recognize expanded-memory configurations. The good thing about this is that all Applesoft programs can run on any Apple II; you've already discovered the downside. I don't know of any way to get an Applesoft program on an Apple II Plus to recognize an Apple 256K card as main memory.

Since you've obviously invested a lot of time in your program, you probably don't want to convert to another language. Try to use the EXEC command to overlay subroutines in your program. They'll slow down the execution of your programs, but the only alternative is to use another language.

Overlaying BASIC subroutines isn't too difficult, but it requires careful planning. Choose a range of line numbers, say 20000–20999, that a number of different subroutines will use. (First capture these subroutines as text files on disk.) All the subroutines must begin with line 20000 and end with a RETURN statement. None should extend beyond 20999. They must also use the same increment between line numbers. Whenever you want to use a subroutine, test to see which routine you want, EXEC the appropriate one from disk, then GOSUB 20000.

By way of illustration, let's say you have a program with two subroutines (your 70-block program should have a large number). Normally, each subroutine would have unique line numbers. Your program might look something like this:

```
400 IF A$ = "Y" THEN GOSUB 20000
410 IF A$ = "N" THEN GOSUB 30000
```

Overlays, though, will change your program:

```
400 IF A$ = "Y" THEN PRINT CHR$(4)
    "EXEC SUBR.1":GOSUB 20000
410 IF A$ = "N" THEN PRINT CHR$(4)
    "EXEC SUBR.2":GOSUB 20000
```

The memory saving comes from not having your entire program in memory at once. The price you pay is that your program must read in the subroutines whenever you need them. You must also spend time extracting and renumbering your subroutines from the current program to create overlays. It can be a tedious process, but it sure beats scrapping all your work and starting over from scratch with a more memory-efficient language.

The Drive's the Thing . . .

We've been using List Handler on a Franklin computer at our school since 1983. Recently, the school acquired an Apple //e. The problem is that I can't get List Handler to boot. Isn't List Handler compatible with the //e?

Dee Lindley
Vidalia, LA

"EDITOR'S CHOICE"— inCider, July 1986
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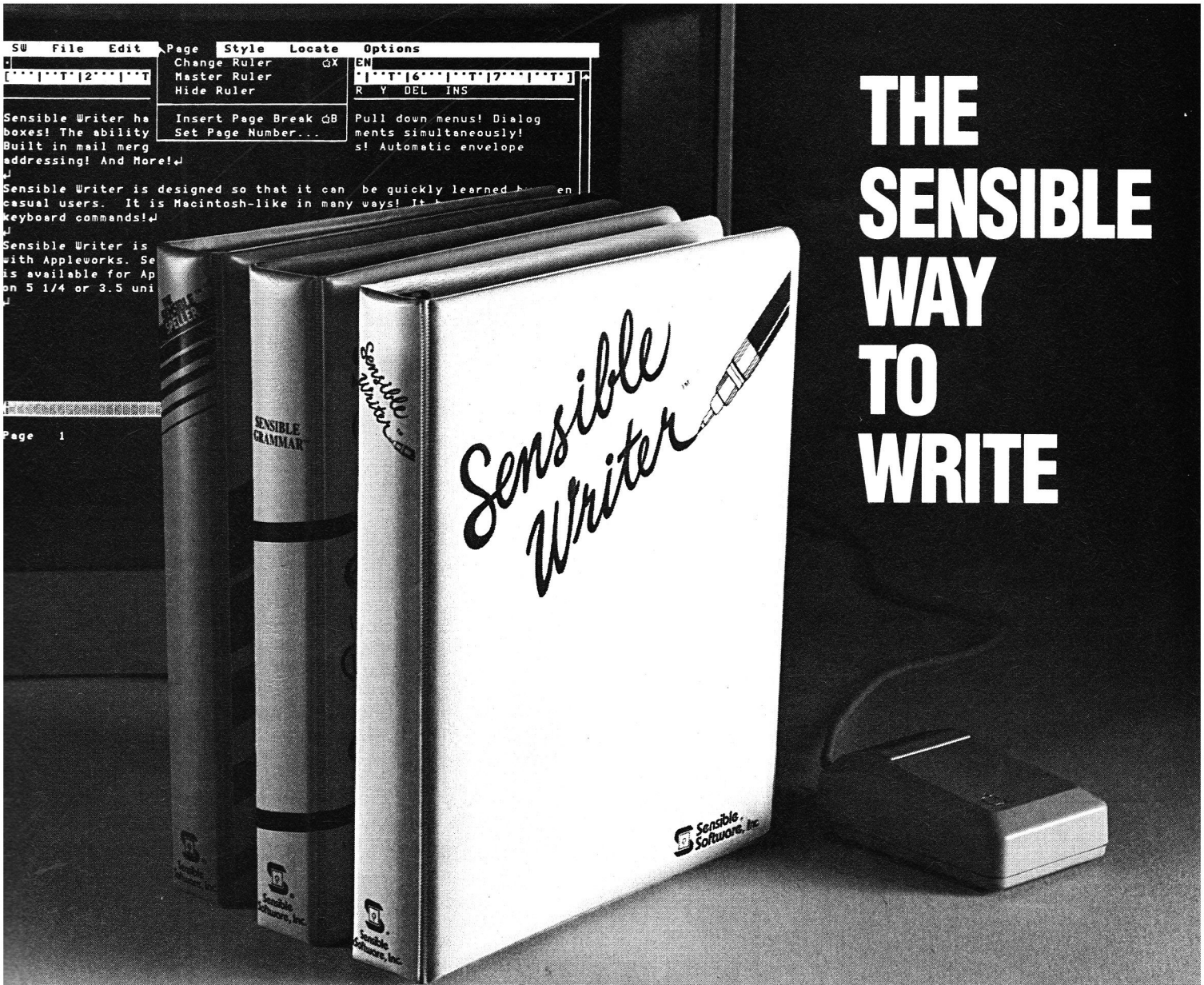

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Vintage 1983 List Handler is a program with which I've had a lot of experience—not all of it pleasant. The problem isn't the program, but rather the copy-protection scheme that locks up the software. List Handler is fragile as a result and susceptible to problems if your disk head is slightly out of alignment or your drive speed is a little fast or slow. I suggest you ask your dealer to check the alignment and speed of your //e's disk drives. List Handler does run on the //e—it just runs better on some than on others. (See our review in the November 1986 issue, p. 144.)

Reader Suggestions

I have an easy, inexpensive solution to the mousetext problem Jerry Patterson encountered using WordStar 3.3 on his enhanced //e (Apple Clinic, September 1986, p. 20). You should PIP WS.COM to a freshly formatted disk, then reinstall the program. When the program asks whether your 80-column card is capable of inverse video (highlighting), answer no. That's the only change you have to make in the installation procedure. The saved program should then replace the old WS.COM (ERA the old program and PIP the changed one in its place). Of course, you'll no longer have highlighted menus, but the irritation from mousetext characters is greatly reduced.

J.H. Stuy
Tallahassee, FL

I recently bought the Premium Softcard from Microsoft and encountered the same difficulty Jerry Patterson did—mousetext characters instead of inverse capital letters. When I called Microsoft, it sent me a program called CPHEN2E that solved the problem. I simply run the program whenever I boot CP/M on my Apple. Microsoft supplies the program's source and object code.

Frank Adler
Lakewood, NJ

With regard to Lieutenant Adcock's letter in the May 1986 Apple Clinic (p. 21), I, too, have a European Apple. It's an Apple II Europlus, purchased in Germany through the Post Exchange. The Exchange promised to convert my computer to U.S. specs before I returned to the States, but reassignment to another part of Germany before I came home prevented me from getting the conversion done.

A 220-volt Apple doesn't work in this country, so when I got home I contacted a couple of dealers to see what I had to do to get my Apple running again. The bottom line was that I could swap my European power supply for an American one and spend several hundred dollars in the process, or buy a new computer. Finally a dealer in Houston suggested I find a reverse transformer (step-up transformer) to convert 110 volts to 220. I found such a transformer for $50. At 250 watts, it runs both my 220-volt Monitor III and the Apple II very nicely. I now have a workable solution to my power problems. ■

CPT Kurt W. Miles
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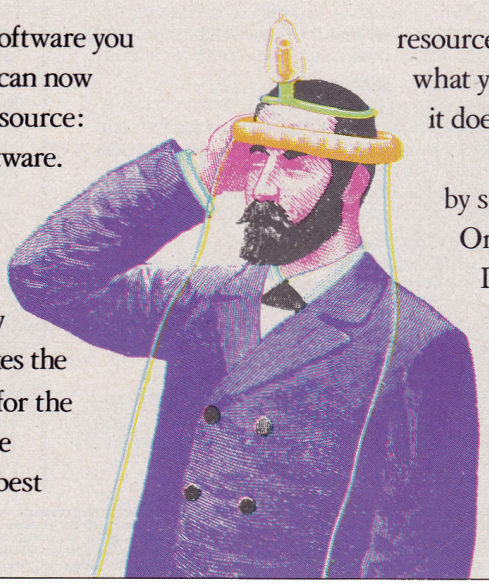

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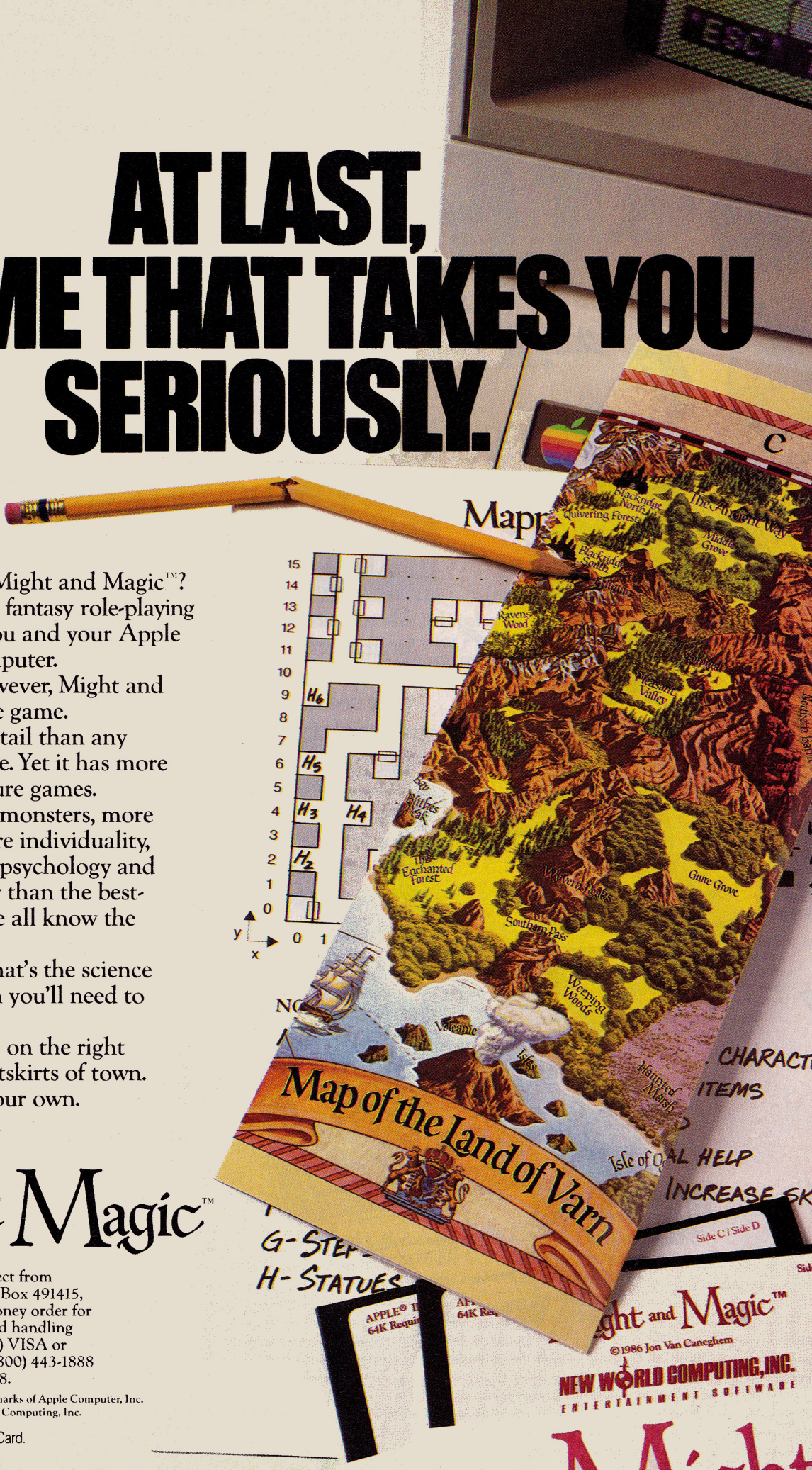

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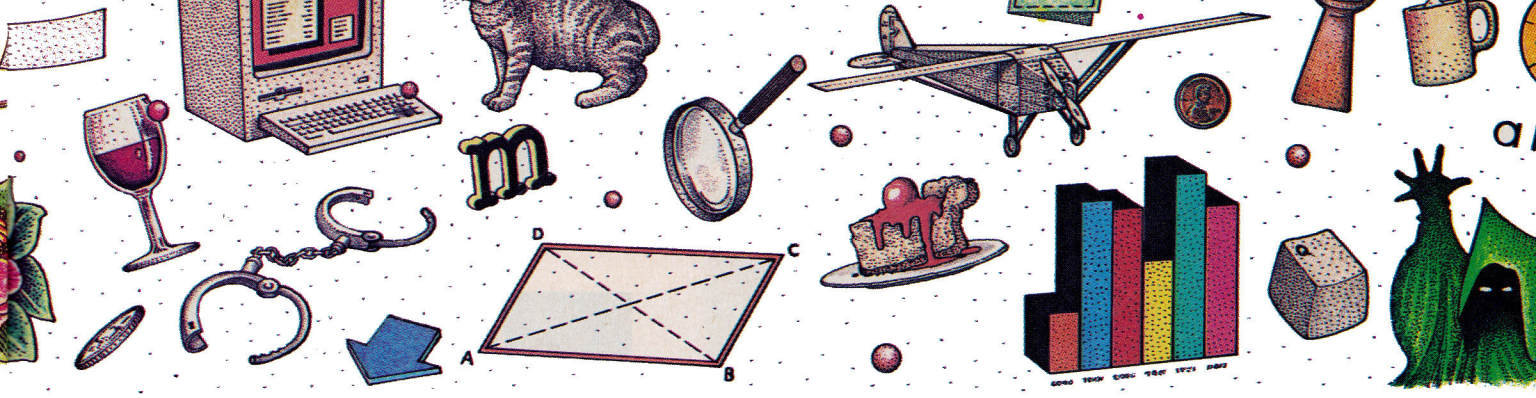

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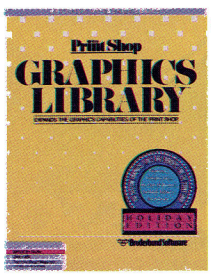

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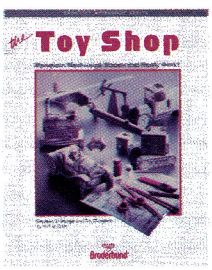

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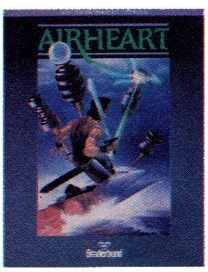

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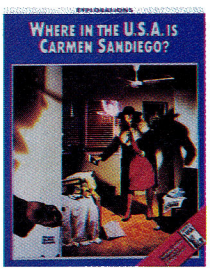

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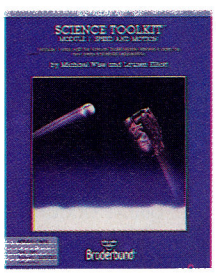

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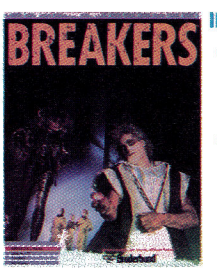

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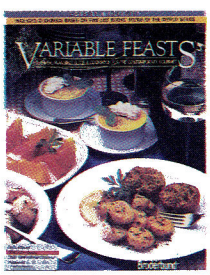

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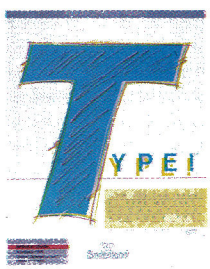

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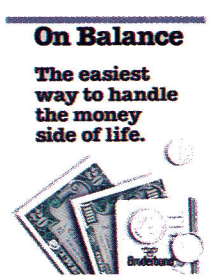

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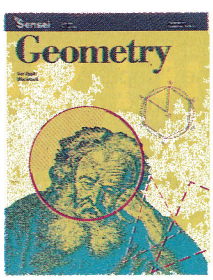

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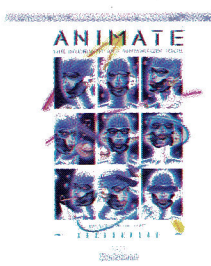

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Trio 1.1; Math Shop; Foundation 1.0; Seikosha SP-1000AP; Panasonic KX-P1080AP; Certificate Maker; SpeedDemon 3.03; Accelerator //e; TransWarp 1.3

The Sum of Its Parts

TRIO 1.1

SoftSync, 162 Madison Avenue, New York, NY 10016

Integrated word processor, spreadsheet, and data base; 128K Apple //e, //c
$79.95

Ease of learning ■■■
Ease of use ■■
Documentation ■
Support ■■
Overall ■■



After spending some time with SoftSync's Trio, I got the feeling I'd stepped into an AT&T commercial—the one where a number of telephone manufacturers boast, "We're cheaper than AT&T," only to have a voice-over respond, "You get what you pay for." Trio integrates word processing, spreadsheet, and data-base functions for a low $79.95, but it basically gives you only what you pay for.

The Trio manual (124 pages, no index) starts with word processing, and Trio Word begins well at first glance. It's command- instead of menu-driven—Open apple-D to load or save a disk file, Open apple-C to copy text, and so on—but commands are always available on screen to refresh your memory, and help screens are only a keystroke away.

Trio Word shows exactly what your printed document will look like, a refreshing change from many Apple word processors. Text appears in a 19-line window, with commands and status information displayed on the other five lines. Since the word processor is integrated with the spreadsheet and data base, you can pull information from those modules and put it into your word-processing document. This process takes a bit of time and effort, but it works.

Unfortunately, after about three paragraphs, Trio starts to lose characters. I'm a decent two-finger typist, and while the program kept up for a time, the more text I entered, the worse it got. After half a page, I was forced to enter text at a snail's pace lest Trio miss half or more of my input. This defeats the whole purpose of word processing.

There must be some remedy for this problem, as the rest of Trio Word works without a hitch. Sure, there are things I didn't care for (like having to type a filename each time I wanted to load one, instead of selecting from a menu), but the basic design seems effective. If only it didn't make you type so-o-o-o slowly once you've entered a page or so.

A Clumsy Calc

The sales literature hints that Trio Calc (the spreadsheet) has the "capability of Lotus 1-2-3 and Framework," plus a larger worksheet than AppleWorks, with a maximum of 99 columns and 3456 rows. However, the manual corrected that impression: You can have "as many as 99 columns OR 999 rows," with a default spreadsheet size of 40 by 84. Must be a typo in the literature.

As with most other spreadsheets, when text from one cell is too long to display, it spills over into adjoining cells. After putting a long label into a cell, I thought it'd make my worksheet look better if I made that column a bit wider. When I did so, Trio split my label, keeping the originally overlapped text within the now distant adjoining cell. The glitch occurs even with the example in Trio's manual, which tells you to type ANNUAL PROJECTIONS into cell A1, then widen the first column to 13 characters. The manual doesn't tell you to erase your title before changing column width, lest your first line read ANNUAL PR (four spaces) OJECTIONS.

Although Trio Calc has a window command, it isn't like any other I've seen. Instead of splitting your screen into two or more windows, Trio lets you select one row or column and then, by pressing two keys, highlight it at the top of the screen.

For me, the worst part of Trio Calc is its cell-referencing technique. If you

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want to add two numbers (let's say one's immediately above the other in a column), you get to type this into the formula line: r[-2]:[-1]c. Fun, right? That tells Trio to add the value two lines above the current cell to the value one line above the current cell in the same column; the colon indicates a range.

I know Microsoft's Multiplan uses this same archaic method of cell referencing, but at least it lets you point at the cells you want while entering your formula. Trio Calc forces you to type in these references, which are next to impossible to read when complete and will drive you batty when you try to figure out a halfway-complex formula.

The Rest of the Story

Trio File is the simplest of the three programs, a fast, easy system for storing and retrieving things like names and addresses. Most Trio commands are available within File (you can copy a cell or range of cells, change the size of your grid, and so on). The program lets you search only one field at a time, and searching is case-sensitive—ask for "Jones," and Trio File won't find "JONES."

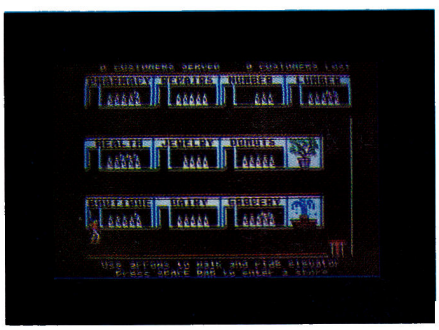
You can quickly and easily sort on any field. Trio File isn't effective for anything much more complex than an address book, but that's just what it's designed for, and it works well with Trio Word to handle form letters.

All told, the Trio package leaves a lot to be desired. Its basic design and logic are generally acceptable, but each module is severely wounded, making the whole a bit too primitive. Word's loss of characters as you type is an intolerable limitation for any word processor. Calc is handicapped by a cell-referencing technique that's miserably difficult (at least without Microsoft's cell-pointing procedure) and is a long way from the promised land of Lotus 1-2-3. File is easy and simple, but hardly powerful.

The sad part is that these programs, because of their integration and overall design, could be something special. How about it, SoftSync? Spend a little more time and effort, and do it right.

Gregory R. Glau
Prescott, AZ

Editor's note: At press time, SoftSync sent inCider *a revised version of Trio, claiming that word-processing speed had been improved; it seemed quicker, but still too slow for ten-finger typing. The spreadsheet matrix, enlarged after the manual was printed, isn't limited to a fixed rectangle; a one-column worksheet, for instance, could have 3456 rows.*



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You stroll through the mall using the left- and right-arrow keys to walk and the up and down arrows to ride the elevator. When you're in front of the store in which you want to work, press the spacebar to enter.

Shops are on three levels, each posing increasingly difficult math problems. The first level contains a boutique, dairy, and grocery store. At the boutique, you must use the fewest coins possible to give your customers correct change. This exercise teaches the value of coins and gives students practice in mental addition and subtraction.

In the dairy, you have to give customers the exact number of eggs



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they request. The grocery store has you packing a customer's purchases in two shopping bags of equal weight.

The second level includes a health-food store, jewelry store, and donut shop. Working here tests your skill in manipulating fractions and decimals. The program asks you to mix the correct amounts of bran and oats for your customers' cereal, to add the correct number of gold bars to produce a desired weight, and to make a particular number of plain, glazed, or filled donuts. In each store, problems become more complex as you serve more customers.

The four stores on the third level—a pharmacy, computer-repair shop, number shop, and lumber store—test more advanced problem-solving skills. In the pharmacy, you have to mix proper proportions of medicines to make up a prescription. To fix the computers in the repair shop, you'll have to look at input numbers, function, and output numbers, then decide what the missing number is.

The number shop is a unique place where customers can order a number that fits certain criteria—greater than 10, less than 30, and a multiple of 4, for instance. As in the other Math Shops, orders become more difficult as the number of customers grows.

In the lumber store, you'll have to cut boards to desired lengths, then add them to produce the length of the original piece.

Come One, Come All

You can work in the Math Shop stores against the clock or with unlimited time. The clock simulates a work day, 9 a.m. to 5 p.m., within an actual elapsed time of five to eight minutes; you continue working until the "day" is over, when the program tells you the number of customers you served.

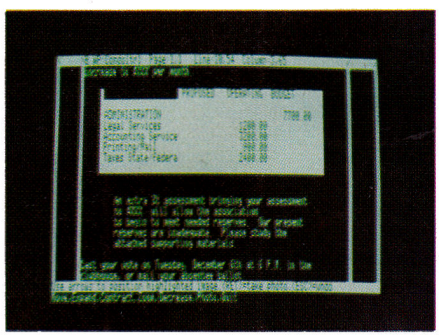
You can also choose to work in one store at a time or to skip among all the shops. The One Shop game is the most flexible for teachers: A student can work in a certain shop for a fixed amount of time, or serve a specific number of customers in whatever store you choose.

The All Shops game is more advanced. Customers enter the mall and shop at all the different stores, while your job is to serve as many of them in as many of the stores as possible. When the number of customers in any one store reaches ten, they all leave if you haven't gotten to them yet. Other customers then begin to arrive, however. The game ends when the number of customers lost reaches 50.

The home edition of Math Shop can help reinforce what your children learn in school, while the teacher's version includes helpful hints, worksheets, and other extra materials for using Math Shop in the classroom. The documentation offers further instructions and ideas. There's also a separate reference card.

Teachers and parents should find Math Shop a good way to get children involved in learning basic math concepts. It's simple enough to avoid frustration, yet the problems cover a range of skill levels broad enough to keep students interested. ■

Lafe Low
inCider *staff*



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Challenging AppleWorks is ambitious enough, but Foundation Corporation envisions its integrated package toppling Lotus Symphony and Microsoft Excel, as well. Today's Apple II (and tomorrow's IIGS) program is only the first step toward a goal of networked Apples and IBM's sharing identical Foundation files, while users enjoy a word processor, spreadsheet, and data base, plus pop-up notepad, calculator, and calendar.

That may not happen—not only is Foundation a David among software

Goliaths, but version 1.0 frequently feels clumsy, with awkward commands aggravated by a poor manual. In fact, our review copy didn't work on *inCider*'s enhanced //e or Laser 128, though Foundation staffers couldn't duplicate the quirk on their own enhanced machines. Even running perfectly on a //c or older //e, my first hours with Foundation were disappointing. Prospective buyers may take a glance and stick with AppleWorks.

That's a shame, because the more I grappled with Foundation's foibles, the more impressed I grew with its abilities: a strong relational data base, a spreadsheet with triple AppleWorks' speed, and power that's frankly amazing for a program that loads entirely into 128K. I don't know about IBM or Mac versions, but a debugged Foundation could shake up the Apple II market.

Song and Dance

Foundation loads in about 25 seconds, counting a mildly annoying curtain raiser—the calculator and some word-processing menus scrolling across the screen to the sound of musical beeps. The package includes program and back-up disks; you can't copy Foundation onto a UniDisk 3.5 or hard disk as you can AppleWorks, though the manufacturer says that's offset by Foundation's loading in one gulp instead of requiring constant disk access during use. The program uses its own 5¼-inch DOS, with its own menu of commands for formatting data disks, copying or deleting files, and so on; a utilities disk imports existing ProDOS text or AppleWorks files. Foundation stores files in 4.5K increments, a waste of space if you store a lot of short 1K or 2K memos.

The display is a cross between the Macintosh menu-and-desktop approach and the type-first-letter command line of Lotus 1-2-3. Files can fill up to 14 windows (or 45K of workspace RAM, whichever comes first); a submenu of window commands let you resize or move the active window or wipe it from memory (after a Y/N confirmation).

Whether at the main desktop level or within an application, the bottom two screen lines hold a menu of commands. Since they're English words, they're easy to understand, but they're activated by inconsistent methods. You can reach some by typing the first or capitalized letter—the main command line features "Word processor," "Spreadsheet," and "daTa-base" (D always calls the desktop menu, where up and down arrows and the return key select among windows).

You must highlight other commands, listed in all capitals, by paddling the cursor along with the space bar (right) or delete key (left) and pressing Return; it's your first introduction to Foundation's often keystroke-laden syntax. The command menu is always active within Foundation's spreadsheet, though word-processing or data-base users must press the escape key to reach the menu, perhaps another letter to enter a submenu, Q to quit or back out of it, then E ("Enter window") to return to work.

Foundation's calculator and calendar are always on hand as all-capital menu choices. The former has memory, log, exponent, and trig as well as ordinary math functions; it also has some shortcomings. Except for numerals and the four math functions, you must laboriously press the calculator buttons one at a time with the arrows and return key (no, you can't use a mouse). You can't transfer a calculator result into an application, either.

The calendar shows the current month, with commands to flip through later or previous months or years. Before entering or viewing a day's appointments, you must use a program on the utilities disk to format an appointment disk, storing either the first or second half of a year (under disk name 87A or 87B, for example). Seeing appointments is then a matter of selecting filters or search criteria, as in Foundation's data base.

Foundation's notepad, selected from the desktop menu instead of a command line, is simply a built-in word-processing window, sized to fill a screen (20 lines of 78 columns). You can add lines for a bigger scratchpad area, but the program crashes if you cut it to less than 20 lines, as you can with your own word-processing windows, to save desktop memory.

The notepad is a good place to try one of Foundation's neat features: a Photo command that zaps a data-

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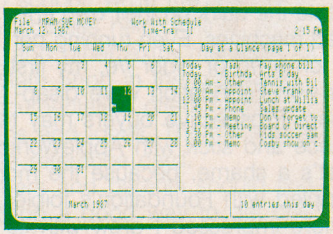



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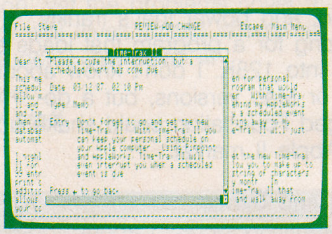

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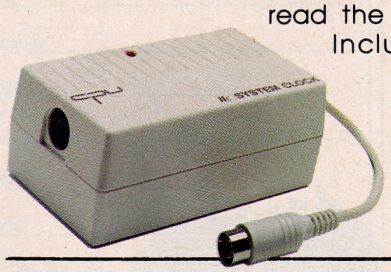

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base record or block of spreadsheet cells or word-processing lines into a word-processing window beneath the original on the desktop. Shrink the first window until it frames the desired material, press P, maneuver the highlighted block into position on the target document, and presto! Framed material sometimes blinks like a kid getting his or her picture taken, isolating the wrong lines, until you learn to scroll through contents with the arrows instead of the Window submenu's Scroll command. But Photo is far handier than AppleWorks' print-to-clipboard routine for pasting spreadsheet rows into a letter.

Word-Processing Controls

When you enter Foundation's word processor, you're given the choice of opening a blank window or loading an existing document. The former offers a default size of 60 lines (just over one single-spaced page) by 78 columns; for margins' sake, you'll probably type a different value before pressing Return to start writing. Maximum file length is 255 lines; you can chain files together to print longer works.

You execute some commands, such as reformatting or right-justifying text, by pressing the escape key and moving the cursor along the command line. Others are available either from pop-up menus or within the text window, with control-key shortcuts such as Control-V (page down), Control-DL (delete line), or Control-SG (global search and replace; the Foundation manual incorrectly lists search commands as starting with Control-A rather than Control-S.)

The word processor is quick and responsive, though better at overwriting than inserting text (Control-Y toggles insert mode, but it takes a control-key command instead of simply pressing Return to insert blank lines). There are plenty of editing commands—you won't see AppleWorks searching backward, for instance—and even commands to draw boxes or borders around text. Mail merge, using Foundation's potent (if rather tricky) data-base report ability, is standard.

I wish the program included more control- or apple-key shortcuts (Foundation ignores the apple keys) instead of making you wade through Escape, left, right, up, down, and Return for functions such as underlining and block operations. Still, the word processor's versatile functions and windowing features make up for minor bothers such as a delete key that deletes either forward or backward, depending on the location of the cursor.

A Speedy Spreadsheet

Foundation Corporation's president described his package to me as "a Lotus killer" whose spreadsheet people compare to Excel. Given its small size (64 columns by 254 rows), lack of Lotus-like financial functions, and clumsy cell pointing for entering formulas—you must use Control-W, Z, A, and S for up, down, left, and right—I'll dispute that. Nevertheless, there are some nice things about the Foundation spreadsheet. For one, it took only 3.2 seconds to recalculate a 400-cell exercise which took AppleWorks 10.5 seconds. That's remarkable for an 8-bit Apple program—just 0.4 second slower than 1-2-3 on a Tandy 1000.

Foundation's spreadsheet is smart when it comes to date math (automatically counting the days since August 26 or whatever) and text-string functions. A Table function performs sophisticated horizontal and vertical lookups; you can name cells, rows, columns, and blocks for convenient reference, as well as frequently used formulas to save retyping. On the other hand, the spreadsheet can't recognize a label when you start typing one as AppleWorks can; since the letter keys are always active for the command menu (just as the arrow keys are ready for formula editing instead of cell pointing), you must preface nonnumeric values with A for alphanumeric, T for date, or F or the equal sign when entering a formula for each cell.

The word "relational" is usually applied to data bases, but Foundation has a relational spreadsheet, too—one that can borrow information from other worksheets on the desktop or disk, such as giving cell E12 in your "Profit" sheet the formula {Budget}D16 to raid the specified cell in the "Budget" file. The first sheet doesn't automatically recalculate when you change the second (you must make the first the active window again and change it or press ! to manually recalculate), and linked filenames are

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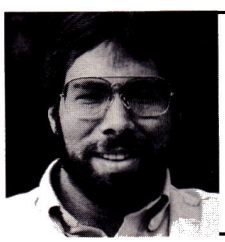

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stubbornly case-sensitive—type "budget" and Foundation can't find the file. But the relational feature, combined with the convenience of keeping multiple spreadsheets in memory, is exceptionally useful.

Heavy-Duty Data Base

The data base opens with what looks like a word-processing window, on which you design a form by typing field labels and underlined spaces for data; when you press the escape key to exit the window, the program highlights fields one at a time while you assign attributes such as those for date fields or number of decimal places. Entering data is a matter of using the return key to move between fields and Control-A to move to the next record; records are stored in a temporary RAM buffer during entry, then safely kept on disk.

From resembling the word processor, the data base soon starts to resemble the spreadsheet. To find records matching particular criteria, you must specify a filter—a spreadsheet-style formula with field numbers instead of cell references, such as F3 < 40000 to choose zip codes or F1 = 'John Doe' to find a name. This is a clumsy way to work for single-field searches or matches, but Foundation's sorting talents are superior—"keyfiles" let you select and order as many sort fields as you like before generating an index for sorted reports.

Data-base formulas can use many of the same functions as their spreadsheet cousins—the manual promises all spreadsheet functions, but I got an error message when I tried to SUM numeric fields. Still, coupled with the ability to specify "phantom" as well as "real" fields—they're displayed on screen, but not stored on disk—Foundation offers versatile real-time calculation, multiplying quantity by price to present a total or using IF...THEN logic to display "Status: High" if "Salary" is more than $50,000.

Best of all, Foundation's relational-data-base power puts other programs to shame. It took me some time to learn my way around the "Links" menu, specifying other data bases and fields in common, making sure files were saved and filenames entered perfectly, but after that Foundation proved a match for MS-DOS data bases.

The active or master file can borrow fields, suitable for phantom status or formulaic operations, from a second, third, fourth, and fifth data base plus one spreadsheet (the latter can both give and receive data-base information, thanks to GET and MOVE TO functions). Want to type data for only a couple of fields, letting the program fill a dozen others, fetching addresses, calculating values, and saving disk space by doing the whole thing on the fly as you call records to the screen? Foundation's your software.

Problems and Potential

Foundation's documentation consists of a beginner's guide of skimpy exercises, a reference manual that roughly presents functions in the order in which they appear on the screen menus, and an addendum discussing file import/export and other things left out of the main manual.

The sample disk files provide a pretty good tutorial, but the printed documentation is grim; its organization makes it hard to find information quickly, and it has loads of misleading statements and errors. For example, the manual insists you assign an attribute to every data-base field and reminds you that zip codes should be alphanumeric lest they lose leading zeros. In fact, alphanumeric fields should have no attribute; Foundation's "Alpha" attribute is strictly alphabetic, giving "Only letters" error messages if you type a number or punctuation mark. I was appalled to find a spreadsheet whose AVERAGE function didn't work, until the telephone-support line told me Foundation's actual syntax is AVER.

Make no mistake: As a responsive windowing system with a great relational data base and fast spreadsheet, Foundation is tremendously impressive. For computing power, it beats AppleWorks soundly; for an 8-bit program that works without disk access (except to data-base files), it's almost unbelievable. But it's not very smooth, not very friendly, not quite debugged, and not at all well documented. I look forward to a revision, but Foundation 1.0 doesn't know its own strength. ■

Eric Grevstad
inCider *staff*

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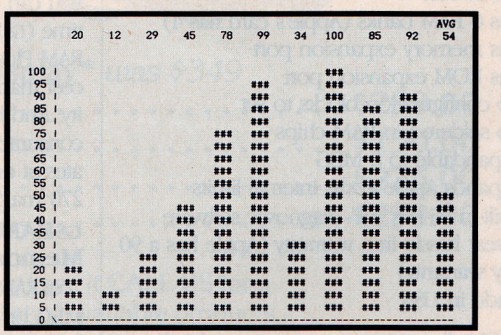

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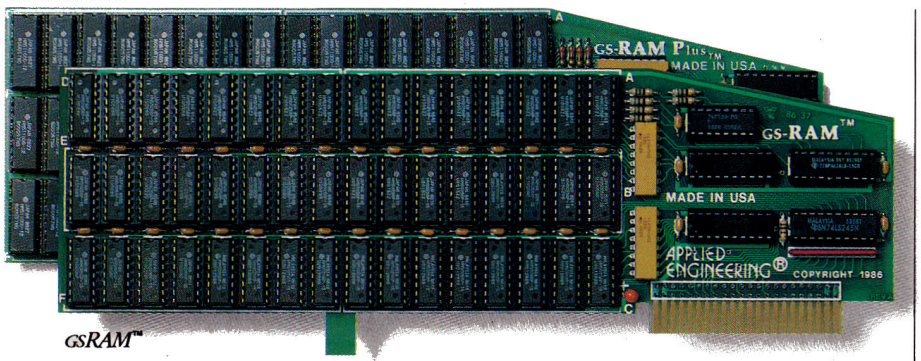

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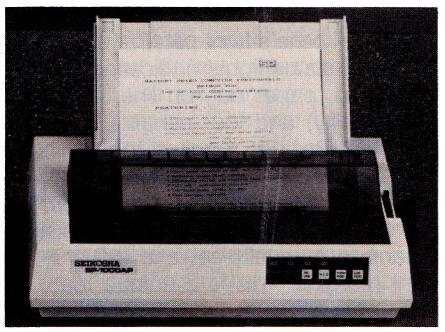

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	Seikosha	Panasonic
Ease of setup	■■■	■■■
Ease of use	■■	■
Documentation	■■	■■
Support	■■■	■■■
Overall	■■	■■

Time was when third-party printer manufacturers strove for Epson compatibility, modem makers targeted Hayes, and computer vendors cloned an army of Big Blue machines. Nowadays, Apple is setting its own standards, with other manufacturers clamoring for a slice of its pie and consumers enjoying increased selection at lower prices. If you're looking at an ImageWriter printer, for example, you may want to consider a cheaper, compatible Seikosha SP-1000AP or Panasonic KX-P1080AP. To be honest, however, you may not want to buy one.

The tremendous popularity of the ImageWriter is directly attributable to the success of the Apple //c and Macintosh. By equipping both computers with serial ports, ignoring the industry trend toward parallel interfaces, Apple created a market for serial printers and achieved a dominant share of that market. That's not to say, however, that the ImageWriter is the best impact dot-matrix printer around.

Among other shortcomings, the ImageWriter has no near-letter-quality (NLQ) mode. Its paper-handling mechanisms aren't the most sophisticated, tending to jam if not carefully tended. Also, it's rather slow compared to similarly priced parallel printers. These deficiencies were addressed with the introduction of the $625 ImageWriter II, but until more software manufacturers offer packages that take advantage of the ImageWriter II's additional features, the original ImageWriter is still a popular choice. Seikosha's and Panasonic's strategy is to offer ImageWriter compatibility plus NLQ output at a lower price.

Seikosha's Compact Clone

The Seikosha SP-1000AP is slightly smaller than the ImageWriter (15 by 11 by 5 inches), but feels significantly less sturdy. The smoked plastic top of this cream-colored unit flips open to reveal a small nine-wire printhead that, in addition to emulating all native ImageWriter print modes, can gener-

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ate NLQ, super- or subscript, and italic characters as well.

The Seikosha is a rear-loaded printer that accepts paper up to three parts thick and comes complete with both tractor- and friction-feed mechanisms. Its tractor, unlike the ImageWriter's, is located behind the printhead; as a result, paper must be advanced a full page before a document can be removed. Further complicating the matter is the lack of a tear bar to aid in separating fanfold paper.

The tractor mechanism snaps easily out of the unit when you need to use single sheets of paper such as letterhead stationery. The SP-1000AP has a nifty adjustable paper rack that guides individual sheets into position for printing. Once placed on the rack, a sheet is automatically loaded to the top of form when you pull the paper-loading lever to the right of the printer. If you intend to print a number of letters, the optional SP-CSF cut-sheet feeder automatically loads and ejects sheets one at a time.

The Seikosha's front panel is adorned with four status lights (indicating power on, paper out, on line, and print quality) and four control switches. Besides toggling the on-line and draft/NLQ status and advancing paper with line feeds or form feeds, the switches serve double duty as a means to manually set and adjust print margins. This is a unique feature, although not one I'm inclined to use very often.

While nowhere nearly as well written as Apple's documentation, the Seikosha's 94-page manual is coherently arranged with plenty of useful illustrations, charts, and examples. The brief instructions for connecting the printer to a //c or Mac fail to mention that data length must be set at 7 or 8 bits, respectively. Fortunately, the printer is shipped configured for use with an Apple II.

Besides letting you change data length, DIP switches on the printer's rear panel determine baud-rate, page-length, language-font, automatic paper-ejection, and carriage-return functions. Access to the DIP switches is easy, but the manual refers to them in reverse order, which may confuse novice users.

Finally, depending on which of the front-panel buttons you press while turning the unit on, the Seikosha enters either a self-test or hexadecimal dump mode. The latter, which prints incoming data in hex, is helpful when troubleshooting programming problems. In self-test mode, the printer repeatedly prints its entire character set—not terribly exciting stuff, but useful in determining whether the ribbon's installed properly or a printhead wire is defective.

Panasonic's Clumsy Compatible

Considering that both are attempts to copy the ImageWriter's form and function, it's no surprise that Panasonic's KX-P1080AP resembles its Seikosha rival. Closer inspection, however, reveals many differences.

The Panasonic has both friction and tractor paper mechanisms, though the tractor unit—which, like the Seikosha's, pulls paper past the printhead rather than feeding it into the machine—isn't removable. Paper is loaded from the rear through two metal separators that prevent the printer from accidentally eating its own output.

By moving a lever inside the unit, you can adjust the printhead position

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for one- to three-part forms. You must remove the plastic top cover to reach this lever, but it's my guess that most owners will use the Panasonic without the cover installed: The tear bar is located under the cover, and you have to lift the bar out of the way to insert paper. Moreover, the tear bar gets in the way when the printer tries to load single sheets to the top of form—a job at which the Seikosha is superior.

The top cover also conceals the printhead, ribbon, and DIP switches. The KX-P1080AP uses compact ribbon cassettes (available in black, brown, blue, and red) that travel horizontally along the platen with the printhead.

The DIP switches, buried beneath the path of the printhead like the ImageWriter's rather than easily accessible like the Seikosha's, control character-set, paper-out detector, data-length, form-length, and carriage-return functions. A second bank of switches control communications parameters such as baud rate, parity, and protocol. You must dismantle the printer to change them.

On-line, form-feed, and line-feed buttons are aligned below the power, paper-error, and on-line indicator lights. A sliding switch on the printer's left side determines the active print mode: standard, NLQ (a sharp 12-by-18 instead of 7-by-9-dot matrix), or an ultra-condensed 136 characters per line, ideal for wide spreadsheets.

Like the Seikosha, the Panasonic has self-test and hex-dump modes, and a 3K print buffer to boot (compared to the 1K buffer of the SP-1000AP). Its manual is peppered with illustrations, but may intimidate novices with its technical jargon, terse explanations, and haphazard layout. Panasonic provides a two-year limited warranty, though, and a toll-free support line for befuddled owners.

Head to Head

While the Seikosha is the clear winner for features and ease of use, the Panasonic comes on strong when comparing performance. The SP-1000AP claims to print 75 characters per second (cps) in draft mode and 15 cps in NLQ; Panasonic boasts 90 and 24 cps respectively. Like other advertised printer speeds (including the ImageWriter's claimed 120 draft cps) or EPA mileage estimates, these burst speeds have little to do with the realities of paper handling and printhead positioning. My test results, for

Continued on p. 140.

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Circle 74 on Reader Service Card.

Which Apple II product, according to our readers, "shines above all"?



PEOPLE'S CHOICE

by Eric Grevstad, *inCider* Review Editor

The votes are in, the readers have spoken, and you've named your favorite and most significant Apple II product—the winner of *inCider*'s first People's Choice Award. Are we editors surprised by your unexpected selection? Well, no. To paraphrase Dorothy Parker, you could have knocked us over with a girder.

If **AppleWorks** dominates the II software market, it's because it's revitalized the market since its introduction in 1984 (see sidebar). At the time, with the IBM PC juggernaut underway and the Mac bandwagon beginning to roll, industry onlookers thought the trusty Apple II was *passé* as far as sophisticated productivity software, let alone a Lotus- or Framework-style integrated package, was concerned.

AppleWorks proved the pundits wrong. Besides vaulting to and staying on top of the best-seller lists, giving the II a spectacular shot in the arm, Apple's unified word-processing, data-base, and spreadsheet program has built a whole industry of revisions, add-ons, templates, and—most of all—satisfied users.

The user who said it best, in our opinion, of the pile of ballots we received (AppleWorks earned twice as many votes as the runner-up product) was Judith Potthast of Los Angeles, California. Potthast is an English teacher and coordinator of the computer lab at Washington Irving Junior High School.

"It allows me to send letters to relatives; keep a budget; keep a data base on phone [numbers], addresses, birthdays; and especially, do work for my profession—teaching."

—Judith Potthast (shown here with the People's Choice Award winner—AppleWorks)

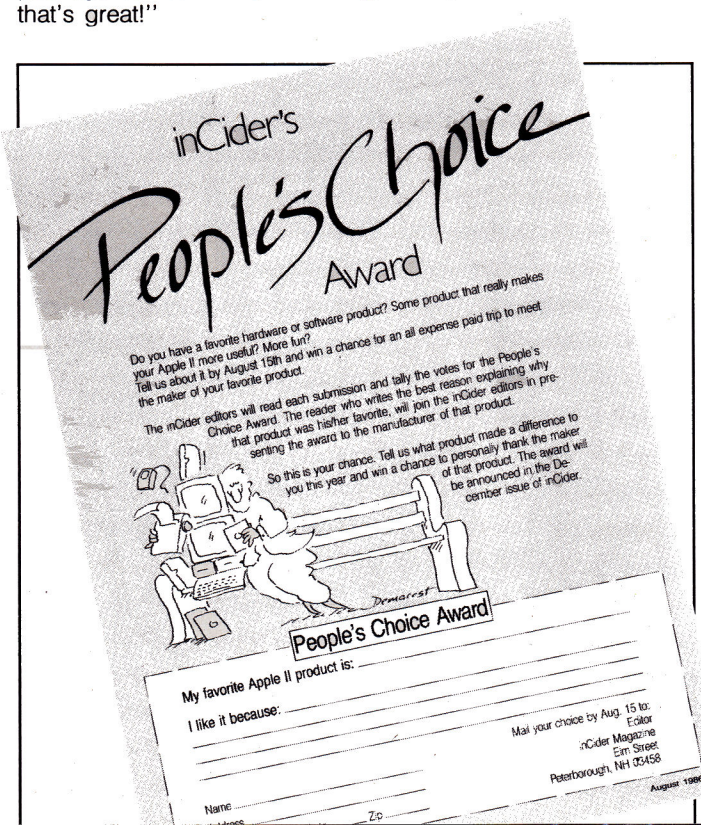
When not using her //c for correspondence and lesson plans at home, Potthast, who holds a master's degree from Pepperdine University in using computers for education, teaches both BASIC programming and applications to seventh, eighth, and ninth graders. The application she teaches is AppleWorks—which has left such an impression on kids that, Potthast told *inCider*, "I had several students who had computers at home and said they were glad they [now] knew what to do with them."

"The best thing about AppleWorks," in Potthast's words, "is that it's so easy that the kids actually think of it as a game rather than work." Whether it's combining sentences with the word processor ("one of the higher forms of editing that you can get students to do, and when they do it with pencil and paper they hate it"), building data bases of friends or U.S. Presidents, or using the spreadsheet to simulate budgeting and running an ice-cream store, AppleWorks makes Potthast's job easier while making students' lessons more involving. "One boy made so much money [in the spreadsheet exercise] I told him there was no way in one store he could have sold that many ice-cream cones," Potthast remembered. "But he didn't care. He felt like a millionaire."

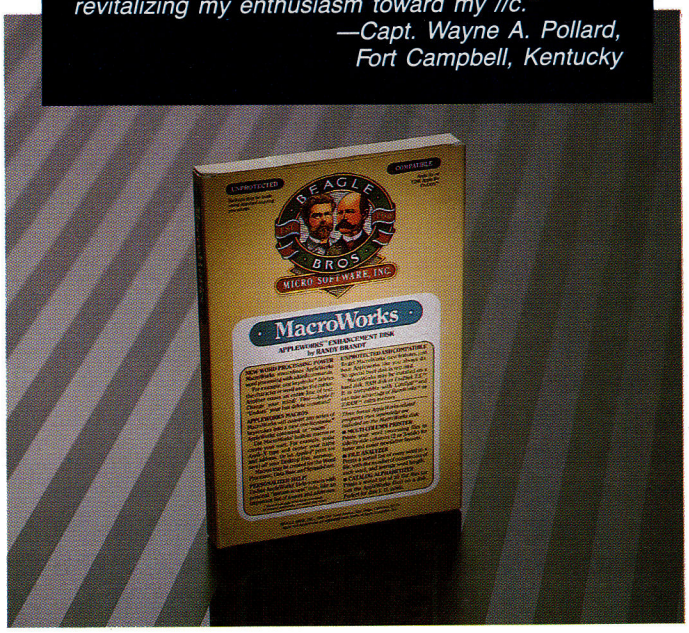
The Perennial Garden

Except for Potthast's desire for larger data-base fields and a request from Norm Boerger of Chevak, Alaska—"More often than not, it is the product found next to my Apple //e. [But] when will Apple produce a mouse version?"—respondents hadn't a bad thing to say about AppleWorks. In fact, Phyllis Dewar of Murfreesboro, North Carolina, could speak for all our voters: "AppleWorks makes Apples work."

"It gives me easy-to-use programs that I need to do [a] most professional job at just about everything I put my mind to," wrote Dan Gibbs of Slate Hill, New York. "AppleWorks, in one word, is just great." Echoed Barbara Larson of Lombard, Illinois: "[AppleWorks] accommodates everything from our home finances to my perennial garden. One package serves all my needs right now, and I think that's great!"



"This amazing product is solely responsible for revitalizing my enthusiasm toward my //c."
—Capt. Wayne A. Pollard,
Fort Campbell, Kentucky



***Third Place**: Beagle Bros' MacroWorks*

As for ease of use, wrote Richard Bolles of Walnut Creek, California, "It is a highly intelligent program that anticipates what the user will do next, and it offers integration of a higher order." According to Marilyn Stubberfield of Kingsville, Ontario, "In no time the manual became dusty on the shelf and my family became quite proficient with both the data base and word processor."

Macros and Mail Merge

All these rave reviews, of course, came before any readers had seen AppleWorks 2.0, with its mail-merge and other extras and the ability to load itself into RAM and produce larger files with Apple and similar memory-expansion cards. Even so, however, *inCider* readers proved eager to upgrade or enhance their favorite program. Several ballots mentioned using AppleWorks with accompanying products like Pinpoint or a Z-RAM card, and one enhancement product—Beagle Bros' **MacroWorks**—gathered enough votes to finish third overall.

W.H. Kieldsing of King George, Virginia, nominated MacroWorks because "it provides the needed enhancements to AppleWorks to make it easier to use—mouse interface, better help files, and macros for everyday operations that utilized more than one keystroke previously."

Agreeing that "MacroWorks is a great program for eliminating keystrokes," Jim Andersen of Rancho Cucamonga, California, wrote, "MacroWorks saves me that most valuable asset: time." Bryan Ross of Lakeside, California, called MacroWorks "an incredible, practical value. Macros for AppleWorks was an idea long overdue!"

MacroWorks' rival, The Software Touch's **AutoWorks**, also picked up a few votes. Walter H. Lewis III of Huntington, West Virginia, said, "It not only gives you more macros than other products, it is also the first sensible AppleWorks mail-merge program, allowing mail merge directly to the printer from within AppleWorks. In addition, it...is an invaluable file organizer." Charles Newby of San Diego claimed, "[AutoWorks] does what MacroWorks' macros do and much, much more."

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- Flush right
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- Headers and footers
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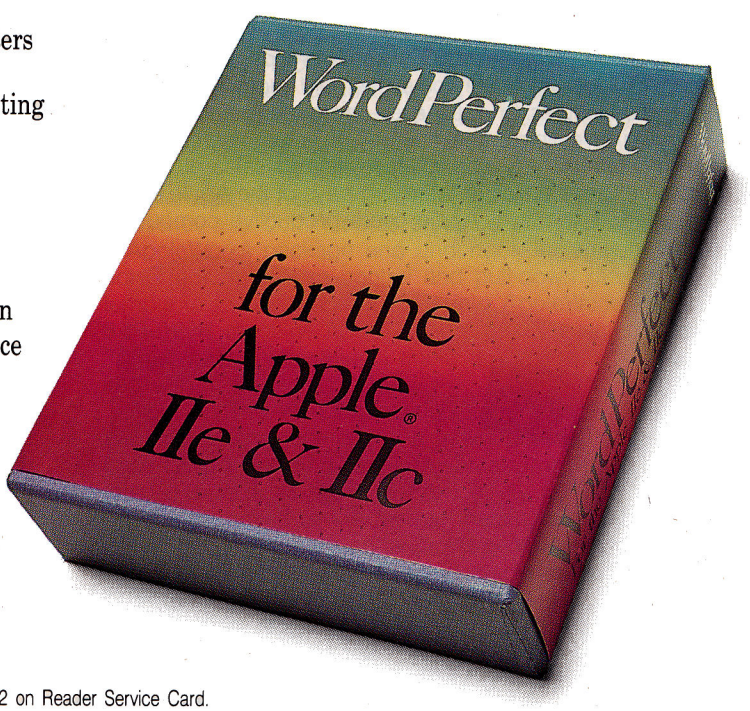


Circle 272 on Reader Service Card.

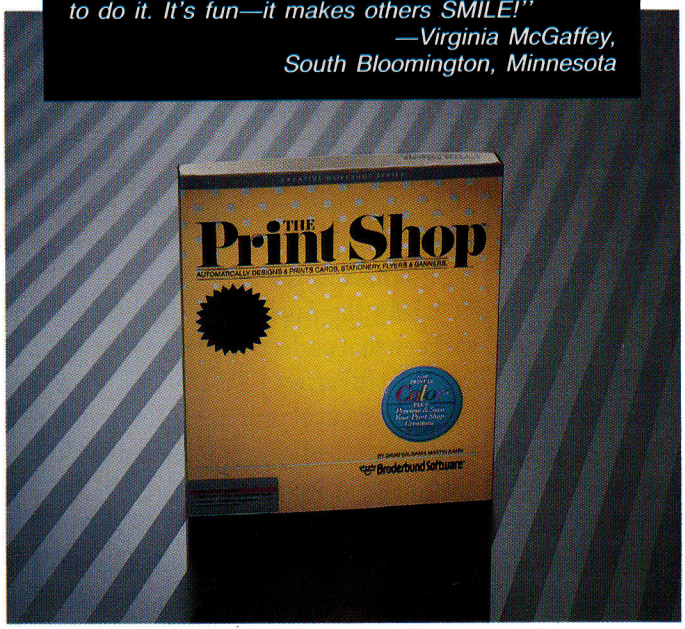
One Friend Had Quadruplets

We've jumped from first to third place. What product finished second to AppleWorks in voters' hearts? **The Print Shop** from Broderbund Software, which inspired Mrs. Barbara Thurman of Larkspur, California, to write, "Its usefulness is never-ending." Larry Nebron of Daly City, California, would agree: When the fire marshal wouldn't let his firm enter its new building without EXIT signs, Nebron made them with The Print Shop.

Sharon Gordon of Winston-Salem, North Carolina, praised The Print Shop in a poem ("One friend had quadruplets, another caught a shark. It's his fifth wedding and there's nothing at Hallmark....The boss collects old lampshades and my neighbor likes to dance. I need cards for holidays, for friendships, and romance"). Rodney Simonson of Montrose, Michigan, wrote that his five-year-old daughter "invents reasons to send cards and letters to friends and relatives. She writes stories in poster mode and illustrates them, with help, by multiple printer runs. So far, she's not into marketing."

The fourth and only other substantial vote-getter in the People's Choice race was a newcomer: StyleWare's **MultiScribe**, a mouse- and menu-driven word processor with the fancy fonts and typestyle mixing of MacWrite. Re-

"I can create cards, stationery, and banners for myself and friends, and I don't have to be an artist to do it. It's fun—it makes others SMILE!"
—Virginia McGaffey,
South Bloomington, Minnesota



***Second Place**: Broderbund's Print Shop*

The Story of AppleWorks

The story of AppleWorks isn't just another Silicon Valley garage success story—it's a backyard success story. It begins in 1981 in Scotts Valley, California, when a talented programmer named Robert Lissner stops by for a chat with neighbor Don Williams, an executive at Apple Computer. They talk about programming Lissner might do to earn some money, and they talk about a data-base product called Small Job.

The chat paid off. It led Lissner within two years to develop one of the best-selling software packages of all time. Apple says AppleWorks has sold more than a half-million copies to date; even the experts have given up trying to estimate the number of actual users, because it's frequently copied. It revitalized sales of the Apple //e, gave a kick to the dying days of the Apple ///, and made millions of Apple users productive computer owners.



With Williams' encouragement, Lissner's first project was to rewrite Small Job, which had been developed by then Apple President Mike Markkula for in-house use. Markkula wasn't a great programmer—as Williams says, "It was spaghetti code." But Lissner and Williams thought the program had potential. Lissner, who had been programming in assembly language for the past 20 years, quickly taught himself Pascal at Apple's urging and rewrote Small Job in that language. Most Apple users at that time were programmers, and the company wanted to make sure the language was easy for users to get into, Williams says; Pascal was more accessible than assembly. Apple actually would have preferred it in BASIC, but it was just too slow, Williams notes.

Apple liked what Lissner had done and bought the program. In 1982, the new Small Job was named Quick File and introduced. One interesting feature was its open-apple Find command, which let users locate data without looking into specific categories, Williams says. It was also the precursor of AppleWorks' open-apple commands.

You can't keep a good assembly programmer in Pascal for long, though. As soon as the Pascal version of Quick File was finished, Lissner rewrote the program for himself in assembly language and dubbed it Quicker File. In assembly it ran much faster and could handle as many as 400 records—substantially more than Quick File. It never came to market, but was used extensively within Apple. "Lissner did it because he really loved assembly. For months at Apple, half the product managers were using Quicker File," Williams remembers.

Quicker File's tighter coding in assembly left a lot of room in the program for other features. It soon became

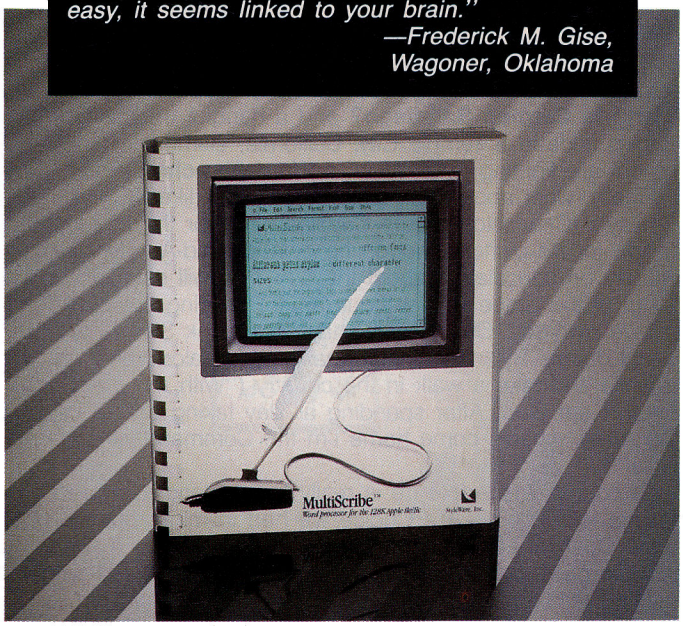
becca Ann Penso of Los Angeles declared, "As a newsletter editor, I need a word processor that does more than spit out standard text. I need an easy-to-use program that creates a variety of fonts while retaining the standard editing features....Not only is [MultiScribe] a complete word processor, but it can reformat text created with AppleWorks. Best of all are the rebus alphabet and the easy-to-use font editor."

For even fancier printouts, Philadelphia's Paul Stevens sent a vote for Data Transforms' **Fontrix**: "This is the most versatile typesetting and graphics program for the Apple //e that I have yet found....Combine [it] with Micro Illustrator and the KoalaPad, and you can be a sophisticated desktop sign maker and publisher."

Honorable Mentions

We were mildly surprised by the scarcity of hardware nominations among People's Choice contenders. Applied Engineering's **RamWorks II** card picked up a couple of votes and Apple's **ImageWriter** and **ImageWriter II** one apiece. A product we're crazy about at *inCider*, the **UniDisk 3.5**, received a single vote, Mario Palumbo of Eatonsville, Maryland: "It opens new possibilities for designing more sophisticated software." Hear that, software companies?

"It's a joy to use. It's MacWrite, only better. On-screen formatting makes prose composition so easy, it seems linked to your brain."
—Frederick M. Gise, Wagoner, Oklahoma



***Fourth Place**: StyleWare's MultiScribe*

Lissner's goal to include word processing and a spreadsheet, Williams says: "It was the dream product. All three in one would be a killer, and he was thinking about it when 1-2-3 was only a twinkle in the eye."

But Lissner wasn't just dreaming. When Quick File came to market, he set up his own company, Productivity Software, in Scotts Valley. The company was formed to promote Quick File and develop the marketing plan for his three-in-one product, remembers Steve High, then Productivity Software's vice president of marketing. High now runs his own public-relations firm in San Jose, California. "We felt pretty sure we could sell it to Apple, but we didn't have any deal ahead of time," High says.

Soon after they founded the company and began work on the three-in-one product, Lissner and High attended a presentation by VisiCorp, which was then developing its integrated program VisiOn. "Someone from VisiCalc was speaking and said it was impossible to write integrated software for 8-bit computers," High recalls. To themselves, Lissner and High were chuckling. They already had a very good prototype of AppleWorks up and running, High says.

During the summer of 1983, Lissner and High took that prototype, dubbed ABC, to Apple. It wasn't an easy sell. "They didn't want to deal with an individual. They would have preferred such a product from a large company such as Lotus Development Corp., Microsoft, or Software Publishing," Lissner remembers. "But in the end, they finally had to deal with me."

And luckily they did. Apple bought the rights to the program for the Apple II and ///. Interestingly, ABC was developed on Lissner's Apple ///, and today he still uses that machine, High notes.

Lissner completed work on ABC around Christmas 1983, and Apple introduced it as AppleWorks for the Apple //e in early 1984. But Apple wasn't the first company to bring Lissner's ABC to market.

Between the time Apple bought the rights to the program and when it introduced the Apple //e version, it decided to kill the Apple ///. So it looked around for a company that was interested in the rights to the Apple /// version of the program. Enter Haba Systems of Van Nuys, California. Haba bought the rights to Apple /// ABC and quickly brought it to market as /// E-Z Pieces, High says. While the product received rave reviews, Haba cut some corners on the documentation in an effort to save time.

As soon as AppleWorks 1.0 was complete, Lissner turned to his next project: writing an AppleWorks-type program for the Macintosh. Williams had already joined him, and the two started a three-year project to develop what is now known as The Works, and is sold by Microsoft of Redmond, Washington.

Lissner also continued to enhance the existing Apple II AppleWorks package and undertook the major project of adding mouse control and pull-down menus. Attempts to put all those features into AppleWorks on an 8-bit 128K machine failed. "I sure tried," Lissner says. "It just wasn't something I could do. You're sort of limited with 128K."

Work on The Works continued, though. According to Williams, Lissner completed a major portion of the data base before deciding to take a break from programming. He sold his share of Productivity Software to Williams and moved to the Sierras, near Lake Tahoe. While he continues to enhance AppleWorks and is its most loyal supporter, he's also considering other projects, such as returning to his first love—programming mainframes, sources say.

But AppleWorks lives on. And its next reincarnation may come in the form of The Works for the Apple II series.□

—Deborah de Peyster

Except for MultiScribe, mouse fans mustered only one vote apiece for Roger Wagner's **MouseWrite** and Version Soft's **Mouse Desk**. Educational products got short shrift, with just two ballots for Broderbund's **Where in the World Is Carmen Sandiego?** and a handful of scattered singles (kids in a Temple City, California, elementary school are fighting over MECC's **Word Munchers**).

Finally, what about the Apple II itself? We liked Ed McCauley's (Charleston, South Carolina) vote for the **IIgs upgrade** for //e owners, though he cast his mid-August ballot entirely on speculation about the "//x": "It will catapult the II out of the Stone Age without (amen) shutting out present //e owners." On the other hand, we think Staff Sergeant James Rylander should leave his //c alone once in a while and take a walk in the country ("With my computer, I am God. After spending all day taking orders in the Army, when I come home I'm the Commander-in-Chief").

Of course, the Apple //e is really too generic a product for the kind of People's Choice we had in mind, but Andrew Quan of Hacienda Heights, California, made a persuasive case. Said Andrew, "Without it, I would have nothing to do with my disk drives, printer, monitor, mouse, software, and joystick."■

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Circle 168 on Reader Service Card.



And the Winner Is Not...

We have no doubt that Grade Busters 1|2|3 is a good gradebook program—in the words of one voter, it lets teachers "enter grades, make changes, and add or drop students, all with virtually foolproof prompts on the screen," then print "student reports, gradebook pages, histograms....So useful, yet so quick and easy." Early in the People's Choice voting, it looked like a dark-horse candidate to win, until we took another look at the stack of Grade Busters votes arriving daily.

For one thing, many ballots were identical photocopies from the same original and machine. For another, every vote but two came from Colorado Springs, Colorado, home of Grade Busters (36-10 Queen Anne Way, zip 80907). The other two were from Woodland Park and Manitou Springs, just outside town on Route 24 past the city limits sign ("Welcome to Colorado Springs—Every Home a Software Test Site").

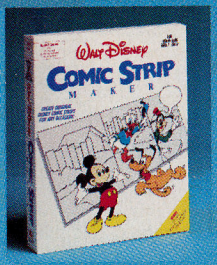
inCider traced the outbreak of enthusiasm to Herb Sweat, media specialist at the city's Coronado High School. Sweat says he's one of three people who developed the program, bringing together the programmer and author and working with 140 Grade Busters beta testers in his and another local school district.

When asked about the flood of People's Choice votes from Colorado Springs, Sweat admitted he "helped on some of that"—specifically, that he "pointed [the contest] out to the beta test group." (One voter we phoned confirmed she was not an *inCider* reader; Sweat had asked her to nominate the product.) He also sent a vote himself—modestly enough, one of the most subdued. Some of the testers gave much higher praise, though Sweat says they had to pay $45 apiece (list is $79.95) for the software.

Sweat claims, "You can't successfully market a product until you get into magazines such as *inCider*." Perhaps he could have tried another way. It would have been awkward if we'd named his ballot the winner and offered him a free trip to meet the manufacturer.□

—Bill Jacob and Eric Grevstad

Walt Disney's greatest creations can now be your greatest creations, too.



If you or your children have ever dreamed of following in the fingertips of Walt Disney, Bantam Software has two unique opportunities to do just that.

Walt Disney Comic Strip Maker lets you become an electronic cartoonist, as you create and print your own comic strips starring Mickey & Minnie, Donald & Daisy, and other classic characters from Disney.

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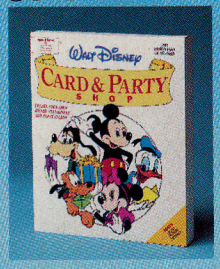
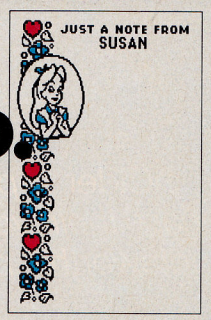
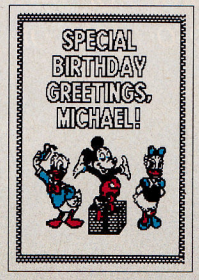
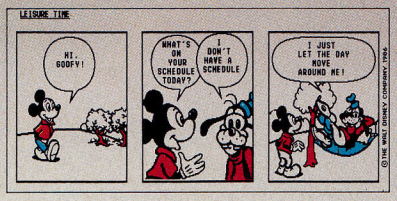
Both programs are designed to take you from a cartoonist's first steps to wherever your imagination may lead. Which makes them both reams and reams of fun.

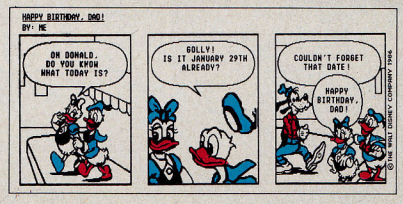














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inCider's panel of experts cast their votes for the most noteworthy products of 1986.



EXPERTS' CHOICE

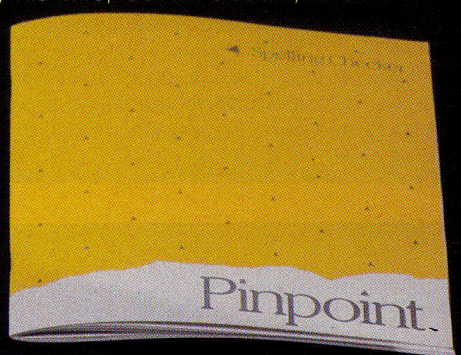
by *inCider* staff

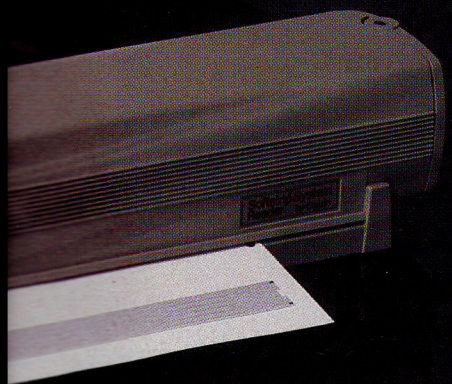
Nineteen eighty-six will be remembered as the year the Apple IIGS appeared, but the IIGS wasn't the only new entry on the calendar. While the People's Choice Award goes to our readers' favorite product overall, we asked some veteran Apple users and experts to comment on products introduced in 1986 (and, considering our September deadline, the last months of 1985)—the best, a few of the worst, and some underrated or unadvertised specials.

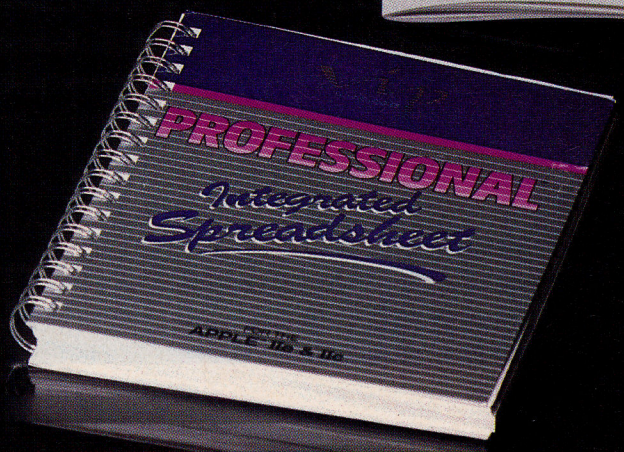
Along the way, we collected candid opinions on a variety of items: a floppy disk that won its skeptics over, an Apple fan who dislikes Macintosh-style products and another who pans IBM software imitations, and which *inCider* editor wants disk envelopes for Christmas.

Our experts see a lot of Apple II products every year, although AppleWorks developer Robert Lissner confesses he's too busy rewriting the program to play with many third-party products. Mike Kramer is a board member and program co-chairman of the Houston Area Apple User Group (HAAUG). Shawn Goodin is the sysop (system operator) of CompuServe's MAUG Apple user group; his wife, Susan Goodin, is assistant sysop for CompuServe's Health Forum and a computer-seminar instructor. William Gollan is president of the popular mail-order distributor Business Computers of Peterborough, New Hampshire.









We also called former *Softalk* guru Tom Weishaar, whose *Open-Apple* newsletter is the only rival publication we cheerfully recommend. *inCider*'s Technical Editor Paul Statt and Review Editor Eric Grevstad insisted on being interviewed; we balanced them with the sane judgment of Rhode Island //c user Cynthia Field, who writes frequent reviews and features for us and moonlights for *InfoWorld*.

Playing Favorites

Setting aside the IIGS as too new for our poll and AppleWorks as too old (Lissner named his program both "best" and "most underrated," while Weishaar declared, "AppleWorks is far and away the most wonderful program there is"), our panel split the ticket when it came to picking the best product of the past year.

Several praised Apple's **UniDisk 3.5**, including Weishaar, who originally panned the drive as storing only 800K for almost the price of a 10MB hard disk ("After living with a couple of them for a year, I'm convinced that they're really nice little units"). Echoes Statt, "When [the UniDisk] was announced, I thought it was Apple's attempt to cut costs by sharing Mac and Apple II peripherals. Now I wonder how I ever lived without it—it's fast and quiet, and it keeps all my files in one place." Field sees "the acceptance of the 3½-inch disk in the Apple II world" as today's biggest trend, bringing "much more storage space, more flexibility, [and] the dawning of compatibility between the II and Mac."

Another multiple vote-getter was a darkhorse: **ProSel**, a ProDOS program selector by programmer Glen Bredon that represents a cross between traditional utility packages and mouse-driven desktops like Quark's Catalyst. Shawn Goodin describes ProSel as "a steal for the price [$40]....It reorganizes disks and speeds up directory searches, supports Apple's mouse as well as the keyboard, and has a wide variety of utilities."

Agrees Weishaar, "[ProSel] has been one of the real bright spots of my year. There are all kinds of things there, like utilities to automatically copy programs onto a RAM disk at startup....I have a hard time understanding why [Bredon] can't find anybody to publish it." (Bredon sells ProSel from his home, and can handle only mail instead of phone orders; at press time, he told us he had met with several potential distributors about giving ProSel broader exposure.)

User groups love program listings, and HAAUG's Kramer nominates the **Cauzin Softstrip** reader as product of the year: "I used to spend hours and hours typing in listings from magazines, and with this innovation that's not necessary." Shawn Goodin "has been very happy" with his **CMC hard disk**: "Everyone has jumped on the Sider bandwagon, but CMC's hard disk is a quality product that represents significant cost savings."

William Gollan casts a vote for a new internal modem: "The **Prometheus 1200A** is going to be good for Apple users because the earlier version was a double board and a bit of a kludge." A single 1200-baud card, by contrast, offers the same mix of speed and convenience that makes internal modems popular in the IBM PC world.

More of the Best

Among software applications, two panel members chose programs based on IBM originals. Susan Goodin admits that **WordPerfect** is "not as intuitive as AppleWorks," but "more suited for serious writers....It's more powerful, and it's faster because you don't have to go through layers and layers of menus to get where you're going."

Grevstad gives a qualified rave to the Lotus 1-2-3 clone, **VIP Professional**: "It needs a loaded enhanced //e or //c, with a 256K RamWorks or Checkmate card (bucking the trend to the Apple memory standard), a mouse for menu work, and a TransWarp card for acceptable speed. But given the hardware, it's just unbeatable spreadsheet software." Speaking of hardware, he adds, "We all seem to hesitate about calling the **Laser 128** the best product of the year, but it's got to be more significant than any except the IIGS. When I first saw one, the words 'cheap and ugly' came to mind; the words are still in my mind, but the Laser's working fine on my desk."

Field endorses the **Pinpoint Spelling Checker**—"different from most in that it's a pop-up checker, so it's very convenient to spot-check a word as opposed to saving your file, swapping disks, and loading the spelling checker. In document mode it's a little slow, but Pinpoint has introduced a fast separate checker for that."

Statt's favorites are the **SwyftCard** ("It does all kinds of jobs—word processing, data-base managing, telecommunications, even formatting disks—and it does all of them fast") and **MacroWorks**, which "applies the Apple II spirit—the hacker ethic—to AppleWorks. You can change AppleWorks to do things the way you like, without giving up the user interface or learning to program in assembler." Weishaar, another early fan of MacroWorks, now

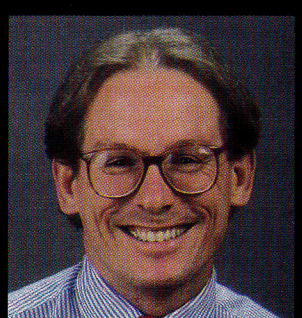
inCider's

Panel of Experts

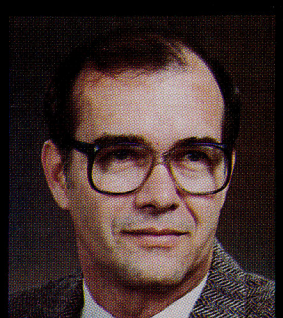
(Shawn and Susan Goodin not shown)



Eric Grevstad



Bill Gollan



Mike Kramer

considers **AutoWorks** superior: "[It not only] lets you add macros on the fly, but has wonderful mail merge."

The Dogs of '86

While everyone eagerly named two or three best products, candidates for the worst of the year were rarer. Statt, seconding Grevstad's November column, deplores the sex game **Interlude II**. (Contributor Field quips, "I never get to review the good stuff.") Statt also condemns the war games **Nam** and **Conflict in Vietnam**: "I just don't care for war games. Nobody's death is a game."

Psychological software fared ill, with Field skeptical of **The Luscher Profile** ("Of the many apparently happy people my friends and I have analyzed with it, everyone comes out as really negative or mentally unhealthy. Of course, it could be that they all use computers"). Grevstad gets bad vibes from **Timothy Leary's Mind Mirror**: "It's the basis of a good analytical game, but with the numbingly dull opportunity to answer the same questions repeatedly for personality profiles of magazines, sports, and inanimate objects, plus a few tasteless sex episodes and reams of jokey pop-psych jargon from a celebrity no one cares about anymore."

More seriously, Susan Goodin downgrades "products that don't take into account the fact that novice users become advanced—for example, AppleWorks should have an 'expert' mode." Shawn Goodin's peeves are "all software products that can't be uploaded to a hard disk because copy-protection schemes prohibit it," and "software written in Pascal and DOS 3.3 instead of ProDOS." Mike Kramer dislikes DesignWare's **EduWare** series and Infocom's and others' **adventure games**: "Anyone who makes a purely text adventure is out of his mind."

More general but perceptive thumbs-down came from Weishaar and Field. The former says, "The worst thing going on [today] is an over-emphasis on the Macintosh type of interface for the II. Certainly the Mac interface has its place—for graphics programs there's nothing better—but the problem is that the Apple II doesn't have the horsepower to drive it [in terms of speed and graphics resolution]."

Field takes a different tack, citing "products that seem to work in the IBM world. An example is real-time spelling checkers, apparently highly successful [there], but transfer them to the Apple II where there's not as much memory or disk storage and they bomb like Quorum's **Spellbound**. PC owners can have memory-resident outline processors; Megahaus' **ThinkWorks** is disk-based—you have to close down AppleWorks and boot up ThinkWorks,



Cheap Thrills

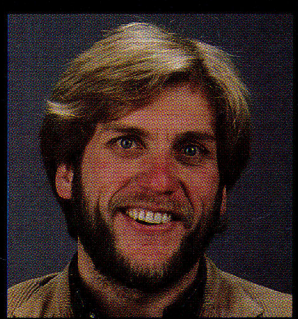
Personal friends of our panelists should skip this sidebar, lest Christmas or Hanukkah not be a surprise—we asked for recommendations of Apple-related holiday gift ideas priced under $100. Lissner suggests a **300-baud modem**, "because I think the area of communications is growing rapidly and most personal-computer users don't have a modem. That's the only thing keeping them from learning how communications can contribute to their overall productivity." Susan Goodin follows with "a subscription to **CompuServe**. It offers a lot of freeware and shareware, which a lot of Apple owners rely on, and there's always someone on line to answer questions."

Several voters chose **Beagle Bros** or **Software Touch programs**, while Grevstad picked the disk utilities **Diversi-Copy** and **Copy II Plus**, but Statt selected a really practical gift: "Somehow I just can't maintain a one-to-one correspondence among disks, jackets, and name tags—I always have more disks than **labels** or **envelopes** and always welcome a gift of either." Field considered giving a mouse, then selected **color ribbons for the ImageWriter II**—"People hesitate to go out and spend $14 on printer ribbons, when they could have fun with products like Dazzle Draw. Once they saw the Apple screen reproduced on paper, I think they'd find it was well worth the expense."

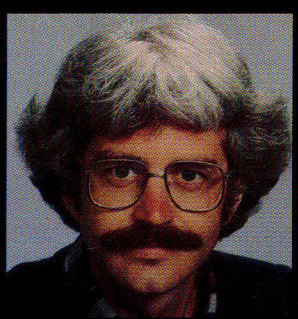
Kramer recommends StyleWare's **MultiScribe** word processor "because it's a lot of fun—if you want fonts, you've got fonts; if you want smiley faces, you've got smiley faces—and it can work with AppleWorks files." Field adds, "MultiScribe is an important product because for the first time Apple users have a really 'what you see is what you get' word processor. Besides, it's the beginning of a poor man's desktop-publishing system."□



Cindy Field



Paul Statt



Tom Weishaar



Bob Lissner

which is fine for a separate project outline but awkward for a casual to-do list. It's not that these products are bad themselves, it's that they're the right products in the wrong place until we have that kind of hardware."

Under a Bushel

Most products mentioned so far are popular, widely advertised, or both, but our panel picked a few favorite discoveries or underrated items. ProSel is one example; Field cites another, CBS Software's educational **A Novel Approach**: "The product is sort of like *Cliff's Notes* and *Classics Illustrated* rolled into one; it works at different levels for students who've never read the book, adults who vaguely remember it, and so on." (The first entry is William Golding's *Lord of the Flies*.) Says Field, "The products themselves aren't as important as what they're speaking of. It'll get some of these computer junkies to peek and poke into other things than computer listings."

Statt reminds users of last June's Editors' Choice, the BASIC editing aid **Program Writer** from The Software Touch: "I can't imagine programming in Applesoft without it. Schools should have it, beginners should have it, everybody who ever writes a line of BASIC should have it."

If that convinces you to buy Program Writer, you'll also get Weishaar's most underrated product: "a freebie on the back of the Program Writer disk, an enhanced version of Applesoft called **ProBASIC**. It lets you write your program in modules, similar to routines in Pascal or Logo where you write a subroutine and it ends up getting a name, and then turn modules into commands [for other programs]. It appears to be a wonderful programming language."

Grevstad, further swelling heads at The Software Touch offices, nominates the "Bird's Better BYE" routine on the **AutoWorks disk's copy of ProDOS**—"It lets you leave one program such as AppleWorks and start another without typing volume paths and .SYSTEM filenames, just by pressing the escape, arrow, and return keys. It cuts down on rebooting and makes ProDOS a lot friendlier."

Looking Ahead

What about 1987? While Field thinks the **3.5-inch drive** marks the trend to watch, Kramer predicts, "The **Mac interface** is easy to use, and [with] the new II's faster processor, there's no reason why Mac-type products shouldn't migrate to the II." Grevstad ventures that "**sound** will make itself heard this year—between the IIGS and MIDI and other sound cards for the //e, we'll never have a better chance to learn whether music and voice will prove useful for applications or stick to today's limited markets for composers and the disabled."

Both Statt and the Goodins see, in Shawn Goodin's words, "a trend toward **more powerful software**," whether "communications software with more intelligent terminal-emulation features" (Goodin) or "software that does more than one thing—not today's forced marriages of word processors, data bases, and spreadsheets, but maybe a writer's word processor with some limited database functions and telecommunications built in" (Statt).

Weishaar worries, "I expect to see an explosion of **computer languages** during the next year. The good thing about that is that I think in many ways we've pushed Applesoft to its limits and it's become a restraining language; the bad thing about it is we're going to lose a certain universality. Right now I can print an example in my newsletter in Applesoft and everyone understands it, but we're going to talk to an audience where 20 percent know BASIC, 20 percent know Pascal, Logo, C, and so on. It's going to be like a Tower of Babel."

Hardware, Software, Dreamware

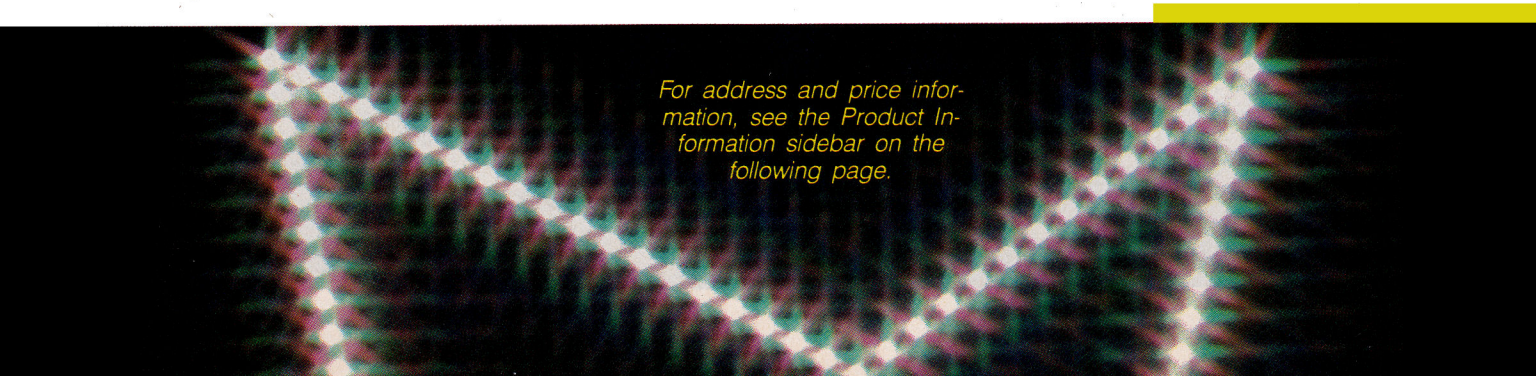
Finally, we asked each expert to name a product that doesn't exist—a fantasy or most-wanted item for the near future ("AppleTalk file server," volunteers Managing Editor Dan Muse). Lissner wishes for "some development systems that are quick" for program compilation, assembly, and testing: "With most development systems out there, it's easy to spend ten, 20, 30 minutes for every test you want to do. A good development system should take ten to 20 seconds. Somehow you don't count all these 20-minute waits when you're figuring how long [a project] will take."

Kramer wishes there were a II equivalent of the Macintosh product **ThunderScan**, an optical scanner that "replaces the ImageWriter ribbon cartridge and transfers a graphics image to the computer for use as clip art." Weishaar dreams of a **bar-code reader** wand for the II, along with something he's mentioned in his newsletter: "The world badly needs a program that will **fill out forms**. Around here, when we got a form for a purchase order or something, we used to fill it out with a typewriter. Now we don't have typewriters anymore, but can't line it up in a printer, so we have to do it by hand."

Grevstad, revealing his MS-DOS background, says, "My fantasy product for the II is **an operating system**; it's a nuisance having to plod through 40-column Filer menus for everyday formatting or copying operations. Kyan's **KIX** is very close to my goal—it's a front end for ProDOS that lets you type commands directly—but its syntax is based on UNIX and is therefore horrendous."

Field "would love a really **portable Apple computer**, maybe styled like the //c but battery-powered, with a decent LCD or electroluminescent screen, a 3½-inch drive and modem built in, and maybe AppleWorks, Pinpoint, and the Pinpoint Spelling Checker in ROM—all for under $500, of course. All you'd have to carry would be a data disk."

As for Statt, "I wish the U.S. Geological Survey would put its entire series of **detail maps of the United States on a 3½-inch disk**, with some retrieval software that would let me look at the terrain from above or in perspective, or change the scale to see all of North Dakota or the Black Hills, or zoom in on Little Big Horn. Teachers, skiers, travel agents, Soviet spies—this is an idea that has broad appeal." ■



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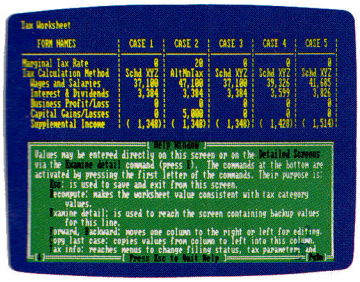
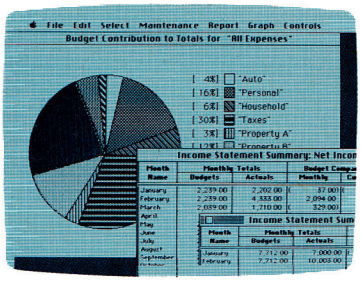
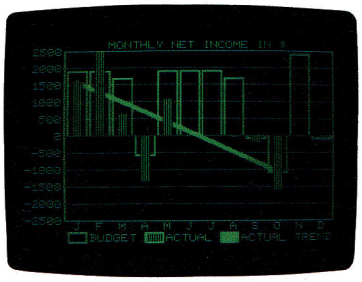


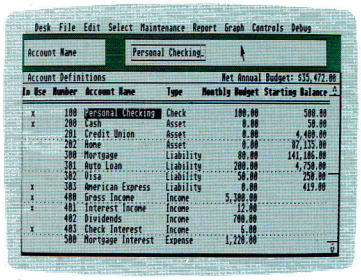
Making tax decisions before tax season. (Version 2.0/IBM® and compatibles)



Analyzing your financial position with graphs and reports. (Version 1.4/ Macintosh™)



Using graphics to capture your complete financial picture. (Version 1.5/ Apple® II family)



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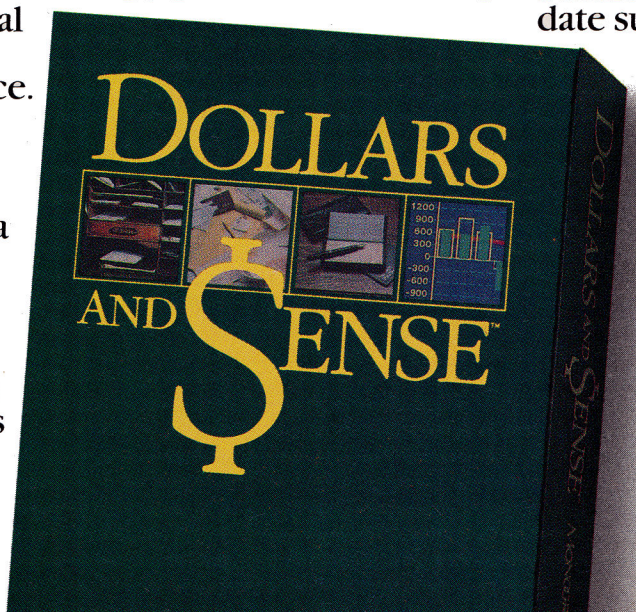

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LASER 128

AN AFFORDABLE COMPATIBLE

With its low price tag and 95 percent Apple //e compatibility, the Laser 128 may be just the bargain you're looking for.

by Eric Grevstad, *inCider* Review Editor



Don't bother discussing "event marketing." Never mind user demographics. Forget about sculptured designs in Apple Fog or Platinum. The Laser 128 is about as pretty as a barracks-beige Army jeep, sold mostly through mail order, and its implicit sales pitch is as subtle as a discount laundry detergent's: "It's cheap and it works." It'll never have the glamor of the IIGS, and it lives under the shadow of an Apple copyright lawsuit—albeit one proceeding at imperceptible speed, with Laser sales unaffected since last spring—but that hasn't stopped the //e-compatible Laser from selling, spinning off a line of peripheral products, and deserving a look from anyone considering a Commodore. Or, to be blunt, anyone considering an Apple //c.

The Laser is built by Video Technology of Hong Kong, whose U.S. branch, based in Illinois, handles sales to retail and most mail-order dealers. (Video Technology supplies electronic educational toys to Sears, which chose the rival Franklin Ace 2100 when picking an Apple clone for its Christmas catalogue.) The most visible Laser vendor, however, is Central Point Software (9700 S.W. Capitol Highway #100, Portland, OR 97219, 503-244-5782), which imports Lasers directly and sells them for $395 plus $20 shipping.

Central Point President Michael Brown doesn't see himself as competing with Apple or even with Franklin; rather, he hopes to promote the Apple II standard to low-end buyers who would otherwise miss out on the superior Apple software base. In practice, though, the Laser is bound to appeal to anyone shopping for an 8-bit computer, as opposed to a 16-bit IIGS or IBM PC clone—II Plus owners looking for an affordable upgrade, parents of Apple-using school kids or schools needing extra machines, office //e users who'd like a clone at home.

In addition, with its new expansion box and 3½- and 5¼-inch disk drives, plus a disk-controller card that promises to run anything from Disk II to Macintosh drives, the Laser is making the transition from a mail-order Brand X to a system brand name in its own right.

The *inCider* staff has been testing everything in the Central Point catalogue, including a "Laser 640" with an internal memory-expansion card that may not see mass distribution. We haven't found a whole Apple //e for half price, but we've found the most important part: about 95





The Laser's Universal Disk Controller and 3½-inch drive—and the awkwardness of leaving cards in the side expansion slot.

percent Apple compatibility. We like the disk-controller card, too.

Visually, the 128 resembles a bigger //c, about 15 versus 11½ inches wide (thanks to its numeric keypad) and half an inch thicker (thanks to the expansion slot on its left side). Its appearance gets mixed reviews from the office staff: I think it's rather homely, with a blockish beige-and-gray keyboard and an awkward side profile of angles and rectangles, but others credit it with a sort of utilitarian appeal.

Like the //c, it has a carrying handle that props up the unit for desktop use, a 17-volt external power supply, a headphone jack and volume control knob, and a disk drive (slot 6, drive 1) on the right. Laser drives' pivoting latches feel more secure, but don't eject disks like the //c and Disk //c's push-down latches.

The Laser's rear-panel interface ports also match the flat Apple's: the AC power connector, two five-pin DIN serial ports for printer and modem, second disk-drive port, composite-video jack, video expansion port, and a mouse/joystick port. These connectors work like their //c counterparts with the same equipment, except that the second drive port accepts only a 5¼-inch drive; like the //e, the Laser can't use a UniDisk 3.5 without a controller card. The best use for the video expansion port is to hook up an IBM-type RGB color monitor (the required adapter cable is $25).

In addition, the 128 has a rear port no Apple supplies: a 15-pin parallel printer interface (the standard Centronics adapter cable is another $25). While port 1 normally emulates a Super Serial Card or //c serial port, flip the parallel/serial switch on the Laser's keyboard and the interface emulates an Apple Parallel or Epson APL card. You may want to explore some graphics applications' printer menus—Springboard's Certificate Maker's SSC driver didn't work with our Laser and ImageWriter II, though we found another printer choice that did—but the two interfaces, backed by a ROM-based menu for choosing printer and communications-port parameters, should let the Laser print with almost anything short of a LaserWriter.

Since you're more likely to use the parallel/serial switch than the standard or Dvorak keyboard toggle, the latter is on the Laser's back panel instead of above the keyboard. The 40/80-column switch is up front, as is a mono/color switch that nicely defuzzes displays on monochrome monitors. There are indicator lights for power on, disk access, and caps lock (in one of its minor annoyances, the Laser always has caps lock active when turned on).

Besides the familiar keys in the familiar layout (with open and solid triangles instead of apples), the Laser keyboard adds a numeric keypad with its own plus, minus, slash, asterisk, and enter keys—handy not only for number entry, but for navigating AppleWorks menus (it would be ideal if it had its own escape key). The keypad's also nice because Laser newcomers reaching for the regular top-row number 5 are prone to hit F5, one of the ten function keys. They're useless for most programs, but shortcuts for some control-key commands—F3 (control-B) and F9 (control-L) in AppleWorks word processing, for example.

Past that, however, the keyboard is one of the Laser's weakest points—stiff, clackety, and noisy, with a generally plastic feel and a sometimes balky, sometimes hair-trigger spacebar. It gives definite tactile feedback and it's bearable after a couple of days' practice, but it never leaves a high-quality impression—even discounting one editor's complaint that it doesn't have a shelf to hold a pencil.

The Next Best Thing

Of course, all the interfaces and keypads in the world wouldn't save the Laser if it flunked the chief test of any clone: running Apple II software. Perfect compatibility is an elusive target—the 128 has easy-to-change ROM chips mounted beneath a bottom panel, and upgrades are $25 for registered owners—but the Laser, with its Applesoft-matching Microsoft BASIC, is impressively close to that goal. Besides all Apple II text and graphics modes, it even boasts double-vertical hi-res and double-hi-res graphics (280 by 384 and 560 by 384 pixels, respectively), should any vendors write Laser-specific programs using them.

While it comes with a slim manual and no operating system (Central Point includes its Copy II Plus utility disk), it runs ProDOS, DOS 3.3, and Pascal—and CP/M, Central Point promises, though we didn't have a Z-80 card to try it. It also runs nearly all the self-booting software you can find.

Software sees the Laser as an enhanced //e, not a //c; Apple's //c System Utilities disk returned an error message, but the Nikrom Diagnostics program "recognized" a //e with 128K of memory and got through its 80-column card test before shouting "Bad news! ROM is BAD!" when it looked for Apple code in Laser chips. As with an enhanced //e or //c, older programs' inverse-video capitals (such as those on the status line of DOS 3.3 Apple Writer //) appear as gibberish, while newer mousetext software looks great.

Some of the programs we tested successfully were AppleWorks 1.1 and 1.3, Apple Writer // (DOS 3.3 and ProDOS), Pinpoint, SuperCalc3a, PFS:Access, Quark Catalyst 3.0, MultiScribe, Fantavision, The Print Shop, F-15 Strike Eagle, The Hitchhiker's Guide to the Galaxy, WordPerfect 1.1, Snooper Troops, and ProFiler 2.14, not to mention preliminary copies of AppleWorks 2.0 and The Rocky Horror Show.

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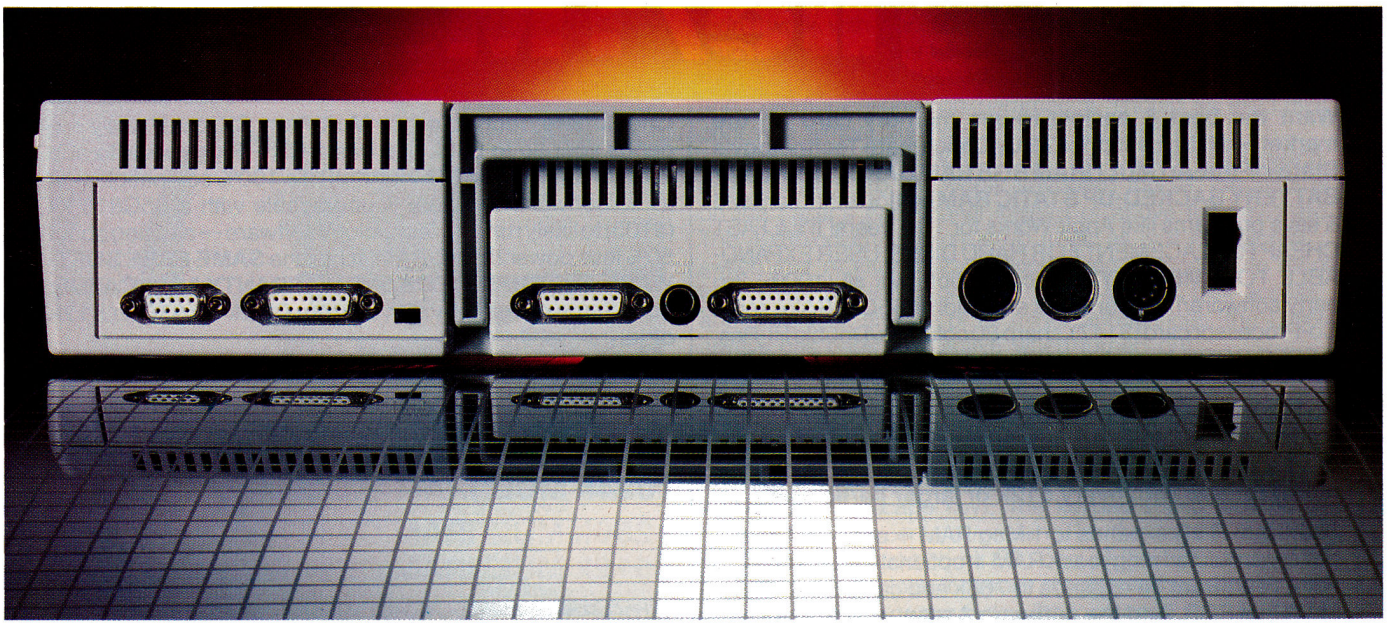


Laser rear panel includes serial printer and modem ports, parallel printer interface, video jacks, and disk-drive port.

Along with a lot of flying colors, we met a handful of defeats. Some were minor—menu titles appeared skewed from their file folders in Pinpoint's Point-to-Point 1.5 (the next version, Central Point says, works correctly). The cursor blinked at double speed with MacroWorks-modified copies of AppleWorks. Kyan's KIX shell for ProDOS produced a garbled message and spun the disk forever when loading, but appeared healthy after a Control-Reset to stop the spinning. More seriously, the integrated program Foundation worked except for its necessary window-sizing routine; the games in Garry Kitchen's GameMaker ran, but the edit menu blinked and blurred too violently for the monitor's vertical-hold control to tame. MouseWrite 1.5.7 (Roger Wagner Publishing) stopped after its title screen, though the new version, 2.6, had no trouble.

Those, however, are all the problems we've found so far. Games, graphics, sound, serious spreadsheets—the Laser is amazingly Apple-compatible. Except for the mediocre keyboard, its only real disadvantage to the //c is that you can't plug a 3½-inch drive directly into it. The external drive port, as mentioned above, takes a Disk //c or the slightly bulkier 5¼-inch drive which Central Point sells for $150 plus $10 handling—an attractive price, and the drive is quiet and works well with a //c as well as a Laser.

The Hardware Picture

Besides beating the //c on price, the Laser has an edge in expandability. If the //c is closed and the //e is open, the 128 could be described as ajar.

For one thing, there's space for a memory-expansion card inside the machine. The Laser we tested had a 512K addition, compatible with Applied Engineering's RamWorks or Checkmate Technology's MultiRAM cards; Applied's AppleWorks Expander recognized and ran with it, as did the new Lotus 1-2-3 clone, VIP Professional.

Central Point's Michael Brown, however, hadn't decided as of early September whether to offer that card or concentrate on the newer Apple Memory Expansion standard, which rules out VIP, but has the advantage of being automatically recognized by current versions of ProDOS and AppleWorks. At press time, Central Point was selling a $249 bundle of Applied's Apple-standard 256K RamFactor card and the Laser expansion box (see below), which Brown said solved most buyers' interest in memory expansion; should the market demand an internal card, he said that an Apple-type unit fitting the space of our model's RamWorks compatible was feasible. Contact Central Point to see what's shipping by the time this is published.

Past that, there's the expansion slot on the Laser's left, the functional equivalent of slot 7 on an enhanced //e. Its obvious drawback is its inability to take cards that won't work in slot 7 (such as the SwyftCard or any auxiliary-slot card), but others we tried, such as the UniDisk //e controller and RamFactor, were fine.

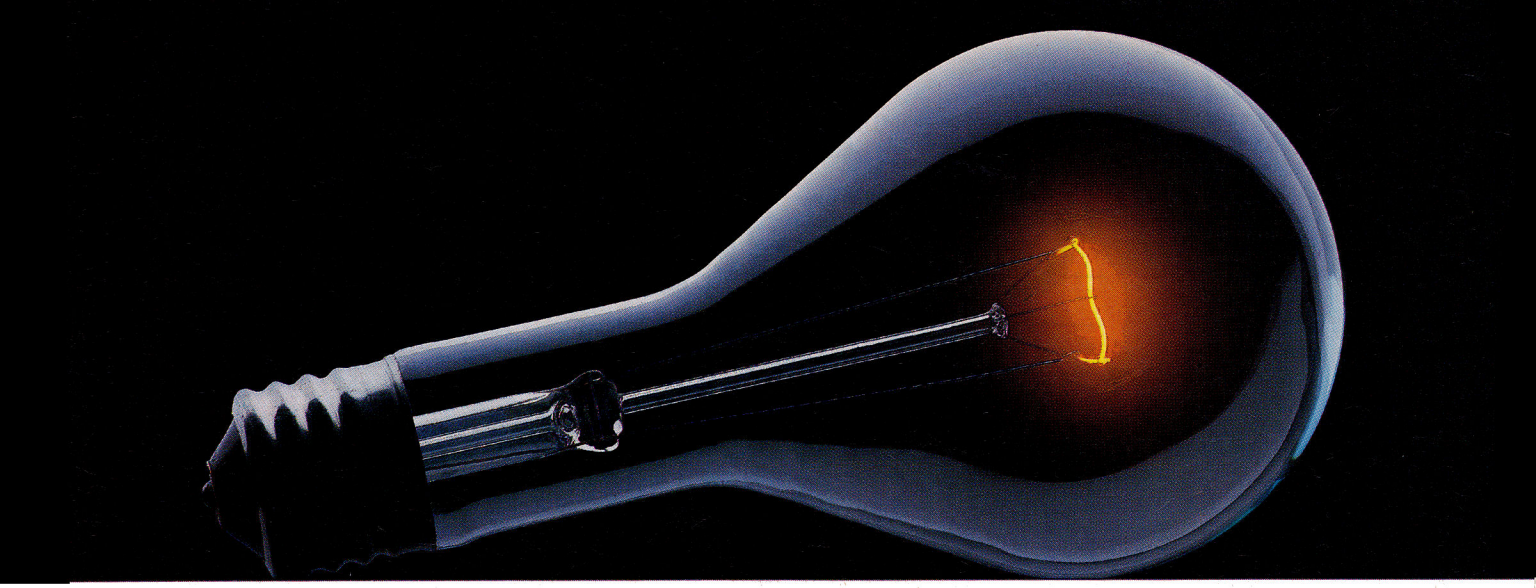
There are, however, two other disadvantages. One is that the slot can't handle any card drawing more than 500 milliamperes of power, such as most accelerator cards (although Brown says that his employees, defying the 500-mA warning in the manual, run Applied's TransWarp card all day long).

The other is the reason Central Point candidly recommends you don't rely on the expansion slot except for occasional use: A circuit board hanging naked from the side of your computer is a frightening sight, one that sent shivers up the spine of everyone who saw it and thought of a carelessly moved hand or marauding house pet. The small UniDisk controller is unobtrusive, but full-length cards run a risk of accidental jolting or removal during use.

For safety's sake (both physical and electrical), you can spend $85.95 and make your already plain Laser an eyesore: Buy the bare-bones metal expansion box, which comes with its own eight-volt power supply and cord, on/off switch and power light, and a short cable that plugs into the Laser's side slot, tipping the box slightly off its base. Inside are slots 5 and 7, plus cutouts for your cards' standard or small (//c-style) interfaces. It adds another five or six inches to your system's width, but the extra slot and extra security are worth it—and a Laser with a TransWarp card, in Brown's phrase, "gets up and hauls."

Cheap Drives, Chameleon Controller

Even Apple owners who don't anticipate buying a Laser should be interested in Central Point's $150 Universal Disk Controller (UDC) card. A production copy of the card's



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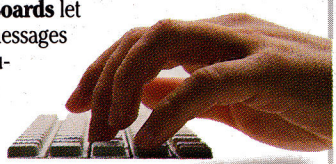

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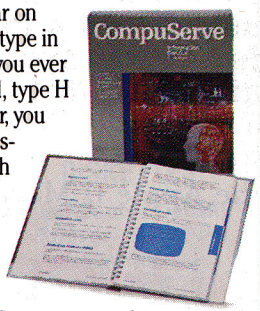

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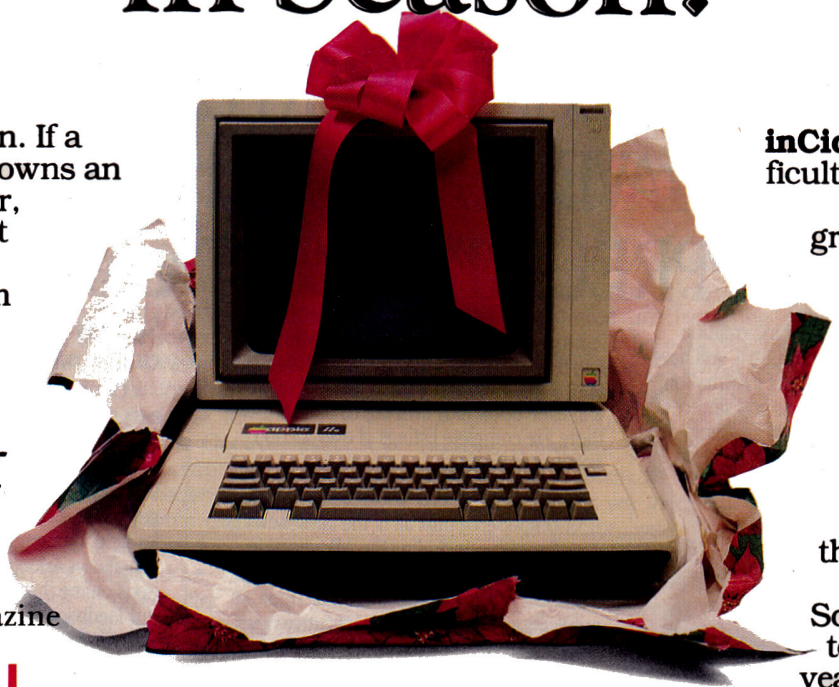

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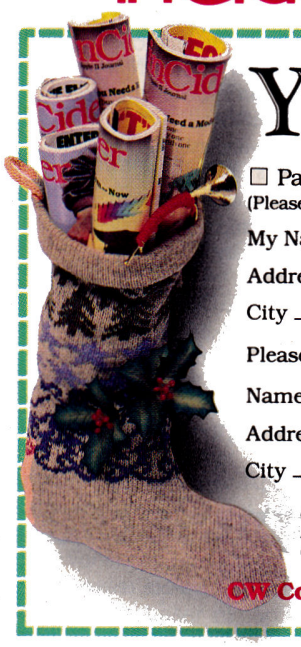

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ROM chip arrived barely in time for our Labor Day deadline and was updated a week later (the July magazine ads were a little vaporous), so we haven't lived with the UDC for long. So far, however, it looks like an innovative achievement: a card that lets you connect two floppy drives of almost any description, mixing and matching among Disk II, Disk //c, Laser 5¼-inch, UniDisk 3.5, generic 3½-inch, or Macintosh (single- or double-sided) units.

The card fits into any free slot. As with Apple's //e UniDisk card, a Laser or enhanced //e will recognize and boot from it (if its attached drives contain disks) in slot 7 before trying the conventional disk controller in slot 6, while II Plus or unenhanced //e owners can type PR#7 (or whatever) from BASIC. Its two 20-pin connectors fit old-fashioned Disk II cables (you must clip one cable line if you plan to mix Disk II and 3½-inch drives), but usually hold two DB-19 cables that plug into newer drives.

From the Laser's side slot or expansion box, the UDC ran both Laser and //c external 5¼-inch drives flawlessly, and accepted Apple's 800K UniDisk 3.5 as Slot 7, Drive 1 (though AppleWorks' "Disk drives you can use" list took a sluggish five seconds to appear); the UniDisk became drive 2 when a //c or Laser 5¼-inch drive was connected to its rear daisy-chain port. A single-sided (400K) Mac external drive read the directories of existing disks, but couldn't boot or retrieve files from them. Maybe ProDOS and the desired files were always on the flip side; Copy II Plus formatted a new 400K ProDOS disk in the Mac drive, which worked perfectly.

As the equivalent of a double-sided Mac drive or UniDisk at a bargain price, Central Point sells a Chinon America drive for $195 (bundled with the UDC for $285). Of the two Chinon drives we received, one was dead on arrival—Brown confessed his first 100 Chinons had a high return rate; current units are "hand-picked." The other worked smoothly with both the UDC and as an external Macintosh drive. It doesn't work with a //e UniDisk controller.

Compared to the UniDisk 3.5, the Chinon 800K drive has no daisy-chain port or access light, though it has a helpful manual-eject button that works even when the power's off. It doesn't convey the same quality as the UniDisk, but then a UniDisk costs as much as two Chinons plus a UDC.

We'll have to wait for later production models to make a final judgment on the Chinon's reliability, but the drive's price and the UDC's versatility make an attractive combination for anyone looking to upgrade to 3½-inch storage. It's hard to say how many buyers would be willing to coax disks out with paper clips in return for sharing drives with their Macintosh, but it's hard to resist the image of a Laser with four disk drives (two 800K plus built-in and external 143K), totaling 1.8 megabytes of storage. You couldn't do it with a //c.

It Grows on You

Overall, that sort of cheap but resourceful spirit sums up the Laser's appeal. You can't pay half Apple's price without giving up something; if you want easy expandability, more visible (as well as intangible) quality, and the last degree of compatibility, the Apple //e is a better computer than the Laser 128. But that $415 figure is a strong argument for //c price cuts. The Laser is a remarkably compatible, competent performer. The Apple market isn't known for hardware bargains, but it has one now.■

Editor's note: Franklin's new Ace 500, which we'd planned to test alongside the Laser, missed our deadline. We'll review the 500 when we receive a production unit.

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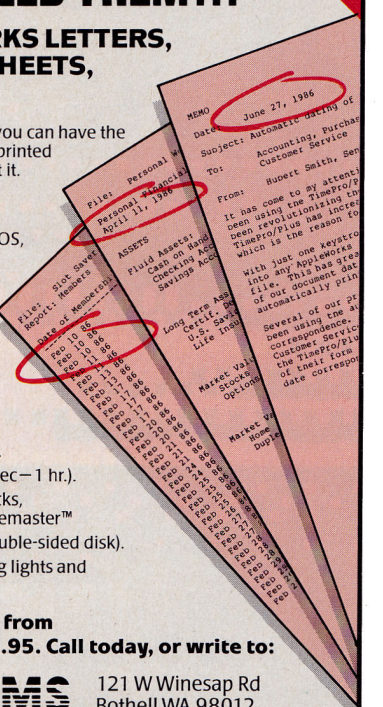

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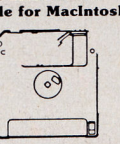

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ADD A Splash OF COLOR

Bring your Apple text and graphics to life—the right combination of printer and software will dazzle you with a rainbow of color.

by Owen W. Linzmayer

Until recently, color printers were thought of as expensive luxury items. Today, however, color printers successfully compete with the more conventional black-and-white dot-matrix models. And as color printers become more affordable, Apple enthusiasts are discovering that color adds a new dimension to the way they use their computers.

From Greeting Cards to Circuits

Whether you want to use Broderbund's Dazzle Draw to color-code wires in an electrical-circuit diagram, or Stickybear Printer (from Weekly Reader Family Software) to design your own Christmas or Hanukkah cards, there's probably a color printer that will fit your needs. (See the accompanying Buyer's Guide chart, list of printer manufacturers, and Product Information box for details.)

If you're looking to create a household budget that uses, for example, blue to show income and red to show expenses, a dot-matrix printer that supports color graphics, such as Apple's ImageWriter II, is a good bet. If you need hardcopy graphics for business presentations, or if you design computer-generated artwork, you'll probably want higher-quality printouts than those of the family-budget variety. A thermal-transfer printer such as the Okimate 20 from Okidata may better suit your needs.

Software Drives the Printer

Many people don't realize that color text represents a printing feature that's as easy to engage as boldface or italics. All that's required is the correct control code. In fact, any word processor that can embed escape-key sequences into a body of text is capable of driving a color printer.

While printing text in color is a relatively trivial matter, obtaining color-graphics hardcopy is far more complicated. The appropriate software is essential to producing hi-res screen dumps. Without the proper software, your sophisticated color printer can't produce the kind of graphics for which you bought it.

Many commercial and public-domain programs can transfer the contents of a hi-res graphics page to a variety of popular black-and-white printers, simply by translating the pixel coordinates of the hi-res screen into dots the printer can put onto paper. It becomes quite an ordeal, however, when you want to reproduce the colors of a hi-res screen. Because of the idiosyncrasies of the Apple's

bit-mapped graphics system and a multitude of confusing printer control codes, you shouldn't attempt to write your own color screen-dump print driver. Any of a number of fine commercial packages will save you aggravation and let you concentrate on choosing the system that's right for you.

While the specific software packages mentioned in this article by no means represent the only ones that support color printers, they're among the best general-purpose programs available.

A Color-Graphics Trio

Baudville's Blazing Paddles is a graphics program along the same lines as Apple's MousePaint (free with Apple-Mouse), yet instead of relying strictly on mouse input, this package also works with joysticks, light pens, graphics tablets, trackballs, and touch screens. Blazing Paddles requires 48K of RAM; it has a more complete set of drawing tools than MousePaint. It also lets you work on the entire graphics screen rather than just one small window at a time. You can load hi-res screens, whether graphics masterpieces or business charts, as well as shape tables into Blazing Paddles, then modify them or print them as is, provided they're in DOS 3.3 format.



"Dot-matrix printers are versatile, producing a variety of typestyles, sizes, and fonts with graphics to boot...but the output tends to look dull and muted."

The print option in Blazing Paddles is relatively unsophisticated—it only lets you swap black for white and requires that your printer-interface card be in slot 1. In addition to supporting many popular black-and-white printers, Blazing Paddles can output to the following color models: ImageWriter II, Epson JX-80 (now discontinued), Okimate 20, Apple Scribe (discontinued), IDS Prism (discontinued), and C. Itoh 8510 SCP + NLQ.

The program's major drawback is its lack of support for double-hi-res graphics. Luckily, however, an excellent program from Broderbund called Dazzle Draw does handle double hi-res.

Dazzle Draw is a must for every serious Apple II artist. Since it's a double-hi-res program, it requires an Apple //c or //e with at least 128K. Dazzle Draw can even use graphics files produced by other programs as long as they're in ProDOS format. Not only does Dazzle Draw incorporate virtually every tool found in other graphics packages, it also introduces some unique features: You can switch one color for another, fill a patterned area with a different pattern, invert and flip sections, zoom into any area of the screen, spray paint with patterns, and even create your own from a palette of 16 vibrant colors.

If you've been contemplating purchasing an Amiga for its superb graphics capabilities, one look at Dazzle Draw on the Apple II may be enough to make you reconsider. It's fast, full-featured, and well-documented. It supports the Apple Scribe, ImageWriter II, and Epson JX-80 color printers. My only disappointment with Dazzle Draw is its lack of versatility—it prints only full-page pictures. Despite this limitation, there aren't enough superlatives in the English language to do justice to Dazzle Draw. Suffice it to say that Dazzle Draw is the undisputed leader in double-hi-res graphics packages.

Broderbund has also announced that its popular Print Shop program has been upgraded to support color printing. Whether you want to make a birthday card for your next-door neighbor's German shepherd or design stationery for your business, the new version of this program is worth your consideration. According to Broderbund, Print Shop owners can mail their original program disk and $20 to Broderbund Customer Service to receive the updated edition.

The Prince of Color

No matter what graphics program you own, you'll certainly want to add Prince, from Baudville, to your software library. In fact, Prince lets you create color printouts *without* a color printer. Using four separate ribbons, you can create color pictures, greeting cards, labels, and even iron-on transfers. (Baudville markets color ribbons for $12 each, although some well-stocked mail-order houses sell them for as little as $5 apiece.)

After you load a hi-res screen and decide to print it, Prince prompts you to insert the appropriate color ribbon into the machine, then prints those parts of the screen containing that hue. When it's finished with one color, Prince automatically rewinds the paper and instructs you to change the ribbon to the next color. The process is slow, but the results are well worth the effort, especially if you own a black-and-white printer and don't want to spend the money for a color model. (If you do own a color printer, you won't have to fuss with changing ribbons, but you won't be able to make iron-on transfers, as they require special ribbons with heat-sensitive ink.)

Not only does Prince faithfully reproduce standard and double-hi-res screens in all their glory, it also lets you alter your print parameters to obtain exactly the kind of hard-copy you want: You can print in three sizes, rotate the output, print only certain colors, swap black for white, and automatically make multiple copies. While Prince includes some rudimentary editing features, it's clearly meant to be used as an accessory to a full-featured graphics package.

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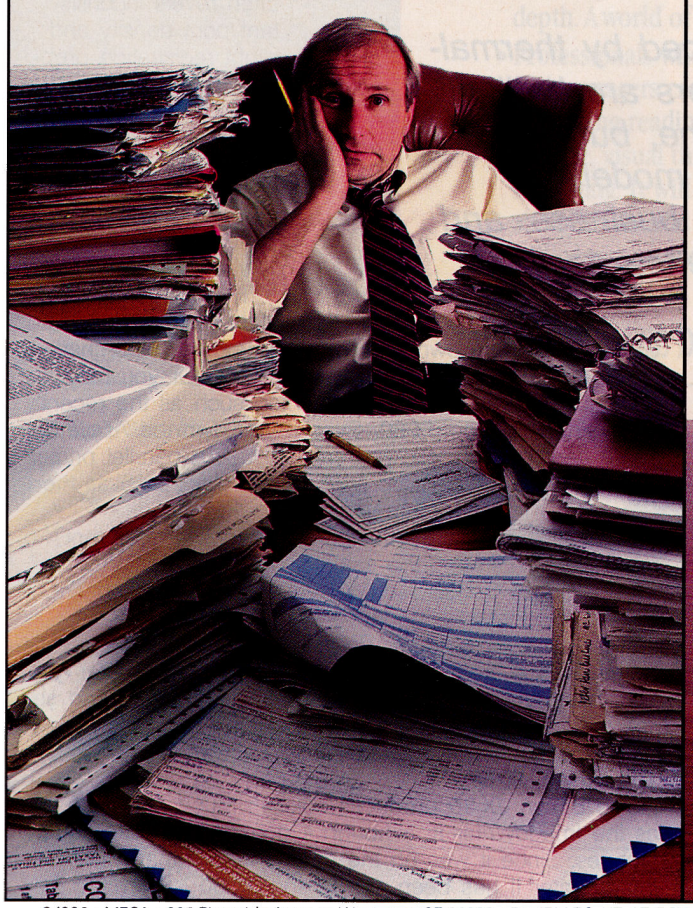

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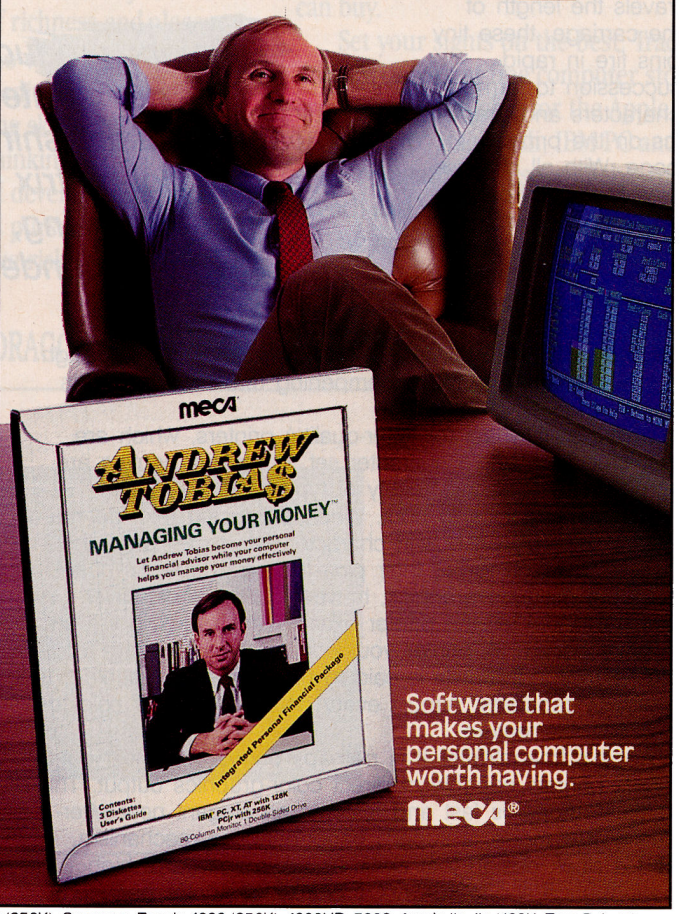

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Prince is available in two versions, one supporting Epson printers, and another for the ImageWriter I (discontinued) and II, Apple DMP, C. Itoh 8510 SCP + NLQ, ProWriter, and NEC 8023.

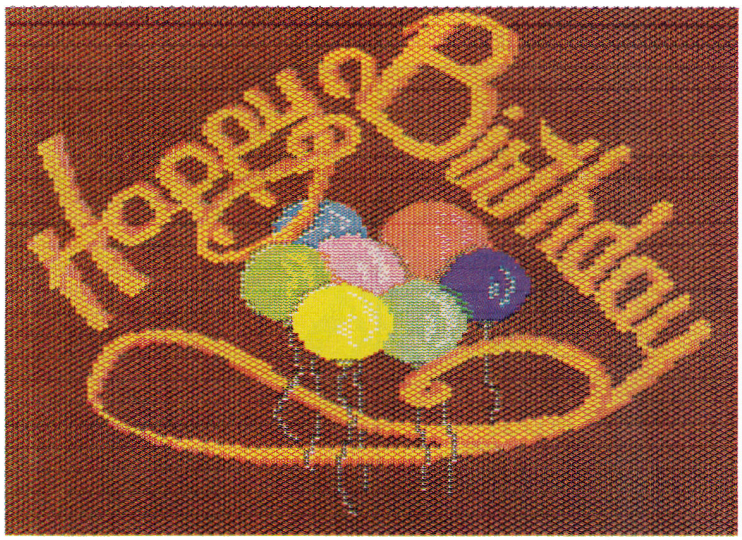
Picking Your Printer

Once you've decided on the software package that best suits your needs, you must then choose a color printer that's supported by that program. Most software packages support two types of color printers—impact dot-matrix and thermal transfer—each with its distinctive advantages and drawbacks. By far the more common of the two is the impact dot-matrix printer.

Impact Dot-Matrix

As the name implies, impact dot-matrix printers operate by physically striking the ribbon and pressing it against the paper to form text and graphics. The printhead contains a set of vertically aligned pins (also referred to as wires) that fire when voltage is applied to them from the rear. When the pin extends forward, it brings a minute portion of the ribbon into contact with the paper, thus forming a printed dot.

As the printhead travels the length of the carriage, these tiny pins fire in rapid succession to form characters and graphics on the printed page. With all of these pins firing, it should come as no great surprise that impact dot-matrix printers make quite a bit of noise while operating. The degree of noise a printer generates depends on its design and the amount of sound-dampening material used in its construction.



"Colors produced by thermal-transfer printers are brilliant and actually shine, but stick with dot-matrix models for programming, business, and correspondence needs."

Unlike daisywheel (or letter-quality) printers, which are restricted to a single character set, dot-matrix printers are versatile, producing a variety of typestyles, sizes, and fonts, with graphics to boot. When producing text, dot-matrix printers rely on built-in character sets to tell them the pattern in which to fire their pins to form a specific character. To produce graphics, however, a software driver program must tell the printer exactly which pins to fire and in what pattern. A printer your computer can instruct to fire its pins individually is said to have dot-addressable graphics capability. Almost every dot-matrix printer sold today has this feature.

Apple's ImageWriter II is perhaps one of the finest dot-matrix printers capable of direct color-graphics output. This versatile model is fast and features an elegant near-letter-quality text mode, a superb paper-handling mechanism, and a sleek design that conjures up images of a high-performance sports car, not a clunky computer peripheral. Because it bears the Apple logo, you can be confident that the ImageWriter II will receive continued strong support from third-party developers.

The ImageWriter II accepts both black and four-color ribbon cartridges. The larger multicolor cartridges contain a one-inch-wide ribbon composed of black, magenta, cyan, and yellow stripes stacked vertically. When your Apple instructs the ImageWriter II to print in one of these colors, the appropriate section of the ribbon is positioned in front of the printhead before the pins fire.

Although the ribbon contains only four colors, you can combine them by overprinting to produce a total of seven colors. By carefully printing dots of these seven colors next to each other, your printer can mix a virtual rainbow of hues.

The ImageWriter II is among the fastest color printers available, yet it suffers from drawbacks inherent in all color impact dot-matrix printers. While the colors you view on the Apple II screen seem rich and saturated because the screen *emits* light, the color dots on a piece of paper only *reflect* light, and the result is that the output of impact dot-matrix printers tends to look dull and muted—something less than great computer art.

Moreover, large areas of a single color often reveal inconsistent print density and slight registration problems. Furthermore, fabric ribbons become adulterated because the unit must overprint lines to produce mixed colors.

Serial versus Parallel

The ImageWriter II has a serial interface. If you don't already own a serial card, you must purchase one to connect this printer to your Apple. Or you may decide to buy a parallel color printer, such as the recently discontinued Epson JX-80. Even if you own the Apple //c, which has a serial port, you can still use a parallel printer if you purchase a serial-to-parallel converter, such as the Grappler C from Orange Micro.

Serial and parallel interfaces are merely two different means of transmitting the same information. Serial transmission sends 8 bits of data 1 bit at a time. In contrast, parallel transmission sends all 8 data bits at once. Although parallel transmission is faster, most printer mechanisms can't accept data as quickly as your computer transmits them, so the difference between parallel and serial, with regard to printers, is negligible.

The Epson JX-80

The Epson JX-80 produces color in much the same way as the ImageWriter II, although it doesn't include as many features. Since it was on the market longer than the ImageWriter II has been, the Epson JX-80 is perhaps the

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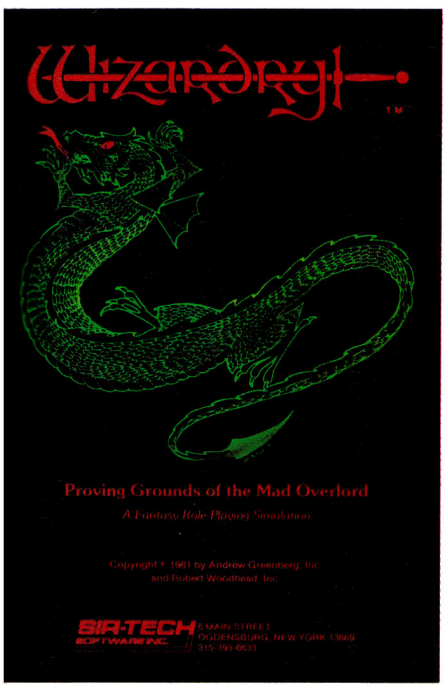

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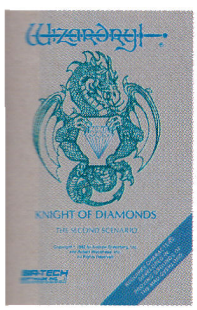

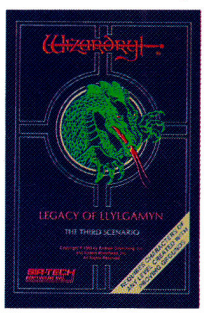

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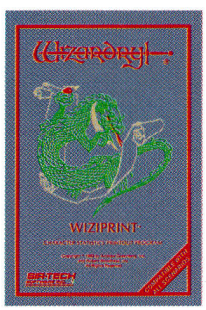

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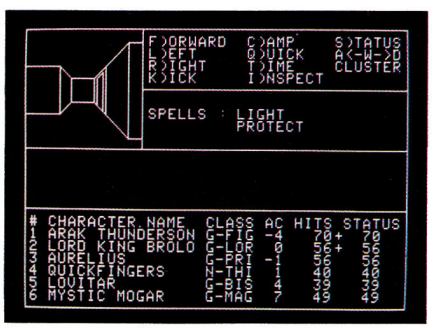

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best-supported color printer for the Apple. Anyone short on cash, but unwilling to compromise on performance, should seriously consider this model: Now that Epson has discontinued it and replaced it with the EX line, you can pick up a JX-80 at a bargain-basement price.

Thermal-Transfer Technique

Thermal-transfer printers are dot-matrix printers of sorts, but differ from impact models in that their printheads contain discrete heating elements instead of tiny pins. Not to be confused with obsolete, low-quality thermal printers that burn characters onto special heat-sensitive paper, thermal-transfer printers melt wax-based ink onto paper.

Thanks to this innovative technology, thermal-transfer printers are virtually silent during operation, making them ideal for environments where noise is of primary consideration. The same feature that's responsible for whisper-quiet operation has a negative aspect, as well, though: Because they don't strike ribbon against paper, thermal-transfer printers are incapable of producing carbon copies.

Thermal-transfer ribbons look like strips of color cellophane, and unlike continuous-loop, fabric cartridges, can be used only once. The ribbon is approximately one-half inch wide and consists of an eight-inch band of yellow, followed by equal lengths of magenta and cyan. To produce the full spectrum of colors, the printer must pass through all three bands for each printed line. This accounts for the low print yield (typically less than ten full-page color printouts per ribbon) and the lethargic print speed characteristic of thermal-transfer machines.

The two most popular models are Apple's own Scribe (now discontinued, although still available from some dealers) and the Okimate 20 from Okidata. Both printers employ 24-element printheads and are remarkably similar in types of features and quality of output. Although it lists for $230, the Scribe can be often found selling for well under $200. Likewise, the Okimate 20 retails for around $300 with the appropriate Plug 'N' Print interface module, but is also heavily discounted.

Although they can produce rather attractive near-letter-quality text, the high cost of color ribbons and special smooth-stock paper required for optimum performance makes thermal-transfer printers impractical for extended daily use. You can't beat the quality of their hi-res color-graphics output, though. Because of their wax-based ribbons, colors are consistent and brilliant, and actually shine on the printed page. If your application calls for graphics of this nature—that is, if you want graphics you can display proudly—consider a thermal-transfer printer for screen dumps, but stick with impact dot-matrix models for programming, business, and correspondence needs.

A Word of Advice

There are, of course, many other color printers on the market; in fact, several other print technologies, such as laser and ink-jet methods, exist. The printers discussed here, though, are those best supported by the Apple community and most representative of the technologies employed.

Investigate other models, but keep one rule in mind: Unless the software package you plan to use specifically claims to support the printer in question, you'll have a difficult time trying to take full advantage of its color-graphics capabilities. Compatibility is key—don't invest until you've checked. ■

Write to Owen Linzmayer at 30 Reedsdale Street, Apartment 2, Allston, MA 02134-2919.

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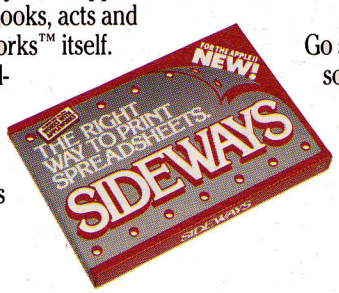

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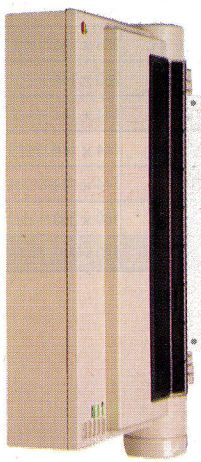

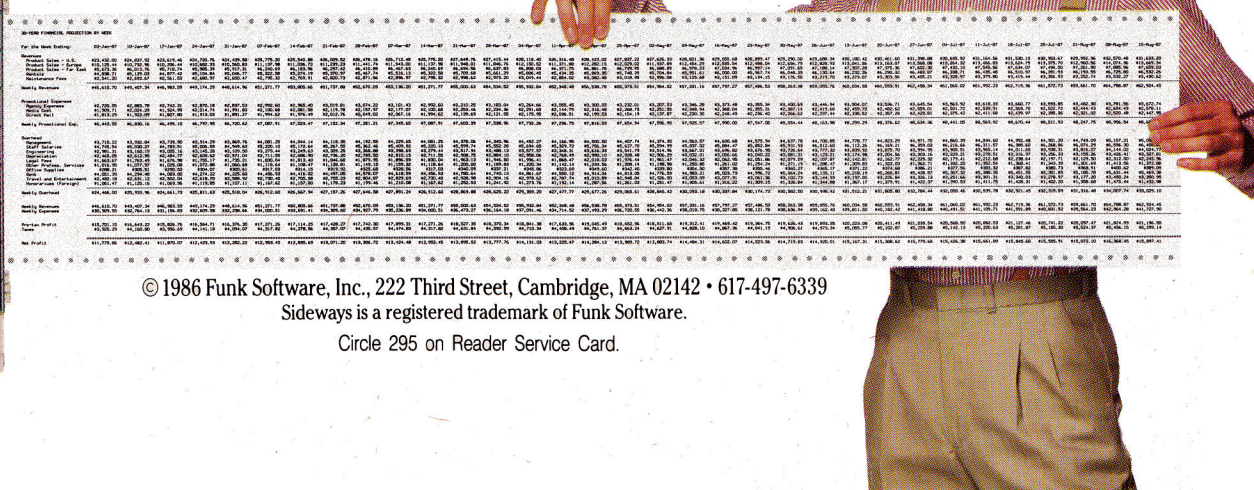

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A GUIDE TO COLOR PRINTERS

			HARDWARE				GRAPHICS
COMPANY	PRINTER	PRICE	CARRIAGE WIDTH	S/P/B	F/T/B	STANDARD BUFFER	RESOLUTION (DPI)
Alps America	ALQ300 18-pin	$ NA	16″	Both	Both	7K	60 × 240
	24-pin		16″	Both	Both	7K	60 × 240
	P2400C 18-pin	NA	16″	Both	Both	4K	60 × 240
	24-pin		16″	Both	Both	4K	60 × 240
Apple Computer	ImageWriter II	595	10″	Serial	Both	2K	160 × 160
Canon USA	PJ-1080A	699	10″	Parallel	Both	.08K	NA
C. Itoh	8510 SCP + NLQ	649	10″	Parallel	Both	2K	160 × 144
Data Products	8010	535	80 cols.	Both	Both	2K	168 × 84
	8020	720	132 cols.	Both	Both	2K	168 × 84
	8050	1599	132 cols.	Both	Both	5K	168 × 84
	8070	2099	132 cols.	Both	Both	5K	168 × 84
Epson	EX-800	828.95	80 cols.	Both	Both	8K	60 × 240
	EX-1000	1074.95	136 cols.	Both	Both	8K	60 × 240
Ergo Systems	Hush Color 180	1195.95	15.5″	Parallel	Both	3K	120 × 120
Fujitsu America	DL2400	1395	16.5″	Both	Both	8K	360 × 180
Genicom	1020	1048	13.6″	Both	Both	2K	240 × 144
	1025	848	8″	Both	Both	2K	240 × 144
	3310	2295	13.6″	Both	Both	.5K	288 × 144
Hattori Seiko	Seikosha MP 1300AI	954	10″	Both	Both	10K	240 × 144
Juki	5510-Color	731	10″	Both	Both	3K	240 × 72
NEC	CP560XL	1695	16″	Parallel	Friction	8K	360 × 360
	CP565XL	1825	16″	Both	Both	8K	360 × 360
	CP660	860	10″	Parallel	Both 0	8K	360 × 360
	CP665	935	10″	Serial	Both 0	8K	360 × 360
	CP760	1160	16″	Parallel	Both	8K	360 × 360
	CP765	1235	16″	Serial	Both	8K	360 × 360
Okidata	Microline 292	749	10″	Both	Both 0	8K	288 × 144
	Microline 293	949	16″	Both	Both	8K	288 × 144
	Okimate 20	258/268	10″	P/S	Both	8K	144 × 144
Printronix	S 7024C	1365	16″	Parallel	Both	6K	144 × 144
Texas Instruments	Omni 857	899	11″	Both	Both	.25K	144 × 144
Toshiba	P351C	1749	15″	Both	Both 0	4K	180 × 360
Xerox	4020	1495	11″	Both	Both 0	2K	120 × 240

KEY

C = color print at half speed
CPI = characters per inch
DB = decibels
D/NLQ/LQ = dot-matrix/near-letter-quality/letter-quality
DF = downloadable fonts
DPI = dots per inch
E = estimate
FC = font cartridges
F/T/B = friction feed/tractor feed/both
LPI = lines per inch
NA = not available
n/xxx = user-designated space between lines in fractions of an inch
O = optional
P = proportional
PC = personality cartridges
PG = programmable
S/P/B = serial/parallel/both

TEXT						OTHER		
D/NLQ/LQ SPEED	D/NLQ/LQ MATRIX SIZE	PITCHES (CPI)	LINE SPACING (LPI)	FC	DF	NOISE (DB)	WEIGHT (LBS.)	WARRANTY
200/-/100	NA	NA	NA	Yes	No	<55dB	37.5	1 year
240/120/80	NA	NA	NA	Yes	No	<55dB	37.5	1 year
250/-/125	NA	NA	NA	NA	No	<55dB	43.7	1 year
360/180/120	NA	NA	NA	NA	No	<55dB	43.7	1 year
250/45/-	7×9/14×8/-	4.5, 9, 10, 12, 13.4, 15, 17, P, C	6, 8, n/144	No	Yes	25dB	NA	90 days
37/-/-	5×7/-/-	6, 12	6, 8	No	No	<50dB	12.3	1 year
180/45/-	9×9/16×16/-	5, 6, 8.5, 10, 12, 17	n/144	No	Yes	63dB	19.8	1 year
180/90/30	9×9/24×9/36×18	10, 12, 13.3, 17.1, P	6, 8, n/144, n/48	No	Yes	65dB	18.7	1 year
180/90/30	9×9/24×9/36×18	10, 12, 13.3, 17.1, P	6, 8, n/144, n/48	No	Yes	65dB	24.7	1 year
250/110/35	18×9/24×9/36×18	10, 12, 13.3, 17.1, P	6, 8, n/144, n/48	Yes	Yes	65dB	40	1 year
400/300/100	18×9/24×9/36×18	10, 12, 13.3, 17.1, P	6, 8, n/144, n/48	Yes	Yes	65dB	40	1 year
300/60/-	9×9/18×18/-	5 through 20	6, n/216	No	Yes	NA	22	1 year
300/60/-	9×9/18×18/-	5 through 20	6, n/216	No	Yes	NA	25.5	1 year
180/90/-	7×9/13×17/-	5, 6, 8.5, 10, 12, 17, P	6, 8, n/120	No	No	56dB	35	90 days
216/-/72	9×7/-/36×24	10, 12, 15, 17.1, 18, 20	3, 4, 6, 8, 16, n/120	Yes	Yes	<55dB	44	1 year
100/-/200	9×9/-/38×18	10, 12, 16, 17, PC	3, 4, 6, 8, n/216, PC	Yes		55dB	39	1 year
100/-/200	9×9/-/38×18	10, 12, 16, 17, PC	3, 4, 6, 8, n/216, PC	Yes		55dB	33.3	1 year
360/-/90	9×9/-/21×18	10, 12, 13.1, 15, 16.7, 18	3, 4, 6, 8, 12, n/144	No	Yes	61.5dB	36.5	1 year
300/50/-	12×9/24×18/-	5, 6, 8.5, 10, 12, 17, 20, P	6, 8, n/72, n/144, n/216	No	Yes	59dB	18.7	2 years
180/30/-	9×9/9×9/-	10, 12, 17, P	6, 8, n/72, n/144, n/216	No	Yes	58dB E	20.5	1 year
290/240/100	NA	10, 12, 15, 17, 20, P	3, 4, 6, 8, n/360	Yes	Yes	53dB	35.2	1 year
290/240/100	NA	10, 12, 15, 17, 20, P	3, 4, 6, 8, n/360	Yes	Yes	53dB	35.2	1 year
216/180/65	NA	10, 12, 15, 17, 20, P	3, 4, 6, 8, n/360	No	Yes	56dB	17.6	1 year
216/180/65	NA	10, 12, 15, 17, 20, P	3, 4, 6, 8, n/360	No	Yes	56dB	17.6	1 year
216/180/65	NA	10, 12, 15, 17, 20, P	3, 4, 6, 8, n/360	No	Yes	56dB	24.3	1 year
216/180/65	NA	10, 12, 15, 17, 20, P	3, 4, 6, 8, n/360	No	Yes	56dB	24.3	1 year
200/100/-	9×9/17×17/-	5, 6, 8.5, 10, 12, 17	6, 8, n/144	No	Yes	57dB	12.5	1 year
200/100/-	9×9/17×17/-	5, 6, 8.5, 10, 12, 17	6, 8, n/144	No	Yes	57dB	16.5	1 year
80/40/-	7×18/14×18/-	5, 6, 8.5, 10, 12, 17	6, 8, n/144	No	No	53dB	6.2	90 days
240/60/-	7×9/18×17/-	10, 12, 15, 17, 20	6, 8	No	Yes	<55dB	40	90 days
150/-/35	9×9/-/32×18	10, 12, 16.7	3, 6, 8	Yes	0	<64dB	15	90 days
288/-/100	24×36/-/24×36	10, 12, 16.7, PC	6, 8, n/48, n/216	Yes	Yes	58dB	33	1 year
80/40/-	12×20/12×20/-	10, 12, 17, P	6	No	No	<55dB	28.6	1 year

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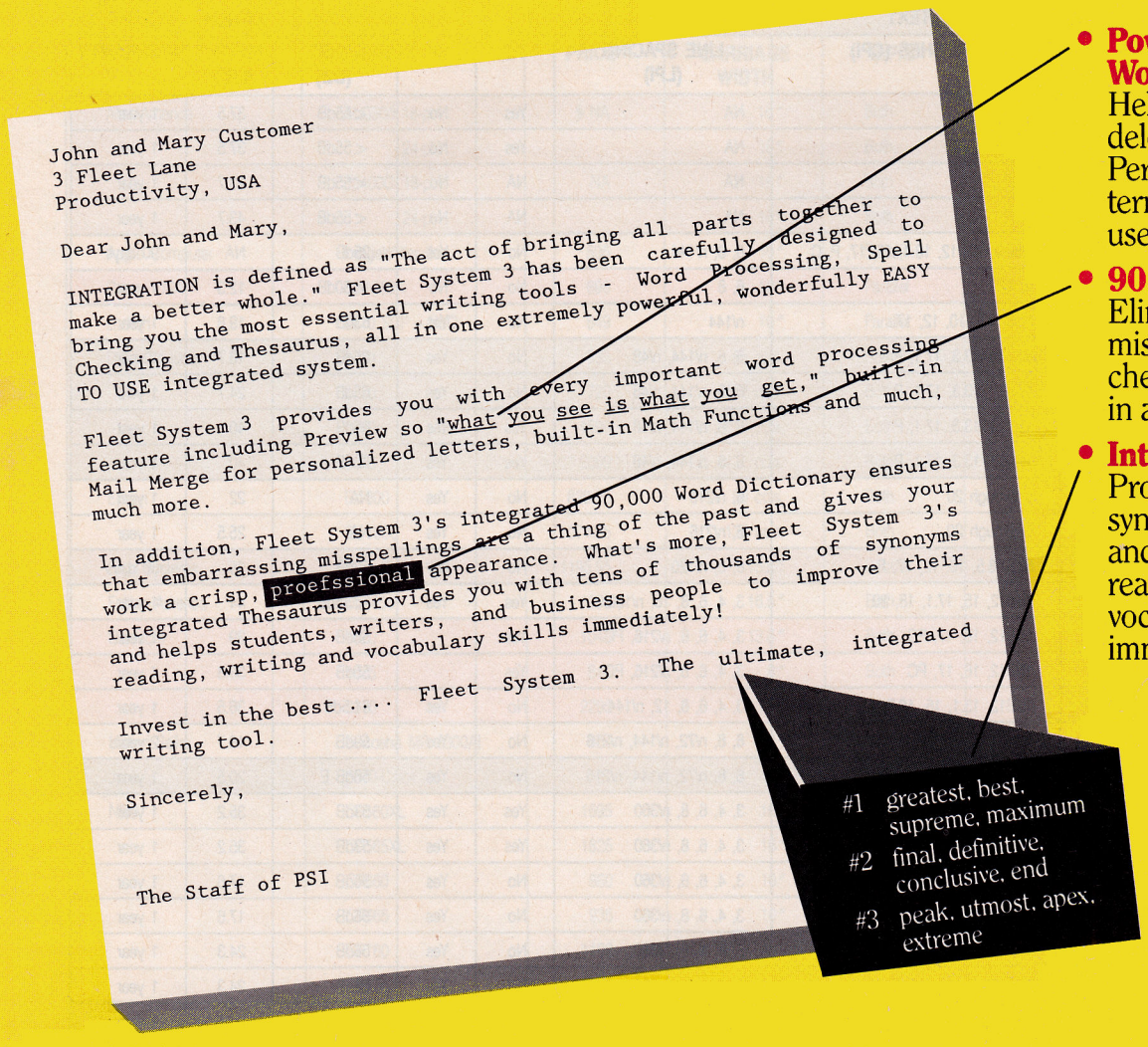

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ACHIEVING A PERSONAL BEST

On and off the job, Apples are helping handicapped users toward self-sufficiency.

by Tan A. Summers



When Wayne Lowry isn't studying history at Colorado Mountain College in Steamboat Springs, he's on the ski slopes training for the 1988 Olympics. Rose Angelocci, on the other hand, is a freshman at the University of New Orleans, where the closest thing to a ski slope is the bridge across the Mississippi River. She prefers to spend her spare time riding her tandem bicycle with friends. Henderson, Minnesota, high-school senior Marc Hagen plays defense for his school's football team, while Gavin Miller, a senior at Oak Grove High School in Louisiana, is president of his own business, Horizon Software. Retired music teacher Georgia Griffith works as a music proofreader for the Library of Congress.

What do people with interests as diverse as these have in common? All use Apples on the job or for homework, but that's not surprising these days. What's unusual about Wayne, Rose, Marc, Gavin, Georgia, and thousands of other Apple enthusiasts like them is the way they use their computers. Both Wayne and Rose use speech synthesis and Braille printers to keep track of what their programs are doing. Both are legally blind. Marc, deaf since childhood, uses his Apple to make telephone calls. For Gavin, who is restricted to a wheelchair and has only limited use of his hands, the computer promises to be a route to employment. Georgia is both blind and deaf, and uses an Apple with braille output to converse with visitors.

Being able to use a computer is a plus in today's society whether you're handicapped or not, especially when it comes to getting a job. But for those with physical disabilities that prevent them from writing a letter, reading a newspaper, making a phone call, or even flipping a light switch, an Apple computer can make life easier and more meaningful, as well. In addition to its traditional roles in work, school, and recreation, the Apple can assist in communication and environmental control.

Georgia Griffith, a system operator for CompuServe's Handicapped Issues Forum, points out that the computer is a great equalizer for the disabled person. "You can't usually tell if someone is handicapped on CompuServe unless [he or she] makes a typo that only a braille user would make, or types very, very slowly," she says. "Many of my users don't know I'm deaf-blind."

Some handicapped individuals—most hearing-impaired and many mobility-impaired users—can use Apples with no modification whatever. People who can't read the computer screen or use a standard keyboard, though, must find special hardware or software to fit their needs. Five years ago, when Apple Computer published its first resource guide for personal computing and the disabled, help for those with unusual computing needs was hard to

locate. Since then a profusion of products has appeared on the scene, along with new ways for the disabled and their families to find the products they need. (See the Product Information sidebar on p. 82.)

Talking Apples

Getting homework—or paperwork of any kind, for that matter—done on time and into a readable form is a big problem for the visually disabled. Rose Angelocci, who graduated first in her high-school class of 200 sighted students, solves the problem by using an Echo Plus speech synthesizer from Street Electronics, along with Raised Dot Computing's word processor Braille-Edit. Braille-Edit lets Rose enter standard text, then check it for accuracy letter by letter or a word or sentence at a time. The computerized voice changes pitch to indicate uppercase letters and punctuation. A newer version called BEX (Braille-Edit Express) also translates text into Grade 2 Braille for printing.

Braille-Edit allows a variety of configurations with different printers and input methods, including file transfer from another computer. That lets Rose take notes in class with Small-Talk, a notebook-sized talking portable computer from VTEK that includes its own word-processing program and other functions. (Its voice can be suppressed for quiet classroom use.) Rose saves her notes on Small-Talk's built-in microcassette drive, then dumps them to her Apple and the Braille-Edit program when she gets home.

Individuals like Georgia Griffith who prefer a six-key, brailler-type keyboard can use VersaBraille, from Telesensory Systems, the same way. VersaBraille comes with a simple word-processing program and tape drive and can act as a braille CRT as well as an input device or stand-alone note taker.

Another computer tool Rose finds indispensable is Talking DOS Utilities (part of the Echo/Cricket Training Set), from Raised Dot. It works with most programs that use text, including graphics programs that use the Apple text window to display information. Rose uses it for practical chores like disk maintenance, and some less practical ones like game playing.

Wayne Lowry also uses Braille-Edit. Concerned at the lack of computer programs for the blind, Wayne's mother, Sherry Lowry, began searching for existing sources and willing developers. Her efforts resulted in Access Unlimited/SPEECH Enterprises, a nonprofit organization dedicated to fostering the development of products for the blind. SPEECH Enterprises acts as a distributor for a number of hardware and software products, and hires college students to adapt existing software to work with speech-synthesis devices.

One popular product available from SPEECH is the Ohtsuki Brailler/Printer. Capable of printing in either braille or ink, the Ohtsuki can even print both on the same sheet, a boon for parents and teachers of visually impaired students or for handicapped adults who work in a sighted environment. The Ohtsuki can create raised illustrations from standard Apple art programs and in conjunction with devices such as the AppleMouse/MousePaint, PowerPad, and KoalaPad when used with another SPEECH Enterprises offering, Lorin Software's Illustrations. Illustrations also works with the modified Cranmer Perkins Brailler from Maryland Computer Services.

Of course, computing isn't just for students. A number of productivity and business programs have been created or adapted for use by the visually impaired. There's Computer Aids Corporation's Calc-Talk, for example, which lets you use your Apple as a scientific calculator. It provides enlarged print on screen as well as synthesized speech. Lorin software makes a talking spreadsheet, Tally-Talk. Also from Computer Aids is a data-base program, INFO. The Master Talker, from Sliwa Enterprises, is a preboot utility that makes other text-oriented programs "talk." Financial-management programs include Traxler's Trax-Pax Checkbook, and Checkbook & Budgeting from G. Carriere, both available from SPEECH Enterprises. MicroTalk offers Pro-Word, a talking word processor for ProDOS users, and ProTerm Plus, a talking communications program that includes sophisticated file-transfer capabilities.

The Hearing Apple

"I wish more kids could use computers," commented Marc Hagen during our modem-to-modem interview. "This is the only way I can use the telephone." Telecomputing is, in fact, the newest breakthrough in communication for the deaf. Old-style TDD's (telephone devices for the deaf) type out messages at a lethargic 45 baud, as compared to the 300 to 2400 baud possible with a computer. Besides, very few hearing individuals have teletype machines, while the number with computers and modems is booming.

Marc is also emphatic when he asserts that without his Apple he would have failed most of his classes. He compares going to school without a computer to going without textbooks. "The teachers talked fast, and I wouldn't get it all," he explains. Marc's mother and teachers worked together to create drill-and-practice and on-screen lecture programs so that Marc could keep up with his classes.

Like Wayne Lowry's family, Marc's parents' search for Apple II products to meet their son's needs turned into a full-time business. Their bimonthly newsletter, *Closing the Gap*, is one of the best sources of information in the nation about computer products for all kinds of handicaps. The Hagens' services include training and individually tailored product listings from *CTG*'s extensive data base.

Thanks in part to the Hagens, it's easier today to find learning software, including programs like The Learning Box from M.D. Fullmer & Associates, which lets teachers type in questions and answers for use in a ready-made game format. Marc uses the Magic Slate word processor, a program from Sunburst Communications that offers three levels of complexity for students of different age ranges. For spreadsheet use Marc prefers the "real thing," Apple Computer's AppleWorks.

At the Louisiana School for the Deaf in Baton Rouge, teachers agree with Marc's assessment of computer training for the hearing-impaired. Linda Thomas, computer-lab instructor and coauthor of a study of the effectiveness of computer teaching for deaf children, likes the fact that students can feel they're in control when they're at the computer. "They're not afraid to make mistakes," she pointed out as we watched nine-year-old June Ann DeLaune use Bank Street Writer, from Broderbund, to compose and edit a letter.

Since they must learn English as a foreign language, deaf children often need extra practice using English and developing abstract-thinking skills. The Baton Rouge school recommends Lessons in Syntax from Dormac as one option for improving language. Other good choices are Krell's Logo, Scholastic's Microzine, and Rhymes and Riddles from Spinnaker.

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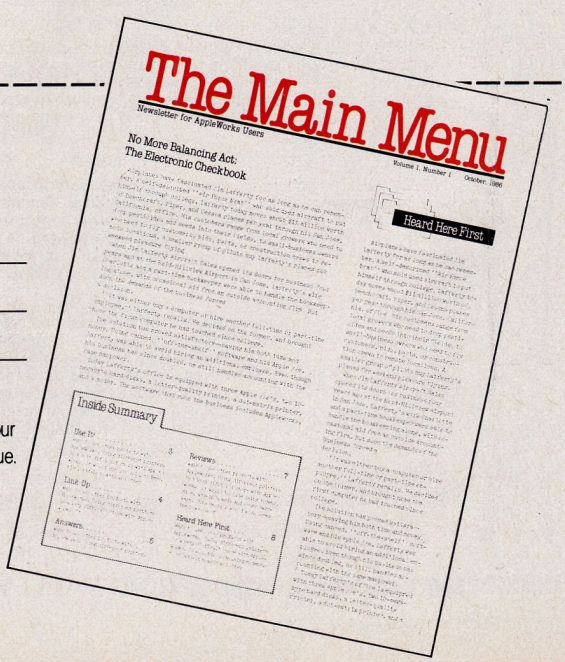

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Young Children from Springboard Software are all attention-getters for visually oriented children that provide the repetition they need. So are graphics programs like The Print Shop from Broderbund, which let children combine words and pictures in an attractive format.

More information about communications and software for the deaf is available from Gallaudet College in Washington, D.C. Gallaudet's Kendall Demonstration Elementary School reviews educational software and maintains a network including computer pen pals for hearing-disabled children.

Getting Around

Gavin Miller had already written his first software product when an auto accident forced him to take several months off for therapy and retraining. While still unable to attend school, Gavin was back at the computer—he used pencils strapped to his hands to press the keys. Now, a year later, he can type with two fingers and has little trouble inserting disks into his drives.

Even people with much less motor control than Gavin can still use an Apple thanks to a wide variety of switches and interfaces. The simplest adjustment many physically disabled users require is help with disk drives and keys that must be pressed simultaneously. A company called TASH, of Markham, Ontario, offers disk guides and key locks to solve these problems. People who have very limited control of hands and arms can use pointers held in the mouth or worn on a headband to press keys. For portable use while traveling and in classes and meetings, individuals with single-pointing access can use the Zygo Notebook. Based on an NEC lap computer, the Zygo Notebook weighs less than four pounds and can transfer word-processing files saved on its built-in tape drive to an Apple computer. Creating a library of frequently used keystrokes speeds up the note-taking process.

Individuals with less motor control may need more specialized input devices. The basis of many such systems is the Adaptive Firmware Card, from Adaptive Peripherals. This plug-in card lets the Apple respond to any of 16 input modes. Its "slow-down" mode lets those with limited physical ability use a wider range of commercial programs, as well. The Adaptive product is a classic in its field, and many input devices are designed to work with it, although some manufacturers offer adapter cards for their own products.

One popular alternate input device for those with limited physical capability is the expanded keyboard, in various styles from different manufacturers, such as Unicorn Engineering and EKEG Electronics. Expanded keyboards provide direct selection of menu items from the Apple keyboard. The Unicorn device, for example, can be purchased with either 64 or 128 holes, each slightly recessed to protect against accidental keystrokes. Overlays and individualized programming let each key or group of keys perform a unique function. Keyguards are available to limit keyboard use to fewer keys for some applications. In addition to an expanded keyboard, EKEG also makes the Ten Key Board, a flexible input device that provides Logo functions and can serve as a communication device. Adaptive Peripherals also makes a multiple switch for use with its Firmware Card.

Since people with different handicaps have a wide variety of needs, manufacturers try to make their products as flexible as possible. The PowerPad from Dunamis is a good example. Depending on the software you use with it, the Power Pad can become a graphics tablet, an expanded keyboard, or a dedicated communicator (when used with a speech synthesizer). You can use off-the-shelf software or create your own with BASIC, Logo, or EZ-Pilot. Nonprogrammers can write customized applications with J. Jordan's Control Without Keyboards, software that uses English-language commands.

Individuals who can't use their hands or a mouthstick or headwand can still use Apples. A number of single-switch devices you can operate with your eyes, head, or face are available for use with Apple computers. A number of switches of this type are available from Don Johnston Developmental Equipment. Its products include switches that respond to varying amounts of pressure and one you can mount on a wheelchair headrest to be activated by slight head movement. In addition, Prentke Romich offers a speech synthesizer called the Light Talker, which the disabled computerist activates by means of an optical head pointer. Speech-impaired individuals with the ability to use their hands can use the Touch Talker synthesizer, or Software Research's Visible Speech Aid.

Another popular device is the scanning keyboard. Some, like the MOD keyboard emulator from TASH display on-screen characters you select using some form of switch. Others use separate devices with lights that indicate characters and include their own switches. Zygo makes two products of this kind, the TETRAscan II and the scanWRITER. Both are completely transparent to the Apple, so that you can use the regular keyboard as well. TETRAscan remains connected to the computer, while scanWRITER, with its own display, printer, and memory, acts as a wheelchair-mountable portable notetaker. You can later upload data to an Apple computer for permanent storage or formatting with a word processor, with the scanWRITER as the input device. Both Zygo products work with any commercial software. Sentient Systems' EyeTyper camera notes which of a number of lights a disabled user is looking at, then displays and speaks a corresponding message.

Of course, gaining complete control of the computer means also being able to use other devices the Apple itself can control. Home-automation equipment falls into this category (see "Let Apple Take Control," November 1986, p. 92). Products like SmartHome I from CyberLynx and others let physically disabled people turn on lights, television sets, and other devices without assistance.

Summing Up

Disabled Apple users are unanimous in praising the medium as one that slashes away at many of the barriers handicaps impose. Individuals who can use computers can be much more competitive in the job market. As computers increase the number of jobs for people who prefer to work at home, more jobs will be available to individuals with severe disabilities who have difficulty working in a standard office environment.

Most important of all, though, is the boost to self-esteem that comes from being more self-sufficient through the use of Apple tools. Georgia Griffith sums it up this way: "A computer is just a machine, but it can be the link to the human race," she asserts. "No one need be shut in, lonely, or unaware of world happenings if that person has a computer!" ■

Tan Summers is a freelance journalist specializing in computer-related topics. Contact her at CompuServe address 70177,1202.

Product Information

Adaptive Firmware Card, $400
Multiple Switch, $40
Adaptive Peripherals
429 Bagley Avenue North
Seattle, WA 98103
(206) 633-2610

Reader Service Number 314

Braille-Edit, $300
Braille-Edit Express, $400
Echo/Cricket Training Set, $10
(also included with Braille-Edit and BEX)
Raised Dot Computing
408 South Baldwin Street
Madison, WI 53703
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Reader Service Number 315

Calc-Talk, $75
INFO, $195
Computer Aids
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Fort Wayne, IN 46802
(800) 647-8255

Reader Service Number 316

Checkbook & Budgeting (G. Carriere), $60
Illustrations (Lorin Software), $115
ProTerm Plus (MicroTalk), $150
ProWord (MicroTalk), $195
Tally-Talk (Lorin Software), $200
Trax-Pax Checkbook (Traxler), $50
Access Unlimited/
SPEECH Enterprises
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Houston, TX 77024
(713) 461-1666

Reader Service Number 317

Closing the Gap
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(612) 248-3294
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Reader Service Number 318

Control Without Keyboards
J. Jordan Associates
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Key Guard, $44
Keylock, $45
MOD Keyboard Emulator, $1050
TASH
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Unit 1
Markham, ON L3R 2Z3
Canada
(416) 475-2212

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Speech Synthesizer
Street Electronics
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Carpinteria, CA 93013
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EKEG Electronics
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Station G
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Canada
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Oakland, CA 94618
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EyeTyper
Sentient Systems Technology
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Pittsburgh, PA 15213
(412) 682-0144
$8000

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Washington, DC 20001
(202) 651-5000

Handicapped Issues Forum
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M.D. Fullmer & Associates
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San Jose, CA 95120
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Reader Service Number 327

Lessons in Syntax
Dormac Software
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Light Talker, $2550
Touch Talker, $1955
Prentke Romich
1022 Heyl Road
Wooster, OH 44691
(216) 262-1984

Reader Service Number 329

Master Talker
Sliwa Enterprises
P.O. Box 1052
Yorktown, VA 23692
(804) 898-8386
$40

Reader Service Number 330

Notebook, $895
scanWRITER, $4000
TETRAscan II, $2050
Zygo Industries
P.O. Box 1008
Portland, OR 97207
(503) 297-1724

Reader Service Number 331

Ohtsuki Printer BT-5000
Ohtsuki Communication Products
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Suite 24
Walnut Creek, CA 94598
(415) 947-3148

Reader Service Number 332

Small-Talk
VTEK
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Santa Monica, CA 90404
(213) 452-5966
$2195

Reader Service Number 333

SmartHome I
CyberLynx
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Boulder, CO 80301
(303) 444-7733
$720 (starter kit)

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Switches
Don Johnston
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Lake Zurich, IL 60047
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VersaBraille
Telesensory Systems
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Mountain View, CA 94039
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$6750

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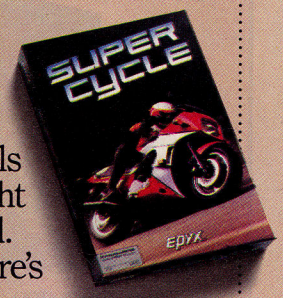

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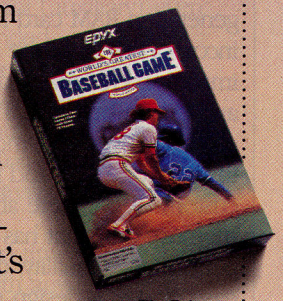

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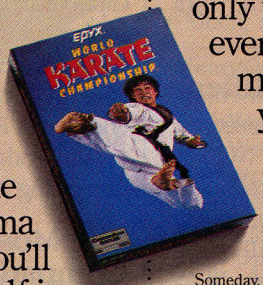

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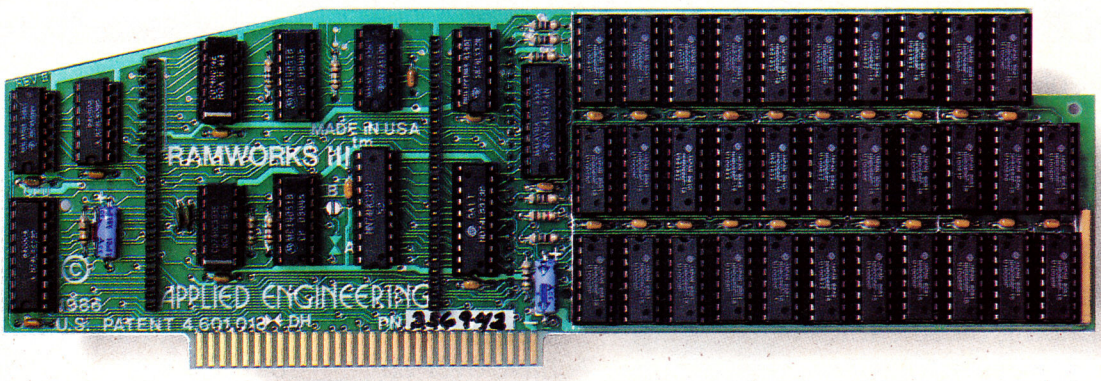

With battery backed RAM port, RGB port, increased memory capacity, full software compatibility and more compact design, RamWorks III is a generation ahead.

RamWorks III is the newest 3rd generation RAM card for the Apple IIe. It incorporates all of the technology and improvements that years of experience and over a hundred thousand sales have given us. By selling more memory cards than anyone else and listening to our customers, we were able to design a memory card that has the ultimate in performance, quality, compatibility and ease of use. A design so advanced it's patented. We call it RamWorks III, you'll call it awesome!

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While RamWorks III is recognized by all memory intensive programs, NO other expansion card comes close to offering the multitude of enhancements to AppleWorks that RamWorks III does. Naturally, you'd expect RamWorks III to expand the available desktop, after all Applied Engineering was a year ahead of everyone else *including Apple* in offering more than 55K, and we still provide the largest AppleWorks desktops available. But a larger desktop is just part of the story. Look at all the AppleWorks enhancements that even Apple's own card does not provide and *only* RamWorks III does. With a 256K or larger RamWorks III, *all* of AppleWorks (including printer routines) will automatically load itself into RAM dramatically increasing speed by eliminating the time required to access the program disk drive. Switch from word processing to spreadsheet to database at the speed of light with no wear on disk drives.

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RamWorks, nothing comes close to enhancing AppleWorks so much.

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RamWorks III is compatible with all Apple IIe's, enhanced, unenhanced, American or European versions.

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Applied Engineering has always offered the largest memory for the IIe and RamWorks III continues that tradition by expanding to 1 full MEG on the main card using standard RAMs, more than most will ever need (1 meg is about 500 pages of text)...but if you do ever need more than 1 MEG, RamWorks III has the widest selection of expander cards available. Additional 512K, 2 MEG, or 16 MEG cards just snap directly onto RamWorks III by plugging into the industry's only low profile (no slot 1 interference) fully decoded memory expansion connector. You can also choose non-volatile, power independent expanders allowing permanent storage for up to 20 years.

It Even Corrects Mistakes.

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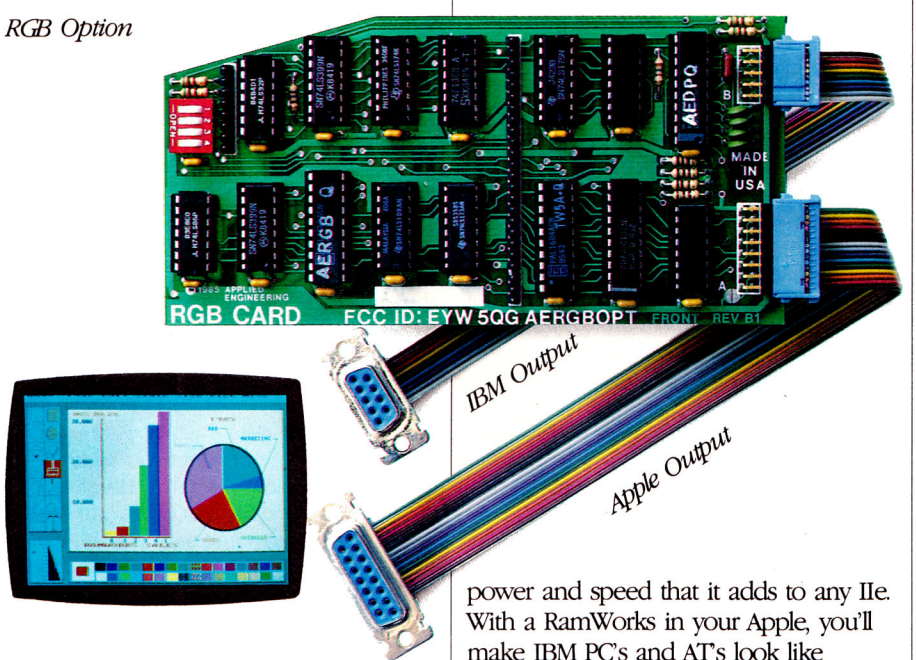
The Ultimate in RGB Color.

RGB color is an option on RamWorks and with good reason. Some others combine RGB color output with their memory cards, but that's unfair for those who don't need RGB *and* for those that do. Because if you don't need RGB

Applied Engineering doesn't make you buy it, but if you want RGB output you're in for a nice surprise because the RamWorks RGB option offers better color graphics plus a more readable 80 column text (that blows away any composite color monitor). For only $129 it can be added to RamWorks giving you a razor sharp, vivid brilliance that most claim is the best they have ever seen. You'll also appreciate the multiple text colors (others only have green) that come standard. But the RamWorks RGB option is more than just the ultimate in color output because unlike others, it's fully compatible with all the Apple standards for RGB output control, making it more compatible with off-the-shelf software. With its FCC certified design, you can use almost any RGB monitor because only the new RamWorks RGB option provides both Apple standard and IBM standard RGB outputs (cables included). The RGB option plugs into the back of RamWorks with no slot 1 interference and remember you can order the RGB option with your RamWorks or add it on at a later date.

RGB Option



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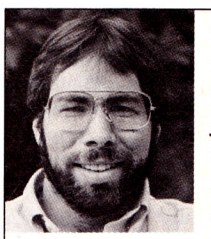

"I wanted a memory card for my Apple that was fast, easy to use, and very compatible; so I bought RamWorks."

Steve Wozniak, the creator of Apple Computer

Apple experts everywhere are impressed by RamWorks's expandability, versatility, ease of use, and the sheer power and speed that it adds to any IIe. With a RamWorks in your Apple, you'll make IBM PC's and AT's look like slowpokes.

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MAKING A LIST

(And Checking It Twice)

Let this Applesoft BASIC program organize your holiday greeting-card chores.

by Dan Bishop

At this time of year, as we scramble to get holiday greeting cards off, wouldn't it be nice to let your Apple generate a mailing list with the addresses and phone numbers of your relatives, friends, and business associates? (And this way you can be sure you don't overlook your rich aunt in Petaluma.) The accompanying **Program listing** will get you organized.

The Data Base

Mail-List Filer uses the simplest form of data storage available to BASIC programmers. Your data are loaded as part of the program itself—into the computer's memory at the same time you load the program. The advantage of this approach is that the program doesn't need special coding for a data-entry screen or for disk-data file storage and retrieval—it keeps the listing short and uncomplicated. The main drawback is that the entire data base must reside in your computer's RAM, so the method is useful only for relatively small collections of data.

Another disadvantage is that you can enter data and edit them only by writing or changing actual program lines. That's not a problem if you're working on your own data base, but don't expect a nonprogrammer to be able to make the changes.

The data base is located at the end of Mail-List Filer (lines 1998–2006). The first three data-base items are unique, while the remainder include the customary name/address/phone-number information. Line 1998 contains the statement:

```
1998 DATA 6
```

This line tells the computer the number of names in your mailing list. Since the sample data base in the **Program listing** contains six names, the number in line 1998 is six. Be sure to use the correct number for your own data base when you set up the program, and don't forget to change the number when you add or delete names.

The second data element, in line 1999, merely lists the title of your data base to appear at the top of screen displays. The third data element, in line 2000, tells the computer the number of records to display at one time on screen; it's set to allow four. Change that number to two or eight and note the effect on the displays when you run the program. As you develop your own applications, you'll want to use a number appropriate to your own display requirements.

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RamWorks III 512K **$209**
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RamWorks RGB Option Even if you bought a RamWorks just to use the RGB option, it would be worth it. The Applied Engineering RGB option has 4 text colors, runs both Apple and IBM RGB monitors, and is compatible with Apple's standard for RGB, includes cables. **$99**
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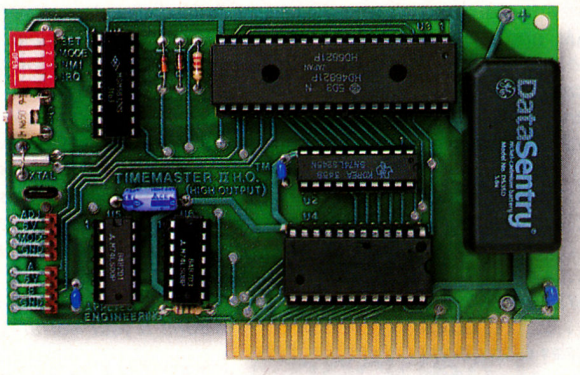

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Finally, lines 2001–2006 contain the six names in this sample data base. I usually choose to place all items related to a single record on the same data line, though BASIC doesn't require it. In fact, the program will run just as well with 30 data lines, each containing a single element. The important thing is that the order of appearance of the data items be the same as shown in the **Program listing**.

Each record contains five items, or elements. The first is the individual's name; the second and third correspond to two address lines; the fourth contains the city, state, and zip code; the fifth contains the phone number. Note that all records must reserve five places for data entries. Commas separate items from each other. Wherever an item is missing, a comma still appears, so that the computer can recognize which information goes where in the display and on the labels.

Note particularly line 2002. This record has a name and one address line; there's no second address line, but the space where one would appear lies between the two adjacent commas. The record contains no phone number. Note that this line ends with a comma, while line 2001 doesn't: The comma at the end of line 2002 is the one that immediately precedes the phone-number field for that record. When you set up your data statements, be careful with this syntax.

Another note on data entry: You don't have to enclose in quote marks any item that begins with an alphabetic character. Any entry that contains a comma or begins with a number, however, must be surrounded by quotes. This is why my city/state/zip entries don't use commas—just call me lazy.

From Data Elements to Array Elements

Mail-List Filer begins (line 10) by reading the first data element into variable NE, telling it the number of records for which to reserve room. The DIM statement then defines five arrays and uses the value for NE to specify the maximum number of elements in each array variable: NM$(1)–NM$(NE) for the mail-list names, A1$(1)–A1$(NE), A2$(1)–A2$(NE), and A3$(1)–A3$(NE) for the three address lines, and PH$(1)–PH$(NE) for the phone numbers.

After defining L$, T$, and TB$ (screen-display variables), the program branches to the subroutine at line 200 where it reads the entire data base into the appropriate arrays. A simple FOR...NEXT loop, using J as the loop counter, handles this project:

```
210 FOR J = 1 TO NE
220 READ NM$(J), A1$(J), A2$(J)
230 READ A3$(J), PH$(J)
240 NEXT J
```

Each time through the loop, the program reads another full record into memory from the data block. As with data statements, it's the order in which the READ variables appear that's important. You could use five READ statements or list all five variables in a single READ statement with no difference in program operation.

The Program Menu

After reading the data into memory, the program then executes the menu subroutine (lines 700–790). Since the program issues an INPUT command after displaying the three options, you must enter the number of your selection and press the return key. If you select option 1 to list all entries in the data base, the program will display them NR at a time on screen. (Remember to adjust the value the program reads for NR by changing the data statement in line 2000. If you have too many data in each record,

Program listing. *Mail-List Filer. Add your own data statements beginning at line 2001. Be sure to use five entries per line, separated by commas. (Use a blank space for missing items.) Change line 1998 to reflect the total number of records in your data base.*

```
1  REM   SIMPLE MAIL-LIST
2  REM   DATABASE PROGRAM
3  REM
4  REM   **********************
5  REM
6  REM  BY DAN BISHOP
7  REM     APPLESOFT ADVISOR
8  REM   INCIDER MAGAZINE-12/86
9  REM   **********************
10  READ NE: DIM NM$(NE),A1$(NE),A2$(NE),A3$(NE),PH$(NE)
20 L$ = "---------": READ T$
30 L$ = "---" + L$ + L$ + L$ + L$:TB$ = "          ": REM  8 BL
    ANKS IN TB$
40  GOSUB 200: REM  READ DATA
50  GOSUB 700: REM  DISPLAY MENU
60  ON M GOSUB 300,800,90
70  GOTO 50
90  HOME : END
96  REM  **********************
97  REM
98  REM  COMMONLY USED ROUTINES
99  REM
100  INPUT "PRESS <RETURN> TO CONTINUE...";X$
110  HOME : RETURN
115  REM
116  REM
120  HOME : PRINT T$
130  PRINT L$
140  RETURN
145  REM
146  REM
150  PRINT CT;". ";NM$(CT)
155  IF A1$(CT) <  > "" THEN  PRINT TB$;A1$(CT)
160  IF A2$(CT) <  > "" THEN  PRINT TB$;A2$(CT)
165  IF A3$(CT) <  > "" THEN  PRINT TB$;A3$(CT)
170  IF PH$(CT) <  > "" THEN  PRINT TB$;TB$;PH$(CT)
180  IF P$ = "Y" THEN  GOSUB 1500
190  PRINT L$: RETURN
196  REM    **********************
197  REM  ROUTINE TO READ DATA
198  REM
199  REM
200  READ NR
210  FOR J = 1 TO NE
220  READ NM$(J),A1$(J),A2$(J)
230  READ A3$(J),PH$(J)
240  NEXT J
250  HOME : PRINT "ALIGN LABELS IN PRINTER AND BE SURE"
260  PRINT "PRINTER IS ON BEFORE CONTINUING IF YOU"
270  PRINT "ARE PLANNING TO PRINT LABELS."
280  PRINT : GOSUB 100: RETURN
296  REM   **********************
297  REM  ROUTINE TO DISPLAY
298  REM  NR RECORDS AT A TIME
299  REM
300  HOME :CT = 0:P$ = "N"
310  INPUT "DO YOU WANT MAILING LABELS PRINTED?        (Y/N)
    : ";P$
320  IF P$ <  > "Y" THEN P$ = "N"
330  GOSUB 120: FOR J = 1 TO NR:CT = CT + 1
340  GOSUB 150: REM  DISPLAY RECORD
350  IF CT = NE THEN J = NR
360  NEXT J
370  GOSUB 100: IF CT = NE THEN 390
380  GOTO 330
390 P$ = "N": RETURN
696  REM    **********************
697  REM  ROUTINE TO DISPLAY MENU
698  REM
699  REM
700  HOME : PRINT T$: PRINT L$: PRINT
710  PRINT "ENTER THE NUMBER OF YOUR SELECTION...": PRINT
720  PRINT "      1. LIST ALL ENTRIES IN DATABASE."
730  PRINT "      2. SEARCH FOR AN INDIVIDUAL."
740  PRINT "      3. END THE PROGRAM."
750  PRINT : INPUT "  CHOICE ====> ";M$
760 M =  VAL (M$): IF M < 1 OR M > 3 THEN  PRINT "**** INVALI
    D  CHOICE ****": PRINT : GOTO 720
790  RETURN
796  REM    **********************
797  REM  ARRAY SEARCH ROUTINE
798  REM
799  REM
800  HOME : PRINT T$: PRINT L$
810  PRINT : PRINT "YOUR DATABASE WILL BE SEARCHED"
820  PRINT "FOR ANY PARTIAL MATCH ON INDIVIDUAL     NAMES.": PRINT

830  PRINT "ENTER THE CHARACTER STRING TO BE USED"
840  PRINT "FOR THE SEARCH (OR PRESS RETURN):"
850  PRINT : INPUT "====>  ";S$
860  IF S$ = "" THEN  RETURN
870 S =  LEN (S$):CT = 0
880  GOSUB 1000
890  IF F = 0 THEN  GOTO 980
900  GOSUB 120: PRINT : GOSUB 150
910  PRINT : PRINT
920  PRINT "PRESS:   <M> FOR MORE;": PRINT "          <P> FOR
    PRINTED LABEL;": PRINT "          <Q> TO QUIT.": PRINT
```

Listing continued.

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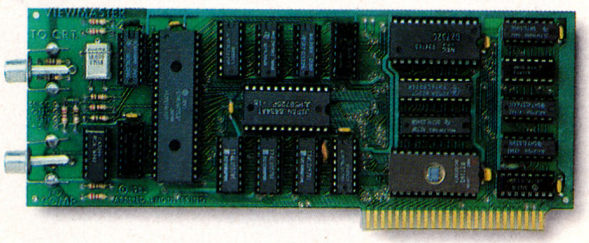

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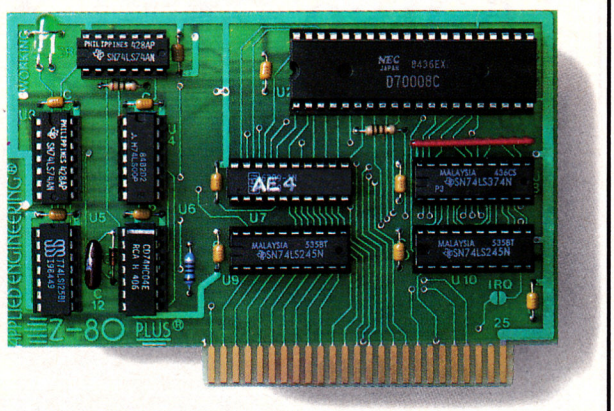

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Listing continued.

```
930  PRINT "     =====> ";: GET X$
940  IF X$ <  > "M" AND X$ <  > "P" AND X$ <  > "Q" THEN 930
950  PRINT X$: IF X$ = "P" THEN  GOSUB 1500
960  IF X$ = "Q" THEN  GOTO 995
970  IF CT < NE THEN  GOTO 880
980  PRINT : PRINT "NO FURTHER MATCHES FOUND."
990  GOSUB 100
995  RETURN
996  REM     **********************
997  REM     SEQUENTIAL ARRAY
998  REM     SEARCH ROUTINE
999  REM
1000 F = 0:CT = CT + 1
1005  HOME : PRINT "SEARCHING ENTRY "CT"..."
1010 L =  LEN (NM$(CT))
1020  IF S > L THEN 1090
1030 D = L - S + 1
1040  FOR J = 1 TO D
1050 D$ =  MID$ (NM$(CT),J,S)
1060  IF D$ = S$ THEN J = D + 10:F = 1
1070  NEXT J
1080  IF J >  = D + 10 THEN  GOTO 1095
1090  IF CT < NE THEN  GOTO 1000
1095  RETURN
1496  REM     **********************
1497  REM
1498  REM    MAIL-LABEL PRINT
1499  REM    ROUTINE
1500  PRINT  CHR$ (4);"PR#1"
1510  PRINT NM$(CT):LC = 1
1520  IF A1$(CT) <  > "" THEN  PRINT A1$(CT):LC = LC + 1
1530  IF A2$(CT) <  > "" THEN  PRINT A2$(CT):LC = LC + 1
1540  IF A3$(CT) <  > "" THEN  PRINT A3$(CT):LC = LC + 1
1550  FOR L = LC + 1 TO 5: PRINT : NEXT L
1560  PRINT : REM  ADD EXTRA PRINT COMMANDS HERE TO MATCH LAB
      EL SIZE
1570  PRINT  CHR$ (4);"PR#0"
1580  RETURN
1996  REM     *******************
1997  REM    DATA BLOCK FOR DATABASE FILES
1998  DATA  6: REM  # OF ENTRIES IN LIST
1999  DATA  ADDRESS-BOOK MAILLIST
2000  DATA  4: REM  # OF RECORDS/SCREEN
2001  DATA     GEORGE WASHINGTON,"125 EAST FIFTH AVENUE",APT.
      35,DENVER  CO  80202, "303-111-1111
2002  DATA      ABRAHAM LINCOLN,"414 OAK STREET",,SANEVILLE A
      R  62123,
2003  DATA     SUZIE QUE,,,HARTSENSTEIN  OK  80000,"505-222-3
      333"
2004  DATA     JOHNIE JAY,"4912 EAST ELM",,DERVISHIRE  ME  00
      112,"912-219-1292"
2005  DATA    MARY MAY,PO BOX 1221,,MAYBERG  SD  72127,"816-66
      6-3741"
2006  DATA    HARRY TRUMAN,"8133 99TH ST.",,INDEPENDENCE  MO
      64124,"726-830-5198"
```

End of Listing.

so that the program can't display four records at once, you'll need to use a smaller number.)

Before Mail-List Filer displays any records, it will ask you whether you want to print labels. Enter Y or N and press Return. (Actually, the program assumes that any response other than Y is negative and displays your data base without printing.) After each screen, the program prompts you to press the return key to continue. When it has displayed the entire data base, it cycles back to the menu.

If you respond by entering Y at the label prompt, as each record is displayed on screen the system pauses and prints a label for that record. Lines 150–190 contain the screen-display routine for a single record. If your data are organized differently from the example used here, you'll want to change the PRINT statements in this subroutine to tailor your screen display accordingly.

Before this subroutine returns control to the loop cycling through the records, it tests the value of P$ (print labels or not); if P$ = "Y" the program invokes the printer subroutine at line 1500. This routine assumes you're using labels that require six linefeeds to go from one label to the next. LC keeps track of the number of lines printed. When the program has printed the label (which may contain only a single line for the name, or the name line and up to three address lines), it encounters an "execute linefeed" loop (line 1550):

```
1550 FOR L=LC+1 TO 5:PRINT:NEXT L
```

You may need to edit this loop, or the PRINT command line in 1560 for skipping over the perforations between labels, to match the vertical width of your own labels.

The second option in the program menu calls for a search through the data base for any records with names containing a match for a string of characters. If you select this option, Mail-List Filer next asks you to enter the string it will use in the search. Type in any string of characters that may match a name or any part of a name in your data base. For example, if you enter *ham*, the computer will find *Abraham* and *shamrock* as well as *ham and eggs*. It won't find *Hamilton*, however, because the search is case-specific—the match must be exact.

The requirement for an exact match may cause problems if your computer doesn't display both upper- and lowercase. When you type information into data lines, you may also accidentally press the shift key as you enter a name (a normal response). If you do, the name *HAMILTON* will appear on screen as *HAMILTON*, but will actually go into memory as *hAMILTON* with a lowercase *h*. When you try to search for this record with *HAM* as your input string, the program won't find a match. If this problem occurs, you must edit or retype your data line—carefully.

Mail-List Filer uses the subroutine in lines 1000–1095 to search sequentially through the names array. As it brings up each name, it searches through it to see if it contains a matching string. (See this month's Applesoft Adviser, p. 102, for technical details.) When it finds and displays a match, it prompts you to press *M* to go on to the next matching record in the data base, *P* to print a label for this individual record, or *Q* to quit and return to the program menu.

BASIC's GET instruction handles your response to this menu; it lets a single keystroke resume the program's execution. (With GET, you don't need to press the return key after entering your response.) You should also note that the program uses the same display subroutine at line 150 and the same printer subroutine at line 1500 for this option as for option 1. By organizing your program functions into subroutines, it's possible to make multiple use of a single set of instructions.

Conclusion

Mail-List Filer contains fewer than 90 lines of code (excluding the REMark lines, which you can omit if you don't want to type them in). Of course, you must add to that figure the data statements containing your names and addresses, but you'd have to enter that information no matter what program you use.

Once you've entered your program and some data, be sure to use the SAVE command (for instance, SAVE FRIENDS MAIL LIST) to store your program on disk. When you want to run the program from disk, type NEW (to clear program memory of any residual garbage) and RUN FRIENDS MAIL LIST. When you want to make additions or changes in the data, enter LOAD FRIENDS MAIL LIST to put the program into memory, then type LIST to display the program and your data lines at the end. Simply edit or retype the data lines you want to change and add more for your new information. And be sure to change line 1998 to contain the updated record count. ■

Dan Bishop is inCider*'s Applesoft Adviser columnist. Write to him at 4124 Beaver Creek Drive, Fort Collins, CO 80526.*

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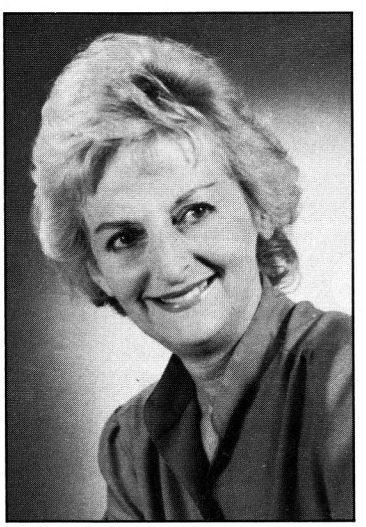
Working with Break-Even Analysis

"A break-even-analysis spreadsheet can show you the amount of sales your business needs to make a profit."



by Ruth K. Witkin

Break-even analysis reflects the relationship among operating costs, sales volume, and profit. The break-even point is where sales are sufficient to cover costs with no profit and no loss. Above the break-even point, the business will show a profit; below the break-even point, it will show a loss. This kind of analysis is valuable if you're planning to introduce a new product, reduce the selling price of an existing one, expand your operations, or commit your company to a costly overhaul of facilities or equipment.

The ingredients of break-even analysis are fixed costs such as salaries, rent, depreciation, and insurance, which remain reasonably constant in relation to sales, and variable costs such as materials, direct wages, and commissions, which fluctuate in direct proportion to sales. Semivariable costs, which tend to increase as sales volume increases, but not in direct proportion, are usually split between fixed and variable, based on their relative importance in the big picture.

Assume you're vice-president of marketing for a sporting-goods manufacturer. Your company is introducing an inflatable raft that will wholesale for $14.75. Variable costs are 70 percent of the selling price; fixed costs are $106,650. You want to know how much in sales you need to reach the break-even point and how much to generate a $48,000 profit.

Figure 1 shows the spreadsheet that provides the answers. All you do is enter the wholesale price, variable costs percentage, each fixed cost, and either the desired profit, as in **Figure 1**, or a zero for break even, as in **Figure 4**. The formulas then calculate the sales dollars, variable costs at that level of sales, gross profit, total fixed costs, each entry as a percentage of sales, and the number of units you must sell. When you change any input number, the formulas calculate the new results instantly.

A Spreadsheet from Scratch

When you see such key combinations as OA-L, hold down the open apple key and type L. If you make a typo, press the delete key to back up the cursor and erase. If you save to disk with a one-drive system, follow the screen prompts that tell you when to swap the Program disk for the data disk.

Use the AppleWorks Startup and Program disks to bring up a new spreadsheet screen. Name this file BREAKEVEN. You should now see the Review/Add/Change screen. Use the following summary to set up the spreadsheet so that it looks like the one in **Figure 2**:

Long Lines: Use an equal sign to enter a line across rows 2, 6, and 24. In each case, place the cursor on the cell in column A and type quotation marks to tell AppleWorks the equal sign is text. Hold down the equal sign key until the sign fills the cells in columns A through C.

Column Width: Each column is now nine characters wide. Use the Layout command (OA-L) to increase the width of column A by 23 characters (to 32 characters), and the widths of columns B and C by seven characters each (to 16 characters each).

Short Lines: With your cursor on B9, type quotation marks, press the spacebar five times, type a minus sign ten times, and move the cursor to C9. Type quotation marks, press the spacebar ten times, type six minus signs, and press the return key. Use the Copy command (OA-C) to copy the lines in B9 and C9 to B18 and C18.

Labels: Type the labels into column A. Several labels are indented in a stair-step fashion. Before typing each fixed cost (Payroll, Rent, and so on), type quotation marks and press the spacebar once. Before *Gross Profit* and *Total Fixed Costs*, type quotes and press the spacebar twice. Before *Net Profit*, type quotes and press the spacebar three times.

Format: Use the Value command (OA-V) to set a standard value of Dollars with no decimal places. Use the Layout command (OA-L) to format B4 and B23 for Commas with no decimal places, B5 for Dollars with two decimal places, and C7 and C8 for Percent with one decimal place. When you enter a formula in C8 and copy it, it will carry the Percent format into the other cells in column C.

Numbers: Type all the numbers



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"0300 Hours. Two hours until dawn. Radar picks up convoy, escorted by two destroyers. We believe that one of the enemy's valuable cargo ships is part of convoy formation."



"0400 Hours. Lookouts on the bridge. Target identification party reports one cargo ship, 4,000 tons, troopship of 10,250 tons, with two *Kaibokan*-type escorts. Moving into attack position."

Tandy 1000/IBM PC Jr. screens shown



"0500 Hours. Sound General Quarters! Battle stations manned. Preparing for torpedo run. Gauge Panel OK. Periscope OK. Charts and Attack Plot Board OK. All mechanical systems OK."



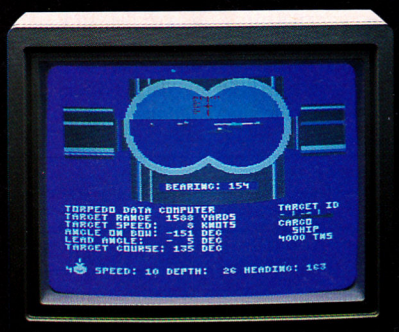
"0525 Hours. Torpedo rooms report full tubes forward and aft. Battery at full charge for silent running. We hope water temperature will provide thermal barrier to confuse enemy sonar."



"0600 Hours. We are at final attack position. Convoy moving at 10 knots. Target distance decreasing rapidly... Crash Dive! Escorts have spotted us and are turning to attack! Rig to run silent."



"0700 Hours. Depth charged for one hour. Some minor damage, but repair parties at work. Destroyer propellèr noises receding. We'll come to periscope depth for our return punch."



"0715 Hours. Torpedo tubes 1, 2, 3 fired. Two destroyers hit and sinking. One of the enemy's last cargo ships coming into 'scope view — an ideal target position. On my mark... Fire Tube 4! Fire 5!"



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Figure 1. AppleWorks break-even-analysis spreadsheet showing sales needed for desired profit.

```
==================A=======================B===============C========
 1|BREAKEVEN ANALYSIS
 2|=================================================================
 3|B/E (0) or Desired Profit                  $48,000
 4|Variable Costs as % of Sales                   70
 5|Price per Unit                              $14.75
 6|=================================================================
 7|Sales Needed                              $582,667          100.0%
 8|Variable Costs                            $407,867           70.0%
 9|                                          ----------          ------
10|  Gross Profit                            $174,800           30.0%
11|
12|Fixed Costs
13| Payroll                                   $92,500           15.9%
14| Rent                                      $10,700            1.8%
15| Utilities                                  $2,400             .4%
16| Insurance                                  $3,200             .5%
17| All Other                                 $18,000            3.1%
18|                                          ----------          ------
19|  Total Fixed Costs                        $126,800           21.8%
20|
21|   Net Profit                              $48,000            8.2%
22|
23|Sales Needed (in units)                     39,503
24|=================================================================
```

Figure 2. Labels, lines, and practice numbers in AppleWorks break-even-analysis spreadsheet.

```
==================A=======================B===============C========
 1|BREAKEVEN ANALYSIS
 2|=================================================================
 3|B/E (0) or Desired Profit                       0
 4|Variable Costs as % of Sales                   70
 5|Price per Unit                              14.75
 6|=================================================================
 7|Sales Needed                                                   1
 8|Variable Costs
 9|                                          ----------          ------
10|  Gross Profit
11|
12|Fixed Costs
13| Payroll                                    72350
14| Rent                                       10700
15| Utilities                                   2400
16| Insurance                                   3200
17| All Other                                  18000
18|                                          ----------          ------
19|  Total Fixed Costs
20|
21|   Net Profit
22|
23|Sales Needed (in units)
24|=================================================================
```

shown in columns B and C. Because of the formatting you did earlier, AppleWorks will produce dollar signs and commas and, in C7, convert the *1* to *100.0%*. Press OA-S to store your work on disk.

Figure 3 shows the formula locations. First, read how the formula works. Then place the cursor on the cell receiving the formula. Move your cursor to the cell locations shown in the formula description and type everything else. When the formula is complete, compare your screen with the formula description. If everything checks out, press the return key. If you have a problem, press the escape key and start again.



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Figure 3. Formula locations in break-even-analysis spreadsheet.

```
==================A=======================B==============C========
 1|BREAKEVEN ANALYSIS
 2|=============================================================
 3|B/E (0) or Desired Profit
 4|Variable Costs as % of Sales
 5|Price per Unit
 6|=============================================================
 7|Sales Needed                          0 (1)
 8|Variable Costs                       0 (2)          ERROR (7)
 9|                                     ----------      ------
10|  Gross Profit                       0 (3)          ERROR
11|
12|Fixed Costs
13|  Payroll                                           ERROR
14|  Rent                                              ERROR
15|  Utilities                                         ERROR
16|  Insurance                                         ERROR
17|  All Other                                         ERROR
18|                                     ----------      ------
19|  Total Fixed Costs                   0 (4)          ERROR
20|
21|   Net Profit                         0 (5)          ERROR
22|
23|Sales Needed (in units)              ERROR (6)
24|=============================================================
```


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Formula 1: Sales Needed

Formula 1 calculates the sales dollars you must generate to cover the fixed and variable costs, and enters the result in B8. The formula uses the equation *Sales = Total Fixed Costs/(1 – Variable Costs) + Break Even or Desired Profit/(1 – Variable Costs).*

Cell location: B7

Description: (B19/(1 – C8)) + (B3/(1 – C8))

Formula 1 doesn't have the numbers it needs to work with, so $0 appears.

Formula 2: Variable Costs

Formula 2 multiplies the sales in B7 by the variable costs as a percentage of sales (B4) and enters the variable costs in B8.

Cell location: B8

Description: +B7*(B4/100)

And again, $0 appears.

Formula 3: Gross Profit

Formula 3 subtracts the variable costs (B8) from the sales (B7) and enters the gross profit in B10.

Cell location: B10

Description: +B7 – B8

Formula 4: Total Fixed Costs

Formula 4 sums the fixed costs (B13 to B17) and enters the total in B19. The formula includes cell B12, which is empty, and cell B18, which contains a line. In this way, if you later insert rows anywhere between rows 12 and 18, AppleWorks will adjust Formula 4 to sum the new entries along with the old. Type only one period when the cursor is on B12; AppleWorks will convert it to three periods.

Cell location: B19

Description: @SUM(B12.B18)

Formula 1, which needs the calculation produced by Formula 4, now has numbers with which to work, so $106,650 appears in B7, which gives the formulas in B8 and B10 something with which to work.

Formula 5: Net Profit

Formula 5 subtracts the total fixed costs (B19) from the gross profit (B10) to produce a zero, if you're testing the break-even point, or the amount of the desired profit in B21.

Cell location: B21

Description: +B10 – B19

The negative number *($74,655)* appears in B21.

Formula 6: Sales Needed (in Units)

Formula 6 divides the sales dollars (B7) by the unit selling price (B5) and enters the number of units you must sell in B23.

Cell location: B23
Description: +B7/B5
At this point, Formula 6 produces *7,231*.

Formula 7: Variable Costs as a Percentage of Sales

Formula 7 divides the variable costs (B8) by sales (B7) and enters the variable costs as a percentage of sales in C8.

Cell location: C8
Description: +B8/B7

The formulas in B7, B8, and B10 now produce the numbers shown in **Figure 4**. Copy Formula 7 so that it calculates the gross profit as a percentage of sales. Leave your cursor on C8 and press OA-C to start the Copy command. Press the return key twice to confirm *Within worksheet* and *Source*. Move the cursor to C10 and press the return key again.

AppleWorks now asks if B8 is a *No change* or *Relative* reference. It's relative because you want the formula to work with B10, not B8, so type **R**. Now AppleWorks asks about B7. Formula 7 must continue to work with B7, so it's *No change*. Press the return key.

Now copy Formula 7 so that it calculates each fixed cost as a percentage of sales: Leave your cursor on C8 and press OA-C. Press the return key twice, move the cursor to C13, and type a period. Move the cursor to C17 and press the return key. Type **R** and press the return key again.

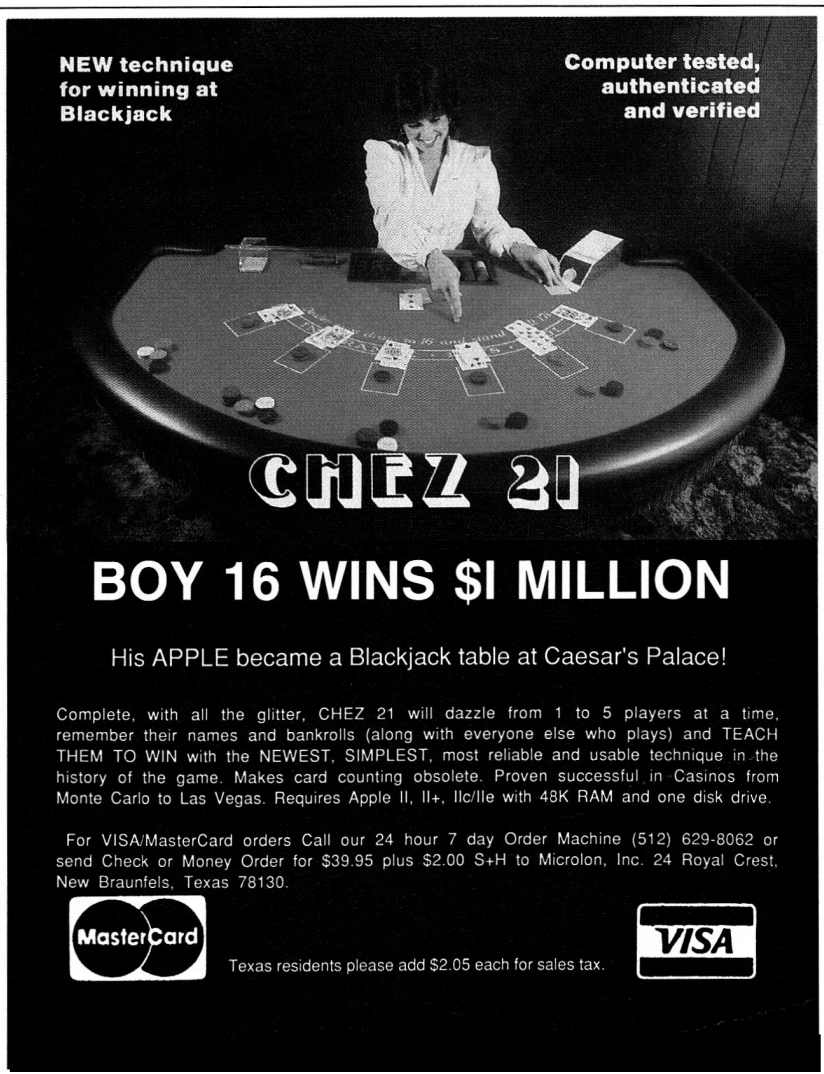
Next, copy Formula 7 so that it calculates the total fixed costs as a percentage of sales: Leave your cursor on C8 and press OA-C. Press the return key twice, move the cursor to C19, and press the return key. Type **R** and press Return.

And, finally, copy Formula 7 to calculate net profit as a percentage of sales: Leave your cursor on C8 and press OA-C. Press Return twice, press OA-8 to jump the cursor to C21, and press the return key. Type **R** and press Return. Your results should match **Figure 4**. Press OA-S to store your spreadsheet on disk.

The best way to make sure nothing unexpected happens to formulas is to have AppleWorks protect them. The fast way is to handle the cells as a block, even though some cells don't contain a formula. Place the cursor on B7 and press OA-L. Type **B** to select *Block*. Press OA-9, then the right arrow key to highlight columns B and C, and press the return key. Type **PN** (for *Protection Nothing*).

Figure 4. Break-even-analysis spreadsheet showing the break-even point.

	A	B	C
1	BREAKEVEN ANALYSIS		
2			
3	B/E (0) or Desired Profit	$0	
4	Variable Costs as % of Sales	70	
5	Price per Unit	$14.75	
6			
7	Sales Needed	$355,500	100.0%
8	Variable Costs	$248,850	70.0%
9			
10	Gross Profit	$106,650	30.0%
11			
12	Fixed Costs		
13	Payroll	$72,350	20.4%
14	Rent	$10,700	3.0%
15	Utilities	$2,400	.7%
16	Insurance	$3,200	.9%
17	All Other	$18,000	5.1%
18			
19	Total Fixed Costs	$106,650	30.0%
20			
21	Net Profit	($0)	-.0%
22			
23	Sales Needed (in units)	24,102	
24			



Now, in the fixed-costs cells, replace the *Nothing* protection with *Values only*. Place the cursor on B12 and press OA-L. Type **B** and press OA-7. Press the return key and type **PV**.

Calculating the Profit Point

To see how this spreadsheet works, have AppleWorks calculate the figures you'll need to generate a $48,000 profit. Place the cursor on B3, type **48000**, and press the return key. To reach this profit level, you need to bring in $515,500 in sales, which means you must sell 34,949 units. The variable costs are now $360,850, and the desired profit is 9.3 percent of sales.

Let's suppose you hire another salesperson. Place the cursor on B13, type **92500**, and press the return key. That's odd. The total fixed costs in B19 changed, but the sales amount in B7, which is supposed to reflect the fixed costs, didn't—and here's why.

Handling Forward References

When one formula needs the calculation of another in a cell below it, you have a condition called a *forward reference*. The sales formula in B7 contains a forward reference to the fixed-costs formula in B19. In the AppleWorks scheme of things, a spreadsheet is calculated from top to bottom, which makes the relative location of formulas important. AppleWorks passes over the sales formula before it calculates the total fixed costs, so the sales formula doesn't have the chance to do its work. When you change a number, be sure your results are accurate by pressing OA-K to tell AppleWorks to calculate a second time. Press OA-K now. The sales figure becomes $582,667, and all the other formulas are calculated accordingly. Your results should now match **Figure 1**.

Printing Your Spreadsheet

This spreadsheet is 64 characters wide and is printed at ten characters per inch. First, set the margins. Press OA-O to bring up the Printer Options screen. Type **LM** and press the return key. Type **.8** and press the return key again. Now type **RM** and press the return key. Type **.8** and press the return key. Next, type **TM** and press Return. Type **.5** and press the return key again. Press OA-S, which stores the spreadsheet on disk, then displays the Review/Add/Change screen.

Now turn on your printer. Press OA-P to start the Print command and press the return key to confirm *All*. Press the return key to select the printer or type a printer number, then press Return. Type today's date and press the return key twice, the second time to confirm one copy. The printer starts working, and here's your spreadsheet.

Viewing and Printing Your Formulas

A formula printout is handy when you troubleshoot a spreadsheet, work on a spreadsheet created by someone else, or want to use a formula on another spreadsheet. Press OA-1 to jump the cursor to the top row, and press OA-Z to zoom into the formulas. Now place the cursor on B7. The sales formula, which you can see in its entirety on the status line, is truncated in its cell. The simple solution is to widen the column: Press OA-L, type **C**, press Return, and type **C** again. Hold down the open apple key and press the right arrow key eight times. Press the return key. The formula is now fully displayed.

You can print formulas directly from the screen or in the same way you print any spreadsheet. Be sure your printer is on. First, to print what's on screen, leave your cursor on B7 and press OA-H. Next, to print every formula, press OA-P and press the return key four times. Now display the spreadsheet again by pressing OA-Z. You didn't save the formula version with the wide column, so all you have to do to bring up the original is reload it from disk.

Next month, I'll explain how to create an employee data base that produces a roster and wage and salary reports.■

Ruth K. Witkin is a consultant in computer applications for business. She is the author of the hotCider Success with AppleWorks *(inCider, CW Communications),* Managing with AppleWorks *(Howard W. Sams & Co.), and* Personal Money Management with AppleWorks *(Hayden Books). Write to her at 5 Patricia Street, Plainview, NY 11803. Enclose a stamped, self-addressed envelope if you'd like a personal reply.*

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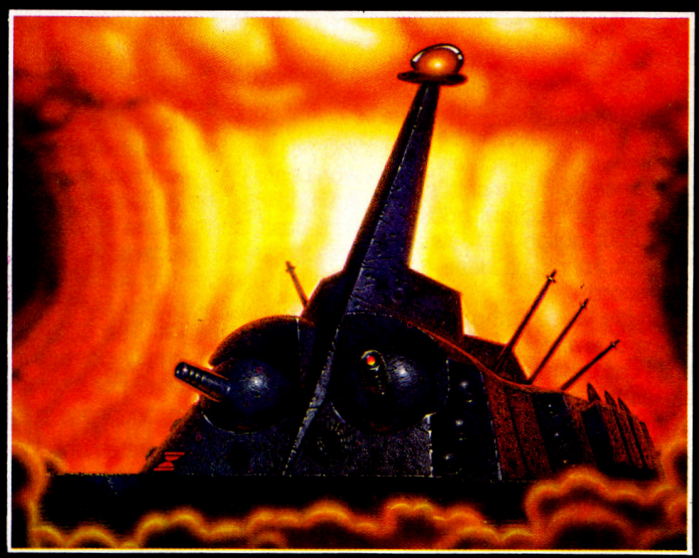

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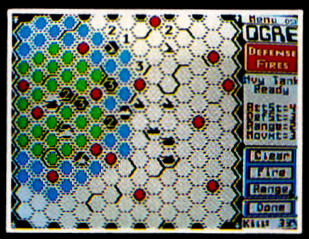

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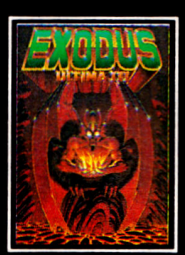

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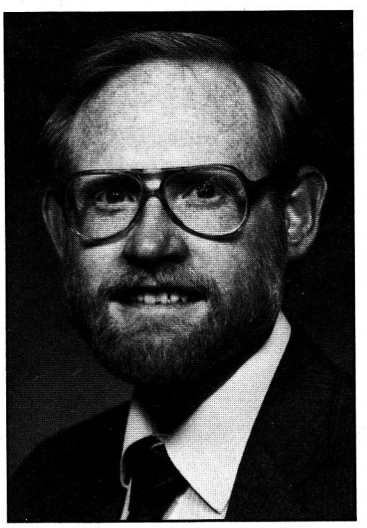
A Data-Base Matchmaker

"Adding a data-manipulation subroutine to your data-base program lets you search for a particular record."



by Dan Bishop

In my last two columns, I showed you how to use BASIC's READ and DATA commands to set up a simple data-base-filing system. Although this approach requires you to use data statements to enter information into the BASIC program itself, you don't have to worry about sophisticated disk-input/output routines, record-format specifications, or data-entry screens and procedures. The important point is to get the information into your Apple's RAM so that you can manipulate it. Last month I introduced the concept of arrays and explained how they can greatly simplify data manipulation using BASIC's FOR/NEXT looping commands.

The original Data Filer and Data-Base Array programs (presented in October 1986, p. 86, and November 1986, p. 124) give you a full-screen list of all data elements. This month's Data-Base Matchmaker program adds a second data-output option that lets you search through your data base for a particular record.

Since the example we're using involves a credit-card inventory (with company name, card number, and expiration date as the only items in each record), the search routine deals only with the company-name field. The program asks you to enter any character string (even part of a name or a single letter), and the program searches through the data base for any company name that contains a match for the character string you specified.

Adding the Menu

Since Data-Base Matchmaker contains two output procedures between which you select, you need to add a routine that displays your options and lets you enter a number corresponding to your choice. In the **Program listing**, you'll see that the main program still occupies lines 1–90. As before, the program reads data into memory and assigns some common variables at the beginning (lines 10–40). At line 50, the program branches to the subroutine at line 700 that handles the menu display. That part of the program accepts entries of only 1, 2, or 3, and assigns the entry value to M.

Returning from the menu subroutine, the main program picks up again at line 60, which contains the instruction:

```
60 ON M GOSUB 300, 800, 90
```

BASIC's ON/GOSUB command is particularly useful for handling menu selections. In this example, the program assigns the variable M a value of one if you select a complete data-base listing, a value of two if you choose a data-base search, or a value of three if you elect to end the program.

When the computer executes line 60, the value assigned to M determines which subroutine in the GOSUB list to execute. (The command at line 90 is *not* a subroutine, but, since it corresponds to the end of the program, you needn't be too fussy—the computer won't care.) As you might guess, the subroutine at line 300 lists the entire data base, and the one at line 800 handles the search procedures.

You can order the subroutine line numbers any way you like in the GOSUB subroutine list. The ON X GOSUB command simply goes to the X'th-listed subroutine. For example,

```
ON X GOSUB 2000, 3000, 900, 1500, 90
```

is a perfectly valid statement. When X equals one, the program branches to the subroutine beginning at line 2000. When X equals three, the program branches to the subroutine at line 900. If X has a value of zero, or, in this example, a value greater than five, BASIC ignores the ON/GOSUB statement and goes to the next line in the program.

Keep in mind that whenever you branch to a subroutine, you must return to the BASIC command that immediately follows the GOSUB command. In the **Program listing**, this corresponds to line 70, which instructs the program to cycle back to line 50 and start over again with the menu display. Thus the only way to end the program is to select menu option 3, End the Program. Program execution then returns to line 60 with M equal to three, and the ON/GOSUB command forces a jump to line 90, where the program ends.

The menu-display subroutine, lines 700–790, is relatively straightforward.

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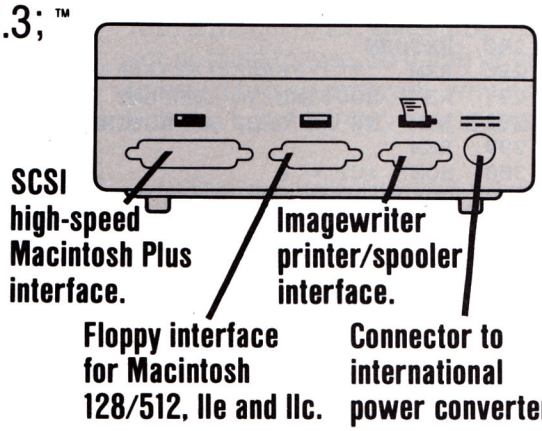

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Program listing. Data-Base Matchmaker.

```
1   REM    DATABASE MATCH MAKER
2   REM    DEMO OF SEQUENTIAL
3   REM    SEARCH THROUGH ARRAY
4   REM    CONT'G DATABASE INFO.
5   REM     **********************
6   REM   BY DAN BISHOP
7   REM      APPLESOFT ADVISOR
8   REM    INCIDER MAGAZINE-12/86
9   REM     **********************
10  READ NE: DIM CD$(NE),CN$(NE),ED$(NE)
20 L$ = "---------": READ T$
30 L$ = "---" + L$ + L$ + L$ + L$
40  GOSUB 200: REM  READ DATA
50  GOSUB 700: REM  DISPLAY MENU
60  ON M GOSUB 300,800,90
70  GOTO 50
90  HOME : END
96  REM  **********************
97  REM
98  REM  COMMONLY USED ROUTINES
99  REM
100  INPUT "PRESS <RETURN> TO CONTINUE...";X$
110  HOME : RETURN
115  REM
116  REM
120  HOME : PRINT T$: PRINT L$
130  PRINT "COMPANY / CARD NO.","EXP.DT."
140  PRINT L$: PRINT : RETURN
145  REM
146  REM
150  PRINT CT;". ";CD$(CT)
160  PRINT "     "CN$(CT);
170  IF  LEN (CN$(CT)) < 11 THEN  PRINT ,;
180  PRINT ,ED$(CT)
190  RETURN
196  REM     **********************
197  REM  ROUTINE TO READ DATA
198  REM
199  REM
200  READ NR
210  FOR J = 1 TO NE
220  READ CD$(J),CN$(J),ED$(J)
230  NEXT J
240  RETURN
296  REM    **********************
297  REM  ROUTINE TO DISPLAY
298  REM  NR RECORDS AT A TIME
299  REM
300  HOME :CT = 0
310  GOSUB 120: FOR J = 1 TO NR:CT = CT + 1
320  GOSUB 150: REM  DISPLAY RECORD CT
330  IF CT = NE THEN J = NR
350  NEXT J: PRINT L$
360  GOSUB 100: IF CT = NE THEN 390
370  GOTO 310
390  RETURN
496  REM     **********************
497  REM  DATA BLOCK FOR DATABASE FILES
498  DATA  13: REM  # OF ENTRIES IN LIST
499  DATA  CREDIT CARD INVENTORY
500  DATA  8: REM  # OF RECORDS/SCREEN
501  DATA  JACK'S PIZZA,"8-6211-48","12/99"
502  DATA  SUE'S SHOES, "421-37-8","05/88"
503  DATA  THE MERCANTILE,"0817-2553","11/86"
504  DATA  DRIVER'S LICENSE,"A-222115","08/89"
```

Listing continued.

A menu subroutine requires a series of PRINT commands to display the list of options (lines 700–740), a keyboard-entry command to obtain your selection (line 750), and a routine to validate the entry (line 760).

You can add a single prompt message to the INPUT command if you enclose it within quotes and separate it from the variable name by a semicolon. Note that although the prompt is for a numeric entry, INPUT assigns that entry to a string variable (M$) as a precaution against receiving Apple's ?REENTER prompt if you enter alphabetic information.

To validate the entry, the program converts M$ to its numeric equivalent in line 760 and assigns it to M with the M = VAL(M$) command. If you enter alphabetic information, M will end up with a value of zero. The program then checks M to be certain its value is one, two, or three. If it isn't, the program prints an error message on screen and redisplays the menu. When it detects a proper value for M, the program executes line 790 (RETURN), returning to the main program at line 60.

The subroutine in lines 300–390, which lists all the records in the data base, differs from last month's Data-Base Array listing in only one major area. Since this program displays data-base records for two different subroutines, I've moved the PRINT commands that handle the data display to lines 150–190, and they now comprise a separate subroutine. You can use GOSUB 150 in both subroutines to display the CT'th record. Similarly, I've changed the PRESS <RETURN> TO CONTINUE... prompt to a subroutine at line 100 so that you can use it from any point in the program.

Data-Base Search and Match

Two subroutines handle the search through the data base for a match between your input string and all or part of a company name. The first, located in lines 800 to 995, begins with a series of PRINT commands that prompt you to enter the string of characters for which you want to search. The subroutine then assigns this string to S$ and its length to S (lines 850 and 870). The statement in line 860 checks S$ for a null keypress, which would indicate your desire to abort this operation and return to the main menu. CT, the record counter, is set to zero in line 870 and tracks the extent of the search as it

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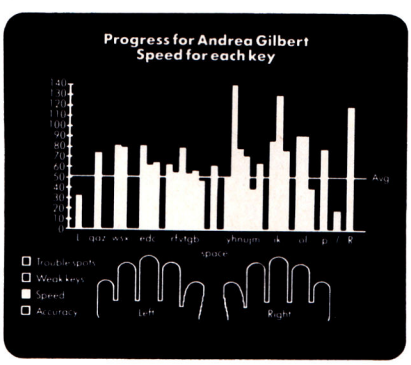

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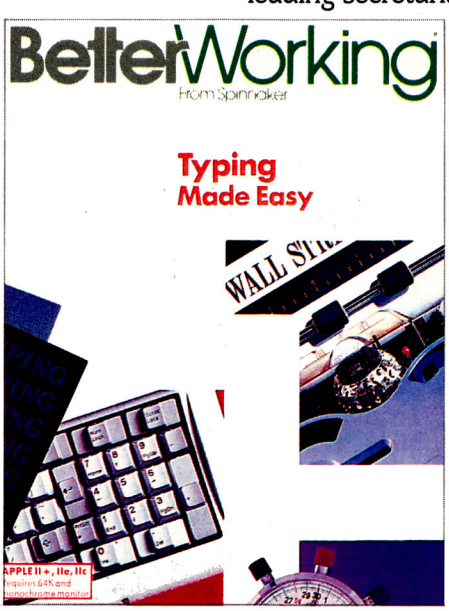

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progresses through the data base.

Line 880 calls the second subroutine (lines 1000–1095), which actually carries out the search by sequentially checking each record for a string of characters that matches S$. When it finds a matching record, it changes a flag variable F (initially set to zero) to one and returns program execution to line 890, where the record is displayed (GOSUB 120:GOSUB 150) and the prompt PRESS <M> FOR MORE; <Q> TO QUIT appears.

Lines 930–950 present an alternative to the INPUT command for keyboard entry. Applesoft BASIC uses the GET command to obtain a single-keystroke entry from the computer. With INPUT, you must press the return key to resume program execution; the GET command automatically resumes program execution the instant you press a key. The variable that accompanies GET stores the actual key you press; GET X$ (line 930) stores the value of the key you press in X$. Line 940 validates your selection and, if incorrect, returns to line 930 with no further prompt. If your response is accepted, it's printed on screen. Unlike INPUT, GET doesn't automatically echo keyboard entry to the display.

Although GET increases program efficiency by eliminating the need to press the return key, I've run into cases in which its use proved detrimental to program operation. One client for whom I wrote a custom accounting program took great pride in her typing speed. She was indeed fast, but not very accurate. She continually called on me to "fix" the program because it seemed to have a mind of its own. It took me some time to realize that the program was "misbehaving" because the keys my client pressed weren't the ones she intended. By changing the GET commands to INPUT, thus slowing her keyboard entry, the problem disappeared.

If you select Q to quit, the program cycles back to the main menu. If you select M to continue searching through the data base, the program first determines whether more records remain to be checked by comparing the record counter, CT, to the number of entries, NE (line 970). If further checks are needed, the program cycles back to line 880, where it executes the GOSUB 1000 command. If all records have been checked, the program displays the message NO

Listing continued.

```
505  DATA  HAPPY HOUR BAR & GRILL, "000-00-001","09/99"
506  DATA  SALLY'S HAIR SALON, "5-928-3",
507  DATA  MARTY'S MECHANICS,"522-88-6178","02/88"
508  DATA  XYZ INVESTMENTS,"3-6211-8497","10/86"
509  DATA  SLICKER OIL CO.,"41-28545","08/88"
510  DATA  JOE'S TOOL CO.,"83214","09/90"
511  DATA  LE CAFE CLUB,"523-523-9929","01/87"
512  DATA   HARRY'S HEALTH CLUB,"21-88-44-669789","02/92"
513  DATA   OLIVE'S GAS-M-UP,"499-276-366",
696  REM    **********************
697  REM  ROUTINE TO DISPLAY MENU
698  REM
699  REM
700  HOME : PRINT T$: PRINT L$: PRINT
710  PRINT "ENTER THE NUMBER OF YOUR SELECTION...": PRINT
720  PRINT "      1. LIST ALL CARDS."
730  PRINT "      2. SEARCH FOR A CARD."
740  PRINT "      3. END THE PROGRAM."
750  PRINT : INPUT "  CHOICE ====> ";M$
760 M =  VAL (M$): IF M < 1 OR M > 3 THEN  PRINT "**** INVALI
     D  CHOICE ****": PRINT : GOTO 720
790  RETURN
796  REM    **********************
797  REM  ARRAY SEARCH ROUTINE
798  REM
799  REM
800  HOME : PRINT T$: PRINT L$
810  PRINT : PRINT "YOUR CREDIT CARD LIST WILL BE SEARCHED"
820  PRINT "FOR ANY PARTIAL MATCH ON COMPANY NAME.": PRINT
830  PRINT "ENTER THE CHARACTER STRING TO BE USED"
840  PRINT "FOR THE SEARCH (OR PRESS RETURN):"
850  PRINT : INPUT "====>  ";S$
860  IF S$ = "" THEN  RETURN
870 S =  LEN (S$):CT = 0
880  GOSUB 1000
890  IF F = 0 THEN  GOTO 980
900  GOSUB 120: GOSUB 150
910  PRINT
920  PRINT "PRESS <M> FOR MORE; <Q> TO QUIT. ===> ";
930  GET X$
940  IF X$ <  > "M" AND X$ <  > "Q" THEN 930
950  PRINT X$
960  IF X$ = "Q" THEN  GOTO 995
970  IF CT < NE THEN  GOTO 880
980  PRINT : PRINT "NO FURTHER MATCHES FOUND."
990  GOSUB 100
995  RETURN
996  REM    **********************
997  REM    SEQUENTIAL ARRAY
998  REM    SEARCH ROUTINE
999  REM
1000 F = 0:CT = CT + 1
1005  HOME : PRINT "SEARCHING ENTRY "CT"..."
1010 L =  LEN (CD$(CT))
1020  IF S > L THEN 1090
1030 D = L - S + 1
1040  FOR J = 1 TO D
1050 D$ =  MID$ (CD$(CT),J,S)
1060  IF D$ = S$ THEN J = D + 10:F = 1
1070  NEXT J
1080  IF J >  = D + 10 THEN  GOTO 1095
1090  IF CT < NE THEN  GOTO 1000
1095  RETURN
```

End of Listing.

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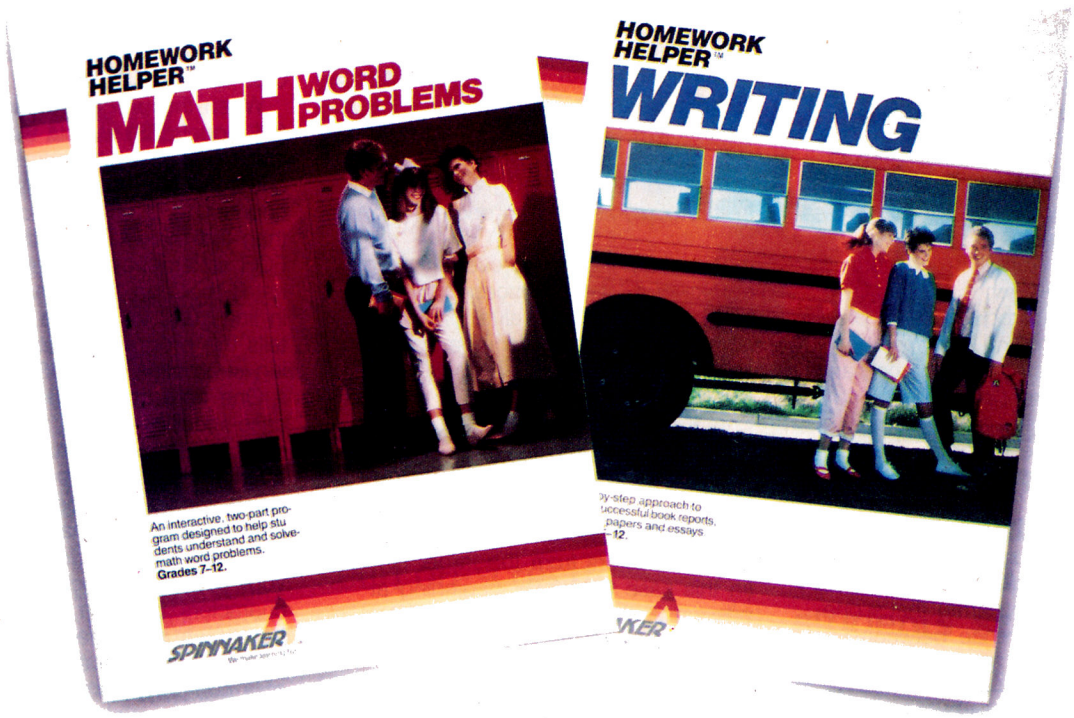

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FURTHER MATCHES FOUND and returns to the main menu.

String Matching

The heart of the search process lies in lines 1000–1095, where your Apple compares S$, which contains the characters for which you're searching, with pieces of the company name of the same length. The subroutine first displays a prompt to indicate which record the computer is scanning. (This keeps you from thinking your machine has died, when, in fact, a long search is in progress.) The program then assigns the value of the number of characters in the company name for the current record to L; if S, the length of the search string, is greater than L, the program automatically skips that record and goes on to the next.

If S is less than or equal to L, the program then calculates a value for D (the number of search positions possible in the company name) that's one more than the difference between L and S. For example, if S$ is OIL (S equals three characters) and the company name is SLICKER OIL CO. (L equals 15 characters), there are 15 – 3 + 1, or 13, possible positions to check for a match. The program first compares OIL to SLI, then to LIC, then to ICK, then to CKE, and so on, until either it finds a match or the last comparison (OIL to CO.) falls through. In this case, the search ends after the ninth try.

The MID$ function proves to be the perfect tool for this process. Since you can calculate a value for D (the number of necessary comparisons), you can place the comparison instructions inside a loop:

```
FOR J = 1 TO D
  D$ = MID$(CD$(CT),J,S)
  IF D$ = S$ THEN J = D + 10:F = 1
NEXT J
```

The MID$ function extracts consecutive characters from the target string (in this case CD$(CT)), beginning at position J. If CD$(CT) is SLICKER OIL CO., and S equals three, then the first time through the loop (J equals one), D$ is given a value SLI: MID$("SLICKER OIL CO.",1,3). The second time through, D$ will have the value LIC: MID$("SLICKER OIL CO.",2,3), and so on.

When the program finds a match (D$ equals S$), it sets the flag variable, F, to one and immediately terminates the loop by setting J, the loop counter, to D plus ten, or ten more than the maximum specified in the FOR statement. This not only terminates the loop, but serves as a flag in line 1080 to indicate a match, and tells the program to return to the calling subroutine at line 890.

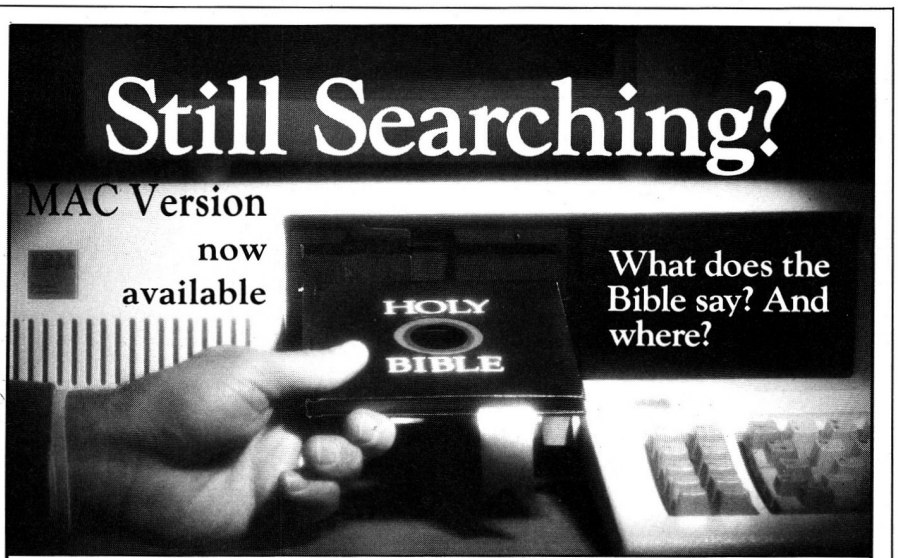
One note of caution: This routine is case-specific—that is, the character string must *exactly* match the sequence of characters in the target string, including upper- and lowercase characters, or no match will be found. This can be a problem, particularly if your system isn't set up for lowercase characters, because lowercase wouldn't be shown on screen. Naturally, you'd tend to press the shift key at the start of a company name: If you're not careful, you might type sLICKER into your data statement. It'll still appear on your display as SLICKER, but, if you try to match it with SLI, your Apple won't find a match.

Conclusion

Data-Base Matchmaker adds the first manipulation subroutine to your data-base program. Using a data-array structure makes programming this subroutine simpler and more efficient. In future columns, I'll add more to this simple program, including a data-base sort routine and routines that illustrate how to use your data base to gather statistical information.

On p. 86 in this issue, you'll find an application of this program that contains a routine to print mailing labels from your data base, either from the entire list or from individual records you select using the Matchmaker routine described above. By noting the similarities and differences between Data-Base Matchmaker and the mail-list program, you can better understand the alterations you need to make to set up your own data-base application. ■

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



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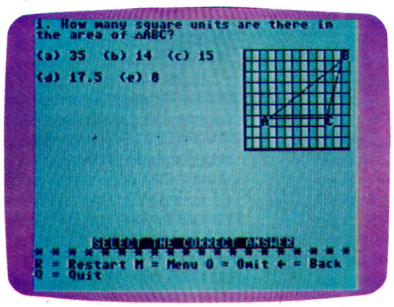

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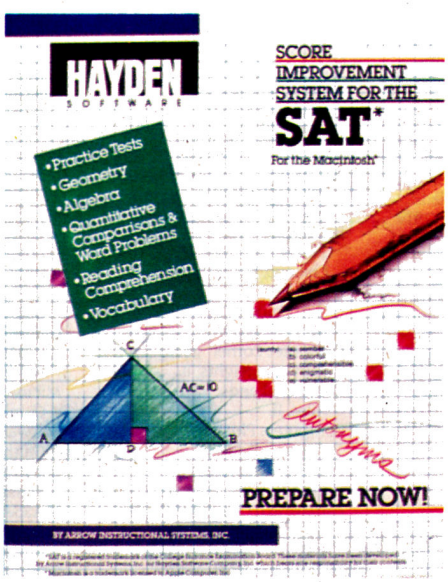

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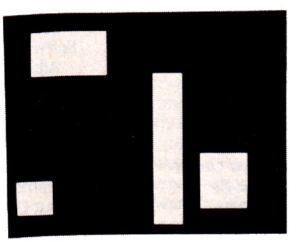

Photo 2. Example using the FILL routine.

BSAVE it with different parameters. FILL should be saved so that it doesn't cross a page boundary. Once you relocate FILL, be sure to change the CALL statement to reflect its new location. You will also have to relocate HIMEM to protect the routine in its new location.

When using FILL, be certain that the point you HPLOT before calling the routine is inside the object you want to fill. If the point lies on the border or outside of an object, you'll get some strange results. ■

28

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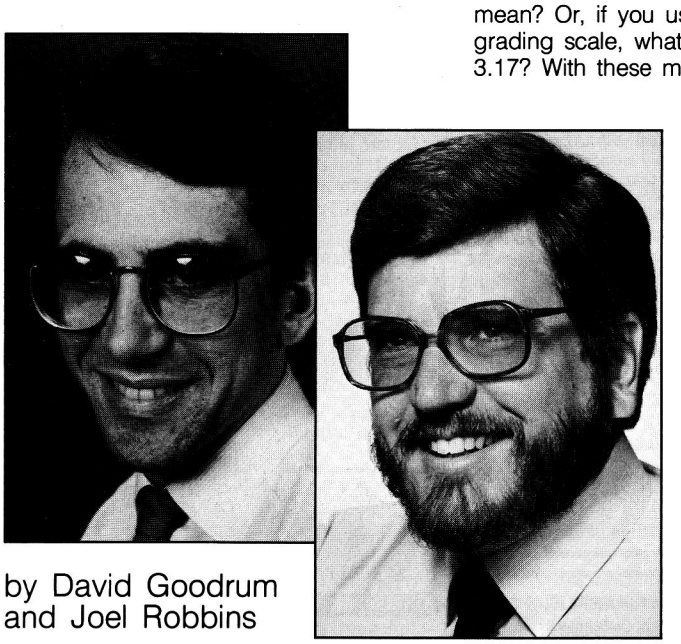
"By converting scores and letter grades to percentages, this BASIC program can help teachers find the perfect grading system."



by David Goodrum
and Joel Robbins

If you're having trouble finding the perfect grading method, you're not alone. Most teachers are still looking for a grading system that can provide easy bookkeeping for themselves and meaningful progress reports for their students.

In their search for the ideal grading system, many teachers have embraced computers to help them communicate better with students, and they periodically post printouts so that students can see their grades and course standings without having to perform mathematical gymnastics or check the teacher's personal gradebook.

Unfortunately, teachers who use nonpercentage grading scales may find that some numerical scores make little sense to students. For instance, is the letter grade corresponding to a score of 34 out of 42 obvious to a student? What does "582 total points" mean? Or, if you use a 12- or 4-point grading scale, what grade is 7.25 or 3.17? With these methods, you often have to explain your grading system to your students and interpret scores for them throughout the year.

Scale Utility (see the **Program listing**) is a BASIC program that will help you switch to percentage grading by solving the problem of converting and presenting scores, averages, and letter grades. Scale Utility lets you create different overall grading scales, enter any top raw score for an individual assignment scale, and produce clear printouts.

A Convenient Conversion Program

To begin, boot up a DOS 3.3 or ProDOS disk and type in the **Program listing**. When you finish, type SAVE SCALE.UTILITY and press the return key. Now type RUN to start the program. At the first prompt (TOUCH <F> IF THIS IS YOUR FIRST RUN, ELSE TOUCH <RETURN>), type F. The second prompt asks you to type a name for the scale you want to create; always use a meaningful name. Let's use SIXTY-FIVE, since the lowest passing grade in the sample scale is 65.

The next 12 prompts ask for cutoff points for the high end of each letter grade. The program won't ask for the highest grade for A+, since A+ will always represent percentages above the cutoff point for an A, up to 100 percent. If you don't want to use A+, type 100 in response to the first prompt. For the sample scale, enter the cutoff points shown in the **Table**.

The program will automatically save this sample scale. Now follow these steps to print the conversion chart and the grading scale:

1) Choose the <P> option from the main menu.

2) Make sure your printer is on.

3) Type 100 at the prompt for the highest raw score.

4) Type 60 at the prompt for the lowest percentage.

5) Type 1 at the prompt for the increment between raw scores.

6) Type N in response to the rounding-up prompt. There may be a delay of several seconds if you're printing a long scale—the program takes time to run through the loops before it comes to the lowest percentage to print.

7) Choose <H> from the menu to print the grade scale.

8) Again, make sure your printer is set and press the return key.

You now have an overall grading scale and conversion chart to post or to reduce on your copier and include with your course syllabus. Raw scores and percentages will be the same on the conversion chart, because it simply provides you and your students with a complete listing of the correlation between percentages and letter grades. The <H> selection from the main menu will give you the same information in a shortened form.

To illustrate the way you'd normally use the program, again choose <P> to print, and enter 28, 55, .5, and N in response to the prompts. You can use this printout for grading a test worth a raw score of 28. You'd grade the test, match the raw score with the raw score and percentage on the printout, and write the percentage and/or letter grade at the top of the test.

It's a good idea to start a folder of conversion charts for future reference, so that you won't have to reprint scales that use the same top raw score. The program can handle up to 20 different scales saved on disk.

Entering Your Own Scale

Now choose the <C> option from the main menu to create a new scale. Enter the scale you currently use or plan to try next term. Type a name for the new scale and type in the appropriate cutoff points. Remember, the rounding-up option in Scale Utility adds half of one percent to students' grades, so that, for example, 79.5 will become 80 percent.

Print the new scale to verify the numbers you've entered. Remember to save your scale by choosing <S> from the main menu. If you don't like a scale, don't save it; if you've already saved it, use the delete option from the main menu to remove it from the list. You must save a scale you want to keep before you create, delete, or load another scale. The program requires you to keep at least one scale on the list. To clear all the scales, choose <F> at the FIRST RUN prompt when you run the program.

Once you've created and saved a new grading scale, you can enter the top raw score and print all the percentages and letter grades for each

Table. *Cutoff points for sample letter-grade scale.*

A	98
A–	95
B+	92
B	89
B–	86
C+	83
C	80
C–	77
D+	74
D	71
D–	68
F	64

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The **quikLoader**™ provides *absolute* security of programs. The program can be put onto an EPROM chip, plugged into the quikLoader, and the quikLoader plugged into any slot of the APPLE™][,][+, or //e. The program cannot be misplaced, and it *will* load when needed.

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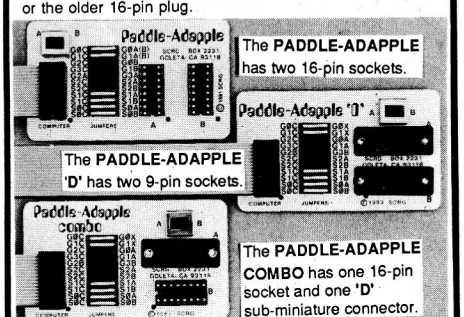

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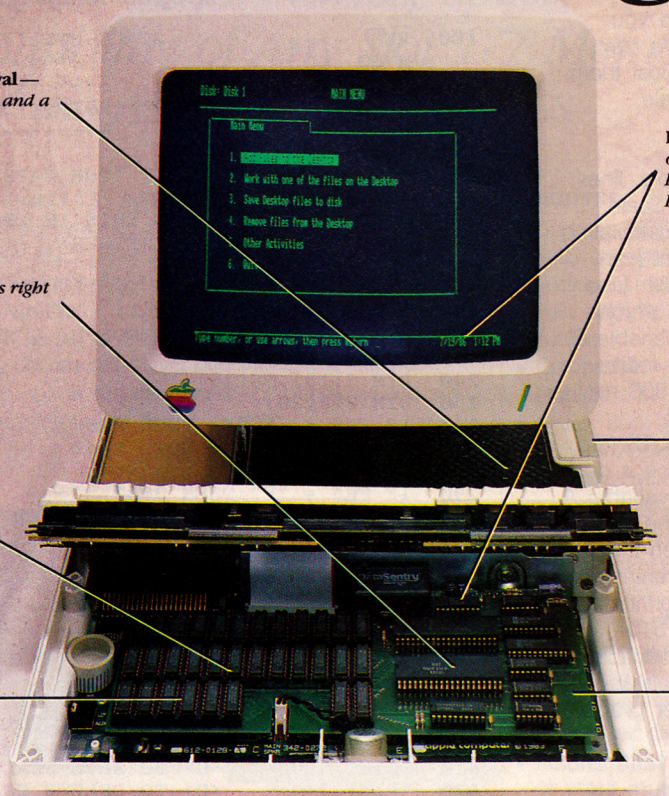

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raw score any time you give a quiz, assignment, or test.

Whichever grading method you use, you can print each test's raw score and percentage and post them with your overall grading scale.

Program Operation

For you BASIC programmers, lines 1000–1470 are the heart of Scale Utility. The program begins calculating with your choice of increment (variable IB) from lines 1150–1152. Line 1210 adds IB to variable B, which represents the raw scores. Variable B increases in value with each loop—notice that lines 1270 and 1300 return to 1210.

The program divides B by TS (top score) in line 1220 to produce a decimal value, then stores it as variable A and multiplies it by 100 in line 1230 to create a percentage. When that percentage is equal to or greater than LP (the lowest score to be printed), the computer executes lines 1310–1430, which determine when variable A passes a cutoff point (G), then assigns the corresponding letter grade to variable G$.

The GOSUB 1310 in line 1260 and the RETURN in line 1440 return the program to lines 1270 and 1280 to print the raw score (B), the percentage (A), and the letter grade (G$). The loop continues until A is equal to or greater than 100, then the program kicks out in line 1290, passing the RETURN in 1440.

A Helpful Hint

If you use lines 160–200, the program will erase all your scales and start a new list. You can delete these lines and resave Scale Utility *after* you've made and saved your first scale, so that you don't inadvertently erase your old lists by starting from scratch.

Next month we'll tell you how to use a data base to organize an educational conference, summer camp, or workshop.■

David Goodrum and Joel Robbins are the developers of SchoolWorks, AppleWorks templates for education, published by K-12 MicroMedia Publishing. Write to them at RR#5, Box 450, Syracuse, IN 46567.

Program listing. Scale Utility.

```
100  REM                SCALE UTILITY 1986 BY JOEL ROBBINS WIT
     H DG
120  REM                    ------------------------
130  REM                ** INSTRUCTIONS AND OPENING MENU **
140  REM                    ------------------------
150  CLEAR
160  HOME : VTAB 4: PRINT "THE CAPS LOCK KEY SHOULD BE DOWN."
170  PRINT
180  PRINT "TOUCH <F> IF THIS IS YOUR FIRST RUN,"
190  PRINT "ELSE TOUCH <RETURN>.";
200  GET FR$: HOME
210 N = 1
220 D$ =  CHR$ (4)
230  REM  ** CHR$(4)=CONTROL-D, & MUST BE USED BEFORE ALL DOS
      COMMANDS.
240  DIM G(15),G$(15)
250  DIM OP$(20)
260  IF FR$ <  > "F" THEN 280
270 TN = 1:N$ = "1": GOTO 2040
280  HOME
290  IF FR$ = "F" THEN 3040
300  VTAB 4: INVERSE : HTAB 11: PRINT " * SCALE UTILITY * ";
310  PRINT : NORMAL : PRINT
320  PRINT "              BY JOEL ROBBINS"
330  PRINT
340  PRINT " CONVERT RAW SCORES TO PERCENTAGES AND"
350  PRINT " LETTER GRADES.  FIRST CREATE OR LOAD A"
360  PRINT " GRADING SCALE.  THEN PRINT A CONVERSION CHART."
370  PRINT
380  PRINT " TOUCH:
390  PRINT "        <L> TO LOAD SCALE"
400  PRINT "        <P> TO PRINT CONVERSION"
410  PRINT "        <S> TO SAVE SCALE"
420  PRINT "        <D> TO DELETE SCALE"
430  PRINT "        <C> TO CREATE SCALE"
440  PRINT "        <H> TO PRINT HARDCOPY OF SCALE"
450  GET NE$
460 MK = 0
470  IF NE$ = "P" THEN 1050
480  IF NE$ = "L" THEN 4040
490  IF NE$ = "C" THEN 4030
500  IF NE$ = "D" THEN 4040
510  IF NE$ = "H" THEN 9006
520  IF NE$ <  > "S" THEN 450
530  IF N = 1 THEN 280
540  GOTO 4040
570  DATA            A,A-,B+,B,B-,C+,C,C-,D+,D,D-,F
1000  REM                    ------------------------
1010  REM                    *** CONVERSION CHART ***
1020  REM  ** USER ENTERS TOP RAW SCORE & LOWEST % AND PROGRA
     M
1030  REM  ASSIGNS PERCENT AND LETTER GRADE, THEN PRINTS RESU
     LTS **
1040  REM                    ------------------------
1050  HOME : PRINT : PRINT : PRINT
1060  IF OP$(TN) = "" THEN 7040
1070 B = 0
1080  INVERSE : PRINT "  TURN ON PRINTER AND ADJUST PAPER."
1090  PRINT : PRINT : PRINT : PRINT
1100  NORMAL : GOTO 1120
1110  HOME : PRINT : PRINT "CHECK THE NUMBERS AND ENTER THEM
     AGAIN."
1112  PRINT "THE INCREMENT CAN'T BE GREATER THAN"
1114  PRINT "THE TOP RAW SCORE."
1120  PRINT : INPUT "WHAT IS THE TOP RAW SCORE-";TS
1130  PRINT : INPUT "LOWEST PERCENTAGE YOU WANT PRINTED?";LP
1140  PRINT : IF LP < 1 OR LP > 100 THEN 1130
1150  PRINT : PRINT "ENTER THE INCREMENT BETWEEN RAW SCORES"
1152  INPUT "YOU WISH TO USE (.5, 1 etc.)";IB
1153  IF IB > TS THEN 1110
1154  IF IB < .1 OR IB > 10 THEN 1150
1160  PRINT : INPUT "DO YOU WANT ROUNDING?   Y  OR  N -->";R$
```

Listing continued.

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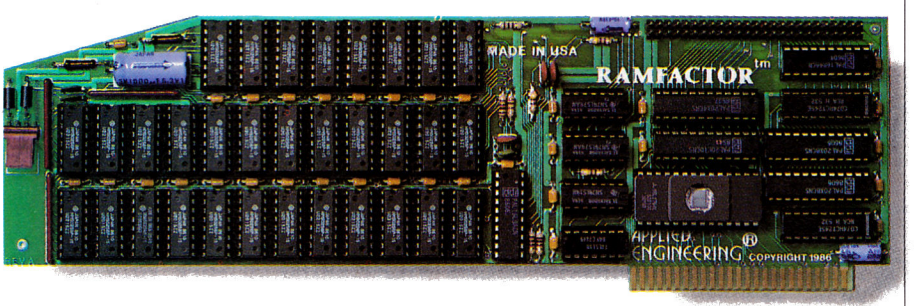

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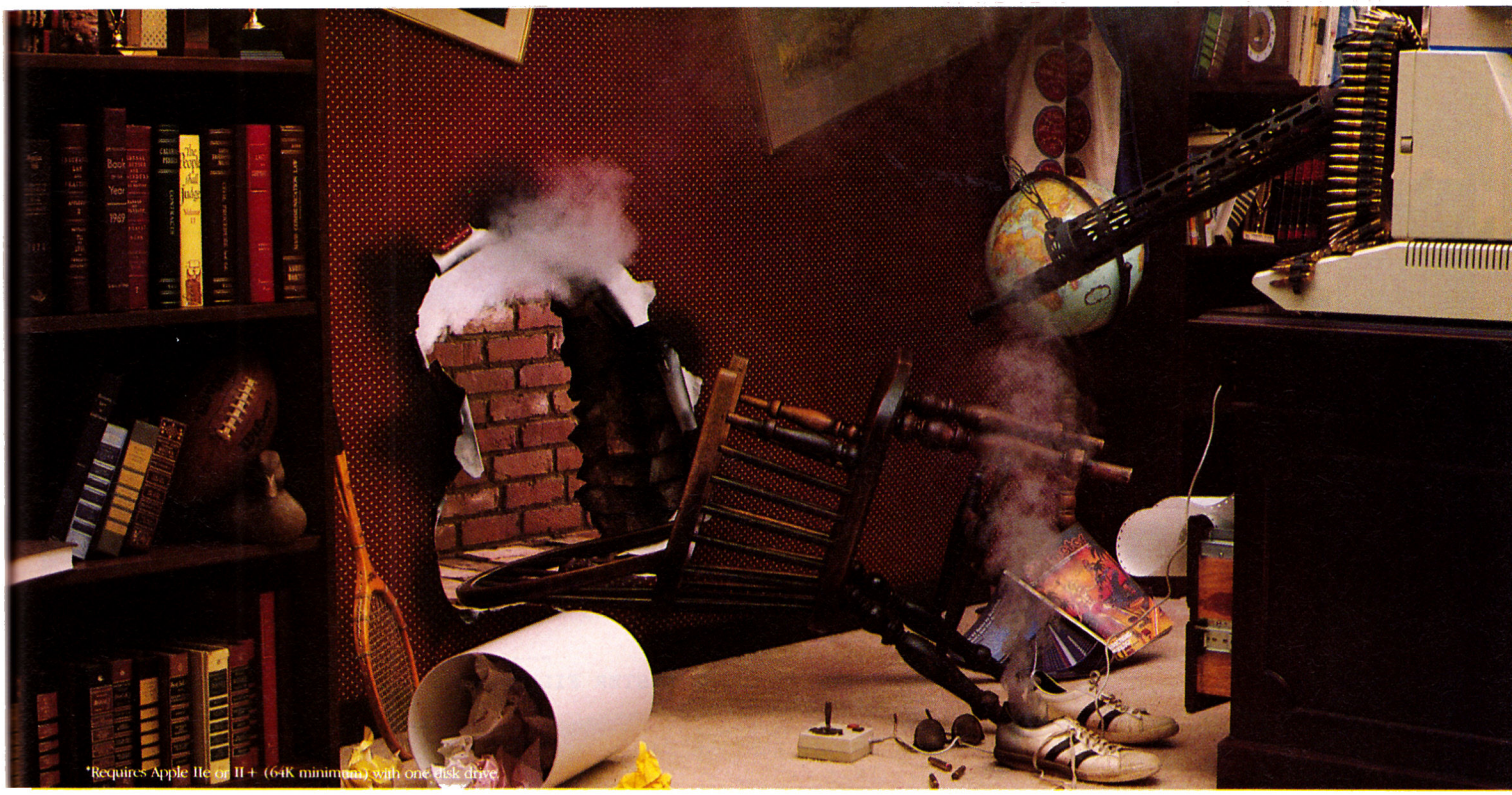
TEACHERS' CHOICE

Listing continued.

```
1170  IF IB > TS THEN 1110
1180  PRINT : PRINT D$;"PR#1"
1190  PRINT " TOP RAW SCORE IS "TS
1200  PRINT : PRINT "RAW SCORE   %      GRADE"
1210 B = B + IB
1215 B =  INT (B * 100 + .51) / 100
1220 A = B / TS
1230 A = A * 100
1240  IF R$ = "Y" THEN A = A + .51
1250 A =  INT (A)
1260  GOSUB 1310
1270  IF A < LP THEN 1210
1280  PRINT B"......";: HTAB 12: PRINT A"....."G$
1290  IF A =  > 100 THEN 1450
1300  GOTO 1210
1310  IF A < G(12) THEN G$ = "F"
1320  IF A > G(12) THEN G$ = "D-"
1330  IF A > G(11) THEN G$ = "D"
1340  IF A > G(10) THEN G$ = "D+"
1350  IF A > G(9) THEN G$ = "C-"
1360  IF A > G(8) THEN G$ = "C"
1370  IF A > G(7) THEN G$ = "C+"
1380  IF A > G(6) THEN G$ = "B-"
1390  IF A > G(5) THEN G$ = "B"
1400  IF A > G(4) THEN G$ = "B+"
1410  IF A > G(3) THEN G$ = "A-"
1420  IF A > G(2) THEN G$ = "A"
1430  IF A > G(1) THEN G$ = "A+"
1440  RETURN
1450  HOME : PRINT : PRINT : PRINT : PRINT
1460  PRINT : PRINT D$;"PR#0"
1470  GOTO 280
2000  REM                  ---------------------
2010  REM       ** CREATE SCALES BY ENTERING CUT-OFF POINTS.
2020  REM          UTILITY STORES THEM AS VARIABLE G(_). **
2030  REM                  ---------------------
2040  PRINT : PRINT "       * CREATE A GRADING SCALE *"
2050  PRINT : PRINT
2060 N =  VAL (N$)
2070  IF FR$ = "F" THEN 2100
2080 N = N + 1
2090  IF N > 20 THEN 280
2100 NY = N
2110  PRINT "TYPE A NAME FOR THE SCALE (DON'T START"
2120  PRINT "WITH NUMBERS OR USE A NAME LISTED": INPUT "ABOVE
     )."";OP$(NY)
2130  FOR ZB = 1 TO N
2140  IF OP$(NY) = OP$(ZB - 1) THEN 2110
2150  NEXT ZB
2160 PW =  ASC (OP$(NY))
2170  IF PW < 65 THEN 2110
2180  PRINT : PRINT
2190 U = U + 1
2200  IF U > 12 THEN TN = N: GOTO 280
2210  READ PP$
2220  GOTO 2240
2230  PRINT  CHR$ (7);: PRINT  CHR$ (7);
2240  PRINT "WHAT IS THE HIGHEST PERCENTAGE THAT"
2250  PRINT "COULD BE CONSIDERED A(N) -"
2260  PRINT : PRINT "            ";PP$" = ";
2270  INPUT G(U)
2280  IF G(U) > 100 THEN 2230
2290  IF U = 1 THEN 2310
2300  IF G(U - 1) <  = G(U) THEN 2230
2310 G$(U) =  STR$ (G(U))
2320  GOTO 2180
3000  REM                        ---------------------
3010  REM  ** OPENS DISKFILE NAMED LISTER AND WRITES NAMES OF
      SCALES **
3020  REM                        ---------------------
3030 NY = N + 1
3040  IF OP$(NY) = "" THEN 7090
3050  FOR ZB = 1 TO N
```

Listing continued.



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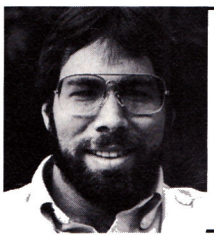

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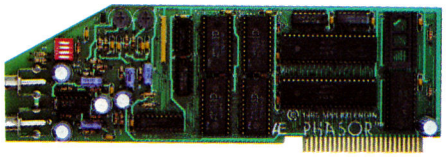

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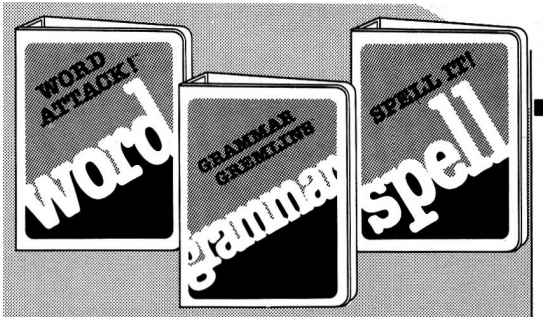

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Circle 19 on Reader Service Card.

Listing continued.

```
3060  IF OP$(NY) = OP$(ZB - 1) THEN 280
3070  NEXT ZB
3080  PRINT D$: PRINT D$;"OPENLISTER"
3090  PRINT D$;"WRITELISTER"
3100  IF FR$ = "F" THEN 3120
3110 N = N + 1
3120 OP$(N) = OP$(NY)
3130 N$ =  STR$ (N)
3140  IF MK = 1 THEN N = N - 2
3150  PRINT N$
3160  FOR H = 1 TO N
3170  PRINT OP$(H)
3180  NEXT H
3190  PRINT D$;"CLOSELISTER"
3195  PRINT : PRINT "SAVING  ";OP$(N)
3200  GOTO 6030
4000  REM                    ---------------------
4010  REM  ** OPENS LISTER FILE, READS & PRINTS SCALE NAMES T
     O SCREEN
4020  REM                    ---------------------
4030 U = 0: RESTORE
4035 TN = 0
4040  PRINT D$
4050  PRINT D$;"OPENLISTER"
4060  PRINT D$;"READLISTER"
4070  HOME : VTAB 2: PRINT "SCALES ON DISK - "
4080  INPUT N$
4090 N =  VAL (N$)
4100  FOR H = 1 TO N
4110  INPUT OP$(H)
4120  PRINT H;" - ";OP$(H)
4130  NEXT H
4140  PRINT D$;"CLOSELISTER"
4150  IF NE$ = "S" THEN 3030
4160  IF NE$ = "D" THEN 8006
4170  IF NE$ = "C" THEN 2040
5000  REM                    ----------------------
5010  REM  ** USER ENTERS SCALE NAME & UTILITY OPENS FILE AND
     READS IT
5020  REM                    ----------------------
5030  PRINT
5040  PRINT : INPUT "TYPE NUMBER OF SCALE TO BE USED - ";TN$
5050  IF TN$ = "" THEN 280
5060 TN =  VAL (TN$)
5070 TH =  ASC (TN$): IF TH < 49 OR TH > 57 THEN 5030
5080  IF TN > N THEN 5040
5090  PRINT D$;"OPEN";OP$(TN)
5100  PRINT D$;"READ";OP$(TN)
5110  FOR CC = 1 TO 12
5120  INPUT G$(CC)
5130 GG =  VAL (G$(CC))
5140 G(CC) = GG
5150  NEXT CC
5160  PRINT D$;"CLOSE";OP$(TN)
5170  GOTO 280
6000  REM                    ---------------------
6010  REM      ** OPENS FILE & SAVES TO DISK THE CUT-OFF POIN
     TS **
6020  REM                    ---------------------
6030  PRINT  CHR$ (4): PRINT D$;"OPEN";OP$(N)
6040 FR$ = ""
6050  PRINT D$;"WRITE";OP$(NY)
6060  FOR CC = 1 TO 12
6070  PRINT G$(CC)
6080  NEXT CC
6090  PRINT D$;"CLOSE";OP$
6100  GOTO 280
7000  REM                    ---------------------
7010  REM  ** ERRORS IN DATA ENTRY ARE CAPTURED AND SENT HERE
     . THEN THE
7020  REM  THEN USER RETURNS TO RIGHT PLACE TO CONTINUE WITH
     UTILITY **
7030  REM                    ---------------------
```

Listing continued.

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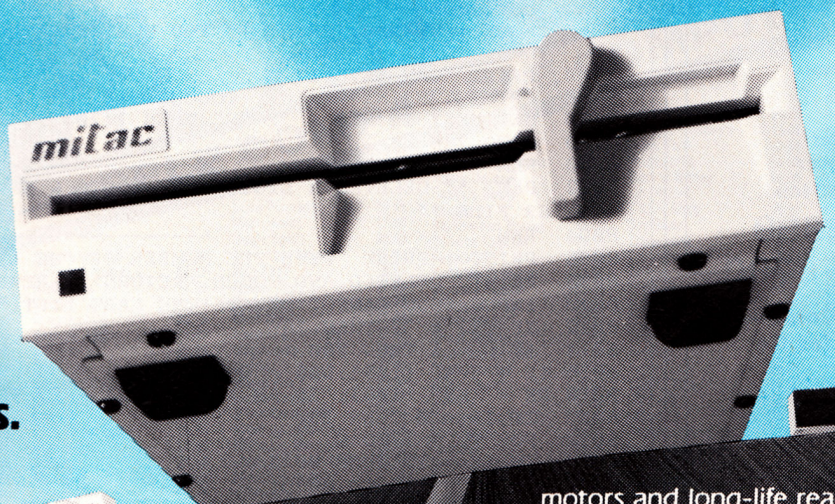

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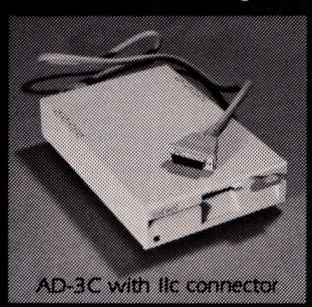
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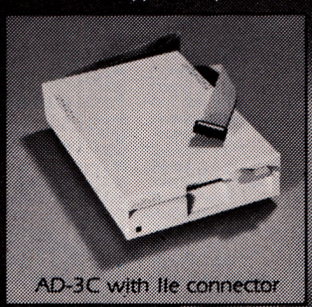
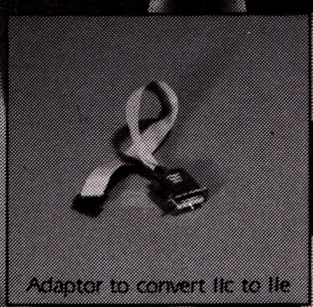

AD-3C with IIe connector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Listing continued.

```
7040  HOME : VTAB 8: PRINT "EITHER CREATE A GRADING SCALE AND
      SAVE
7050  PRINT "IT OR LOAD ONE YOU SAVED EARLIER."
7060  PRINT : PRINT "          TOUCH <N>"
7070  GET NE$: IF NE$ >  < "N" THEN 7070
7080  GOTO 280
7090  HOME : VTAB 8: PRINT "  YOU MUST CREATE A SCALE BEFORE
     YOU"
7100  PRINT "CAN SAVE IT."
7110  PRINT : PRINT "        TOUCH <N>"
7120  GET NE$: IF NE$ <  > "N" THEN 7120
7130  GOTO 280
8000  REM                    ------------------------
8002  REM  ** DELETES A LIST, THEN SORTS & SAVES REVISED LIST
     ER FILE **
8004  REM                    ------------------------
8006  PRINT : PRINT "TYPE THE NUMBER OF THE LIST TO BE"
8008  PRINT "DELETED AND TOUCH <RETURN>.  REMEMBER -"
8010  INPUT "YOU CANNOT DELETE THE LAST LIST.";IE$
8012  IF IE$ = "" THEN 280
8014  IF N = 1 THEN 280
8016 IE =  VAL (IE$):DE$ = OP$(IE)
8018 RE =  ASC (IE$): IF RE < 49 OR RE > 57 THEN 8006
8020  IF IE = 0 THEN 150
8022  FOR TT = 1 TO N
8024  IF IE = TT THEN 8032
8026  IF RP = 1 GOTO 8036
8028  GOTO 8040
8032 RP = 1
8034 OP$(TT) = ""
8036  IF TT = N THEN 8042
8038 OP$(TT) = OP$(TT + 1)
8040  NEXT
8042  PRINT  CHR$ (4);"DELETE"DE$
8044 N = N - 1
8046  PRINT D$;"OPEN LISTER"
8048 N$ =  STR$ (N)
8050  PRINT D$;"WRITE LISTER"
8052  PRINT N$
8054  FOR TT = 1 TO N
8056  PRINT OP$(TT)
8058  NEXT
8060  PRINT D$;"CLOSE LISTER"
8062  GOTO 150
9000  REM              ---------------------------
9002  REM   ** PRINT CURRENT SCALE TO PRINTER AND RETURN TO M
     ENU
9004  REM              ---------------------------
9006  IF OP$(TN) = "" THEN 7040
9008  HOME : PRINT : PRINT : INVERSE
9010  PRINT "  TURN ON PRINTER AND ADJUST PAPER THEN PRESS <R
     ETURN>  "
9012  NORMAL : GET DG$
9014  PRINT : PRINT D$;"PR#1"
9016  PRINT : PRINT "**** GRADING SCALE ****": PRINT : PRINT
9017  IF G(1) = 100 THEN 9020
9018  PRINT "A+    100 - ";G(1) + 1
9020  PRINT "A      ";G(1)" - ";G(2) + 1
9022  PRINT "A-     ";G(2)" - ";G(3) + 1
9024  PRINT "B+     ";G(3)" - ";G(4) + 1
9026  PRINT "B      ";G(4)" - ";G(5) + 1
9028  PRINT "B-     ";G(5)" - ";G(6) + 1
9030  PRINT "C+     ";G(6)" - ";G(7) + 1
9032  PRINT "C      ";G(7)" - ";G(8) + 1
9034  PRINT "C-     ";G(8)" - ";G(9) + 1
9036  PRINT "D+     ";G(9)" - ";G(10) + 1
9038  PRINT "D      ";G(10)" - ";G(11) + 1
9040  PRINT "D-     ";G(11)" - ";G(12) + 1
9042  PRINT "F      ";G(12)"   AND BELOW"
9044  PRINT : PRINT : PRINT : PRINT : PRINT D$;"PR#0"
9046  GOTO 280
```

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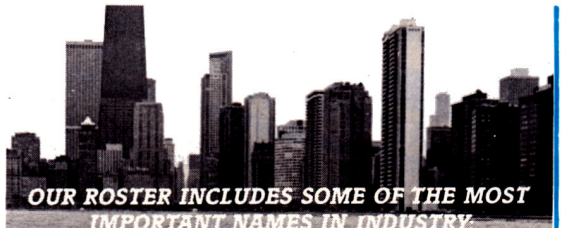

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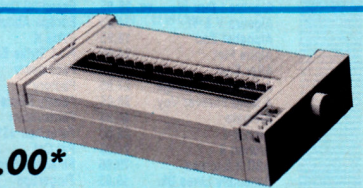

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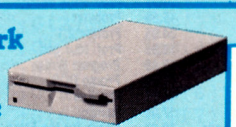

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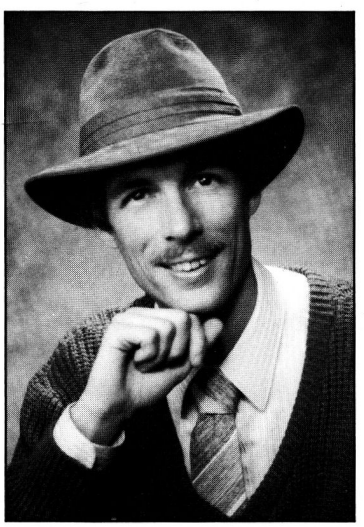

by Roger Wagner

In my last column (October 1986, p. 98), we explored simple addition in assembly language. This month, you'll learn how to do subtraction with both positive *and* negative numbers and results.

First, let's start with a simple subtraction operation. In assembly language, you perform subtraction very much as you do addition, except that a *borrow* is required. Rather than using a separate borrow flag for this operation, the computer uses the opposite of the carry as a borrow. That is, the subtract command treats a set carry flag as a *clear borrow* (or no borrow taken), and a clear carry as a *set borrow* (borrow unit taken).

The command for subtraction is SBC, for SuBtract with Carry. The command SEC, for SEt Carry, clears the borrow. (Remember, things look backward here). A subtraction equivalent of our addition program from the last installment of Right of Assembly would look like the program in **Listing 1**. (The same Applesoft BASIC program we used for the addition programs last time can call this program; see **Listing 2**.)

This assembly-language routine works fine for subtracting one positive number from another, but how can we handle negative numbers? Think of negative numbers as a way of handling certain common arithmetic possibilities, such as subtracting a larger number from a smaller one (for example, 3 − 5 = −2), or adding a positive number to a negative number (such as 5 + −8 = −3) to obtain a given result.

To be successful, we must come up with a system that will be consistent with the arithmetic of signed numbers as you now know it.

The Sign Bit

A good first approach to the problem is to arbitrarily decide to use one of the 8 bits in a byte as a flag to indicate whether the number is positive or negative. If the bit is clear, the number will be positive. If the bit is set, your Apple will regard the number as negative. We'll use bit 7 (the eighth bit). Thus +5 would be represented as 00000101, while −5 would be 10000101.

Note that by sacrificing bit 7 to show the sign, we're now limited to values from −127 to +127. When using 2 bytes to represent a number, such as an address, this means we'll be restricted to a range of −32767 to +32767. Sound familiar? If you've ever noticed the limits for integer variables in Applesoft BASIC, you'll recognize this as the same range.

Although this new scheme is pleasing in terms of simplicity, it does have one minor drawback—it doesn't work. If we attempt to use this result to add a positive and a negative number, we get disturbing effects:

```
    +5     00000101
+   -8     10001000
-------    --------
    -3     10001101 = -13
```

Although we should get −3 as the result, with our signed-bit system we get −13. Tsk, tsk—there must be a better way. Well, with the help of what looks like numeric magic, we can get something that works, although some of the conceptual simplicity gets lost in the process.

To perform this wizardry we'll invoke the idea of number *complements*. You've probably heard of complementary angles—two angles that add up to 180 degrees. In binary math, the simplest complement is called a *ones' complement*. You get the ones' complement of a number by reversing each one and zero throughout the original binary number. Let's try this as a negative number.

For example, the ones' complement of five (00000101, or +5) would be 11111010 = −5. For eight, you'd figure 00001000 = +8 and 11110111 = −8.

This process is essentially one of *definition*—that is, we declare to the world that 1110111 will now represent −8 without specifically trying to justify it. (Undoubtedly there are lovely mathematical proofs of such things that present marvelous ways of spending an afternoon, but for our purposes, a general notion of the system will be sufficient.) Fortunately, computers are very good at following arbitrary numbering schemes without asking, "But why is it that way?"

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RIGHT OF ASSEMBLY

Listing 1. Assembly-language subtraction program.

```
                        1     ********************************
                        2     *    SUBTRACTION EXAMPLE #1    *
                        3     *          12/1/86             *
                        4     *       MERLIN ASSEMBLER       *
                        5     ********************************
                        6     *
                        7             ORG   $300
                        8     *
                        9     N1      EQU   $06         ; $06,07
                        10    N2      EQU   $08         ; $08,09
                        11    RSLT    EQU   $0A         ; $0A,0B
                        12    *
0300: 38                13    START   SEC               ; SET CARRY
                                                          = 'CLEAR
                                                          BORROW'
0301: A5 06             14            LDA   N1          ; GET LOW BYTE
                                                          OF
                                                          1ST VALUE
0303: E5 08             15            SBC   N2          ; SUBTRACT LOW
                                                          BYTE
                                                          OF 2ND VALUE
0305: 85 0A             16            STA   RSLT        ; PUT IN LOW
                                                          BYTE OF
                                                          'RSLT'
0307: A5 07             17            LDA   N1+1        ; GET HIGH
                                                          BYTE OF
                                                          1ST VALUE
0309: E5 09             18            SBC   N2+1        ; SUBTRACT N2
                                                          WITH
                                                          BORROW IF
                                                          NEEDED
030B: 85 0B             19            STA   RSLT+1      ; PUT IN HIGH
                                                          BYTE
                                                          OF 'RSLT'
030D: 60                20    END     RTS               ; DONE!
```

Listing 2. BASIC code for calling assembly-language subtraction program.

```
0  REM MACHINE SUBTRACTION ROUTINE
10  HOME
20  INPUT "N1,N2?";N1,N2
30  N1 = ABS(N1): N2 = ABS(N2):REM NO NEG. NUMBERS YET
35  IF N2 > N1 PRINT "WE CAN'T DO THAT YET!":END
40  POKE 6,N1 -  INT (N1 / 256) * 256: POKE 7, INT (N1 /
    256)
50  POKE 8,N2 -  INT (N2 / 256) * 256: POKE 9, INT (N2 /
    256)
60  CALL 768
70  PRINT : PRINT "RESULT IS: "; PEEK (10) + 256 *  PEEK
    (11)
80  PRINT : GOTO 20
```

Now let's see if we're any closer to a working system:

```
    +5      00000101
+   -8      11110111
-------     --------
    -3      11111100 = -3
            (0000011 = +3)
```

Hmmmm...this seems to work pretty well. Let's try another:

```
    -5      11111010
+   +8      00001000
-------     --------
     3      00000010 = 2
            (Plus Carry)
```

We seem to be closer. At least our answers will be right half the time. Don't despair—there's a solution. It's called the *twos' complement* system. The only difference between this and the ones' complement system is that after deriving the negative number by reversing each bit of its corresponding positive number, we add one.

Seems mysterious (although obviously adding one to the second example would have fixed it). Look at

Continued on p. 133.



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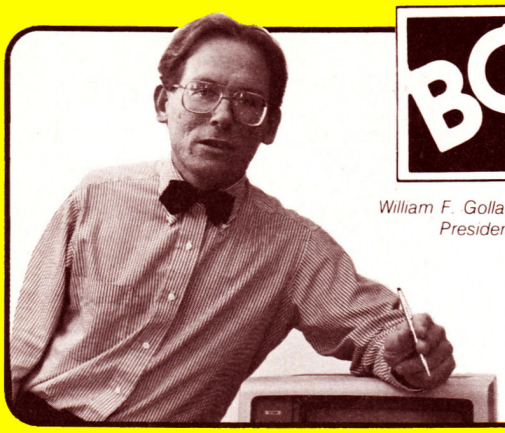

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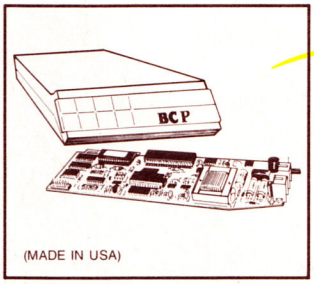

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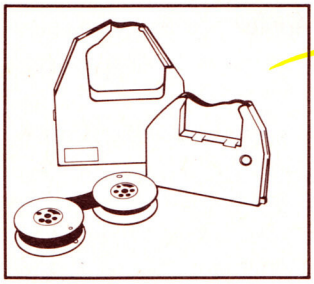

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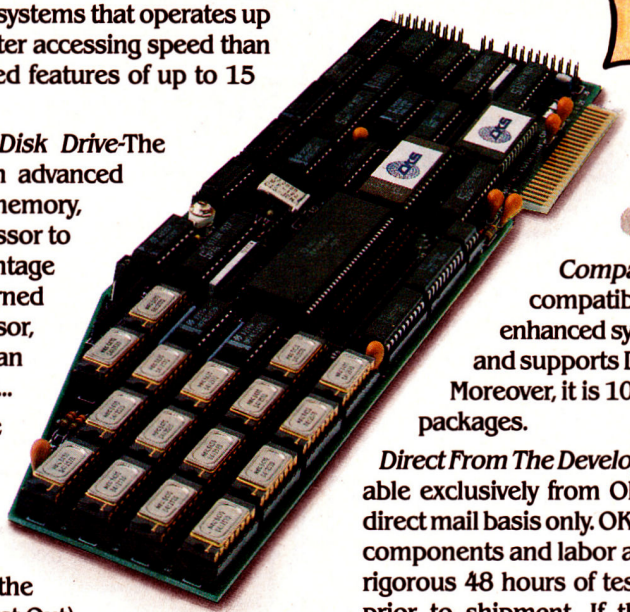

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Continued from p. 128.

Figure 1 to see how this works. Next let's try the two earlier operations—see **Figures 2** and **3**.

At last! It works in both cases. It turns out that *twos'-complement* math works in all cases. Most of the time, you probably won't need negative numbers, but you've at least gained a little insight into the reason integer variables are limited to the size they are; if you do ever have to deal with negative numbers, you'll be prepared.

The best thing about this lesson, though, is that we can now use the term *sign bit*. A flag in the status register, usually called the sign flag, provides easy testing of bit 7. Whenever a byte is loaded into a register, or any arithmetic operation takes place, the sign flag will be conditioned according to the final state of bit 7 (the sign bit). For example, LDA #$80 sets the sign flag to one (set), whereas LDA #$40 clears the flag. The commands BPL (for Branch PLus) and BMI (for Branch MInus) test this condition.

Testing Status

Regardless of whether you're using signed numbers or not, these instructions can be very useful for testing bit 7 of a byte. Bit 7 is often used in various parts of the Apple to indicate status. For example, the keyboard location $C000 sets the sign bit (we've also been calling it the high bit) whenever you press a key. Until now, we've always tested by comparing the value returned from $C000 to the value #$80, such as in **Listing 3**.

This program stays in a loop until you press a key. If the value returned in $C000 is equal to or greater than $80, your Apple detects a keypress. A more elegant method is to use the BPL command, as in **Listing 4**.

In this case, as long as the high bit stays clear (that is, no keypress), your computer will take the BPL and continue the loop. As soon as you press a key, bit 7 will be set to one, and the BPL will fail. The strobe is then cleared and the return done.

The open-apple ($C061) and closed-apple ($C062) keys (equivalent to pushbuttons on game controllers) work in a similar way. If bit 7 of the corresponding memory location is set, someone's pushing the button (see **Listing 5**).

Figure 1. Computing complements.

```
For -5:                                          For -8:

     5 = 00000101                                     8 = 00001000
            ↓          ones' complement...
          11111010                                        11110111

            ↓          now add one...

    -5 = 11111011                                   -8 = 11111000
```

Figure 2. Subtracting with complements.

```
   +5   00000101            -5   11111011
+  -8   11111000         +  +8   00001000
   -3   11111101 = -3       +3   00000011 (Plus Carry)
```

Figure 3. Does 1111101 equal −3?

```
starting number:     00000011 = 3

ones' complement:    11111100
add 1:                     +1

twos' complement:    11111101 = -3   (perfect!)
```

Listing 3. Testing for keypresses by comparison.

```
                  ********************************
                  *      KEYTEST PROGRAM #1      *
                  *           12/1/86            *
                  *       MERLIN ASSEMBLER       *
                  ********************************
                  *
                            ORG  $300
                  *
                  KYBD      EQU  $C000
                  STROBE    EQU  $C010
                  *
0300: AD 00 C0    CHECK     LDA  KYBD        ; GET VALUE
                                               FROM
                                               KYBD
0303: C9 80                 CMP  #$80        ; KEYPRESS?
0305: 90 F9                 BCC  CHECK       ; NO, TRY
                                               AGAIN
                  *
0307: 8D 10 C0    CLR       STA  STROBE      ; CLEAR
                                               KEYBOARD
030A: 60          END       RTS
```

Listing 4. Testing for keypresses with the BPL command.

```
                    1    ********************************
                    2    *      KEYTEST PROGRAM #2      *
                    3    *           12/1/86            *
                    4    *       MERLIN ASSEMBLER       *
                    5    ********************************
                    6    *
                    7             ORG   $300
                    8    *
                    9    KYBD     EQU   $C000
                    10   STROBE   EQU   $C010
                    11   *
0300: AD 00 C0      12   CHECK    LDA   KYBD       ; GET VALUE
                                                     FROM
                                                     KYBD
0303: 10 FB         13            BPL   CHECK      ; NO KEYPRESS,
                                                     TRY
                                                     AGAIN
                    14   *
0305: 8D 10 C0      15   CLR      STA   STROBE     ; CLEAR
                                                     KEYBOARD
0308: 60            16   END      RTS
```

Listing 5. Testing for button pressing.

```
                    1    ********************************
                    2    *         BUTTON TEST          *
                    3    *           12/1/86            *
                    4    *       MERLIN ASSEMBLER       *
                    5    *************************"*****
                    6    *
                    7             ORG   $300
                    8    *
                    9    PB0      EQU   $C061      ; PUSHBUTTON 0
                                                     OR
                                                     OPEN-APPLE
                                                     KEY
                    10   *
0300: AD 61 C0      11   CHECK    LDA   PB0        ; GET STATUS
                                                     BYTE
0303: 10 FB         12            BPL   CHECK      ; AGAIN IF NO
                                                     BUTTON
                                                     PUSH
                    13   *
0305: 60            14   END      RTS
```

Listing 6. BPL used to terminate loop.

```
ENTRY   LDY #$50      ; STARTING VALUE FOR THE LOOP
LOOP    DEY           ; Y = Y - 1
        BPL LOOP      ; AS LONG AS Y IS POSITIVE (I.E. < $80)
DONE    RTS
```

Listing 7. BMI used to terminate loop.

```
ENTRY   LDY #$A0      ; STARTING VALUE FOR THE LOOP
LOOP    INY           ; Y = Y + 1
        BMI LOOP      ; AS LONG AS Y IS NEGATIVE (I.E. > $7S)
DONE    RTS
```

You can also use BPL and BMI to terminate a loop of less than 128 cycles that must end when the Y register passes zero (see **Listings 6** and **7**). In the first example, the Y register will "wrap" from $00 to $FF when it passes zero, causing the BPL to fail, thus terminating the loop. In the second example, the wrap is from $FF to $0, and BMI is used. The main drawback to this approach is that your loop counter must always be either positive or negative until the critical point. In other words, you couldn't start at $FF and count down to zero, because $FF is already negative, and so the BPL wouldn't work to keep the loop going.

Happy Appling!■

Roger Wagner is the author of Assembly Lines: The Book *and is president of Roger Wagner Publishing, publisher of Merlin and MerlinPro assemblers. Write to him at Roger Wagner Publishing, 10761 Woodside Avenue, Suite E, P.O. Box 582, Santee, CA 92071.*

CORRECTION

Line 30 in Listing 4 of the August 1986 Right of Assembly (p. 86) contains an error. The following line should be substituted:

```
30    LDA  PTR+1
```

This puts the current value of PTR+1 into the accumulator for the comparison that immediately follows.

This is the last installment of Right of Assembly. But programmers will soon find plenty to think about in a new inCider *column dedicated to getting inside the Apple IIGS.*

Programming the Apple IIGS will be a challenge for those of you used to traditional Apple II's; Macintosh programmers will feel more at home. The IIGS has more software in ROM ("firmware") than the original Apple II had RAM, along with "linker" software and the anticipated ProDOS 16.

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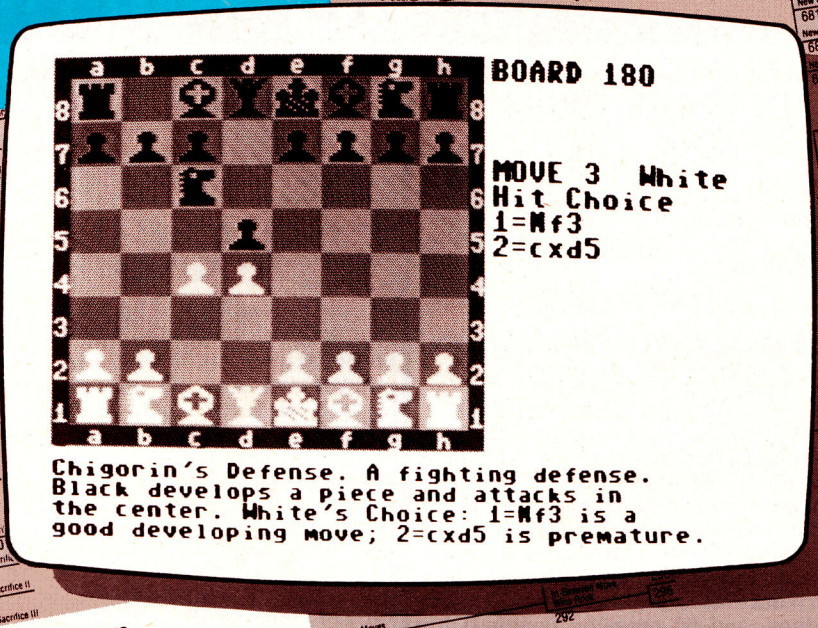

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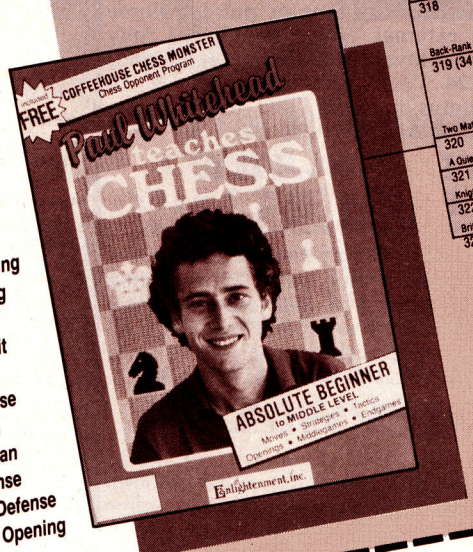

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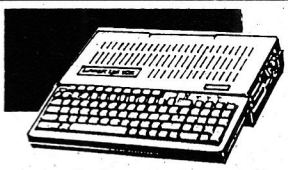

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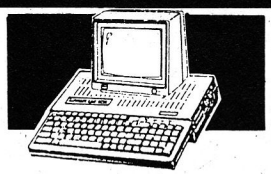

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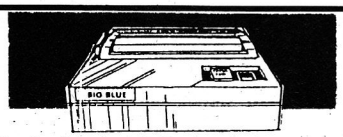

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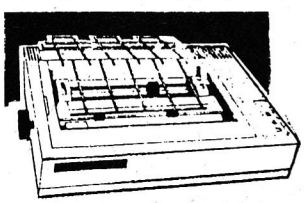

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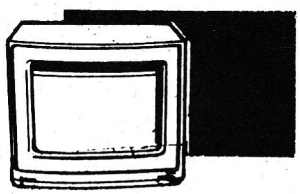

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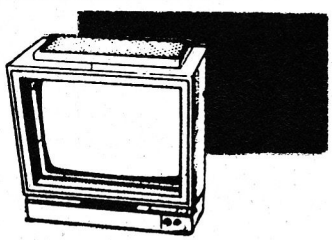

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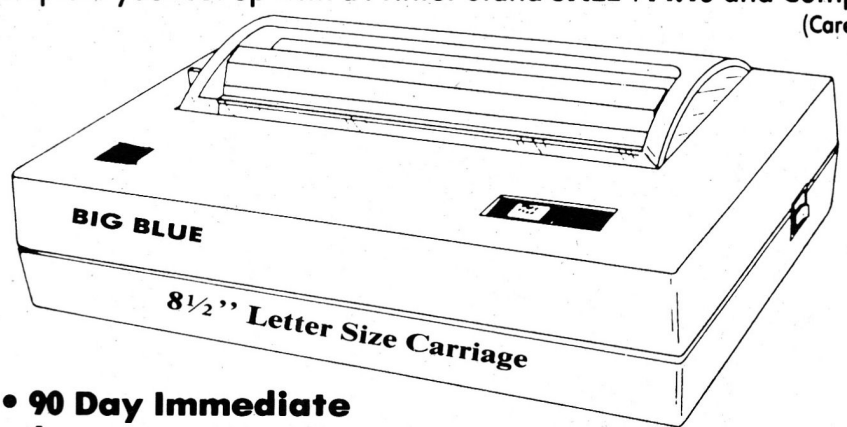

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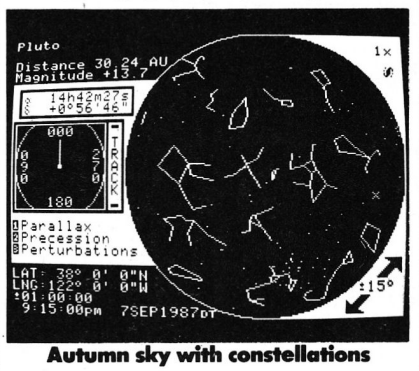
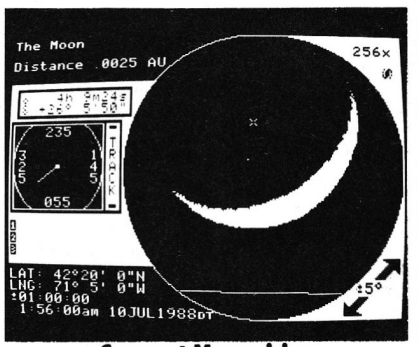


Autumn sky with constellations



Crescent Moon rising

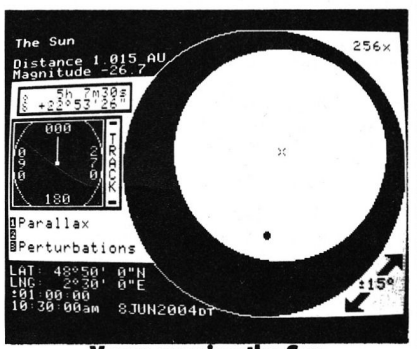


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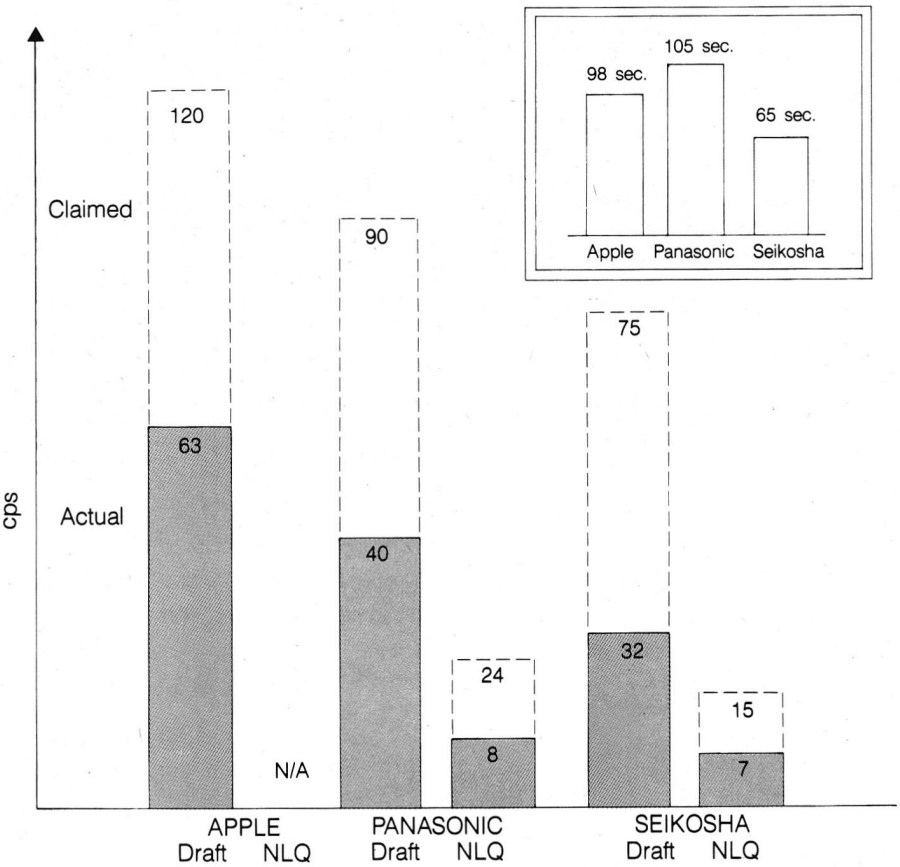
Figure. *The Apple ImageWriter I, Panasonic KX-P1080AP, and Seikosha SP-1000AP's claimed and actual draft and NLQ print speeds. Inset: The printers' times to produce a MousePaint graphic.*



Continued from p. 41.

both compatibles and the ImageWriter, appear in the **Figure**.

The first task involved printing a 7½-page draft document, testing both long-haul speed and paper-handling efficiency; the second was to print a one-page business letter in NLQ mode. The Panasonic was marginally faster than the Seikosha in both tests, though the ImageWriter had the quickest draft output. The text quality of both printers is very nearly the same; it's a matter of opinion whether you prefer the Panasonic's slightly darker and thicker or the Seikosha's slightly more detailed font.

For graphics (printing a full-page MousePaint picture), the Seikosha proved 33 percent faster than the second-place ImageWriter, but clearly sacrifices print quality. Compared to both its rivals, the SP-1000AP's dots are lighter, spaced further apart, and of inconsistent quality.

The question of which printer is better is further complicated by the matter of compatibility itself. The Seikosha succeeds in faithfully reproducing every ImageWriter control code and function, but the Panasonic falls short. According to its own documentation, the KX-P1080AP doesn't know how to interpret control codes pertaining to downloadable fonts, reverse linefeeds, and some obscure form-handling features. To be fair, few commercial software packages make use of these codes anyway.

Which printer do I prefer? Quite frankly, neither. While the printers' low prices are attractive, the Panasonic proved to be poorly designed and too awkward for daily use; the Seikosha suffers from inconsistent graphics quality and painfully slow paper handling. For guaranteed compatibility and easy servicing, I'd stick with either the tried-and-true ImageWriter I or the NLQ- and color-capable ImageWriter II.■

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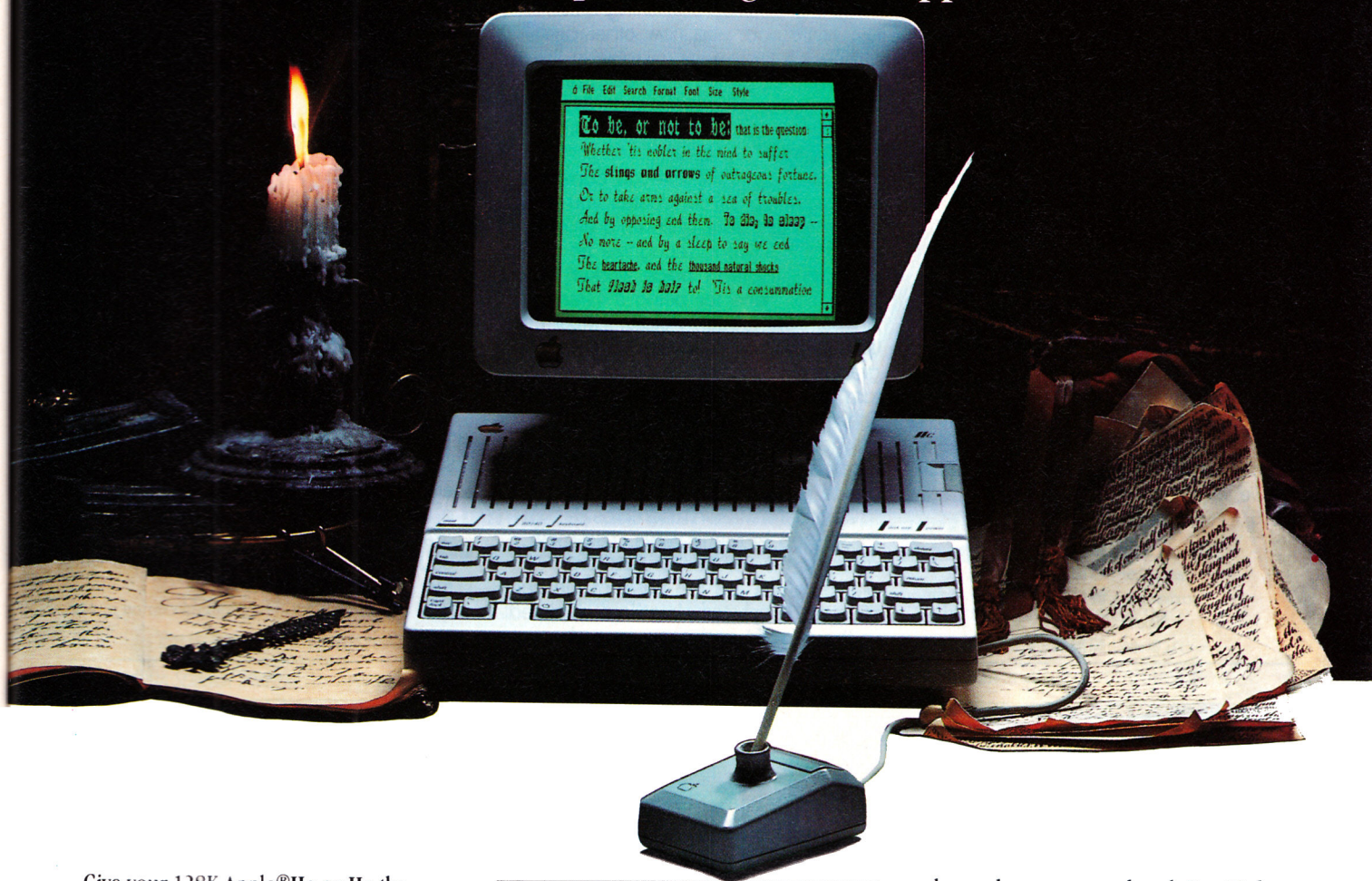

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Broderbund's Print Shop foreshadowed the desktop-publishing craze a few years ago, and now other programs are filling various roles in the do-it-yourself printing market. Springboard Software, producer of The Newsroom, has found a new niche with Certificate Maker.

Certificate Maker lets you construct a wide variety of certificates you can use to praise your children's or students' schoolwork, recognize an outstanding athlete or office worker, or honor someone for being a "Party Animal" or "Couch Potato." Most certificates contain predesigned titles and graphics and have space for a custom text citation, signature, and date. Other forms are more or less blank and let you design your own certificate, although you can't change or create graphics.

Certificate Maker resembles The Print Shop in many ways. The main difference is the use of 220 templates, which are the basis of the certificates. These templates are depicted in the manual and show you where the title, graphic, body of text, signature line, and date will appear. After selecting a template, you simply supply all the information required to fill out the certificate. You can print text in two sizes; 24 selectable borders and five selectable font styles help customize each award.

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The Limits of Fun

Certificate Maker is easy to use, and that's the positive side of the program. Even mouse-driven programs are harder to use, only because you can't always see what's on the pull-down menus.

Continued on p. 148.

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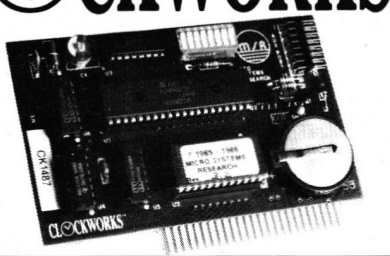

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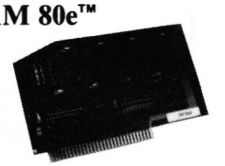

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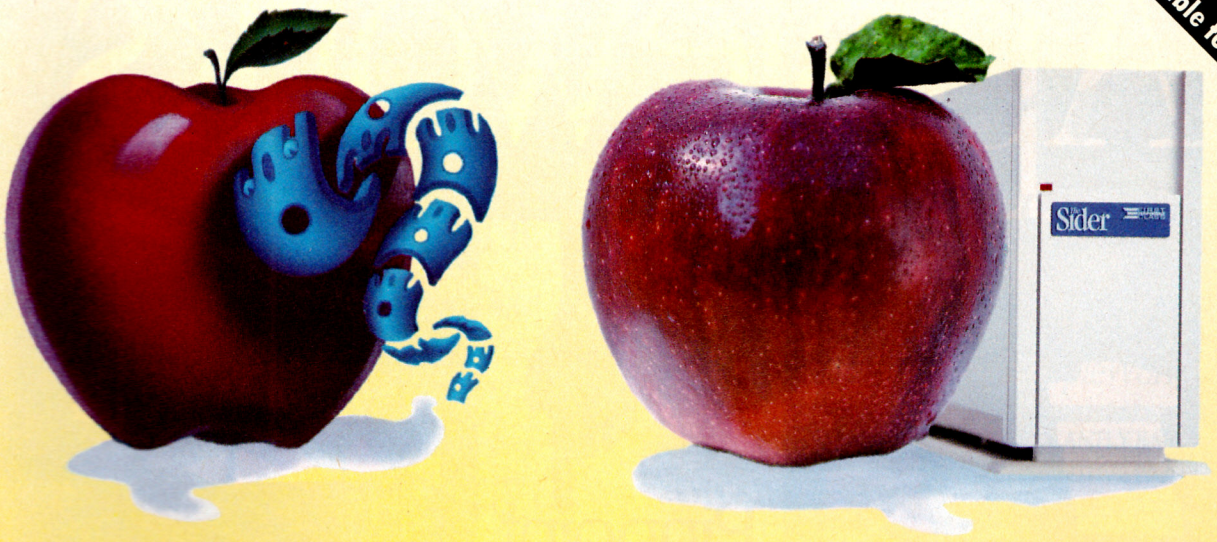

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Our Special Second Anniversary offer of **$499** is the affordable solution you've been waiting for. Operating your Apple® IIGS, II + or IIe can become cumbersome when you have to continuously shuffle and store floppies. First Class Peripherals has a solution to the "floppy shuffle"... the Sider.

Sider, a 10-megabyte subsystem, is an economic business tool that allows you to save time and money with a bootable hard disk that is reliable, fast and affordable.

The field-proven Sider was introduced in 1984. First Class Peripherals worked closely with Xebec to produce a quality hard disk that works with all major operating systems—DOS®, ProDOS®, CP/M® and Pascal®—and is interactive from one system to another. The Sider's hard disk has an access rate many times faster than that of a floppy disk, and the storage on the 10-megabyte hard disk drive is equivalent to 72 floppy disks... and that's a lot of floppies to shuffle.

The Sider offers expandability. Its hard disk drive is partitionable, allowing you to allocate up to four operating systems on the same disk. And you can daisy-chain any two Sider products for a maximum of 40-megabytes of storage.

No Matter How You Slice It... It's a Sweet Deal.

You may ask yourself how First Class Peripherals can offer a 10-megabyte drive for only **$499.** The answer is simple. This second anniversary price is possible through innovative technology, high capacity on-shore manufacturing and factory direct sales methods. By selling through direct mail, dealer and distribution expenses are avoided, so you pay only for the product and its components... nothing more.

In addition to its great price, the Sider also comes with Siderware—installation and support utilities, host adapter card, all necessary cables and a reassuring 15 day money-back guarantee. Simply order the Sider and use it for 15 days. If you're not completely satisfied, return it for a full refund. If you choose to keep the unit (we're sure you'll love it), you also receive First Class Peripheral's one year limited warranty.

So Make Your Apple Perfect and Order a Sider Today!

To receive your 10-megabyte Sider for only **$499,** your 20-megabyte Sider II for **$799** or your B-Sider tape drive for **$695,** simply order using the coupon below, or for faster service order by phone and charge to your VISA, MasterCard or American Express. **Call Toll Free: 1-800-538-1307, Extension 23.**



☐ **Yes,** please send me the items indicated:

- ☐ 10-Megabyte Sider @ **$499**
- ☐ 20-Megabyte Sider II @ **$799**
- ☐ B-Sider (tape drive) @ **$695**

Please add $15.00 for shipping and handling. Residents of CA and Nevada please add appropriate sales tax. Allow 4 to 6 weeks for delivery. Offer ends Dec. 31, 1986. Apple and ProDOS are trademarks of Apple Computer, Inc. CPM is a trademark of Digital Research, Inc.

I prefer to pay by:

- ☐ Check or money order enclosed (payable to First Class Peripherals)
- ☐ VISA ☐ MasterCard ☐ American Express

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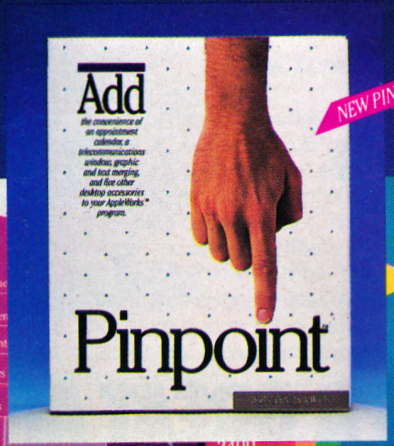
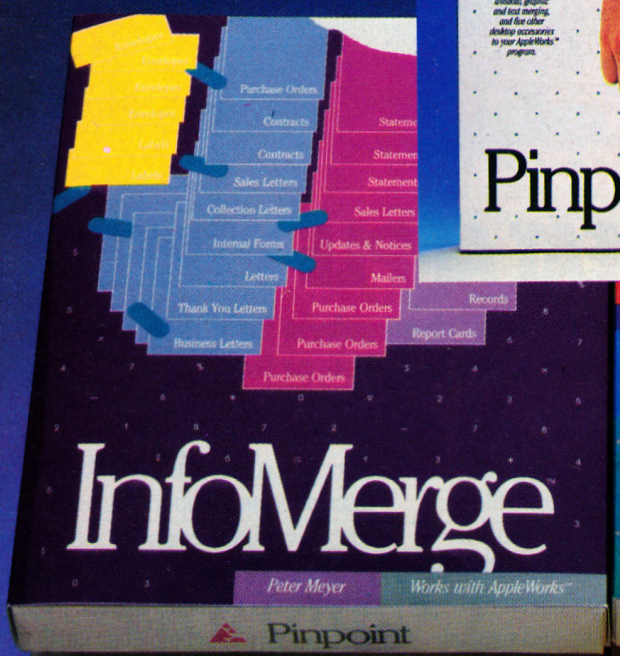
Circle 132 on Reader Service Card.

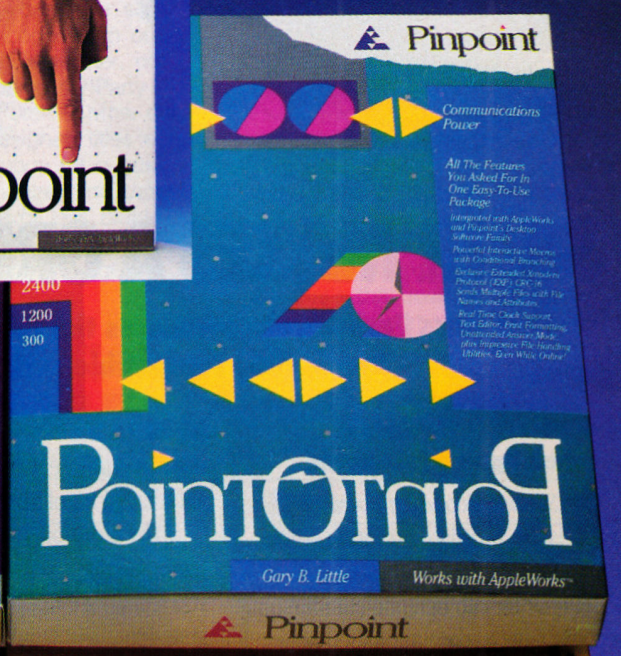
AppleWorks™

NEW PINPOINT 2.0

Works with AppleWriter™ and WordPerfect too!

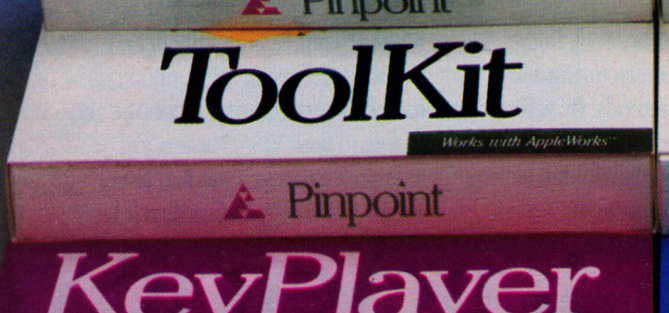






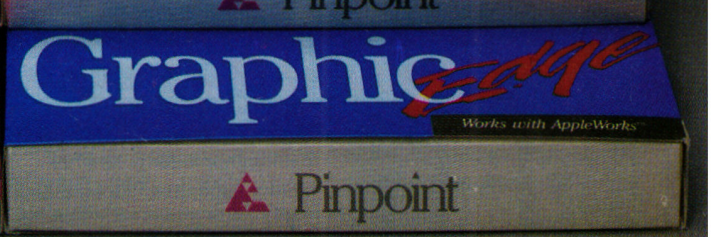












Power Tools

Circle 276 on Reader Service Card.

Power Tools

Over 500,000 people take a shortcut to work.

APPLEWORKS SURE

There are reasons why AppleWorks is the number one software program for all Apple II's, including the new Apple IIGS.

And why AppleWorks is likely to remain #1 for years to come.

Quite simply, it has the power to get your most-needed work done.

And when it comes to adding value to this world-wide best seller, look to Pinpoint Publishing.

You'll quickly discover the power and convenience of an integrated line of software programs designed specifically to extend the capabilities and add flexibility to the way you work.

Take a close look and compare the complete AppleWorks/ Pinpoint solution to any other. Only then will you appreciate the security and performance of Apple Computer's own software family.

Picture this on your Apple IIc, IIe or new Apple IIGS.

By Steve Cochard

CHART THE FUTURE

This Christmas, you could be producing stunning presentation graphics, charts and graphs, full-color slides and classroom view foils.

Introducing GRAPHIC EDGE. The charting and graphing program with the hot-link connection to Apple-Works' own spreadsheet data.

The color slide program with two million pixel resolution and nearly one million colors.

The color presentation program that works with Printshop and a dozen other new Apple II Series graphics programs all with cut-and-paste simplicity.

Starting at only $129.00 for your complete workstation software, GRAPHIC EDGE quickly grows into a complete production system ideal for school districts, small business and professional organizations.

Watch for GRAPHIC EDGE's exciting November introduction.

Pinpoint

These accessories make AppleWorks twice as efficient.

EIGHT GREAT REASONS

Add PINPOINT Desktop Accessories' complete selection of pop-up power tools to enhance your Apple-Works, or other selected ProDOS™ programs.

Just one keystroke away, this package contains the most-used AppleWorks productivity tools with great potential for growth built in! (See PINPOINT TOOLKIT, RUN-RUN, and KEY PLAYER™ below.)

Here's what's inside every PINPOINT Desktop Accessory box:

- Appointment Calendar
- Automatic Telephone Dialer
- Baby Word Processor / Pop-up Notepad
- Envelope Addresser/Labeler
- Four-Function Calculator
- Graphics and AppleWorks Document Merge Printing
- Memory-Writer Style Typewriter
- Telecommunications Window

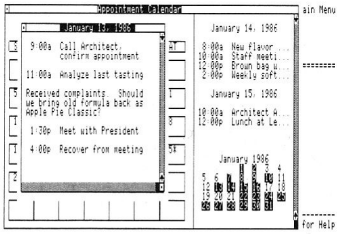
Each so well integrated with AppleWorks, you'll think of them as part of AppleWorks itself. And in a way, they are.

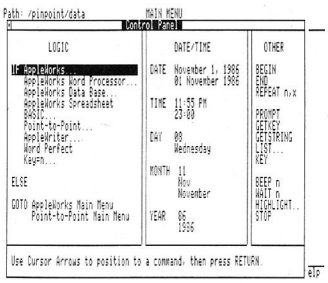
Yet, the amazing thing is, each desktop accessory is also a power-ful ProDOS application.

$149 **PP3/SP3**

PINPOINT and SPELLING CHECKER

Now, you can order both PINPOINT Desktop Accessories and the SPELLING CHECKER for one money-saving price. As a special bonus, we'll include our very helpful RAM ENHANCEMENT KIT, FREE!





KEYPLAYER

Apple II Forever. Apple IIc, Enhanced IIe and hot new Apple IIGS.

ToolKit

$89.00 **PP**
PINPOINT Desktop Accessories

$49.00 **TK**
PINPOINT TOOLKIT
Programmer's resource and toolbox for writing Desktop Accessories all your own. Includes a Programmer's Calculator, pop-up ProDOS Filer, RunRun multi-tasking desktop and high-capacity disk drive manager, Memory Window, Resource Converter, Video Resource Editor, and the Accessory Mover. Requires Pinpoint Desktop Accessories.

$69.00 **SP**
SPELLING CHECKER
Requires AppleWorks and Pinpoint

$69.00 **DC**
DOCUMENT CHECKER
Requires AppleWorks

$99 **SPDC**
SPELLING CHECKER and DOCUMENT CHECKER
Both spelling checkers in one convenient, money-saving package.

$29.00 **RK**
RAM ENHANCEMENT KIT
Pinpoint recommended

$29.00 **AK**
PINPOINT APPLE IIe UPGRADE

Pinpoint and Spelling Checker require an Apple IIGS, Apple IIc, Enhanced Apple IIe with 128K or Apple IIe with Pinpoint's Apple IIe Upgrade Kit and 128K; two Apple 5.25 drives, or one Apple 3.5 drive, hard disk or extended RAM card. Communications Window and Telephone Dialer require a modem. Most popular dot matrix printers and interface cards supported. Not copy protected. Contact Pinpoint Direct for a list of compatible hardware and software, or a FREE CATALOG.

KeyPlayer

Macro Keys for AppleWorks.

INSTANTLY BANISH BORING, REPETITIVE WORK FROM YOUR DESKTOP.

Watch KEY PLAYER turn one keystroke into complete turn-key AppleWorks solutions. Design new courseware and training applications, insert boiler plate text, or design interactive demonstrations.

KEY PLAYER can also add new capabilities to AppleWorks, and in time, other selected ProDOS applications. Commands like block delete with 'undo', delete word, and automatic save then print. Things that make every minute you spend with AppleWorks incredibly more productive.

You'll marvel at KEY PLAYER's amazing skill in adding pop-up menus, powerful 16-level nested macros, IF—THEN— ELSE conditional branching, automatic keyboard recording directly to an AppleWorks file for quick review and easy editing.

You can even assign one macro key to perform the same function inside different applications. So now, every application can have the same 'Save then Print' or 'Delete Word' command!

Good news, you can have all the power and convenience of KEY PLAYER's amazing macro keys on your PINPOINT Desktop.

Frankly, KEY PLAYER is the single most important and exciting AppleWorks productivity product for 1986.

$49 **KP**
KEY PLAYER
Macro keys and scripting program for AppleWorks. Requires Pinpoint Desktop Accessories.

Requires Apple IIGS, Apple IIc, Enhanced Apple IIe with 128K or Apple IIe with Pinpoint's Apple IIe Upgrade Kit and 128K; two Apple 5.25 drives, or an Apple 3.5 drive, hard disk or extended RAM card. Not copy protected. Contact Pinpoint Direct for a list of compatible hardware and software or a FREE CATALOG.

Circle 276 on Reader Service Card.

Power Tools

Add capacity and flexibility to your AppleWorks and PFS:File database files.



PROFILER

WORLD RECORD HOLDER

ProFILER 3.0 combines the most useful database and report-writing features, with the wonder of the Apple mouse. Powerful 65,000 record, 250 field (including text comment fields) capacity, and a free-form report writer means there are very few jobs ProFILER 3.0 can't tackle.

Plus, there's no need to reenter your most valuable Apple-Works and PFS:File databases to take advantage of ProFILER's impressive information management features.

Then add PINPOINT, PINPOINT TOOLKIT, RUN-RUN and KEY PLAYER compatibility to ProFILER's long, long list of power-ful features. This is the database manager to turn to when your AppleWorks runs out of gas.

$129 **PF/PFL0**

PROFILER 3.0

Order today and we'll rush to you our $29.95 PROFILER LABEL UTILITY, FREE.

$129.00 **PF**

PROFILER 3.0

$79.00 **PF22**

PROFILER 2.2

Similar database management and report writing capabilities in an earlier, cursor-based version.

$29.95 **PFL**

PROFILER LABEL UTILITY

Requires Apple IIGS, Apple IIc, Enhanced Apple IIe with 128K or Apple IIe with Pinpoint's Apple IIe Upgrade Kit and 128K; one Apple 5.25 drive, an Apple 3.5 drive, hard disk or extended RAM card. Not copy protected. Contact Pinpoint Direct for a list of compatible hardware and software or a FREE CATALOG.

Point-to-Point

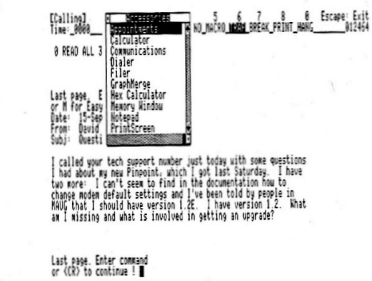
By Gary B. Little

Noted author, columnist and expert Apple II programmer.

Only Point-to-Point sends and receives multiple files auto-matically, error-free.

NO CONVERSIONS OR RENAMING REQUIRED

This year's big communications news is Point-to-Point's exclusive Extended Xmodem Protocol (EXP) that automatically sends/receives batches of ready-to-run files, file names, hidden bits and all — error free. There's never been an easier way to share information, program updates, or entire computer solutions with people anywhere in the world.



COMMUNICATIONS POWER

Point-to-Point's got all the most-used features you'll use everyday. Powerful auto log-on macros go well beyond ordinary dial-the-phone, NAME and PASSWORD stuff. Including conditional branching, Quick-Key macros and real time clock support.

Yet everything is AppleWorks easy; right down to the familiar AppleWorks file card design, Open-Apple commands and immediately useful AppleWorks data files.

Add to that, simultaneous formatted printing, disk file capture and display while online, plus full 300/1200/2400 baud modem sup-port or direct-connect file transfers at up to 9600 baud.

SAY IT YOUR WAY

Point-to-Point's is the only communications program that lets you extend the value of your infor-mation using PINPOINT Desktop Accessories, PINPOINT TOOLKIT, KEY PLAYER and GRAPHIC EDGE (see descriptions below)!

Point-to-Point includes free or money-saving offers including CompuServe's Executive Service, Delphi,The Source, NewsNet, OAG, and GEnie.

$129 **PT/RR0**

POINT-TO-POINT

Order today and we'll rush to you our $49.00 RUN-RUN ProDOS desktop manager, FREE.

$50 Rebate **PT2**

POINT-TO-POINT

At your option, instead of the free RUN-RUN offer above, receive a $50 Trade-In Credit for your old telecommunications software master disk, whose retail price was $50 or greater. Just send it, with your order for Point-to-Point, directly to "Trade-In Offer" c/o Pinpoint Direct, Box 13323, Oakland, CA 94661-0323. No returns, exchange only. Contact Pinpoint Direct at (415) 654-3050 for complete details.

Requires Apple IIGS, Apple IIc, Apple IIe, (Enhanced Apple IIe with 128K or Apple IIe with Pinpoint's Apple IIe Upgrade Kit and 128K required for Pinpoint Desktop Accessories' compatibility); one Apple 3.5 or 5.25 drive, hard disk or extended RAM card. Most modems and interface cards fully supported. Not copy protected. Contact Pinpoint for a compatible hardware list or a FREE CATALOG.

$49 **RR**

RUN-RUN

The ProDOS desktop manager and disk organizer that runs multiple accessories at once. A must-have program for your Apple 3.5 drive, extended RAM card or hard disk. Ideal integrated environment for use with PINPOINT Desktop Accessories as stand-alone applications.

$49.95 **QTT**

TEACHERS' TOOLS

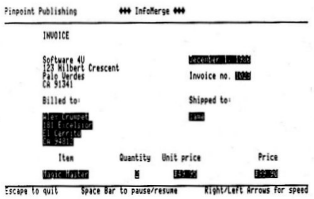
Student grading system with varying curves and standards, research and assignment files. An AppleWorks template program.

LEARN PINPOINT PROGRAMS FAST

All Pinpoint programs include on-screen help, sample data files, step-by-step tutorials and the best user guides in the industry so you can learn at your own pace.

InfoMerge

By Peter Meyer



Tirelessly, this mail merge and database reporting program prints things AppleWorks never will.

DIRECT MERGE PRINTING

Only INFOMERGE offers you on-screen, direct merge-printing, with direct AppleWorks database manipulation. Perfect for invoices, sales letters, report cards, standard agreements or for personalizing your holiday "Thank You" letters.

And you can do all this without bothersome record limitations or cumbersome clipboard "print files" imposed by AppleWorks and other add-on programs.

So stop retyping everything by hand, and let INFOMERGE deliver what-you-see-is-what-you-get printed perfection, every time.

NUMBERS ADD UP

Plus, only INFOMERGE includes powerful calculated fields with easy <QUANTITY> * <PRICE> = <TOTAL> formulas that can use AppleWorks' own catagory names. It's columnar printing is so savvy the decimal points even line up!

This way, sending invoices, statements and report cards is not only possible, but are suddenly simple to do.

Much, much more than a mailing program, here are all the most-asked-for features that AppleWorks simply forgot.

$79 **NF/QIB0**

INFOMERGE

Order today and we'll rush to you Q-Mar's INSTANT BUSINESS LETTERS program, worth $49.95, FREE.

Spelling Checker



Finally, a choice in full-featured spell checkers.

POP-UP CONVENIENCE

Only Pinpoint Publishing offers you the choice. Our pop-up SPELLING CHECKER checks your documents without leaving AppleWorks behind. Check a word or a paragraph at a time, or check everything when you're done against our amazingly accurate 61,000-word dictionary.

SPELLING CHECKER displays up to 10 alternate spellings next to suspected misspelled words, then corrects and reformats using AppleWorks' own powerful editing commands. Or, at your option, you may add words to your own unlimited capacity personal dictionary for technical terms, abbreviations, names and places.

There're even special features like word counting, spell-checking summaries, and the ability to highlight misspelled words without displaying alternative spellings for vocabulary and word-skill lessons.

Document Checker

FASTEST BATCH SPELLING CHECKER

For long documents, reports or contracts, the stand-alone DOCUMENT CHECKER uses the full power of your Apple II to check up to 16 documents in sequence. The fastest AppleWorks spelling checker available, it checks your work at 30 to 150 words per second, thanks to Pinpoint Publishing's exclusive word cache design that actually increaces in speed the more documents you check!

DOCUMENT CHECKER features the same amazing 61,000 word dictionary and convenient check, suggest and correct features as our SPELLING CHECKER.

And because they both feature (and can share interchangeably) an unlimited capacity personal dictionary, every special word you add with one can be used by the other so there's no wasted effort.

No wonder most people take advantage of the high performance and special low price on this unbeatable spell checking team.

$99 **SPDC**

SPELLING CHECKER and DOCUMENT CHECKER
Both spelling checkers in one convenient, money-saving package.

$69 **SP**

SPELLING CHECKER
Requires Pinpoint and AppleWorks

$69 **DC**

DOCUMENT CHECKER
Requires AppleWorks

Requires Apple IIGS, Apple IIc, Apple IIe, (Enhanced Apple IIe with 128K or Apple IIe with Pinpoint's Apple IIe Upgrade Kit and 128K required for Pinpoint and Spelling Checker compatibility); two Apple 5.25 drives, one Apple 3.5 drive, hard disk or extended RAM card. Not copy protected. Contact Pinpoint Direct for a FREE CATALOG.

FREE OFFERS

FREE OFFERS are available for retail purchases, or orders placed directly with Pinpoint Publishing, between October 1st and December 31st, 1986.

To qualify, purchase the products listed in the offer, then send completed product registration cards, plus proof of purchase, to Pinpoint Publishing, Box 13323, Oakland, CA 94661-0323. Pinpoint Publishing will rush to you, by return mail, your special bonus products, FREE! Call Pinpoint Direct at (415) 654-3050 for complete details.

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$399 **2400-G**

PROMODEM 2400G, New external 300/1200/2400 baud modem for Apple II, Macintosh or IBM PC. Cables not included.

$199 **PR-1200A**

PROMODEM-A2, New single-slot internal 300/1200 baud modem for the Apple IIe/IIGS.

$199 **PR-1200G**

PROMODEM 1200G, New external 300/1200 baud modem for Apple II, Macintosh or IBM PC. Cables not included.



Apple II Forever.
Apple IIc, Enhanced IIe and hot new Apple IIGS.

Power Tools

24 Hour Toll Free Order Phone

800-633-2252/Ext. 636

Power Tools

ORDER FORM

Order 24 Hours TOLL FREE

800/633-2252 Ext. 636

YES, Please rush to me the products I've checked below.

PP	$ 89.00	Pinpoint Desktop Accessories	☐
PP3/SP3	149.00	Pinpoint & Spelling Checker *FREE $29.00 RAM Kit*	☐
TK	49.00	Pinpoint Toolkit	☐
SPDC	99.00	Spelling & Document Checker	☐
SP	69.00	Pop-up Spelling Checker	☐
DC	69.00	Document Checker	☐
PT/RR0	129.00	Point to Point *FREE $49.00 RunRun*	☐
PT2	79.00	Point-to-Point, Rebate Offer	☐
NF/QIB0	79.00	InfoMerge Mail Merge *FREE $49.95 Business Letters*	☐
QIB	49.95	Instant Business Letters	☐
QTT	49.95	Teachers Tools Templates	☐
PF/PFL0	129.00	ProFILER 3.0 Database *FREE $29.95 Label Utility*	☐
PF22	79.95	ProFILER 2.2 Database	☐
PFL	29.95	ProFILER Label Utility	☐
PFC/PRO	12.00	ProFILER Data Conv.	☐
PFC/DOS	12.00	ProFILER Data Conv.	☐
KP	49.00	KeyPlayer Macro Keys	☐
RK	29.00	RAM Enhancement Kit	☐
AK	29.00	Pinpoint Apple IIe Upgrade	☐
RR	49.00	RunRun ProDOS Desktop	☐
PR/1200A	199.00	ProModem 1200A Internal	☐
PR/1200G	199.00	ProModem 1200G External	☐
PR/2400G	399.00	ProModem 2400G External	☐

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Add $3.00 Shipping and Handling. For UPS Blue, add $5.00, International Air Mail, $15.00. In California add 6.5% sales tax. 30 Day No-Hassle Money Back Guarantee. Returns subject to a 15% restocking fee.

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Thank you for your order.

Pinpoint

The blood of Kings or of Knaves or both. Family Roots software helps you trace your bloodlines back through lost generations and the mists of time.

For your Apple, IBM, Commodore, Kaypro, TRS-80,* and many others, Family Roots offers all kinds of genealogical assistance: Individual and group sheets, charts, name indices, general search and text capabilities. Adapts to most disk drives, printers, and screens. You get more utility programs, plus lots of personal control. A comprehensive (new) manual is included.

Blood.

All for just $185.

Write or call today for more information and a free brochure.

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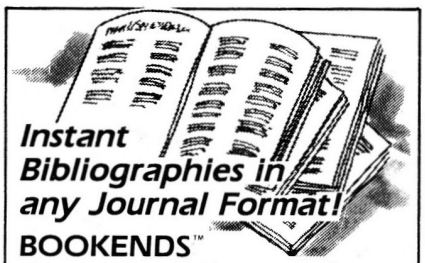

Instant Bibliographies in any Journal Format!

BOOKENDS™ allows you to quickly put your finger on any journal, any paper, any book, any specific information contained in your voluminous files.

As the New England Journal of Medicine states in its issue of January 12, 1984, it "addresses two widespread problems: first, the challenge of cataloging all the information we read; second... the need to convert bibliographic information into the...format demanded by each medical journal. Both problems are solved here in an excellent way."

Bookends has extraordinary versatility and edits with the ease of a word processor. There is no quicker or more efficient means of saving, retrieving and formatting reference information.

Bookends Extended is available with above features plus 80-column display, more memory, and ability to handle unlimited references.

BOOKENDS™, the reference management software system is available for Apple computers for $124.95. Bookends Extended $149.95.

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Birmingham, MI 48011 (313) 258-5566

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REVIEWS

Continued from p. 142.

User-friendliness, however, sometimes implies that a program isn't very powerful and doesn't offer many options. Such may be the case here. For example, one thing that annoys me about The Print Shop is that you can't edit the body of text to be printed on a sign. Pressing the escape key to jump back three lines, then deleting (backspacing) from the end of the line to the typo, is asking too much. But Certificate Maker goes one better. Discover a typo on the first line after progressing to line five? Start deleting—all the way up—and start over. Didn't Springboard notice the arrow keys on the keyboard? Simplicity in the name of user-friendliness has gone too far.

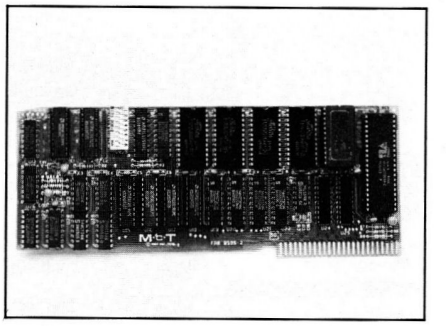
More examples: Once you create a name list, you can't delete it without going to DOS. You can't save completed certificate designs on disk (it would be nice to have one prepared for use with a name file; the date could be written in by hand). The program automatically alphabetizes your name lists, so that if a list contains subgroups, you can't keep them together and later elect to print one or more groups (such as a Boy Scout troop organized into patrols, for example). A few more options would make the program more practical to use.

Certificate Maker fills two double-sided copy-protected disks, with three sides containing the certificate templates. You'll need a blank disk to save your name files. The documentation is organized in a flowchart manner and, like the program, is very easy to follow.

After spending about an hour trying to print my first certificate, though, I was surprised to see the manual's first entry under "Printer Tips" read, "Colored ribbons and colored paper, available from your favorite computer store, can add flair to your certificates." Although I eventually traced the problem to an outdated version of the printer interface, the manual did provide me with some "user-friendly" laughter.

All in all, Certificate Maker does what it's supposed to do, supplying certificates for nearly every possible need. More attention to detail, though, would have made this cute little program well implemented. Regardless, I wonder if its novelty will run out faster than the time it takes to put $49.95 in the bank.■

Bill Jacob
Yaphank, NY



Accelerator Cards: Speed Times Three

SPEEDDEMON 3.03

McT, 1745 21st Street, Santa Monica, CA 90404

Accelerator card; Apple II, II Plus, //e, Laser 128
$189

ACCELERATOR //e

Titan Technologies, 310 West Ann Street, Ann Arbor, MI 48104

Accelerator card; Apple II, II Plus, //e
$279 (includes 80K of RAM)

TRANSWARP 1.3

Applied Engineering, P.O. Box 798, Carrollton, TX 75006

Accelerator card; Apple II, II Plus, //e, Laser 128
$279 (includes 256K of RAM)

	SpeedDemon	Accelerator //e	TransWarp
Ease of setup	■■■■	■■■■	■■■■
Ease of use	■■■■	■■■■	■■■■
Documentation	■■	■■■	■■■
Support	■■■■	■■■	■■■
Overall	■■■	■■■	■■■

When I bought my first computer, the trusty Apple //e, experienced friends warned me that it was slow. Slow? How could that be? Word processing would save hours of retyping. Spreadsheet calculations would be finished before my brain was even in gear. Compared with manual methods, the Apple's electronic manipulations were like lightning.

Of course, I quickly discovered that real time is measured psychologically. A minute spent adding figures with a pencil is fast; a minute spent waiting for a computer recalculation is slow. You may have spent hours manually sorting your Rolodex, but now you may grit your teeth when AppleWorks says, "Arranging the file. Estimated time 12 seconds."

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Andrew P. Niemic
President of Checkmate Technology

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MultiRam //EX - the original and the best no-slot "mini-board" that uses the 65C816 microprocessor to turn your computer into a true 16-bit computer. Priced from **$189.95** (suggested list).

MultiRam CX & 16-bit Option - 1/2 megabyte capacity memory board for the Apple //c. Features simple installation with no soldering or disk drive removal. With the addition of the CX Kit, the //c may also be upgraded to a true 16-bit computer. Prices start at **$199.95** (256K, suggested list). Optional 65816 Kit - **$119.95** suggested list.

MultiRam CX PLUS - this "piggyback" board for the MultiRam CX allows an additional 512K RAM to be added, for a total of 1 megabyte on your Apple //c. Prices start at **$249.95** (256K, suggested list).

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Andrew P. Niemic, President of Checkmate Technology speaks out.

"Many Apple II owners find that buying a RAM card is a confusing process. Conflicting claims by manufacturers only cloud the issue".

"User Groups are known for being knowledgeable and not influenced by any profit motive. They are responsible to no one but their members. Here is what their reviewers have said when comparing memory cards":

"In my opinion, the MultiRam //e card by **Checkmate Technology** is superior in several respects... It has the best manual, easiest to use software set-up, very friendly customer service, it is expandable and upgradeable without becoming obsolete like some of the other cards. Best of all, you get most features for best price." **-Joe Farkas, CRAB-Apple Bulletin, County of Rockland Apple Branch, January 1986.**

"After using the **Checkmate MultiRam RGB**, I can see that they aren't selling sales hype; they actually have a good product that doesn't need hype." **-Dick Ferris, Apple LUG News, Apple Lansing Users Group, September 1986.**

"The **MultiRam RGB** card is presently the most versatile memory card for the Apple //e and less expensive than several others..." **-Dr Kolan K. Bisbee, The Spokesman, The New York State Technology Education Association.**

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Circle 227 on Reader Service Card.

Table. Speed-up board benchmarks and overall performance index. All times in seconds except performance-index number.

	AppleWorks			BASIC			
	Replace	Recalc	Sort	Count	Array	Sieve	Overall
Applied TransWarp	11.9	16.5	4.0	5.8	14.4	110.2	3.1
Titan Accelerator //e	14.3	17.0	4.6	6.0	14.8	112.8	2.9
McT SpeedDemon	19.3	23.4	6.0	7.5	18.7	145.3	2.2
Plain Apple //e	32.3	51.6	12.1	18.4	47.0	360.4	1.0

Fortunately, there's a solution for those losing patience with their Apples: an accelerator card. The regular II-series microprocessors, the 6502 and 65C02, execute instructions at a clock rate of one million cycles per second (1 megahertz). A speed-up card like those offered by McT, Titan Technologies, or Applied Engineering routes instructions through its own processor—a 65C02 running three and a half times faster. Even allowing for a gap between theoretical and actual performance, caused by components built to slower speed limits, such as your Apple's disk drives or memory chips, an accelerator card can triple your productivity.

Although there are differences (as we'll see) in the performances of accelerator cards, there are many similarities. All are easy to install, requiring only that you set a few switches to work with the other cards you have already. All can work in any slot except the //e auxiliary slot—even slot 3, normally unusable in the //e. What's more, speed-up cards work transparently with your favorite software in any Apple II; nothing except their speed is apparent in use.

Accelerators have their limitations. They must slow down for time-sensitive devices like floppy disks. (Data traveling through these must decelerate, like cars leaving the high-speed highway to pass through a small village.) Similarly, software that depends on 1-MHz timing (some games and communications programs) may require you to turn off or slow down your accelerator card.

All speed-up cards generate heat, making a fan more important, especially if you're using several slots. If you're using many power-hungry peripherals, you'll want to be attentive to the accelerator card's demand on the Apple's power supply.

Because there are other specialized limitations—problems with CP/M cards, for example—read the manual or ask the manufacturer before buying. For hard-disk owners, some Apple ProFile series B controller cards (including mine) have timing problems with accelerator cards. On the positive side, I found telephone support to be adequate (or better) from all three companies.

The Testing Schedule

I tested McT's SpeedDemon, Titan's Accelerator //e, and Applied's TransWarp in an enhanced Apple //e, fully loaded with RamWorks II, Thunderclock, Apple Super Serial, ProFile, parallel, mouse, and Disk II controller cards. For each of the three accelerators, I ran three tests using AppleWorks and three with BASIC programs. I repeated each test three times. (I'm calling this the St. Ives test.)

The AppleWorks Replace test used the word processor's find-and-replace capability, changing 230 *e*'s to asterisks in a 2K (153-word) document. The Recalc test calculated 999 cells in a spreadsheet, all changing when the first cell was changed. The Sort test rearranged a 65K data base both numerically and alphabetically.

Of the BASIC programs, Count is a simple (five-line) counting loop with variables and constants. The Array program adds arrays, FOR. . .NEXT, and GOSUB commands to the count. Finally, I used the popular Sieve of Eratosthenes benchmark to find and count 1899 prime numbers.

Results of the six races, plus an overall (average) index of speed-up performance—a multiple of the stock Apple //e rating of 1.0—appear in the **Table**.

McT SpeedDemon 3.03

SpeedDemon is a good value. Though the slowest of the three cards tested, it nevertheless doubled AppleWorks' performance and increased the speed of BASIC programs two and a half times. An auto-test feature lets SpeedDemon check its own and other memory; should you want to return to normal speed, you can easily disable the card by pressing the escape key immediately after you turn on your Apple. Telephone support was excellent, and documentation is adequate, if minimal.

One reason for SpeedDemon's low price is also one reason for its slower performance: It's the only one of the cards tested to use a memory cache rather than its own shadow RAM. Cache technology depends on the fact that even the longest program works by repeating small pieces of code. When your program calls for a certain segment of code, SpeedDemon finds it and stores it in its own 4K of data memory. (An additional 4K of tag RAM keeps track of the source of the cached data.) The first time that code is executed, your program runs at the Apple's usual 1-MHz speed. For each subsequent execution, SpeedDemon processes the cached code at 3.5 MHz. As new segments of code are required, SpeedDemon bumps old segments out of the cache to make room for the new ones.

When not running cached, frequently used code routines, SpeedDemon relies on the Apple's own (slower) memory. This limits its performance compared to its Titan and Applied Engineering rivals. On the other hand, it has fewer parts, costs less, and is less susceptible to damage by static electricity than accelerators with extra chips. According to the manufacturer, SpeedDemon's power draw is a modest 575 milliamperes.

Titan Accelerator //e

Titan was the first to introduce an Apple accelerator card, in 1983, and

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AutoWorks *by Alan Bird*

(AUTOmatic AppleWORKS)

AutoWorks adds to AppleWorks several important time-saving features including mail merge, file organizing, macros, new AppleWorks commands and mouse control.

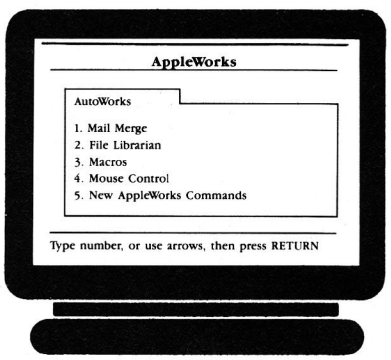
MAIL MERGE allows you to automatically print form letters and fill out forms from your Apple Works data base files. Form letters are reformatted to accommodate varying lengths of names, addresses, etc. Since AutoWorks is built-in, there is never any need to leave AppleWorks to do a mail merge.

AutoWorks allows you to use your MOUSE to make menu selections and to quickly scroll through and position the cursor in your document, data base file or spreadsheet. This feature alone is worth the price of AutoWorks.

With AutoWorks' powerful MACROS, you can automatically enter hundreds of keys including AppleWorks commands with a single keystroke. You can, for example, print out one or several reports by entering one key. The macros are easily updated instantly using the AppleWorks word processor. New AppleWorks commands are also included with macros such as forward delete, word delete, jump to beginning or end of line, etc. With macros you can even create your own AppleWorks commands.

The Disk Librarian helps you keep track of all your disk files. It reads ProDOS file information directly from your disks into an AppleWorks data base file where you may search for certain files and disks, sort on various file characteristics, find disks with free space, etc.

AutoWorks is compatible with AppleWorks versions 1.1, 1.2, and 1.3.



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FontWorks *by Mark Simonsen*

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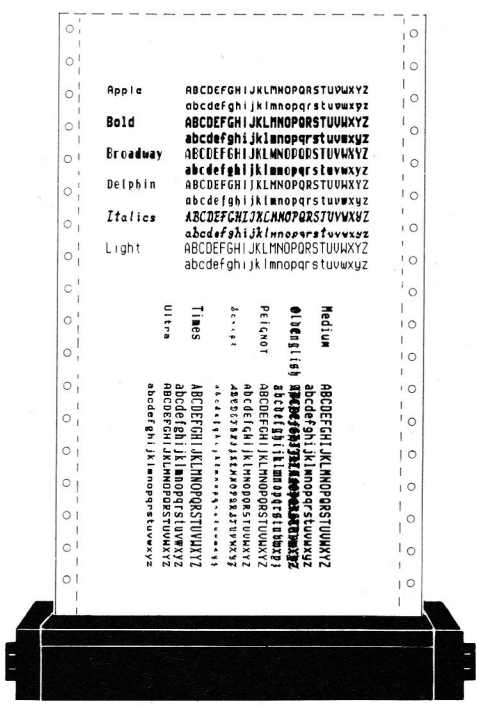
There are no complicated commands to learn. FontWorks incorporates the same easy-to-use menu style as AppleWorks.

Choose from 15 typefaces of various styles and sizes, including Broadway, Delphin, Old English, Peignot, Script, Times, and many more. You can use up to 4 of these typefaces at one time when printing your AppleWorks files. And FontWorks comes with its own Font Editor, allowing you to customize our typefaces or create your own.

FontWorks works with any Apple IIe or IIc and is compatible with most popular dot-matrix printers, including ImageWriter, Epson, and Okidata.

Note: Owners of previous versions of FontWorks may upgrade for FREE by returning their original FontWorks (disk only) to The Software Touch.



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its current version continues to use shadow-RAM technology. The Accelerator //e has its own 80K of fast memory, holding the (copied) contents of the Apple's 16K ROM, 48K of main memory, and 16K corresponding to a language card. (You can eliminate the language card in your II or II Plus by installing the Accelerator //e in slot zero.) So, unlike the SpeedDemon, the Titan doesn't continuously move code in and out of cache memory. All instructions in the first 64K of memory, as well as ROM routines, are processed at 3.5 MHz.

Faster than the SpeedDemon and a close second to the TransWarp in my tests, the Accelerator //e can be disabled or slowed down by running a preboot disk. It has no self-test feature (a minor loss), but its documentation is adequate both for the technically minded and for people who couldn't tell a DIP switch from a dipstick. It was also the only one of the three cards to work perfectly with my ProFile hard disk.

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The Accelerator //e uses a CMOS (complimentary metal-oxide semiconductor) gate array, developed by Titan, which contains the logic controlling access to RAM. Like the 65C02 microprocessor, which also uses CMOS technology, the gate array is vulnerable to static electricity, but uses less power than the chips it replaces. Titan rates its card's power consumption below 500 mA.

Applied Engineering TransWarp 1.3

The newest of the three speed-up cards, TransWarp is also the fastest, giving 3.1 times normal performance. With its own 256K of fast memory, TransWarp is the only card able to speed up a program's use of auxiliary memory, duplicating not only your Apple's ROM and main memory, but the second 64K on extended 80-column text cards. (The remaining TransWarp memory isn't normally used; 256-kilobit chips were chosen for design and cost.)

If TransWarp doesn't show a substantial gain over Accelerator //e in AppleWorks tests, it's because the tests don't exploit TransWarp's potential. Most AppleWorks code resides in main memory; auxiliary memory is used primarily for data. Programs that execute code in auxiliary memory, such as Managing Your Money, VIP Professional, and Pascal 1.3, should prove faster yet with TransWarp.

Like SpeedDemon, TransWarp has a built-in self-test and is disabled with the escape key; its claimed power consumption is 650 mA. Like Accelerator //e, it can be slowed to half speed and replace a language card in slot zero. Its manual is complete. It's the only one of the three cards to advertise SwyftCard compatibility and to sell an optional accelerated 65C802 chip for those wanting to work with that 16-bit processor's extended addressing modes and operation codes. (According to McT, SpeedDemon also works with 65C802's.) When the standard TransWarp didn't work with my ProFile hard disk, Applied Engineering sent four replacement chips that solved the problem.

It's easier to use an accelerator card than to choose one. SpeedDemon, although the slowest, is the cheapest. Accelerator //e, the middle finisher, is best tested in the marketplace. TransWarp, although the youngest, is the fastest.■

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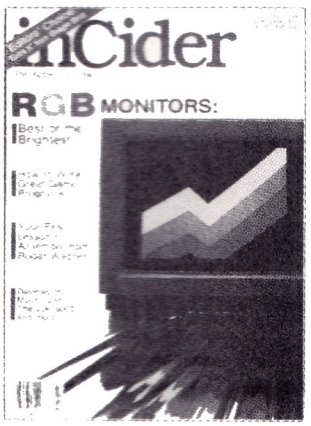

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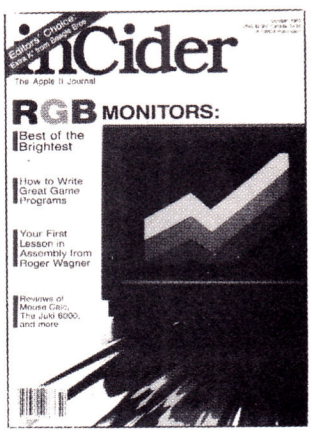

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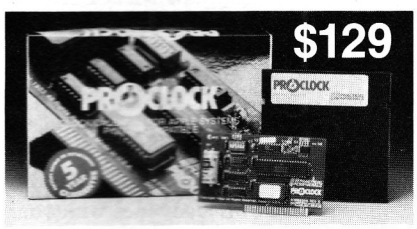

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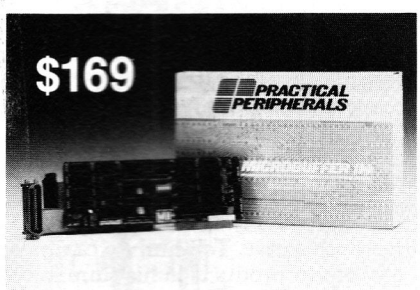

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Circle 291 on Reader Service Card.

THE BEAGLE COMPILER

NEW! COMING DEC. 1

$74.95 (for any Apple II–64K min.) / by Alan Bird

Machine-Language Speed for Applesoft Programs

Boot THE BEAGLE COMPILER and then run practically any Applesoft BASIC program from disk. The program will be converted on the spot, in seconds, to run at machine language speed.

HOW FAST IS IT?

It depends on your original Applesoft program. 5- to 7-times speed is about average. 10-times speed–and up–is not uncommon.

HOW EASY IS IT TO USE?

Say you've got a normal (slow) Applesoft program on disk named "ABC". Simply type RUN ABC and, within seconds, ABC is running at machine language speed!

It's just that easy.

If you want, make changes to your program (using Applesoft) and immediately re-run it at machine language speed.

"Beginning programmers love it. Experts are amazed."

IT'S QUICK!

Compiling takes only a few seconds (more or less–it depends on a program's size).

EFFECTIVE

Most programs compile without alteration. Syntax errors, illegal GOTO's, and so on, are automatically trapped before a program runs.

COMPACT AND CONVENIENT

A compiled program actually occupies less memory than its Applesoft original. You can even save in compiled format so people can't read or change your original Applesoft code.

PRODOS BASED

Compile Applesoft programs from ProDOS floppy disks, hard disks or Unidisk 3.5's.

Like all Beagle Bros software since 1980, The Beagle Compiler is not copy-protected.

BEAGLE SCREENS

NEW!

$34.95 (for any Apple IIe, IIc or IIGS)
by Fred & Sara Crone, Matt Reimer, Bert Kersey and Rob Renstrom

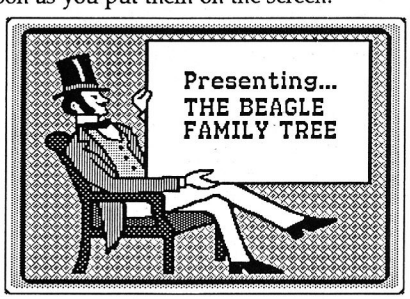


Choose from a dozen caption typestyles to give your messages variety. Beagle Screens is compatible with Font Mechanic fonts too.

BEAGLE SCREENS will get your message across–anything from "Happy Birthday" to "Hands Off"– in a unique and colorful way. Use our pictures to add a touch of class to your Apple programs or presentations.

Or just use them to show off your Apple.

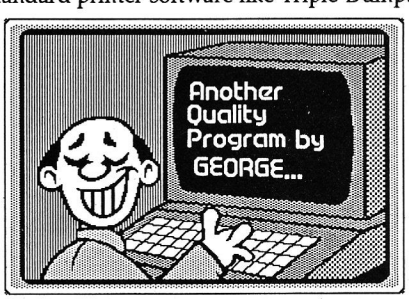
You get forty captionable full-screen pictures on disk (samples shown here). Half of the pictures are automatically animated as soon as you put them on the screen.



Each picture has a blank area (or "balloon") where you can add your own message.

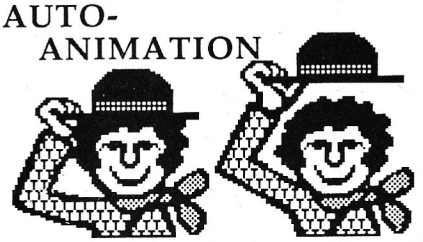
We make it EASY to add your own words and create colorful on-screen "slide shows".

Or print the pictures up as unique signs. (Printing requires a dot matrix printer and any standard printer software like Triple-Dump.)



It's easy–just type the message on the screen, and save the picture on disk.

AUTO-ANIMATION



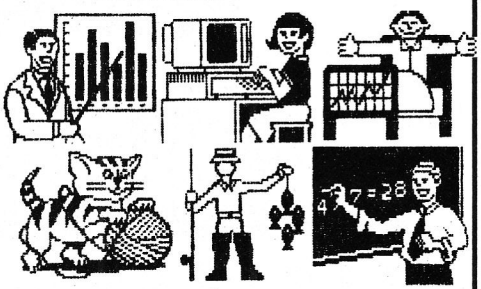
Animation gives your messages extra punch. Twenty Beagle Screen pictures are automatically animated as soon as you load them onto the screen.

MINIPIX DISK #2

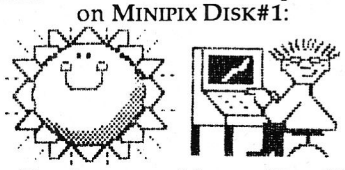
NEW!

$29.95 / by Fred & Sara Crone

MINIPIX DISK#2 is 200 pictures–ALL NEW and ready to use with THE PRINT SHOP™:



Plus–You'll find 200 more pictures on MINIPIX DISK#1:



Coming soon: MINIPIX DISK#3 and Minipix for THE NEWSROOM.™

TRIPLE-DUMP

$39.95 (for any version of Apple II)
by Mark Simonsen & Rob Renstrom

TRIPLE-DUMP combines with your dot-matrix (graphics-capable) printer and any Apple II to print:

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- Lo-res graphics
- 40-column text
- Double Hi-res graphics
- Double Lo-res graphics
- 80-column text

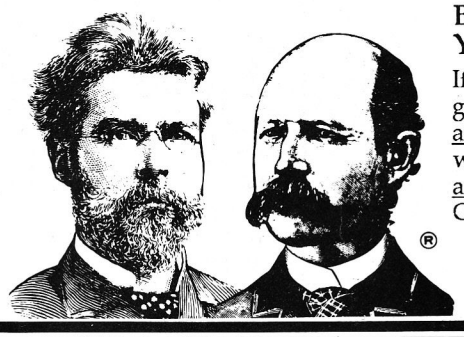
Make "hard copies" of all kinds of images with absolutely no programming knowledge.

Or, if you're a programmer, use Triple-Dump's routines in your Applesoft programs.

Triple-Dump offers picture cropping, rotating and magnifying, plus the ability (on many printers) to adjust the print density.

BANNERS!

Print giant (8"-high letters) text banners on any printer. Great for special occasions!



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If your dealer is out of a particular disk, get on his case. Tell him he can have any of our products in his store for you within a couple of days by contacting any major Apple software distributor. Or by phoning Beagle at **619-296-6400**.

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MACROWORKS

$34.95 (for AppleWorks version 1.3 or older)
by Randy Brandt

Note: New AppleWorks Version 2.0 requires New SUPER MACROWORKS→

MACROWORKS streamlines AppleWorks' word processor with new features. For example, one keystroke now deletes the character or word at the cursor. Another keystroke jumps to the start or end of a line. Another erases an entire line.

Change your mind? Press ⌘-U to "undo" your last delete-command.

New! AppleWorks MOUSE CONTROL

MacroWorks lets you use your Apple's Mouse to control AppleWorks' menus, scrolling, word-block highlighting, and so on.

APPLEWORKS MACROS

MacroWorks will convert any series of keystrokes into a new one-keystroke solid-Apple (⌘) command. (All open-Apple commands stay intact.)

Use MacroWorks' built-in macros or define your own. For example, make ⌘-N type your name and address. Or let ⌘-X save or print all of your desktop files, nonstop.

You can set up macros that execute any often-repeated function. You can even skip over unwanted AppleWorks questions like "How many copies?".

"...THE BEST SINGLE APPLEWORKS ADD-ON AVAILABLE TODAY."
—A+ Magazine Oct. 86

"...IF YOU USE APPLEWORKS, BUY MACROWORKS."
—Editor's Choice inCider, Aug. 86

JUST BOOT APPLEWORKS, AND GO!

MacroWorks is not a time-consuming "pre-boot" disk. To start up, just boot AppleWorks like you always do. Now you've got optional Mouse control and you've got over 4,000 keystrokes-worth of macros at your fingertips.

SUPER MACROWORKS NEW!

$49.95 (requires new AppleWorks version 2.0)
by Randy Brandt

SUPER MACROWORKS provides the same AppleWorks enhancements and improvements as MacroWorks, PLUS:

AUTO STARTUP

Boot AppleWorks and it will get itself up and running without another keypress. It will also automatically load any file that you want.

DIRECTORY DATABASE

Read file names from any or all of your disks into the AppleWorks Data Base.

Now you can sort by file name, type, date, etc., and make printouts, to see what's *really* in that disk library of yours.

NO MORE TYPING PATHNAMES!

When AppleWorks wants a pathname (another disk or direc-tory), you now select from a menu instead of typing. Simply highlight the name you want–it's just like loading files.

TIME/DATE MACRO

One keystroke prints the current date or time anywhere in AppleWorks–in any application.

READ-THE-SCREEN MACROS

Convert from lower case to upper and back! Cut and paste anywhere, including from field-to-field or record-to-record in the Data Base.

LOCAL/GLOBAL MACROS

Define macros that work in one specific application (for example, in the Spreadsheet, but not in the Data Base).

Updates: Mail old MacroWorks manual front cover+$22.50 to Beagle Bros (add 6% if California).

POWER PRINT

$39.95 (for any Apple II–64K min.)
by Rob Renstrom
Works with most full-font downloadable printers, including: Apple DMP and IMAGEWRITER (I & II), EPSON (FX, JX, EX), OKIDATA (92, 93, 192, 193), PANASONIC (1092, 1093), STAR (DELTA, RADIX, SD, SG, SR), and more

POWER PRINT lets you "download" a second typestyle into your printer's memory, so you can alternate between your standard printer-font and a custom font with special characters and symbols:

ABCDabcd6789*&?
ABCDE12345←↑→↓□
OLD ENGLISH
BORDER FONTS TOO!

(Custom fonts appear on your printer, not on the screen. Any key can be made to print any character.)

OUR FONTS OR YOURS

Many custom printer-fonts are included on the Power Print disk. An easy-to-use Font Editor lets you redraw any of the characters in our fonts. Or you can design your own custom fonts and special characters from scratch.

You can even design a set of custom characters that combine to print a small illustration like a signature.

Honestly,
A. Lincoln
Uncle Abe

For a creative touch, print your logo at the top of all of your word processing documents.

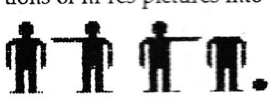
FAST–and Compatible with APPLEWORKS

Unlike other printer-font software, Power Print won't slow your printer down one bit. And it's compatible with AppleWorks, and most other Apple software.

SHAPE MECHANIC

$39.95 (for any version of Apple II)
by Bert Kersey & Mark Simonsen

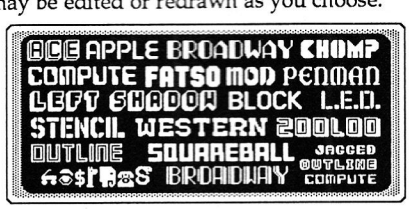
SHAPE MECHANIC converts hi-res drawings into animatable shapes that can be put on the screen with simple Applesoft commands. It also converts sections of hi-res pictures into "drawable" shapes.



Easy "List and Learn demos on the Shape Mechanic disk teach you how to create your own hi-res programs.

HI-RES TYPEFACES TOO

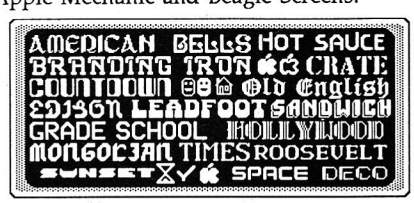
30 proportionally spaced hi-res screen display fonts–both large and small–are included on the Shape Mechanic disk. Each character may be edited or redrawn as you choose.



FONT MECHANIC

$29.95 (for any version of Apple II)
by Mark & Jon Simonsen

FONT MECHANIC gives you thirty new hi-res display typefaces compatible with all of the programs on Shape Mechanic, Apple Mechanic and Beagle Screens.



G.P.L.E.

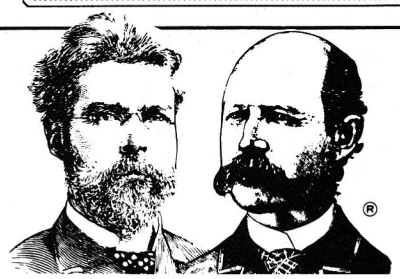
$49.95 (for any version of Apple II)
by Neil Konzen

GPLE is Beagle Bros' "Global Program Line Editor"–still the NUMBER ONE editor for your Applesoft programs.

INSERT AND DELETE characters and words in your basic programs. No more awkward "cursor tracing" to make changes.

SEARCH AND REPLACE: Find every occurrence of any word or variable in a program. Or replace any word with any other.

ESCAPE MACROS: GPLE lets you make Escape-anykey do almost anything you want. For example, Esc-1 can Catalog drive 1. Esc-N can type your name and address, etc.



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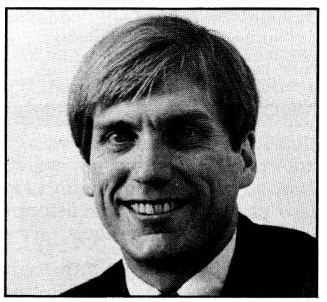
STATTUS REPORT



Economy

by Paul Statt, Technical Editor

"Beware of any enterprise that requires new software."

Winter is the acquisitive time of year—what fun are the holidays without "wish lists"?

Here's my Apple Christmas list, but it's not traditional. What I want is less software, not more. Henry David Thoreau—who never celebrated Christmas, owned a personal computer, or wanted to—once warned, "Beware of any enterprise that requires new clothes." Henry didn't go in much for technology, but he didn't scamper naked through the woods at Walden, either. It wasn't clothing to which he was opposed, it was unnecessary apparel he'd wear only once.

Thoreau, if he'd had an Apple II, PFS:Write, or Pinpoint—unlikely gifts for the Concord, Massachusetts, hermit—might have warned, "Beware of any enterprise that requires new software."

Thoreau's advice about life in general, and mine about software, is "Simplify, simplify." Don't buy a new product unless you have to, and be wary of software that does only one job. A cookbook program, for example, is a data-base manager. A checkbook organizer is a spreadsheet. An idea processor is a word processor with delusions of grandeur.

We need products that can do two things at once—or three. AppleWorks is entrancing not for the wonderful things it does: The word processor is slow and makes typos, you can't copy its spreadsheets directly into the word processor, and the data base is slow and unwieldy. AppleWorks' power hasn't made it popular—it's just been the only Apple II product that can do more than one thing at one time on one disk.

If you could buy only one piece of software for your II, AppleWorks would be a grudging good choice: It's versatile and can grow with your needs. Now you have Foundation and SoftSync's Trio from which to choose, too—they both get lukewarm reviews this month (pp. 32 and 28). But now we're seeing truly integrated software for our Apple II's—not PFS-style kludges that let you cut and paste among applications.

I hear rumors of nice software melds. Quark claims that Opus, its desktop-publishing program for the Apple IIGS, includes a word processor that will make WordPerfect weep. The guys at PBI who developed CommWorks tell me they do a lot of writing with its text editor. These programs are great ideas; if you're a writer who publishes a newsletter or constantly sends copy cross-country, it just doesn't make sense to separate your typewriter from your printing press or teletype.

The apotheosis of integration is Information Appliance's SwyftCard. Thoreau might have added "SwyftCard—$79.95" to the frugal balance sheet of his year at Walden Pond: Not only can it do several jobs, it does them simply. Everything—filing, typing, sending, printing, calculating—is in the computer at once, the moment you turn it on.

I don't want more software, I want less. That's a personal opinion. Some folks, when they take up a new hobby—say, bicycling—rush out and buy special equipment: bike shoes, bike pants, a bike computer, and a bike toolkit. I'd rather try a new pair of sneakers, some nylon shorts, a watch, and a couple of Allen wrenches and screwdrivers—stuff I can put to work in the winter when the bike's in the barn.

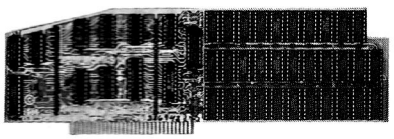
My advice? Before you buy anything new, think hard. Will something you already have do the trick? Can your word processor's search-and-replace function, for instance, do all the data-base management you need? Can you write a spreadsheet formula that will do the calculations your loan amortization program can? Can you write a BASIC program?

You could buy software that catalogues the roses on your trellis, or a template for an AppleWorks spreadsheet that adds up your deposits and subtracts your checks. But if that entices you to part with your cash, you need more help managing your money than the Apple II can offer.

Whenever I buy—software, a jackknife, or a sweater—I look for something I can use in more than one season, climate, or application. As Thoreau noted, "That man is richest whose pleasures are the cheapest"—and that's why I wish for nothing this Christmas. That's economy.■

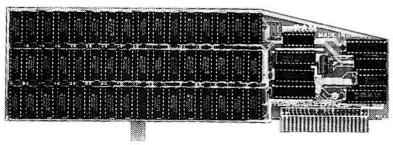
A Comparison Between the #1 Maker of Apple Memory Cards (Applied Engineering) and the #2 Maker (Apple Computer)

FOR THE IIe



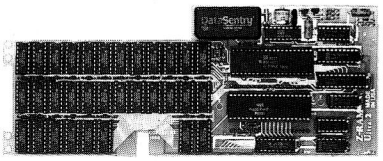
	RamWorks III®	Apple's™ Card
Maximum Desktop	3017K	1012K
Maximum Number of Records in Database	25,100	1350
Maximum Number of Lines in Word Processor	15,300	2250
Autoloads All of AppleWorks	YES	NO
Auto Segments Files	YES	NO
Built-in Printer Buffer	YES	NO
Compatible with All Versions of AppleWorks	YES	NO
Displays Time & Date on AppleWorks Screen	YES	NO
RGB Option	YES	NO
16 Bit Co-Processor Port	YES	NO
Memory Expansion Port	YES	NO
80 Columns Built-in	YES	NO
Maximum Total Functions	6	1
Software Standard	YES	YES
Made in	USA	Singapore
Warranty	5 years	90 days

FOR THE IIGS



	GSRAM™ GSRAM Plus™	Apple's™ Card
Maximum Desktop	8000K	1012K
Maximum Number of Records in Database	25,100	6000
Maximum Number of Lines in Word Processor	15,300	6000
Autoloads All of AppleWorks	YES	NO
Auto Segments Files	YES	NO
Built-in Printer Buffer	YES	NO
Displays Time & Date on AppleWorks Screen	YES	NO
Time and Date Macros	YES	NO
Built-in Hi-Res Diagnostics	YES	NO
Memory Expansion Port	YES	NO
ROM Expansion Port	YES	NO
Number of RAM Banks	6	4
Maximum Memory on Main Card	1.5 or 6 MEG	1 MEG
Software Standard	YES	YES
Made in	USA	Singapore
Warranty	5 years	90 days

FOR THE IIc



	Z-RAM Ultra™	Apple's™ Card
Compatible with All IIc's	YES	NO
Maximum Desktop	727K	1012K
Maximum Number of Records in Database	25,100	1350
Maximum Number of Lines in Word Processor	15,300	2250
Autoloads All of AppleWorks	YES	NO
Auto Segments Files	YES	NO
Built-in Printer Buffer	YES	NO
Compatible with All Versions of AppleWorks	YES	NO
Displays Time & Date on AppleWorks Screen	YES	NO
16 Bit Co-Processor Port	YES	NO
Built-in ProDos, DOS 3.3 Clock	YES 1	NO
Built-in CP/M Capability	YES 2	NO
Maximum Total Functions	5	1
Software Standard	YES	YES
Made in	USA	Singapore
Warranty	5 years	90 days

Apple makes good peripherals for their computers. Perhaps that's why they sell more monitors, printers, disk drives and other accessories for their computers than anyone else. Well, almost anyone else. You see, Applied Engineering is the only company to outsell Apple in the peripheral business. In fact, according to several independent studies we outsell them 2 to 1. Why? Are Apple's memory cards not up to par? No, actually they're just as good as their other peripherals, it's just that ours are a generation ahead.

One look at the chart above will tell you why most Apple owners choose Applied Engineering when they want to expand their Apple's performance.

You can find the number 1 memory cards for the Apple at over 2,000 Applied Engineering dealers worldwide. Call 214-241-6060 for the dealer nearest you or to place an order.

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1) Only on Ultra 2 or 3, 2) only on Ultra 3

E.G. FOR EXAMPLE



Hooked on Software

by Eric Grevstad, Review Editor

"Why are some programs not only useful tools, but addictive pastimes?"

Usually other *inCider* staffers follow technology trends and reader preferences while the assistant editor and I are the nerds who play with new products, but counting People's Choice Award votes has put the office into a hands-on frame of mind. The technical editor is writing a Status Report about simple products, plugging his favorite SwyftCard and making fun of people who wear digital watches (I wear a Casio Data Bank and wish the SwyftCard had half a dozen more commands, instead of making users write BASIC statements for double spacing). The editor in chief is rapt with our preview copy of AppleWorks 2.0, and the managing editor has been playing Broderbund's Karateka since we raided a dusty software closet while testing the Laser 128.

It's started me thinking about why products become popular, why some programs are not only useful tools, but addictive pastimes. There are users who'll never write a line of BASIC in their lives, but spend hours customizing AppleWorks with a macro utility; there are people who spend $80 for a piece of software, use it twice, and put it on the shelf. What makes a program worth coming back to?

One reason is simple inertia—people getting addicted to software out of habit. Normally the program is one that does its job well enough that users don't feel the need to change or upgrade: AppleWorks walks off with the People's Choice Award, Lotus 1-2-3 beats out its competition, many hardy souls still use WordStar.

Occasionally it's one that lures users with a novel feature: Apparently everyone who tries StyleWare's MultiScribe word processor—the freelancers who sent queries about reviewing it, the People's Choice voters who gave it fourth place—develops a bizarre compulsion to sprinkle correspondence with different typestyles, nouns in Dante Bold, verbs in Chaucer Outline, fonts for the sake of fonts. It's MacWrite gone mad, desktop publishing as a dangerous nuisance; I predict MultiScribe buyers will sober up and return to single fonts for most jobs within a month.

But there's a more serious reason for some products' addictive quality: They're open-ended as opposed to closed programs. Should the managing editor defeat Karateka's warlord and rescue Princess Mariko a few times, there'll be nothing left to do except possibly wonder why Mariko is a blue-eyed blonde.

The same applies to Broderbund's new Toy Shop ($59.95), a program that prints patterns you affix to adhesive cardboard (supplied) and cut and fold into mechanical models. The toys are terrific—a steam engine, a carousel, a mechanical bank—but the program's no more creative than painting by number, though you can put your own text on the side of the delivery truck and so forth. When you've made all 20 toys, obviously, you're done with the program.

By contrast, the most popular products are simple enough to get you started easily, but let you do and discover new things as you go along. The Apple II itself is a shining example, though the ever-expandable //e a far better one than the limited, almost airtight //c. The Print Shop, lest I be accused of depicting all Broderbund products as closed boxes, keeps enough of you finding new uses to score second place in People's Choice voting.

Among serious software, Lotus and WordStar have created whole industries of add-on utilities, and we can't begin to count the Apple enhancements, templates, and miscellaneous products ending in "Works." AppleWorks 2.0 arrived here a few weeks before official release, with no documentation and disks stamped "Confidential," and kept the editors exploring for the better part of an afternoon: "Hey! It's got mail merge!" "Wow! It's loading itself into my RamFactor card!" "Heck! It won't work with our MacroWorks and AutoWorks!" (A 2.0-compatible AutoWorks and Super MacroWorks were near completion at press time.) It's an open-ended program, and that's what keeps people coming back. If you could learn everything about someone on a first date, no one would ever get married.

Well, the managing editor is wading through the guards and has gotten past the spiked gate, but one obstacle is giving him fits. Any Karateka experts out there, send tips to "Help Dan Beat the Bird," c/o *inCider*. ■

Computer Network

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Circle 183 on Reader Service Card.

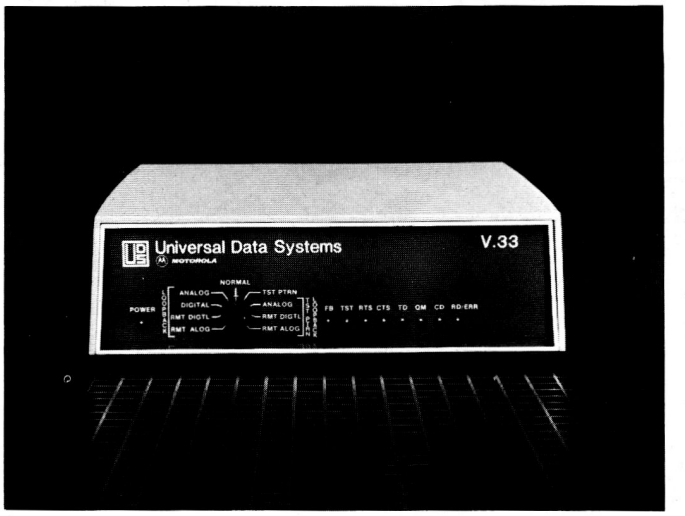
NEW PRODUCTS

edited by Lafe Low

Hardware

Safe Transmission

Transmit data at **14,400 bits per second** over unconditioned four-wire private lines with Universal Data Systems' Model V.33 **external direct-connect modem**. The V.33 features automatic fall-back to 12,000 and 9600 baud in the event that phone-line quality deteriorates; it also includes Trellis-coded modulation to reduce error rate on poor-quality private lines and automatic adaptive equalization to compensate for line distortions without the need for pre-equalizers. The UDS V.33 modem retails for $2450, from Universal Data Systems, division of Motorola Information Systems Group, 5000 Bradford Drive, Huntsville, AL 35805, (205) 721-8000. Circle Reader Service number 362 for more information.



UDS' V.33 external direct-connect modem transmits at rates of up to 14,400 baud.

Cover Up

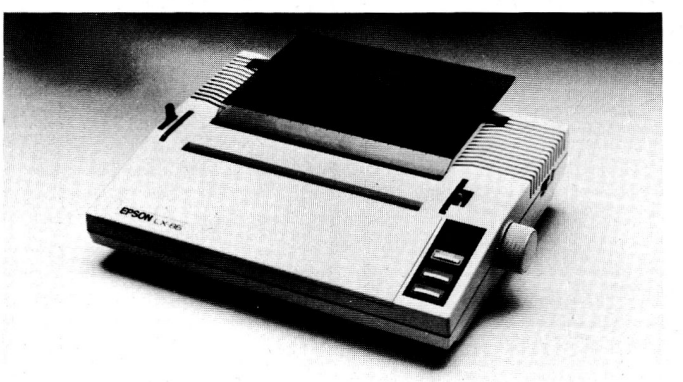
Keep your equipment quiet in a Sound-Write **Acoustical printer cover**. An expanded line of cabinets is now available in putty, oak, and walnut scratch- and stain-resistant finishes. For more information on the Sound-Write series of printer cabinets, contact Ring King Visibles at 2210 Second Avenue, P.O. Box 599, Muscatine, IA 52761, (319) 263-8144, or circle Reader Service number 361.

Selectable Type

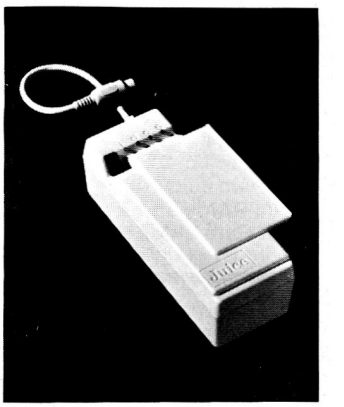
Select print quality at the touch of a button with the SelecType control panel on Epson's latest **dot-matrix printer**. The Epson LX-86 prints at a rate of 120 characters per second in draft pica mode and 16 cps in near-letter-quality. This 80-column, nine-pin printer operates bidirectionally in text modes and unidirectionally for bit-image graphics. The Epson LX-86 retails for $349, from Epson America, 2780 Lomita Boulevard, Torrance, CA 90505, (213) 539-9140. For more information, circle Reader Service number 364.

Power Plus

Provide up to 20 minutes of emergency power for your computer system during outages with Electronic Specialists' Sine UPS, a **sine-wave uninterruptible power supply**, available in 250- or 500-watt capacities. This on-line unit operates without disruptive switching transients and incorporates internal battery charging. Wide-band EMI/RFI filtering, high-speed and high-current spike suppression and an integral overload/short-circuit-proof configuration offer additional protection. The Sine UPS is available for $1095 (250-watt) and $1495 (500-watt), from Electronic Specialists, 171 South Main Street, Natick, MA 01760, (617) 655-1532. Circle Reader Service number 360 for more information.



The Epson LX-86: print-quality selection at the touch of a button, plus 120 cps in draft mode.



The Juice provides up to two hours of uninterruptible battery power for your //c.

Apple //c Juice

Protect your //c from memory loss during power surges or interruptions: The Juice **battery-based uninterruptible power supply** provides continuous power for up to two hours. It also makes your //c more portable—just plug the //c power cord into Juice's input receptacle and the Juice power output cord into your //c, and you're ready to go. The Juice weighs three pounds and is the smallest UPS made for the //c. It comes in an impact-resistant case that complements the color of the //c. The Juice UPS sells for $169.95, from Orbic Controls, 7853 Balboa Avenue, San Diego, CA 92111, (206) 488-8621. Circle Reader Service number 363 for more information.

Software

Games, Graphics, Models, and Menus

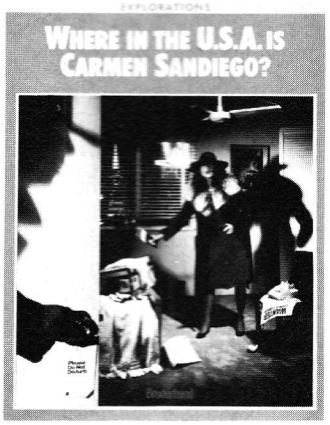
The folks at Broderbund Software have been busy lately, with five new releases: a **flight-simulation game**, a sequel to **Where in the World Is Carmen Sandiego?**, a **graphics-animation package**, a **model-construction program**, and a **menu planner**.

Airheart, selling for $34.95, is a double-hi-res, three-dimensional game that challenges you to pilot your craft around a variety of robotic opponents, each with unique characteristics and powers. In Where in the USA Is Carmen Sandiego? ($44.95) you'll be searching for Carmen and her villainous henchmen throughout the 50 states and the District of Columbia while learning about U.S. geography. The package includes a copy of the 460-page *Fodor's USA* travel guide to help you out.

Animate ($69.95), Broderbund's new graphics tool, offers a double-hi-res palette of 16 colors for creating and manipulating animated graphics routines. You can also incorporate designs from Dazzle Draw into your Animate sequences.

Make your own working mechanical models with Toy Shop ($59.95). Choose a project from the menu and customize it with patterns, graphics, and text, then print it. Place your hard-copy on the sturdy cardboard provided with the program, cut out the shapes, and assemble your model. Variable Feasts ($49.95) helps you plan your dinner menus. Select a main dish, then choose from suggested side dishes, soups, salads, appetizers, and desserts. Variable Feasts contains 260 recipes based on Time-Life Books' *Foods of the World* series.

These five new programs are available from Broderbund Software, 17 Paul Drive, San Rafael, CA 94903, (415) 479-1170. For more information, circle Reader Service number 359.



Track Carmen and other assorted villains around the United States in Where in the USA Is Carmen Sandiego?.

Matter of Figures

Figure your interest percentage, reconcile your checkbook, or plot a profit margin with a new **electronic worksheet** from SimplSoft. It Figures is a cross between a programmable calculator and a spreadsheet, with 51 applications for home, school, or business use. It Figures features complete line and screen editing, access to on-screen help lines and menus, local- and global-variable definition, and preprogrammed math and trigonometric functions. It Figures retails for $39.95 on 5¼-inch disks and $43.95 on 3½-inch disks, from SimplSoft Products, 5330 Sterling Drive, Suite C, Boulder, CO 80301, (303) 444-8771. Circle Reader Service number 355 for more information.



Gessler's La Corrida de Toros: Spanish vocabulary practice set in a bullfighting ring.

Still Hacking

In Hacker II: The Doomsday Papers, sequel to the 1985 **strategy-adventure simulation** Hacker, the U.S. government has learned of a plot to destroy the nation and asks you to help collect the details of a project known only as "the Doomsday Papers." You're confronted with a break into a private computer system; with no clues or rules, you have to search for the information and decide what to do with it. Accept your mission for $39.95, from Activision, 2350 Bayshore Frontage Road, Mountain View, CA 94043, (415) 960-0410. Circle Reader Service number 358 for more information.

Vocabulary Games

Gessler has two new ways to play **Hangman—in Spanish and French**. In La Corrida de Toros, students learn hundreds of Spanish vocabulary words in six categories, each with a vocabulary review and matching exercise set in a bullfighting ring. La Guillotine presents vocabulary words by topic in French, with reviews and exercises depicting events at the Bastille. La Corrida de Toros and La Guillotine retail for $29.95 each.

Another **language game** from Gessler, Giant World, is available in **French, Spanish, German, and English**. One hundred simulations build vocabulary and comprehension skills. Giant World sells for $39.95, from Gessler Educational Software, 900 Broadway, New York, NY 10003, (212) 673-3113. For more information on Gessler's educational games, circle Reader Service number 353.

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Circle 184 on Reader Service Card.

NEW PRODUCTS

Stickybear Strikes Again

Four new Stickybear titles—Stickybear **Drawing**, Stickybear **Music**, **Math Word Problems**, and Stickybear **Reading Comprehension**—give you extra hours of fun and learning. You can use Stickybear Drawing with a keyboard, mouse, joystick, or touchpad; choose from freehand Draw, Circle, Box, or Lines, plus a variety of brushes and colors in this menu-driven program. Stickybear Music lets you compose a melody (each note appears on screen as you enter it), play it, change the tempo, and edit individual notes and sections, then store your songs on disk to play or print anytime.

Math Word Problems includes more than 150 addition, subtraction, multiplication, and division exercises for students in grades four through six. Parents and teachers can add their own problems and adjust the program up or down to match students' progress. Stickybear Reading Comprehension contains more than 30 stories with accompanying questions. Teachers, students, or parents can enter their own stories and questions, choose appropriate grade levels, and print stories and answers.

The four new Stickybear titles retail for $39.95 each, from Weekly Reader Family Software, 245 Long Hill Road, Middletown, CT 06457, (203) 638-2400. For more information, circle Reader Service number 350.

The Classics on Screen

Electronic Arts' latest **adventure-game package**, Age of Adventure, includes two full-length games. In The Return of Heracles you lead a band of heroes through ancient Greece to complete the 12 Herculean tasks. You'll encounter more than 230 mythical monsters and explore up to 60 rooms. Your party can include as many as 19 travelers, with various levels of strength, dexterity, speed, and weaponry among them.

In Ali Baba and the 40 Thieves, you'll travel across Thieves' Mountain in ancient Persia to rescue the Sultan's daughter, by way of 62 rooms filled with all sorts of monsters, traps, and clues. Your band of rescuers can include up to 19 humans, dwarves, elves, and halflings. Age of Adventure retails for $14.95, from Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404, (415) 571-7171. For more information, circle Reader Service Number 356.

Printer Support

Give your printer a hand with **five printer-support utilities** rolled into one package. Print-Quick's programs let you set up combinations of printing features, use your printer as an electronic typewriter, do easy screen dumps, design and edit character sets, and print or display text files with printer-command characters shown. Print-Quick sells for $49.95 from Third Wave Technology, 11934 Lorain Avenue, Cleveland, OH 44111, (216) 671-8991. Circle Reader Service number 351 for more information.

Onward and Forth

For **Forth** programs you can run unedited on a variety of computers, get ahold of the **programming tool** MasterForth. MasterForth provides a Forth programming environment, including an assembler and full file interface. Forth programs you write on your Apple II will run on the Macintosh, IBM PC, and Commodore 64, and under Z-80 CP/M. MasterForth's relocatable

utilities and transient definitions make it possible to run substantial programs even with limited memory. Standard features include a string package, screen editor, and resident debugger. A target compiler is optional. MasterForth retails for $125, from Micromotion, 8726 South Sepulveda Boulevard, #A-171, Los Angeles, CA 90045, (213) 821-4340. For more information, circle Reader Service number 357.

Crossing Words

Design your own **crosswords**, with up to 20 words and clues per puzzle. Crossword Creator features a simple menu-driven format, manual or automatic puzzle generation, and an error-checking routine. The window-menu design makes composing crosswords easy. Puzzle and instructions are displayed on screen throughout the design process, and you can store, retreive, correct, or print your puzzle at any time. Crossword Creator sells for $29.95, from DEC Computing, 5307 Lynnwood Drive, West Lafayette, IN 47906. For more information, circle Reader Service number 354.

Mysterious Murder

Play the role of a London reporter in The Scoop, a new **mystery game** based on a novel by Agatha Christie and the Detection Club of London. A woman has been murdered, along with a reporter covering the story for a rival newspaper. Search for clues and interview witnesses as you try to solve the mystery. The Scoop retails for $39.95, from Telarium, a division of Spinnaker Software, One Kendall Square, Cambridge, MA 02139, (617) 494-1200. Circle Reader Service number 367 for more clues.

Resources

Pascal Mastery

Experienced **Turbo Pascal** programmers can take advantage of a new reference. *Turbo Pascal—Advanced Applications* provides a number of Pascal topics in a series of articles by different authors writing in their respective fields of expertise. The book is application-oriented, focusing on techniques to solve programming problems and implement solutions. *Turbo Pascal—Advanced Applications* retails for $16.95, from Rockland Publishing, 190 Sullivan Crossroad, Suite N, Columbia Falls, MT 59912, (406) 257-9119. For more information, circle Reader Service number 365.

Repair Center Directory

Where can you go for **computer-equipment repair**? The *Circuit Board and Disk Drive Repair Directory* can tell you. The listing includes 75 companies specializing in floppy-disk drives, hard drives, Winchester service, board repair, component rebuilding, and other services. The *Circuit Board and Disk Drive Repair Directory* is published by Coordinated Service, in conjunction with the *Coordinated Service Newsletter*. You can get a copy of the directory by sending $5 to cover shipping and handling to Linda, c/o Coordinated Service, 531 King Street, P.O. Box 1260, Littleton, MA 01460, (617) 486-0388. Circle Reader Service number 366 for more information.

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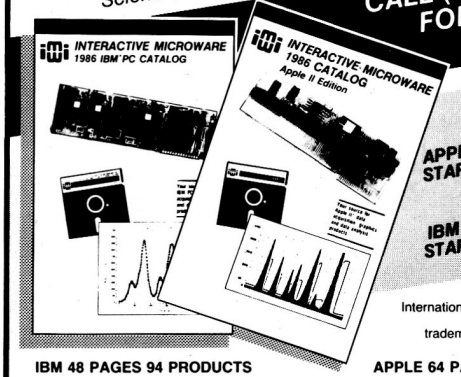

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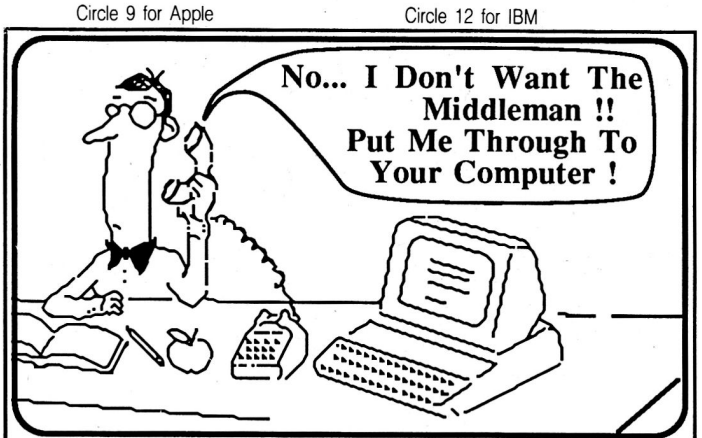

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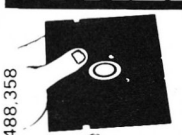

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● An upgraded version of **The Print Shop** lets you preview and save designs and print them in color. You can choose from up to eight hues, plus a "rainbow" color combination to accent each element of your design, including text, borders, backgrounds, and graphics. The updated Print Shop is available for $49.95, from Broderbund Software. Owners of the original Print Shop can mail in their disks with $20 (see address below) to receive the new edition.

● Broderbund has also added some features to its **Print Shop Graphics Library**. A **Holiday Edition** features new fonts, borders, images, and symbols to use with The Print Shop to create cards, banners, signs, and letterheads for more than 15 different holidays—from Christmas and Thanksgiving to St. Patrick's Day, Valentine's Day, and the Jewish holy days. The Holiday Edition of the Print Shop Graphics Library sells for $24.95 from Broderbund Software.

● Believe it or not, there's still more from Broderbund: two new programs for **Science Toolkit Master Module**. Science Toolkit **Module 1: Speed and Motion** includes an on-screen speedometer and tachometer, a balloon-powered car, a light-sensitive photocell, and a manual of ideas for experiments. **Module 2: Earthquake Lab** has an "earthquake detector" and an on-screen seismograph. The two Science Toolkit modules retail for $39.95 each.

Along with those programs, Broderbund has also released a **School Edition** of the Science Toolkit Master Module, priced at $89.95, which includes all the hardware and software that come with the original package; a back-up disk and teacher's manual with lesson plans, objectives, extra activities, and reproducible worksheets are sold separately for $30 per set. Contact Broderbund Software, 17 Paul Drive, San Rafael, CA 94903, (415) 479-1170.

● Dow Jones Information Services has enhanced its on-line data bases with a gateway link between **Dow Jones News/Retrieval** and **Westlaw**: Westlaw customers can now automatically log on to Dow Jones.

Dow Jones News/Retrieval has also upgraded its **corporate-earnings estimator** service. The original version, EARN, provided earnings-per-share forecasts for the current and next fiscal year. The new version, EPS, offers those figures plus the current week's earnings highlights, a list of companies whose earnings have drastically increased or decreased, names of companies whose earnings were much higher or lower than projected, analysts' buy and sell recommendations, and earnings estimates for about 100 industry groups. Subscribers can enter a company's stock symbol and obtain estimates of that firm's quarterly, annual, and five-year annualized EPS, plus a list of broker-

age firms tracking the company with analysts' ratings. For more information, contact Dow Jones, P.O. Box 300, Princeton, NJ 08540, (609) 452-2000.

● WordPerfect Corporation has released an updated version of its word processor for the Apple //e and //c. **WordPerfect 1.1** features increased overall speed for text entry and display and an installation program that takes advantage of expanded memory and other ProDOS-compatible hardware. The new WordPerfect also includes a 50,000-word spelling checker (formerly a $30 option). Two things the company apparently hasn't updated are the program's price and memory requirement. WordPerfect still costs $179 and requires 128K. WordPerfect Corporation is located at 288 West Center Street, Orem, UT 84057, (801) 227-4000.

● Abracadata has taken over distribution of the **Design Your Own Home** line of programs. Originally published by Avant-Garde, the series includes Architectural Design, Interior Design, and Landscape Design. Abracadata has made some improvements, such as use of Beagle Bros graphics routines, which support 47 printers and 64 interface cards. The company has also established a disk-exchange policy for owners of earlier Apple versions of the software. Contact Abracadata for details at P.O. Box 2352, Eugene, OR 97402, (503) 342-3030.

● Polarware/Penguin Software has permanently lowered the price tags on all software titles, new and old: Apple programs are now available for less than $40 each. Titles in the **Comprehend** interactive-novel series now sell for $17.95 each, the **Electric Crayon** line retails for $14.95 per module, and **home applications** range from $12.95 to $24.95. **Graphics Magician Painter and Animator** and the **Complete Graphics System** retail for $39.95 each. **Graphics Magician Junior** and other accessories sell for $12.95 to $19.95. Contact Polarware/Penguin Software for further details at 521 Hamilton, Box 311, Geneva, IL 60134, (312) 232-1984 or (800) 323-0884.

● The popular **Superbase** and **Superscript** programs are now available for the Apple II family. Superbase is a fully menu-driven data-base management system featuring more than 100 commands and a BASIC enhancement for creating complex custom applications. Superscript, a word processor, features built-in spelling-checker and mail-merge facilities, a full-function calculator, and a "Lotus-style" menu and screen display. The Apple versions of Superbase and Superscript retail for $99.95 and $79.95, respectively, from Progressive Peripherals and Software, 464 Kalamath Street, Denver, CO 80204, (303) 825-4144.

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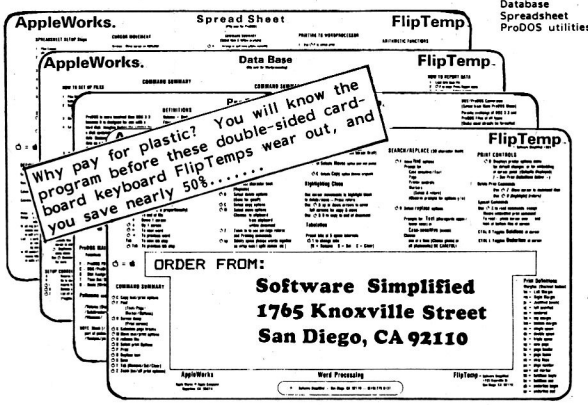

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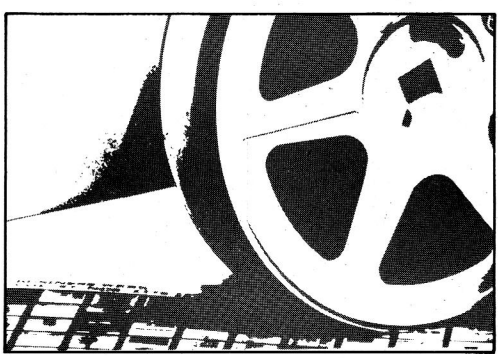

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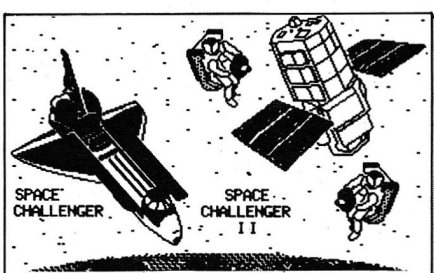

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GAME ROOM

by Brian J. Murphy

In Game Room, Brian Murphy tells us what's new in the world of Apple games. Look here for inCider's scoop on the latest fun.

How good are you at calculating odds and making decisions under pressure? The two war games we'll review this month pose that question in strikingly different ways.

One is a complex simulation of the Civil War's most famous battle; it may be the best war game ever published for the Apple II. The opposing forces are pretty even—factors such as surrounding terrain and your own coolness under fire are the elements that tip the scales.

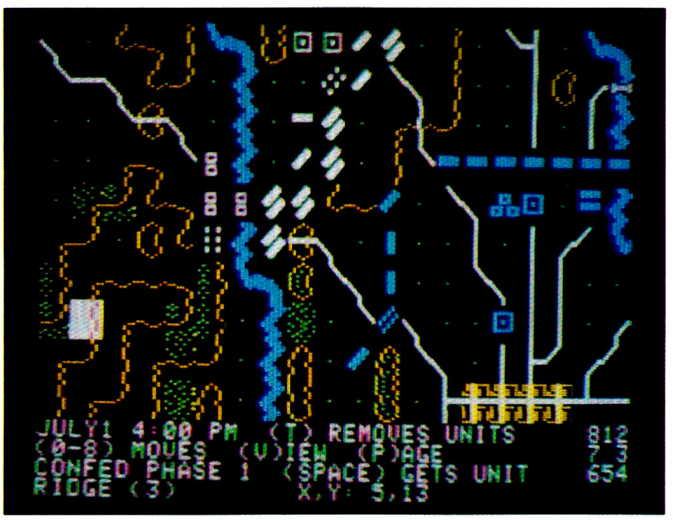
In the other game, a simulation of a hellish 21st-century war, numbers mean nothing. You have an army, but the odds favor one monstrous automated tank. Can all your skill—plus a double helping of luck—even the odds?

Gettysburg: The Turning Point

★★★★

Strategic Simulations
1046 North Rengstorff Avenue
Mountain View, CA 94043
Tactical war game
(one or two players)
Any 64K Apple II with Applesoft, one drive
$59.95

The odds in SSI's **Gettysburg: The Turning Point** aren't as even as you might think at first. While the number of Union soldiers is nearly equal to that of the Confederate force, the quality of the program routines controlling your computer's army makes it tough to beat.



The details of battle are faithfully simulated in Gettysburg: The Turning Point.

I admit it—I blew it. On the first day of the actual Battle of Gettysburg, converging Confederates enormously outnumbered the Union side. Somehow, though, Union General Abner Doubleday managed not to squander his command. On the other hand, the game program soundly thrashed your humble Union correspondent with the best automatic opposition of any war game I've played. Gettysburg is supposed to be a three-day scenario, but I was out of it on the first day.

As humiliating as my defeat is, I have to admit that Gettysburg is the best-designed, most exciting war game for the Apple II. It's even better than its direct ancestor, Battle of Antietam, which SSI released earlier this year (see Reviews, August 1986, p. 32). I gave Antietam a rating of four—*inCider*'s highest—in every category. If I could give Gettysburg five stars, I would.

Why is Gettysburg so engrossing? First, it simulates a challenging battle situation: When the odds are square, your skill as a commander decides the game. You'll lose sleep trying to figure your way out of a hundred and one tough tactical problems.

The game is also lavishly detailed; it faithfully re-creates every hill and clump of trees. You're moving demi-brigade-sized units of 500 to 1200 men each, so each turn involves hundreds of decisions regarding attack, defense, terrain, sighting, and movement, all while keeping the big picture in mind, so that your strategy is coherent.

Third, despite the complexity of battle, the game system itself is easy to master. Play moves smoothly, and you don't have to interrupt it to repeatedly consult the manual. Finally, you can command either side and compete at three levels of play; the game is flexible enough to let you see the battle from new and exciting perspectives.

Ogre

★★★

Electronic Arts
1820 Gateway Avenue
San Mateo, CA 94404
Science-fiction tactical war game
(one or two players)
Any 64K Apple II,
one drive
$39.95

In the mists of antiquity, before I saw my first computer game, there was **Ogre**—the definitive game of insurmountable odds. At the time, Ogre was a cute little paper war game for about $4. Now it's available from Origin Systems (distributed by Electronic Arts) for about $40, but it's still the same bloodthirsty donnybrook.

The premise is simple. Ogre—the ultimate battle tank—rumbles along a barren battlefield in a bleak future era. Fully automated and utterly remorseless, Ogre packs missiles and three other types of offensive weapons capable of destroying opposing tanks, armored vehicles, or infantry. With three-meter-thick walls of superhard armor, Ogre is heavy and can triumph just by colliding with another vehicle. To make matters worse, it's fast, hitting speeds of about 45 kilometers per hour.

To oppose this one tank, you have a formidable force of armored vehicles, plus infantry, to defend your command post. The

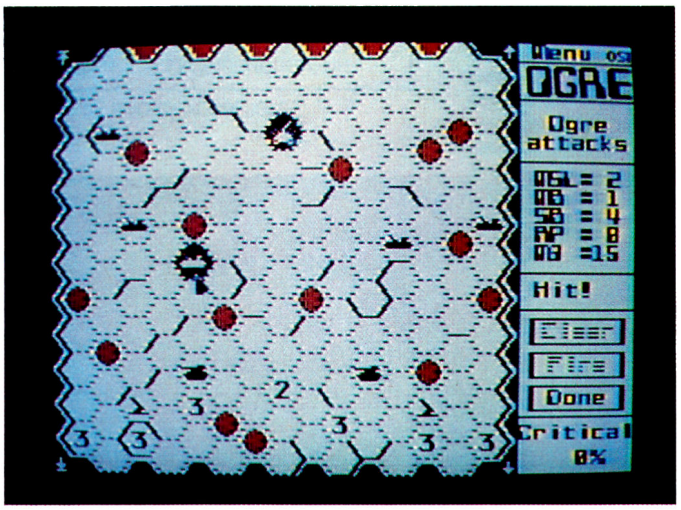
inCider's Ratings

★★★★	Excellent
★★★	Above average
★★	Good enough
★	Not up to standards
☆	The empty set

odds should be about 50 to one in your favor. They're more like 300 to one against you—Ogre is one mean tank. Even with all your tanks, troops, howitzers, and ground-effect vehicles, beating a "mark 3" Ogre (the weaker of the two versions) seems impossible and takes many games to master.

If you want to learn winning tactics with as little damage to your ego as possible, take a vacation from the usual limits and order the program to accept vastly inflated numbers of defending vehicles and guns. This will give you a chance to see what works best against Ogre—if any weapon can be said to have an effect.

Strategy is simple: Knock out Ogre's three weapon systems and its treads. The game gets really interesting when you discover that merely having Ogre in range of your weapons may not be enough. Just when you need them most (in other words, with every attempt), you'll find your shots missing or glancing off the armor. Then Ogre will fire, usually at three targets, knocking them all out.



Ogre presents the ultimate challenge: a ruthless, unstoppable armored tank.

Here's just the sort of challenge you like—a desperate battle with hopeless odds—one Ogre versus your dozen or so guns and vehicles with supporting infantry. Add some Macintosh-style pull-down menus, lively color graphics, and scintillating sound, and odds are you'll at least have a ripping good time, even while Ogre is giving you the beating of your life. ■

Brian Murphy is anxious to learn what you think of the current state of computer games. Write him at inCider, *Elm Street, Peterborough, NH 03458, and let him know your opinion.*

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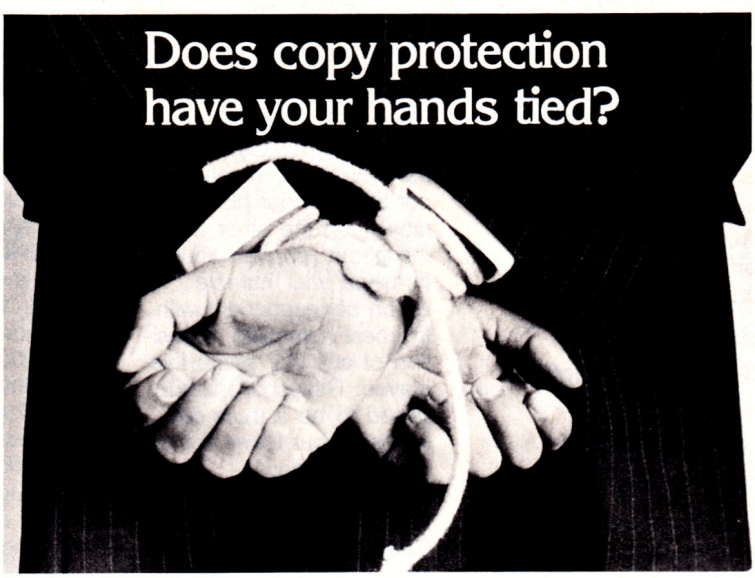

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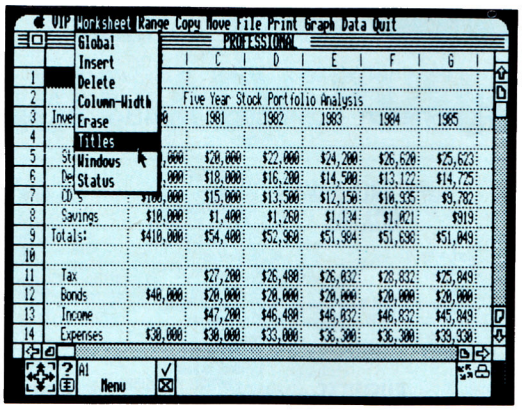

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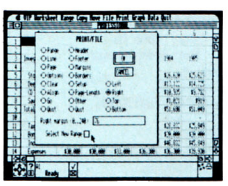

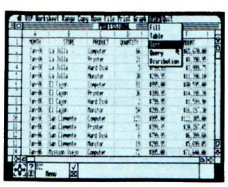

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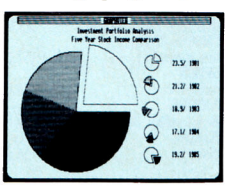

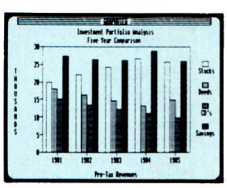

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In & Out

by Harold D. Portnoy

Applesoft BASIC's INPUT statement won't accept certain characters, such as commas or colons, and has no line-editing ability, while its PRINT statement doesn't provide wraparound. Although Apple's ProDOS System Utilities disk includes an improved INPUT statement that accepts any character and lets you insert and delete characters, and a PRINT command that handles wraparound, they occupy 15 pages of RAM and aren't relocatable; in addition, the INPUT statement accepts only 160 characters.

In & Out (see **Listing 1**) has similarly intelligent INPUT and PRINT statements, but with the following advantages: The program occupies only two pages of RAM and is relocatable, and the INPUT statement accepts up to 256 characters. You can use the INPUT function in EXEC programs to interrupt program execution or type in up to five characters.

Listing 1 provides two forms of the INPUT statement, &INPUT X$ and &INPUT X$,L, where X$ represents any legal string variable, and L a length parameter from zero to 255. If you don't specify L, &INPUT will accept 256 characters. Use the PRINT statement in the form &PRINT X$ or &?X$, where X$ is, again, any legal string variable. These two functions can create or print only string variables, and work under DOS 3.3 or ProDOS in 40- or 80-column format.

Listing 1. *In & Out.*

```
CALL -151
2000:00
2001<2000.20FEM
2000:A5 74 38 E9 02 85 74 AE 00 BF E0 4C D0 03 18 69
2010:04 48 85 43 A2 00 8E F6 03 38 68 8D F7 03 E9 21
2020:85 08 A0 00 A9 21 84 3C 85 3D A0 FD A9 22 84 3E
2030:85 3F A0 00 84 42 4C 2C FE 00 00 00 00 00 00 00
2100:20 B7 00 C9 84 F0 39 A9 BA 20 C0 DE 20 E3 DF 20
2110:6C DD A5 24 8D 7B 05 A0 00 B1 83 F0 22 85 FE C8
2120:B1 83 85 AB C8 B1 83 85 AC A0 00 F0 15 C4 FE B0
2130:0E B1 AB C8 C9 20 F0 0A 09 80 20 ED FD D0 EE 60
2140:F0 4F 84 3E A2 01 86 3D C4 FE B0 09 C8 E6 3D B1
2150:AB C9 20 D0 F3 38 A5 21 2C 1F C0 10 06 ED 7B 05
2160:B8 50 02 E5 24 85 3C E5 3D 10 0C C6 3C A6 3C A9
2170:A0 20 ED FD CA 10 F8 A4 3E 2C 1F C0 10 07 AD 7B
2180:05 F0 0B D0 04 A5 24 F0 05 A9 A0 20 ED FD B8 50
2190:9C 20 B1 00 20 E3 DF 85 85 85 AB 84 86 84 AC 20
21A0:6C DD A9 00 85 FE 85 FD A9 FF 85 FF A5 24 A4 25
21B0:2C 1F C0 10 06 AD 7B 05 AC FB 05 85 F9 84 FA 20
21C0:B7 00 F0 13 20 BE DE 20 B7 00 20 F8 E6 86 FF 20
21D0:B7 00 F0 03 4C C9 DE A2 00 86 FB B8 50 50 E4 FD
21E0:F0 07 E8 20 F4 FB B8 50 F5 A4 24 B1 28 20 1B FD
21F0:C9 FF F0 3E C9 A0 90 3E A4 FF 88 C4 FE B0 06 20
2200:3A FF B8 50 D2 A4 FE C4 FF B0 F4 48 C6 FD B9 00
2210:02 99 01 02 88 C4 FD D0 F5 C8 68 99 00 02 E6 FE
2220:E6 FD E6 FD A9 01 85 FC B8 50 76 B8 50 A9 50 4B
2230:F0 AC F0 4B F0 C9 C9 8D F0 0E C9 88 F0 22 C9 95
2240:F0 27 C9 84 F0 39 D0 B7 A6 FE F0 07 A9 00 85 FC
2250:B8 50 4E 20 39 D5 A9 00 A0 02 20 ED E3 4C 7B DA
2260:A4 FD F0 9B C6 FD B8 50 C2 A4 FE F0 92 88 C4 FD
2270:90 8D E6 FD B8 50 B4 F0 DA D0 B0 50 6C F0 B1 A4
2280:FD F0 B1 88 B9 01 02 99 00 02 C8 C4 FE D0 F5 88
2290:A9 A0 99 00 02 85 FC B8 50 07 C6 FE C6 FD B8 50
22A0:8A A2 FF 86 FB E8 B8 50 40 AD FB 05 2C 1F C0 30
22B0:02 A5 25 C9 17 D0 11 2C 1F C0 10 08 AD 7B 05 C9
22C0:4F B8 50 04 A5 24 C9 27 D0 0A C6 FA C6 25 20 C1
22D0:FB 20 70 FC BD 00 02 20 ED FD E8 E4 FE D0 CA A5
22E0:FC F0 94 C9 A0 F0 B3 D0 90 A5 F9 85 24 8D 7B 05
22F0:A5 FA 85 25 20 C1 FB A5 FB F0 82 D0 AC 00
300:A9 A0 4C 1B FD
BSAVE IN.OUT,A8192,L766
-IN.OUT
3D0G
A$="   USING IN & OUT IN AN EXEC PROGRAM"
B$="This is a demonstration of the use of the input anything
and wrap-around print routines in the IN & OUT program.
First note that each line of print properly wraps around so
that no word is split at the end of a line. "
C$="Second, note that the input to the screen stops and
waits for you to enter a RETURN."
D$="Normally an EXEC program will not stop for an input.
Using IN & OUT, the EXEC program stops for your prompt. If
you like, it will not only stop but will also accept an
input. Try this!"
E$="    1. Print message X"
F$="    2. Print message Y"
G$="This is message X. Note in the original text of this
program how VTAB PEEK(37) is used to eliminate the bracket
```

Listing continued.

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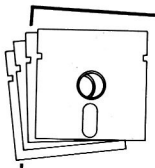

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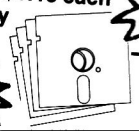

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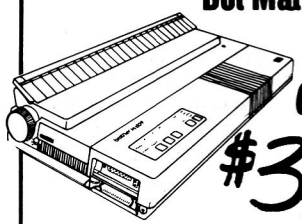

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Listing continued.

```
prompt that clutters a message EXECed to the screen."
H$="This is message Y. Note in the original text of this
program how IF statements are used to direct the printing of
messages."
I$="You did not select a message."
HOME

VTAB PEEK(37):?A$
VTAB PEEK(37): CALL -958
VTAB PEEK(37):&?B$
VTAB PEEK(37):&?C$
VTAB PEEK(37): CALL -958
VTAB PEEK(37):?"Press RETURN to continue. ";:&INPUTZ$,Ø
HOME
VTAB PEEK(37):&?D$
VTAB PEEK(37): CALL -958
VTAB PEEK(37):?E$
VTAB PEEK(37): CALL -958
VTAB PEEK(37):?F$
VTAB PEEK(37): CALL -958:Z$="Ø"
VTAB PEEK(37):?"Enter your selection. ";:&INPUTZ$,1
VTAB PEEK(37): CALL -958
IF Z$ = "1" THEN VTAB PEEK(37):&?G$
IF Z$ = "2" THEN VTAB PEEK(37) -2:&?H$
IF Z$ <> "1" AND Z$ <> "2" THEN VTAB PEEK(37) -4:&?I$
VTAB PEEK(37): CALL -958
?"An example using CALL 768. ";: CALL 768
```

End of Listing.

&INPUT and &PRINT let you expand text files for EXEC programs. &PRINT's wraparound printing feature lets you write screen text while minimizing prompt (]) printing, since you can type long character strings without splitting words at the end of a line. The new &INPUT function lets you stop the EXEC program to type in material.

Listing 1 creates the binary file IN.OUT when you type it on a word processor, then convert it to a text file and run it. It also demonstrates how to make EXEC files look better by eliminating the bracket prompt (]). &INPUT can alter the course of an EXEC program with careful use of IF statements as shown in **Listing 1**. You can also improve your program's appearance by using VTAB PEEK(37): CALL -958 to erase screen prompts. These commands back up the cursor one line and clear the screen from the cursor to the lower-right corner. Type in the listing exactly as shown, being careful not to insert any blank lines.

How does &INPUT stop the EXEC program? The &INPUT routine uses the KEYIN subroutine at $FD1B, which reads the keyboard. Unlike the more frequently used character-input subroutine, RDKEY at $FD0C, KEYIN doesn't echo the character to the keyboard-input buffer in page 2 of RAM; therefore, it doesn't recognize the next RETURN character in the EXEC program, and thus doesn't force the program to continue.

You can stop printing to the screen in an EXEC program by calling KEYIN directly, but this prints on screen whatever character is in the accumulator, and results in a messy screen. Eliminate the character in the accumulator with the short routine below, which loads a space into the accumulator before jumping to the KEYIN subroutine:

```
300:A9 A0 4C 1B FD
```

Access this routine with CALL 768 (see the example in the last line of **Listing 1**).

IN & OUT's main routine begins at $2100 and is relocatable. You can use it separately in your own programs, but be sure to direct the ampersand vector at $3F5 to the beginning of the routine. The file loads in at $2000. The code from $2000 to $2038 is a launcher that automatically determines whether you're running DOS 3.3 or ProDOS, resets HIMEM, moves the relocatable code $2100–$22FC above HIMEM, and changes the ampersand vector to point to the beginning of the routine.■

Write to Harold Portnoy at 1431 Woodward, Bloomfield Hills, MI 48013.

Spreadsheet Highlighting

by Morton M. Axler

In the "olden days," when VisiCalc and MagiCalc were about the only electronic spreadsheets on the market, you could set up an @IF formula that would insert asterisks instead of numbers into particular cells. The instruction books described this as a form of graphing, but for that purpose it was rather crude. As a highlighter, though, the asterisk was useful for pointing out any significant changes from one column to the next.

AppleWorks doesn't have this graphing feature, but you can adapt three other symbols for the same function: # for increase, E for no change, and N for negative change, or decrease. While they're not as dramatic-looking as asterisks, they're effective and more specific.

The technique depends on the fact that when an AppleWorks spreadsheet column is too narrow to show a value, it produces a pound (#) symbol; and when either @ERROR or @NA is present in a narrow column, only the letters that fit are printed on screen. The **Figure** shows a rudimentary spreadsheet template that compares stock prices from one period to another. Here's a step-by-step description:

1) Column B lists your securities.

2) Column C lists the current prices of the stocks.

3) Column D lists the prices of the stocks the last time you ran the template.

4) Go to column F. Press open apple-L, C (column), right arrow (to include column F), and Return. Press open apple-left arrow; repeat until columns E and F are one space wide; hit Return. Both columns are narrowed so that column E separates symbols from numbers. If you prefer the symbols flush against the last number, narrow only one column.

5) Place the cursor on F7. Type in the following formula: @IF(C7>D7, 100,@IF(C7=D7,@ERROR,@NA)). (Translation: If today's price is higher than last time's, put the number 100 into F7. Since F7 is only one space wide, the program will print the # symbol instead of the number. If the price isn't higher, if the two prices are equal, print ERROR. Again, since the column is only one space wide, only the E prints. If neither of the above statements is true, print NA, which shows up as N.)

6) Press open apple-C, W (within document), and Return. Move the cursor to F8, type a period, move the cursor down column F to the last entry, and press Return. Type R (relative) for all references.

The definitions of these three symbols aren't restricted to *higher*, *lower*, and *equal*—you can designate them for any type of comparison, perhaps for 10 percent, 20 percent, and 30 percent changes. In any application, though, they make it easier to look through a long column of figures and spot the data that need your attention. ■

Write to Morton Axler at 11400 Southwest 67th Avenue, Miami, FL 33156.

Figure. *AppleWorks spreadsheet stock comparison.*

A	B	C	D	EF
1				
2	STOCK	CURRENT	PREVIOUS	
3	NAME	SHARE	SHARE	
4		PRICE	PRICE	
5				
6	==========	==========	==========	==========
7	WIDGET CO	19.25Ø	19.25Ø	E
8	XYZ CO	18.5ØØ	18.875	N
9	ABC CO	13.ØØØ	14.25Ø	N
1Ø	SPACE INC	28.325	12.125	#
11	TOY CO	1Ø.ØØØ	18.25Ø	N
12	CANDY INC	15.5ØØ	21.ØØØ	#

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Listing 2. Magic Numbers patch.

```
 115    GOSUB 8000: REM  GAMES IN REGULAR SEASON
8000    REM  NUMBER OF GAMES IN REGULAR SEASON PLAY
8010    HOME : VTAB 4: HTAB 4: INVERSE : PRINT "LENGTH OF
        REGULAR PLAYING SEASON": NORMAL
8020    VTAB 8: PRINT "NUMBER OF GAMES PLAYED BY EACH TEAM"
8030    VTAB 10: INPUT "DURING THE REGULAR SEASON: ";TG
8040    RETURN
```


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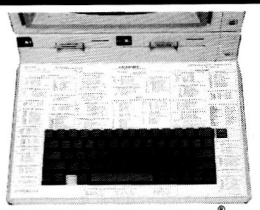

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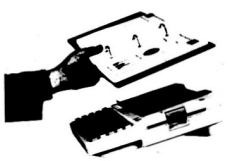

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Magic Numbers Patch

by F.E. Trousdale

The statistical program Magic Numbers (see July 1986, p. 101), as written, is restricted to major-league baseball-team records and standings. If you're not a fan of our national pastime, with a few modifications you can also use the program for any league-type sport in which all teams play the same number of games per season.

The trick is to realize that each major-league baseball team plays 162 games during the regular season. To open the program up, change this figure to a constant wherever it appears, and add a routine to enter the number of games played per season in the league or sport in which you're interested. Follow these steps to make the patch:

1) Replace the number *162* in lines 1150, 1160, 2300, 2310, 2330, 2510, 2520, 2540, 5120, 5130, 5550, and 5560 with the letters *TG*.

2) Add the lines shown in **Listing 2**.

3) Give your program a new name (that is, not Magic Numbers) and save it.

Your modified Magic Numbers now works just as well for teams in your local touch-football league as it does for NFL, NBA, or major-league baseball clubs.■

Write to ETCM F.E. Trousdale, U.S.S. Blue Ridge (LCC-19), FPO San Francisco, CA 96628.

Applesoft Screen Printer

by Dudley Glass III

If you're looking for a way to get your Apple II screen to the page, the program module shown in **Listing 3** can solve your problem.

It's not fast (an 80-column screen requires 45 seconds to convert), but it's simple, and it works. It uses an array (LINE$(N)) to buffer the screen data, which are assembled byte by byte. Nested loops starting at line 60020 handle the strange screen-to-memory mapping with which Apple II programmers must wrestle.

During operation, the screen will be scrambled while the program sends data to your printer, but the original image is restored as soon as the transfer is complete (lines 60180–60210).

To use **Listing 3** as a subroutine in a program, just incorporate the lines as shown. Note that your Apple should encounter line 60000 only once; if your program is going to use this routine more than once per run, either move line 60000 to avoid REDIM'D ARRAY errors, or direct all GOSUB's to the routine after the first one to use line 60010 as their entry point.

If your printer-interface card is in a slot other than number 5, edit line 60130 accordingly.

With some slight modifications, you can use the routine for 40-column displays, as well. Simply delete lines 60010, 60060, 60080, and 60090, and change the output-vector-restore instruction in line 60170 from PR#3 to PR#0.

If you delete the last line, you can also run the routine as a separate program. Among the screen data it will capture, though, is the RUN command you entered to start the effort. To avoid including it in the output, change the loop values in line 60140 to eliminate printing the last lines of the screen, if you prefer.■

Write to Dudley Glass at 7894 Tyson Oaks Circle, Vienna, VA 22180.

Listing 3. Applesoft Screen Printer, a screen-dump program for 80 columns.

```
1  REM

       80 COL SCREEN PRINT

2  REM

            BY

3  REM

       DUDLEY GLASS, III

4  REM

60000  DIM LINE$(23)
60010  POKE 49153,0: REM  DELETE FOR 40 COL
60020  FOR A = 0 TO 80 STEP 40
60030  FOR B = 0 TO 896 STEP 128
60040  FOR C = 0 TO 39
60050  Q = 1024 + A + B + C
60060  POKE 49237,0: REM  DELETE FOR 40 COL
60070  Y = PEEK (Q):LINE$(N) = LINE$(N) + CHR$ (Y)
60080  POKE 49236,0: REM  DELETE FOR 40 COL
60090  Y = PEEK (Q):LINE$(N) = LINE$(N) + CHR$ (Y):
       REM  DELETE FOR 40 COL
60100  NEXT
60110  N = N + 1
60120  NEXT : NEXT
60130  PRINT  CHR$ (4);"PR#5": REM  CHANGE TO YOUR
       PRINTER SLOT #
60140  FOR X = 0 TO 23
60150  PRINT LINE$(X)
60160  NEXT
60170  PRINT  CHR$ (4);"PR#3":
       REM  CHANGE TO #0 FOR 40 COL
60180  FOR X = 0 TO 23
60190  VTAB X + 1
60200  PRINT LINE$(X);
60210  NEXT
60220  RETURN : REM  DELETE IF NOT USED AS SUBROUTINE
```

Modified Transfer

by Harold D. Portnoy

A sharp *inCider* reader has pointed out an error in Transfer (August 1986, p. 106), a program that transports your selected files from disk to the ProDOS RAM drive: In line 1180, the second GOTO should be followed by the line number 530, not 320. In addition, the other accompanying modifications (see **Listing 4**) improve the efficiency of the program.

Using your word processor, type in the program lines shown in **Listing 4** and save them as a text file. Load your earlier copy of Transfer, then EXEC the text file to correctly edit the program. Your copy of Transfer should now be bug-free.■

Write to Harold D. Portnoy at 1431 Woodward, Bloomfield Hills, MI 48013.

Got a hint of your own? inCider would like to see it. If we can use it in Hints/Techniques, we'll buy it from you. Send your tip to inCider, Elm Street, Peterborough, NH 03458.

Listing 4. Transfer modifications.

```
105   LOMEM: 28672
130   DIM L$(50): DIM L(50): DIM CK(50)
620
660   L$ = L$(I):L = L(I)
675   T = PEEK (828)
690   PRINT  CHR$ (4);"CREATE/RAM/";L$;",T";T
720   PRINT  CHR$
      (4);"BLOAD";V$;L$;",A$2000,B";B;",L";LN;",T";T
730   PRINT  CHR$
      (4);"BSAVE/RAM/";L$;",A$2000,B";B;",L";LN;",T";T
850   HOME : PRINT  CHR$ (21): END
1180  E =  PEEK (222): CALL  -3288: ON (E = 9) GOTO 1210:
      ON (E = 5) GOTO 530
```

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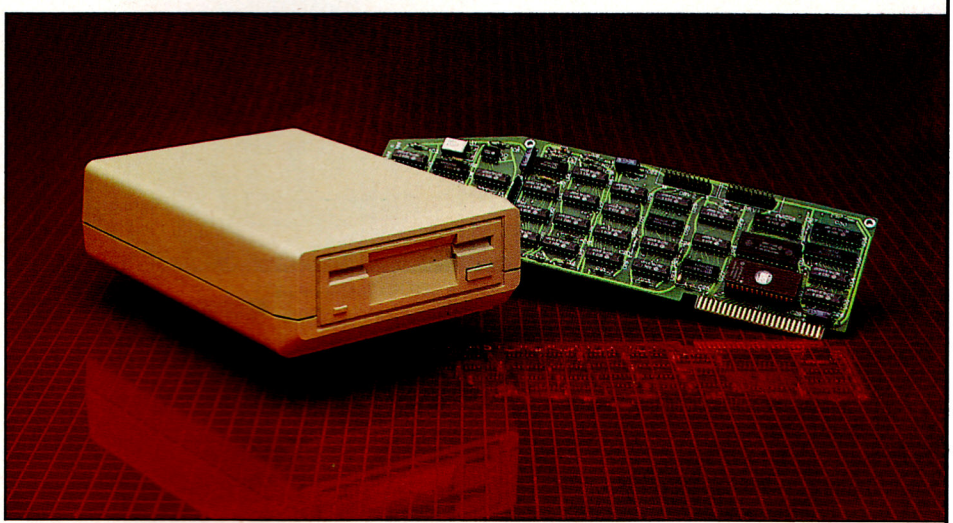

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LogoWriter: The Turtle Wins the Race

Students in the computer lab at the Hennigan School, Boston, Massachusetts, are learning about Logo programming, word processing, and computer graphics—all at once. The Hennigan School is a test site for **LogoWriter**, a programmable word processor and turtle-graphics program from Logo Computer Systems International (LCSI). We've visited the school and used LogoWriter in our offices, and we're impressed.



The package contains enough material to occupy a classroom for at least a year: six *Learning with LogoWriter* project booklets, each accompanied by a set of activity cards, a thorough reference manual, a set of reference cards, a teacher's manual, keyboard stickers, and a poster.

When Technical Editor Paul Statt and Assistant Editor Lafe Low visited the Hennigan School, they noted the students' response to LogoWriter. "Those kids were incredibly enthusiastic," according to Low. "I'd just stand behind some of them, watching for a moment, and they'd turn around and start right in explaining what they were doing, showing me pictures they'd drawn and stories they'd written. They were very, very proud."

It's easy for children (and editors) to be proud of what they've produced with LogoWriter. The project books lead students through all the Logo commands (called *primitives*) in a logical progression, each building on those learned in the previous module. Very soon, children are creating their own drawings and stories. They probably don't even realize they're also learning Logo programming.

LogoWriter includes a number of features that make it especially easy to learn. Guided by the first project booklet, students go through built-in tutorials, called Learn Pages, that introduce the keyboard and Logo's graphics commands and input commands. LogoWriter keeps students' interest with a variety of activities, ranging from making greeting cards and writing interactive mystery stories to creating musical cartoons. After completing all the exercises in a project booklet, students are referred to the accompanying set of activity cards for more ideas and assignments.

Almost as important to LogoWriter's educational effectiveness as the program and supporting materials is the LogoWriter site-license agreement, which allows teachers unlimited copying of the LogoWriter program within their schools. "More educational-software companies should have an arrangement like LCSI's," says Managing Editor Dan Muse. "It makes quality software a lot more accessible to school systems that can't afford to buy separate packages for every machine."

For an additional licensing fee, an extension privilege permits students to take copies of LogoWriter home. LCSI also offers districtwide and statewide licensing (contact the company for details). Teachers can order documentation, activity cards, and other support material through LCSI.

The LogoWriter package sells for $395 from Logo Computer Systems International, 9960 Côte de Liesse Road, Lachine, Quebec, Canada H8T 1A1, telex 05 821624. The U.S. office is located at 555 West 57th Street, Suite 1236, New York, NY 10019, (212) 765-4780, or (800) 321-LOGO. ■

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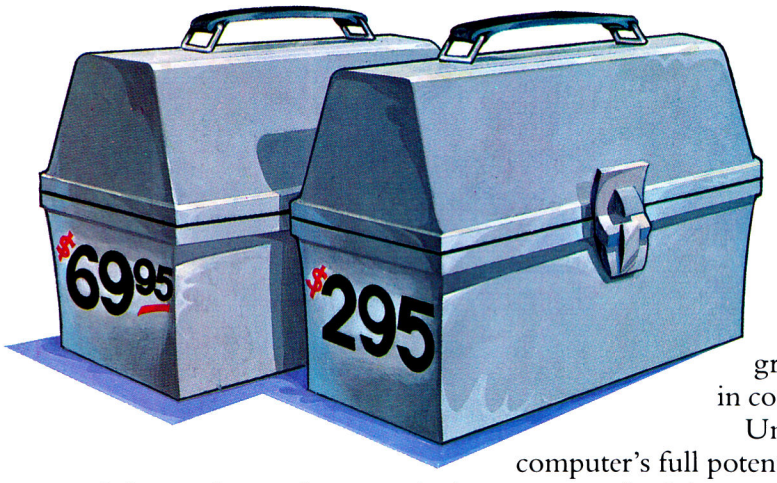

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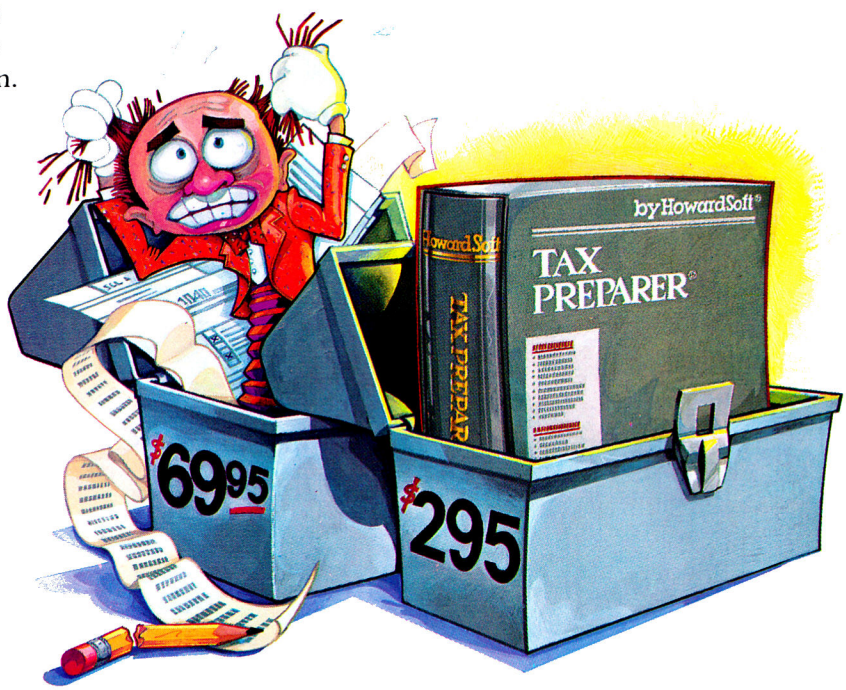

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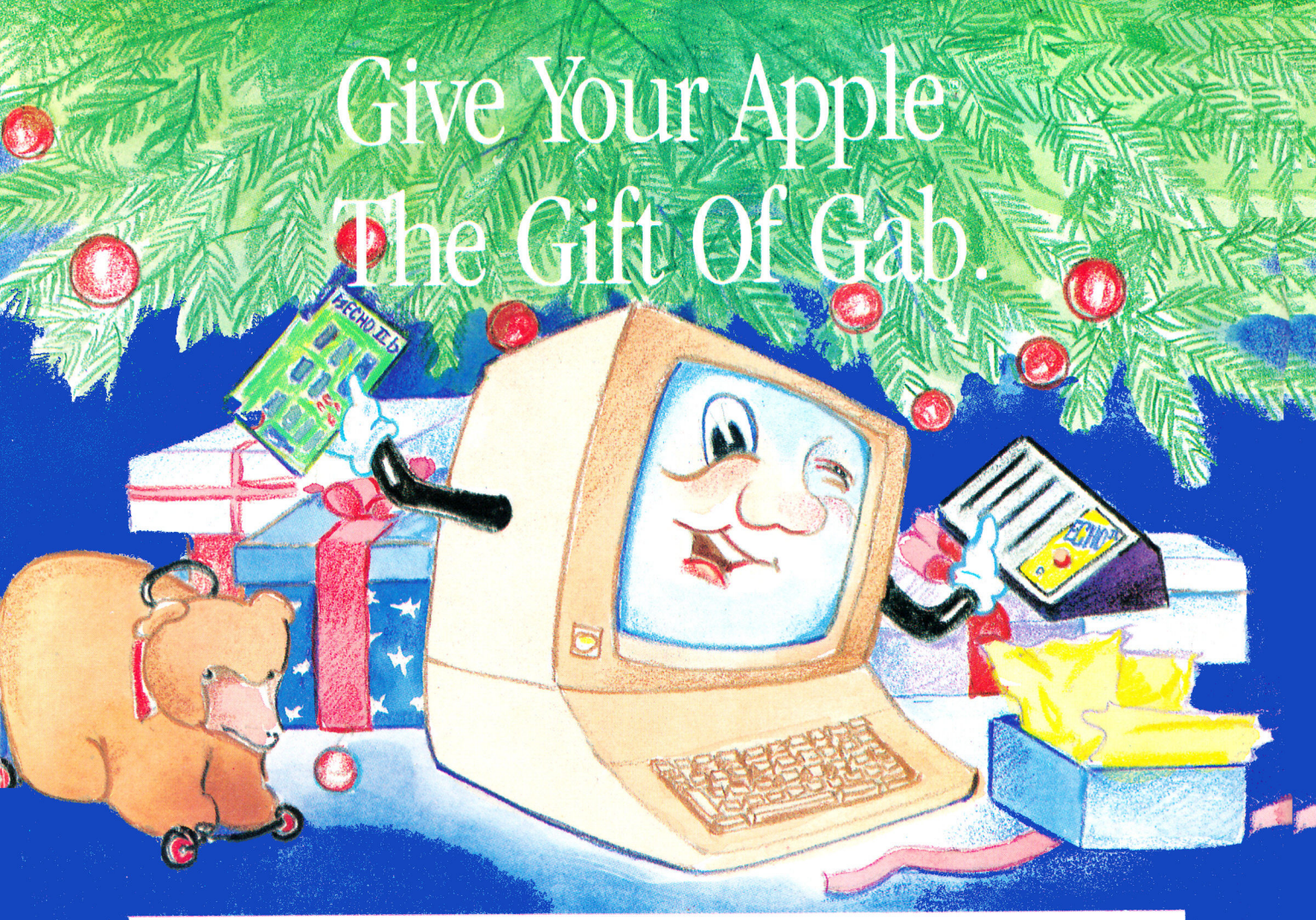

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The Echo IIb comes with a high-quality external speaker with volume control and headphone jack, a tutorial manual, and a diskette which includes a number of demonstration and utility programs.

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The Echo IIb, like the Echo II, Echo +, and Cricket, is compatible with over 100 educational programs as well as numerous programs for special needs applications. Contact Street for a list of companies offering these talking programs.

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